National Culture and the Return Manipulation of Hedge Funds

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ABSTRACT

Using a sample of hedge funds from 40 countries, we investigate the effects of national culture on the extent to which hedge fund managers smooth self-reported returns. We find that hedge fund returns smoothing behaviors are significantly influenced by four dimensions of national culture pioneered by Hofstede, after controlling for fund characteristics and liquidity. Specifically, Individualism, Masculinity, and Power distance are positively related to returns smoothing and Uncertainty avoidance is negatively related to that. Moreover, other than returns smoothing, our cultural measures also have some explanatory power on suspicious patterns in hedge fund returns identified by prior studies. Overall, our results suggest that national culture play an important role on explaining unethical behaviors of hedge funds and therefore give some valuable information to investors and regulators.

Keywords: hedge fund; national culture; return manipulation;

JEL classification: G15, G20, G23, G02

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1. Introduction

Hedge funds have enjoyed explosive growth over the last two decades and played a major role in the global financial markets. This remarkable growth of hedge fund industry may arise because they record superior performance persistently with reduced volatility based on talented managers' ability. Due to this prominent performance and great impact on the financial markets, many academic researchers and practitioners have much interest on their trading strategies and managerial skills.

However, as several cases of fraud and man-made patterns in their reported returns have been detected, the dark sides of the prominent performance come up to the surface with great importance for both investors and regulators. Those concerns about reliability of reported returns are fueled by several notable features of hedge fund industry for following reasons. First of all, hedge fund managers are rewarded by two types of compensation process. Specifically, they are compensated by incentive fees determined based on annual performance and management fees determined by asset under management. Given the facts that investors are more likely attracted to funds that record superior performance, hedge fund managers have both direct and indirect economic incentives to manipulate returns to exaggerate their performance (See, Bollen and Pool 2009; Agarwal, Daniel, and Naik 2011; Fung, Hsieh, Naik and Ramadorai 2008). Second, hedge funds enjoy the light regulations. Due to much more limited disclosure requirements than other institutions, hedge fund trading strategies and holding positions are highly secretive. Under that circumstance, investors and regulators hard to verify the reliability of self-reported performance records with limited information. In this regard, hedge fund managers have great opportunities to manipulate returns. Finally, hedge fund database reporting system is voluntary. Since hedge funds are under no legal obligation to report their returns, the decision to report in a database is voluntary and therefore primary purpose of that is advertising. Given that they need a good performance record to draw a new investment capital, the question about the reliability of reported returns naturally arises. Collectively, based on the nature of hedge fund industry discussed above, hedge fund managers have strong incentives and great opportunities to manipulate their performance to maximize their economic compensation.

Prior researchers have tried to investigate the suspicious patterns observed in reported returns as an evidence of manipulation by hedge fund managers. Among these patterns, substantial serial correlation of hedge fund returns is well documented by prior research (see Asness, Krail, Liew 2001; Getmansky, Lo, and Makarov 2004; Cassar and Gerakos 2011). Those studies try to uncover the determinants driving that anomalous property of hedge fund returns and figure out the mechanisms through which this phenomenon occurs. Getmansky, Lo, and Makarov (2004) find evidence of greater positive serial correlation in the self-reported hedge fund returns and suggest two main drivers of the abnormal serial correlation of hedge fund returns, *asset illiquidity* and *intentional smoothing*. After that, Cassar and Gerakos (2011) also find the evidence consistent with arguments of Getmansky et al. (2004) and conclude that illiquidity of assets is the major factor driving smoothed returns of hedge funds.

The questions about whether substantial serial correlation observed in hedge fund returns is intentional or not have great importance in economic perspectives. As noted by Getmansky et al. (2004), intentional smoothing by managers can artificially generate low volatility of observed returns and thereby distort risk-adjusted performance measures such as Sharpe ratio. Moreover, Fung et al. (2008) show that risk-adjusted performance is a major determinant of hedge fund capital flows. Given that managers receive a percentage of asset under management as management fee, fund managers have strong incentives to manipulate their performance opportunistic way to prevent capital outflows and encourage capital inflows. Taken together, this unethical behavior of hedge funds are likely to damage wealth of investors and thus intentional smoothing by hedge funds is an important issue to fund investors and regulators.

Despite the great importance of hedge fund misreporting behaviors, the extant studies examining these suspicious patterns are restricted to US. Since hedge funds are widely distributed worldwide, investigating this topic using international hedge fund data has great implications.

Our main research question is whether and how commonly used dimensions of national culture influence returns smoothing of hedge funds in an international setting. Specifically, we posit

hypotheses that the extents to which hedge fund managers smooth returns are significantly different in different national culture. Borrowing the arguments in well-established cultural framework of Hofstede, we empirically investigate the impact of national culture on that behavior.

We use national culture as our main explanatory variable in hedge fund context for following reasons. For international studies, one important factor that differentiates one country from another is culture, which imposes informal constraints on human behavior. Based on that premise, the effect of culture on the behavior of individuals and corporations is well documented (see, Li, Griffen, Yue, and Zhao 2011; Eun, Wang, and Xiao 2015; Han, Kang, Salter, and Yoo 2010; Kanagaretnam, Lim, and Lobo 2011). Moreover, many academic researchers examine the relations between national culture and business ethics (see, Lu, Rose, and Blodgett 1999; Beekun Stednam, and Yamamura 2003; Douglas and Wier 2005; Smith and Hume 2005; Scholtens and Dam 2007; Zhang, Liang, and Sun 2013). While the effect of national culture has been widely documented in other research area, there has not yet been examined the effects of national culture in hedge fund literature. As Kanagaretnam, Lim, and Lobo (2011) noted, in respect that the influence of national culture may be of great power in industries where information secretiveness and autonomy are higher, hedge fund industry provides an ideal environment in which to explore the effects of national culture on their behavior. In addition, by showing the significant effects of national culture on returns smoothing of hedge funds, we can give some supportive evidence consistent with the one of competing views about the substantial serial correlation of hedge fund returns, namely, intentional smoothing view. It is grounded on that, if that anomalous pattern observed in hedge fund returns solely result from asset illiquidity of their holding positions, the effects of national culture may be negligible after controlling for fund characteristics related to fund liquidity.

To test our main predictions of cultural effects on hedge fund smoothing behavior, we use a publically available hedge fund database and four dimensions of national culture identified by Hofstede. We then match cultural dimensions to each fund using management company location. Our final sample consists of 9,550 unique hedge funds in 40 countries over the period 1994-2013. In our main analysis,

we employ three smoothing measures used in Cassar and Gerakos (2011) and include control variables such as fund characteristics and fund liquidity which are shown to be associated with return manipulation of hedge funds and widely used in hedge fund literature. By using these three smoothing measures and a wide set of control variables, we strengthen the robustness of our findings.

Our main empirical findings are as follows. For each measure of smoothing, four dimensions of national culture, our main variables of interest, have significant impacts on returns smoothing of hedge funds. More specifically, consistent with our predictions, Individualism, Masculinity, and Power distance are positively related to returns smoothing and Uncertainty avoidance is negatively related to returns smoothing, after controlling for fund characteristics and liquidity. These results are closely related to following papers in that, anomalous patterns in hedge fund returns are frequently observed in earnings management of corporations. Han, Kang, Salter, and Yoo (2010) find evidence that individualism and uncertainty avoidance of Hofstede's cultural dimensions are important factors that explain corporate managers' earnings discretion across countries. And Kanagaretnam, Lim, and Lobo (2011) also examine the effect of four dimensions of national culture on earnings quality of banks and find evidence that banks in high individualism, high masculinity, and low uncertainty avoidance countries report smoother earnings. For control variables, funds with longer lockup and redemption notice period have higher degree of returns smoothing. Funds with low average returns and high volatility also show higher returns smoothing. As discussed in Agarwal, Daniel, and Naik (2011), our results suggest that funds with higher incentives and opportunities to manipulate returns have higher level of smoothing. In addition, consistent with prior results that institutional restrictions play an important role on explaining an unethical behavior of hedge funds, funds which are not US-domiciled and do not conduct audit service are associated with higher level of smoothing. From these results, we can identify that hedge funds, in common with many other industries, are affected by national culture. Moreover, by showing that our cultural measures still have a significant explanatory power on returns smoothing even after controlling for fund liquidity, we indirectly confirm that smoothed returns of hedge funds are considerably induced by intentional smoothing. We further conduct two sensitivity analyses to confirm the robustness of our findings. First, to mitigate the biases

caused by uneven distribution of hedge funds across countries, we repeat our main analysis using a reduced sample that excludes US hedge funds and funds in countries having less than 10 individual hedge funds. Second, to alleviate the concern that managers' behavior could be shaped by their nations' culture, we repeat our main analysis using cultural index of managers' nation instead of company location. In both analyses, our main findings are not qualitatively changed.

Additionally, we examine explanatory power of our cultural measures on other suspicious patterns identified by prior researchers. Other than greater serial correlation of hedge fund returns, they have demonstrated additional suspicious patterns observed in hedge fund return data. Bollen and Pool (2012) identify the low correlation between hedge fund reported returns and other assets caused by deliberate misreporting. And Bollen and Pool (2009) report significant discontinuity, or *kink*, in the distribution of hedge fund monthly returns around zero. Moreover, Agarwal, Daniel and Naik (2011) find that returns in December are significantly higher than returns in the rest of the year, even after controlling for risk. Following Bollen and Pool (2012) and Dimmock and Gerken (2014), we generate misreporting flags for each suspicious pattern described above and perform logistic regression. Our empirical findings suggest that cultural differences may be of help to explain the propensity to misreport occurred in hedge fund industry.

Our paper extends prior research on returns smoothing of hedge funds by investigating the influential factors, i.e. national culture, for returns smoothing in an international setting. Our study identifies the cultural dimensions that are related to returns smoothing of hedge funds and give some supportive evidence that intentional smoothing is a significant driver of smoothed returns of hedge funds. And our study complements a growing body of literature examining the association between national culture and business ethics by showing that four cultural dimensions are important factors that affect the hedge fund managers' unethical behavior such as intentional smoothing. Finally, our findings also give valuable information to investors and regulators. Given the facts that the credibility of hedge fund returns is significantly influenced by cultural factors, investors and regulators have to interpret reported returns with caution.

The remainder of this paper is organized as follows. Section 2 presents the research hypotheses. Data and variable construction are described in Section 3. And section 4 reports research design and empirical results. Section 5 includes some additional tests and Section 6 concludes.

2. Hypotheses Development

Our main research question is whether commonly used cultural values influence returns smoothing of hedge funds in an international setting. There are a good number of studies exploring the impacts of national culture as a potential driver in explaining cross-country differences in behavior of individuals and corporations. Along with the stream, we empirically investigate the impact of national culture on hedge funds misreporting behavior. Considering the distinct nature of hedge fund industry, we expect that cultural values are more relevant factor explaining the differences in their behavior than other industries. To address our research question, we borrow the arguments in well-established cultural framework for formulating our hypotheses and utilize the four dimensions of national culture (i.e. individualism, uncertainty avoidance, masculinity, and power distance) in Hofstede (1980) for empirical investigations.

High individualism culture emphasizes individual achievements, self-orientation, and autonomy (Hofstede 2001). Hedge fund managers are rewarded by two types of compensation process, *incentive fees* and *management fees*. Since those two types of compensation are directly depend on a fund performance, for their individual achievements, hedge fund managers have strong incentives to overstate their performance records. Given the greater emphasis on individual achievements and self-oriented nature in high individualism cultures, managers in such cultures are less likely to concern for other investors' welfare. Moreover, Gray (1988) indicates that risk-taking incentives are also likely to be greater in high individualism societies. If the argument in Gray (1988) is true, funds in high individualism culture may have more volatile returns, inducing mangers to engage in a higher level of returns smoothing. Collectively, the above arguments suggest that the level of return smoothing will

be higher in high individualism countries. Consistent with this reasoning, Han et al. (2010) and Kanagaretnam et al. (2011) find a positive relation between individualism and earnings management for corporations. Following hypothesis is presented in null form.

Hypothesis 1: Returns smoothing in hedge funds is unrelated to the individualism dimension of national culture.

Hofstede (2001) address that high *masculinity* societies are characterized by an emphasis on performance. And Masculinity implies aggressive behavior that comprises decisiveness and competitiveness. Based on this character, high risk-taking behavior are more likely in societies with higher masculinity traits (see, Gray 1988). Funds in high masculinity culture may have more volatile returns and therefore mangers have great incentives to engage in a higher level of returns smoothing. Given that desire to achieve individual outcome and risk-taking natures are likely to be greater in high masculinity countries, the managers in such cultures are likely to engage in a higher level of returns smoothing. Following hypothesis is presented in null form.

Hypothesis 2: Returns smoothing in hedge funds is unrelated to the masculinity dimension of national culture.

High *uncertainty avoidance* countries are more likely to have uniform standards. This argument implies that high uncertainty avoidance societies will have lower returns smoothing. In case of earnings smoothing in corporations, Han et. al. (2010) and Kanagaretnam el. al. (2011) find empirical evidence that earnings management is negatively associated with uncertainty avoidance. Moreover, high uncertainty avoidance countries are likely to have lower level of risk-taking and higher level of anxiety. This, in turn, will result in lower incentives for returns smoothing by hedge funds. Following hypothesis is presented in null form.

Hypothesis 3: Returns smoothing in hedge funds is unrelated to the uncertainty avoidance dimension of national culture.

High *power distance* countries are characterized by societies that decisions are more centralized, and

managers have greater influence on reporting. Gray (1988) argues that information transparency is also low in high power distance countries. Therefore, we expect that, in high power distance countries, managers can more easily manipulate reporting returns for opportunistic ways. Given that, we predict a positive relation between the power distance dimension of national culture and returns smoothing by hedge funds. Following hypothesis is presented in null form.

Hypothesis 4: Returns smoothing in hedge funds is unrelated to the power distance dimension of national culture.

3. Data and Variable Construction

3.1. Data description

The main dataset of hedge funds used for our study is the Tremont Advisory Shareholder Services (TASS) database. The TASS database is widely used in hedge fund literature for empirical investigations. The database reports net-of-fee monthly returns, asset under management, and also contains information on fund characteristics such as lockup and redemption period, incentive and management fee rates, inception dates and investment style. And they also provide information on company location.[2] Because TASS database reports information on defunct funds after 1994, our sample starts from 1994 to mitigate potential survivorship bias.

During our sample period from 1994 to 2013, TASS contains a total of 19,370 live and graveyard funds. Following the commonly used fund selection criteria, we filter out funds that report quarterly (not monthly), funds that report returns before (not after) fees, and funds with unknown styles, which leaves 18,617 unique funds.[3] We also filter out observations after 2013, which yields 18,581 unique funds. To control for backfill bias, we further exclude the first 18 months of returns for each fund, yielding 16,604 unique funds. We then filter out 4,302 funds because they do not have at least 24

[2] The database contains information as of the date for which the fund's data are downloaded. Following prior studies, we assume that these information hold throughout the life of the fund.

[3] For our purpose, we do not filter out funds that report returns in currencies other than US dollars. Rather, we use month-end exchange rates to convert them to US dollars. In the process, we lose some return observations (but no fund observations) due to missing exchange rate data.

return observations. We also drop funds that do not provide a management company in TASS, leading to a sample of 12,165 unique funds. Finally, we follow Aggarwal and Jorion (2010) and correct for master-feeder duplicates, resulting in a sample of 9,550 unique funds (3,586 unique companies).

3.2. Cultural Measures

In our paper, we are trying to investigate whether hedge funds are affected by national culture in terms of the extent to which hedge fund managers manipulate their performance. To characterize national culture, we use well-established framework of national culture pioneered by Hofstede (2001). Following prior studies examining the role of culture, we obtain Hofstede's four dimensions of national culture data and the values are assumed to be held constant over the sample period. (e.g., Han, Kang, Salter, and Yoo 2010; Kanagaretnam, Lim, and Lobo 2011). And finally, using company locations of hedge funds obtained from 'Companydetails.txt' file, we assign the Hofstede's country-level cultural index to each fund.

Hofstede's four cultural dimensions consist of Individualism (IND), Uncertainty avoidance (UA), Masculinity (MAS), and Power distance (PD) and indices are displayed in appendix: Individualism (IND) is stronger in United States, Australia, and United Kingdom, and is weaker Venezuela, Colombia, and Pakistan. Greece, Portugal, and Uruguay are the highest uncertainty avoidant (UA) countries, while Singapore, Denmark, and Hong Kong are the lowest uncertainty avoidant countries. Japan and Austria has the highest score for masculinity (MAS), and Norway and Netherlands the lowest. Finally, the Malaysia and Philippines are considered as higher power distance (PD) countries, whereas Austria and Israel are considered as the lower.

3.3. Smoothing Measures

In this section, we explain the three measures used to proxy for returns smoothing of hedge funds. The first is the monthly serial correlation ($\hat{\rho}$) in hedge funds reported returns. Getmansky, Lo, and Makarov (2004) attribute a substantial positive serial correlation in hedge fund returns either to asset

illiquidity of funds holding or to the intentional smoothing of reported returns by managers. Based on the argument in Getmansky et al. (2004), we use the serial correlation of monthly returns as our first measure for returns smoothing. To estimate this measure, we regress monthly fund returns on their own first lag as follow:

$$R_t^O = \alpha + \rho R_{t-1}^O + \varepsilon_t$$

where R_t^O is a fund's observed returns at month t. We use the estimates of $\hat{\rho}$ (Serial Correlation) as our first measure of return smoothing.

In the process of analyzing the key drivers of abnormal serial correlation in reported returns, Getmansky et al. (2004) assume that hedge fund managers do not report their true returns. Rather than, hedge funds report a monthly return R_t^O that is a weighted average of the funds' true economic returns R_t over the most recent k+1 month

$$R_t^O = \theta_0 R_t + \theta_1 R_{t-1} + \ldots + \theta_k R_{t-k}$$

$$1 = \theta_0 + \theta_1 + \theta_2 + \ldots + \theta_k$$

In this setting, serial correlation of observed returns rely on the values of θ_k

$$\text{Corr}\,(R_t^O,\ R_{t-m}^O) = \frac{Cov(R_t^O, R_{t-m}^O)}{Var(R_t^O)} = \frac{\sum_{j=0}^{k-m} \theta_j \theta_{j+m}}{\sum_{j=0}^{k} \theta^2} \quad \text{if } 0 \leq \ m \ \leq \ k$$

Although the assumed process does not affect expected returns, it lowers the observed volatility, thereby raising the Sharpe ratios.

$$\text{Var(R)} = (\theta_0^2 + \theta_1^2 + \ldots + \theta_k^2)\sigma^2 \leq \sigma^2$$

$$SR^O \equiv \frac{1}{\sqrt{\theta_0^2 + \theta_1^2 + \ldots + \theta_k^2}} \frac{E[R_t]}{\sqrt{\text{Var}(R_t)}} >= \frac{E[R_t]}{\sqrt{\text{Var}(R_t)}} \equiv \text{SR.}$$

In that case, managers who report smoothed returns can make higher serial correlation of reported returns and overstate their funds' risk-adjusted performance. Combine with the fact that a critical determinant of flow is risk-adjusted performance such as Sharpe ratio, hedge fund managers may have

strong incentives to report smoothed returns (see Fung, Hsieh, Naik, and Ramadorai 2008).

We follow the methodology described in GLM to estimate two additional measures. Getmansky et al. (2004) define the demeaned return process and assume that actual monthly innovations are normally distributed and are smoothed using a moving average model with two lags.

$$X_t = R_t^O - \mu$$

$$X_t = \theta_0\eta_t + \theta_1\eta_{t-1} + \theta_2\eta_{t-2}$$

$$1 = \theta_0 + \theta_1 + \theta_2$$

$$\eta_k \sim \text{Nor}(0, \sigma_\eta^2)$$

Following Getmansky et al. (2004), we use maximum likelihood to estimate a moving average model with two lags. Then, we transform the estimated coefficients by dividing each $\widehat{\theta_l}$ by $1 + \widehat{\theta_1} + \widehat{\theta_2}$ to normalize them. Our second empirical smoothing measure is the first coefficient $\widehat{\theta_0}$ (Theta Coefficient). Finally, as a summary statistic for the smoothing process, we calculate the concentration of the $\theta_k$weights as follow:

$$\xi = \sum_{j=0}^{k} \theta_j^2$$

We use $\hat{\xi}$ estimated with two lags as our third empirical measure of smoothing and refer to it as the Smoothing Index. Lower values of ξ represent greater smoothing.

We estimate above three measures for returns smoothing using a two-year rolling window of monthly returns for each fund with at least 18 non-missing return observations over the prior 24 months. In the process of estimating MA (2) model, we use only estimated results with convergence, and therefore sample size of funds could be different across three smoothing measures.

The summary statistics of these measures displayed in Table1[4]. Panel A of Table 1 reports time series mean, standard deviation, and quartile values of cross-sectional averages of smoothing measures. The average serial correlation for our sample is 0.127, and its standard deviation is 0.185. The average

[4] we winsorize all three measures to the 1 percentiles to remove the effects of outliers

Theta Coefficient is 0.919, and the standard deviation of this measure is 0.236. Finally, the mean and standard deviation of Smoothing Index are 0.962 and 0.520, respectively. Panel B of Table 1 presents the time-series average of the cross-sectional Pearson correlations between each pair of smoothing measures. As we can see in the results, all measures are highly correlated. Specifically, the correlation between Serial Correlation and Theta0 is -0.822 and the correlation between Smoothing Index and Theta Coefficient is 0.973.

Even though these measures are highly correlated each other, each measure has different rationale for construction and interpretations. Thus, throughout the analyses, we use all three measures of returns smoothing as our main dependent variable to improve robustness of our results.

3.4. Control Variables

In our study, to analyze own explanatory power of cultural factors, we include several control variables which are shown to be associated with return manipulation of hedge funds and widely used in hedge fund literature. In the stage of specifying control variables, we assume that impacts of country-level institutional environment (e.g., GDP, creditor rights, investor protection) are negligible due to the less regulated and self-governed nature of hedge fund industry. Our control variables include fund characteristics, such as lockup period, redemption notice period, management fee, incentive fee, average returns, volatility, fund age, asset under management, on/offshore dummy, and use of leverage and audit service[5]. As noted by Agarwal, Daniel and Naik (2011), incentives and opportunities to manipulate reported returns are significantly related to fund characteristics. Therefore, we use those characteristics as our control variables in that intentional smoothing of reported returns is a kind of manipulation by hedge fund managers.

In addition, we also include two additional variables to control for higher serial correlation caused by asset illiquidity of their holdings. Getmansky et al. (2004) argue that substantial positive serial

[5] Shore dummy is indicator variable that takes the value of 1 if the fund is located onshore, and 0 otherwise. And Audit is indicator variable that takes the value of 1 if the last audit date is listed in the TASS database, and 0 otherwise. For asset under management variable, we convert them to US dollars using month-end exchange rates.

correlation in returns of hedge funds could be caused by portfolio illiquidity. And Cassar and Gerakos (2011) show that although funds using opaque pricing sources and funds that allow managers to exercise greater discretion in pricing their investment positions have higher levels of returns smoothing, asset illiquidity is still a major driver of smoothed returns of hedge funds. Thus, we first include the exposure to Pastor and Stambaugh's (2003) liquidity risk factors as proxy for illiquidity of hedge funds. Moreover, we include the investment style dummies in order to control for the differences in liquidity caused by distinction of investment style they use. Since asset illiquidity varies with investment style, we create indicator variables for the 12 hedge fund investment styles classified by TASS to control for the mean illiquidity of each style[6].

3.5. Descriptive Statistics

The sample used in our regression analysis consists of 340,071 fund-month observations for the period from 1994 to 2013 in 40 countries. Descriptive statistics for the cultural variables and fund characteristics are reported in Table 2. Panel A of Table 2 presents the summary statistics of our key variables. First, from the results, we observe that sample statistics of our main variables, *culture index*, is similar to that of United States. It is because large portion of our sample consists of the funds located in United States (about 57%)[7]. And the results also show that the mean lockup and redemption notice period is 2.75 and 1.10 months. The mean of Management Fee and Incentive Fee are 0.01 and 0.15, respectively, and average monthly return and volatility of our sample funds measured by using prior 24 month returns is 1% and 4%, respectively. Finally, 55% of our sample funds are onshore funds and 60% are using leverage. Additionally, in the unreported results, we confirm that there is great dispersion in the number of hedge funds and other fund characteristics across countries.

Panel B of Table 2 shows Pearson correlations between smoothing measures and key variables. The

[6] Following prior research on hedge funds, we assume that the fund's investment style is invariant over the sample period.
[7] IND, UA, MAS, and PD of the United States are 91, 46, 62, and 40, respectively.

degree of smoothing is positively related to IND, MA and PD and negatively related to UA. We also find positive relation between smoothing measures and several control variables such as lockup, redemption, average returns, age, and size and negative relation with management/incentive fee, volatility, use of leverage, and liquidity beta. Based on these results, we could find evidence that hedge funds in countries with higher IND, MA, and PD and lower UA score have smoother returns. Although these preliminary results are consistent with our predictions, those results have to be interpreted with caution because we do not take the effects of control variables into account.

In the unreported results, we find that control variables are not highly correlated with each other (all pairs of correlations do not exceed 0.26 in absolute value). Thus, we conduct multivariate regression analysis to investigate the relation between cultural factors and degree of returns smoothing in hedge fund returns, after controlling for all variables discussed above.

4. Empirical Analysis

4.1. Empirical Design

To test the relation between national cultures and returns smoothing by hedge funds, we use the multivariate regression approach. In this stage, we use panel regression with clustered standard errors to account for both serial and cross-sectional correlations (Petersen 2009). Using three measures described in section 3.1 as proxy for degree of returns smoothing, we perform the following multivariate regression for each measure. Our control variables include fund characteristics, such as lockup period, redemption notice period, management fee, incentive fee, average returns, volatility, fund age, average AUM, on/offshore dummy, and use of leverage and audit service

$$Smoothing_{i,t} = \beta_0 + \beta_1 IDV_{i,t} + \beta_2 UA_{i,t} + \beta_3 MAS_{i,t} + \beta_4 PD_{i,t} + \beta_4 PD_{i,t} + \beta_5 Control_{i,t} + \varepsilon_{i,t}$$

Where $Smoothing_{i,t}$ is smoothing measure of fund i in month t; $IDV_{i,t}$, $UA_{i,t}$, $MAS_{i,t}$ and $PD_{i,t}$

are values for culture index of country in which fund i's management company locate and the values are assumed to be held constant over the sample period; $Lockup_{i,t}$ and $Redemption_{i,t}$ are the lockup and redemption notice period measured in units of 30 days, respectively, for fund i; $Incenfee_i$ and $Mfee_i$ are the incentive fee and management fee rate charged by fund i, respectively; $Mean\_Ret_{i,t}$ and $Vol_{i,t}$ is the average and volatility of the prior 24-month returns for fund i, respectively; $Age_{i,t}$ is the age of the fund i at month t; $Mean\_AUM_{i,t}$ is the average of monthly assets under management of fund i over the prior 24 months at month t; $Shore_{i,t}$ is an indicator variable that takes the value of 1 if fund i is an onshore fund, and 0 otherwise; $Audit_{i,t}$ and $Leverage_{i,t}$ are indicate variables for use of audit service and leverage, respectively; $Liquidity\ beta_{i,t}$ is the exposer to liquidity risk factors for fund i for month t, estimated by the preceding 24-month time series regression of excess returns on liquidity risk factors after controlling for the seven factors of Fung and Hsieh (2004); $Style_{i,s,t}$ are investment style dummies that take the value of 1 if fund i belongs to style s and 0 otherwise; and $\varepsilon_{i,t}$ is the error term[8].

To address the main research hypotheses, we mainly focus on the coefficients of the four culture variables: Individualism (IND), Uncertainty avoidance (UA), Masculinity (MAS), and Power distance (PD). As we described in Section 2, we expect that higher value of IND, MAS, and PD are likely associate with higher degree of returns smoothing, while higher value of UA leads to lower level of returns smoothing.

4.2. Empirical Results

Our main regression results are displayed in Table 3. To tests the relations between cultural factors and returns smoothing of hedge funds, we regress three smoothing measures as our dependent variables and the results for Serial Correlation, Theta Coefficient, and Smoothing Index are in Panel A,

[8] Lockup, redemption, management fee, incentive fee, shore, audit, leverage, and style dummies are time-invariant.

Panel B, and Panel C, respectively. All results for three measures have qualitatively similar interpretation and we, therefore, confirm that our results are robust to selection of smoothing measures. We are focusing on the results of serial correlation case from now on.

In Table 3, Model 1-4 and Model 5 present the results of panel regressions of the reduced model and full model, respectively. Specifically, Model 1-4 show the effects of individual cultural factors on returns smoothing, controlling for fund characteristics and liquidity. And we include all four cultural and control variables in Model 5. For the main variables of interest, Model 1-4 show that the coefficient on IND and MAS are positive and significant while that of UA are negative and significant at the 1% level. In Model 5, in which all cultural variables are included, we find that the coefficients on IND, MAS, and PD are significantly positive while the coefficient on UA is significantly negative at 1% level. These results indicate that hedge funds in countries with higher values of IND, MAS, and PD and lower value of UA have the greater extent of returns smoothing. Our findings permit us to reject our main hypotheses 1-4 that state our cultural variables are not related to returns smoothing of hedge funds. These results are closely related with prior studies that examine the relation between national culture and manager's behavior. Han et al. (2010) find evidence that national culture play an important role on the degree to which managers exercise earnings discretion. And Kanagaretnam et al. (2011) also show the effects of national culture on earnings quality of bank industries. Zhang, Liang, and Sun (2013) provide evidence that corporate behavior is strongly influenced by cultures, legal rules, and law enforcement. In addition, there are some studies unearth the effect of cultural difference on ethical behavior of business professionals. Using comparative analysis, Beekun, Stedham, and Yamamura (2003) and Smith and Hume (2005) show that ethical decisions of business professionals could be different in different cultures.

Table 3 also provides several economic inferences about control variables. First, lockup and redemption notice period are positively related to returns smoothing[9]. Because managers in funds with

[9] Lockup period is the minimum time that the investors have to commit before withdrawing their invested capital. And redemption notice period is the sum of notice period and redemption period. Notice period is the time that investors who want to withdraw their capital have to notice in advance and redemption period is the

longer restriction periods are free to invest in various asset classes which are hard to price, they are likely easy to manipulate reporting returns. In Table 3, we confirm the evidence that managers having great discretion are more likely engaged in returns smoothing behavior. Meanwhile, sometimes lockup and redemption notice period are used as measures of hedge fund liquidity (see Sadka 2010; Aragon 2007; Agarwal, Daniel, and Naik 2009; Teo 2011). Thus, positive relations between these variables and returns smoothing could be interpreted as consequence that higher illiquidity leads to higher level of smoothing. Second, as described in Agarwal, Daniel, and Naik (2011), we also find evidence that hedge funds with higher incentives and opportunities to manipulate returns have higher level of smoothing. Since personal wealth of hedge fund managers is solely determined by performance records of their funds, managers in funds with bad performance may have great incentives to manipulate their reported returns for better risk-adjusted performance. And also, managers in funds with higher volatility may have higher opportunities to manipulate returns with greater ease. Consistent with our premise, the estimate of average return is significantly negative while that of volatility is significantly positive, both at 1% level. Finally, estimates of shore and audit variables are significantly negative at 1% level. In line with prior studies that institutional restrictions have critical impact on unethical behavior of hedge funds, results in Table 3 suggest that funds which are not US-domiciled and do not conduct audit service are associated with higher level of smoothing.

In sum, the results in Table 3 support our main hypotheses that the cultural dimensions play an additional role in explaining returns smoothing even after controlling for other fund characteristics and fund liquidity.

4.3. Robustness Checks

4.3.1. Sample Bias

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time that the funds return the invested capital to the investors. Longer lockup and redemption notice periods therefore prevent fund investors to withdraw their capital immediately.

In the previous section, we are trying to investigate the impact of national culture on the level of smoothing in reported returns in an international setting. Because, in common with other international studies, sample sizes vary greatly across countries, we need to ensure whether the uneven distribution of fund numbers across countries bias our results. For example, hedge funds management companies located in US account for more than 50% of our entire sample. To deal with this bias caused by uneven distribution of fund numbers across countries, we employ two different ways of checking the robustness of our results. First, we repeat the main regression by excluding funds from US to assess the sensitivity of the results to the large number of US observations. And second, we repeat the regression by excluding funds in countries that have less than 10 individual funds. The results of both cases are reported in Table 4. Panel A of Table 5 reports the results of non-US hedge fund regression, and Panel B of Table 5 presents the regression results of second modification. From Table 4, we find that the results estimated using two different samples are similar to those reported in Table 3. From the results, we confirm that our main findings of this paper are not affected by sample bias.

4.3.2. Culture Index

In our main analysis, we use company location from 'Companydetails.txt' file for each fund to assign the Hofstede country-level index. In this case, however, there is concern that results using culture index of company location could be driven by omitted characteristics of company locations that are correlated with both culture index and hedge fund returns smoothing. Moreover, portfolio managers' nations also exert influence on their behavior. To alleviate those concerns, we repeat our main analysis in different setting using national culture of managers' nations. To implement this, we first identify the managers who manage the portfolios of each fund and collect their nations from 'Peopledetail.txt' file. In the stage of assigning the Hofstede country-level culture index to each fund, we calculate the average culture index of managers' countries for each fund if the fund has more than one manager. The details for information included in 'PeopleDetails.txt' file are as follows. The average and median funds have 0.81 and 1 portfolio managers, respectively. The corresponding numbers become 1.68 and 1, after excluding 4,570 funds that do not provide location information for

any portfolio managers. Among 4,980 funds that provide location information for at least one portfolio manager,[10] 4,664 funds have all their portfolio managers located in one country,[11] while the remaining 105 funds have their managers located in two countries.

The regression results are presented in Table 5. As we can see in Table 5, although the estimates of main cultural variables are somewhat weaker in significance, the overall estimated results are qualitatively same to those in Table 3. From the results, we also confirm that our results are robust.

5. Additional Tests

The previous section mainly investigates the impacts of national culture on returns smoothing of hedge funds. However, other than returns smoothing, many researchers have detected and investigated suspicious patterns in hedge fund returns[12]. Based on these suspicious patterns, Bollen and Pool (2012) propose several flags as indicators of a heightened risk of fraud and show that those flags can help to identify observed fraud of hedge funds. Thus, in this section, we conduct further analysis whether our cultural factors provide additional information for other suspicious patterns which are identified by indicators of actual fraud.

5.1. Returns Misreporting Flags

This subsection describes the five categories of misreporting flags we use to capture the suspicious patterns of hedge fund returns. Following prior researches, we generate misreporting flags using the entire history of returns available over the sample period. In this process, to capture the suspicious patterns solely induced by managers, we use raw reported returns, not converted returns to US dollars

[10] 4,769 (95.8%) funds provide location information for all portfolio managers, while 211 (4.2%) funds provide location information for some, but not all, portfolio managers.

[11] 3,630 funds (77.8%) locate their portfolio managers in the country where its management company is headquartered.

[12] See Bollen and Pool, 2008, 2009, 2012; Agawal, Daniel, and Naik, 2011; Cassar and Gerakos, 2011; Dimmock and Gerken, 2014; Patton, Ramadorai, and Streatfield, 2013.

for some flags (e.g., *kink* flag) which could be calculated by return distribution itself. Methodological details are as follows.

5.1.1. Discontinuity at Zero

Bollen and Pool (2009) find that distribution of monthly hedge fund returns is discontinuous at zero. To support their argument, they show that the number of small gains is significantly greater than expected, whereas the number of small losses is significantly lower. Because, all else equal, hedge fund investors direct more capital into funds that report a greater fraction of monthly returns that are positive, hedge fund managers are likely to have incentives to manipulate self-reported monthly returns.

Following Bollen and Pool (2012), we generate return discontinuity measure, *kink*, using the histogram approach of Burgstahler and Dichev (1997) to capture the manipulating behavior of individual hedge funds[13]. For each fund, we count the number of monthly returns in three adjacent bins, two to the left of zero and one to the right. As in Bollen and Pool (2012) and Silverman (1986), we calculate the optimal bin width for individual funds given by

$$\alpha \times 1.364 \times \min\left(\sigma_i, \frac{Q_3 - Q_1}{1.34}\right) \times n^{-0.2}$$

where α is a distribution-specific constant and set to 0.776, corresponding to a normal distribution, σ_i is the standard deviation of the monthly returns, $Q_3 - Q_1$ is the interquartile range and used to construct a more robust estimate of the standard deviation, and n is the number of observation.

If the fund return distribution is smooth, the number of observations in the middle bin has to approximately equal to the average of the two adjacent bins. Thus, as in Bollen and Pool (2012), the *kink* flag is triggered when the number of observations in the bin just below zero is significantly less than the average of the two adjacent bins at a 10% significance level.

5.1.2. Low Correlation with Other Assets.

[13] Bollen and Pool(2012) indicate that statistical methodology of Bollen and Pool(2009) is infeasible for testing individual funds and ,therefore, use the histogram approach of Burgstahler and Dichev(1997)

Bollen and Pool (2012) point out that if a manager deliberately misreports returns, his fund may have low correlation with standard asset classes, hedge fund style factors, and even funds using same strategy. Thus, they generate two flags about the distinctiveness of a fund's return series, *Maxrsq* and *Indexrsq*, to detect manager's undesirable behavior. The first flag, *Maxrsq*, is about the maximum proportion of a fund's returns that is explained by Fung and Hsieh (2004) style factors. For each fund, we regress fund returns on the subset of Fung and Hsieh (2004) 7-factors that maximizes the adjusted R-squared, and label *Maxrsq*. We then, genarate critical values for each fund using bootstrap simulation to test whether the *Maxrsq* is significantly different from zero[14]. Following Bollen and Pool (2012), the *Maxrsq* flag is triggered if the fund's adjusted R-squared is smaller than the 90th percentile simulated critical value.

The second flag, *Indexrsq*, is about the relation between the hedge fund's returns and the returns of its style index. For each fund-period, we create equally weighted style index using all other funds in the same style. We then, regress the fund's returns on the equally weighted style index. As in Bollen and Pool(2012), the *Indexrsq* flag is triggered if the coefficient of style index is statistically insignificant at the 10% level.

5.1.3. Unconditional Serial Correlation

As we discussed in main analyses, substantial positive serial correlation of hedge fund returns could arise from the intentional smoothing of performance by hedge fund managers. To capture unconditional intentional smoothing of hedge fund managers we regress fund returns on their first lag as follows

$$R_t^O = \alpha + \beta R_{t-1}^O + \varepsilon_t$$

Where R_t^O is a fund's observed return at date t and it could be potentially different from R_t , the actual return of the fund. We label this the *AR(1)* flag. The *AR(1)* flag is triggered if the coefficient of

[14] In this process, we limit the number of factors used in a given regression to six, corresponding to the most prominent strategies a fund follows, though typically the procedure results in a smaller subset

lagged return(β) is positive and significant at the 10% level.

5.1.4. Conditional Serial Correlation

Prior studies point out that relatively high serial correlation of hedge fund returns can occur when either illiquidity of the assets they hold is high or managers manipulate fund returns to make their performance more attractive (see, Getmansky, Lo, and Makarov 2004; Cassar and Gerakos 2011). Because serial correlation of hedge fund returns naturally increase with asset illiquidity they hold, it is hard to conclude that highly correlated returns come from intentional smoothing by managers without additional information. In this rationale, Bollen and Pool (2008) suggest a more elaborate model of manager behavior to distinguish intentional smoothing from innocuous causes of serial correlation. Bollen and Pool (2008) argue that managers have an incentive to manipulate the shape of the return distribution to make it more attractive to investor and therefore, they tend to fully report gains and partially report losses. In that case, the degree of serial correlation depends on the realization of lagged returns and conditional serial correlation could be an indicator of intentional smoothing.

To test for conditional serial correlation, we have to estimate the difference between a fund's observed return and the actual return of fund's portfolio. Because the actual return of a fund is not observable, we use the fitted value of the optimal factor model estimated in the *Maxrsq* test as proxy for it. Following Bollen and Pool (2008), we regress observed returns on their lag with an interaction term as follows

$$R_t^O = \alpha + \beta^+ R_{t-1}^O + \beta^-(1 - I_{t-1})R_{t-1}^O + \varepsilon_t$$

where I_{t-1} is an indicator variable that takes value of 1 if the fitted value of observed returns in month t-1 is greater than its mean and zero otherwise. Because β^- captures the additional serial correlation following poor performance, a positive value of β^- is evidence about intentional smoothing by manager after poor performance. We label this value the *CAR(1)* flag. The *CAR(1)* flag is triggered if the β^- is positive and significant at the 10% level.

5.1.5. December Spike

Agarwal, Daniel, and Naik (2011) argue that hedge fund managers generally tend to manage their returns upward during December in order to maximize their incentive fees which are usually determined once a year based on annual performance at year-end. They also argue that this phenomenon is stronger for funds with high incentives and greater opportunities to manipulate returns. Using both raw and risk-adjusted returns, they provide empirical evidence consistent with their arguments. Following Agarwal, Daniel, and Naik (2011), we construct two December spike flags, returns spike and residual spike. For returns spike, labeled *Decret*, we regress the fund's monthly returns on dummy variable indicating the month of December. And for residual spike, labeled *Decresid*, we regress the fund's monthly returns on Fung and Hsieh (2004) seven-factor and dummy variable indicating the month of December together. For both flags, the flags are triggered if the coefficient of indicator variable is positive and significant at the 10% level.

5.2. Regression Specification

To examine whether national cultures are significantly associate with various misreporting flags described above, we estimate the following logistic regression for each flag. Since each misreporting flag is generated by using entire history of returns available over the sample period, there is one observation per each fund-period. Regression specification is as follow:

$$Flag_i = \beta_0 + \beta_1 IDV_i + \beta_2 UA_i + \beta_3 MAS_i + \beta_4 PD_i + \beta_4 PD_i + \beta_5 Control_i + \varepsilon_i$$

Where $Flag_i$ is performance flag measure of fund i. $Flag_i$ is an indicate variable that takes the value of 1 if fund i satisfy the condition of trigger, and 0 otherwise; IDV_i, UA_i, MAS_i and PD_i are values for culture index of country where fund i's management company locate; $Lockup_i$ and $Redemption_i$ are the lockup and redemption notice period measured in units of 30 days for fund i, respectively; $Incenfee_i$ and $MFee_i$ are the incentive fee and management fee rate charged by fund i, respectively; $Mean\_Ret_i$ and Vol_i is the full sample average return and volatility for fund i, respectively; Age_i is the age of fund i in months; Avg_AUM_i is the average of assets under

management of fund i over the full sample period; $Shore_i$ is an indicator variable that takes the value of 1 if fund i is an onshore fund, and 0 otherwise; $Audit_i$ and $Leverage_i$ are indicate variables for use of audit service and leverage, respectively; $Liquidity_i$ is the exposer to liquidity risk factor for fund i, estimated by using full period regression of excess returns on liquidity risk factor after controlling for the seven factors of Fung and Hsieh (2004); $Style_{i,s}$ are investment style dummies that take the value of 1 if fund i belongs to style s and 0 otherwise; and ε_i is the error term.

5.3. Regression Results

Table 6 reports estimate results of logistic regression. In this stage, we newly generate composite flag, *Any Flag*, which is set equal to one if the fund triggers one or more flags discussed above, and zero otherwise. For each misreporting flag, we report the regression coefficients and corresponding p-values in parentheses. First seven columns display the regression results for the effects of cultural variables on the propensity of hedge funds to trigger each misreporting flag, after controlling for a same set of variables used in main analysis. And last column show the results of *Any Flag*.

In this regression, positive (negative) estimates on cultural variables suggest that hedge funds in higher dimensions of those national culture are more (less) likely to trigger misreporting flag. In other words, corresponding suspicious patterns are observed in countries with higher value of cultural dimensions at a higher (lower) frequency. Following the same arguments discussed in Section 2, we predict that the coefficients on IND, MAS, and PD are positive and significant, while that of UA are significantly negative.

In Table 6, we find that the coefficients on cultural variables have expected sign and are statistically significant in case of *Maxrsq*, *Indexrsq*, and *Serial Correlation*. However, we could not find consistent results in remaining four flags. Bollen and Pool (2012) show that, among several flags used in their study, *Maxrsq* and *Indexrsq* flags contain incremental information about risk of fraud even after controlling for other fund characteristics. Combined with their findings, although explanatory

power of cultural measures on various suspicious patterns is selective, our results that cultural factors could explain the risk of fraud identified by those two patterns are noteworthy. Finally, in the case of *Any Flag*, results are much stronger than individual flags. The coefficients on IND, MAS, and PD are positive and significant at the 1% level, and the coefficient on UA is negative and significant at the 1% level. The results say that cultural measures are influential factors explaining general cases of fraud.

6. Conclusion

Recent frauds of hedge funds and suspicious patterns in their reported returns bring about serious concerns about the reliability of their performance records. Imprecise information about their performance provided by hedge funds would affect fund evaluation process, and thereby inducing mischoice of funds by investors and consequently damage to investor welfare. In this regard, many academic researchers have tried to investigate the suspicious patterns in reported returns of hedge funds as a signal of a heighted risk of fraud and to figure out the mechanisms through which those phenomenons occur.

Using a sample of hedge funds from 40 countries over the period 1994-2013, we hypothesize and empirically investigate whether commonly used dimensions of national culture are important factors that explain the unethical behavior of hedge funds indicated by suspicious patterns in their reported returns. Our analysis is grounded on the assumption that national culture has significant impacts on individual behaviors and therefore we expect that unethical behaviors of hedge funds appear differently in different culture. Our predictions are supported by a good number of studies that examine the relations between national culture and behavior of managers in other industries.

Our main empirical finding is that four dimensions of national culture, our main variables of interest, have significant impact on returns smoothing of hedge funds. Specifically, consistent with our prediction, Individualism, Masculinity, and Power distance are positively related to returns smoothing and Uncertainty avoidance is negatively related to returns smoothing, after controlling for fund

characteristics and liquidity. Given that culture imposes informal constraint on individual behaviors, our result can give some supportive evidence consistent with intentional smoothing. Additionally, we further examine the explanatory power of our cultural measures on other suspicious patterns identified by prior researchers. Additional results show that cultural differences may be of help to explain the propensity to misreport occurred in hedge fund industry.

Our paper contributes to literature for several ways. We extend research on return smoothing of hedge funds by investigating the influential factors, i.e. national culture, for returns smoothing. And our study enriches a growing body of literature investigating the relations between national culture and business ethics by showing that those relations also exist in hedge fund industry. Finally, our findings that credibility of reported returns is significantly influenced by culture give valuable information to investors and regulators in that hedge funds misreporting has undesirable effects on investor welfare.

References

Agarwal, R., Jorion, P., 2010. The Performance of Emerging Hedge Funds and Managers. *Journal of Financial Economics* 96, 238-256.

Agarwal, V., Daniel, N., Naik, N., 2011. Do Hedge Fund Managers Manage Their Reported Returns? *Review of Financial Studies* 24, 3281-3320.

Aragon, G, 2007. Share Restrictions and Asset Pricing: Evidence from the Hedge Fund Industry. *Journal of Financial Economics* 83, 33-58.

Asness, C., Krail, R., Liew, J., 2001. Do Hedge Funds Hedge? *Journal of Portfolio Management* 28, 6-19.

Beekun, R. I., Stedham, Y., Yamanura, J. H., 2003. Business Ethics in Brazil and the US: A Comparative Investigation. *Journal of Business Ethics* 42, 267-279.

Bollen, N., Pool, V., 2008. Conditional Return Smoothing in the Hedge Fund Industry. *Journal of Financial and Quantitative Analysis* 43, 267-298.

_____. 2009. Do Hedge Fund Managers Misreport Returns? Evidence from the Pooled Distribution. *Journal of Finance* 64, 2257-2288.

_____. 2012. Suspicious Patterns in Hedge Fund Returns and the Risk of Fraud. *Review of Financial Studies* 25, 2673-2702.

Burgstahler, D., Dichev, I., 1997. Earnings Management to Avoid Earnings Decreases and Losses. *Journal of Accounting and Economics* 24, 99-126.

Cassar, G., Gerakos, J., 2011. Hedge Funds: Pricing Controls and the Smoothing of Self-Reported Returns. *Review of Financial Studies* 24, 1698-1734.

Dimmock, S. G., Gerken, W. C., 2014. Regulatory Oversight and Return Misreporting by Hedge Funds. *Working Paper*, Nanyang Technological University.

Douglas, P. C., Wier, B., 2005. Cultural and Ethical Effects in Budgeting Systems: a Comparison of US and Chinese Managers. *Journal of Business Ethics* 60, 159-174.

Eun, C. S., Wang, L., Xiao, S. C., 2015. Culture and R^2. *Journal of Financial Economics* 115, 283-303

Fung, W., and D.A.Hseih. 2004. Hedge Fund Benchmarks : A Risk-Based Approach. *Financial Analysts Journal* 60, 65-80

Fung, W., Hsieh, D., Naik. N., Ramadorai, T., 2008. Hedge Funds: Performance, Risk, and Capital Formation. *Journal of Finance* 63, 1777-1803.

Getmansky, M., Lo, A., Makarov, I., 2004. An Econometric Model of Serial Correlation and Illiquidity in Hedge Fund Returns. *Journal of Financial Economics* 74, 529-609.

Gray, S. J., 1988. Towards a Theory of Cultural Influence on the Development of Accounting Systems Internationally. *Abacus*,24(1): 1–15.

Han, S., Kang, T., Salter, S., Yoo, Y. K., 2010. A Cross-Country Study on the Effects of National Culture on Earnings Management. *Journal of International Business Studies* 41, 123-141.

Hirshleifer, D., 2001. Investor Psychology and Asset Pricing. *Journal of Finance* 56, 1533-1597.

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

Kanagaretnam, K., Lim, C. Y., Lobo, G. J. A Cross-Country Study on the Effects of National Culture on Earnings Management. *Journal of International Business Studies* 42, 853-874.

Li, K., Griffin, D., Yue, H., Zhao, L., 2011. National Culture and Capital Structure Decisions: Evidence from Foreign Joint Ventures in China. *Journal of International Business Studies* 42, 477-503.

Lu, L. C., Rose, G. M., Blodgett, J. G., 1999. The Effects of Cultural Dimensions on Ethical Decision Making in Marketing: An Exploratory Study. *Journal of Business Ethics* 18, 91-105.

Pastor, L., Stambaugh, R. F., 2003. Liquidity Risk and Expected Stock Returns. *Journal of Political Economy* 111, 642-685.

Patton, A. J., Ramadorai, T., Streatfield, M., 2013. Change You Can Believe In? Hedge Fund Data Revisions, *Working Paper*, Duke University.

Petersen, M.A., 2009. Estimating Standard Errors in Finance Panel Data Set: Comparing Approaches. *Review of Financial Studies* 22, 435-480.

Sadka, R., 2010. Liquidity Risk and the Cross-Section of Hedge Fund Returns. *Journal of Financial Economics* 98, 57-71.

Shiller, R. J., Pound. J., 1989. Survey Evidence on Diffusion of Interest and Information among Investors, *Journal of Economic Behavior and Organization* 12, 47-66.

Silverman, B. W., 1986. Density Estimation for Statistics and Data Analysis. Chapman and Hall, London.

Straumann, D, 2009. Measuring the Quality of Hedge Fund Data. *Journal of Alternative Investments* 12, 26-40.

Smith, A., Hume, E. C., 2005. Linking Culture and Ethics: A Comparison of Accountants' Ethical Belief Systems in the Individualism/Collectivism and Power Distance Contexts. *Journal of Business Ethics* 62, 209-220.

Scholtens, B., Dam, L., 2007. Cultural Values and International Differences in Business Ethics. *Journal of Business Ethics* 75, 273-284.

Teo, M., 2011. The Liquidity Risk of Liquid Hedge Funds. *Journal of Financial Economics* 100, 24-44

Zhang, X., Liang, X., Sun, H., 2013. Individualism-Collectivism, Private Benefits of Control, and Earnings Management: *A Cross-Culture Comparison. Journal of Business Ethics* 114, 655-664.

Table 1.

Summary statistics of smoothing measures used in our analysis.

This table reports summary statistics of the three smoothing measures. The first is the monthly serial correlation ($\hat{\rho}$) in hedge funds reported returns. To estimate this measure, we regress monthly fund returns on their own first lag as follow:

$$R_t^O = \alpha + \rho R_{t-1}^O + \varepsilon_t$$

where R_t^O is a fund's observed returns at month t.

Next, we follow the methodology described in GLM to estimate two additional measures. In GLM, they assume that actual monthly innovations are normally distributed and smoothed by a moving average model with two lags.

$$X_t = \theta_0 \eta_t + \theta_1 \eta_{t-1} + \theta_2 \eta_{t-2}$$

$$1 = \theta_0 + \theta_1 + \theta_2$$

$$\eta_k \sim \text{Nor}(0, \sigma_\eta^2)$$

Following GLM, we use maximum likelihood to estimate a moving average model with two lags and then, transform the estimated coefficients by dividing each $\widehat{\theta_i}$ by $1 + \widehat{\theta_1} + \widehat{\theta_2}$ to normalize them. The first coefficient $\widehat{\theta_0}$ (Theta Coefficient) is our second empirical measure. Finally, we calculate our third measure (Smoothing Index) as follow:

$$\xi = \sum_{j=0}^{k} \theta_j^2$$

For each measure, we estimate those measures using prior two-year of monthly returns for each month. In this process, we include only funds with at least 18 non-missing returns observations over the prior 24 months.

Panel A of Table1 reports time series means, standard deviation, and quartile values of cross-sectional averages of smoothing measures. And Panel B of Table 1 presents the time-series average of the cross-sectional Pearson correlations between each pair of smoothing measures.

Panel A : Summary Statistics

Variable	Mean	SD	Q1	Median	Q3
Serial Correlation ($\hat{\rho}$)	0.127	0.185	-0.009	0.125	0.254
Theta Coefficient ($\widehat{\theta_0}$)	0.919	0.236	0.745	0.875	1.039
Smoothing Index ($\hat{\xi}$)	0.962	0.520	0.645	0.795	0.606

Panel B : Pearson Correlation

	$\hat{\rho}$	$\widehat{\theta_0}$	$\hat{\xi}$
Serial Correlation($\hat{\rho}$)	1.000	-0.822	-0.733
Theta Coefficient ($\widehat{\theta_0}$)		1.000	0.973
Smoothing Index($\hat{\xi}$)			1.000

Table 2.

Summary statistics of cultural variables and fund characteristics.

This table reports the summary statistics for the key variables used in our main regression. Panel A of Table 2 presents that the time-series mean, standard deviation and quartile values of the cross-sectional average of cultural variables and fund characteristics. And Panel B of Table 2 shows Pearson correlations between smoothing measures and those variables. Lockup period is the minimum time that the investors have to commit before withdrawing their invested capital. And redemption notice period is the sum of notice period and redemption period. Notice period is the time that investors who want to withdraw their capital have to notice in advance and redemption period is the time that the funds return the invested capital to the investors. Management fee and incentive fee are terms of the compensation contract. Mean returns and volatility is the average and volatility of the prior 24-month returns. Fund age is the age of the fund in months. Mean AUM is the average of monthly assets under management over the prior 24 months. Shore is an indicator variable that takes the value of 1 if the fund is an onshore fund, and 0 otherwise. Audit and leverage are also indicate variables for use of audit service and leverage, respectively. Liquidity beta is the exposer to liquidity risk factor, estimated by the preceding 24-month time series regression of excess returns on liquidity risk factor of Pastor and Stambaugh (2004) after controlling for the seven factors of Fung and Hsieh (2004). Lockup, Redemption, Management Fee, Incentive Fee, Shore, Audit, Leverage are time-invariant.

Panel A : Summary Statistics					
Variable	Mean	SD	Q1	Median	Q3
Main variables					
IDV	83.20	14.38	83.12	89.31	91.00
UA	47.63	11.20	43.84	46.00	49.70
MAS	61.40	8.33	61.03	62.00	63.64
PD	40.78	8.87	37.76	40.00	40.18
Control Variables					
Lockup(month)	2.75	6.17	0.00	0.00	3.50
Redemption(month)	1.10	0.96	0.34	0.92	1.55
Management Fee (%)	1.45	0.75	1.00	1.36	1.86
Incentive Fee (%)	15.05	7.85	9.68	19.90	20.00
Mean Return(%)	0.73	1.57	0.20	0.65	1.18
Volatility(%)	4.00	5.54	1.87	3.36	5.05
log(Age)	4.34	0.45	3.98	4.30	4.66
log(Mean AUM)	17.44	1.71	16.38	17.52	18.58
Shore	0.55	0.50	0.00	0.86	1.00
Audit	0.92	0.25	1.00	1.00	1.00
Leverage	0.60	0.49	0.00	0.94	1.00
Liquidity beta	0.00	0.21	-0.08	0.00	0.06

Panel B : Pearson Correlation			
Variable	rho	theta0	index
IDV	0.04	-0.03	-0.02
UA	-0.03	0.03	0.02
MA	0.02	-0.03	-0.03
PD	0.01	0.00	0.00
Lockup	0.07	-0.05	-0.04
Redemtion	0.17	-0.14	-0.12

Table 2. Continued

Management Fee	-0.02	0.03	0.03
Incentive Fee	-0.02	0.02	0.03
Mean Return	0.00	0.00	0.00
Volatility	-0.12	0.10	0.08
log(Age)	0.02	0.00	0.00
log(Mean AUM)	0.13	-0.10	-0.09
Shore	-0.04	0.03	0.03
Audit	0.00	0.00	0.00
Leverage	-0.03	0.04	0.04
Liquidity beta	-0.01	0.01	0.01

Table 3.

Regression results for the returns smoothing of hedge funds

This table presents the estimation results from the panel regression of each smoothing measure on four dimensions of culture and control variables (lockup, redemption, management fee, incentive fee, mean return, volatility, age, mean aum, shore dummy, audit dummy, leverage dummy, and liquidity beta). The results for Serial Correlation, Theta Coefficient, and Smoothing Index are in Panel A, Panel B, and Panel C, respectively. Our sample period is from 1994:1 to 2013:12. We report t statistics based on clustered standard errors after correcting for both serial and cross-sectional correlations in parentheses. Numbers in bold denote statistically significance at 10% level

Panel A : Dependent : Serial Correlation					
Variable	Model 1	Model 2	Model 3	Model 4	Model 5
IND	**0.0010**				**0.0012**
	(5.31)				**(5.57)**
UA		**-0.0008**			**-0.0008**
		(-4.67)			**(-4.30)**
MAS			**0.0005**		**0.0004**
			(2.50)		**(2.16)**
PD				**-0.0006**	**0.0010**
				(-2.62)	**(3.55)**
Lockup	**0.0007**	**0.0008**	**0.0009**	**0.0009**	**0.0006**
	(2.17)	**(2.52)**	**(2.67)**	**(2.68)**	**(1.89)**
Redemption	**0.0255**	**0.0268**	**0.0273**	**0.0275**	**0.0241**
	(9.40)	**(9.71)**	**(9.71)**	**(9.80)**	**(9.00)**
Mfee	0.3806	**0.3857**	0.2730	0.3358	**0.3900**
	(1.45)	(1.46)	(1.05)	(1.29)	(1.45)
Incenfee	0.0283	0.0421	**0.0558**	**0.0539**	0.0122
	(0.91)	(1.34)	**(1.76)**	**(1.70)**	(0.40)
Mean_ret	**-1.7358**	**-1.6866**	**-1.6751**	**-1.6624**	**-1.7843**
	(-4.37)	**(-4.19)**	**(-4.15)**	**(-4.11)**	**(-4.53)**
Vol	**0.3465**	**0.3338**	**0.3284**	**0.3268**	**0.3591**
	(3.98)	**(3.75)**	**(3.67)**	**(3.65)**	**(4.17)**
Age	**-0.0081**	-0.0061	-0.0057	-0.0055	**-0.0094**
	(-1.74)	(-1.34)	(-1.25)	(-1.21)	**(-2.00)**
Mean_aum	**0.0134**	**0.0134**	**0.0136**	**0.0134**	**0.0136**
	(10.56)	**(10.51)**	**(10.66)**	**(10.50)**	**(10.73)**
Shore	**-0.0127**	-0.0052	**-0.0069**	**-0.0079**	**-0.0100**
	(-3.08)	(-1.26)	**(-1.71)**	**(-1.96)**	**(-2.38)**
Audit	**-0.0209**	**-0.0225**	**-0.0237**	**-0.0239**	**-0.0186**
	(-2.56)	**(-2.72)**	**(-2.86)**	**(-2.88)**	**(-2.30)**
Leverage	-0.0031	-0.0034	-0.0041	-0.0033	-0.0037
	(-0.77)	(-0.85)	(-1.00)	(-0.81)	(-0.93)
Liquidity	0.0011	0.0012	0.0026	0.0026	-0.0007
	(0.09)	(0.10)	(0.21)	(0.21)	(-0.06)
Intercept	**-0.1919**	**-0.0823**	**-0.1570**	**-0.0992**	**-0.2352**
	(-4.89)	**(-2.03)**	**(-3.97)**	**(-2.49)**	**(-5.26)**
Style control	Yes	Yes	Yes	Yes	Yes
N	340071	340071	340071	340071	340071
Adjusted rsquare	9.67%	9.43%	9.28%	9.29%	9.90%

Panel B : Dependent : Theta Coefficient					
Variable	Model 1	Model 2	Model 3	Model 4	Model 5
IND	**-0.0014**				**-0.0018**
	(-4.46)				**(-5.18)**
UA		**0.0014**			**0.0015**
		(4.77)			**(4.90)**
MAS			**-0.0011**		**-0.0012**
			(-3.10)		**(-3.39)**
PD				0.0006	**-0.0022**
				(1.56)	**(-4.68)**
Lockup	**-0.0009**	**-0.0011**	**-0.0012**	**-0.0012**	-0.0007
	(-1.90)	**(-2.22)**	**(-2.37)**	**(-2.40)**	(-1.53)
Redemption	**-0.0404**	**-0.0418**	**-0.0424**	**-0.0435**	**-0.0371**
	(-9.66)	**(-9.77)**	**(-9.81)**	**(-10.02)**	**(-9.06)**
Mfee	**-0.8606**	**-0.8825**	-0.6528	-0.7735	**-0.8636**
	(-1.79)	**(-1.83)**	(-1.37)	(-1.62)	**(-1.76)**
Incenfee	**-0.1179**	**-0.1328**	**-0.1551**	**-0.1553**	-0.0854
	(-2.12)	**(-2.36)**	**(-2.71)**	**(-2.71)**	(-1.57)
Mean_ret	**1.9944**	**1.9356**	**1.9174**	**1.8899**	**2.1116**
	(3.24)	**(3.11)**	**(3.08)**	**(3.02)**	**(3.45)**
Vol	**-0.3873**	**-0.3724**	**-0.3637**	**-0.3578**	**-0.4167**
	(-2.94)	**(-2.78)**	**(-2.71)**	**(-2.66)**	**(-3.19)**
Age	0.0101	0.0074	0.0069	0.0064	0.0127
	(1.31)	(0.98)	(0.91)	(0.84)	(1.64)
Mean_aum	**-0.0159**	**-0.0159**	**-0.0163**	**-0.0159**	**-0.0163**
	(-7.83)	**(-7.78)**	**(-7.98)**	**(-7.81)**	**(-8.03)**
Shore	**0.0193**	0.0076	0.0099	**0.0129**	**0.0133**
	(2.75)	(1.07)	(1.45)	**(1.89)**	**(1.85)**
Audit	**0.0265**	**0.0285**	**0.0302**	**0.0310**	**0.0217**
	(2.16)	**(2.28)**	**(2.42)**	**(2.47)**	**(1.78)**
Leverage	**0.0121**	**0.0126**	**0.0137**	**0.0125**	**0.0138**
	(1.85)	**(1.92)**	**(2.09)**	**(1.90)**	**(2.13)**
Liquidity	-0.0106	-0.0103	-0.0127	-0.0132	-0.0067
	(-0.61)	(-0.59)	(-0.72)	(-0.74)	(-0.40)
Intercept	**1.3850**	**1.2166**	**1.3580**	**1.2610**	**1.5071**
	(22.07)	**(19.34)**	**(21.32)**	**(20.06)**	**(20.10)**
Style control	Yes	Yes	Yes	Yes	Yes
N	285121	285121	285121	285121	285121
Adjusted rsquare	5.75%	5.70%	5.60%	5.52%	6.01%

Panel C : Dependent : Smoothing Index					
Variable	Model 1	Model 2	Model 3	Model 4	Model 5
IND	**-0.0040**				**-0.0048**
	(-4.27)				**(-4.66)**
UA		**0.0034**			**0.0035**
		(3.92)			**(3.74)**
MAS			**-0.0034**		**-0.0032**
			(-3.14)		**(-3.04)**
PD				**0.0023**	**-0.0047**
				(2.04)	**(-3.36)**
Lockup	**-0.0023**	**-0.0028**	**-0.0030**	**-0.0030**	-0.0019
	(-1.72)	**(-2.09)**	**(-2.21)**	**(-2.24)**	(-1.41)
Redemption	**-0.1046**	**-0.1095**	**-0.1102**	**-0.1128**	**-0.0967**
	(-8.96)	**(-9.12)**	**(-9.11)**	**(-9.26)**	**(-8.51)**
Mfee	-2.3953	-2.4079	-1.7938	-2.1604	-2.3520
	(-1.64)	(-1.64)	(-1.24)	(-1.49)	(-1.59)
Incenfee	-0.2547	**-0.3075**	**-0.3602**	**-0.3577**	-0.1829
	(-1.50)	**(-1.78)**	**(-2.05)**	**(-2.04)**	(-1.10)
Mean_ret	**4.6361**	**4.4517**	**4.4190**	**4.3341**	**4.8992**
	(2.90)	**(2.75)**	**(2.73)**	**(2.67)**	**(3.07)**
Vol	**-1.0212**	**-0.9722**	**-0.9548**	**-0.9390**	**-1.0883**
	(-2.98)	**(-2.78)**	**(-2.73)**	**(-2.69)**	**(-3.18)**
Age	0.0094	0.0014	0.0004	-0.0009	0.0152
	(0.42)	(0.06)	(0.02)	(-0.04)	(0.69)
Mean_aum	**-0.0431**	**-0.0432**	**-0.0441**	**-0.0432**	**-0.0440**
	(-7.24)	**(-7.22)**	**(-7.41)**	**(-7.23)**	**(-7.41)**
Shore	**0.0634**	0.0326	**0.0363**	**0.0443**	**0.0472**
	(3.06)	(1.59)	**(1.82)**	**(2.23)**	**(2.29)**
Audit	0.0440	0.0510	0.0545	0.0567	0.0332
	(1.25)	(1.42)	(1.53)	(1.58)	(0.94)
Leverage	**0.0402**	**0.0417**	**0.0450**	**0.0410**	**0.0445**
	(2.15)	**(2.23)**	**(2.40)**	**(2.19)**	**(2.40)**
Liquidity	0.0165	0.0159	0.0104	0.0095	0.0255
	(0.34)	(0.32)	(0.21)	(0.19)	(0.52)
Intercept	**2.4588**	**2.0073**	**2.3884**	**2.0807**	**2.7466**
	(14.38)	**(12.13)**	**(13.85)**	**(12.40)**	**(12.99)**
Style control	Yes	Yes	Yes	Yes	Yes
N	285121	285121	285121	285121	285121
Adjusted rsquare	4.20%	4.20%	4.10%	4.00%	4.34%

Table 4.

Robustness checks

This table presents robustness check for our main findings. We conduct panel regression of each smoothing measures on foul national dimensions of culture and control variables with replaced sample. Panel A reports the estimation results based on the sample limited to hedge funds whose management company locate in non-US. And Panel B reports the estimation results based on the sample limited to hedge funds in countries that have more than 10 individual funds. Our sample period is from 1994:1 to 2013:12. We report t statistics based on clustered standard errors after correcting for both serial and cross-sectional correlations in parentheses. Numbers in bold denote statistically significance at 10% level

Panel A : Hedge funds whose management company locate in non-US			
Variable	Serial Correlation	Theta Coefficient	Smoothing Index
IND	**0.0006**	**-0.0009**	**-0.0028**
	(3.34)	**(-2.67)**	**(-2.83)**
UA	**-0.0005**	**0.0012**	**0.0027**
	(-3.12)	**(3.70)**	**(2.96)**
MAS	0.0002	**-0.0008**	**-0.0022**
	(1.21)	**(-2.27)**	**(-2.15)**
PD	**0.0005**	**-0.0014**	**-0.0031**
	(2.03)	**(-3.02)**	**(-2.25)**
Lockup	-0.0003	0.0009	0.0019
	(-0.66)	(1.14)	(0.85)
Redemption	**0.0226**	**-0.0318**	**-0.0843**
	(6.29)	**(-5.75)**	**(-5.45)**
Mfee	0.4238	**-1.5697**	**-4.0808**
	(1.09)	**(-2.21)**	**(-1.88)**
Incenfee	0.0209	**-0.1311**	-0.3462
	(0.48)	**(-1.70)**	(-1.48)
Mean_ret	**-2.4185**	**3.5384**	**9.2417**
	(-5.06)	**(4.57)**	**(4.30)**
Vol	**0.4607**	**-0.6806**	**-1.8825**
	(4.34)	**(-4.14)**	**(-4.12)**
Age	**-0.0214**	**0.0309**	0.0518
	(-2.72)	**(2.34)**	(1.35)
Mean_aum	**0.0118**	**-0.0140**	**-0.0354**
	(6.32)	**(-4.66)**	**(-4.01)**
Shore	**-0.0212**	**0.0336**	**0.0877**
	(-2.60)	**(2.51)**	**(2.24)**
Audit	**-0.0626**	**0.0562**	**0.0952**
	(-4.78)	**(2.70)**	**(1.54)**
Leverage	0.0064	-0.0067	-0.0114
	(1.04)	(-0.65)	(-0.39)
Liquidity	0.0130	-0.0198	-0.0152
	(0.76)	(-0.84)	(-0.24)
Intercept	-0.0835	**1.3147**	**2.2966**
	(-0.92)	**(9.78)**	**(6.61)**
Style control	Yes	Yes	Yes
N	156141	131934	131934
Adjusted rsquare	8.61%	6.10%	4.90%

Panel B : Hedge funds in countries having more than 10 individual hedge fund			
Variable	Model 5	Model 5	Model 5
IND	**0.0013**	**-0.0019**	**-0.0049**
	(5.75)	**(-5.17)**	**(-4.52)**
UA	**-0.0009**	**0.0017**	**0.0039**
	(-4.75)	**(5.15)**	**(3.90)**
MAS	**0.0006**	**-0.0014**	**-0.0040**
	(2.64)	**(-3.89)**	**(-3.58)**
PD	**0.0011**	**-0.0023**	**-0.0048**
	(3.61)	**(-4.68)**	**(-3.25)**
Lockup	**0.0007**	-0.0007	-0.0018
	(1.99)	(-1.51)	(-1.32)
Redemption	**0.0220**	**-0.0338**	**-0.0862**
	(7.93)	**(-7.86)**	**(-7.31)**
Mfee	0.4016	**-0.8877**	-2.3704
	(1.35)	**(-1.71)**	(-1.54)
Incenfee	-0.0176	-0.0476	-0.0941
	(-0.51)	(-0.82)	(-0.54)
Mean_ret	**-2.1384**	**2.7503**	**6.4800**
	(-5.16)	**(4.13)**	**(3.63)**
Vol	**0.2566**	-0.2794	**-0.9462**
	(1.88)	(-1.39)	**(-1.73)**
Age	**-0.0098**	**0.0162**	0.0266
	(-1.83)	**(1.86)**	(1.08)
Mean_aum	**0.0134**	**-0.0158**	**-0.0423**
	(9.36)	**(-6.92)**	**(-6.28)**
Shore	-0.0074	0.0081	0.0261
	(-1.60)	(1.03)	(1.16)
Audit	**-0.0251**	**0.0250**	0.0347
	(-2.76)	**(1.86)**	(0.88)
Leverage	0.0002	0.0069	0.0242
	(0.04)	(0.93)	(1.15)
Liquidity	0.0036	-0.0118	0.0226
	(0.19)	(-0.46)	(0.31)
Intercept	**-0.2164**	**1.4694**	**2.6431**
	(-4.19)	**(17.19)**	**(11.21)**
Style control	Yes	Yes	Yes
N	317641	265945	265945
Adjusted rsquare	10.28%	6.20%	4.47%

Table 5.

Robustness checks

This table presents robustness check for our main findings. We repeat our main analysis in different setting using national culture of managers' nations, not management company locations. We conduct panel regression of each smoothing measures on foul national dimensions of culture and control variables. Our sample period is from 1994:1 to 2013:12. We report t statistics based on clustered standard errors after correcting for both serial and cross-sectional correlations in parentheses. Numbers in bold denote statistically significance at 10% level

Variable	Serial Correlation	Theta Coefficient	Smoothing Index
IND	**0.0010**	**-0.0015**	**-0.0036**
	(4.21)	**(-3.98)**	**(-3.32)**
UA	-0.0001	**0.0009**	**0.0022**
	(-0.54)	**(2.77)**	**(2.28)**
MAS	0.0003	**-0.0011**	**-0.0033**
	(1.23)	**(-2.84)**	**(-2.68)**
PD	**0.0011**	**-0.0024**	**-0.0061**
	(3.04)	**(-3.72)**	**(-3.20)**
Lockup	0.0002	-0.0002	-0.0003
	(0.65)	(-0.29)	(-0.23)
Redemption	**0.0179**	**-0.0258**	**-0.0680**
	(5.74)	**(-5.42)**	**(-5.31)**
Mfee	0.4225	-0.7478	-2.0594
	(1.11)	(-1.02)	(-0.93)
Incenfee	0.0593	**-0.1607**	**-0.4237**
	(1.33)	**(-2.23)**	**(-1.89)**
Mean_ret	**-1.3975**	**1.5749**	**3.0923**
	(-4.23)	**(3.07)**	**(2.31)**
Vol	**0.3235**	-0.2758	**-0.8707**
	(2.78)	(-1.58)	**(-1.86)**
Age	**-0.0121**	0.0128	0.0065
	(-2.30)	(1.54)	(0.28)
Mean_aum	**0.0132**	**-0.0170**	**-0.0471**
	(9.68)	**(-7.67)**	**(-7.24)**
Shore	-0.0054	0.0038	0.0244
	(-1.08)	(0.46)	(1.05)
Audit	-0.0030	0.0049	-0.0041
	(-0.37)	(0.40)	(-0.11)
Leverage	**-0.0114**	**0.0200**	**0.0563**
	(-2.42)	**(2.74)**	**(2.72)**
Liquidity	-0.0180	0.0007	0.0411
	(-1.46)	(0.04)	(0.71)
Intercept	**-0.2443**	**1.5564**	**2.9605**
	(-4.88)	**(18.36)**	**(12.44)**
Style control	Yes	Yes	Yes
N	221655	185452	185452
Adjusted rsquare	9.50%	5.52%	4.20%

Table 6.

Regression results for the returns smoothing of hedge funds

This table presents the estimation results from the cross-sectional logistic regression of each misreporting flag (Kink, Maxrsq, Indexrsq, AR(1), CAR(1), Decret, Decresid, Any flag) on four dimensions of culture and control variables (lockup, redemption, management fee, incentive fee, mean return, volatility, age, mean aum, shore dummy, audit dummy, leverage dummy, and liquidity beta). In this table, *Any flag* is set equal to one if the fund triggers one or more misreporting flags, and zero otherwise. our sample period is from 1994:1 to 2013:12. We report standard logistic regression coefficients and corresponding p-values in parentheses. Number in bold denote statistically significance at 10% level.

Variable	Kink	Maxrsq	Indexrsq	AR(1)	CAR(1)	Decret	Decresid	Any flag
IND	-0.0006	**0.0095**	**0.0141**	**0.0046**	0.0031	0.0003	0.0005	**0.0068**
	(0.87)	**(0.00)**	**(0.00)**	**(0.05)**	(0.41)	(0.92)	(0.89)	**(0.00)**
UA	**0.0082**	**-0.0133**	**-0.0184**	**-0.0086**	0.0051	0.0010	-0.0054	**-0.0084**
	(0.02)	**(0.00)**	**(0.00)**	**(0.00)**	(0.21)	(0.76)	(0.15)	**(0.00)**
MAS	0.0028	**0.0184**	**0.0177**	**0.0073**	**-0.0097**	**-0.0075**	**-0.0087**	**0.0089**
	(0.58)	**(0.00)**	**(0.00)**	**(0.02)**	**(0.01)**	**(0.06)**	**(0.05)**	**(0.00)**
PD	0.0010	**0.0185**	**0.0123**	0.0051	**-0.0133**	-0.0028	-0.0003	**0.0095**
	(0.86)	**(0.00)**	**(0.03)**	(0.19)	**(0.02)**	(0.59)	(0.96)	**(0.00)**
Lockup	0.0035	**-0.0187**	**-0.0224**	0.0078	**0.0153**	0.0024	0.0092	0.0055
	(0.60)	**(0.01)**	**(0.01)**	(0.12)	**(0.02)**	(0.73)	(0.20)	(0.29)
Redemption	**0.1086**	0.0435	-0.0517	**0.3179**	**-0.0908**	**-0.1119**	-0.0816	**0.1657**
	(0.02)	(0.30)	(0.29)	**(0.00)**	**(0.09)**	**(0.02)**	(0.15)	**(0.00)**
Mfee	-5.1466	-6.0348	-7.5510	0.3547	**10.1971**	0.5944	-5.0420	0.9490
	(0.41)	(0.24)	(0.17)	(0.94)	**(0.06)**	(0.92)	(0.46)	(0.80)
Incenfee	**1.3403**	**2.3874**	**3.3595**	**-1.1198**	-0.7379	-0.0071	0.6581	**0.9771**
	(0.03)	**(0.00)**	**(0.00)**	**(0.02)**	(0.28)	(0.99)	(0.36)	**(0.02)**
Mean_ret	7.7777	-4.3883	**-13.3325**	**-25.5638**	**-18.3429**	**51.2837**	**45.1130**	**-13.9196**
	(0.27)	(0.29)	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**
Vol	-0.0044	-0.0154	0.0117	0.0221	0.0146	**-0.0552**	-0.0159	**0.0362**
	(0.86)	(0.47)	(0.61)	(0.20)	(0.59)	**(0.02)**	(0.55)	**(0.02)**
Age	**-11.2435**	**-2.7964**	-1.1644	**-4.2966**	**1.6933**	**-9.6565**	**-12.6163**	**-2.9943**
	(0.00)	**(0.04)**	(0.41)	**(0.00)**	**(0.03)**	**(0.00)**	**(0.00)**	**(0.00)**
Mean_aum	0.0602	**-1.0251**	**-0.8619**	**1.1975**	**0.5463**	**1.2251**	**0.3919**	**0.5608**
	(0.46)	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**
Shore	0.0516	-0.1203	-0.0802	**-0.1546**	-0.0941	**-0.3517**	**-0.1926**	**-0.2838**
	(0.59)	(0.15)	(0.38)	**(0.02)**	(0.35)	**(0.00)**	**(0.06)**	**(0.00)**
Audit	-0.1469	-0.0948	**-0.3147**	-0.1377	-0.0429	-0.0741	0.1005	**-0.3752**
	(0.34)	(0.42)	**(0.01)**	(0.22)	(0.81)	(0.65)	(0.57)	**(0.00)**
Leverage	0.0241	**0.1530**	0.0690	0.0152	-0.0882	0.0929	**0.1921**	0.0747
	(0.80)	**(0.06)**	(0.43)	(0.81)	(0.37)	(0.30)	**(0.06)**	(0.22)
Liquidity	-0.2051	0.1009	0.1684	**2.1644**	0.5364	**-1.1898**	-0.0148	**0.8536**
	(0.67)	(0.72)	(0.56)	**(0.00)**	(0.22)	**(0.01)**	(0.98)	**(0.00)**
Intercept	**-2.0188**	**2.4615**	**1.8504**	**-6.2981**	**-3.2978**	**-5.6467**	**-2.0285**	-1.0275
	(0.05)	**(0.01)**	**(0.05)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.05)**	(0.37)
Style control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	6087	6087	6087	6087	6087	6087	6087	6087
Pseudo rsquare	2.78%	8.86%	13.93%	19.10%	1.67%	6.48%	2.63%	8.75%

Appendix

Cultural dimensions of Hofstede

This table presents the four cultural dimensions of Hofstede (2001) for 40 countries in our sample.

Country	IDV	UA	MA	PD
Argentina	46	86	56	49
Australia	90	51	61	36
Austria	55	70	79	11
Belgium	75	94	54	65
Brazil	38	76	49	69
Canada	80	48	52	39
Chile	23	86	28	63
China	20	40	66	80
Czech Republic	58	74	57	57
Denmark	74	23	16	18
Finland	63	59	26	33
France	71	86	43	68
Germany	67	65	66	35
Greece	35	112	57	60
Hong Kong	25	29	57	68
India	48	40	56	77
Indonesia	14	48	46	78
Ireland	70	35	68	28
Israel	54	81	47	13
Italy	76	75	70	50
Japan	46	92	95	54
Kuwait	38	68	52	80
Malaysia	26	36	50	104
Netherlands	80	53	14	38
New Zealand	79	49	58	22
Norway	69	50	8	31
Panama	11	86	44	95
Peru	16	87	42	64
Poland	60	93	64	68
Portugal	27	104	31	63
Singapore	20	8	48	74
South Africa	65	49	63	49
Spain	51	86	42	57
Sweden	71	29	5	31
Switzerland	68	58	70	34
Thailand	20	64	34	64
Turkey	37	85	45	66
United Arab Emirates	38	68	52	80
United Kingdom	89	35	66	35
United States	91	46	62	40
Uruguay	36	100	38	61