

## Culture and CEO Compensation

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# **Culture and CEO Compensation**

## **Abstract**

This paper examines CEO compensation in 43 countries from the 1996 to 2009 period and focuses on how national culture affects contracting decisions. Our empirical analysis documents that cultural factors (measuring such societal traits as individualism and uncertainty avoidance) are significant determinants of the relative use of equity-based compensation. These factors are highly significant after controlling for the previously-identified determinants of compensation structure relating to legal environment and firm-specific characteristics. By empirically verifying the strong relation between culture and compensation, we hope to contribute to a more comprehensive understanding of the interaction between informal institutions and corporate decision-making.

## **Culture and CEO Compensation**

In this study, we document that CEO compensation structure (i.e., the relative use of equity-based compensation) differs across countries, and we seek to better understand the determinants of this cross-sectional variation. Prior research has identified the important role of formal institutions (e.g., law) in the development of debt and equity markets across the globe, and therefore on the types of contracts available and held in different nations. More recent research has considered the importance of law in determining the design of compensation contracts across countries. This study adds to our understanding of how institutional factors affect contracting decisions by examining whether culture also contributes to persistent cross-sectional differences in compensation structures.

We use CEO compensation data for firms from 43 nations over the period between 1996 and 2009. We rely on dimensions of culture captured by Hofstede (2001), Schwartz (2006), and the World Values Survey. Our study expands the application of quantitative measures of cultural value dimensions to the financial contracting literature and provides initial evidence of how national culture impacts executive compensation. Our empirical analysis indicates that our measures of culture are significantly related to the cross-sectional variation in the use of equity-based compensation. Because these results exist after controlling for previously-identified determinants of compensation structure (i.e., firm-specific factors and legal environment), the data strongly suggest that an understanding of culture can contribute to a better understanding of compensation contracting.

Additionally, we find anecdotal evidence in our data indicating a potential relation between culture and compensation structure. As one example, the Delhaize Group (a Belgian company with U.S. operations) explicitly states in its annual report that it incorporates

differential pay practices across executives in different countries based upon regional norms, and it notes that equity-based compensation is more widely prescribed in the U.S. than in Europe.

Further, as we see in the below quotation from its 2008 annual report, Delhaize encourages the following ownership levels based upon country-specific norms:

*“ . . . [D]uring their active employment, each of our Chief Executive Officers and our other executive officers is expected to acquire and maintain ownership of Delhaize Group stock equal to a multiple of such officer’s annual base salary. These multiples are as follows: Chief Executive Officer: 300% of annual base salary; U.S.-based executive officers: 200% of annual base salary; European-based executive officers: 100% of annual base salary.”*

Although our focus is on differences across firms in different countries (rather than differences *within* firms, as the Delhaize example illustrates), the Delhaize disclosure lends additional credence to operationalized differences in compensation structure, explicitly attributed to informal factors, including aspects of cultural norms.

Thomas Friedman (2005) has famously argued that the forces of globalization are mitigating the effects of cross-national differences so that the world is becoming “flat”. If applied within the context of corporate governance, this “flat world” perspective would be consistent with the convergence hypothesis articulated by Coffee (1999). That is, the most effective compensation structures will become more widely-adopted and cross-country differences in compensation design should dissipate over time.

However, recent empirical evidence is inconclusive regarding such a convergence (or “flattening” of the world) with respect to executive compensation. Fernandes et al. (2012) test for convergence in various compensation policies across a sample of 14 countries from 2003-2008. After controlling for firm-level and country-level effects, they provide evidence of compensation convergence for their sample countries during their sample period. Alternatively, after considering a longer time series, Bryan et al. (2010, 2011) indicate that there is no recent

international convergence towards U.S. standards of compensation structure. These Bryan et al. studies primarily attribute the cross-sectional variance in CEO compensation structure to differences in the legal environment. However, in addition to the legal systems, other types of institutional variables may impact compensation structure. Dyck and Zingales (2004) and Stulz and Williamson (2003) identify that financial decisions may be affected by “extra-legal” characteristics (such as social or cultural norms). While the intersection of culture and economics has attracted increasing attention in the finance literature (e.g., Ahern, Daminelli, and Fracassi (2012), Breuer and Salzman (2010), Giannetti and Yafeh (2012), and Guiso, Sapienza, and Zingales (2006, 2009)), the impact of culture on compensation design has largely been unexplored.

We initially draw from the work of two Nobel Prize winning economists to consider the impact of culture on compensation design. Coase (1937) explains that “institutions matter”; North (1990) documents that institutions are the “rules of the game in a society” that “consist of both informal constraints and formal rules”. While the contracting implications of the “formal rules” (such as the legal and regulatory environments) have been more thoroughly examined in the law and finance and in the regulatory economics literatures, the role of the “informal constraints” has drawn much less attention from financial economists. Therefore, we focus on these informal constraints in our efforts to contribute to a more comprehensive understanding of the interaction between institutions and corporate decision-making.

Indeed, we find that culture matters. We first confirm the persistence of significant differences in the design of compensation contracts across countries by studying CEO compensation structures for firms in 43 nations. We then focus on the source of this cross-sectional variation. While we support the contentions of the “law and finance” literature by

verifying that some of the cross-sectional variation is related to differences in legal environment, our data also indicate a strong role for culture in explaining the design of compensation contracts. Specifically, we draw from the sociology and cross-cultural psychology literatures to identify cultural factors that theory predicts should influence contracting decisions. Our empirical analysis confirms that cultural factors (measuring such societal traits as individualism and uncertainty avoidance) are significant determinants of the relative use of equity-based compensation.

We recognize that concerns may be raised about our study. First, endogeneity may be problematic when compensation structure is explained using variables that are jointly determined. For purposes of this study, culture is deemed to be predetermined, instead of jointly determined, with regard to observed values of compensation structure in our sample. Second, we recognize that our findings may be driven by an omitted variable that is correlated with culture and with CEO compensation structure. We attempt to address this concern by rerunning our empirical models after randomly assigning values to the cultural factors studied. We then retest the significance of our findings based on the simulated distribution of slope coefficients. We find our results are not driven by chance and that the cultural factors we investigate are significantly related to the relative use of equity-based compensation.

To further investigate whether culture matters, we test the significance of the factors in two subsets of the data. We separate firms that produce tradable goods (i.e., products that may be sold internationally) from those with non-tradable goods (i.e., products that may be sold only domestically). Since firms primarily selling non-tradable goods should be domestically-focused and should be more likely to hire CEOs locally, culture should play a more important role in explaining compensation structure for firms with local markets (non-tradable goods), as opposed

to global markets. Our findings are consistent with this hypothesis. Cultural factors are more significant for firms that produce non-tradable goods. However, cultural factors continue to play a role, albeit smaller, in explaining compensation structure for firms with tradable goods. We feel that these additional tests help reduce concern about an omitted variables problem. We describe these tests in greater detail later in the paper.

Our findings are robust to the use of alternative instruments identified in the literature to measure cultural dimensions. Furthermore, our results are robust to different partitionings of the data and are also robust to the inclusion of additional institutional variables (such as measures of the religion, language, and the tax environment).

We organize the remainder of the paper as follows. Section I describes the intersection of culture and contracting decisions and introduces our cultural variables. In Section II, we review the previously-established factors affecting the structure of compensation contracts. Section III documents our data sources and sample and provides descriptive statistics. We present our primary empirical results in Section IV and conduct robustness testing in Sections V and VI. Section VII provides a summary and conclusion.

## **I. The Role of Culture in Contracting Decisions**

### *A. Measures of Culture*

Drawing from North's (1990) analogy of institutions as defining "the rules of the game", Siegel et al. (2011) refer to culture as "the unwritten, unspoken rules of the game". While perhaps unwritten and unspoken, culture is not unmeasurable, at least according to the cross-cultural psychologists. The field of cross-cultural psychology has specified numerous paradigms for identifying international cultural differences. These quantifiable measures of societal traits

allow for the formulation of testable hypotheses regarding culture's impact on economic decision-making. As summarized by Sondergaard (1994), one of the most widely-utilized and empirically-validated typologies of culture was developed by Geert Hofstede (1980).

Hofstede (1980) defines culture as the “software of the mind”. Hofstede uses values as a means to operationalize his dimensions of cultural variation (known as cultural value dimensions or CVD).<sup>1</sup> Hofstede's cross-cultural study to identify and quantify values is rooted in psychology and sociology theory and focuses on the fundamental challenges encountered by all societies. Hofstede (1980) concludes that cultures face four basic problems: 1) the relationships between the individual and the group, 2) the inequitable distribution of power, 3) the social implications of gender, and 4) the ability to tolerate uncertainty. Theory should also help to delineate the expected societal response or the expected means of addressing these pervasive cultural dilemmas. Hofstede argues that each of his value dimensions reflects a particular culture's solution to each societal problem. Specifically, Hofstede's cultural value dimensions provide a bi-polar spectrum of possible responses as a means of coping with each of the four major issues.

Hofstede's model identifies where a country's culture ranks along a spectrum for each of the four issues. He uses detailed interviews to gauge the society's stance regarding the various values and identifies quantifiable measures that discriminate among cultures through factor analysis and other statistical techniques. Hofstede's original study involved over 100,000 surveys conducted in 50 countries. Sondergaard (1994) reports that Hofstede's work has been subsequently expanded (covering 74 countries and regions), has been widely-cited (over 6,225 citations per SCCI for 1980-2011), and has been broadly validated through replication.

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<sup>1</sup>Siegel et al. (2011) further support the use of CVD by noting that cultural values are the standards that outline appropriate behavior in various circumstances and are paramount in establishing frameworks for people vis-à-vis their relationships with each other.



Accordingly, we use Hofstede's cultural value dimensions (CVD) in our empirical analysis (although we employ several other of the major typologies of culture as part of our robustness testing).<sup>2</sup>

### *B. Cultural Dimensions and Agency Costs*

Jensen and Meckling (1976) argue that firms may use equity-based compensation to better align the interests of managers and stockholders. However, the potential severity of these conflicts of interest may differ across firms and also across countries. To better understand the country-level influences, we draw from Hofstede's (1980) measures of cultural value dimensions. We focus on the Hofstede cultural value dimensions that should most directly affect agency conflicts, and thus should most directly affect the structure of executive compensation. Of the four dimensions specified by Hofstede, our analysis of the literature (described below) suggests that Hofstede's measures of *Individualism* and *Uncertainty Avoidance* are the most likely to directly affect the potential severity of the types of agency conflicts most likely to be addressed through compensation contracts.<sup>3</sup>

#### *1. Individualism*

Agency problems of equity occur when managers pursue individual self-interests at the expense of shareholders. The Hofstede (1980) measure of Individualism (vs. Collectivism) appears especially relevant to this potential conflict of interest. Hofstede (1991) describes that a society's Individualism dimension reflects the relation between the individual and the group and demonstrates the degree to which individual interests may prevail over collective interests. That

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<sup>2</sup> For example, Schwartz (2006) provides a similar typology based on bi-polar dimensions or "value types". We use cultural measures from Schwartz and from other researchers in our robustness analysis.

<sup>3</sup> Hofstede has specified additional cultural value dimensions. However, as we describe in the following sections, we feel that *Individualism* and *Uncertainty Avoidance* are the most theoretically justifiable cultural factors to consider when examining the role of compensation structure in aligning incentives. Accordingly, we do not think that it is appropriate or relevant to include other Hofstede variables in our analysis of compensation structure.

is, members of a society ranking high on the Individualism spectrum are more inclined to pursue their own self-interest and be less attuned to the interests of the group. Individualistic societies involve loosely-knit social relations, emphasize self-reliance and independent action, and embrace personal challenge and individual freedom. Conversely, societies scoring lower on Hofstede's Individualism scale are characterized by more tightly-connected and cohesive in-groups, where the general interests of the collective prevail over those of the individual. Accordingly, in a more individualistic society, the interests of the manager (i.e., the individual) should be less closely aligned with the collective (i.e., the shareholders or the "group" of minority owners). As a result, the agency costs of equity should be positively related to the *Individualism* measure. This leads to our first hypothesis regarding the impact of culture on compensation structure. Since equity-based compensation helps to reduce stockholder/manager conflicts, we expect a greater relative use of equity-based compensation in countries with cultures scoring high on Individualism.

## *2. Uncertainty Avoidance*

A society's level of comfort with uncertainty (or its level of Uncertainty Avoidance, to use Hofstede's nomenclature) is another cultural characteristic that may affect compensation structure. The Hofstede (1980) Uncertainty Avoidance index (UAI) measures the degree to which people feel stress or discomfort in unstructured or risky circumstances. This metric takes on higher values in cultures that crave greater predictability of outcomes and perceive ambiguity as a threat. Societies scoring high on the UAI spectrum seek greater stability and are less tolerant of conflict and competition (especially when outcomes are indeterminate). Conversely, societies that Hofstede characterizes as having low degrees of UAI are more tolerant of ambiguity, are more willing to take risks, and are more secure in unstructured situations.

Cultures with lower UAI are also more accepting of competition and more comfortable with conflict and confrontation.

Several empirical studies investigate the economic implications of a society's propensity for uncertainty avoidance. These studies support Hofstede's theoretical prediction that entities in societies with higher levels of UAI typically make decisions that reflect a greater degree of risk-aversion. For example, Griffin et al. (2008) report a negative relation between Uncertainty Avoidance and corporate risk-taking. Kogut and Singh (1988) find that firms from cultures exhibiting higher Uncertainty Avoidance choose more conservative entry methods when engaging in foreign direct investment. Ramirez and Tadesse (2007) document that firms from cultures with higher Uncertainty Avoidance hold larger cash balances. Kirkman, Lowe, and Gibson (2006) provide an excellent summary of other studies that further demonstrate the empirical validity of Hofstede's UAI.

Regarding the specific impact of UAI on compensation structure, we expect a negative relation between a nation's UAI and the use of equity-based executive compensation. Specifically, if high UAI cultures favor stability and security and strongly seek to avoid uncertainty, CEO compensation contracts of firms in high UAI countries should involve a greater use of cash-based compensation and a lower use of the riskier, equity-based compensation. Alternatively, if the culture is more tolerant of risk-taking and more willing to accept ambiguity of outcome, CEO compensation design should include a greater amount of equity-based pay.

### *3. Alternative Instruments of Culture*

We also recognize that the sociology and cross-cultural psychology literatures provide a rich array of metrics for expressing cultural differences. To help confirm the robustness of our results, we identify alternative variables that serve as instruments for cultural dimensions.

### *3a. Schwartz Variable: Mastery vs. Harmony*

We complement our use of the Hofstede dimensions by considering the cultural orientation scores developed by Schwartz (2006). Based on extensive interviews conducted during 1988-2004, Schwartz derived three broad measures of societal traits, with each following a bi-polar spectrum. In many respects, the Schwartz spectra are similar to Hofstede's cultural value dimensions. However, the Schwartz variable Mastery (vs. Harmony) appears to capture additional cultural attributes (not explicitly measured by Hofstede) that may also affect the agency conflicts that compensation structure may be designed to mitigate. Specifically, the Mastery/Harmony variable conceptualizes the degree of a society's acceptance of entrepreneurial endeavors and individual assertiveness.

A firm in a high-Mastery culture may be more adversely affected by the agency problems of equity. We expect that managers may be more likely to undertake actions that provide personal benefits (at the possible expense of the best interests of shareholders) if the national culture approves of and attaches higher social value to personal success and active self-assertion.<sup>4</sup> Accordingly, since equity-based compensation is one means to better align stockholder/manager interests, we expect a greater use of equity-based compensation in cultures scoring high in Mastery (and expect a lower use of equity-based compensation in cultures scoring high in Harmony).

### *3b. Language*

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<sup>4</sup> Chui et al. (2002) also consider the relation between scores on the Schwartz (2006) Mastery/Harmony spectrum and agency costs of equity. Specifically, they contend that a higher Mastery score suggests a greater propensity for stockholder/manager conflicts (especially the "free cashflow problem"). Since Jensen (1986) notes that the use of debt helps to mitigate the "free cashflow problem", Chui et al. (2002) expect that firms from cultures with high Mastery scores should use more leverage (to better align the interests of the managers and stockholders). The study confirms a positive relation between Mastery scores and the level of leverage in capital structures. We perform similar tests, but focus on compensation structure as the primary method to address agency conflicts.

In seminal papers linking the culture and “law and finance” literatures, Stulz and Williamson (2003) and Licht et al. (2001) use language as an instrument for culture. Language appears to be a good instrument for culture, since Siegel et al. (2011) consider it an exogenous factor and Hallpike (1986) documents that people sharing a language also share many fundamental societal principles and world-views.<sup>5</sup> Stulz and Williamson (2003) and Licht et al. (2001), focusing on the connection between language and legal environments across countries, note that legal protection of shareholder rights is stronger in English common-law countries. Stulz and Williamson (2003) and Licht et al. (2001) raise the issue that these differences may have a cultural genesis. Specifically, Licht et al. (2001) suggest that the “cultural infrastructure” of the English-speaking countries may affect the differences in the legal systems between the common-law and the other nations. Accordingly, our robustness tests include language as an alternative means of assessing the interaction of culture and compensation structure.

### *3c. Religion*

Guiso et al. (2003) focus on religion as a fundamental determinant of various differences in societal values and economic decision-making. These authors consider how religion affects trust (Guiso et al., 2003), bilateral trade (Guiso et al., 2006), and stock market participation (Guiso et al., 2008). Stulz and Williamson (2003) also identify religion as a proxy for culture and demonstrate that religion has significant explanatory power in understanding variation in legal systems across countries.

Additionally, religion may underlie aspects of our primary measures of culture. We recognize a potential connection between religion and Hofstede’s (1980) UAI. Hofstede (1983) observes that cultures scoring high on Uncertainty Avoidance feel greater stress from ambiguity

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<sup>5</sup>Guiso et al. (2009) further support the connection between language and culture by identifying that a common language is one of the most significant determinants of trust between nations.

and seek to minimize indeterminate outcomes. He further contends that, particularly in societies characterized by high levels of Uncertainty Avoidance, religion may serve as a coping mechanism by helping to make uncertainty more tolerable.<sup>6</sup> Hofstede (1983) argues that cultures high in Uncertainty Avoidance seek institutions providing order and predictability and gravitate towards religions that are more rigidly structured and are more likely to claim absolute truth. Such religions reduce ambiguity and make uncertainty more bearable (which is especially important to people highly stressed by uncertainty). Furthermore, LaPorta et al. (1997b) note that hierarchical religions (such as Catholicism) emphasize strict, vertical bonds of authority that may help to instill the order and structure favored in a culture ranking high in Uncertainty Avoidance.

If countries with more hierarchical religions (e.g., Catholicism) are generally characterized by greater Uncertainty Avoidance, we would expect that firms in countries with hierarchical religions should use less equity-based compensation. We follow Kwok and Tadesse (2006) and use religion as an instrument for a culture's tolerance for uncertainty (Uncertainty Avoidance). Therefore, since prior research suggests a positive relation between Catholicism and Hofstede's measure of Uncertainty Avoidance, we repeat our empirical analysis using religion as an alternative measure of culture.

### *3d. Trust*

While the Hofstede and (to a lesser extent) Schwartz variables have dominated the empirical literature examining the consequences of culture, Sapienza et al. (2010) note that trust is another cultural factor that is becoming more widely studied. Sapienza et al. (2010) report that over 500 papers have involved measures of trust (primarily derived from the World Values

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<sup>6</sup>Tannaconne (1998) and Hull and Boyd (1989) also identify a potential relation between religion and a society's tolerance of uncertainty. These authors argue that many standard elements of religious institutions were developed to mitigate risk.

Survey).<sup>7</sup> Therefore, since measures of trust may provide alternative means of assessing cultural differences, we also include a trust variable in our robustness tests. We follow Aghion et al. (2010) and draw our empirical proxy from the World Values Survey (WVS) item focusing on trust of business. The specific WVS question gauges the individual's degree of confidence or trust in companies. We focus on the distrust of companies because it is a lack of trust within the firm that contributes to the agency conflicts that compensation structure is designed to address.<sup>8</sup>

We expect that firms from societies reflecting lower levels of trust should use less equity-based compensation. Specifically, Guiso et al. (2008) find that individuals in cultures exhibiting lower levels of trust hold less of their total wealth in equities. Since our measure of compensation structure reflects the proportion of total compensation provided by equity, we similarly contend that a lower level of trust will be associated with a lower use of equity-based compensation. Guiso et al. (2008) also note that national stock markets are less developed in low trust cultures. Bryan et al. (2010) identify a lower use of equity-based compensation in countries with less developed equity markets.<sup>9</sup> Accordingly, if lower trust contributes to a less developed stock market, we should expect a lower use of equity-based compensation in nations where trust of business is low.

## **II. Law, Agency Costs, and the Structure of Compensation Contracts**

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<sup>7</sup>The extant literature has demonstrated a strong connection between trust and various economic outcomes. For example, recent empirical studies have shown that a society's lack of trust can be linked to a diminished level of overall economic growth (LaPorta et al., 1997b), a lower degree of stock market participation (Guiso et al., 2008), and a reduced amount of bilateral trade and foreign direct investment (Guiso et al., 2009).

<sup>8</sup>Fukuyama (1995) notes that large organizations, such as those in our sample, require cooperation between strangers. Such cooperation is heavily predicated on trust. Similarly, Coffee (2001) refers to trust as the critical "organizational glue". The level of trust within the culture affects the strength of this "glue" and the potential severity of agency conflicts.

<sup>9</sup> Stock prices must be informationally efficient to provide an accurate retrospective of firm performance and a reasonable means of motivating and compensating managers. If the stock market is not informationally efficient, share price has diminished value for monitoring and for linking pay to performance.

### *A. The Legal Environment and Compensation Structure*

While we focus on the potential impact of culture on compensation structure, we recognize that other institutional characteristics (primarily the nation's legal system) may also affect contract design. Bryan et al. (2010, 2011) provide empirical evidence that differences in legal systems contribute to the cross-sectional variation in compensation structures. Most commercial law derives from one of two broad traditions: common law or civil law. Common law is determined primarily by judges in legal systems where laws are formulated through precedent and then later incorporated into the legislature. Common law is based on English tradition and, like the other systems, has been spread across the world mostly through occupation and colonization. Civil law, on the other hand, relies on statutes and comprehensive codes, formulated and articulated primarily by legal scholars and governmental authorities.

One of the more important areas of difference among legal systems is the level of protection afforded to stockholders and the relative strength of shareholder rights. We use the Anti Self-Dealing Index (developed by Djankov et al. (2008)) to measure the degree of legal protection for shareholders. The Anti Self-Dealing Index focuses on shareholder protection against expropriation by insiders. The index explicitly considers such control mechanisms as legally mandated disclosure and approval processes, as well as procedural remedies and penalties if minority shareholders are wronged. As described by Djankov et al. (2008) and Johnson, LaPorta, Lopez-de-Silanes, and Shleifer (2000), insider self-dealing (i.e., expropriation by majority owners or "tunneling") is a major concern to minority shareholders. The Anti Self-Dealing Index directly targets the level of legal protection against this risk and has been used extensively in recent studies of the intersection of law and finance. Furthermore, the quality of each nation's law enforcement may also affect contracting decisions. In other words, the legal



rights of investors can be undermined if a country has ineffective enforcement of well-designed laws. We measure the effectiveness of law enforcement in each country using the Rule of Law index from LaPorta et al. (1997a). This variable takes on a higher value for nations with a stronger tradition of law and order.

We expect a greater use of equity-based compensation for CEOs in countries providing stronger protection of shareholder rights. This is primarily because equity-based compensation will be most effective when stock prices are informationally efficient. Bryan et al. (2010, 2011) provide evidence consistent with this hypothesis.

#### *B. Firm-Specific Agency Costs and Compensation Structure*

Most studies of the determinants of U.S. compensation structure have focused on the role of agency costs of debt and equity. When assessing the potential severity of conflicts within a firm, the contracting literature primarily examines enterprise-specific characteristics (e.g., the firm's growth options, size, free cash flow, and leverage).

Authors such as Bryan et al. (2000), Kole (1997), Bizjak, Brickley, and Coles (1993), and Gaver and Gaver (1993) contend that firms with greater amounts of growth options have broader informational asymmetries that create a larger potential for opportunistic behavior by managers. As a result, these firms should use more equity-based compensation. Our proxy for the prevalence of growth options is the ratio of the market value to the book value of the firm's assets (MVBV). This ratio is equal to the book value of assets minus the book value of equity plus the market value of equity divided by the book value of assets.

Jensen and Meckling (1976) contend that agency costs increase with firm size since a larger span of operations allows for greater managerial opportunism and contributes to less effective external monitoring. Previous studies (e.g., Yermack (1995)) have found that bigger

firms pay managers with significantly larger relative amounts of equity-linked compensation. These studies also attribute this relation to the greater degree of difficulty in monitoring managers of larger companies. As used by Gabaix and Landier (2008) and Baker and Hall (2004), our proxy for size is the natural logarithm of the firm's total assets. We predict a positive relation between firm size and the relative use of equity-based compensation.

Yermack (1995) and Bryan et al. (2000) have shown that excess cash is negatively related to equity-based pay. We measure the firm's free cash flow by using Lehn and Poulsen's (1989) cash flow statistic. This proxy for the firm's free cash flow is: operating income before depreciation less income tax, interest, and dividends paid. This measure of free cash flow is divided by the sum of the firm's market value of equity and book value of debt. The FCF ratio provides an indication of cash availability.

Finally, prior research has also shown a negative relation between a firm's use of debt and the use of equity in the compensation structure. Specifically, John and John (1993), Yermack (1995), and Bryan et al. (2006) contend that higher levels of leverage exacerbate agency conflicts between stockholders and bondholders, increasing the agency cost of debt. Equity-based compensation would work against alleviating this conflict within a highly-levered firm. We investigate this issue by examining whether the ratio of a firm's book value of total debt to total assets is related to the use of equity-based compensation.

### **III. Data and Descriptive Statistics**

The following section describes the data that we use to measure and explain patterns in the design of compensation contracts. To obtain detailed compensation information for a wide, cross-section of countries, we examine the financial disclosures of 589 firms (from 42 countries)

that issued ADRs during 1996-2009.<sup>10</sup> As we will describe below, these ADR issuers must provide documentation of compensation structure in their filings with the SEC. Therefore, examining ADR issuers is an effective way to acquire executive compensation data covering a wide sample of non-U.S. firms for a long time period.<sup>11</sup> We also examine detailed compensation information for all U.S. firms from the ExecuComp database.

#### *A. Data Sources*

The ability of researchers to investigate cross-country differences in compensation policy has been limited by a lack of a long time series of readily available, detailed, and consistently presented compensation data for a broad array of countries. The key to our study is the information made available through the SEC's Form 20-F. Form 20-F is a reporting requirement for foreign firms whose equity trades in the U.S. market through American Depository Receipts (ADRs). Sponsored ADRs (those managed by a depository bank) are classified as Level 1, Level 2, Level 3, or Rule 144A. Level 1 ADRs are traded over-the-counter, while Rule 144A ADRs are private placements. Both are exempt from a majority of U.S. reporting requirements (such as filing the Form 20-F). Level 2 ADRs are listed on an exchange, or quoted on NASDAQ. Level 3 ADRs are for new equity offerings. Level 2 and Level 3 ADR issuers must file the Form

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<sup>10</sup> Our use of ADR-issuers as our sample of non-U.S. firms biases against a finding that cultural differences affect contract design. By definition, ADR-issuers have chosen to pursue a cross-national ownership base and have taken steps to establish a presence in the U.S. financial markets.

<sup>11</sup> As in most empirical work, there are tradeoffs involved in the selection of data sources. For example, Desai, Foley, and Hines (2004), Booth et al. (2001), Rajan and Zingales (1995), and Megginson, Nash, and Van Randenborgh (1994) note that using cross-country data may lead to measurement error when comparing countries (due to inconsistencies in accounting practices). However, SEC filings must follow either U.S. generally accepted accounting principles or International Financial Reporting Standards. U.S. firms must follow the former and non-U.S. firms have a choice of either. Differences in these sets of standards have narrowed over the years, and standard-setters have the goal of full convergence. Moreover, our data source for firm-specific financial information is Compustat, which standardizes the data even further. Other, more recent sources of cross-national data (such as Capital IQ) present a much more limited time series of data. Also, by including data from non-ADR issuers, Capital IQ can provide fewer assurances regarding the standardization of accounting information.

20-F and thus provide the compensation data that we use in our analysis.

In compiling our sample, we first search the Compustat database for a listing of all companies with Level 2 and Level 3 ADR programs during 1996-2009. Next, we use the Securities and Exchange Commission's EDGAR database to hand-collect information from the Form 20-F filings. We obtain information to measure the value of stock options, restricted stock, and cash-based compensation to analyze cross-country differences in the design of the firm's compensation structure. We also gather information about any other forms of managerial compensation (such as non-equity payouts from long-term incentive plans) to include in our analysis of compensation structure.

#### *B. Primary Components of Compensation Structure*

We measure the value of options granted using the Black-Scholes (1973) model. We obtain country-specific risk-free rates from the IMF's International Financial Statistics Yearbook. We calculate dividend yields from Compustat data and stock return volatility from the Center for Research in Securities Prices (CRSP) database. As is standard in the compensation literature (Yermack, 1995; Bryan et al., 2000), the option expected time to maturity is 10 years for all firms, unless stated otherwise.

Our primary measure of compensation structure focuses on the relative use of equity-based pay. Equity-based compensation is the sum of the value of stock options and restricted stock. We define the relative use of equity-based compensation (EquityPct) as the value of equity-based compensation divided by total compensation, where total compensation is the sum of equity-based compensation, long-term incentive plans, and cash compensation.

To more thoroughly examine the relation between the compensation structures of U.S. and non-U.S. companies, we complement our ADR sample with data for U.S. firms. For the

U.S. sample, we obtain information on all components of CEO compensation, as defined above, from the Standard & Poor's (S&P) ExecuComp database. ExecuComp provides detailed data for companies included in the S&P 500, S&P 400 MidCap, and S&P 600 SmallCap indexes.

We use Compustat to form the enterprise-level control variables in our empirical models for both U.S. firms and our ADR sample. Our final sample covers the period 1996-2009 and consists of 2,801 firm-year observations from 42 non-U.S. countries and 24,644 firm-year observations for U.S. firms.

### *C. Primary Measures of National Culture*

We measure national culture primarily through Hofstede's dimensions of *Individualism* and *Uncertainty Avoidance*. As we described earlier, Hofstede's (1980) cultural value metrics provide a very widely-cited and rigorously validated typology of cross-country differences in culture. We obtain the most recent values of the *Individualism* and *Uncertainty Avoidance* variables from Hofstede's website.<sup>12</sup>

### *D. Descriptive Statistics*

Table I indicates that there is clustering in our data with respect to the number of firm-year observations across countries, in addition to variation across time within each country. The ADR-issuing firms in our sample are more likely to be geographically close to the U.S. (e.g., Mexico, Brazil, or Chile), to have strong trade relations with the U.S. (e.g., France, Germany, Italy, Japan, and China), or to have capital-market orientations similar to the U.S. (e.g., England).<sup>13</sup> These findings are consistent with the evidence in Bryan et al. (2010), Pagano, Roell, and Zechner (2002), and Tesar and Werner (1995).

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<sup>12</sup> Detailed information about Hofstede's work as well as data for each of his value dimensions are available at [www.geert-hofstede.com](http://www.geert-hofstede.com).

<sup>13</sup> Again, each of these similarities biases against a finding that cultural differences are related to cross-sectional

Insert Table 1 about here

Figure 1 presents the time-series variation in the use of equity in the CEO compensation mix for U.S. and non-U.S. firms. For each year during the 1996-2009 period, non-U.S. firms used substantially less equity-based compensation than U.S. firms. Despite this consistent cross-sectional difference between U.S. and other companies, the pattern of changes in the equity-based pay of U.S. companies over time appears to be largely mirrored by changes in the compensation structures of companies in other countries.

Insert Figure 1 about here

As shown in the figure, equity-based pay as a percentage of total CEO compensation for U.S. companies increased from about 35% in 1996 to just under 50% in 2001. It then declined to approximately 42% in 2003, remaining at that level through 2005, before falling to 35% in 2006. However, it had climbed back to around 48% by 2008 before moving to about 42% in 2009.

For non-U.S. firms, by comparison, equity represented less than 5% of the CEO compensation mix in 1996, climbing to just over 20% in 2001 before declining to approximately 12% in 2002. Equity-based compensation stayed at around 12% through 2004, declined to 8% by 2008, and rose to around 14% in 2009.

The important point from Figure 1 is that not only did U.S. firms use more equity-based compensation than non-U.S. firms, the cross-sectional difference in CEO compensation structure between those two groups of firms did not narrow over the 14-year sample period. This finding is consistent with our hypothesis that CEO compensation structures vary across nations due to

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variation in compensation structure.

country-level differences, and is inconsistent with the notion that globalization of labor and capital markets has led to a convergence in CEO pay practices.

Table II provides information on the average use of equity in the CEO's compensation structure by firms from each of the countries in our sample. The use of equity-based compensation is higher for countries that have an English Common Law origin than for those with non-English Common Law origin. For example, firms from countries such as Australia (33.4%), Bermuda (44.3%), England (25.6%), and the U.S. (43%) use more equity in the CEO's compensation mix than those from France (15.5%), Germany (16.3%), and Japan (3.8%).

Insert Table II about here

Table II also indicates that the non-U.S. firms issuing Level 2 and Level 3 ADRs tend to be large relative to the average U.S. firm. If these large firms are issuing ADRs to tap into the deep U.S. capital markets and are willing to bond themselves to U.S. oversight and governance, they are likely to be more similar to U.S. firms than their local counterparts.<sup>14</sup> If true, this should bias our results against finding significant differences in compensation structure across countries. More important, if these non-U.S. firms behave like those in the U.S., differences in national culture should not help explain any observed differences in compensation structure. To the extent we determine that culture matters, the findings should be even more significant in a sample that includes local firms that did not issue ADRs.

Figure 2 presents the time series variation in the use of equity-based compensation by partitioning the sample by legal origin – firms from countries with English Common Law origin versus those with non-English Common Law origin (i.e., civil law systems). To ensure that our

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<sup>14</sup> For detailed analysis of ADR-issuers, see Lang et al. (2003), Pagano et al. (2002), Reese and Weisbach (2002), among many other studies of the cross-listing process.

findings are not driven by the pay practices of U.S. firms, we further partition the data for firms from countries with English Common Law origin into two groups: U.S. and non-U.S. firms.

Insert Figure 2 about here

Figure 2 indicates that firms from countries with English Common Law origin use more equity in the CEO's compensation structure than those from countries with non-English Common Law origins. Moreover, within the common law family, U.S. firms use larger amounts of equity-based compensation than firms from non-U.S. English Common Law countries. The cross-sectional differences between these three groups of firms do not narrow over time. This suggests that factors other than legal origin must contribute to those consistent differences.

We next investigate whether cultural differences are associated with the cross-sectional variation in compensation structure. We initially focus on Hofstede's measures of *Individualism* and *Uncertainty Avoidance* as measures of national culture that should relate to the cross-sectional variation in compensation structure. We hypothesize that firms from countries scoring higher on Hofstede's measure of *Individualism* should use larger levels of equity in their compensation structure. Similarly, firms from countries characterized by higher levels of *UAI* should use less equity, and more cash, in the compensation structure.

To examine whether compensation structures are related to cultural differences, we first divide the full sample of firms into quartiles based on country-level values for *Individualism* and *UAI*.<sup>15</sup> Figure 3 graphs the average equity structure by quartile for our total sample (i.e., that includes U.S. firms), where we form quartiles based on country-level values for *Individualism*.

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<sup>15</sup>Since the quartiles are based on country-level values of the two cultural variables, the sample contains approximately equal numbers of countries within each quartile. However, since our compensation data are at the level of the firm, each quartile contains different numbers of firm.



Consistent with our hypothesis, firms from cultures with higher levels of *Individualism* use more equity in the compensation mix.

Insert Figure 3 about here

Figure 4 presents the average compensation structure for firms in each quartile based on Hofstede's *UAI* metric. As expected, firms from countries characterized by high levels of *UAI* use lower amounts of equity-based compensation.

Insert Figure 4 about here

To ensure that the results are not being driven by the U.S. observations in our sample, we also create quartiles using only the sample of non-U.S. firms. Figures 5 and 6 provide average compensation structures for firms in each quartile based on the country-level values of *Individualism* and *UAI*. The results indicate that for non-U.S. firms, the average use of equity-based compensation is positively related to the country's level of *Individualism* and negatively related to the country's level of *UAI*.

Insert Figures 5 and 6 about here

Table III provides descriptive statistics for compensation structure and for firm-specific control variables (size, market-to-book ratio, leverage, and free cash flow) for quartiles formed from the legal and the cultural determinants that we investigate in this paper. The legal variables are the *Anti Self-Dealing Index* and the *Rule of Law*. The cultural variables are *Individualism* and *UAI*.

Insert Table III about here

As we report in Table III, the data indicate that (for quartiles based on the *Anti Self-Dealing Index* and the *Rule of Law*) the relation between and among firm characteristics, compensation structure, and the legal environment is consistent with theory and with prior empirical evidence in Bryan et al. (2010).<sup>16</sup>

Moreover, regarding the focus of our study, the initial findings for the relation between cultural determinants and compensation structure are very supportive of theory (and our hypotheses). Firms from countries with high levels of *Individualism* (Quartiles 3 and 4) use more equity in their compensation structure. The data also support the theory regarding the relation between *UAI* and equity-based compensation. That is, as expected, firms from countries with low levels of *UAI* use larger relative amounts of equity-based compensation.

#### **IV. Empirical Results - Determinants of CEO Compensation Structure**

The following sections describe our empirical findings regarding the determinants of the observed cross-sectional differences in the use of equity-based compensation. Our regressions include industry and year dummy variables to control for fixed effects and firm-specific variables that proxy for agency costs. We use a Tobit model as the data are left censored. The dependent variable is the percent of equity in the compensation structure (*EquityPct*); the independent variables of primary interest are measures of the cultural environment. As is general practice with panel data, we correct the standard errors for heteroscedasticity and serial correlation.

##### *A. The Legal Environment and Compensation Structure*

Before testing whether culture affects compensation structure, we first confirm the

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<sup>16</sup> Bryan et al. (2010) examine similar data but only for 1996-2000.

empirical relation between legal environment and the use of equity-based compensation. Accordingly, our models include measures of the issuer's home legal system.

Table IV about here

The results in Table IV are consistent with our expectations and with earlier findings by Bryan et al. (2010) for data over the 1996-2000 period, and by Bryan et al. (2011) for the 1996-2008 period. After controlling for industry and year fixed effects, the *Anti Self-Dealing Index* is significantly positively related to the proportion of equity in the compensation structure. This is true for the sample that includes U.S. firms (Model 1) and for the sample of non-U.S. firms (Model 3). Similarly, the *Rule of Law* is also significantly positively related to the proportion of equity in the compensation structure for all firms and for the subsample of non-U.S. firms.<sup>17</sup>

#### *B. The Cultural Environment and Compensation Structure*

We examine the impact of culture on compensation structure in Table V. In Panel A, we investigate the full sample (that includes U.S. firms). In Panel B, we restrict our analysis to non-U.S. firms. In both panels, Models 1 to 3 (4 to 6) examine the relation between a country's level of *Individualism (UAI)* and the structure of the compensation package. Models 2 and 5 also control for industry and year fixed effects, while Models 3 and 6 add firm-level characteristics (size, the market-to-book ratio, leverage, and free cash flow) as further control variables.

The results in Panels A (all firms) and B (non-U.S. firms) of Table V indicate that, consistent with our hypothesis, culture plays an important role in explaining cross-sectional

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<sup>17</sup> The empirical analysis in Table IV also confirms the significance of firm-specific determinants of compensation structure. With respect to the agency factors reflected by enterprise-level characteristics, we find that firms that are larger, have higher market-to-book ratios, and are less levered are significantly more likely to use equity-based compensation. For non-U.S. firms, in addition to the significant relations mentioned above, free cash flow is also negatively related to the use of equity in the compensation structure. These results are all consistent with prior studies of the compensation structures of U.S. firms (Yermack, 1995) and with the evidence in Bryan et al. (2010, 2011) for U.S. and non-U.S. firms.

differences in compensation structures. In Models 1 to 3 of both panels, *Individualism* is significantly positively related (at the one percent level) to the use of equity-based compensation for both the full sample and the subsample of only non-U.S. firms. The results also indicate that *Uncertainty Avoidance* is significantly negatively related (at the one percent level) to the equity component of the compensation for both the full sample and the subsample of only non-U.S. firms. The magnitude of the coefficients on *Individualism* and *Uncertainty Avoidance* are similarly significant for the sample of all firms and for the subsample of non-U.S. firms.

Overall, the findings in Table V provide strong support for the hypothesis that the cultural environment, as captured by *Individualism* and *Uncertainty Avoidance*, is significantly related to the cross-sectional variation in compensation structures. These results for our cultural variables are highly significant after controlling for firm-level characteristics and for industry and year fixed effects.<sup>18</sup>

### C. Cultural and Legal Environments as Determinants of Compensation Structure

Having determined that proxies for the legal environment and cultural environment separately explain cross-sectional variation in compensation structure, we next examine the correlation matrix for the cultural and legal variables. We then provide the results for our models which include both sets of factors.

Table VI presents the correlation matrix for the two legal variables (*Anti Self-Dealing Index* and the *Rule of Law*) and our primary cultural variables (*Individualism* and *Uncertainty Avoidance*). *Individualism* is significantly positively correlated with both the *Anti Self-Dealing Index* and the *Rule of Law*. This is consistent with the notion that highly individualistic societies have stronger protection of minority shareholders and more effective enforcement of laws.

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<sup>18</sup> In models containing each cultural variable, we find that the enterprise-specific control variables (measuring likelihood of agency conflicts) remain significantly related to compensation structure.

*Uncertainty Avoidance* is negatively correlated with both variables representing the country's legal environment.

Insert Table VI about here

Since we focus on how culture affects the cross-sectional differences in compensation structure, our robustness tests in the next section present several alternative variables that the literature identifies as capturing different aspects of a nation's cultural environment. We also include those variables in this correlation matrix. Specifically, Table VI includes Schwartz's measure of *Harmony* (whose polar opposite is *Mastery*), the percentage of respondents in a country who are Catholic (*Catholic*), the extent to which respondents of the World Values Survey report a distrust of companies in their country (*DistrustComp*), and a dummy variable that takes on a value of 1 if the primary language of the country is English (*LangEng*).<sup>19</sup>

Table VII presents findings for the multivariate regressions that consider both the cultural and legal variables. Models 1 to 4 investigate the sample that includes U.S. firms, while Models 5 to 8 focus on the non-U.S. sample. Models 1 and 5 examine whether the two legal variables remain significant after controlling for industry and year fixed effects and firm-specific characteristics, but without either of the cultural variables. Models 2 and 6 add *Individualism* as the cultural variable, while Models 3 and 7 add *Uncertainty Avoidance* as the cultural variable. Models 4 and 8 of Table VII include both *Individualism* and *Uncertainty Avoidance* in the regressions.

Table VII about here

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<sup>19</sup> In Section I, we described each of these complementary cultural variables and the expected relation of each to compensation structure.

In considering the impact of culture on compensation design, the primary variables of interest are Hofstede's measures of *Individualism* and *Uncertainty Avoidance*. The data strongly indicate that culture is a significant determinant of compensation structure. After controlling for the legal environment and for firm-specific agency variables (and industry and year fixed effects), we confirm that culture matters. *Individualism*, in Models 2 and 6, is significantly positively related to equity in the compensation mix. Similarly, the coefficient on *Uncertainty Avoidance*, in Models 3 and 7, is negative and significant at the one percent level. Furthermore, both cultural variables remain significant in Model 4. This indicates that the cultural dimensions reflected by *Individualism* and *Uncertainty Avoidance* are each significant determinants of compensation structure, and that culture reflects aspects of a country's institutional setting that are different from those measured by the legal environment.<sup>20</sup>

Models 5 to 8 of Table VII verify that the cultural dimensions of a country are significantly related to its pay practices. *Individualism* and *Uncertainty Avoidance* are significant in a majority of the regression models. These tests confirm the importance of culture in explaining the use of equity-based compensation (after accounting for the other, previously-identified determinants of compensation structure).

## V. Robustness Tests - Potential Omitted Variables Problem

We recognize that our findings of a relation between culture and compensation structure could be due to an omitted variable that is correlated with both culture and compensation

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<sup>20</sup> The results also indicate that both the *Anti Self-Dealing Index* and the *Rule of Law* are significantly positively related to the proportion of equity in the compensation mix. Both variables are significant at the one percent level in Models 1 through 4. In Models 5 through 8, the results are slightly weaker for the *Rule of Law*, but continue to indicate that the proportion of equity-based compensation is significantly related to the legal environment in the non-U.S. sample. The results further show that the firm-specific variables have significant explanatory power. This finding is consistent with theory and with previous findings in Bryan et al. (2010, 2011).

structure. We perform the following additional tests to mitigate concerns about this potential problem.<sup>21</sup>

#### *A. Simulated Slope Coefficients*

To investigate whether our results are subject to an omitted correlated variables problem, we re-run the regressions in Models 4 and 8 of Table VII after randomly assigning values for *Individualism* and *Uncertainty Avoidance* to each country. We do not change the data for the remaining legal and control variables. We estimate a distribution of slope coefficients for the two cultural factors by performing the regressions 1000 times. We then test whether the slope coefficients reported in Models 4 and 8 of Table VII are significantly different from zero.

Focusing on the sample that includes U.S. firms, we find that the mean (median) value of the slope coefficient on *Individualism* is 0.00014 (0.00054) with a standard deviation of 0.0050. This indicates that we are unable to reject the hypothesis that the average (median) slope coefficient is different from zero when the data are randomly generated. However, the slope coefficient of 0.0123 in Model 4 of Table VII is significantly positive at the one percent level. For *Uncertainty Avoidance*, the mean (median) slope coefficient is 0.00018 (0.00037) with a standard deviation of 0.00434. This indicates that the average (median) coefficient is not different from zero. The value of -0.0017 in Model 4 of Table VII is also insignificant. Together, the results from the simulated distribution of slope coefficients indicate that culture, most specifically *Individualism*, is significantly related to compensation structure.

When we consider only the non-U.S. firms, the simulated mean (median) value of the slope coefficient on *Individualism* is -0.00008 (-0.00003) with a standard deviation of 0.00425. This indicates that the mean (median) simulated value is not significantly different from zero.

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<sup>21</sup> The authors thank Mike Lemmon for these suggestions.

However, the reported value of 0.0133 in Model 8 of Table VII is significantly positive at the one percent level. Regarding *Uncertainty Avoidance*, the mean (median) value is 0.00020 (0.00026) with a standard deviation of 0.00354, indicating that the value is not different from zero. The value reported in Table VII, -0.0017, is also insignificant. Overall, this finding that the “randomized” Hofstede values are not significant in the simulated models provides some assurance that the cultural variables in the primary models are not simply capturing a country effect.

### *B. Tradable versus Non-Tradable Goods*

If culture does contribute to the variation in compensation structure across countries, its importance should depend on whether the labor market for CEOs is global versus local. If CEOs are hired locally, compensation structures should be more dependent on local norms. However, if CEOs are hired from the global labor market, local norms (i.e., culture) should play less of a role in explaining the variation in compensation structures. We hypothesize that firms whose products have a primarily domestic market are more likely to hire their CEOs from a local talent pool. As such, we expect national culture to play a more significant role in explaining the cross-sectional variation in compensation structure for firms with non-tradable (or domestic) goods versus those whose products are traded internationally.

We base this hypothesis on the “organizational learning” literature. For example, Burkema and Vermaleun (1998) and Kogut and Zander (1993) argue that firms operating in diverse, multi-national markets (such as firms that we distinguish as selling “tradable” goods) develop a more cosmopolitan orientation brought on by broader exposures of ways of doing things in other cultures. If a firm functions in a purely domestic market (such as the firms that we designate as selling “non-tradable” goods), its more homogenous environment limits



opportunities to learn from the outside. As a result, the policies and processes of the more isolated firm will be more likely to primarily reflect its local culture.

We create an indicator variable, *Nontrade*, that takes on a value of 1 if the firm produces goods that are likely to be traded only in the firm's domestic market, and 0 if the firm produces goods that are likely to trade internationally. The variable specification follows Sarkissian and Schill (2004).<sup>22</sup> We feel that using tradable versus non-tradable goods is a reasonable means of distinguishing firms with a more domestic focus from those with a more multinational orientation. Dreher (2006), Clark (2000), and Norris (2000) note that the cross-regional flow of goods helps to erode national boundaries and mediates cultural differences. Therefore, the decision-making and contracting policies for a firm producing tradable goods should be less impacted by its local culture. Accordingly, for firms that are more cosmopolitan, the measures of national culture should have a less pronounced effect on compensation structure.

Our Tobit model includes interaction terms for all independent variables to allow the slope coefficients to differ across the two subsamples. The primary variables of interest are the coefficients on the two culture variables and the coefficients on the interaction terms between the two culture variables and the indicator variable. The slope coefficients on the culture variables capture the relation between culture and compensation structure for firms whose goods are traded internationally (tradable goods). The coefficients on the interaction terms capture whether the relation between culture and compensation is significantly different for those firms whose

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<sup>22</sup> Sarkissian and Schill (2004) use industry classifications to distinguish firms producing tradable and non-tradable goods. Industries with tradable goods are: chemicals, consumer products, electronics, manufacturing, pharmaceuticals, mining, oil and gas, and paper. Coval and Moskowitz (2001) and Kang and Stulz (1997) similarly partition firms by output type (tradable vs. non-tradable) when examining the geographical preferences of equity investors.

goods trade in domestic markets (non-tradable goods). Our hypothesis is that the slope coefficient on the interaction terms will be significantly different from zero.<sup>23</sup>

Insert Table VIII about here

Models 1-3 of Table VIII provide results for the full sample of firms, while Models 4-6 provide results for the sample of non-U.S. firms. The coefficient on *Individualism* is significantly positive at the one percent level in all of the models. The coefficient on *Uncertainty Avoidance* is significant for the full sample of firms. Together, the results indicate that culture (most specifically, *Individualism*) does explain the variation in compensation structure for firms whose goods are traded internationally.

Consistent with our hypothesis, the coefficient on the interaction term with *Individualism* is significantly positive at the one percent level in all models. The coefficient on the interaction term with *Uncertainty Avoidance*, however, is insignificant at conventional levels. Overall, the findings are consistent with the hypothesis that culture is more significant in explaining the variation in compensation structure for firms whose goods trade primarily in domestic markets. Since we expect firms whose products trade in domestic markets may be more likely to hire CEOs primarily from their local markets, our findings suggest that local norms may exert a stronger influence over compensation structure for these firms. Furthermore, our results indicate that culture does explain, albeit less strongly, the variation in compensation structure for firms with global products.

## **VI. The Relative Importance of Culture and Law**

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<sup>23</sup> This approach is also used by Stulz and Williamson (2003) and Rameriz and Tadesse (2007). Using similar types of interaction terms, both studies conclude that a greater international orientation will temper the impact of national culture while the impact of culture is more pronounced when firms are more domestically focused.

The results thus far indicate that both culture and the legal environment are related to the cross-sectional variation in the structure of CEO compensation. In this section, we investigate the role of culture and legal environment in determining the unobservable time-invariant country level heterogeneity (or country level fixed effect) in the cross-sectional variation in compensation structure.<sup>24</sup> Specifically, we are interested in understanding what percentage of the country fixed effects is explained by the cultural and legal variables that we study.

We begin by estimating a Tobit model where the dependent variable is the relative use of equity based pay (EquityPct) and the independent variables are the enterprise-specific factors examined in Tables V and VII (firm size, market-to-book ratio, leverage, and free cash flow). In this model, we include firm fixed effects to capture any unobservable time-invariant firm-level heterogeneities. We also include country fixed effects in the model. The coefficient estimates on the country fixed effects then become the variable of interest in the second stage of the analysis. Here, we investigate whether *Individualism*, *Uncertainty Avoidance*, the *Anti Self-Dealing Index*, and the *Rule of Law* are related to the country fixed effects.

Table IX presents findings for the regressions explaining the unobservable time-invariant country level heterogeneities. The coefficients on all variables from the univariate OLS regressions have the expected signs. Model 1 indicates that *Individualism* is significantly positively related to, and explains 25% of, the country fixed effects. *Uncertainty Avoidance*, is significantly negatively related to, but explains only 13% of the country fixed effects. Both the *Anti-Self Dealing Index* and the *Rule of Law* are significantly positively related to, but explain less than 8.5% of, the variation in country fixed effects.

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<sup>24</sup> Graham, Li, and Qui (2011) use this methodology to examine the role of unobservable time-invariant firm and manager heterogeneities in determining executive pay.

Table IX about here

The multivariate regressions in Models 5 through 7 of Table IX continue to provide strong support that *Individualism* is important in explaining the unobservable time-invariant country level heterogeneity in compensation structure. The *Individualism* variable is significantly positive in all three multivariate regressions. The contribution of *Uncertainty Avoidance* is smaller (though still marginally significant in Model 5). The variables representing the legal environment provide no marginal contribution to what is already captured by the two cultural variables. While *Individualism* alone explains 25% of the country fixed effects, the two cultural variables combined explain about 30% of the variation in county fixed effects, suggesting that *Uncertainty Avoidance* does add some explanatory power above that provided by *Individualism*. However, adding the legal variables provides no additional explanatory power.

In summary, these results indicate that culture appears to be more important than law in explaining the unobservable time-invariant country level heterogeneity in compensation structure. Second, for the firms in our sample, *Individualism* alone captures most of the explanatory power provided by the cultural environment. Third, additional work is needed to understand the unexplained portion of the unobservable time-invariant country level heterogeneity in compensation structure.<sup>25</sup> Overall, the findings from Table IX strongly suggest that understanding culture may substantially contribute to understanding compensation structure.

## VII. Robustness Tests - Alternative Instruments for Culture

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<sup>25</sup> For example, taxes may play a role in the cross-sectional variation of executive compensation. Accordingly, we also estimated the models in Table IX after controlling for the impact of taxes. While there are many tax issues to consider across 43 countries and throughout 14 years (1996-2009), we feel that the tax differential most relevant to compensation structure would be the country-specific spread between taxes on capital gains and ordinary income. We refer to this spread as a “tax wedge”. We gathered data for capital gains tax rates for each country from Djankov et al. (2010). We gathered data for the highest marginal tax rate on ordinary income in each country from the Financial Structure and Economic Development Database from the World Bank (Beck et al. (2000)). Our measure of the “tax wedge” was insignificant in all models.

In this section, we draw from the extant literature to identify alternative instruments of culture (but also include proxies to control for the legal environment, for firm-specific agency costs, and for industry and year fixed effects). Panel A of Table X provides our findings for the sample that includes U.S. firms, while Panel B presents our results for non-U.S. firms.

*A. Schwartz's Harmony Metric and the Structure of Compensation*

As discussed previously, Schwartz's (2006) measures are seen as alternatives to Hofstede's statistics in the cross-cultural psychology literature. We investigate Schwartz's measure of *Harmony* (whose polar opposite is *Mastery*). The Schwartz Mastery/Harmony metric captures certain cultural elements (which may also affect the stockholder/manager agency conflicts) that are less explicitly measured by Hofstede's *Individualism* statistic. We hypothesize that *Harmony* will be negatively related to the use of equity-based compensation.

Model 1 in Panels A and B of Table X indicate that, consistent with our expectations, *Harmony* is negatively related to the proportion of equity in the compensation mix, even after controlling for the legal environment. The coefficient is significant at the one percent level, as are the coefficients of the two legal variables.

Table X about here

*B. Religion and the Structure of Compensation*

Guiso et al. (2003, 2006, and 2008) and Stulz and Williamson (2003), among others, have also used religion to measure aspects of a country's culture. Accordingly, we use the proportion of respondents to the World Values Survey, in each country, who stated that they were Catholic. As noted earlier, we expect that countries with higher proportions of Catholics should use less equity-based compensation.

Model 2 (Panels A and B) of Table X indicates that, consistent with our hypothesis, firms from countries with higher percentages of Catholics use less equity in the compensation structure. The coefficient is significant at the one percent level for the U.S. sample (Panel A), and significant at the five percent level when studying non-U.S. firms (Panel B). The regression coefficients for legal environment (*Anti Self-Dealing Index* and the *Rule of Law*) are positive and significant at the one percent level in both Panels A and B. This suggests that religion is another cultural factor that affects compensation structure (even after controlling for law).

### *C. Language and the Structure of Compensation*

Following Stulz and Williamson (2003) and Licht et al. (2001), we consider language as a measure of culture. Specifically, we investigate whether countries where the dominant language is English have firms that use more equity-based compensation (after controlling for the legal environment, for firm-specific agency factors, and for industry and year fixed effects).

Model 3 (Panels A and B) of Table X present our findings. The data indicate that when examining the U.S. sample (Panel A), the proportion of equity-based compensation is significantly higher for firms in countries where English is the dominant language. Our results are weaker when examining non-U.S. firms. Also, in both Panels A and B, our measures of the country's legal environment remain significant (indicating that language adds an independent dimension when explaining the cross-sectional variation in compensation structure).

### *D. Trust and the Structure of Compensation*

We hypothesize that trust should be related to pay practices across countries. Guiso et al. (2008) find that individuals hold less wealth in the stock market in countries with greater degrees of distrust (which contributes to lower levels of equity market development). Bryan et al. (2010) document that firms use less equity in the compensation mix in countries where the stock market

is less developed. As such, we hypothesize a negative relation between trust and the use of equity-based compensation. We follow Aghion et al. (2010) and focus on the level of *distrust of companies* in a country. Since higher levels of distrust should yield less equity investment by minority shareholders and a less developed equity market, we expect a lower use of equity-based compensation in countries with higher levels of distrust of companies.

Panels A and B of Table X indicate that, consistent with our expectations, firms in countries with higher levels of distrust use less equity-based compensation. Our findings are significant at the one percent level when the sample includes U.S. firms, and significant at the ten percent level when examining only non-U.S. firms.

Overall, we find that alternative specifications of national culture are also significantly related to the cross-sectional variation in the compensation structures of firms. Since these findings exist after controlling for previously-identified determinants of compensation structure (i.e., firm-specific factors and legal environment), the data strongly suggest that culture plays a separate and significant role in the design of executive compensation contracts.

### **VIII. Summary and Conclusions**

Are the forces of globalization mitigating the effects of cross-national differences so that the world is becoming “flat” and that the most effective CEO compensation structures are becoming more widely-adopted? In other words, are cross-country differences in CEO compensation structures dissipating over time?

Our study addresses this issue by using CEO compensation data for firms from 43 countries over the 1996 to 2009 period. Instead of finding that cross-country differences in compensation structures are dissipating over time, we document that CEO compensation structures across countries, specifically the relative use of equity-based pay, have not converged.

While the average structure of CEO compensation differs for firms segregated by legal origin, the time series trend in these data does not converge over time. This indicates that country-level factors other than legal environment must affect the cross-sectional differences in CEO compensation structure.

We add to the literature by examining whether culture contributes to persistent differences in compensation structures across countries. We rely on dimensions of culture captured by Hofstede (2001), Schwartz (2006), and the World Values Survey. Our study expands the application of quantitative measures of cultural dimensions to the financial contracting literature and provides initial evidence of how national culture impacts CEO compensation structure.

We find that culture matters. Our results suggest that cross-national differences in compensation structures are significantly related to cross-national differences in culture. Specifically, in this study, we focus on the cultural value dimensions that should most directly affect agency conflicts and thus should most directly affect the structure of executive compensation. The data indicate that these measures of culture are significant determinants of the use of equity-based compensation. Consistent with our expectations, we show that the equity portion of CEO compensation is positively related to a nation's level of *Individualism* and negatively related to its degree of *Uncertainty Avoidance*. These significant results remain after controlling for legal environment, firm-specific agency factors, and industry and year fixed effects. We also present evidence to mitigate concerns regarding problems potentially stemming from endogeneity and omitted variables. Moreover, our robustness tests help to confirm that alternative instruments for national culture (e.g., language, religion, trust) play a significant role in explaining cross-national differences in compensation structures. Overall, by verifying the



strong relation between culture and CEO compensation design, we contribute to a more comprehensive understanding of the interaction between informal institutions (i.e., national culture) and corporate decision-making.

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**Table I**  
**Observations for Each Country by Year**

This table presents the number of firm-level observations for which we have executive compensation data. The data are presented by country for the years 1996-2009. We identify the American Depository Receipts (ADR) issuers from Compustat and obtain the specific executive compensation data from Form 20-F, provided by the SEC's EDGAR database. We express the observations in firm years.

Country	Year														Totals
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	
Argentina	4	7	8	8	9	8	9	9	9	5	4	4	3	7	94
Australia	2	7	9	10	7	11	10	10	9	6	5	6	5	3	100
Austria					1										1
Belgium					1	1	1	1	1	1	1	1	1	1	10
Bermuda	1	2	4	4	2				1					29	43
Brazil	1	3	10	16	16	16	16	16	17	8	7	7	6	25	164
British Virgin Islands				1		1		1	1					4	8
Cayman Islands												1	23	27	51
Chile	8	10	11	11	12	12	12	12	11	7	6	6	5	8	131
China	5	7	7	8	10	8	9	9	9	8	7	7	7	15	116
Denmark	1	1		1	1	1	1	1	1	1	1	1	1	1	13
England	14	23	33	40	53	52	50	50	51	29	27	27	38	19	506
Finland	1	1	1	3	6	1	1	1	1	1	1	1	1		20
France	9	14	18	17	19	15	14	14	13	13	12	12	14	6	190
Germany	5	5	5	6	11	9	8	7	6	4	4	4	5	2	81
Greece			1	2	2	1	1	1	1					3	12
Hong Kong	1	1	2	4	6	1	1	1	1	1	1	1	1	3	25
Hungary		1	1	1	1										4
India			1	2	5	3	3	3	4	3	3	3	3	2	35
Indonesia		1	2	2	1	1	1	1	2	2	2			1	16
Ireland	1	5	8	9	12	9	9	9	8	4	3	3	3	7	90
Israel	5	7	7	7	10	7	7	6	7	5	5	5	5	2	85
Italy	4	5	8	10	9	10	10	9	11	8	7	8	9	2	110

**Table I (continued)**

Country	Year														Totals
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	
Japan	4	9	10	13	14	10	9	9	11	8	7	8	7	16	135
Luxembourg	1	2	2	2	3									3	13
Mexico	11	13	16	21	17	11	10	11	13	8	8	8	7	12	166
Netherlands	9	11	16	16	17	14	14	14	14	7	6	6	5	10	159
New Zealand		1	2	2	2	1	1	1	1	1	1	1	1	1	16
Norway	2	2	1	1	2	1	1	1						1	12
Peru		1	1	1	1	1	1							1	7
Philippines		1	1	1	2	1	1	1	1	1	1	1	1	1	14
Portugal			1	1	2	1	1	1	1	1	1	1	1	1	13
Russia	1	1	2	3	2	2	2	2	2	2	2	2	2	4	29
Singapore				1	2	1	1	1	1	1	1	1	1		11
South Africa		2	3	3	6	4	3	3	3	3	3	3	3	5	44
South Korea	3	3	3	5	3	4	4	4	4	3	3	3	3	8	53
Spain	1	2	3	4	5	3	3	3	3	1	1	1	1	3	34
Sweden	5	8	8	9	9	8	7	6	6	4	3	4	5		82
Switzerland	1	1	2	1	7	5	5	5	5	3	2	2	2	9	50
Taiwan		1	1	1	4	3	2	3	3	3	2	2	2	5	32
Turkey						1	1	1	1	1				1	6
Venezuela	2	2	2	2		1	1	1	2	2	2	1	2		20
Non U.S. Totals	102	160	210	249	292	239	230	228	235	155	139	141	173	248	2,801
U.S. Firms	1,661	1,680	1,736	1,809	1,785	1,678	1,678	1,750	1,754	1,750	1,857	1,926	1,833	1,747	24,644
All Firms	1,763	1,840	1,946	2,058	2,077	1,917	1,908	1,978	1,989	1,905	1,996	2,067	2,006	1,995	27,445



**Table II****Mean Values of Compensation Structure and Firm-Specific Variables by Country**

This table presents the mean values for our measure of compensation structure (EquityPct) and for our firm-specific control variables. EquityPct is the ratio of total equity-based compensation (stock option compensation plus restricted stock compensation) to total compensation. Total compensation is the sum of cash compensation, stock option compensation, restricted stock, and long-term incentive compensation. We measure stock option compensation with the Black-Scholes (1973) option pricing model. Size is the natural logarithm of the firm's total assets. Market-to-Book (MVBV) is the book value of total assets less the book value of equity plus the market value of equity divided by the book value of total assets. Leverage (LEV) is the ratio of the firm's total debt to total assets. Free Cash Flow (FCF) is the ratio of operating income before depreciation less the sum of income tax, interest, and dividends paid scaled by the firm's market value of equity and total debt.

<b>Country</b>	<b>Obs</b>	<b>Mean</b>				
		<b>EquityPct</b>	<b>Size</b>	<b>MVBV</b>	<b>LEV</b>	<b>FCF</b>
Argentina	94	0.000	7.071	1.847	0.288	0.071
Australia	100	0.334	6.407	2.429	0.202	0.002
Austria	1	0.000	7.860	1.408	0.566	0.016
Belgium	10	0.185	9.399	1.109	0.422	0.094
Bermuda	43	0.443	7.524	1.077	0.303	-0.168
Brazil	164	0.039	8.481	1.067	0.361	0.123
British Virgin Islands	8	0.245	6.032	1.567	0.090	-0.063
Cayman Islands	51	0.109	6.097	1.512	0.180	0.055
Chile	131	0.006	7.476	1.508	0.370	0.035
China	116	0.052	8.767	1.255	0.285	0.075
Denmark	13	0.000	8.682	3.252	0.120	0.044
England	506	0.256	8.437	2.265	0.297	0.007
Finland	20	0.244	9.034	2.839	0.122	0.037
France	190	0.155	7.172	2.101	0.210	0.010
Germany	81	0.163	3.746	1.935	0.118	0.032
Greece	12	0.071	8.990	1.284	0.408	0.099
Hong Kong	25	0.050	9.412	2.143	0.131	0.093
Hungary	4	0.002	8.648	1.789	0.532	0.112
India	35	0.103	6.318	2.817	0.109	0.015
Indonesia	16	0.000	7.751	1.707	0.388	0.069
Ireland	90	0.139	6.525	1.952	0.214	0.012

**Table II (continued)**

<b>Country</b>	<b>Obs</b>	<b>EquityPct</b>	<b>Size</b>	<b>Mean</b>		
				<b>MVBV</b>	<b>LEV</b>	<b>FCF</b>
Israel	85	0.153	6.413	1.867	0.266	0.019
Italy	110	0.053	8.399	1.491	0.311	0.062
Japan	135	0.038	9.919	1.321	0.283	0.069
Luxembourg	13	0.497	10.576	1.266	0.312	0.081
Mexico	166	0.012	7.810	1.418	0.329	0.068
Netherlands	159	0.152	9.906	1.510	0.402	0.044
New Zealand	16	0.350	8.342	2.143	0.472	0.057
Norway	12	0.089	6.309	1.593	0.191	0.018
Peru	7	0.000	7.960	1.646	0.367	0.117
Philippines	14	0.000	8.630	1.653	0.470	0.063
Portugal	13	0.000	9.759	1.419	0.495	0.069
Russia	29	0.053	8.035	2.273	0.384	0.088
Singapore	11	0.278	8.505	1.311	0.419	0.062
South Africa	44	0.137	7.293	1.675	0.393	0.020
South Korea	53	0.043	10.212	1.236	0.373	0.131
Spain	34	0.021	10.847	1.506	0.450	0.085
Sweden	82	0.028	6.499	2.365	0.254	0.010
Switzerland	50	0.281	9.569	2.217	0.258	0.045
Taiwan	32	0.091	8.946	2.342	0.220	0.087
Turkey	6	0.000	8.544	2.300	0.258	0.065
Venezuela	20	0.000	7.260	1.706	0.131	0.142
U.S.	24,644	0.430	7.528	1.857	0.292	0.028

**Table III**  
**Mean Values of Compensation Structure and Firm-Specific Variables**  
**by Potential Legal and Cultural Determinants**

This table presents the mean values of compensation structure (EquityPct) and the main control variables arrayed according to factors measuring the nation's legal environment (SelfDeal and Rule of Law) and cultural environment (Individualism, IDV; and Uncertainty Avoidance, UAI). SelfDeal is a measure of shareholder rights protection (from Djankov et al. (2008)), where higher values suggest stronger protection of shareholder rights. Rule of Law (from La Porta et al. (1997a)) is a measure of how effectively a nation enforces its laws. Higher values indicate a stronger tradition of enforcement. IDV (from Hofstede (1980)) reflects the relation between the individual and the group. Higher scores indicate a culture in which individual interests are more likely to prevail over collective interests. UAI (from Hofstede (1980)) measures the degree to which people feel stress or discomfort in unstructured or risky circumstances. Higher values indicate less tolerance of risk. Quartiles are based on the number of countries in the sample. EquityPct is percentage of total compensation composed of stock options and restricted stock. Size is the natural logarithm of the firm's total assets. Market-to-Book (MVBV) is the book value of total assets less the book value of equity plus the market value of equity divided by the book value of total assets. Leverage (LEV) is the ratio of the firm's total debt to total assets. Free Cash Flow (FCF) is operating income before depreciation less the sum of income tax, interest, and dividends paid scaled by the firm's market value of equity and total debt.

*Panel A: Legal Environment: SelfDeal and Rule of Law*

*SelfDeal*

<b>Countries</b>	<b>Quartile</b>	<b>EquityPct</b>	<b>Size</b>	<b>MVBV</b>	<b>LEV</b>	<b>FCF</b>
11	1	7.31%	8.660	1.425	0.347	0.084
10	2	6.72%	7.482	1.868	0.271	0.039
11	3	4.80%	8.843	1.683	0.303	0.063
11	4	42.36%	7.534	1.859	0.292	0.028

*Rule of Law*

<b>Countries</b>	<b>Quartile</b>	<b>EquityPct</b>	<b>Size</b>	<b>MVBV</b>	<b>LEV</b>	<b>FCF</b>
11	1	8.54%	7.608	1.765	0.299	0.047
10	2	6.98%	7.802	1.448	0.314	0.066
11	3	15.10%	8.534	1.906	0.276	0.033
11	4	42.54%	7.546	1.857	0.292	0.028

*Panel B: Cultural Environment: Individualism (IDV) and Uncertainty Avoidance (UAI)*

*Individualism (IDV)*

<b>Countries</b>	<b>Quartile</b>	<b>EquityPct</b>	<b>Size</b>	<b>MVBV</b>	<b>LEV</b>	<b>FCF</b>
11	1	4.16%	8.478	1.383	0.331	0.076
10	2	2.84%	8.414	1.522	0.322	0.078
11	3	17.35%	7.045	1.946	0.256	0.019
11	4	42.27%	7.550	1.860	0.292	0.028

*Uncertainty Avoidance (UAI)*

<b>Countries</b>	<b>Quartile</b>	<b>EquityPct</b>	<b>Size</b>	<b>MVBV</b>	<b>LEV</b>	<b>FCF</b>
11	1	42.42%	7.538	1.861	0.291	0.028
10	2	15.31%	8.453	1.781	0.316	0.037
11	3	5.57%	8.054	1.419	0.321	0.080
11	4	4.76%	8.360	1.654	0.311	0.055

**Table IV**  
**Regression Results Using Firm-Specific and Legal Determinants of Compensation Structure**

This table presents regression results from Tobit models. Our dependent variable is EquityPct, the ratio of total equity-based compensation (stock option compensation plus restricted stock compensation) to total compensation. Total compensation is the sum of cash compensation, stock option compensation, restricted stock, and long-term incentive compensation. Cash compensation is salary plus bonus. Independent variables are as follows. SelfDeal is a measure of shareholder rights protection (from Djankov et al. (2008)), where higher values suggest stronger protection of shareholder rights. Rule of Law (from La Porta et al. (1997a)) is a measure of how effectively a nation enforces its laws. Higher values indicate a stronger tradition of enforcement. Size is the natural logarithm of the firm's total assets. Market-to-Book (MVBV) is the book value of total assets less the book value of equity plus the market value of equity divided by the book value of total assets. Leverage (LEV) is the ratio of the firm's total debt to total assets. Free Cash Flow (FCF) is the ratio of operating income before depreciation less the sum of income tax, interest, and dividends paid scaled by the firm's market value of equity and total debt. For all models, we include industry and year controls, but do not report coefficient values. Standard errors robust to serial correlation and heteroskedasticity are in parentheses. \*\*\*, \*\*, \* indicate significance at .01, .05, and .1, respectively.

	All Firms		Non-U.S. Firms	
	1	2	3	4
Observations	27,402	27,445	2,758	2,801
Noncensored	20,301	20,199	510	511
Intercept	-0.8356 <sup>***</sup> (0.0300)	-1.8864 <sup>***</sup> (0.0443)	-1.4389 <sup>***</sup> (0.1570)	-1.4926 <sup>***</sup> (0.1717)
SelfDeal	1.1947 <sup>***</sup> (0.0402)		0.7828 <sup>***</sup> (0.1158)	
Rule of Law		0.3671 <sup>***</sup> (0.0083)		0.1693 <sup>***</sup> (0.0309)
Size	0.0502 <sup>***</sup> (0.0018)	0.0530 <sup>***</sup> (0.0018)	0.0412 <sup>**</sup> (0.0144)	0.0077 (0.0143)
MVBV	0.0434 <sup>***</sup> (0.0026)	0.0409 <sup>***</sup> (0.0025)	0.0993 <sup>**</sup> (0.0269)	0.0955 <sup>**</sup> (0.0267)
LEV	-0.0951 <sup>***</sup> (0.0180)	-0.1067 <sup>***</sup> (0.0176)	-0.6724 <sup>**</sup> (0.1953)	-0.4386 <sup>**</sup> (0.1932)
FCF	0.0048 (0.0041)	0.0042 (0.0034)	-0.991 <sup>**</sup> (0.3381)	-0.6371 <sup>**</sup> (0.2461)
Industry Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes

**Table V**  
**Regression Results Using Cultural Determinants of Compensation Structure**

This table presents regression results from Tobit models. Our dependent variable is EquityPct, the ratio of total equity-based compensation (stock option compensation plus restricted stock compensation) to total compensation. Total compensation is the sum of cash compensation, stock option compensation, restricted stock, and long-term incentive compensation. Cash compensation is salary plus bonus. Independent variables are as follows. IDV (from Hofstede (1980)) reflects the relation between the individual and the group. Higher scores indicate a culture in which individual interests are more likely to prevail over collective interests. UAI (from Hofstede (1980)) measures the degree to which people feel stress or discomfort in unstructured or risky circumstances. Higher values indicate less tolerance of risk. Size is the natural logarithm of the firm's total assets. Market-to-Book (MVBV) is the book value of total assets less the book value of equity plus the market value of equity divided by the book value of total assets. Leverage (LEV) is the ratio of the firm's total debt to total assets. Free Cash Flow (FCF) is the ratio of operating income before depreciation less the sum of income tax, interest, and dividends paid, scaled by the firm's market value of equity and total debt. Results in Panel A include all firms (U.S. and Non-U.S.) in the sample. Panel B presents results for Non-U.S. firms only. In both panels, models 2, 3, 5, and 6 include industry and year controls (coefficients not reported), but not models 1 and 4. Standard errors robust to serial correlation and heteroskedasticity are in parentheses. \*\*\*, \*\*, \* indicate significance at .01, .05, and .1, respectively.

*Panel A: All Firms*

<i>Model</i>	IDV			UAI		
	1	2	3	4	5	6
Observations	27,370	27,370	27,370	27,370	27,370	27,370
Noncensored	20,312	20,312	20,312	20,312	20,312	20,312
Intercept	-1.1597*** (0.0357)	-1.3021*** (0.0386)	-1.6802*** (0.0396)	1.0629*** (0.0195)	0.9445*** (0.0237)	0.6591*** (0.0234)
IDV	0.0169*** (0.0004)	0.0172*** (0.0004)	0.0177*** (0.0004)			
UAI				-0.0152*** (0.0004)	-0.0149*** (0.0004)	-0.0157*** (0.0004)
Size			0.0581*** (0.0018)			0.0523*** (0.0018)
MVBV			0.0387*** (0.0025)			0.0421*** (0.0026)
LEV			-0.1293*** (0.0174)			-0.1005*** (0.0178)
FCF			0.0042 (0.0037)			0.0045 (0.0038)
Industry Fixed Effects	No	Yes	Yes	No	Yes	Yes
Year Fixed Effects	No	Yes	Yes	No	Yes	Yes

**Table V (continued)**

*Panel B: Non-U.S. Firms*

<i>Model</i>	IDV			UAI		
	1	2	3	4	5	6
Observations	2,726	2,726	2,726	2,726	2,726	2,726
Noncensored	518	518	518	518	518	518
Intercept	-1.7124 <sup>***</sup> (0.1144)	-2.075 <sup>***</sup> (0.2289)	-1.772 <sup>***</sup> (0.1651)	-0.137 <sup>*</sup> (0.0794)	-0.4321 <sup>**</sup> (0.2181)	-0.5213 <sup>**</sup> (0.1617)
IDV	0.0166 <sup>***</sup> (0.0014)	0.0153 <sup>***</sup> (0.0014)	0.0150 <sup>***</sup> (0.0015)			
UAI				- 0.0100 <sup>***</sup> (0.0013)	- 0.0089 <sup>***</sup> (0.0013)	- 0.0082 <sup>***</sup> (0.0013)
Size			0.0274 <sup>*</sup> (0.0142)			0.0369 <sup>**</sup> (0.0147)
MVBV			0.0630 <sup>**</sup> (0.0270)			0.1022 <sup>**</sup> (0.0274)
LEV			-0.5867 <sup>**</sup> (0.1955)			-0.6005 <sup>**</sup> (0.1984)
FCF			-0.4826 (0.3357)			-1.1083 <sup>**</sup> (0.3425)
Industry Fixed Effects	No	Yes	Yes	No	Yes	Yes
Year Fixed Effects	No	Yes	Yes	No	Yes	Yes

**Table VI  
Correlation Matrix**

This table presents correlations between the main legal and cultural variables that may affect compensation structure. SelfDeal is a measure of shareholder rights protection (from Djankov et al. (2008)), where higher values suggest stronger protection of shareholder rights; Rule of Law (from La Porta et al. (1997a)) is a measure of how effectively a nation enforces its laws. Higher values indicate a stronger tradition of enforcement. IDV (from Hofstede (1980)) reflects the relation between the individual and the group. UAI (from Hofstede (1980)) measures the degree to which people feel stress or discomfort in unstructured or risky circumstances. Harmony (from Schwartz (2006)) measures whether the culture espouses passive acceptance of the world as it is vs. active efforts to control the social environment through self-assertion. Catholic (from Guiso et al. (2003)) measures the percentage of the nation's population reporting Catholicism as their religion. DistrustComp (from Aghion et al. (2010)) measures the degree of confidence in major companies as expressed by respondents to the World Values Survey (1981-2000). LangEng (from Stulz and Williamson (2003)) identifies whether English is the primary language spoken by the largest percentage of the nation's population.

	Rule of Law	IDV	UAI	Harmony	Catholic	DistrustComp	LangEng
SelfDeal	0.3051 <.0001	0.52462 <.0001	-0.6769 <.0001	-0.6795 <.0001	-0.5711 <.0001	-0.6907 <.0001	0.69544 <.0001
Rule of Law	1	0.87404 <.0001	-0.5473 <.0001	-0.4677 <.0001	-0.1645 <.0001	-0.6858 <.0001	0.76273 <.0001
IDV		1	-0.6822 <.0001	-0.651 <.0001	-0.3226 <.0001	-0.7168 <.0001	0.89993 <.0001
UAI			1	0.66134 <.0001	0.48445 <.0001	0.79129 <.0001	-0.7537 <.0001
Harmony				1	0.55685 <.0001	0.69487 <.0001	-0.7729 <.0001
Catholic					1	0.52473 <.0001	-0.329 <.0001
DistrustComp						1	-0.7671 <.0001
LangEng							1

## Table VII

### Regression Results Using Cultural and Legal Determinants of Compensation Structure

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This table presents regression results from Tobit models that combine both cultural and legal determinants of compensation structure (along with firm-specific control variables). Our dependent variable is EquityPct, the ratio of total equity-based compensation to total compensation. Independent variables are as follows. IDV (from Hofstede (1980)) reflects the relation between the individual and the group. Higher scores indicate a culture in which individual interests are more likely to prevail over collective interests. UAI (from Hofstede (1980)) measures the degree to which people feel stress or discomfort in unstructured or risky circumstances. Higher values indicate less tolerance of risk. SelfDeal is a measure of shareholder rights protection (from Djankov et al. (2008)), where higher values suggest stronger protection of shareholder rights. Rule of Law (from La Porta et al. (1997a)) is a measure of how effectively a nation enforces its laws. Higher values indicate a stronger tradition of enforcement. Size is the natural logarithm of the firm's total assets. Market-to-Book (MVBV) is the book value of total assets less the book value of equity plus the market value of equity divided by the book value of total assets. Leverage (LEV) is the ratio of the firm's total debt to total assets. Free Cash Flow (FCF) is the ratio of operating income before depreciation less the sum of income tax, interest, and dividends paid, scaled by the firm's market value of equity and total debt. All models include industry and year controls (coefficients not reported). Standard errors robust to serial correlation and heteroskedasticity are in parentheses. \*\*\*, \*\*, \* indicate significance at .01, .05, and .1, respectively.



<i>Model</i>	All Firms				Non-U.S. Firms			
	1	2	3	4	5	6	7	8
Observations	27,402	27,370	27,370	27,370	2,758	2,726	2,726	2,726
Noncensored	20,301	20,287	20,287	20,287	510	507	507	507
Intercept	-2.2865*** (0.0529)	-1.8871*** (0.0561)	-1.8171*** (0.0932)	-1.683*** (0.101)	-2.0792*** (0.1918)	-1.888*** (0.1858)	-1.7757*** (0.255)	-1.6901*** (0.2579)
IDV		0.0126*** (0.0008)		0.0123*** (0.0008)		0.0134*** (0.002)		0.0133*** (0.002)
UAI			-0.0037*** (0.0006)	-0.0017** (0.0007)			-0.0027* (0.0016)	-0.0017 (0.0016)
SelfDeal	0.8803*** (0.0459)	0.3056*** (0.0588)	0.6373*** (0.0594)	0.2235** (0.0679)	0.8979*** (0.1167)	0.4009** (0.1315)	0.7409*** (0.1428)	0.315** (0.1535)
Rule of Law	0.3306*** (0.0085)	0.0936*** (0.0167)	0.3018*** (0.0096)	0.0852*** (0.0171)	0.2135*** (0.031)	0.0256 (0.0399)	0.2025*** (0.0317)	0.0175 (0.0406)
Size	0.0564*** (0.0017)	0.0583*** (0.0017)	0.0568*** (0.0017)	0.0584*** (0.0017)	0.0227 (0.0141)	0.0259* (0.0139)	0.0221 (0.0141)	0.0259* (0.0139)
MVBV	0.039*** (0.0025)	0.0382*** (0.0025)	0.0388*** (0.0025)	0.038*** (0.0025)	0.0683** (0.0268)	0.0432 (0.0266)	0.065** (0.0269)	0.0411 (0.0266)
LEV	-0.1261*** (0.0174)	-0.1314*** (0.0174)	-0.1266*** (0.0174)	-0.1318*** (0.0174)	-0.6393** (0.1934)	-0.6247** (0.1914)	-0.6259** (0.1933)	-0.6249** (0.1912)
FCF	0.0042 (0.0036)	0.0041 (0.0037)	0.0043 (0.0036)	0.0040 (0.0037)	-0.5963* (0.3338)	-0.2388 (0.3295)	-0.5627* (0.3339)	-0.2346 (0.3292)
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

**Table VIII**

**Regression Results Using Cultural Determinants of Compensation Structure:  
Effect of Type of Product (Tradable vs. Non-Tradable)**

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This table presents regression results from Tobit models. Our dependent variable is EquityPct, the ratio of total equity-based compensation (stock option compensation plus restricted stock compensation) to total compensation. Total compensation is the sum of cash compensation, stock option compensation, restricted stock, and long-term incentive compensation. Cash compensation is salary plus bonus. Independent variables are as follows. Nontrade is an indicator variable that takes on a value of 1 if the firm produces goods that are likely to be traded only in the firms' domestic market and 0 if the firm produces goods that are likely to trade internationally. This variable is specified by Sarkissian and Schill (2004). IDV (from Hofstede (1980)) reflects the relation between the individual and the group. Higher scores indicate a culture in which individual interests are more likely to prevail over collective interests. UAI (from Hofstede (1980)) measures the degree to which people feel stress or discomfort in unstructured or risky circumstances. Higher values indicate less tolerance of risk. Size is the natural logarithm of the firm's total assets. Market-to-Book (MVBV) is the book value of total assets less the book value of equity plus the market value of equity divided by the book value of total assets. Leverage (LEV) is the ratio of the firm's total debt to total assets. Free Cash Flow (FCF) is the ratio of operating income before depreciation less the sum of income tax, interest, and dividends paid, scaled by the firm's market value of equity and total debt. Results in columns 1-3 are for all firms and results in columns 4-6 are for only Non-U.S. firms. In all models, we include year controls (coefficients not reported). Standard errors robust to serial correlation and heteroskedasticity are in parentheses. \*\*\*, \*\*, \* indicate significance at .01, .05, and .1, respectively.

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<i>Model</i>	All Firms			Non-U.S. Firms		
	1	2	3	4	5	6
Observations	27,370	27,370	27,370	2,726	2,726	2,726
Noncensored	20,287	20,287	20,287	507	507	507
Intercept	-2.1818*** (0.0876)	-2.1597*** (0.1375)	-1.9652*** (0.1443)	-1.7776*** (0.2705)	-1.4972*** (0.3708)	-1.4085*** (0.3687)
Nontrade	0.5719*** (0.1135)	0.5907*** (0.1868)	0.4226** (0.2037)	-0.0888 (0.3424)	-0.8065 (0.4993)	-0.7621 (0.5055)
Nontrade*IDV	0.0103*** (0.0019)		0.0102*** (0.0019)	0.0119*** (0.0043)		0.0123*** (0.0043)
Nontrade*UAI		-0.0021 (0.0013)	0.0013 (0.0014)		0.0049 (0.0032)	0.0059* (0.0033)
Nontrade*SelfDeal	-0.5412*** (0.1253)	-0.1288 (0.1186)	-0.4693*** (0.1408)	0.1867 (0.2801)	1.1157*** (0.2966)	0.4900** (0.3274)
Nontrade*Rule of Law	-0.2440** (0.0359)	-0.0934*** (0.0194)	-0.2339*** (0.0365)	-0.2853*** (0.0832)	-0.1087* (0.0635)	-0.2569*** (0.0842)
Nontrade*Size	0.0051 (0.0035)	0.0046 (0.0035)	0.0050 (0.0035)	0.0684** (0.0282)	0.0674** (0.0289)	0.0668** (0.0284)
Nontrade*MVBV	-0.0089* (0.0050)	-0.0085* (0.0050)	-0.0087* (0.0050)	0.0160 (0.0535)	0.0406 (0.0543)	0.0255 (0.0537)
Nontrade*LEV	-0.0536 (0.0348)	-0.0607*** (0.0349)	-0.0520 (0.0348)	-1.1893*** (0.3857)	-1.4592*** (0.3939)	-1.1678*** (0.3886)
Nontrade*FCF	0.0061 (0.0292)	0.0053 (0.0247)	0.0064 (0.0300)	-0.1109 (0.6685)	-0.0567 (0.6803)	-0.0791 (0.6708)
IDV	0.0090*** (0.0010)		0.0089*** (0.0010)	0.0073*** (0.0024)		0.0072*** (0.0024)
UAI		-0.0025*** (0.0009)	-0.0019* (0.0010)		-0.0035 (0.0023)	-0.0032 (0.0023)
SelfDeal	0.5174*** (0.0754)	0.7303*** (0.0818)	0.4235*** (0.0906)	0.2892* (0.1725)	0.3047 (0.2011)	0.1248 (0.2075)
Rule of Law	0.1979*** (0.0229)	0.3541*** (0.0149)	0.1864*** (0.0237)	0.1479*** (0.0551)	0.2332*** (0.0470)	0.1282** (0.0567)
Size	0.0561*** (0.0025)	0.0548*** (0.0025)	0.0563*** (0.0025)	-0.0100 (0.0192)	-0.0093 (0.0198)	-0.0062 (0.0193)
MVBV	0.0409*** (0.0036)	0.0414*** (0.0036)	0.0407*** (0.0036)	0.0337 (0.0408)	0.0420 (0.0417)	0.0260 (0.0411)
LEV	-0.1024*** (0.0255)	-0.0944*** (0.0256)	-0.1039*** (0.0255)	0.1021 (0.2819)	0.1518 (0.2876)	0.0455 (0.2840)
FCF	0.0033 (0.0037)	0.0033 (0.0037)	0.0033 (0.0037)	-0.0855 (0.5059)	-0.4341 (0.5099)	-0.1757 (0.5064)
Industry Fixed Effects	No	No	No	No	No	No
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

**Table IX**

**Regression Results Using Cultural and Legal Factors to Explain Country-Fixed Effects**

This table presents regression results from OLS models that consider how cultural and legal factors affect country fixed effects (which are first derived from models of compensation structure employing firm-level explanatory variables). In the first stage, we estimate a Tobit model where the dependent variable is the relative use of equity-based pay (EquityPct) and the independent variables are the enterprise-specific factors examined in Tables IV, V, and VII (firm size, market-to-book ratio, leverage, and free cash flow). In this first stage, we include firm fixed effects and country fixed effects to capture any unobservable time-invariant firm-level and country-level heterogeneities. The coefficient estimates on the 43 country fixed effects then become the variable of interest in the second stage of the analysis. In the results presented below, our dependent variable is the coefficient on each of the country fixed effects. Independent variables are as follows. IDV (from Hofstede (1980)) reflects the relation between the individual and the group. Higher scores indicate a culture in which individual interests are more likely to prevail over collective interests. UAI (from Hofstede (1980)) measures the degree to which people feel stress or discomfort in unstructured or risky circumstances. Higher values indicate less tolerance of risk. SelfDeal is a measure of shareholder rights protection (from Djankov et al. (2008)), where higher values suggest stronger protection of shareholder rights. Rule of Law (from La Porta et al. (1997a)) is a measure of how effectively a nation enforces its laws. Higher values indicate a stronger tradition of enforcement. Standard errors are in parentheses. \*\*\*, \*\*, \* indicate significance at .01, .05, and .1, respectively.

<i>Model</i>	1	2	3	4	5	6	7
Intercept	58.920*** (4.023)	59.017*** (4.521)	0.527*** (0.043)	3.899*** (0.200)	-1.232 (0.862)	-2.100 (1.140)	-1.967 (1.271)
IDV	8.466*** (2.374)				0.0273*** (0.009)	0.027*** (0.009)	0.029** (0.012)
UAI		-6.762** (2.668)			-0.016* (0.009)	-0.011 (0.010)	-0.011 (0.010)
SelfDeal			0.053** (0.026)			1.173 (1.017)	1.128 (1.048)
Rule of Law				0.252** (0.124)			-0.057 (0.230)
Adj R2	0.2509	0.1342	0.0817	0.0707	0.2982	0.3052	0.2842

**Table X**

**Robustness Testing: Regression Results Using Alternative Instruments of Culture**

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This table presents regression results from Tobit models that include alternative instruments of cultural factors (along with the legal variables and the firm-specific control variables). Our dependent variable is EquityPct, the ratio of total equity-based compensation to total compensation. Independent variables are as follows. Harmony (from Schwartz (2006)) measures whether the culture espouses passive acceptance of the world as it is vs. active efforts to control the social environment through self-assertion. Catholic (from Guiso et al. (2003)) measures the percentage of the nation's population reporting Catholicism as their religion. LangEng (from Stulz and Williamson (2003)) identifies whether English is the primary language spoken by the largest percentage of the nation's population. DistrustComp (from Aghion et al. (2010)) measures the degree of confidence in major companies as expressed by respondents to the World Values Survey (1981-2000). Higher scores indicate less confidence. SelfDeal is a measure of shareholder rights protection (from Djankov et al. (2008)), where higher values suggest stronger protection of shareholder rights. Rule of Law (from La Porta et al. (1997a)) is a measure of how effectively a nation enforces its laws. Higher values indicate a stronger tradition of enforcement. The firm-specific variables are as follows. Size is the natural logarithm of the firm's total assets. Market-to-Book (MVBV) is the book value of total assets less the book value of equity plus the market value of equity divided by the book value of total assets. Leverage (LEV) is the ratio of the firm's total debt to total assets. Free Cash Flow (FCF) is the ratio of operating income before depreciation less the sum of income tax, interest, and dividends paid, scaled by the firm's market value of equity and total debt. All models include industry and year controls (coefficients not reported). Standard errors robust to serial correlation and heteroskedasticity are in parentheses. \*\*\*, \*\*, \* indicate significance at .01, .05, and .1, respectively.

Panel A presents results for all firms and Panel B presents results for Non-U.S. firms only.

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**Table X (continued)***Panel A: All Firms*

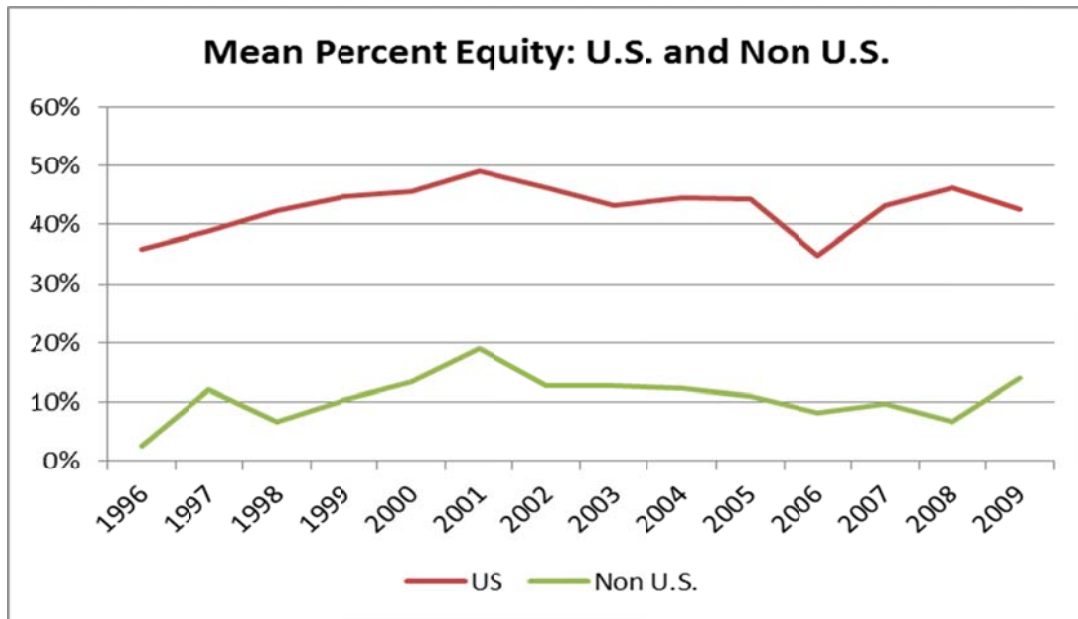
	1	2	3	4
Observations	27,347	27,445	27,445	27,325
Noncensored	20,213	20,241	20,241	20,258
Intercept	0.7108*** (0.1561)	-2.2185*** (0.0584)	-1.2855*** (0.0716)	-1.8573*** (0.1205)
Harmony	-0.6283*** (0.0306)			
Catholic		-0.0011*** (0.0004)		
LangEng			0.5690*** (0.0337)	
DistrustComp				-2.3185*** (0.3649)
SelfDeal	0.1616*** (0.056)	0.8244*** (0.0504)	-0.0796 (0.0700)	0.5319*** (0.0666)
Rule of Law	0.2552*** (0.0085)	0.3308*** (0.0085)	0.1392*** (0.0132)	0.3229*** (0.0141)
Size	0.0617*** (0.0018)	0.0562*** (0.0018)	0.0591*** (0.0017)	0.0585*** (0.0018)
MVBV	0.0380*** (0.0025)	0.0390*** (0.0025)	0.0389*** (0.0025)	0.0395*** (0.0025)
LEV	-0.0914*** (0.0177)	-0.1246*** (0.0174)	-0.1387*** (0.0173)	-0.1233*** (0.0174)
FCF	0.0032 (0.003)	0.0042 (0.0036)	0.0039 (0.0033)	0.0041 (0.0036)
Industry Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes

**Table X (continued)***Panel B: Non-U.S. Firms*

	1	2	3	4
Observations	2,703	2,801	2,801	2,681
Noncensored	486	513	513	425
Intercept	-0.9749 <sup>***</sup> (0.3516)	-1.8936 <sup>***</sup> (0.2012)	-1.9541 <sup>***</sup> (0.2172)	-2.0949 <sup>***</sup> (0.3063)
Harmony	-0.5375 <sup>***</sup> (0.1199)			
Catholic		-0.0026 <sup>**</sup> (0.0009)		
LangEng			0.1255 (0.1104)	
DistrustComp				-1.3452 <sup>*</sup> (0.7626)
SelfDeal	0.4450 <sup>***</sup> (0.1445)	0.7561 <sup>***</sup> (0.1279)	0.7244 <sup>***</sup> (0.1901)	0.7214 <sup>***</sup> (0.1635)
Rule of Law	0.3066 <sup>***</sup> (0.0369)	0.2226 <sup>***</sup> (0.0312)	0.1970 <sup>***</sup> (0.0339)	0.2501 <sup>***</sup> (0.0420)
Size	0.0181 (0.0147)	0.0153 (0.0145)	0.0241 <sup>*</sup> (0.0142)	0.0206 (0.0157)
MVBV	0.0369 (0.0275)	0.0645 <sup>**</sup> (0.0269)	0.0657 <sup>**</sup> (0.0268)	0.0744 <sup>**</sup> (0.0302)
LEV	-0.2481 (0.202)	-0.5983 <sup>***</sup> (0.1943)	-0.6576 <sup>***</sup> (0.1937)	-0.4502 <sup>**</sup> (0.2202)
FCF	-0.4148 (0.3285)	-0.5517 <sup>*</sup> (0.3345)	-0.5837 <sup>*</sup> (0.3326)	-0.5570 (0.3773)
Industry Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes

**Figure 1**

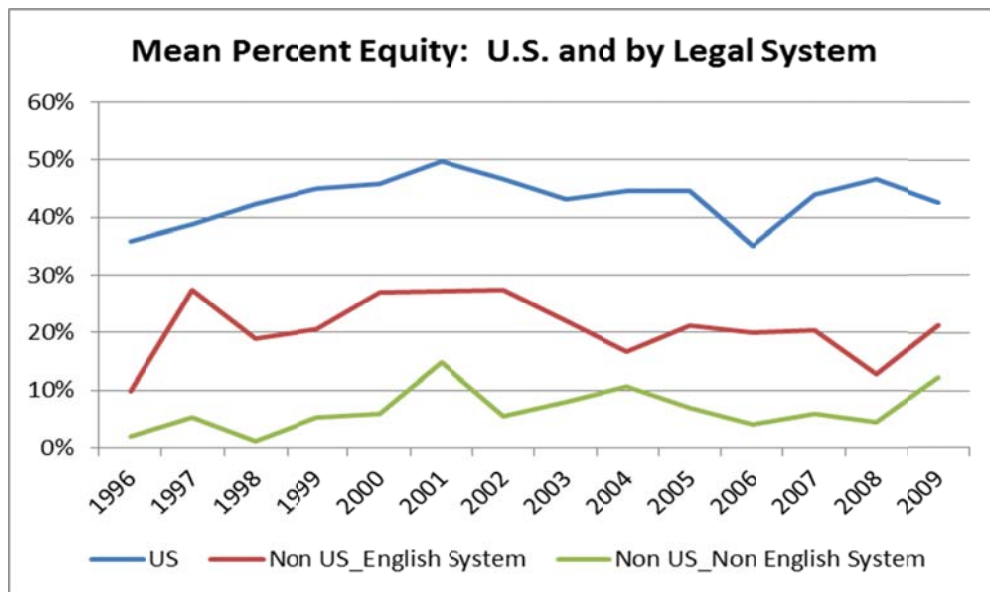
This figure presents the average value of EquityPct (equity-based compensation as a percentage of total compensation) per year from 1996-2009 for our sample of firms from 43 countries. The data are arrayed based on nationality: U.S. and Non-U.S. firms.





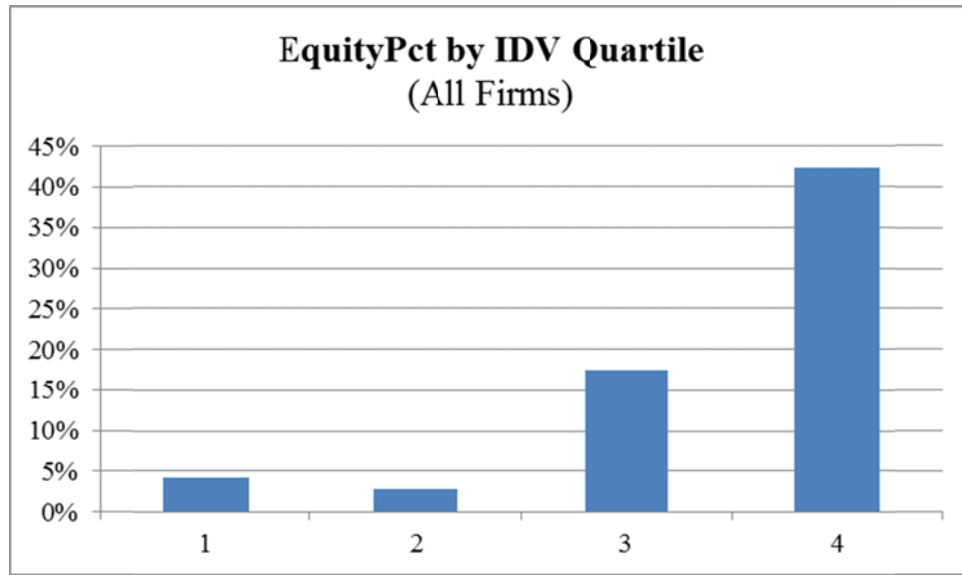
**Figure 2**

This figure presents the average value of EquityPct (equity-based compensation as a percentage of total compensation) per year from 1996-2009 for our sample of firms from 43 countries. The data are arrayed by nationality and by origin of legal system. Our three groupings are: U.S. firms (English common law legal system), non-U.S. firms (English common law legal system), and non-U.S. firms (non-English common law legal system).



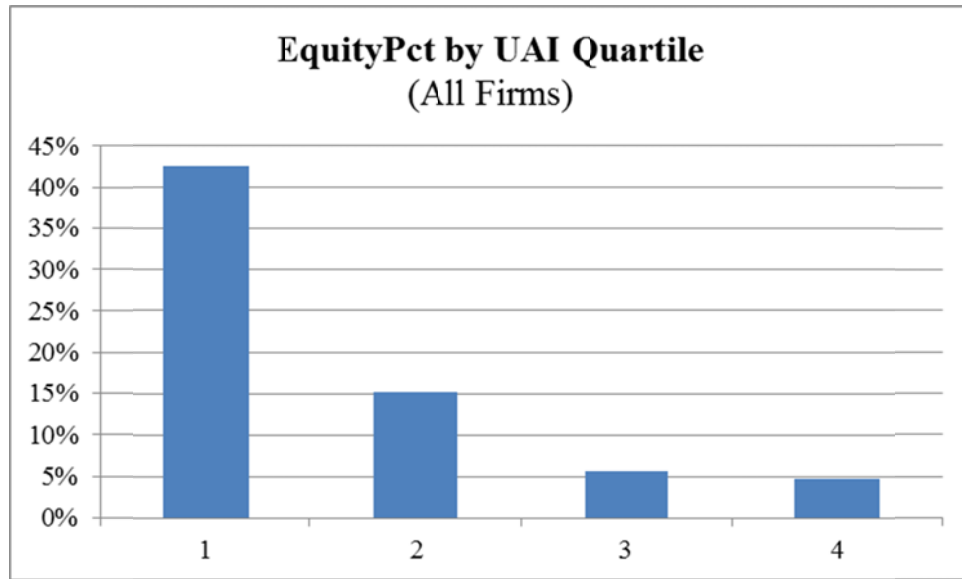
**Figure 3**

This figure presents the average value of EquityPct (equity-based compensation as a percentage of total compensation). The data are from all nations in our sample and are arrayed by quartiles based on each country's score on the Individualism (IDV) metric. Developed by Hofstede (1980), the IDV score reflects how each nation specifies the relation between the individual and the group. Higher IDV scores indicate a culture in which individual interests are more likely to prevail over collective interests.



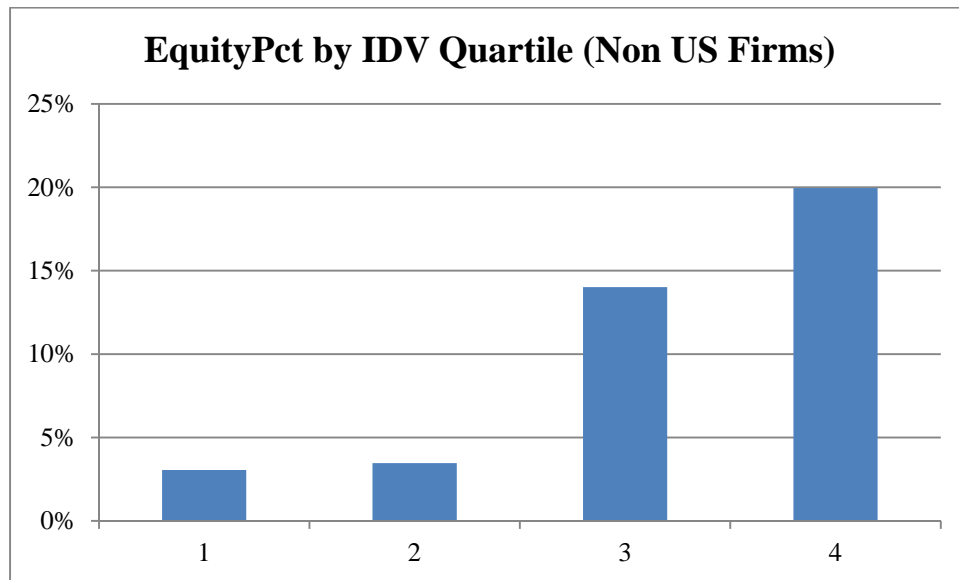
**Figure 4**

This figure presents the average value of EquityPct (equity-based compensation as a percentage of total compensation). The data are from all nations in our sample and are arrayed by quartiles based on each country's score on the Uncertainty Avoidance Index (UAI). Developed by Hofstede (1980), the UAI measures the degree to which people from each country feel stress or discomfort in unstructured or risky circumstances. Higher UAI values indicate less tolerance of uncertainty.



**Figure 5**

This figure presents the average value of EquityPct (equity-based compensation as a percentage of total compensation). The data are from the non-U.S. nations in our sample and are arrayed by quartiles based on each country's score on the Individualism (IDV) metric. Developed by Hofstede (1980), the IDV score reflects how each nation specifies the relation between the individual and the group. Higher IDV scores indicate a culture in which individual interests are more likely to prevail over collective interests.



**Figure 6**

This figure presents the average value of EquityPct (equity-based compensation as a percentage of total compensation). The data are from the non-U.S. nations in our sample and are arrayed by quartiles based on each country's score on the Uncertainty Avoidance Index (UAI). Developed by Hofstede (1980), the UAI measures the degree to which people from each country feel stress or discomfort in unstructured or risky circumstances. Higher UAI values indicate less tolerance of uncertainty.

