

# **CEO Tournaments: A Cross-Country Analysis of Causes, Cultural Influences and Consequences**

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## **Abstract**

We examine CEO tournament structure (measured as the ratio of pay between the CEO and other top executives) using a cross-country sample and find it to be steeper in the U.S. than in other countries. Testing the primary implications of tournament theory, we find that across countries, the tournament structure tends to be positively related to firm value. Further, we find that the tournament structure itself varies across firms systematically according to firm and country characteristics. In particular, the cultural values of Power distance, Fair income differences and Competition are significantly associated with differences in tournament structures.

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## **CEO tournaments: A cross-country analysis of causes, cultural influences and consequences**

### **1. Introduction**

Tournaments can help spur the participants to ever higher levels of achievement, whether the tournament is among sports players, portfolio managers, or managers within a firm.<sup>1</sup> Theory suggests that rank-order promotion tournaments in which the final (i.e., CEO) stage has a substantially higher level of compensation encourages competition, leading to better performance and ultimately, higher firm value. Corporate promotion tournaments are considered important because of the incentives they provide for higher managerial performance throughout the firm (Lazear and Rosen, 1981; Bognanno, 2001). Recently Kale, Reis, and Venkateswaran (2009) find support for this argument in U.S. data with their empirical evidence that firm value is positively associated with a measure of firm tournament structure, the dollar pay differential between the CEO and other top executives in the firm. In contrast, other empirical research in the U.S., e.g., Rajgopal and Srinivasan (2006), and Bebchuk, Cremers and Peyers (2011), using different data and measures, conclude that tournament pay is either not associated or negatively associated with higher firm value.<sup>2</sup> Thus, the previous research based on single country analyses has conflicting results. In this paper we examine the CEO tournament structure across countries, which allows us to provide new evidence regarding the causes and consequences of CEO tournaments.

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<sup>1</sup> See, for example, Nalebuff and Stiglitz (1983); Lazear and Rosen (1981), Rosen (1986); Brown, Harlow and Starks (1996); Bognanno (2001); Kale, Reis, and Venkateswaran (2009); Kempf, Ruenzi, and Thiele (2009).

<sup>2</sup> Conyon, Peck and Sadler (2001) examine implications of tournament theory in the U.K. Although they find some results consistent with these implications, they do not find a positive association between their tournament pay measure and firm value.

Given the existence of CEO tournaments, theory suggests that the incentives provided through the tournament structure depend on the assessed probability of winning the tournament, the participants' utility functions, and the final prize (or steepness of the tournament).<sup>3</sup> These attributes of the tournament and their effects would in turn be expected to be influenced by the cultural, economic and legal environments in which they arise. Thus, if CEO tournaments are an important source of incentives for managers, then the motivations a tournament initiates as well as its consequences should be not only related to firm characteristics (e.g., Kale, et. al., 2009), but also to the cultural values, economic climate, and legal standards encountered by the tournament's participants.

It would be natural for the level and structure of executive compensation to be influenced by cultural values since these values manifest in social systems, including corporate governance systems. For instance, a society's opinion on the fairness of income differentials due to differences in work would be expected to influence the degree or acuteness of the tournament. The hypothesis that cultural values help drive firms' tournament structures is consistent with the Guiso, Sapienza and Zingales (2009) argument and evidence that culture has an effect on preferences and beliefs, and these preferences in turn affect economic outcomes. The hypothesis is also consistent with previous empirical research showing country cultural values to be associated with economic and financial outcomes.<sup>4</sup>

Accordingly, we test whether CEO tournament structures across countries are related to their cultural, economic, and legal environments using cross-country data on CEO compensation

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<sup>3</sup> See for example, Lazear and Rosen, 1981; Green and Stokey, 1983; Rosen, 1986. Green and Stokey show that optimal tournament structures dominate optimal independent contracts when the common shock is sufficiently diffuse or when there are a large number of participants. These are both conditions one would expect to exist.

<sup>4</sup> See, for example, Guiso, Sapienza, and Zingales, 2006; Griffin, Li, Yue and Zhao, 2009; Ahern, Daminelli, and Fracassi, 2012; Chui, Titman, and Wei, 2010; Titman, Sheridan, Wei and Xie, 2010; Chen, Dou, Rhee, Truong, and Veeraraghavan, 2012.

and firm characteristics from Capital IQ. Specifically, we examine the CEO tournament structure for 8,386 firms in 52 countries over the 2006-2010 sample period and find differences in the levels and tournament structures of executive pay. First, in univariate results before controlling for other differences, we find that U.S. CEOs are paid significantly more than non-U.S. CEOs, which is similar to the findings of other researchers of cross-country comparisons of CEO pay (e.g., Fernandes, Ferreira, Matos, and Murphy, 2013; Conyon, Core, and Guay, 2011).<sup>5</sup> Moreover, we provide new evidence on cross-country comparisons of executive compensation by showing that the U.S. univariate pay premium extends beyond the CEO – top executives just below the CEO receive higher compensation in the U.S. than do their counterparts in other countries.

We use several measures of a firm's tournament structure: the CEO pay gap, which is the absolute dollar difference in pay between the CEO and the firm's next three highest paid executives (Bognano, 1991; Kale, et. al., 2009); the CEO pay slice, which is the percentage the CEO claims of the total compensation to the top executive group (Bebchuk, Cremers and Peyer, 2011); and the CEO pay ratio, which is the ratio of the CEO's compensation to that of the other three highest paid executives.<sup>6</sup> These tournament measures are primarily focused on internal promotions to CEO, which makes sense given that most studies of CEO succession find that the majority of CEOs are appointed from managers internal to the firm (e.g., Parrino, 1997; Huson, Parrino, and Starks, 2001; Agrawal, Knoeber, and Tsoulouhas, 2006).<sup>7</sup> We find each of these measures of CEO pay differential to be greater in the U.S. than in other countries, indicating a

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<sup>5</sup> See Murphy (1999, 2012) for reviews of the executive compensation literature.

<sup>6</sup> We use three top executives under the CEO rather than the four top executives that is common in the U.S. literature because the average number of other top executives for which data is available in other countries is three.

<sup>7</sup> Fernandes, Ferreira, Matos and Murphy (2013) find the outside succession for non-U.S. firms to be higher but still less than 50%. In the case of external hires, Coles, Li and Wang (2013) argue the existence of an industry tournament.

steeper tournament structure for U.S. executives. Using the measures in multivariate analyses to control for other explanatory variables, we test whether variations in CEO tournament structures across countries are associated with firm, cultural, economic, and legal characteristics. Similar to prior studies on differences in CEO and other executive pay, we show these differences to be related to firm characteristics. We provide novel findings through the use of proxies for culture from Hofstede (1980, 2001) and the more recent 2005-2009 World Values Survey. Specifically, we find CEO tournaments are associated with Hofstede's Power distance measure implying that the CEO tournament structure is reflective of the strength of the power structure in a society. We also find tournament structure to be significantly related to measures of a society's perceived desirability of income inequality and competition from the World Values Survey.<sup>8</sup>

Given the incentives provided by CEO tournaments, a key testable implication is that the current tournament structure should be related to future firm performance, which will be reflected in the firm's market value. We test this hypothesis for the firms in our dataset across the 52 countries. We find a significant positive association between measures of tournament pay and Tobin's Q for firms in the worldwide sample overall, and in the regional areas of North America, Europe, Oceania, and Africa. The results for North America (and the United States) are consistent with the Kale, et. al. (2009) results, but are inconsistent with the Rajgopal and Srinivasan (2006) and Bebchuk, Cremers and Peyer (2011) empirical results for the U.S.

In additional new analyses we find that cultural values appear to influence the effectiveness of a CEO tournament in improving firm performance. If competition is viewed more favorably in a country coupled with a steeper tournament, firm value is enhanced. We also

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<sup>8</sup> It should be noted that although Hofstede's (1980, 2001) measures are from surveys taken a number of years ago, as we discuss later, the concept of cultural values is that they are embedded within a society and are very slow-moving. Moreover, the World Value Surveys are contemporaneous with our compensation data.

find a tendency for firm value to increase under steeper CEO tournaments when a country's residents believe income differentials based on effort exerted are fair outcomes.

This study is the first to provide a cross-country comparison of the CEO tournament structure, its determinants, and its association with firm value. Due to limited data availability, early research on cross-country CEO compensation largely relied on summary compensation measures or consultants' estimates and focused primarily on comparisons of CEO cash compensation.<sup>9</sup> More recent research, e.g., Fernandes, Ferreira, Matos, and Murphy (2013), focuses on the cross-country differences in CEO compensation and explanations for those differences. Fernandes, Ferreira, Matos and Murphy (2013) conclude that the differences between the compensation of U.S. and other country CEOs reflects a risk premium for the greater use of option compensation in the U.S. Our study contributes to the existing body of literature by providing analysis on the CEO tournament across countries and its relation to firm and country characteristics, including cultural variables. Studying the ratio of the CEO's pay to that of other top executives in the same firm is advantageous because it alleviates concerns that there exist unaccounted for firm and governance characteristics that affect the tournament. This is because within a given firm, each of the CEO and the other top executives are necessarily exposed to the same economic, firm-specific, and governance factors.

We also contribute to the recent and growing literature on the influence of culture on economic outcomes. For instance, Guiso, Sapienza and Zingales (2009) show that religious backgrounds have an impact on preferences for redistribution and that these preferences influence state-level policies in the U.S. Ahern, Daminelli, and Fracassi (2012) examine the role of culture in cross-border takeovers and find that dimensions of national culture (trust, hierarchy,

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<sup>9</sup> See, for example, Kaplan (1994); Conyon and Murphy, (2000); Abowd and Kaplan (1999).

and individualism) affect merger transactions in both the volume of mergers as well as synergy gains from the mergers. They further find that cultural variables are related to the merger announcement returns. Frijns, Gilbert, Lehnert, Tourani-rad (2011) also explore culture and takeovers and find that Hofstede's (1980) uncertainty avoidance score is associated with the level of takeover activity in a country as well as the type of takeover undertaken.<sup>10</sup> In a contemporaneous paper, using a sample of firms cross-listed in the U.S., Bryan, Nash and Patel (2012) examine the relation of the elements of compensation to culture and conclude that country cultural characteristics are significant determinants of the relative use of equity-based compensation. Finally, the relation of tournament compensation structure to cultural factors is related to recent literature in finance on behavioral factors and CEO compensation and actions (e.g., Malmiender and Tate, 2005; Dittman, Maug and Spalt, 2010; Cronqvist and Makhija and Yonger, 2011; Gervais, Heaton and Odean, 2011; Graham, Harvey and Puri, 2012). Our research contributes to this literature by providing a direct test of the role cultural plays in economic outcomes through CEO tournament structures. In the next section, we describe our data and univariate results regarding CEO compensation and tournament structure. In Section 3, we introduce our hypotheses regarding the relation between tournament structures and cultural values. In Section 4, we present our primary empirical results on the relation between tournament structure and firm value. We conclude in Section 5.

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<sup>10</sup> Other papers that provide analyses of the influence of culture on financial outcomes include Stulz and Williamson (2003), Guiso, Sapienza, and Zingales (2008), Bogaard and Pirinsky (2011), and Kumar, Page and Spalt (2011).

## 2. Data

### 2.1 Firm characteristics

We obtain data on individual firms' characteristics, including executive compensation, from Capital IQ. Total compensation is defined as the sum of all compensation components for an executive including salary, bonus, restricted stock, and options.<sup>11</sup> We also employ Capital IQ (CIQ) data on the firm's size (measured as the log of revenue), leverage (measured as total debt to assets), profitability (ROA, measured as net income divided by assets), and level of cash holdings (cash ratio, measured as cash to total assets). In addition, we collect data on institutional ownership from CIQ and the percent insider ownership from Datastream; insiders include ownership by current and former directors, officers, and other private individuals owning more than five percent of the firm's shares.<sup>12</sup> We measure firm risk (standard deviation of return) using data from Datastream, and lose observations in specifications with this variable. To reduce the influence of large outliers, we winsorize compensation and firm characteristic measures at the 5<sup>th</sup> and 95<sup>th</sup> percentiles. The primary sample contains 8,386 firms and 22,617 firm-years over the period 2006-2010 for 52 countries. Out of the 22,617 observations, 9,244 are non-U.S. firms. Table 1 shows the country and year break out for our sample.

[Table 1]

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<sup>11</sup> Capital IQ derives most of the compensation components from company annual reports. In Appendix A we list the sources from which CIQ obtains this data for our sample.

<sup>12</sup> CIQ attempts to make the data consistent across countries, however, such an effort has obvious limitations due to differences in accounting practices across countries.



## **2.2 Country characteristics**

### **2.2.1 Measures of culture**

Our cultural value characteristics derive from two sources, Hofstede (1980, 2001) and the 2005-2009 World Values Survey. Hofstede develops a set of cultural value dimensions according to national origin. In so doing, he argues that these cultural values are formed through early socialization and are long lasting.<sup>13</sup> According to Hofstede's model, culture can be characterized in terms of several dimensions. Two of these dimensions potentially influence the CEO tournament structure: Power distance and Individualism. The Power distance index, which measures perceptions of equality in the distribution of power in a society, is calculated based on three questions from the Hofstede survey. The second Hofstede measure we employ is intended to capture the degree to which a society appreciates the individual versus the collective. We term this measure Individualism.<sup>14</sup>

Hofstede's (1980, 2001) cultural value dimensions, although measured a number of years ago, are considered to be long-lived. This is consistent with the Guiso, Sapienza, and Zingales (2006) definition of culture, "those customary beliefs and values that ethnic religious and social groups transmit fairly unchanged from generation to generation." Similarly, Becker (1996) suggests that culture changes slowly over time. However, our other measures of cultural values are based on questions from the 2005-2009 World Values Survey that are roughly coincident with our compensation data. The World Values Survey (WVS) has been developed by "a

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<sup>13</sup> In the 1960s and 1970s, Hofstede (1980, 2001) measured culture using survey responses from almost 90,000 IBM employees across 40 countries. This measure has been used extensively in prior research (see Kirkman, Lowe, and Gibson (2006) for a review).

<sup>14</sup> Hofstede (1980, 2001) refers to this measure as Individualism-Collectivism. We did not perceive a rationale for the other two original Hofstede cultural value dimensions (masculinity and uncertainty avoidance) to be relevant to the CEO tournaments. With regard to uncertainty avoidance, the three questions that comprise this variable are: (1) How often do you feel nervous or tense at work? (2) Company rules should not be broken, even when the employee thinks it is in the company's best interests. (3) How long do you think you will continue to work for this firm (with potential answers of less than 2 years, 2-5 years, more than 5 years)?

worldwide network of social scientists studying changing values and their impact on social and political life.”<sup>15</sup> These scientists conduct representative national surveys in 97 societies containing almost 90 percent of the world’s population. The surveys, which are conducted in person, have been administered in waves: 1981-1984, 1990-1994, 1995-1998, 2000-2004, and 2005-2009.<sup>16</sup> The major advantage of the WVS data relative to the Hofstede data is that it is more recent and covers a broader set of countries.

The WVS has several questions that should be relevant to the relation between a country’s tournament structure and its cultural values. These questions measure the extent to which people see income inequality as desirable, competition and hard work as rewarding, and the workplace as hierarchical. Two questions measure national attitudes on income inequality and these can be summarized as (1) whether it is fair for a person to be paid more when there are differences in efficiency and (2) whether income inequality is warranted to provide appropriate incentives. We refer to these as *Fair income differences* and *Income inequality*.

We measure a country’s attitudes towards competition and hard work using the outcomes of two other questions from the WVS survey. The first measures whether the survey takers consider competition to be good or harmful and we refer to this as *Competition*. The second question measures whether they consider that hard work brings success and we refer to this as *Hardwork*. For the variables *Income inequality*, *Hardwork*, and *Competition*, which are surveyed on a scale of 1 to 10, our measure is the average response for each country.<sup>17</sup> For *Fair income differences*, our measure is the percentage positive responses - percentage negative responses + 100, implying on a scale of 0 to 200 that 0 corresponds to "Not Fair" and 200 corresponds to "Fair".

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<sup>15</sup> See [www.worldvaluessurvey.org](http://www.worldvaluessurvey.org).

<sup>16</sup> Although cultural values change very slowly over time, because we know the year in which a particular country is surveyed, we match the most recent measure of a cultural item from the WVS to the year of the compensation data.

<sup>17</sup> We have reversed the signs on competition and hard work so that the tournament structure would be increasing in those variables.

We provide a summary of the cultural variables, their expected relation with tournament compensation, the complete questions for each of these measures and their descriptive statistics in the Appendix.<sup>18</sup>

If the tournament structures are related to cultural values as we hypothesize, a positive association should exist between the steepness of the tournament structure and each of the cultural variables. That is, the CEO pay ratio should increase in a society's willingness to accept power differentials, respect for individualism, perceptions that income differentials based on work differences are fair, that income inequality is desirable, that competition is good and that hard work brings success.

### **2.2.2 Country economic characteristics**

Beyond a country's cultural values, we also expect the CEO tournament structure to be related to the country's economic environment. We employ two measures. First, we use each country's GNP per capita for each year of the sample from the World Bank's World Development Indicators Database. Second, we measure the distribution of income within a society using the country's Gini coefficient reported by the U.S. Central Intelligence Agency (CIA). A Gini coefficient of zero implies perfect equality where all incomes are the same. A Gini coefficient of one (100 on the percentile scale) implies maximal inequality among values (for example where only one person receives all of the income). The other country characteristic that we consider is the legal environment using Durnev and Kim's (2005) measure.

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<sup>18</sup> Ahern, Daminelli and Fracassi (2012) discuss the construct validity of the World Values Survey and conclude that country level cultural values are appropriate proxies for the cultural values held by the employees of the firm.

## **2.3 Cross-country comparisons of executive compensation and tournament structures**

### **2.3.1 Executive compensation**

The first basic requirement for a firm's executive compensation structure to imply the existence of a tournament is that a large differential must exist between the CEO's compensation and the next level of executives. Thus, we begin our analysis by comparing CEO total compensation to that of other top executives in the firm. Figure 1 illustrates these differences for the average across U.S. firms and for the average across other countries' firms. In both the U.S. and countries outside the U.S., a large pay gap exists between the top executive in a firm and those just below. Moreover, the figure shows large differences between executives in the U.S. and other countries. That is, not only do U.S. CEOs receive a higher total compensation, on average, than non-U.S. CEOs, but executives just below the CEO level also receive higher total compensation than non-U.S. CEOs and executives. Panel A of Table 2 provides more detail on these differences. In our sample, the average total compensation for U.S. CEOs is \$2.5 million, which is almost twice as high as the total compensation for non-U.S. CEOs of \$1.2 million, a difference that is both economically and statistically significant. Panel A also shows the comparisons for the average compensation of the other top executives in a firm. As is the case for the CEOs, a U.S. pay premium exists for the total compensation of non-CEO executives. The result of pay premium differences between U.S. executives and executives of other countries is consistent with previous research, but as pointed out by Fernandes, Ferreira, Matos and Murphy (2013), it is important to analyze the pay premium in a multivariate framework, controlling for other factors associated with levels of pay.

[Table 2]

Tests of hypotheses on CEO tournament structures across firms and countries require a tournament measure that allows comparability across firms, industries, and most importantly,

countries and currencies. That is, because of the broader comparisons being made, we need some normalization of the tournament differential in pay. Consequently, the primary measure we employ is the ratio of CEO pay to other executive pay. By focusing on the ratio of a CEO's pay to other executives, we are able to avoid some of the inherent endogeneity issues in using compensation levels. For comparison, we also employ alternative measures used in previous studies.

In Panel A of Table 2 we provide summary statistics on the measures of the tournament structure separately for U.S. and non-U.S. firms. Examining the CEO pay ratio, we find that the tournament structure is greater for U.S. CEOs than the non-U.S. CEOs: U.S. CEOs make 1.94 (2.12) times the mean (median) top executive, while non-U.S. CEOs make 1.56 (1.67) times the mean (median) top executive. Using the Kale, Reiss, and Venkateswaran (2009) pay gap (the difference between the CEO's pay and the median of other top executives' pay), we find, similar to their paper, U.S. CEO compensation is significantly higher than the median compensation of the firm's other top executives by an average of \$1.26M. We also find a tournament structure in the non-U.S. countries but to a lesser absolute degree, with the difference between CEO and other executives being \$0.28M.<sup>19</sup>

The third measure shown in Table 2 is the Bebchuk, Cremers, and Peyer (2011) CEO pay slice (CPS) measure, i.e., the percentage of top executive compensation paid to the CEO. Not surprisingly, consistent with the pay ratio and pay gap measures, we find the CEO pay slice to be slightly higher in the U.S. than in other countries. However, as Table 2 shows, the economic significance of the difference is low given that 36% and 33% of the top executive pay goes to the CEO in the U.S. and non-U.S. countries, respectively. Similar to Bebchuk, et. al. (2011), we also

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<sup>19</sup> It is important to note that the measures of tournament address concerns regarding purchasing power parity since they are ratios of executive pay in the same country, and comparisons of tournament across countries are made using these ratios.

separate the CEO pay slice measure into its equity and non-equity components. The measure of the CEO's slice of equity compensation, denoted CEO-E, shows that of those firms that pay their executives with equity, 33% of the equity-based incentive compensation goes to the CEO, in contrast to 28% to the CEO in non-U.S. countries.<sup>20</sup> Correspondingly, the CEO's slice of non-equity compensation, denoted CEO-NE, is also greater in the U.S. relative to other countries, but to a lesser degree. In summary, U.S. CEOs are paid more than non-U.S. CEOs relative to other top executives, but they also appear to take on more risk in their compensation through their incentive compensation structure, which is consistent with earlier results of Fernandes, et. al. (2013).

Panel B describes the characteristics of the firms in our sample. The average revenue of firms in the sample of U.S. (non-U.S.) firms is \$2.36 billion (\$3.09 billion).<sup>21</sup> Other measures of size, including assets and market value also show that the average non-U.S. firm in our sample is larger than the U.S. firms. This is striking because average compensation for U.S. firms in the univariate analysis is larger than for non-U.S. firms. Tobin's  $q$  is an average of 1.24 for U.S. firms and 1.14 for non-U.S. firms. Over our sample period, the risk (return standard deviation measured over 12 months) is higher for U.S. firms. Not surprisingly, given the differences in ownership structure across countries, insider ownership is lower and institutional ownership is higher in the U.S. as compared to other countries.

Table 3 presents the same statistics as in Table 2 but using the subset of Capital IQ firms that are in the top tercile of size to facilitate comparison with previous studies of U.S. compensation. The average revenue of this U.S. (non-U.S.) sample is \$4.3 billion (\$6.6 billion). Similarly, total compensation for U.S. CEOs (non-U.S.) is greater at \$4.2M (2.0M). The

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<sup>20</sup> Because this measure is valid only for those firms that use equity-based compensation and many non-U.S. firms do not employ such compensation, the sample size for the non-U.S. firms reduces to 2,888.

<sup>21</sup> Thus, our sample of U.S. firms includes smaller firms than that of other studies on U.S. compensation.

difference between U.S. and non-U.S. compensation is even greater than that reported in Table 2, reflecting that U.S. pay might be more sensitive to firm size. The compensation of other executives is also greater in the U.S. In general, the results in Table 3 mirror those in Table 2, but the differences between the U.S. and non-U.S. compensation variables are somewhat magnified.

[Table 3]

### **2.3.2. Determinants of CEO tournament structures**

In this section, we examine whether CEO tournament structure can be explained by firm characteristics as well as how the structure differs across countries, primarily examining differences between the U.S. and other countries. Table 4 presents the determinants of the CEO tournament structure in a multivariate framework. The dependent variables in models (1) and (2) are the ratios of the CEO compensation to mean and median top executive non-CEO compensation, respectively. In model (3), the dependent variable is the CEO pay slice, the percent of total compensation that goes to the CEO, as in Bebchuk et. al (2011). In model (4), we examine the CEO pay gap, i.e., the difference between the CEO and median executive pay, as in Kale, Reis, and Venkateswaran (2009). In model (5) we examine how equity compensation is used in the U.S. relative to other countries for the subset of firms that use options or restricted stock to compensate executives, while model (6) measures the use of non-equity compensation (both measures follow Bebchuk et. al., 2011). In model (7), we include additional firm characteristics as explanatory variables for a much smaller subset of the sample. In all seven models, we control for country, industry, and year fixed effects. We also cluster standard errors by country.

[Table 4]

In the first four regressions of the CEO tournament structure, the indicator variable *U.S.* is positive and significant in all specifications. Thus, consistent with the univariate results in Tables 2 and 3, even after controlling for other firm characteristics, we find that, relative to other countries, U.S. CEOs on both absolute and relative bases have larger pay differentials from their top management teams, suggesting a steeper tournament structure in the U.S. However, regressions (5) and (6) show that for the subset of firms that use equity-based compensation, the equity slice for non-U.S. CEOs is not significantly greater than that of U.S. CEOs. Therefore, while there are significantly fewer non-U.S. firms offering restricted stock and options in the first place, when they do provide equity compensation, it is offered to a similar extent to non-CEOs.

In terms of firm characteristics, we find that in most specifications the steepness of the tournament structure is related to the size of the firm (as measured by the log (revenue)), but the signs vary by whether we use an absolute or relative measure of the tournament structure. When using a relative measure (CEO pay ratio or CEO pay slice), we find the structure to be less steep for larger firms. For the absolute measure (CEO pay gap), we find the structure to become steeper in large firms. As in Bebchuk, et. al. (2011) we find the CEO pay slice to be positively related to the firm's return on assets. Since institutional ownership has been shown to have a positive relation with incentive compensation (Hartzell and Starks, 2003), we expect it to have a positive effect on tournament structure, which is a form of incentive compensation structure. Consistent with this expectation, we find the relation between tournament structure and institutional ownership to be positive and significant in all regressions.

In the final regression, we check to see whether our results are robust to controlling for CEO and board characteristics shown to have an association with CEO compensation.<sup>22</sup> This

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<sup>22</sup> See Yermack, 1996; and Core, Holthausen and Larcker, 1999 on board size; Hartzell and Starks, 2003, on independence; Core, Holthausen, and Larker, 1999; Goyal and Park, 2002, Cyert, Kang, and Kumar, 2002; Conyon and Murphy, 2000; on CEO duality.



data is obtained from BoardEx and the sample size decreases by more than 60% after conditioning on availability of this data; 96% of the remaining observations are from the US, UK, and Australia, leaving little country variation. Similar to Bebchuk et. al. (2011), we find a negative and significant coefficient on board size. There is also a significantly positive coefficient on independent boards and CEO duality. The coefficient on the percent of the board that is independent is positive, which is consistent with Lee, Lev, Hian, and Yeo (2008), reflects the board's attempt to increase incentives from the tournaments, which can improve firm performance. CEO's who are also chairs can have more power, which upwardly influences their compensation relative to non-CEOs. More central to our paper, the results that the CEO tournament structure is steeper in the U.S. continue to hold after inclusion of these governance variables, even when in comparison to countries that seem very similar to that of the US.

### **3. CEO tournament structure and cultural values**

The need for a managerial tournament arises from the inability of the shareholders (or the board of directors) to monitor the managers perfectly. Lazear and Rosen (1981) argue that a promotion rank-order tournament with executive pay disparity motivates managers to perform at higher levels because of the opportunities to move up in the organization. That is, the large differences in compensation between positions on the corporate ladder will provide motivation for higher managerial performance, resulting in greater firm value. Thus, managerial effort should be positively associated with the size of the pay differential, which can lead to better firm performance assuming that firm performance is increasing in managerial effort. Further, at the top of the ladder (CEO vs. executives directly under the CEO) these pay differentials need to be even greater due to the end stage of the game (Rosen, 1986).

We hypothesize that CEO tournament structures are influenced by their environments given the variations in cultural values, economic climates, and investor protection regimes across countries. Accordingly, we test the hypothesis that culture influences both the use of tournaments, as well as a tournament's effectiveness in improving performance.

For example, cultural values can pick up aspects of the relationship the CEO has with other executives in the firm. Bebchuk, Cremers, and Peyer (2011) argue that the CEO pay slice is important because it provides an estimate of the relative significance the CEO has versus the other executives based on power, abilities, or contribution to the firm. Their hypothesis suggests that the CEO pay slice shows whether the firm has a team or dominant leadership style. Thomas (2004) argues that the dispersed ownership structure of U.S. companies gives U.S. CEOs more power relative to shareholder-control dominated systems, implying that U.S. CEOs should be paid more. He goes on to argue that the use of tournaments should be more important in the U.S. since U.S. CEOs can be more powerful or have greater authority than non-U.S. CEOs. To capture this cultural factor across countries we use Hofstede's (1980, 2001) Power distance measure, which is the degree to which a culture accepts that power is distributed unequally. Similarly, the extent to which individuals' goals and accomplishments are seen as more important than society's goals and accomplishments could also lead to steeper tournaments. For this cultural attribute, we employ Hofstede's (1980, 2001) individualism measure, the degree to which individuals are autonomous.<sup>23</sup>

In their study comparing CEO compensation across the U.S., U.K. and other European countries, Conyon and Murphy (2000) speculate that differences in compensation across countries could be due to higher cultural tolerance in the U.S. for income inequality that arises

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<sup>23</sup> Several studies in finance use Hofstede's (1980, 2001) individualism measure as a proxy for managerial overconfidence (Chen, Dou, Rhee, Truong, Veeraraghavan, 2012; Chui, Titman, and Wei, 2010; Titman, Wei, Xie, 2010).

from differences in effort, talent, or risk taking. If individuals view working hard as beneficial, they could prefer a steeper tournament structure (greater income inequalities) as reward for their efforts.<sup>24</sup> Similar to their conjecture we employ measures of a society's attitudes toward income equality. We also examine cultural perceptions of the fairness of income differences, competition, and the benefits of hard work. All four of these cultural values are obtained from the World Values Survey.

Our hypotheses concerning the influence of cultural values on the CEO tournament structure are supported in part by previous research. Using a consulting firms' estimates of aggregate measures of CEO compensation at the country level for 23 countries from 1997-2001, Tosi and Greckhamer (2004) provide a rough estimate of the relation between Hofstede's (1980, 2001) cultural values and compensation. They conclude that aggregate country measures of compensation are positively related to a country's Power distance and Individualism scores, implying that CEO pay is reflective of the strength of the power structure in a society as well as the extent to which individual needs are considered more important than group needs.

One would also expect differences in executive compensation, including differences in tournament structures, to be related to other institutional environmental factors in a country. For example, given that higher investor protection is associated with more equity financing (LaPorta, Lopes-de-Silanes, Shleifer, and Vishny, 1997 and 1998), it should be particularly important to incentivize management to maximize shareholder value, and therefore, the tournament structure of compensation could be related to the level of investor protection in a country.<sup>25</sup>

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<sup>24</sup> Conyon and Murphy (2000) do not test their conjecture.

<sup>25</sup> As mentioned earlier, previous studies find differences in the level and composition of CEO compensation across countries, e.g., Fernandes, Ferreira, Matos, and Murphy (2013), although Fernandes et al argue that, the differences are not substantial once one controls for international differences in corporate governance. Bryan, Nash, and Patel (2012) study CEO compensation of 256 ADR firms from 36 non-U.S. countries and find that firms in countries with stronger investor protection and with stronger rule of law have more equity compensation. In a study of 158 of the

We test our hypothesis that national cultural values influence CEO tournament structures by including the previously described cultural value characteristics: Power distance, Individualism, Fair income differences, Income inequality, Hard Work and Competition. We also consider the country economic and legal characteristics: GNP per capita, and an updated measure of a country's legal environment as developed by Durnev and Kim (2005).<sup>26</sup> The Durnev and Kim (2005) legal variable, *Legal*, is defined as the product of anti-director rights and rule of law, using the updated anti-director rights index from Spamann (2010). The descriptive statistics are included in Appendix A.

One concern is the correlation structure across our country variables. We present these correlations in Table 5. All of the cultural variables are significantly correlated at the 10 percent level or better; the shaded cells are correlations in absolute magnitudes of 0.50 or greater. As can be seen, there are high correlations between several of the cultural variables as well as the other country characteristics. Thus, in adding the country characteristics (cultural and legal) to the compensation regressions we first include each country variable separately.

[Table 5]

The results of the tournament compensation determinant regressions with cultural variables added are provided in Table 6. Models (1) through (6) include Power distance, Individualism, Fair income differences, Income inequality, Hardwork, and Competition, respectively.<sup>27</sup> For each country's cultural measure, we subtract the sample mean in order to evaluate the influence of the cultural measure relative to the average. In this specification, we use the CEO pay ratio as the

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largest European firms in the year 2000, Muslu (2010) finds higher incentive compensation when agency costs are higher, but only in countries with higher investor protection.

<sup>26</sup> Doidge, Karolyi, and Stulz (2007) find that GNP per capita, the ratio of stock market capitalization to GDP and the Durnev and Kim (2005) legal variable explain more variation in firm-specific governance than do firm-specific characteristics.

<sup>27</sup> Because of high correlations with some of the cultural variables, GNP per capita is orthogonalized against Power distance, Individualism, and Fair income differences when included in regressions with those variables.

measure of tournament (the results remain qualitatively similar if we use the other tournament structure compensation variables). All regressions include standard errors clustered by country in addition to industry and year fixed effects. In all six models, even after including the country characteristics, the differences between tournament structures in the U.S. and non-U.S. countries remain significant.

[Table 6]

The results on the cultural variables indicate that greater ease with power differentials (Power distance) and income differentials as based on job performance (Fair income differences) are positively associated with steeper tournament structures. Similarly, the positive coefficient on Competition can be interpreted as meaning that when competition is viewed by a society as beneficial, the tournament structure is steeper. The other cultural variables have insignificant coefficients. Regressions (7) and (8) include each of the additional country characteristics separately, the legal environment and the Gini coefficient. Although there is no significant relation between the legal environment and the tournament measure, the positive and significant Gini coefficient indicates that steeper tournaments reflect greater income differences in society in general.

In Panel B of Table 6, we report regressions that include all of the cultural variables in two specifications. In model (1), we include all of the cultural, economic, and legal variables as well as the firm characteristics. Once we include all of the variables, only Power distance and Competition remain significant. It is also notable that in this model, the U.S. indicator becomes insignificant implying that cultural characteristics explain some differences in tournaments between the U.S. and other countries, consistent with the Conyon and Murphy (2000) conjecture that culture could, in part, explain differences in compensation between U.S. and non-U.S.

countries.<sup>28</sup> However, it is important for the reader to keep in mind that these variables are highly correlated.

Finally, we consider the relation between the tournament structure and firm risk by including the firm's standard deviation of return.<sup>29</sup> Including this variable reduces the number of observations because we do not have return data for all of the firms in the sample. The results, presented in Model (2) of Panel B, show that the CEO tournament structure is related to the risk of the firm in that riskier firms have lower CEO pay ratios, *ceteris paribus*. It is also notable that the risk measure does not change the qualitative interpretations – Power distance and Competition enhance the tournament structure.<sup>30</sup>

#### **4. CEO tournaments and firm value**

According to the tournament theories, the ultimate result of the tournament structure is better managerial performance and greater firm value, which empirically suggests a positive relationship between executive pay disparity and firm valuation. Thus, our second primary hypothesis is whether a relationship exists across countries between CEO tournament structures and firm values.

This relationship between tournament structure and firm value has been tested previously in individual countries (the U.S., U.K., and Denmark) with mixed results. Two studies (Rajgopal and Srinivasan (2006) using U.S. data, and Conyon, Peck and Sadler (2001) using U.K. data) find no evidence that their measure of tournament pay (pay dispersion measured as the standard

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<sup>28</sup> We also ran the regressions in Panel B of Table 6 excluding U.S. companies from the analysis and find that the coefficients on Power distance and Competition remain significant.

<sup>29</sup> Kini and Williams (2012) provide evidence that tournament incentives can affect CEO's risk decisions.

<sup>30</sup> In untabulated results, we also add in firm level governance measures as a robustness check on the subsample of 9,316 observations for which these data were available. Because 96% of this sample is made up of the US, UK, and Australia, there is little variation in the observations for cultural characteristics. As such, they are insignificant.

deviation of executive compensation) is significantly related to firm performance (measured by stock returns). On the other hand, several studies find evidence in support of the tournament theory—Lee, Lev and Yeo (2008), measuring tournament incentives through pay dispersion (the standard deviation of compensation divided by the mean compensation) find a positive relation between that measure and Tobin’s Q or stock performance for U.S. firms. Kale, Reis and Venkateswaran (2009), measuring tournament incentives as the dollar difference between the CEO’s compensation and the median of the next 4 top executives in the firm, find a positive relation between this measure and firm performance (measured by Tobin’s Q and operating performance) for U.S. firms.<sup>31</sup>

We test these implications by regressing a measure of firm value (Tobin’s  $q$ ) on a measure of the CEO pay ratio (CEO compensation/Mean of other top executives’ compensation) for the companies in our sample. The results of the regressions are shown in Table 7. In Model (1), we include data from all countries. In the remaining models in the table, we run the regression for firms from different geographic regions individually. All of the regressions include industry (Fama-French 12) and year controls. Standard errors are clustered by country when appropriate.

[Table 7]

In Model (1), which includes both U.S. and non-U.S. firms, the indicator variable for non-U.S. firms is insignificant suggesting no significant systematic differences between Tobin’s  $q$  for U.S. firms as compared to other firms across the world. There is, however, a significantly positive relation between a firm’s Tobin’s  $q$  and the CEO tournament pay measure. In Models (2) through (8) we present the results of the tests of firm value and CEO tournament structure by region. We find that North America, not surprisingly since it is dominated by U.S. companies,

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<sup>31</sup> In addition, Eriksson (1999) (for Danish companies) and Audas, Barmby, and Treble (2004) (for a single British employer) find support for the predictions of tournament theory that executive effort is positively related to the spread in compensation.

continues to show a positive relation between  $q$  and CEO tournament pay as do the European, Oceanic, and African (dominated by S. Africa) regions. We do not find a significant relation between the tournament structure and  $q$  in the Nordic, Asian, and Middle East regions.<sup>32</sup> This result could be due to differences in tournament structures across the countries or it could be due to lack of power given that we have much fewer observations in these countries. It should be noted that we do not find a negative relation between the CEO tournament measure and Tobin's  $q$ .

In general, the positive relation between  $q$  and CEO tournament pay appears to hold across firms in diverse geographic regions, providing evidence consistent with tournament theory. While tournaments are positively associated with firm value, Table 6 shows that culture influences tournament structure. Therefore, we next examine whether the relation between  $q$  and tournament structure is heightened in the presence of some cultural characteristics. For instance, if power distance is acceptable in a culture, then greater power distance and steeper tournament structures could react together to enhance firm value; on the other hand if power distance is not acceptable, and the tournament structure is steep, this interaction could potentially even reduce firm value. We therefore regress firm value on the interaction of tournament and measures of culture. We include country indicators in the regressions, rather than culture by itself, since many country level factors besides culture affect firm value. Because country subsumes culture, it is then econometrically correct to exclude culture as stand-alone variables. The results, presented in Model (1) of Table 8, show that when competition is viewed more favorably and tournaments are steeper, firm value is enhanced.<sup>33</sup> There is also some evidence that a positive view on fair income differences is associated with increases in firm value. In Model (2), we add the firm's standard

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<sup>32</sup> We do not include South America in this table due to the small number of observations.

<sup>33</sup> We also use a two-stage analysis to test culture and find similar results.



deviation of returns to the model. The results do not change materially when this variable is included with the exception of the cultural variable, fair income differences, which becomes insignificant.

[Table 8]

## **5. Conclusions**

The degree to which the CEO tournament structure is influenced by cultural factors, and the success of such a structure in terms of enhanced firm value are two issues that we address through a comprehensive analysis of cross-country differences in executive compensation tournament structure. In testing for the determinants of CEO tournament structures, we find that the tournament structure is steeper in U.S. companies as compared to foreign companies. Our results indicate that this can be partially explained by cultural influences, which include measures of the acceptability of power, income differentials and the desirability of competition. We find that a steeper tournament structure appears to lead to better performance generally across firms in our sample from a wide variety of regions. Our regressions also suggest that the interaction of culture and tournament affects the CEO tournament's impact on firm value. Steeper tournaments can be more effective at improving firm value in countries that value competition and that believe income differences are fair.

Overall, our analysis supports the hypothesis that tournaments are an important incentive mechanism for motivating corporate managers and further that tournaments lead to improved firm performance. In countries that value power, competition, and differences in income due to differing levels of efficiency, tournaments are steeper and appear to be even more effective.

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**Table 1**  
**Distribution of observations**

This table shows the distribution of observations by country and time. We segment the countries by their different regions.

<b>Country</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>Total</b>
<b>North America</b>						
United States	2,429	3,005	2,917	2,966	2,056	13,373
Canada	198	174	145	89	43	649
<b>Europe</b>						
Austria	10	10	9	13	8	50
Belgium	4	5	2	8	1	20
Channel Islands	4	5	2	0	0	11
Cyprus	1	1	1	6	0	9
Czech Republic	2	0	0	0	0	2
						0
France	79	95	121	91	31	417
Germany	150	133	149	151	71	654
Italy	6	2	6	5	6	25
Liechtenstein	0	1	1	0	0	2
Luxembourg	2	2	2	4	1	11
Netherlands	61	49	56	74	30	270
Poland	4	6	14	20	2	46
Portugal	2	0	3	14	4	23
Russia	2	0	0	1	0	3
Slovenia	7	2	8	11	1	29
Spain	5	8	5	4	1	23
Switzerland	14	65	78	75	22	254
United Kingdom	513	465	427	479	190	2,074
Ukraine	0	0	0	1	0	1
<b>Nordic</b>						
Denmark	9	10	10	19	12	60
Finland	11	4	11	4	4	34
Norway	45	39	32	50	12	178
Sweden	47	33	46	51	8	185
<b>Oceania</b>						
Australia	442	357	463	491	330	2083
New Zealand	7	4	5	0	2	18
Papua New Guinea	1	1	1	0	1	4

<b>Country</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>Total</b>
<b>Asia</b>						
Cambodia	0	0	0	1	0	1
China	67	60	81	269	34	553
Hong Kong	309	235	306	0	60	954
India	12	11	18	72	3	128
Macau	0	0	0	1	0	1
Pakistan	22	14	20	0	0	90
Philippines	0	0	0	1	0	1
Singapore	13	11	10	21	6	85
Thailand	1	0	4	0	0	5
Vietnam	1	1	0	1	0	4
<b>Middle East</b>						
Israel	5	6	16	25	2	56
Jordan	0	0	0	3	0	3
Kazakhstan	1	1	1	2	1	6
<b>Africa</b>						
Botswana	0	0	1	1	0	2
Mauritius	0	0	0	1	0	1
Namibia	0	0	0	1	0	1
South Africa	126	82	108	0	54	391
<b>South America</b>						
Argentina	0	0	0	1	0	1
Chile	0	0	0	1	0	1
Colombia	0	1	0	2	0	3
Peru	0	0	0	2	0	2
<b>Total</b>	<b>4,612</b>	<b>4,898</b>	<b>5,079</b>	<b>5,032</b>	<b>2,996</b>	<b>22,617</b>



**Table 2**  
**Univariate statistics for differences in compensation, tournament structures,**  
**and firm characteristics between U.S. and Non-U.S. executives**

This table reports univariate statistics for executive compensation in the U.S. versus non-U.S. countries. Panel A shows total compensation in U.S. dollars for CEOs as well as the next top three executives in the firm. It also shows several tournament measures that compare the CEO's executive compensation to that of the other executives: the CEO pay ratio (CEO total compensation/mean others), the CEO pay ratio using the median compensation of other executives, the CEO pay gap (the difference in total compensation between the CEO and the median of other executives), the CEO pay slice (the percentage of executive compensation that goes to the CEO), CEO-E pay slice and CEO-NE pay slice (the percentage of equity and non-equity compensation that goes to the CEO). Panel B provides means for the firm characteristics: Sales, Assets, Market Value, Net Income, Debt Ratio(Total Debt/Assets), Return on Assets(EBIT/Assets),Cash Ratio (Cash/Assets), Tobin's Q(sum of MV of equity+ BV of debt, adjusted by assets), and Returns (average yearly stock returns). Each row shows the mean and number of observations for U.S. and non-U.S. observations. The final column of each row provides the results of t-tests of the differences between the U.S. and Non-U.S. means. \*\*\*, \*\*, \* denote significance at the 1%, 5% and 10% levels, respectively.

**Panel A CEO tournament measures**

Variable	U.S.		Non U.S.		Diff(U.S. vs. Non-U.S.)
	Mean	N	Mean	N	
CEO total compensation	2,541,879	13,373	1,198,484	9,244	***
Top 3 non-CEO total compensation	1,469,645	13,373	974,475	9,244	***
CEO pay ratio with mean	1.94	13,373	1.56	9,244	***
CEO pay ratio with median	2.12	13,373	1.67	9,244	***
CEO pay gap (in millions USD)	1.26	13,373	0.28	9,244	***
CEO pay slice (percentage of top pay)	0.36	13,373	0.33	9,244	***
CEO equity pay slice	0.33	10,634	0.28	2,888	***
CEO non-equity pay slice	0.302	13,371	0.297	9,242	*

**Panel B Firm characteristics**

Variable	U.S.		Non U.S.		Diff(U.S. vs. Non-U.S.)
	Mean	N	Mean	N	
Sales	2,361	13,373	3,099	9,244	***
Assets	5,541	13,373	9,650	9,244	***
Market value of equity	2,900	13,373	3,776	9,244	***
Net income	161	13,373	269	9,244	***
Debt ratio	0.22	13,373	0.18	9,244	***
ROA	0.01	13,373	0.04	9,244	***
Cash ratio	0.12	13,373	0.14	9,244	***
Tobin's <i>q</i>	1.24	13,373	1.14	9,244	***
Standard deviation of returns	0.12	11,115	0.11	7,420	***
%Insiders	12.26	13,373	17.86	9,244	***
%Institution	45.15	13,373	20.16	9,244	***
Age	56.00	8,658	51.96	4,891	***

**Table 3****Univariate statistics for differences in compensation, tournament structures, and firm characteristics between U.S. and Non-U.S. executives**

This table reports univariate statistics for executive compensation in the U.S. and in non-U.S. countries for the largest half of firms in the sample. Panel A shows total compensation in U.S. dollars for CEOs as well as the next top three executives in the firm. It also shows several tournament measures that compare the CEO's executive compensation to that of the other executives: the CEO pay ratio (CEO total compensation/mean others), the CEO pay ratio using the median compensation of other executives, the CEO pay gap (the difference in total compensation between the CEO and the median of other executives), the CEO pay slice (the percentage of executive compensation that goes to the CEO), CEO-E pay slice and CEO-NE pay slice (the percentage of equity and non-equity compensation that goes to the CEO). Panel B provides means for the firm characteristics: Sales, Assets, Market Value, Net Income, Debt Ratio(Total Debt/Assets), Return on Assets(EBIT/Assets),Cash Ratio (Cash/Assets), Tobin's Q(sum of MV of equity+ BV of debt, adjusted by assets), and Returns (average yearly stock returns). Each row shows the mean and number of observations for U.S. and non-U.S. The final column of each row provides the results of t-tests of the differences between the U.S. and Non-U.S. means. \*\*\*, \*\*, \* denote significance at the 1%, 5% and 10% levels, respectively.

**Panel A Tournament measures**

Variable	U.S.		Non-U.S.		Diff(US vs. non-US)
	Mean	N	Mean	N	
CEO total compensation	4,201,351	7,082	2,002,921	4,226	***
Top 3 non-CEO total compensation	1,892,546	7,082	1,327,912	4,226	***
CEO pay ratio with mean	2.08	7,082	1.48	4,226	***
CEO pay ratio with median	2.30	7,082	1.59	4,226	***
CEO pay gap (in millions USD)	2.05	7,082	0.46	4,226	***
CEO pay slice (percentage of top pay)	0.36	7,082	0.31	4,226	***
CEO equity pay slice	0.33	6,268	0.28	1,317	*
CEO non-equity pay slice	0.30	7,082	0.28	4,226	***

**Panel B Firm characteristics**

Variable	U.S.		Non-U.S.		Diff(US vs. non-US)
	Mean	N	Mean	N	
Sales	4,330	7,082	6,619	4,226	***
Assets	10,324	7,082	20,947	4,226	***
Market value of equity	5,327	7,082	8,097	4,226	***
Net income	305	7,082	581	4,226	***
Debt ratio	0.25	7,082	0.23	4,226	***
ROA	0.07	7,082	0.08	4,226	***
Cash ratio	0.07	7,082	0.09	4,226	***
Tobin's <i>q</i>	1.06	7,082	1.00	4,226	***
Returns	0.09	6,593	0.18	3,840	***
Standard deviation of returns	0.08	6,047	0.08	3,492	***
%Insiders	7.56	7,082	14.38	4,226	***
%Institution	60.49	7,082	27.50	4,226	***
Age	56.11	4,912	53.21	2,518	***

**Table 4**  
**CEO tournament structures**

This table shows the multivariate estimation where the dependent variable is a measure of the CEO tournament structure and the independent variables are potential determinants, all of which are lagged one year. The different tournament measures compare the CEO's compensation to that of the top 3 other executives: the CEO pay ratio using total compensation/mean others (1), the CEO pay ratio using total compensation/median others (2), the CEO pay slice (the percentage of executive compensation that goes to the CEO) (3), the CEO pay gap (the difference in total compensation between the CEO and the median of other executives) (4), CEO-E pay slice (5) and CEO-NE pay slice (6) (the percentage of equity and non-equity compensation that goes to the CEO). Model 7 also includes additional firm characteristics available for a smaller subsample. For each variable, the coefficient is reported on the first line with the p-value in parentheses underneath. We control for robust standard errors clustered by country as well as country, industry and year fixed effects. \*\*\*, \*\*, \* denote significance at the 1%, 5% and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	<b>CEO pay ratio- mean</b>	<b>CEO pay ratio- median</b>	<b>CEO pay slice</b>	<b>CEO pay gap</b>	<b>CEO-E pay slice</b>	<b>CEO-NE pay slice</b>	<b>CEO pay ratio- mean</b>
<b>US</b>	0.315*** (0.00)	0.394*** (0.00)	0.721*** (0.00)	0.710*** (0.00)	0.025 (0.20)	-0.006 (0.81)	0.230*** (0.00)
<b>log(Revenue)</b>	-0.014** (0.05)	-0.005 (0.64)	-0.007*** (0.00)	0.236** (0.02)	-0.009*** (0.00)	-0.009*** (0.00)	0.013 (0.12)
<b>Leverage</b>	0.076 (0.20)	0.093 (0.13)	0.005 (0.52)	0.085 (0.41)	0.014*** (0.00)	0.004 (0.55)	-0.001 (0.98)
<b>ROA</b>	0.119 (0.20)	0.129 (0.12)	0.053*** (0.00)	-0.327 (0.13)	0.045** (0.03)	0.070*** (0.00)	0.198** (0.05)
<b>Cash ratio</b>	0.102 (0.33)	0.130 (0.20)	-0.019* (0.08)	0.463*** (0.00)	-0.040*** (0.00)	-0.025* (0.06)	-0.281* (0.10)
<b>log(GNP per capita)</b>	-0.079* (0.09)	-0.114* (0.05)	0.005 (0.38)	0.022 (0.69)	-0.002 (0.90)	0.005 (0.59)	-0.150*** (0.00)
<b>% Insider ownership</b>	0.002 (0.18)	0.003 (0.13)	0.000*** (0.00)	-0.003 (0.11)	-0.000** (0.02)	0.001*** (0.00)	0.002*** (0.00)
<b>% Institutional ownership</b>	0.004*** (0.00)	0.004*** (0.00)	0.000*** (0.00)	0.009*** (0.00)	0.000*** (0.00)	0.000*** (0.00)	0.003*** (0.00)
<b>Age</b>							-0.005*** (0.01)
<b>Board Size</b>							-0.038*** (0.00)
<b>% Indep</b>							0.808*** (0.00)
<b>CEO/Chair</b>							0.090*** (0.00)
<b>Constant</b>	2.036*** (0.00)	2.427*** (0.00)	0.243*** (0.00)	-1.627** (0.02)	0.300* (0.08)	0.239*** (0.00)	2.762*** (0.00)
<b>Observations</b>	22,617	22,617	22,617	22,617	13,523	22,617	9,564
<b>Adjusted R2</b>	0.042	0.039	0.179	0.074	0.045	0.061	0.053

**Table 5****Correlations of cultural, economic and legal attributes**

This table reports correlations of measures of culture from Hofstede (1980) and the World Values Survey, a measure of a country's legal environment using the Durnev-Kim (2005) (2005) legal variable, equal to the product of anti-director rights and rule of law, where the anti-director rights index is from Spamann (2010) and economic variables from the CIA (Gini). The variables are described in the Appendix. Shaded cells are correlations significant at the 10% level or better.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<b>(1) GNP_per_capita</b>	1								
<b>(2) Power distance</b>	-0.47	1							
<b>(3) Individualism</b>	0.56	-0.30	1						
<b>(4) Fair income differences</b>	0.50	-0.07	0.60	1					
<b>(5) Income inequality</b>	0.27	-0.01	0.69	0.57	1				
<b>(6) Hardwork</b>	0.20	-0.16	-0.41	-0.49	-0.51	1			
<b>(7) Competition</b>	0.00	0.14	-0.32	-0.61	-0.49	0.73	1		
<b>(8) Legal (Spamann * ROL)</b>	0.16	-0.43	0.11	-0.45	-0.31	0.50	0.50	1	
<b>(9) Gini</b>	-0.16	0.29	0.34	0.45	0.60	-0.78	-0.59	-0.71	1

**Table 6**  
**CEO tournaments and cultural values**

This table shows the multivariate estimation where the dependent variable is CEO pay ratio (total CEO pay divided by the mean pay of the top three non-CEO executives). The cultural variables include Power distance, Individualism, Fair income differences, Income inequality, Hardwork, and Competition, as well as Legal (Spamann \* ROL) and the Gini coefficient. Variables are described in the Appendix. GNP per capita is orthogonalized against cultural attributes to which it is significantly correlated. For each variable, the coefficient is reported on the first line with the p-value in parentheses underneath. Panel A reports regressions with each of the cultural variables separately. Panel B reports regressions with the joint estimation of the cultural variables included in the regressions. We control for robust standard errors clustered by country as well as industry and year fixed effects. \*\*\*, \*\*, \* denote significance at the 1%, 5% and 10% levels, respectively.

**Panel A Individual cultural variables**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<b>U.S.</b>	0.307** (0.00)	0.304** (0.00)	0.233** (0.00)	0.309** (0.00)	0.336** (0.02)	0.354** (0.00)	0.410** (0.00)	0.476*** (0.00)
<b>log(Revenue)</b>	-0.019** (0.03)	-0.013* (0.10)	-0.015** (0.04)	-0.015** (0.04)	-0.016** (0.04)	-0.017** (0.03)	-0.014* (0.06)	-0.016** (0.04)
<b>Leverage</b>	0.081* (0.08)	0.085* (0.06)	0.082* (0.08)	0.083* (0.07)	0.083* (0.06)	0.083* (0.06)	0.084* (0.06)	0.081* (0.08)
<b>ROA</b>	0.071 (0.42)	0.047 (0.63)	0.060 (0.52)	0.056 (0.56)	0.059 (0.52)	0.060 (0.52)	0.052 (0.59)	0.057 (0.54)
<b>Cash ratio</b>	0.006 (0.93)	0.006 (0.92)	0.006 (0.93)	0.007 (0.91)	0.007 (0.92)	0.006 (0.93)	0.009 (0.89)	0.006 (0.93)
<b>log(GNP/capita)</b>	0.022 (0.73)	-0.106 (0.15)	-0.105* (0.05)	-0.061 (0.39)	-0.055 (0.58)	-0.065 (0.37)	-0.106 (0.11)	- (0.00)
<b>% Insider</b>	-0.000 (0.66)	0.000 (0.79)	-0.000 (0.77)	0.000 (0.82)	-0.000 (0.98)	-0.000 (0.95)	0.000 (0.82)	-0.000 (0.84)
<b>% Institutional</b>	0.004** (0.00)	0.004** (0.00)	0.004** (0.00)	0.004** (0.00)	0.004** (0.00)	0.004** (0.00)	0.004** (0.00)	0.004*** (0.00)
<b>Power distance</b>	0.008** (0.03)							
<b>Individualism</b>		0.003 (0.40)						
<b>Fair income diff</b>			0.003** (0.03)					
<b>Income inequality</b>				0.050 (0.32)				
<b>Hardwork</b>					0.009 (0.93)			
<b>Competition</b>						0.017** (0.05)		
<b>Legal</b>							0.007 (0.36)	
<b>Gini</b>								0.009* (0.06)
<b>Constant</b>	1.234** (0.00)	1.152** (0.00)	1.240** (0.00)	1.838** (0.02)	1.757* (0.08)	1.859** (0.02)	2.233** (0.00)	3.038*** (0.00)
<b>Observations</b>	20882	20882	20882	20882	20882	20882	20882	20882
<b>Adjusted R2</b>	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050

**Panel B Joint estimations of culture**

	(1)	(2)
<b>U.S.</b>	-0.031 (0.86)	-0.076 (0.69)
<b>log(Revenue)</b>	-0.012* (0.06)	-0.011** (0.01)
<b>Leverage</b>	0.080* (0.10)	0.046 (0.35)
<b>ROA</b>	0.045 (0.64)	0.043 (0.74)
<b>Cash ratio</b>	0.002 (0.98)	-0.045 (0.67)
<b>log(GNP per capita)</b>	0.049 (0.74)	0.075 (0.65)
<b>% Insider</b>	-0.000 (0.87)	0.000 (0.34)
<b>% Institutional</b>	0.004*** (0.00)	0.004*** (0.00)
<b>Power distance</b>	0.017*** (0.00)	0.019*** (0.00)
<b>Individualism</b>	0.011 (0.14)	0.011 (0.13)
<b>Fair income differences</b>	0.003** (0.03)	0.003** (0.03)
<b>Income inequality</b>	0.014 (0.87)	0.043 (0.60)
<b>Hardwork</b>	0.035 (0.77)	0.010 (0.93)
<b>Competition</b>	0.272** (0.01)	0.270** (0.03)
<b>Legal</b>	-0.004 (0.66)	-0.009 (0.31)
<b>Gini</b>	0.002 (0.76)	0.004 (0.50)
<b>Standard deviation of return</b>		-0.049*** (0.01)
<b>Constant</b>	1.446*** (0.00)	0.815 (0.64)
<b>Observations</b>	20890	17158
<b>Adjusted R2</b>	0.053	0.048

**Table 7: Tournament structure and firm value**

This table reports the multivariate estimation where the dependent variable is Tobin's  $q$  and the independent variables are all lagged one year. The CEO tournament is total CEO pay divided by the mean of total top three non-CEO executive pay (CEO Total/Mean Others). P-values are in parenthesis. \*\*\*, \*\*, \* denote significance at the 1%, 5% and 10% levels, respectively. We control for robust standard errors clustered by country as well as country, industry and year fixed effects.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	All	N. America	Europe	Nordic	Oceania	Asia	M. East	Africa
<b>CEO pay ratio</b>	0.041** (0.03)	0.013*** (0.00)	0.031*** (0.00)	0.036 (0.27)	0.329*** (0.00)	0.031 (0.67)	0.160 (0.28)	0.014*** (0.00)
<b>U.S.</b>	-0.241 (0.32)							
<b>log(revenue)</b>	-0.179*** (0.00)	0.038*** (0.00)	0.058*** (0.00)	0.007 (0.97)	-0.292*** (0.00)	0.104** (0.03)	-0.204 (0.51)	0.086*** (0.00)
<b>Leverage</b>	0.253 (0.43)	-0.060* (0.07)	-0.354*** (0.00)	-2.772*** (0.00)	-1.275*** (0.00)	-2.376** (0.01)	0.074 (0.97)	-1.932*** (0.00)
<b>Cash</b>	5.118*** (0.00)	1.192*** (0.00)	1.574*** (0.00)	2.628** (0.03)	5.416*** (0.00)	1.434 (0.33)	2.645 (0.36)	1.381*** (0.00)
<b>Log GNP per capita</b>	-0.063 (0.60)	-0.329* (0.06)	0.109 (0.12)	-0.582 (0.62)	0.432*** (0.01)	-0.371* (0.06)	0.906* (0.10)	0.348 (0.87)
<b>% Insider</b>	-0.006** (0.02)	0.000 (0.96)	0.003*** (0.00)	0.010 (0.69)	0.005*** (0.00)	-0.010* (0.10)	0.001 (0.93)	-0.002*** (0.00)
<b>% Institutional</b>	0.002 (0.34)	0.002*** (0.00)	0.004*** (0.00)	-0.007 (0.30)	0.040*** (0.00)	0.008* (0.07)	0.004 (0.81)	-0.003*** (0.00)
<b>Constant</b>	3.851*** (0.00)	4.719** (0.01)	0.308 (0.68)	8.835 (0.53)	-2.368** (0.02)	5.580*** (0.00)	-7.216 (0.11)	1.174 (0.95)
<b>Observations</b>	22149	13748	3849	449	2055	1612	60	369
<b>Adj. R-squared</b>	0.069	0.155	0.145	0.106	0.116	0.076	0.216	0.066

**Table 8: Tournament structure, firm value and culture**

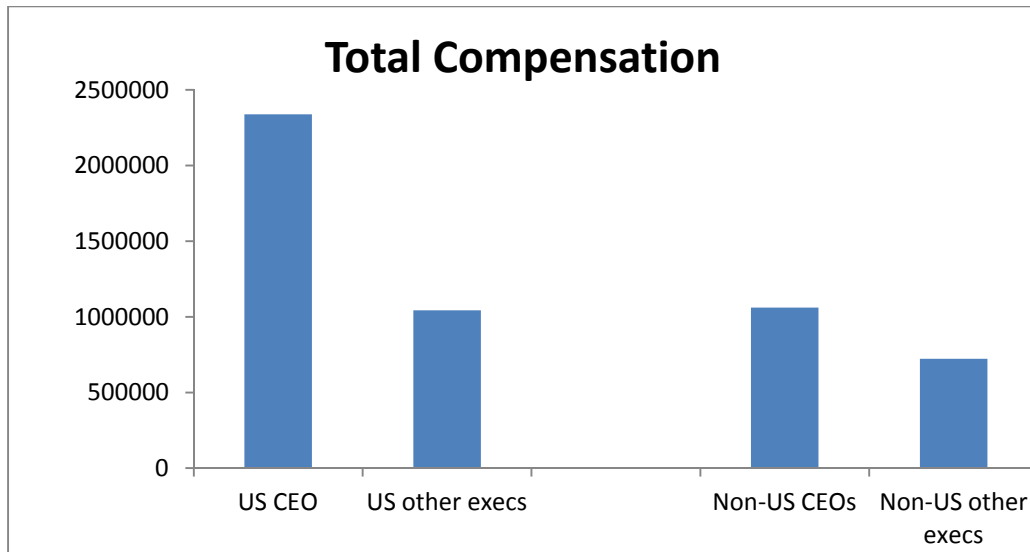
This table reports the multivariate estimation where the dependent variable is Tobin's  $q$  and the independent variables are all lagged one year. The CEO tournament is total CEO pay divided by the mean of total top three non-CEO executive pay (CEO Total/Mean Others). P-values are in parenthesis. \*\*\*, \*\*, \* denote significance at the 1%, 5% and 10% levels, respectively. We control for robust standard errors clustered by country as well as industry and year fixed effects.

	(1)	(2)
<b>CEO tournament</b>	0.168 (0.70)	0.425 (0.40)
<b>log(Revenue)</b>	-0.149*** (0.00)	-0.115** (0.01)
<b>Leverage</b>	0.455* (0.10)	0.088 (0.79)
<b>Cash ratio</b>	5.408*** (0.00)	5.487*** (0.00)
<b>log(GNP per capita)</b>	3.195*** (0.00)	2.176** (0.05)
<b>% Insider</b>	-0.002 (0.50)	-0.003* (0.10)
<b>% Institutional</b>	0.001 (0.57)	0.001 (0.69)
<b>Standard deviation of return</b>		1.665*** (0.00)
<b>CEO pay ratio*Power distance</b>	0.007 (0.14)	0.003 (0.50)
<b>CEO pay ratio*Individualism</b>	0.003 (0.81)	0.008 (0.55)
<b>CEO pay ratio*Fair income differences</b>	0.005* (0.10)	0.002* (0.08)
<b>CEO pay ratio*Income inequality</b>	0.045 (0.47)	0.026 (0.73)
<b>CEO pay ratio*Hardwork</b>	0.110 (0.33)	0.087 (0.54)
<b>CEO pay ratio*Competition</b>	0.187** (0.03)	0.139** (0.04)
<b>CEO pay ratio*Legal</b>	0.016 (0.21)	-0.000 (0.99)
<b>CEO pay ratio*Gini coefficient</b>	-0.004 (0.75)	-0.010 (0.42)
<b>Constant</b>	37.526*** (0.00)	36.040*** (0.00)
<b>Observations</b>	20467	17024
<b>Adjusted R2</b>	0.084	0.094



**Figure 1**

Figure 1 shows the total compensation in U.S. dollars for the CEO and top three other executives in the U.S. and non-U.S. countries.



## Appendix

### Table A-1 Description of cultural attributes

This table describes the culture attributes from Hofstede (1980) and the World Value Survey.

Variable	Description
Power distance	The degree to which people in the society are comfortable with power differentials – higher numbers correspond to more comfort with power differentials (Hofstede, 1980)
Individualism	The degree to which people in the society are individualistic. Higher scores imply higher individualism. (Hofstede, 1980).
Fair income differences	The degree to which people in a society consider differences in income to be fair based on the answer to the question: Imagine two secretaries, of the same age, doing practically the same job. One finds out that the other earns considerably more than she does. The better paid secretary, however, is quicker, more efficient and more reliable at her job. In your opinion, is it fair or not fair that one secretary is paid more than the other? A value of 1 is Fair; 0 is Not Fair. Our measure is the % positive responses in a country - % negative responses + 100. Thus, the range is from 0 (corresponding to Not Fair) to 200 (corresponding to Fair). World Values Survey.
Income_inequality	The degree to which people in a society believe that income differences can provide incentives: Incomes should be made more equal vs. we need larger income differences as incentives, scale of 1 to 10 where a value of 10 is ‘We need larger income differences as incentives.’ We measure the average response. Higher numbers correspond to income differences being perceived as desirable. World Values Survey.
Competition	The degree to which people in a society believe competition to be good: It stimulates people to work hard and develop new ideas vs. Competition is harmful. It brings the worst in people. Scale of 1 to 10 where 10 is ‘Competition is harmful.’ World Values Survey. (We measure the average response, but reverse the sign so that less negative numbers correspond to Competition being more desirable.)
Hardwork	The degree to which people in a society believe hard work brings success vs. Hard work doesn’t generally bring success – it’s more a matter of luck and connections. Scale of 1 to 10 where 10 is ‘Hard work doesn’t generally bring success – it’s more a matter of luck and connections.’ World Values Survey. . (We measure the average response, but reverse the sign so that less negative numbers correspond to Hard Work being more desirable.)
Legal (Spamann * ROL)	Measure of a county’s legal environment using the Durnev and Kim (2005) legal variable, equal to the product of anti-director rights and rule of law, where the anti-director rights index is from Spamann (2010).
Gini Coefficient	The Gini coefficient measures the inequality among values of a frequency distribution (for example levels of income). A Gini coefficient of zero expresses perfect equality where all values are the same (for example, where everyone has an exactly equal income). A Gini coefficient of one (100 on the percentile scale) expresses maximal inequality among values (for example where only one person has all the income).
Log GNP	Log of the country’s GNP
Mkt cap./GDP	The country’s market capitalization adjusted by the country’s GDP.

## Questions from the World Values Survey

### **Fair income differences:**

*Imagine two secretaries, of the same age, doing practically the same job. One finds out that the other earns considerably more than she does. The better paid secretary, however, is quicker, more efficient and more reliable at her job. In your opinion, is it fair or not fair that one secretary is paid more than the other?*

*0 Not Fair*

*1 Fair*

### **Income inequality:**

*How would you place your views on this scale? 1 means you agree completely with the statement on the left; 10 means you agree completely with the statement on the right; and if your views fall somewhere in between, you can choose any number in between. Sentences:*

*Incomes should be made more equal vs. We need larger income differences as incentives*

### **Competition:**

*How would you place your views on this scale? 1 means you agree completely with the statement on the left; 10 means you agree completely with the statement on the right; and if your views fall somewhere in between, you can choose any number in between. Sentences:*

*Competition is good. It stimulates people to work hard and develop new ideas vs. Competition is harmful. It brings the worst in people*

**Hardwork:**

*How would you place your views on this scale? 1 means you agree completely with the statement on the left; 10 means you agree completely with the statement on the right; and if your views fall somewhere in between, you can chose any number in between.*

*In the long run, hard work usually vs. Hard work doesn't generally bring success  
brings a better life - it's more a matter of luck and connection*

**Table A-2**  
**Country Cultural Values**

These values are derived from Hofstede (1980) and the World Values Survey 2005-2008.

	<b>log(GNP – per capita)</b>	<b>Power distance</b>	<b>Individualism</b>	<b>Fair income differences</b>	<b>Income inequality</b>	<b>Hardwork</b>	<b>Competition</b>	<b>Revised LLSV * ROL</b>	<b>GINI</b>
<b>North America</b>									
United States	10.74	40	91	181.45	6.10	3.81	3.43	30.00	45.00
Canada	10.53	39	80	158.37	5.56	3.95	3.79	40.00	32.10
<b>Europe</b>									
Austria	10.65	11	55	177.23	4.09	4.07	3.59	25.00	26.00
Belgium	10.64	65	75	142.01	5.51	4.83	4.73	30.00	28.00
Channel Islands	11.01								
Cyprus	10.15			180.11	5.09	4.70	4.28		29.00
Czech Republic	9.34	57	58	193.32	5.49	5.13	3.22		26.00
France	10.57	68	71	154.43	5.07	5.17	4.96	31.43	32.70
Germany	10.57	35	67	166.82	4.35	5.04	3.76	32.31	27.00
Italy	10.42	50	76	145.55	5.92	5.31	4.43	20.83	32.00
Liechtenstein	11.04								
Luxembourg	11.04	40	60	162.36	6.60		4.50		26.00
Netherlands	10.71	38	80	150.96	5.81	5.04	4.63	25.00	30.90
Poland	9.24	68	60	159.35	6.07	5.94	4.65		34.20
Portugal	9.94	63	27	150.94	4.78	5.85	4.38	21.70	38.50
Russia	8.66	93	39	186.43	6.75	5.27	4.21		40.95
Slovenia	9.98	71	27	172.01	4.26	4.17	3.83		26.97
Spain	10.26	57	51	134.35	5.18	4.33	4.42	39.00	32.00
Switzerland	10.96	34	68	167.84	4.43	5.28	3.70	30.00	33.70
United Kingdom	10.65	35	89	146.51	5.46	4.62	4.10	42.85	34.00
Ukraine	8.07			173.56	7.66	5.07	4.72		27.50

	log(GNP – per capita)	Power distance	Individualism	Fair Income differences	Income inequality	Hardwork	Competition	Revised LLSV * ROL	GINI
<b>Nordic</b>									
Denmark	10.92	18	74	164.03	6.72	6.06	4.00	40.00	29.00
Finland	10.67	33	63	159.23	4.92	3.60	4.12	35.00	26.80
Norway	11.04	31	69	109.71	5.31	5.02	3.53	35.00	25.00
Sweden	10.78	31	71	160.77	5.99	4.55	3.42	35.00	23.00
<b>Oceania</b>									
Australia	10.52	36	90	167.66	5.67	4.31	3.77	40.00	30.50
New Zealand	10.18	28	79	181.13	5.43	3.98	3.27	40.00	36.20
Papua New Guinea	7.47								50.90
<b>Asia</b>									
Cambodia	7.47								44.40
China	7.88	80	20	174.21	5.90	3.63	3.27		41.50
Hong Kong	10.3	68	25	171.92	4.78		3.81	41.10	53.30
India	7.47	77	48	130.74	4.72	3.33	2.83	22.10	36.80
Kazakhstan	8.51								28.30
Macau	10.56								
Pakistan	7.47	55	14		3.83	4.36	4.07	17.68	30.60
Philippines	7.47	94	32	136.56	6.56	3.79	4.06	17.68	45.80
Singapore	10.43	74	20	181.37	6.96		3.36	42.85	48.06
Thailand	8.04	64	20	163.74	7.07	5.14	4.75	25.00	51.28
Turkey	9.09								
Vietnam	7.47	70	20	185.18	6.07	3.46	3.78		37.60
<b>Middle East</b>									
Israel	10.05	13	54		3.77			19.28	39.20
Jordan	8.21			159.28	6.97	3.76	2.44	11.05	39.70

	<b>log(GNP – per capita)</b>	<b>Power distance</b>	<b>Individualism</b>	<b>Fair income differences</b>	<b>Income inequality</b>	<b>Hardwork</b>	<b>Competition</b>	<b>Revised LLSV * ROL</b>	<b>GINI</b>
<b>Africa</b>									
Botswana	8.75								63.00
Egypt	7.5	80	25	193.86	6.76	2.46	2.70	13.26	34.40
Mauritius	8.81								39.00
Namibia	8.36								70.70
South Africa	8.59	49	65	125.85	5.53	3.01	3.51	22.10	65.00
<b>South America</b>									
Argentina	8.88	49	46	108.21	5.33	4.99	4.71	13.38	45.80
Chile	9.16	63	23	136.74	4.78	5.17	4.86	28.08	52.10
Colombia	8.34	67	20	121.36	5.50	4.88	3.67	13.26	58.50
Mexico	9.21	80	30	140.37	6.11	3.35	3.22	16.05	51.70
Peru	8.29	64	16	154.32	7.48	4.61	3.41	19.89	48.00