

# **The Pay Divide: (Why) Are U.S. Top Executives Paid More?\***

Nuno Fernandes, IMD International  
Miguel A. Ferreira, Universidade Nova de Lisboa  
Pedro Matos, University of Southern California  
Kevin J. Murphy, University of Southern California

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## **Abstract**

We use data from recently expanded disclosure rules to analyze the level and structure of compensation for CEOs in 3,304 firms in 27 countries. Top executives in the U.S. are paid more than their counterparts in foreign companies, even after controlling for a wide spectrum of firm, industry, governance, and CEO characteristics. Most of the U.S. vs. non-U.S. pay differences are explained by differences in the use of incentive plans which merely shifts the question: Why do U.S. executives receive more incentive compensation? We cannot identify any firm-level agency-theoretic or economic determinants of differences that could explain these cross-country differences, suggesting that the differences are largely country-specific and related to cultural, tax, accounting, political, and path-dependent institutional histories.

JEL classification: G32, G34, G38

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# **The Pay Divide: (Why) Are U.S. Top Executives Paid More?**

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## **1. Introduction and Summary**

While the United States' status as "the" preeminent economic superpower is increasing challenged by the European Union and emerging Asian economies, there is one sector where U.S. dominance seems fairly secure: top executive compensation. By all accounts (and there are many), U.S. executives are paid significantly more than their foreign counterparts, and receive a greater share of their compensation in the form of stock options, restricted shares, and performance-based bonuses.<sup>1</sup>

Attempts to document empirically the precise magnitude and determinants of the alleged U.S. "pay premium" have been plagued by international differences in rules regulating the disclosure of executive compensation. While the U.S. has required detailed disclosures on executive compensation since the 1930s (which were significantly expanded in 1978, 1993, and 2006), most other countries have historically required reporting (at most) the aggregate cash compensation for the top-management team, with no individual data and little information on the prevalence of equity or option grants. Cross-country studies of the U.S. pay premium have therefore largely been based on aggregate cash pay, small-sample comparisons where individual data are available, or countrywide estimates provided by consulting firms.<sup>2</sup>

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<sup>1</sup> See, for example, Abowd and Bognanno (1995), Abowd and Kaplan (1999), Bryan, Nash, and Patel (2006), Conyon and Murphy (2000, 2002), Muslu (2008), Murphy (1999), and Thomas (2003, 2008).

<sup>2</sup> Academics have used cash compensation aggregated across executives to analyze executive pay in, for example, Japan (Kaplan (1994a)), China (Kato and Long (2005)), Portugal (Fernandes (2008)), and Korea (Kato, Kim, and Lee (2003)). Smaller-sample studies using individual data include Conyon and Murphy's (2000) comparison of U.S. and U.K. practices, and Zhou's (2000) analysis of Canadian executives. Several academic studies (including Abowd and Bognanno (1995) and Abowd and Kaplan (1999)) have relied on countrywide estimates from Towers Perrin's bi-annual Worldwide Remuneration Survey. In this survey, Towers Perrin's consultants in different countries are asked to describe the competitive level and structure of pay for a hypothetical executive in a mid-size manufacturing firm.

The disclosure situation has improved markedly in recent years. Canada, for example, adopted U.S.-style disclosure rules in October 1993,<sup>3</sup> and disclosure rules in the United Kingdom (U.K.) were expanded to include stock option and equity grants in 1997.<sup>4</sup> Regulations mandating disclosure of executive pay in Australia were introduced in 2004.<sup>5</sup> And, in October 2004 the European Union (EU) Commission recommended that all listed companies in the EU report details on individual compensation packages, including equity and option grants. While the Commission recommendations are not binding, the Commission reported that most EU countries were disclosing compensation by 2007.<sup>6</sup> Similar disclosure requirements were adopted in a variety of other developed and developing countries in Asia and Africa.

In this paper, we use data from the recently expanded disclosure rules to conduct a comprehensive international comparative analysis of CEO pay.<sup>7</sup> As described in detail in Section 2, we extract CEO pay data from a variety of sources, including ExecuComp, BoardEx, Annual Reports, Proxy Statements (or their equivalent, such as “Management Information Circulars” in Canada) and SEC Form 20F (used for foreign companies cross-listing in the U.S.). In addition, we use firms’ financial data from Datastream/Worldscope, ownership structure from FactSet/Lionshares, corporate governance variables from BoardEx, and detailed information for individual CEOs (e.g., age, employment histories, education) from BoardEx. Our final sample includes fiscal 2006 data for CEOs from 3,304 firms in 27 countries.

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<sup>3</sup> Canadian rules disclosure requirements are promulgated by the Ontario Securities Commission and cover all firms located in or listed in Ontario (including all companies on the Toronto Stock Exchange); see Zhou (2000).

<sup>4</sup> The 1997 expansion of disclosure requirements in the U.K. followed the Greenbury and Hampel reports; see Conyon and Murphy (2000).

<sup>5</sup> Australian disclosure is governed primarily by AASB 1024 (effective June 2004), but ASX Listing Rule 4.1 (effective May 2003) and Section 300.A of the Corporations Act (effective July 2004) also impact pay disclosure; see Finch (2006).

<sup>6</sup> See EU Commission, 2007, “Report on the application by Member States of the EU of the Commission Recommendation on directors’ remuneration,” Commission Staff Working Document 13 July 2007. Although not in the EU, Norway and Switzerland also adopted EU-style disclosure rules (although, in the case of Switzerland, individual compensation is reported only for the “highest-paid” executive who might not be the chief executive officer).

<sup>7</sup> We use the term “CEO” to refer to the highest-ranking executive in each firm, regardless of whether the firm uses the “chief executive officer” designation or some other designation (such as “Managing Director” or “Executive Chairman”).

Our initial focus is analyzing whether U.S. CEOs are, indeed, paid more than similarly situated executives in similarly situated firms elsewhere in the world. We find that, controlling for firm size and industry, CEOs in the U.S. receive total compensation (including grant-date values of options and restricted shares) that is 87% higher than the compensation received by CEOs in the 26 other countries taken as a group. The U.S. pay premium is reduced to 45% after controlling for firm performance, stock-price volatility, institutional and insider ownership, and corporate governance, and to 40% after also controlling for CEO characteristics.

We find that most of the observed U.S. pay premium reflects differences in the structure of compensation in the U.S. compared to other countries. While our total compensation measure, for example, treats a dollar increase in base salary as equivalent to a dollar increase in the Black-Scholes value of the current option grant, risk-averse and undiversified executives will predictably demand a premium when trading fixed compensation for risky performance-based compensation. Once we control for the ratio of incentive compensation to total compensation in our comparison regressions, we find that the U.S. pay premium controlling for firm size and industry falls from 87% to 27% (still statistically significant), and falls from 40% to a statistically insignificant 12% after controlling for firm and CEO characteristics.

Our result that the U.S. pay premium is driven by differences in pay structures does not “explain” the premium, but rather shifts the question: why do U.S. CEOs receive more stock, options, and other performance-based pay than do their foreign counterparts, even after controlling for firm, industry, and CEO characteristics? We explore a variety of plausible country-specific factors that might contribute to this difference, including tax and accounting regimes, legal origin, and cultural differences. Ultimately, our results here are speculative and inconclusive, but suggest important avenues for future research.

In addition to analyzing the U.S. pay premium, we document a variety of determinants of CEO pay that have not been explored or well-documented in the literature. We find, for example, that CEO pay is negatively related to insider ownership (including ownership by families) but positively related to the percentage of outstanding shares held by institutions. We find that CEO pay is higher when foreign sales (as a fraction of total sales) are higher, and find that CEOs of foreign firms that cross-list on U.S. exchanges are paid more than CEOs of foreign firms that are not cross-listed. In addition, we document that “connectedness” matters: CEO pay is higher

when both the CEO and other board members have sat on other boards in the past. But surprisingly (to us), we find that CEO pay is lower when the CEO has previously served as a CEO at another firm.

We also document interesting differences between the determinants of pay in the U.S. and in other countries. We find, for example, that CEO pay is negatively related to leverage in the U.S., but not significantly related to leverage outside of the U.S., while share turnover is positively related to pay outside of, but not within, the U.S. In addition, we show that holding the titles of both CEO and Chairman corresponds to *higher* compensation in the U.S. but *lower* compensation in other countries. And, CEOs classified as “foreign” (i.e., nationality different from the corporate headquarters) receive marginally higher pay outside the U.S., but lower pay within the U.S.

The remainder of the paper is organized as follows. Section 2 describes our sample and various data sources and variables definitions. Section 3 presents our analysis of whether the observed U.S. pay premium is explained by firm characteristics (Section 3.1) and CEO-specific characteristics (Section 3.2). Section 4 analyzes cross-country differences in the use of incentive pay, and offers robustness checks for our results. Section 5 explores country-level determinants that may explain both the observed (residual) differences in pay levels and pay structures after controlling for firm, industry, and CEO characteristics. Section 6 concludes.

## **2. Data**

This section describes the sample and the data. Our primary selection criterion is that the firm and its top executive are included in the “BoardEx” database compiled by the U.K.-based consulting firm Management Diagnostics Limited. BoardEx is the leading database on board composition of publicly listed firms, and includes detailed biographic information on individual executives and board members of approximately 10,000 firms in nearly 50 countries across Europe, North America, Asia, and Africa. To the best of our knowledge, the coverage for international firms is unparalleled by any other data provider. These data have been used previously in Cohen, Frazzini, and Malloy (2008) to study educational links between CEOs and mutual fund managers in the U.S. and in Ferreira and Matos (2008b) to study board links

between banks and firms worldwide. In identifying the top executive, BoardEx takes into account that the top executive title is not uniform across different countries. For example, while the top executive in U.S. firms almost always holds the title of “Chief Executive Officer” (often in conjunction with the titles President or Chairman), the top executive in the U.K. and many continental Europe countries often holds the title “MD” (Managing Director) or “Chairman (Executive).”

## **2.1. CEO Compensation**

Our main data source for compensation of top executives outside the U.S. is BoardEx. In addition to providing biographic information, BoardEx also includes detailed compensation data – including salaries, bonuses, payouts under long-term plans, option grants, and share grants – for top executives in companies where such data are publicly disclosed. Three aspects of BoardEx’s compensation calculation deserve special mention. First, instead of providing grant-date values for stock option grants, BoardEx computes the value of options granted using the closing stock price on the last trading day of the calendar year rather than the stock price on the grant date. Second, for performance share plans (in which the number of restricted shares awarded is based on realized performance), BoardEx computes the value based on the maximum (rather than the target or minimum) shares that can be awarded under the plan, again multiplied by the calendar-year closing stock price. Third, all BoardEx compensation data are converted to U.S. dollars using the relevant exchange rate as of the close of the calendar year.

To supplement the BoardEx data – and to evaluate the quality of the BoardEx compensation data – we have manually collected all company filings for the 30 largest publicly listed (as defined by stock-market capitalization) in 47 countries (excluding the U.S.).<sup>8</sup> We have searched for executive compensation information in annual company reports, 20F forms for firms with a cross-listing in the U.S., and other proxy filings (e.g., Management Information Circulars for Canadian firms). We also use these manually collected to verify compensation values for top 30 firms in each country covered by BoardEx. With the caveat above regarding the BoardEx methodology, we determined that the BoardEx data are generally complete and accurate. We

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<sup>8</sup> For Canada and Australia – where BoardEx compensation data were unusually incomplete – we manually collected compensation data for approximately 100 firms each.

draw top executive compensation data for the U.S. from Compustat’s ExecuComp database, focusing on the set of 1,271 U.S. firms whose CEO could be matched to biographic data from BoardEx. We use ExecuComp compensation data rather than data from BoardEx to maintain comparability with the existing literature on U.S. CEO pay. In addition, the BoardEx methodology tends to overstate compensation relative to the ExecuComp methodology, so using ExecuComp biases against finding a U.S. pay premium. For example, since 2006 was a generally positive year for the stock markets in the countries included in our study, valuing options using calendar-end stock prices (a la BoardEx) produces a slightly higher value than using grant-date prices (a la ExecuComp). Similarly, valuing performance-share plans using maximum awards (BoardEx) produces a higher value than using target awards (ExecuComp).<sup>910</sup> With the exception of these methodological differences, the BoardEx compensation data for U.S. firms closely match the ExecuComp data, and by using ExecuComp we estimate pay for U.S. executives with a somewhat conservative bias. In the robustness section, we will see this does not make difference for the main findings in this study.

We exclude firms without usable compensation data, and also exclude firms from countries with fewer than five firms with compensation data.<sup>11</sup> This leaves us with 4,086 firms but, of these, only 3,739 firms can be matched to Datastream/Worldscope (“Datastream”) (and have reported sales in Datastream). We then eliminate CEOs serving in their first year to avoid data anomalies reflecting compensation for multiple positions (for CEOs promoted internally) and partial-year compensation and signing bonuses or grants (for CEOs hired from outside). Our final sample consists of 3,304 top executives with disclosed 2006 compensation in 27 countries.

Table A.1 in the Appendix provides data sources and observations per country. In terms of data sources, the large majority of CEO compensation values are available directly from BoardEx and

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<sup>9</sup> The bias here is small, since relatively few U.S. companies offered performance-share plans in 2006.

<sup>10</sup> Boardex labels equity-related incentive plan awards as “Long-Term Incentive Plans” (LTIPs). While it is generally true that non- U.S. firms don’t use cash awards, this may overstate the use of “equity-based incentive plans” for non-US firms. Our Execucomp measure for “equity-based incentive plans” for U.S. firms, however, may be understated as we consider all LTIPs to be non-equity-related. This introduces a conservative bias against finding that U.S. firms rely more on “equity-based incentive plans”, which we document later in the paper.

<sup>11</sup> This latter screen excludes 21 countries for which CEO compensation data are only available for a small number of firms: Argentina, Brazil, Columbia, Chile, Czech Republic, Egypt, Greece, Hungary, Indonesia, Japan, South Korea, Mexico, Peru, Philippines, Pakistan, Portugal, Russian Federation, South Korea, Sri Lanka, Taiwan, Turkey, and Venezuela.

ExecuComp, but we have been able to complement these sources with 244 firms for which we have collected compensation information manually from company filings as described above. Table A.1 also reports the market capitalization of the sample firms as a percentage of the total market capitalization of all Datastream-covered firms in the country. Overall, the firms in our sample represent 68.5% of the market capitalization of these countries, indicating that we are able to grasp the lion's share of firms in the countries included in our study.<sup>12</sup> The 1,271 U.S. firms included in the sample – those covered in both Boardex and ExecuComp – represent 74% of the U.S. stock market capitalization. The country with the second largest number of sample firms is the U.K. with a total of 1,030 firms representing 88% of the U.K. market capitalization. Despite the lower number of firms, our sample still represents large fractions of local stock market capitalization in the major European countries like France (81%), Germany (67%), Italy (76%), and Sweden (77%). Coverage is lower for other continents but still quite significant in countries like Australia (60%), Hong Kong (65%), Singapore (47%), and South Africa (54%).

Table A.1 also reports CEO compensation summary statistics by country. Total Compensation includes salaries, bonuses, performance-share awards, and the value of equity and options granted during the year (measured at grant-date for U.S. firms and at calendar year-end for BoardEx firms). We measure Total Compensation for the year 2006 and all monetary amounts are in U.S. dollars. We are able to decompose compensation into two main components: Non-Incentive Pay and Incentive Pay. Non-incentive pay represents fixed values paid independently of the firm's performance, and includes the annual salary plus other compensation. Incentive Pay includes both equity-based incentive plan awards (stock and options awards) and non-equity incentive pay (bonus and other cash payments awarded if company meets a specified accounting or share price target). Appendix B provides detailed data definitions for all compensation-related variables we use in the tests.<sup>13</sup>

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<sup>12</sup> The firms in our sample had a total market capitalization of \$25 trillion and the combined market capitalization of these countries was \$37 trillion in December 2006. The world market capitalization was \$46 trillion in December 2006, so firms in our sample still represent more than half of overall world market capitalization.

<sup>13</sup> Our measure of total pay for US firms is very similar to TDC1 in ExecuComp, which is frequently used in other studies. It is important to note also that we take into account that while the majority of firms have reported under the new FAS123(R) reporting requirements, there are still some firms reporting under the old rules. This is flagged in ExecuComp by OLD\_DATAFMT\_FLAG=1. For these firms the data definitions are: salary = salary; other pay = othann + allothtot; equity incentives pay = rstkgrnt + shrtargxprec + option\_awards\_blk\_value; options = option\_awards\_blk\_value; non-equity incentive pay = bonus + valtag.



## 2.2. Firm Characteristics

We draw stock market and accounting information for the firms in our sample from Datastream. We match the firms in our sample to Datastream using CUSIP codes (for U.S. firms) and ISIN codes (for non-U.S. firms), and in some cases using company names. Our primary regressions include a variety of firm characteristics frequently used in the CEO pay literature, including firm size (sales), performance (return on assets, stock return), valuation (Tobin Q), risk (standard deviation of returns) and liquidity (turnover). We follow the literature on defining these variables (e.g., Core, Holthausen, and Larcker (1999)) and use values for the year prior to the compensation data (i.e., 2005). Table A.2 in the Appendix provides summary statistics per country and Appendix B provides variable definitions. To avoid the influence of outliers, we “winsorize” financial variables at the bottom and top 1% levels.

Given the international dimension of our study, we look at additional determinants of executive pay not commonly used in single-country studies. In particular, we investigate the role of international visibility measures such as the extent of firm operations abroad (ratio of foreign sales to total sales) and whether the firms’ shares are part of the MSCI All-Country world index (widely used as a benchmark by international investors). For non-U.S. firms, another issue we also explore is the effect of cross-listing on a U.S. stock exchange.<sup>14</sup> U.S. cross-listings have been shown to have unique governance benefits (“bonding hypothesis”) and a positive effect on firm valuation (Dojode, Karolyi, and Stulz (2004, 2008)). In addition, we suspect that foreign firms cross-listing in the U.S. are more likely to benchmark compensation practices to those in U.S. firms.

Another potential source of considerable variation across firms and countries is ownership and corporate governance. To bring light to these issues, we obtain the percentage of shares held by firms’ insiders (families, other corporations, managers) from Datastream and held by institutional investors (mutual funds, pension funds, bank trusts) from FactSet/Lionshares. Insider ownership is the percentage of shares in the hands of shareholders who hold 5% or more of the outstanding shares, which encompasses officers, directors (and their immediate families),

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<sup>14</sup> Data on non-U.S. firms listed on U.S. exchanges (Level 2 and 3 ADRs) are obtained from the major depository institutions: Citibank, Bank of New York Mellon, JP Morgan, and Deutsche Bank. We also add cases of non-U.S. firms with ordinary listings on U.S. exchanges (as is the case with several Canadian and Israeli firms).

trusts, another corporation, pension plans and shares held by other individuals (Dahlquist, Pinkowitz, Stulz and Williamson (2003)). Unfortunately, we cannot isolate the stock ownership of top executives. The institutional investors' data have been previously used in Matos and Ferreira (2008a) to study the role of institutions in corporations around the world. Table A.2 shows that insider ownership averages 28% in our sample and institutional ownership represents nearly 50% of shares outstanding, but there is considerable cross-country variation. U.S. corporations display high institutional stock ownership with few shareholders having more than 5% ownership blocks, in stark contrast to corporations of other countries, where there are typically dominant shareholders (as documented by LaPorta, Lopez-de-Silanes, Shleifer (1999)).

In all of our sample companies, decisions over the level and composition of executive compensation are the ultimate responsibility of the board of directors, and the role of strong boards on corporate activities and corporate value has been highlighted in previous studies (Denis and McConnell (2002) and Dahya, Dimitrov, and McConnell (2008)). BoardEx's detailed board-member data allow us to examine how CEO pay varies with board characteristics. For each firm, we have board size (number of executive and supervisor directors), board independence (fraction of independent directors over board size), the diversity of nationalities among board directors (nationality mix), and the average current and past board seats in other quoted corporations held by board members. In addition, we are also able to identify if the CEO is simultaneously the chairperson of the board. As shown in Table A.2, there is considerable variation in board size and composition across countries.

### **2.3. CEO Characteristics**

BoardEx also provides employment histories and personal attributes of the CEOs which may affect the level and composition of compensation. For each top executive, we have resume-like information including: biographical data (name, age, nationality); current board positions; past employment and board positions (with starting and ending dates); educational background (including degrees earned); club memberships; awards, honors, and a variety of other information. To the best of our knowledge, this is the first study to provide such a comprehensive picture of a large international population of top executives. Table A.3 provides average CEO characteristics per country.

Our methodology for constructing the individual characteristics used in our analysis is illustrated in Appendix C using the case of James Dimon, President/CEO at JP Morgan Chase & Co in December 2006. We construct several variables to summarize a CEO's professional experience. First, we measure "CEO time in role", which is the time he has been the top executive in the firm as of December 2006. In the case of James Dimon, this would be since December 2005, where he first took the title of CEO, so his "CEO time in role" equals one year. Second, we create a "CEO external hire dummy" that takes the value one if CEO was externally hired (to account for transition period, we consider a CEO appointment in the first year of employment to be an external hire), and zero otherwise. For Mr. Dimon, this dummy equals zero as he joined the firm before December 2004. Third, we measure the CEO's industry experience. In the example, Mr. Dimon has worked his entire career since 1982 in the financial sector, so his "CEO time in sector" equals 25 years and his "CEO other industry experience dummy" equals zero. Additionally, we measure international professional experience. In the example, the "CEO other country experience dummy" equals zero as this executive has not worked abroad. Finally, we use a dummy variable to indicate if the CEO was top executive of other quoted firms in the past. Mr. Dimon was previously CEO of Bank One (which ultimately was acquired by JP Morgan Chase) and therefore his "CEO has been Past CEO experience dummy" equals one. To make all these classifications, we need to match every quoted firm in the resume to the universe of firms in Datastream. Given this match, we are able to get the country where the firm is located and primary industry where it operates (to simplify industry groups, we use SIC codes and then classify any firm into one of the 12 Fama-French industry groups).<sup>15</sup> For cases where BoardEx had no ISIN code information, we have matched the data using company names.

Director networks are potentially important mechanisms in setting CEO pay (Barnea and Guedj (2008)), and the BoardEx data allow us to measure the extent to which executives are connected in the corporate world. Specifically, we count the number of board positions the CEO has at present and in the past in other publicly listed firms. We then add the board seats in quoted firms in December 2006 ("CEO current board positions") and all seats in the past but not active ("CEO

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<sup>15</sup> We use 12 industry portfolios of Fama-French (Consumer Non-Durables, Consumer Durables, Manufacturing, Energy, Chemicals, Business Equipment, Telecom, Utilities, Shops, Healthcare, Money & Finance, Other). The mapping between 4-digit SIC codes and the 12 industries are available in Ken French's website: [http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/Data\\_Library/det\\_12\\_ind\\_port.html](http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/Data_Library/det_12_ind_port.html).

past board positions”). In our example, Mr. Dimon at JP Morgan CEO has one current board seat and had a total of six in the past. We proxy for CEO’s human capital using his educational background. We summarize the educational data into three variables: “CEO college dummy” that equals one if the CEO has a bachelor’s degree or higher, and zero otherwise; “CEO graduate dummy” that equals one if the CEO has a MBA, Masters, JD or PhD degree, and zero otherwise; and “CEO U.S. MBA dummy” that equals one if the CEO has a MBA degree from a U.S. university. The U.S. MBA dummy is motivated by the rise in business education among U.S. CEOs in recent decades, which may explain the trend in CEO pay (Frydman (2007), Murphy and Zabojsnik 2008).

### **3. The U.S. Pay Premium**

We begin our analysis of the U.S. pay premium by comparing raw compensation values for CEOs of U.S. firms with their counterparts in non-U.S. companies. Panel A of Table 1 shows that the average total compensation for U.S. CEOs in our sample is US\$5.5 millions while for non-U.S. CEOs in our sample it is only US\$2.3 million. Thus, in our sample and without controlling for any firm or industry characteristics, U.S. top executives are paid on average 145% more than non-U.S. top executives.

Panel A of Table 1 also presents sample means of pay variables by region. North America (U.S. and Canada) have the highest total “pay gap” relative to the rest of the world. In addition, the use of incentive-based pay varies substantially across regions. While salaries are generally homogenous across countries, there is a much greater use of equity-based pay in North America. Figure 2 shows, for example, that the average CEO in North America receives 41.4% of his pay in the form of options or stock, nearly double the average in the U.K. (24.3%) and more than triple the 14% average in what we have defined as the “Euro Zone” (all EU countries with the exception of the U.K. and “Nordic” countries – Sweden, Norway, and Denmark).

The U.S. CEO pay premium implied by Table 1 ignores differences in firm size and industry long-documented to be important determinants of the level of executive compensation (Murphy (1999), Hall and Murphy (2003), Gabaix and Landier (2006)). Indeed, Panel B of Table 1 shows that sales for the average U.S. firm are greater than for overseas companies, which suggests that

the 145% U.S. pay premium is overstated. In order to analyze cross-country differences in CEO pay after adjusting for size and industry, we regress the logarithm of Total Compensation on the logarithm of Sales and industry and country dummies. We then take a hypothetical firm with \$1 billion sales (approximately equal to the median sales in our sample) in an “average” industry (formed by multiplying each estimated industry dummy variable by the proportion of our sample firms in each industry) and estimate the average CEO total pay for each country using the estimated coefficients on the 27 country dummy variables.

Figure 1 shows the size- and industry-adjusted pay per country. Countries are sorted in descending order in terms of total estimated pay. U.S. executives come at the top with a CEO of a U.S. company with \$1 billion in sales predicted to make \$2.7 million annually in 2006. This is substantially more than CEOs of similar firms situated in other countries. The highest-paid countries are dominated by Anglo-Saxon nations such as Canada (#2 at \$2.3 million), the U.K. (#4 at \$1.9 million), and Australia (#5 at \$1.9 million). Switzerland (#6 at \$1.8 million) is the first continental European country in this ranking of countries by total pay.<sup>16</sup>

### 3.1. Can Firm Characteristics Explain the U.S. CEO Pay Premium?

Table 2 presents our primary regression tests on the existence of a U.S. CEO pay premium relative to the rest of the world. Naturally, compensation levels are expected to increase with firm size and to vary with firm attributes and across industries. U.S. CEOs may control more resources but also corporate governance mechanisms and ownership structure of U.S. corporations may imply that CEOs are more powerful or have greater authority than non-U.S. CEOs (Thomas (2002)). Therefore, we need to analyze total compensation levels controlling for firm characteristics. To this end, we estimate the following cross-sectional regression:

$$\begin{aligned} \text{Log (Total Compensation}_i) = & \alpha + \beta_1 (\text{U.S. Dummy}) + \beta_2 (\text{Firm Characteristics}_i) \\ & + \text{Industry dummies} + \varepsilon_i \end{aligned} \quad (1)$$

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<sup>16</sup> Disclosure rules in Switzerland require companies to report only the compensation of the single highest-paid executive, who may or may not be the CEO. Thus, our estimate for Switzerland possibly overstates the predicted compensation for a Swiss CEO.

Our main variable of interest is “U.S. Dummy” which evaluates the pay-level differential of U.S.-based executives over those from other countries. The OLS regression includes fixed effects for 12 Fama-French industries and standard errors are clustered at the country level to take into account that residuals may not be independent within a country. Table 2 reports the results of this regression for all firms in our sample (columns (1)-(4)) and separately for U.S. and non-U.S. firms (columns (5) and (6)). The purpose of the last two columns is to analyze if there are different drivers of pay between U.S. and non-U.S. firms.

Column (1) of Table 2 reports results from estimating (1) controlling only for firm size and industry (similar to what we have used to estimate size-adjusted Figure 1 but now using just one country dummy for the U.S.). The  $R^2$  of 0.50 indicates that half of the variance in compensation across CEOs in our 27 countries is explained by size, industry, and whether or not the firm is located in the U.S. The coefficient on the U.S. dummy of 0.6261 implies that predicted CEO pay is 87% ( $= e^{0.6261} - 1$ ) higher in the U.S. than in other countries after controlling for size and industry.

In column (2) of Table 2 we introduce other commonly used factors affecting executive pay and find that pay levels are positively associated with growth opportunities (Tobin Q), and negatively to risk (volatility of stock returns). The relation between firm performance and total pay is mixed depending if we consider return on assets (negative) or stock returns (positive) to measure performance. The U.S. dummy coefficient drops from 0.6261 in column (1) to 0.5167 in column 2 once we control for these firm characteristics, but it is still highly significant and indicates a U.S. pay premium of 68%.

Given the international context of our study, we want to control for the market in which the firm operates. Large multinational firms may hire their top executives from a world managerial labor market. So controlling for international visibility of firms is important for these “benchmarking” effects, namely that the more internationalized firms, the more likely is the use of peer groups that encompass international companies and potentially adopt more “U.S.-style” pay packages. In column (3) of Table 2 we find indeed that percentage of foreign sales is positively correlated with total pay. Besides operating in international product markets, we measure if the firm has access to international capital markets, as proxied by being a member of the MSCI World index (MSCI dummy), as these firms have a broader investor clientele. We find that the MSCI dummy

coefficient is also positive and significant, which is consistent with the view that CEO pay is positively related with the extent of a firm's internationalization.

Another main determinant of pay is the corporate governance arrangements in the firm (e.g., Core, Holthausen, and Larcker (1999)). Column (4) of Table 2 shows that CEO pay levels are related to the ownership structure. We find that institutional ownership is positively associated to CEO total pay. In addition, we find that CEOs are paid less if there are large insider shareholders in the firm. Overall, the result in Table 2 may reflect the actions of controlling shareholders to monitor and limit high levels of CEO pay, or might also reflect founding CEOs who own large amounts of stock and consequently have reduced incentive compensation.

Another dimension of governance is the composition of board of directors. In column (4) of Table 2, we find that larger boards tend to be associated with higher CEO pay, consistent with the idea that larger boards are poorer monitors (Yermack (1996)). Additionally, the results in Table 2 shows that boards composed of directors who have had many board seats in the past – likely current or retired executives themselves – are positively correlated to higher total pay. Finally, higher pay is found in firms with boards of directors that have more diverse nationality backgrounds. This could be executives from other firms that are better paid than managers of the company they seat on. Overall, our findings are consistent with both “international benchmarking” and “busy directors” leading to higher CEO total pay. We also conclude that board composition and ownership structure help to explain why U.S. are paid more than their counterparts.

Having controlled for several firm-level aspects, the U.S. dummy in column (4) of Table 2 falls to 0.37 (in logs) but is still statistically significant and represents a 45% premium of U.S. CEOs relative to non-U.S. CEOs. The R-squared of the regressions increases from 50% in column (1) to 57% in column (4). Thus, firm characteristics other than firm size help to explain total pay and the U.S. pay premium, but not in a dramatic way.

In Figure 3 we estimate, for each country, the pay predicted to be earned by CEO of our hypothetical firm with \$1 billion sales and average firm characteristics in our sample. We adopt the specification in column (4) of Table 2 with the “U.S. dummy” replaced by a set of 27 country dummies. We then use estimated coefficients for size and other firm controls, as well as country

dummies, to estimate average Log(Total Compensation) per country. To allow a comparison with the size-adjusted results in Figure 1 we keep the same ordering of countries. U.S. executives still come out as the best paid but the pay gap is significantly reduced.<sup>17</sup>

To better understand differences in pay setting for U.S. top executives versus their counterparts, we present separate regressions for U.S. and non-U.S. firms in columns (5) and (6) of Table 2, respectively. We observe that the elasticity of CEO pay to firm size is higher in the U.S., and while some characteristics act similarly (MSCI dummy, institutional ownership, board size, board connectedness) others are correlated with pay only outside the U.S. (turnover, board nationality mix). One important difference is that CEO pay is negatively related to insider ownership only outside the U.S. Another issue where the U.S. differs from other countries is the influence on pay of CEOs that hold also the position of chairman of the board. Columns (5) and (6) shows that “CEO-Chairman dummy” impacts positively compensation in the U.S. but negatively overseas.

One other issue that we explore in column (6) of Table 2 is whether CEOs from non-U.S. firms that are cross-listed on U.S. stock exchanges get higher pay. Interestingly, there is strong evidence of a U.S. cross-listing pay premium among non-U.S. firms. The effect is economically significant with a premium of 0.2173 (in logs), which corresponds to 24% additional pay.<sup>18</sup> In section 4 below, we find that CEOs of foreign firms cross-listed in the U.S. receive more of their pay in the form of equity or stock options than CEOs of counterpart firms not cross-listed. We speculate that firms cross-listing in the U.S. are more likely to benchmark compensation practices to those in U.S. firms. Our findings suggest that previous international pay comparisons based only on 20F filings from companies cross-listing in the U.S. (e.g., Bryan, Nash, and Patel (2006)) significantly under-estimate the U.S. pay premium.

### **3.2. Can CEO Characteristics Explain the U.S. CEO Pay Premium?**

U.S. CEOs are not only in charge of larger corporations with different characteristics, but may have a different job market or outside opportunities. To assess whether U.S. executives have any

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<sup>17</sup> Several countries are missing in Figure 3 for lack of data in these regressions.

<sup>18</sup> Omitting the “U.S. cross-listing dummy” from the regression does not change significantly the coefficients on other firm variables



special attributes, we examine international variation in compensation levels controlling also for CEO characteristics. For example, U.S. manager skills may be more transferable and less firm specific than skills of non-U.S. managers. Such general management skills can be particularly valuable in the recent context of technological and regulatory change (Rajan and Zingales (2001)). Broader skill sets may command higher pay in the marketplace (Murphy and Zabojnik (2004, 2008)). We examine factors like education, industry experience, and career paths. If pay differentials are driven by market forces, then characteristics that make U.S. CEOs more valuable may carry a pay premium. To this end, we add CEO characteristics as regressors to regression equation (1):

$$\begin{aligned} \text{Log (Total Compensation}_i) = & \alpha + \beta_1 (\text{U.S. Dummy}) + \beta_2 (\text{Firm Characteristics}_i) \\ & + \beta_3 (\text{CEO Characteristics}_i) + \text{Industry dummies} + \varepsilon_i \quad (2) \end{aligned}$$

Table 3 presents average biographic, professional experience, and educational background of U.S. CEOs versus their foreign peers. U.S. top executives are older and have spent more time in their position, in the current firm and in the same industry than have their counterparts in foreign firms. U.S. CEOs are less likely to have been hired from outside the firm: 37% of U.S. CEOs are appointed from outside compared to 50% outside of the U.S. U.S. CEOs also have higher-level education degrees and only fall short of their counterparts with respect to their foreign experience (i.e. worked outside of their home country).

In Table 4 we reports results of our analysis of the U.S. pay premium including CEO characteristics as explanatory variables. Regressions include the same firm characteristics used in column (4) of Table 2 (coefficients are not shown to conserve space). Column (1) of Table 4 shows that age, gender, and nationality of CEOs are not significantly related to pay levels. Columns (4) and (5) estimate total pay regressions separately for U.S. and non-U.S. firms and show divergence on pay for foreign CEOs: CEOs classified as “foreign” (i.e., nationality different from the corporate headquarters) receive lower pay in the U.S., but marginally higher pay outside the U.S. These pay differentials could be explained by some CEO cross-country migration around the world but we leave it as an open question at this point.

Column (2) of Table 4 introduces professional experience. We find that CEO pay is higher for CEOs who have previous experience overseas and who have had more past board positions in

other publicly-listed firms. The dummy variable for whether CEO has been a top executive in other firms is negatively related to pay levels. These results are weaker when analyzing separately the sub-sample of U.S. firms and non-U.S. in columns (4) and (5). In column (3) we consider the CEO educational background. Only an MBA education in a U.S. school seems to award CEOs with higher compensation as evidenced by the positive and significant “CEO US MBA dummy” coefficient. This result seems to apply only when U.S. CEOs with MBAs are compared against all CEOs, but not when the comparison is done strictly within their own group (see column (4)).

Overall, the “U.S. dummy” remains statistically significant after controlling for CEO characteristics and the magnitude of the coefficient falls only slightly relative to the results in Table 2 that only considers firm characteristics. The estimated coefficient on the U.S. dummy variable of 0.3365 in column (3) of Table 4, which represents a 40% premium for U.S. CEOs (this compares with a 45% premium in column (4) of Table 2). Thus, differences in CEO skills and experience explain a small proportion of the U.S. pay gap. Indeed, given the imperceptible increase in the R-squared from column (4) in Table 2 to column (3) in Table 4 (which simply adds variables to the earlier specification), we find weak evidence that CEO-specific characteristics help to explain CEO pay levels in the U.S. or abroad.<sup>19</sup>

In Figure 4, we conduct a similar hypothetical \$1 billion sales firm exercise, now controlling for both firm and CEO characteristics. The procedure is the same described above for Figures 1 and 3. The results are not substantially different from Figure 3 but the U.S. pay gap is reduced now even further to firms from other countries.

#### **4. Are U.S. Executives Just Paid Differently?**

One salient and well-documented difference between CEO pay in the U.S. and the rest of the world is that U.S. executives receive a larger portion of their pay in the form of stock options, restricted shares, and other performance-based incentives. For example, Table 1 showed that

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<sup>19</sup> When we run a specification with only firm size and CEO individual characteristics (and none of the firm characteristics used in Table 2), we find that the coefficient on the U.S. dummy is still 0.54 (in logs), which corresponds to a U.S. pay premium of 72%.

equity-based pay accounts for over 41% of pay for the average U.S. CEO, but only 20% for the average non-U.S. CEO. And, while nearly 60% of U.S. CEOs receive stock options, less than 20% of non-U.S. CEOs receive options. Although these differences are substantial, the “pay structure” gap between U.S. and foreign CEOs has shrunk significantly in recent years, as more countries have loosened restrictions on equity-based pay and more companies have adopted U.S.-style incentive plans. In this section, we explore whether the U.S. pay premium documented in Section 3 is largely an artifact of cross-country differences in pay structures.

#### 4.1. Is the Story of U.S. CEO Higher Pay The Story of Higher Incentive Pay?

The significant differences in the structure of pay between U.S. and foreign executives have important consequences for our interpretation of the U.S. pay premium. In particular, our measure of total compensation is meant to approximate the expected *opportunity cost* to shareholders of the CEO’s pay package. However, our measure does not approximate the value of the package from the perspective of a risk-averse and undiversified CEO who presumably does not hedge the risk of the package.<sup>20</sup> Thus, for example, while the opportunity cost to shareholders of giving an additional \$100 in base salary is the same as the opportunity cost of giving \$100 in restricted stock, a risk-averse and undiversified CEO will prefer certain salary to risky stock, and will predictably discount the value of the stock. Put differently, all else equal, we expect that CEOs at companies with riskier pay will receive higher expected levels of pay to compensate for the increased risk. To control for differences in the riskiness of pay, we include regressors that capture the riskiness of the pay package.

To test whether accounting for pay structure differences may help in explaining international differences in pay, we estimate the following regression:

$$\begin{aligned} \text{Log (Total Compensation}_i) = & \alpha + \beta_1 (\text{U.S. Dummy}) + \beta_2 (\text{Firm Characteristics}_i) \\ & + \beta_3 (\text{CEO Characteristics}_i) + \beta_4 (\text{Pay Structure}_i) + \text{Industry dummies} + \varepsilon_i \end{aligned} \quad (3)$$

Table 5 presents the results. Column (1) shows that when we add the ratio of Incentive Pay to Total Compensation as regressor, the “U.S. dummy” is substantially reduced to 0.11 and it is no

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<sup>20</sup> For examinations of the distinction between the company’s cost and the executive’s value of equity-based compensation, see Lambert, Larcker and Verrecchia (1991), Meulbroek (2001), and Hall and Murphy (2002).

longer statistically significant at the 5% level. The R-squared also goes up substantially relative to those in Table 4.<sup>21</sup> Indeed, differences in pay structures appear to be, at least, as important as firm and CEO characteristics, in explaining the observed U.S. pay premium. In unreported regressions, we add the fraction of pay linked to performance to our base regression in column (1) of Table 2 and find that the U.S. dummy coefficient reduces from 0.6261 to 0.2389. Thus, the implied U.S. pay premium reduces from 87% to 27%, but it is still significant at the 5% level and the R-squared increases from 50% to 67%.

In column (2) of Table 5, we differentiate between equity-based pay (executive ownership of common stock and of stock options) and non-equity incentives (cash payment plans based on accounting or share price targets). We expect that CEO pay will be positively related to both of these variables, and expect a higher coefficient on the equity-pay variable since equity pay is traditionally riskier than bonuses based on accounting returns. Consistent with our prediction, we find that while both variables are associated with higher CEO compensation, the coefficient on equity-based pay is higher than the coefficient on non-equity-based pay. In column (3) we see that the use of option plans has a positive effect in total pay. In column (4) and (5) we find support for our findings on incentive pay for both U.S. and non-U.S. firms.

In Figure 5, we re-calculate the hypothetical \$1 billion sales firm exercise, now controlling additionally for pay structure. The specification is similar to that of column (1) of Table 5 but replacing the U.S. dummy with 27 dummies for each country in our sample. U.S. CEOs now cease to be at the top in the world in terms of CEO total pay. Indeed, having controlled for differences in pay structures, the U.S. pay gap seems to have largely disappeared.

Figure 6 summarizes the progress we made in explaining the U.S. CEO pay gap. We start with the original ratio of 145% between average Total Compensation for U.S. and Non-U.S. CEOs. The U.S. pay gap drops to 87% when we size-adjust (and industry-adjust) pay levels and further drops to 45% when we take into account other firm characteristics differences (in particular in firm's internationalization, ownership, and corporate governance). In contrast, CEO characteristics seem to add little to explain the gap. Pay structure, and in particular incentive-

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<sup>21</sup> Specifications in Table 5 include all firm and CEO characteristics as in column (3) of Table 4.

oriented pay, seems to be a crucial determinant of the U.S. pay gap and pushes the gap down to just 12%, which is statistically insignificant at the 5% level.

So far we have focused on explaining the U.S. pay premium and it is tempting to declare victory aboard an aircraft carrier sporting a “Mission Accomplished” banner. However, we recognize that our result that the U.S. pay premium is driven by differences in pay structures does not “explain” the premium, but merely shifts the question in an interesting direction: why do U.S. CEOs receive more stock, options, and other performance-based pay than do their foreign counterparts, even after controlling for firm, industry, and CEO characteristics? Before addressing this new question directly (but speculatively), we first consider a variety of robustness checks and sensitivity analyses for our results.

#### **4.2. Robustness Check: Propensity-Score Matching**

In a study different from but closely analogous to ours, Aggarwal, Erel, Stulz, and Williamson (2008) analyze the “governance gap” between U.S. and non-U.S. firms. To evaluate the governance a foreign firm would be predicted to have if it were in the U.S., Aggarwal, et. al. match each foreign firm to a U.S. firm based on a “propensity-score” estimated using a probit regression and defined as the probability that a firm with given characteristics is a foreign firm.

Similarly, our objective is to measure the “pay gap” between U.S. and non-U.S. firms. We therefore match each non-U.S. firm to a U.S. firm based on the size and industry dummies (the same variables as in column (1) of Table 2). Non-U.S. firms are matched to U.S. firms based on a probit model where the dependent variable is a dummy that takes the value of one if a firm is non- U.S., and zero otherwise. Column (1) of Table 6 shows that the average difference in Total compensation between U.S. firms and matched non-U.S. firms is 111% (a 0.7484 difference in logs). Interestingly, Canadian executives have an insignificant gap relative to U.S. executives.

When we also include firm and CEO characteristics in the probit regression, the U.S. pay gap becomes statistically insignificant (see column (2) of Table 6) as well as when we control for pay structure (column (3) of Table 6). This non-parametric test result is consistent with the regression results of Table 5.

### 4.3. Other Robustness Checks

In Table 7 we conduct several other robustness checks of our main results in Table 5. First, in columns (1) and (2) of Table 7 we use firms' Total Assets and Market Capitalization as alternative measures for firm size and find that "U.S. dummy" is still statistically insignificant. A second concern is that the distribution function of executive pay may be heavily skewed, so we use least-absolute deviation regression (median regression) instead of least squares. Median regressions are more robust to the presence of outliers. In column (3) of Table 7 we find that the "U.S. dummy" is still insignificant. In unreported regressions, we estimate regressions for the 1<sup>st</sup> quartile (25<sup>th</sup> percentile) and the 3<sup>rd</sup> quartile (75<sup>th</sup> percentile) and find our results are also robust.

Another concern we address is that we use ExecuComp data for U.S. CEO pay and Boardex data for non-U.S. CEO pay. As we described in the data section, the BoardEx methodology results in total compensation values that are generally higher than those in ExecuComp, and thus our use of ExecuComp data for U.S. pay (1) biases our results *against* finding a U.S. premium, and (2) biases our results *for* explaining the U.S. premium. In column (4) of Table 7 we find that the "U.S. dummy" is only marginally significant, albeit the coefficient on the variable being somewhat bigger than in column (1) of Table 5. The number of observations in this specification increases as more firms are covered in Boardex than in ExecuComp.

The last robustness check we perform in Table 7 is to compare CEO compensation at constant purchasing power across countries. We take the purchasing power parity (PPP) adjustment factor in 2006 from the World Development Index (WDI). Most countries in our sample have higher costs of living than the U.S. in 2006, in particular in Nordic countries (e.g. the cost of living in Denmark is 44% higher than in the U.S.), in the U.K. (20% higher), and in all continental Europe countries (the only exception is Spain with a 5% lower cost of living than in the U.S.). We divide each CEO's dollar total compensation by the PPP factor. We find that adjusting for purchasing power actually increases the U.S. pay premium from 12% (in column (1) of Table 5) to 28% (in column (5) of Table 7).

#### 4.4. What Determines CEO Pay Structure, Rather Than Pay Levels?

So far we have documented that U.S. executives are paid more because firms are larger and different, but also because of a greater use of pay-for-performance. Thus, the next logical question is what explains the greater use of incentive pay in the U.S.?

Table 8 offers a preliminary exploration of this issue. We regress incentive pay variables on the same set of variables used to explain total pay, to see if there are potentially interesting correlations in the data. As pay ratios are naturally bounded between 0 and 1 we use Tobit specifications in these tests that account for the censoring in the dependent variable.

The “U.S. dummy” is positive and significant in all incentive pay-ratio regressions, confirming the more intense use of incentive compensation for CEOs in the U.S., even after controlling for firm, industry, governance, and CEO characteristics. Equity-based incentives seem to be driven by different forces than non-equity-based incentives, but effects may be somewhat mechanical given our findings on equity-incentive pay if there is little variation in non-incentive pay across countries. Insider ownership is negatively associated to the use of equity incentive pay, as controlling shareholders may not want to give up control of their firms and will resist giving equity to professional managers. In contrast, we find that institutional ownership is positively associated with incentive pay, consistent with Hartzell and Starks’ (2003) finding that concentrated institutional shareholdings are positively correlated with pay-for-performance in the U.S. Stock liquidity, MSCI membership and board connectedness are also positively associated with the use of equity-based incentives. Return on assets, risk, and CEO age are negatively related to the use of equity incentives. Column (4) of Table 8 shows that similar findings apply to the use of options. Results in column (3) are often different for non-equity incentive pay.

Columns (1)-(4) of Table 8 include proxies for most of the determinants of equity-based incentives suggested by agency theory. But, as documented by Yermack (1995), agency-theoretic variables have surprising little explanatory value in predicting the use of equity-based compensation in publicly traded firms. Conyon and Murphy (2000) consider (and ultimately reject) a variety of agency-theoretic explanations for the relative importance of equity-based pay in the U.S. vs. the U.K., including differences in risk aversion (higher risk aversion would lead to lower dependence on equity-based pay), the “noise” in stock-price-based performance measures

(higher noise would lead to less equity-based pay), or the marginal productivities of CEOs (higher marginal products would lead to more equity-based pay). To our knowledge, there is no reason to expect that U.S. CEOs are less risk-averse than their foreign counterparts, that the U.S. stock markets are systematically more informative than the other major international stock markets, or that U.S. CEOs have inherently superior ability or higher marginal productivity. However, while there is no reason to suspect that U.S. CEOs are more able or more productive, U.S. CEOs *may* have more decision rights and influence over corporate results than do their non-U.S. counterparts. Unfortunately, traditional agency theory provides no guidance on why production functions or hierarchical structures should vary across international boundaries.

Finally, Columns (5) and (6) of Table 8 explore U.S. vs. non-U.S. differences in the determinants of equity-based CEO pay. We find, for example, significant U.S. vs. non-U.S. differences in the relations between CEO incentive pay and leverage, foreign sales, the fraction of independent directors, the CEOs current board positions, and the value of a graduate degree (all positive in the U.S. and negative elsewhere).<sup>22</sup> Also, insider ownership and the CEO-chairman dummy are insignificantly related to equity-based pay in the U.S. but negatively related elsewhere. These results suggest that the mechanism underlying the use of incentive compensation in the U.S. versus other countries is significantly different and not easily explained by standard economic determinants.

## **5. Explaining What is Left: Country-Level Determinants of CEO Pay?**

The results in Table 8 indicate that the difference in the use of equity-based pay for U.S. CEOs is not explained by firm size and other firm characteristics, industry, corporate governance, and CEO-specific characteristics. These results suggest that the structure of CEO pay may depend on country-specific factors not yet incorporated into our models. Thus, as a last step in our analysis, we examine the role of country-level factors.

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<sup>22</sup> Although the point estimates are not always “significantly positive” for the U.S. and “significant negative” for other countries, the difference is statistically significant.



Table 9 examines the country-level determinants of CEO compensation levels and structure. Columns (1) and (2) show results for OLS cross-sectional regressions of the log CEO total compensation and include firm and CEO characteristics (as in Tables 4 and 5) as well as country characteristics. Columns (3) and (4) then estimate Tobit regressions for incentive and equity-incentive pay ratios as in Table 8 (columns (1) and (2)).

The first determinant we examine is the general level of income per capita in a country. We find some evidence that CEOs from richer countries tend to earn higher compensation levels and their compensation packages make greater use of equity-based incentives. We also look at whether CEOs from more stock-market-oriented economies (as proxied by the ratio of market capitalization to GDP) get larger equity incentives, but do not find support for this idea.

We then turn our attention to laws and regulations in place. We find that CEOs in countries with a common-law legal origin receive more equity-based incentive pay. Countries like the U.K., Canada and Australia have similar country-level governance structures to those in place in the U.S. and this seems to be related to greater use of stock-based incentive schemes. We also look also at an index of enforcement of laws against abuse by directors and key officers (La Porta, Lopez-de-Silanes, and Shleifer (2006)) and find this is negatively associated with use of incentive pay.

We also examine other country institutional factors. We look at relative labor union power and protection of workers during disputes. Continental Europe countries like France and Germany score high in these indices, contrary to the U.S. We find a negative relation between this variable and total pay, but no such relation for the use of incentive pay. Second, we look at the effect of high marginal tax rates for high-income individuals (notoriously high in Nordic countries) and find some evidence that high personal taxes are associated with lower use of equity-based incentives.

## **6. Conclusion**

Although anecdotal or small-sample evidence has often concluded that U.S. executives are paid more than their foreign counterparts, comprehensive analyses of cross-country differences in

CEO pay have been hindered by the lack of detailed individual-level data on executive salaries, bonuses, and equity-based compensation. Recent and sweeping changes in international disclosure rules have provided the necessary comparison data, sometimes available in compiled data sets but often only available in obscure country- or company-specific corporate filings. In this paper, we exploit all sources of available data and were ultimately able to obtain detailed fiscal-year 2006 compensation information for CEOs in 3,304 firms across 27 countries.

We find that top executives in the U.S. are paid more than their counterparts in foreign companies, even after controlling for a wide spectrum of firm, industry, corporate governance, and CEO characteristics. Moreover, we find that after controlling for firm size and other firm characteristics, most of the cross-country difference in pay levels is explained by differences in the structure of pay: CEOs are paid more in firms with a higher percentage of incentive pay (particularly equity-based pay), plausibly reflecting pay premiums demanded by risk-averse and undiversified executives who would prefer a dollar in base salary to a dollar in performance-based compensation. CEOs in the U.S. receive a much larger fraction of their pay through equity-based pay (primarily stock options and restricted shares), thus “explaining” the observed U.S. pay premium.

However, the fact that the observed U.S. pay premium is “explained” by the fact that U.S. CEOs have different pay structures merely shifts the question: Why do U.S. executives receive more incentive compensation (and particularly more equity-based compensation)? We cannot identify any firm-level agency-theoretic or economic determinants of differences that could explain these cross-country differences, suggesting that the differences are largely country-specific and related to cultural, tax, accounting, political, and path-dependent institutional histories. To the extent that such differences converge in a world economy, we predict that compensation structures and pay levels will also converge.

We conclude with an analogy and cautionary tale. In a well-circulated paper in the late 1980s, French and Poterba (1991) famously asked “Are Japanese Stock Prices Too High?”, citing the average increase in the Nikkei Index of nearly 30% annually between 1984 and 1989. Between the time the paper was submitted (March 1990) and published (October 1991), the Nikkei average had fallen by nearly 30% and the published version was re-titled at the last minute as: “*Were* Japanese Stock Prices Too High?” (emphasis added).

Taking lessons from French and Poterba (1991), we are hesitant to declare that the U.S. will necessarily continue its dominance in the executive-pay arena, thus avoiding an awkward title of “*Were U.S. Top Executives Paid More?*”. First, as we have shown, the U.S. premium primarily reflects important cross-sectional differences in the use of equity-based pay. Second, there is substantial evidence of a slow-but-steady convergence in international pay practices, as the rest of the world emulates U.S.-style pay packages. As recently as 1984, for example, Towers Perrin reported that equity-based compensation was non-trivial only in Canada, France, the U.K. and the U.S. (Towers Perrin (1988), Abowd and Bognanno (1995), Conyon and Murphy (2002)). Indeed, using stock options to compensate executives was prohibited in Japan until 1997 and in Germany until 1998.<sup>23</sup> As we have shown in this paper (recall Table A.1), by 2006 equity-based pay represents at least 8% of average pay for CEOs in 24 of our 27 sample countries (with the exceptions being Sweden, Thailand, and Spain), and incentive pay (equity and non-equity) represents at least 20% of pay in all of our sample countries. The U.S. remains the unquestioned leader in incentive pay (with their near-north neighbor Canada close behind), but the world managerial labor market is undeniably converging, and we predict that pay levels will be likewise converging.

As further evidence of a global convergence, the historical U.S. monopoly on the controversy surrounding CEO compensation has also disappeared, representing (interestingly) both a cause and effect of the expanded international disclosure rules regarding top-executive compensation. Most recently, in the 2008 financial meltdown and consequent bailout, several countries in addition to the U.S. have imposed implicit or explicit restrictions on executive compensation, especially for executives in bailed-out firms.<sup>24</sup> For example, CEOs (and other top executives) from bailed-out firms in the U.S. were prohibited from receiving termination-related severance payments or incentive compensation that provided incentives to take “unnecessary and excessive risks,” and the deduction firms could take as a compensation expense was capped at \$500,000. In France, Germany, and the Netherlands executives from failed firms were prohibited (or limited) from receiving severance payments upon termination. Australian and U.K. CEOs of failing

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<sup>23</sup> Peter Landers, “Sharing the Wealth: Tokyo to Legalize Stock Options,” *Far Eastern Economic Review* (29 May 1997); Sven Tishendorf, “Planning for Stock Options in Germany,” *International Tax Review* (1 December 1998).

<sup>24</sup> The details for non-U.S. firms are summarized in JoAnn S. Lublin and Mike Esterl, “Executive Pay Curbs Go Global,” *Wall Street Journal* (21 October 2008), A1.

institutions were barred from pay practices that might promote excessive risks, and Sweden and Germany imposed explicit limits on the level of executive pay.

Finally, many critics of CEO pay (notably Bebchuk and Fried (2004)) have argued that executive pay is excessive because there is no real market for executives, who in turn can effectively set their own pay levels. Indeed, Bebchuk, Fried and Walker (2002) cite the relatively high pay of U.S. CEOs relative to their foreign counterparts as evidence for their assertion. In contrast, our evidence that pay practices are converging – especially among firms with operation abroad, firms with access to international capital markets, and firms cross-listed on U.S. exchanges – suggests an increasingly important and increasingly international managerial labor market for CEOs.

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THE PAY DIVIDE: (WHY) ARE U.S. TOP EXECUTIVES PAID MORE?

**Table 1**  
**Sample Means of Level and Composition of CEO Compensation and Firm Characteristics**

Panel A presents sample means of level and composition of the level and composition of CEO compensation and firm characteristics as of 2006. Refer to Appendix B for variables definition. The sample consists of 1,271 U.S. firms and 2,033 non-U.S. firms.

|                                   | U.S.      | Non-U.S.  | Difference<br>t-statistic | North<br>America | U.K.      | Euro<br>Zone | Nordic    | Oceania   | Asia      |
|-----------------------------------|-----------|-----------|---------------------------|------------------|-----------|--------------|-----------|-----------|-----------|
| Panel A: Compensation             |           |           |                           |                  |           |              |           |           |           |
| Total compensation                | 5,529,920 | 2,255,760 | 15.49                     | 5,580,220        | 1,742,719 | 2,720,104    | 1,478,959 | 2,759,325 | 1,673,081 |
| Salary                            | 780,292   | 668,587   | 5.22                      | 788,791          | 516,647   | 840,647      | 657,181   | 1,148,918 | 453,867   |
| Other pay                         | 315,346   | 140,930   | 2.56                      | 298,176          | 107,985   | 199,560      | 305,692   | 1,693     | 4,932     |
| Non-incentive pay                 | 1,095,638 | 809,517   | 3.91                      | 1,086,967        | 624,631   | 1,040,207    | 962,873   | 1,150,612 | 458,799   |
| Options                           | 1,481,021 | 231,377   | 13.39                     | 1,454,902        | 52,017    | 443,728      | 113,444   | 211,877   | 286,576   |
| Equity incentive pay              | 3,130,290 | 898,327   | 14.54                     | 3,170,796        | 770,329   | 969,271      | 162,194   | 522,856   | 456,158   |
| Non-equity incentive pay          | 1,303,993 | 547,916   | 12.27                     | 1,322,458        | 347,759   | 710,626      | 353,891   | 1,085,858 | 758,124   |
| Incentive pay                     | 4,434,283 | 1,446,243 | 16.41                     | 4,493,253        | 1,118,088 | 1,679,897    | 516,086   | 1,608,714 | 1,214,282 |
| Non-incentive pay/Total           | 0.342     | 0.594     | -24.92                    | 0.338            | 0.609     | 0.604        | 0.731     | 0.511     | 0.491     |
| Options/Total                     | 0.201     | 0.064     | 18.42                     | 0.201            | 0.050     | 0.066        | 0.061     | 0.066     | 0.062     |
| Options dummy                     | 0.570     | 0.183     | 25.04                     | 0.566            | 0.164     | 0.162        | 0.130     | 0.400     | 0.110     |
| Equity incentive pay/Total        | 0.414     | 0.203     | 21.22                     | 0.416            | 0.243     | 0.140        | 0.080     | 0.171     | 0.144     |
| Non-equity incentive pay/Total    | 0.244     | 0.203     | 5.89                      | 0.246            | 0.148     | 0.256        | 0.188     | 0.318     | 0.365     |
| Incentive pay/Total               | 0.658     | 0.406     | 24.92                     | 0.662            | 0.391     | 0.396        | 0.269     | 0.489     | 0.509     |
| Panel B: Firm Characteristics     |           |           |                           |                  |           |              |           |           |           |
| Sales (\$ billion)                | 6.161     | 4.261     | 3.39                      | 6.190            | 2.191     | 8.227        | 2.528     | 3.543     | 3.989     |
| Leverage                          | 0.208     | 0.202     | 0.87                      | 0.208            | 0.176     | 0.245        | 0.209     | 0.267     | 0.202     |
| Tobin Q                           | 2.088     | 1.977     | 2.07                      | 2.083            | 2.063     | 1.720        | 2.255     | 2.116     | 1.820     |
| Return on assets                  | 0.061     | 0.027     | 6.37                      | 0.062            | -0.007    | 0.052        | 0.065     | 0.077     | 0.087     |
| Stock return volatility           | 0.296     | 0.311     | -2.24                     | 0.294            | 0.355     | 0.264        | 0.325     | 0.229     | 0.237     |
| Stock return                      | 0.110     | 0.277     | -10.24                    | 0.122            | 0.170     | 0.353        | 0.601     | 0.261     | 0.223     |
| Turnover                          | 2.209     | 0.820     | 33.09                     | 2.129            | 0.883     | 0.683        | 1.053     | 0.788     | 0.670     |
| MSCI dummy                        | 0.353     | 0.292     | 3.71                      | 0.380            | 0.128     | 0.357        | 0.314     | 0.773     | 0.699     |
| U.S. cross-listing dummy          | n.a.      | 0.105     | n.a.                      | n.a.             | 0.050     | 0.138        | 0.071     | 0.133     | 0.082     |
| Foreign sales                     | 0.218     | 0.320     | -9.19                     | 0.224            | 0.266     | 0.396        | 0.425     | 0.286     | 0.244     |
| Insider ownership                 | 0.161     | 0.348     | -23.43                    | 0.160            | 0.315     | 0.409        | 0.325     | 0.348     | 0.568     |
| Institutional ownership           | 0.853     | 0.245     | 79.69                     | 0.840            | 0.242     | 0.226        | 0.290     | 0.121     | 0.146     |
| Domestic institutional ownership  | 0.818     | 0.144     | 96.42                     | 0.793            | 0.193     | 0.068        | 0.183     | 0.020     | 0.016     |
| Foreign institutional ownership   | 0.063     | 0.102     | -10.01                    | 0.074            | 0.049     | 0.159        | 0.107     | 0.101     | 0.129     |
| Board size                        | 9.513     | 9.286     | 1.57                      | 9.633            | 7.111     | 11.957       | 9.473     | 8.455     | 14.389    |
| Fraction of independent directors | 0.837     | 0.523     | 48.20                     | 0.832            | 0.457     | 0.536        | 0.674     | 0.643     | 0.643     |
| CEO-chairman dummy                | 0.596     | 0.154     | 29.17                     | 0.578            | 0.071     | 0.368        | 0.018     | 0.000     | 0.100     |
| Nationality mix                   | 0.055     | 0.154     | -14.65                    | 0.064            | 0.119     | 0.190        | 0.144     | 0.188     | 0.210     |
| Past board positions              | 1.183     | 1.097     | 4.53                      | 1.183            | 1.150     | 1.032        | 1.040     | 0.953     | 0.300     |
| Current board positions           | 1.975     | 1.835     | 6.01                      | 1.985            | 1.739     | 1.927        | 1.950     | 2.060     | 1.810     |

**Table 2**  
**Regression of CEO Total Compensation on Firm Characteristics**

Estimates of OLS cross-sectional regressions of the log CEO total compensation as of 2006 are shown. Refer to Appendix B for variables definition. The sample consists of 1,271 U.S. firms and 2,033 non-U.S. firms. Robust t-statistics adjusted for country-level clustering are in parentheses. Coefficients significant at the 5% level are in boldface.

|                                      | (1)                      | (2)                       | (3)                       | (4)                       | (5)                     | (6)                       |
|--------------------------------------|--------------------------|---------------------------|---------------------------|---------------------------|-------------------------|---------------------------|
|                                      | All firms                |                           |                           |                           | U.S.<br>firms           | Non-U.S.<br>firms         |
| U.S. dummy                           | 0.6261<br><b>(5.25)</b>  | 0.5167<br><b>(3.76)</b>   | 0.6447<br><b>(4.15)</b>   | 0.3712<br><b>(3.41)</b>   |                         |                           |
| U.S. cross-listing dummy             |                          |                           |                           |                           |                         | 0.2173<br><b>(2.85)</b>   |
| Sales (log)                          | 0.3199<br><b>(15.54)</b> | 0.3186<br><b>(12.28)</b>  | 0.2494<br><b>(13.49)</b>  | 0.1853<br><b>(7.75)</b>   | 0.2495<br><b>(5.78)</b> | 0.1680<br><b>(6.67)</b>   |
| Leverage                             |                          | 0.1361<br>(0.61)          | 0.1258<br>(0.59)          | 0.1623<br>(1.08)          | 0.4475<br><b>(3.13)</b> | -0.0635<br>(-0.62)        |
| Tobin Q                              |                          | 0.0444<br><b>(4.09)</b>   | 0.0130<br>(0.79)          | 0.0128<br>(0.72)          | -0.0048<br>(-0.14)      | 0.0316<br>(1.72)          |
| Return on assets                     |                          | -0.6390<br><b>(-7.25)</b> | -0.5317<br><b>(-5.53)</b> | -0.1548<br>(-1.22)        | -0.2360<br>(-0.60)      | -0.0780<br>(-0.38)        |
| Stock return volatility              |                          | -0.5418<br><b>(-4.66)</b> | -0.4868<br><b>(-3.51)</b> | -0.3086<br><b>(-2.60)</b> | -0.3147<br>(-1.42)      | -0.4094<br><b>(-2.65)</b> |
| Stock return                         |                          | 0.0923<br>(1.76)          | 0.1094<br><b>(2.33)</b>   | 0.1098<br><b>(2.00)</b>   | 0.0631<br>(0.50)        | 0.1745<br><b>(3.84)</b>   |
| Turnover                             |                          | 0.0925<br>(1.52)          | 0.0850<br>(1.69)          | 0.0472<br>(1.85)          | 0.0302<br>(0.85)        | 0.1570<br><b>(3.99)</b>   |
| MSCI dummy                           |                          |                           | 0.4545<br><b>(4.98)</b>   | 0.3931<br><b>(5.47)</b>   | 0.3910<br><b>(5.27)</b> | 0.2343<br><b>(2.43)</b>   |
| Foreign sales                        |                          |                           | 0.2505<br><b>(3.99)</b>   | 0.1048<br><b>(1.99)</b>   | 0.2672<br><b>(2.89)</b> | 0.0578<br>(0.88)          |
| Insider ownership                    |                          |                           |                           | -0.5509<br><b>(-4.26)</b> | -0.0542<br>(-0.32)      | -0.5196<br><b>(-7.13)</b> |
| Institutional ownership              |                          |                           |                           | 0.3070<br><b>(4.94)</b>   | 0.2539<br><b>(2.00)</b> | 0.3569<br><b>(3.04)</b>   |
| Board size                           |                          |                           |                           | 0.0261<br><b>(4.16)</b>   | 0.0292<br>(1.95)        | 0.0331<br><b>(4.43)</b>   |
| Fraction of independent directors    |                          |                           |                           | 0.1111<br>(1.47)          | 0.1977<br>(0.87)        | 0.0400<br>(0.35)          |
| CEO-chairman dummy                   |                          |                           |                           | 0.0288<br>(0.28)          | 0.1800<br><b>(2.95)</b> | -0.1852<br><b>(-2.64)</b> |
| Nationality mix                      |                          |                           |                           | 0.4316<br><b>(4.16)</b>   | 0.1859<br>(0.82)        | 0.4998<br><b>(4.41)</b>   |
| Past board positions                 |                          |                           |                           | 0.1323<br><b>(3.84)</b>   | 0.0905<br><b>(2.45)</b> | 0.1407<br><b>(2.43)</b>   |
| Current board positions              |                          |                           |                           | 0.0715<br>(1.60)          | 0.0697<br>(1.40)        | 0.0211<br>(0.37)          |
| Industry dummies                     | Yes                      | Yes                       | Yes                       | Yes                       | Yes                     | Yes                       |
| Standard errors clustered by country | Yes                      | Yes                       | Yes                       | Yes                       | No                      | Yes                       |
| Observations                         | 3,304                    | 3,104                     | 3,104                     | 2,599                     | 1,144                   | 1,455                     |
| R-squared                            | 0.50                     | 0.51                      | 0.52                      | 0.57                      | 0.41                    | 0.58                      |

**Table 3**  
**Sample Means of CEO Characteristics**

This presents sample means of level and composition of the level and composition of CEO compensation and firm characteristics as of 2006. Refer to Appendix B for variables definition. The sample consists of 1,271 U.S. firms and 2,033 non-U.S. firms.

|                                     | U.S.   | Non-U.S. | Difference<br>t-statistic | North<br>America | U.K.   | Euro<br>Zone | Nordic | Oceania | Asia   |
|-------------------------------------|--------|----------|---------------------------|------------------|--------|--------------|--------|---------|--------|
| CEO age                             | 55.515 | 52.276   | 11.48                     | 55.471           | 51.263 | 54.306       | 50.091 | 54.000  | 55.679 |
| CEO male dummy                      | 0.978  | 0.975    | 0.47                      | 0.978            | 0.974  | 0.975        | 0.988  | 0.973   | 0.986  |
| CEO foreign dummy                   | 0.017  | 0.085    | -8.12                     | 0.018            | 0.083  | 0.093        | 0.059  | 0.080   | 0.082  |
| CEO external hire dummy             | 0.370  | 0.498    | -7.28                     | 0.372            | 0.544  | 0.472        | 0.509  | 0.520   | 0.164  |
| CEO time in role                    | 8.537  | 6.908    | 6.66                      | 8.541            | 6.652  | 7.213        | 6.087  | 6.545   | 9.031  |
| CEO time in firm                    | 16.535 | 11.910   | 12.35                     | 16.512           | 11.155 | 12.694       | 10.530 | 10.780  | 19.609 |
| CEO time in sector                  | 20.438 | 14.457   | 14.88                     | 20.471           | 13.849 | 15.493       | 12.104 | 13.960  | 16.339 |
| CEO other industry experience dummy | 0.329  | 0.347    | -1.08                     | 0.330            | 0.337  | 0.361        | 0.349  | 0.414   | 0.250  |
| CEO other country experience dummy  | 0.123  | 0.317    | -12.90                    | 0.141            | 0.292  | 0.316        | 0.278  | 0.514   | 0.350  |
| Past CEO experience dummy           | 0.178  | 0.198    | -1.44                     | 0.187            | 0.153  | 0.251        | 0.195  | 0.329   | 0.150  |
| CEO past board positions            | 0.705  | 0.790    | -1.56                     | 0.712            | 0.676  | 1.024        | 0.776  | 0.610   | 0.111  |
| CEO current board positions         | 1.660  | 1.569    | 2.25                      | 1.668            | 1.327  | 2.009        | 1.663  | 1.390   | 1.222  |
| CEO college dummy                   | 0.861  | 0.624    | 15.18                     | 0.857            | 0.554  | 0.724        | 0.828  | 0.640   | 0.178  |
| CEO graduate dummy                  | 0.521  | 0.321    | 11.67                     | 0.512            | 0.278  | 0.346        | 0.550  | 0.307   | 0.110  |
| CEO U.S. MBA dummy                  | 0.344  | 0.040    | 25.51                     | 0.331            | 0.030  | 0.050        | 0.024  | 0.080   | 0.014  |

**Table 4**  
**Regression of CEO Total Compensation on Firm and CEO Characteristics**

Estimates of OLS cross-sectional regressions of the log CEO total compensation as of 2006 are shown. Regressions include the firm control variables (coefficients not shown) used in column (4) of Table 2. Refer to Appendix B for variables definition. The sample consists of 1,271 U.S. firms and 2,033 non-U.S. firms. Robust t-statistics adjusted for country-level clustering are in parentheses. Coefficients significant at the 5% level are in boldface.

|                                      | (1)                       | (2)                       | (3)                       | (4)                       | (5)                       |
|--------------------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
|                                      |                           | All firms                 |                           | U.S. firms                | Non-U.S. firms            |
| U.S. dummy                           | 0.3608<br><b>(3.44)</b>   | 0.3787<br><b>(3.71)</b>   | 0.3365<br><b>(3.06)</b>   |                           |                           |
| Sales (log)                          | 0.1970<br><b>(9.00)</b>   | 0.1985<br><b>(8.85)</b>   | 0.1970<br><b>(9.02)</b>   | 0.2479<br><b>(5.94)</b>   | 0.1817<br><b>(8.48)</b>   |
| U.S. cross-listing dummy             |                           |                           |                           |                           | 0.2395<br><b>(2.91)</b>   |
| CEO age                              | -0.0040<br><b>(-1.73)</b> | -0.0036<br><b>(-0.80)</b> | -0.0028<br><b>(-0.57)</b> | 0.0047<br><b>(0.78)</b>   | -0.0062<br><b>(-1.54)</b> |
| CEO male dummy                       | 0.0641<br><b>(0.98)</b>   | 0.0733<br><b>(1.12)</b>   | 0.0777<br><b>(1.15)</b>   | 0.1706<br><b>(1.22)</b>   | 0.1020<br><b>(0.89)</b>   |
| CEO foreign dummy                    | 0.0773<br><b>(0.82)</b>   | 0.0388<br><b>(0.36)</b>   | 0.0334<br><b>(0.31)</b>   | -0.3534<br><b>(-2.02)</b> | 0.1473<br><b>(1.67)</b>   |
| CEO external hire dummy              |                           | 0.0139<br><b>(0.35)</b>   | 0.0094<br><b>(0.24)</b>   | 0.0436<br><b>(0.69)</b>   | -0.0388<br><b>(-0.70)</b> |
| CEO time in role                     |                           | -0.0018<br><b>(-0.24)</b> | -0.0017<br><b>(-0.24)</b> | -0.0129<br><b>(-1.37)</b> | 0.0101<br><b>(1.94)</b>   |
| CEO time in firm                     |                           | -0.0037<br><b>(-1.66)</b> | -0.0032<br><b>(-1.35)</b> | -0.0023<br><b>(-0.56)</b> | -0.0053<br><b>(-1.29)</b> |
| CEO time in sector                   |                           | 0.0032<br><b>(1.08)</b>   | 0.0026<br><b>(0.83)</b>   | -0.0003<br><b>(-0.09)</b> | 0.0033<br><b>(0.65)</b>   |
| CEO other industry experience dummy  |                           | 0.0303<br><b>(0.85)</b>   | 0.0195<br><b>(0.49)</b>   | -0.0457<br><b>(-0.57)</b> | 0.0630<br><b>(1.44)</b>   |
| CEO other country experience dummy   |                           | 0.0971<br><b>(3.45)</b>   | 0.1017<br><b>(3.38)</b>   | 0.1308<br><b>(1.38)</b>   | 0.0788<br><b>(1.67)</b>   |
| Past CEO experience dummy            |                           | -0.1264<br><b>(-2.39)</b> | -0.1221<br><b>(-2.39)</b> | -0.1707<br><b>(-1.44)</b> | -0.0787<br><b>(-1.16)</b> |
| CEO past board positions             |                           | 0.0295<br><b>(3.25)</b>   | 0.0285<br><b>(3.49)</b>   | 0.0378<br><b>(1.60)</b>   | 0.0246<br><b>(1.82)</b>   |
| CEO current board positions          |                           | -0.0211<br><b>(-1.02)</b> | -0.0232<br><b>(-1.18)</b> | 0.0335<br><b>(1.02)</b>   | -0.0313<br><b>(-1.62)</b> |
| CEO college dummy                    |                           |                           | 0.0682<br><b>(0.70)</b>   | 0.3095<br><b>(2.07)</b>   | -0.0315<br><b>(-0.46)</b> |
| CEO graduate dummy                   |                           |                           | -0.0180<br><b>(-0.56)</b> | -0.0231<br><b>(-0.32)</b> | 0.0010<br><b>(0.03)</b>   |
| CEO U.S. MBA dummy                   |                           |                           | 0.1034<br><b>(3.38)</b>   | 0.0522<br><b>(0.74)</b>   | 0.0344<br><b>(0.23)</b>   |
| Firm characteristics                 | Yes                       | Yes                       | Yes                       | Yes                       | Yes                       |
| Industry dummies                     | Yes                       | Yes                       | Yes                       | Yes                       | Yes                       |
| Standard errors clustered by country | Yes                       | Yes                       | Yes                       | No                        | Yes                       |
| Observations                         | 2,496                     | 2,474                     | 2,474                     | 1,138                     | 1,336                     |
| R-squared                            | 0.56                      | 0.57                      | 0.57                      | 0.44                      | 0.59                      |

**Table 5**  
**Regression of CEO Total Compensation on Firm and CEO Characteristics and Pay Structure**

Estimates of OLS cross-sectional regressions of the log CEO total compensation as of 2006 are shown. Regressions include the firm control variables (coefficients not shown) used in column (4) of Table 2. Refer to Appendix B for variables definition. The sample consists of 1,271 U.S. firms and 2,033 non-U.S. firms. Robust t-statistics adjusted for country-level clustering are in parentheses. Coefficients significant at the 5% level are in boldface.

|  | (1)                     | (2)                     | (3)                     | (4)                      | (5)                     |
|--|-------------------------|-------------------------|-------------------------|--------------------------|-------------------------|
|  | All firms               |                         |                         | U.S. firms               | Non-U.S. firms          |
| U.S. dummy                               | 0.1097<br>(1.63)        | 0.1178<br>(1.77)        | 0.1749<br>(1.80)        |                          |                         |
| Sales (log)                              | 0.1622<br><b>(8.83)</b> | 0.1649<br><b>(9.27)</b> | 0.1954<br><b>(8.86)</b> | 0.1840<br><b>(5.14)</b>  | 0.1550<br><b>(7.39)</b> |
| Incentives/Total compensation            | 2.0328<br><b>(5.75)</b> |                         |                         | 2.6532<br><b>(13.45)</b> | 1.5584<br><b>(9.77)</b> |
| Non-equity incentives/Total compensation |                         | 1.7886<br><b>(9.48)</b> | 0.6244<br><b>(3.70)</b> |                          |                         |
| Equity incentives/Total compensation     |                         | 2.0960<br><b>(5.27)</b> |                         |                          |                         |
| Option dummy                             |                         |                         | 0.4695<br><b>(4.95)</b> |                          |                         |
| Firm characteristics                     | Yes                     | Yes                     | Yes                     | Yes                      | Yes                     |
| CEO characteristics                      | Yes                     | Yes                     | Yes                     | Yes                      | Yes                     |
| Industry dummies                         | Yes                     | Yes                     | Yes                     | Yes                      | Yes                     |
| Standard errors clustered by country     | Yes                     | Yes                     | Yes                     | No                       | Yes                     |
| Observations                             | 2,474                   | 2,474                   | 2,474                   | 1,138                    | 1,336                   |
| R-squared                                | 0.72                    | 0.72                    | 0.60                    | 0.70                     | 0.70                    |

**Table 6**  
**Level of CEO Compensation of Non-U.S. Firms Relative to U.S. Firms: Propensity-Score Matching**

The table examines the average difference in the level of CEO compensation of non-U.S. firms relative to matching U.S. firms as of 2006. The matching of the firms is done using propensity scores. The propensity score is estimated using a probit model where the dependent variable is a non-U.S. firm dummy and the regressors are: (1) sales and industry dummies (as in column (1) of Table 2); (2) sales, firm characteristics and CEO characteristics (as in column (3) of Table 4); (3) sales, firm characteristics, CEO characteristics and pay structure (as in column (3) of Table 5). Tests for U.S. against Oceania and Asia are missing in columns (2) and (3) because of lack of enough observations to estimate the matching probit model. Refer to Appendix B for variables definition. The sample consists of 1,271 U.S. firms and 2,033 non-U.S. firms.

|           | (1)                         |        | (2)  |        | (3)  |        |
|-----------|-----------------------------|--------|--|--------|--|--------|
|           | Match by Sales and Industry | t-stat | Match by Sales, Industry, Firm and CEO Characteristics | t-stat | Match by Sales, Industry, Firm and CEO Characteristics and Pay Structure | t-stat |
| Canada    | -0.0316                     | -0.17  | -0.0748  | -0.14  | -0.5062  | -0.76  |
| U.K.      | -0.5676                     | -3.19  | -0.6396  | -0.74  | -0.5835  | -0.68  |
| Euro Zone | -0.8378                     | -10.47 | -0.2631  | -0.40  | -0.0392  | -0.05  |
| Nordic    | -1.0209                     | -7.30  | -1.8379  | -2.17  | 0.9282   | 0.87   |
| Oceania   | -0.4576                     | -2.58  |  |        |  |        |
| Asia      | -1.3942                     | -6.38  |  |        |  |        |
| Total     | -0.7484                     | -7.89  | -0.2711  | -0.30  | -0.2502  | -0.26  |

**Table 7**  
**Robustness of Regression of CEO Total Compensation**

Estimates of OLS cross-sectional regressions of the log CEO total compensation as of 2006 are shown. Regressions include the firm and CEO control variables (coefficients not shown) used in column (1) of Table 5. The sample consists of 1,271 U.S. firms and 2,033 non-U.S. firms. Robust t-statistics adjusted for country-level clustering are in parentheses. Coefficients significant at the 5% level are in boldface.

|                                      | (1)                     | (2)                          | (3)                      | (4)                      | (5)                              |
|--------------------------------------|-------------------------|------------------------------|--------------------------|--------------------------|----------------------------------|
|                                      | Size =<br>Assets        | Size =<br>Market<br>capital. | Median<br>regression     | U.S. BoardEx             | Total<br>compen. PPP<br>adjusted |
| U.S. dummy                           | 0.0944<br>(1.28)        | 0.0652<br>(0.97)             | 0.0191<br>(0.40)         | 0.1446<br>(1.68)         | 0.2502<br><b>(4.55)</b>          |
| Sales (log)                          |                         |                              | 0.1735<br><b>(19.81)</b> | 0.1931<br><b>(11.46)</b> | 0.1647<br><b>(9.27)</b>          |
| Total assets (log)                   | 0.2135<br><b>(7.77)</b> |                              |                          |                          |                                  |
| Market capitalization (log)          |                         | 0.2400<br><b>(10.20)</b>     |                          |                          |                                  |
| Incentives/Total compensation        | 1.9974<br><b>(5.74)</b> | 1.9600<br><b>(5.53)</b>      | 2.1802<br><b>(50.89)</b> |                          | 2.0492<br><b>(5.81)</b>          |
| Firm characteristics                 | Yes                     | Yes                          | Yes                      | Yes                      | Yes                              |
| CEO characteristics                  | Yes                     | Yes                          | Yes                      | Yes                      | Yes                              |
| Industry dummies                     | Yes                     | Yes                          | Yes                      | Yes                      | Yes                              |
| Standard errors clustered by country | Yes                     | Yes                          | Yes                      | Yes                      | Yes                              |
| Observations                         | 2,507                   | 2,507                        | 2,474                    | 2,719                    | 2,474                            |
| R-squared                            | 0.72                    | 0.72                         |                          | 0.73                     | 0.74                             |

**Table 8**  
**Regression of CEO Pay Structure**

Estimates of cross-sectional regressions of the CEO pay structure as of 2006 are shown. Columns (1) to (3) estimate Tobit regressions for different pay structure ratios. Column (4) estimates probit model for Option dummy. Refer to Appendix B for variables definition. The sample consists of 1,271 U.S. firms and 2,033 non-U.S. firms. T-statistics are in parentheses. Coefficients significant at the 5% level are in boldface.

|                                   | (1)                             | (2)                                       | (3)   | (4)                         | (5)                                       | (6)                                    |
|-----------------------------------|---------------------------------|---|---|-----------------------------|---|--|
|                                   | All Firms                       |   |   |                             | U.S. Firms                                | Non-U.S. Firms                         |
|                                   | Tobit<br>[Incentives<br>/Total] | Tobit<br>[Equity<br>incentives<br>/Total] | Tobit<br>[Non-equity<br>incentives<br>/Total] | Probit<br>[Option<br>dummy] | Tobit<br>[Equity<br>incentives<br>/Total] | Tobit<br>[Equity<br>incentives /Total] |
| U.S. dummy                        | 0.1138<br><b>(4.50)</b>         | 0.0910<br><b>(2.52)</b>                   | 0.0600<br><b>(2.95)</b>                       | 0.8190<br><b>(6.05)</b>     |   |  |
| U.S. cross-listing dummy          |                                 |   |   |                             |   | 0.1139<br><b>(2.49)</b>                |
| Sales (log)                       | 0.0209<br><b>(4.54)</b>         | 0.0089<br>(1.34)                          | 0.0184<br><b>(4.89)</b>                       | -0.0465<br>(-1.72)          | 0.0200<br>(1.95)                          | 0.0068<br>(0.70)                       |
| Leverage                          | -0.0031<br>(-0.10)              | -0.0127<br>(-0.27)                        | 0.0154<br>(0.59)                              | -0.3417<br><b>(-4.39)</b>   | 0.0793<br>(1.41)                          | -0.1318<br>(-1.72)                     |
| Tobin Q                           | -0.0031<br>(-0.66)              | -0.0034<br>(-0.50)                        | -0.0027<br>(-0.69)                            | -0.0310<br><b>(-5.13)</b>   | -0.0132<br>(-1.45)                        | 0.0016<br>(0.14)                       |
| Return on assets                  | -0.0543<br>(-1.11)              | -0.2419<br><b>(-3.46)</b>                 | 0.1452<br><b>(3.45)</b>                       | -0.6191<br><b>(-3.94)</b>   | -0.1501<br>(-1.35)                        | -0.3309<br><b>(-3.31)</b>              |
| Stock return volatility           | -0.1088<br><b>(-2.73)</b>       | -0.2259<br><b>(-3.76)</b>                 | 0.0281<br>(0.87)                              | -0.4645<br>(-1.64)          | -0.2689<br><b>(-3.34)</b>                 | -0.2069<br><b>(-2.26)</b>              |
| Stock return                      | 0.0590<br><b>(4.09)</b>         | 0.0242<br>(1.14)                          | 0.0378<br><b>(3.23)</b>                       | 0.0422<br>(1.20)            | 0.0877<br><b>(2.95)</b>                   | 0.0177<br>(0.56)                       |
| Turnover                          | 0.0117<br><b>(2.23)</b>         | 0.0196<br><b>(2.64)</b>                   | -0.0010<br>(-0.24)                            | 0.0383<br>(1.47)            | 0.0180<br><b>(2.35)</b>                   | 0.0354<br>(1.79)                       |
| MSCI dummy                        | 0.0647<br><b>(4.06)</b>         | 0.0936<br><b>(4.13)</b>                   | -0.0224<br>(-1.75)                            | 0.3390<br><b>(2.90)</b>     | 0.0655<br><b>(2.40)</b>                   | 0.0612<br>(1.51)                       |
| Foreign sales                     | 0.0151<br>(0.72)                | 0.0070<br>(0.23)                          | 0.0168<br>(0.99)                              | 0.0165<br>(0.09)            | 0.1146<br><b>(2.58)</b>                   | -0.0454<br>(-1.03)                     |
| Insider ownership                 | -0.1570<br><b>(-5.33)</b>       | -0.3002<br><b>(-6.91)</b>                 | -0.0143<br>(-0.60)                            | -0.3540<br>(-1.89)          | -0.0464<br>(-0.72)                        | -0.3668<br><b>(-5.46)</b>              |
| Institutional ownership           | 0.1219<br><b>(4.28)</b>         | 0.1838<br><b>(4.53)</b>                   | -0.0130<br>(-0.57)                            | 0.1846<br>(0.86)            | 0.1215<br><b>(2.77)</b>                   | 0.2938<br><b>(3.66)</b>                |
| Board size                        | 0.0037<br>(1.74)                | -0.0036<br>(-1.16)                        | 0.0074<br><b>(4.31)</b>                       | 0.0158<br>(0.71)            | 0.0058<br>(1.11)                          | -0.0031<br>(-0.71)                     |
| Fraction of independent directors | 0.0580<br>(1.62)                | 0.0639<br>(1.21)                          | 0.0148<br>(0.51)                              | 0.3526<br>(1.64)            | 0.2017<br><b>(2.49)</b>                   | -0.0259<br>(-0.35)                     |
| CEO-chairman dummy                | 0.0157<br>(1.15)                | -0.0121<br>(-0.61)                        | 0.0126<br>(1.15)                              | 0.0579<br>(0.89)            | 0.0187<br>(0.84)                          | -0.0862<br><b>(-2.20)</b>              |
| Nationality mix                   | 0.0971<br><b>(2.56)</b>         | 0.0672<br>(1.23)                          | 0.0697<br><b>(2.29)</b>                       | 0.2371<br>(0.93)            | -0.0745<br>(-0.90)                        | 0.1372<br>(1.75)                       |
| Past board positions              | 0.0170<br>(1.93)                | 0.0213<br>(1.70)                          | 0.0002<br>(0.03)                              | 0.0129<br>(0.47)            | 0.0153<br>(0.97)                          | 0.0168<br>(0.84)                       |
| Current board positions           | 0.0310<br><b>(2.46)</b>         | 0.0568<br><b>(3.16)</b>                   | -0.0088<br>(-0.87)                            | 0.0980<br>(1.48)            | 0.0089<br>(0.39)                          | 0.0717<br><b>(2.51)</b>                |



THE PAY DIVIDE: (WHY) ARE U.S. TOP EXECUTIVES PAID MORE?

**Table 8: Continued**

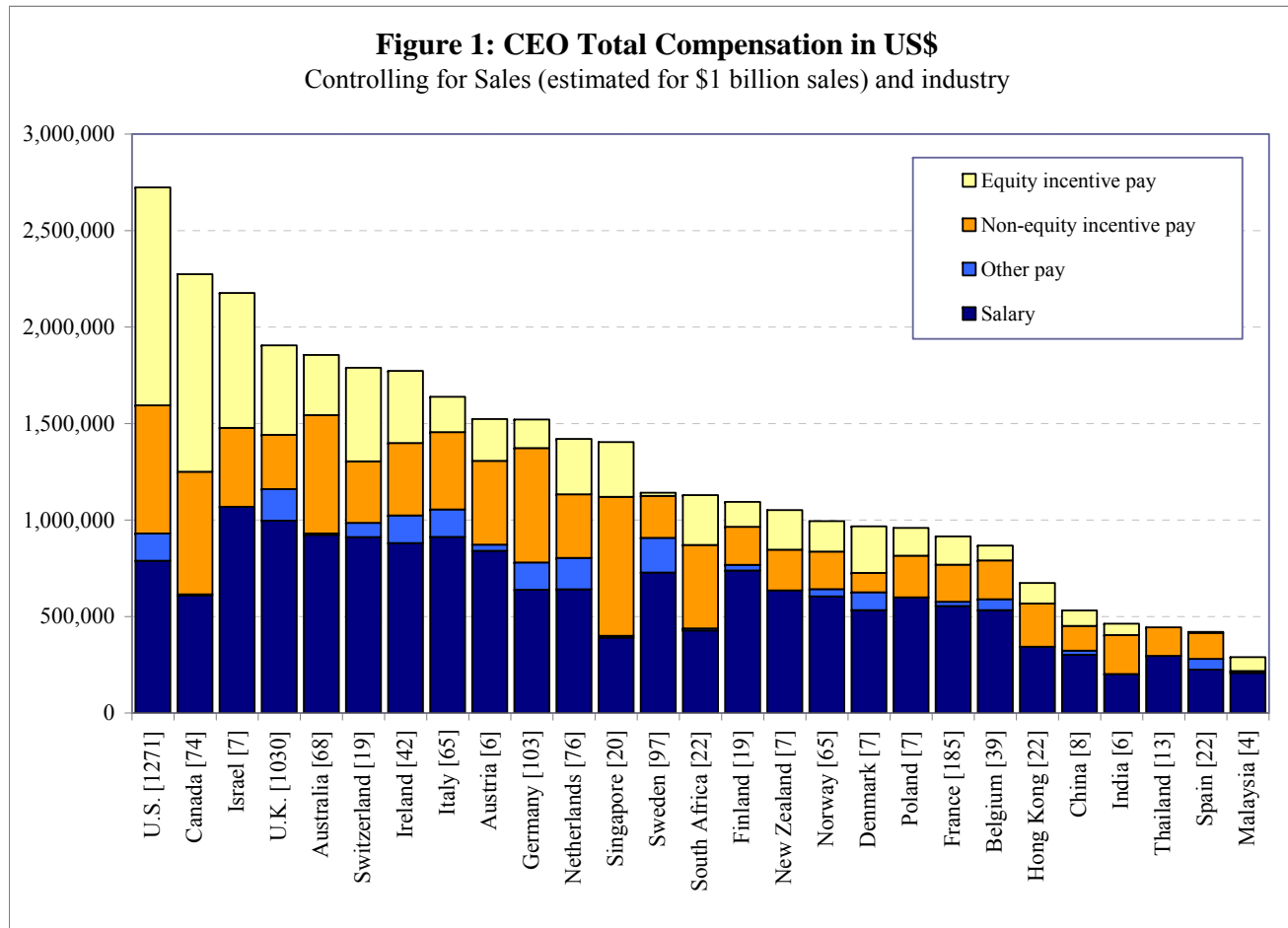
|                                      | (1)                             | (2)                                       | (3)   | (4)                         | (5)                                       | (6)                                    |
|--------------------------------------|---------------------------------|---|---|-----------------------------|---|--|
|                                      | All Firms                       |   |   |                             | U.S. Firms                                | Non-U.S. Firms                         |
|                                      | Tobit<br>[Incentives<br>/Total] | Tobit<br>[Equity<br>incentives<br>/Total] | Tobit<br>[Non-equity<br>incentives<br>/Total] | Probit<br>[Option<br>dummy] | Tobit<br>[Equity<br>incentives<br>/Total] | Tobit<br>[Equity<br>incentives /Total] |
| CEO age                              | -0.0039<br><b>(-4.59)</b>       | -0.0046<br><b>(-3.68)</b>                 | -0.0013<br><b>(-1.89)</b>                     | -0.0069<br><b>(-3.00)</b>   | -0.0043<br><b>(-2.64)</b>                 | -0.0048<br><b>(-2.48)</b>              |
| CEO male dummy                       | 0.0459<br>(1.20)                | 0.0495<br>(0.90)                          | 0.0132<br>(0.43)                              | 0.2534<br><b>(2.13)</b>     | 0.0357<br>(0.53)                          | 0.0885<br>(0.98)                       |
| CEO foreign dummy                    | -0.0212<br><b>(-0.80)</b>       | 0.0223<br>(0.59)                          | -0.0379<br><b>(-1.79)</b>                     | 0.0617<br>(0.50)            | -0.0258<br><b>(-0.33)</b>                 | 0.0424<br>(0.87)                       |
| CEO external hire dummy              | 0.0069<br>(0.47)                | 0.0122<br>(0.58)                          | -0.0074<br><b>(-0.62)</b>                     | -0.0428<br><b>(-0.94)</b>   | -0.0022<br><b>(-0.08)</b>                 | -0.0024<br><b>(-0.07)</b>              |
| CEO time in role                     | -0.0012<br><b>(-1.05)</b>       | -0.0023<br><b>(-1.33)</b>                 | 0.0007<br>(0.72)                              | -0.0101<br><b>(-1.58)</b>   | -0.0044<br><b>(-2.27)</b>                 | 0.0011<br>(0.37)                       |
| CEO time in firm                     | -0.0011<br><b>(-0.99)</b>       | -0.0009<br><b>(-0.58)</b>                 | -0.0009<br><b>(-1.03)</b>                     | 0.0051<br>(1.44)            | -0.0003<br><b>(-0.16)</b>                 | -0.0019<br><b>(-0.62)</b>              |
| CEO time in sector                   | 0.0008<br>(0.96)                | 0.0014<br>(1.18)                          | 0.0002<br>(0.35)                              | 0.0009<br>(0.30)            | 0.0013<br>(0.92)                          | 0.0005<br>(0.26)                       |
| CEO other industry experience dummy  | 0.0164<br>(1.20)                | 0.0149<br>(0.76)                          | 0.0016<br>(0.14)                              | -0.0565<br><b>(-0.85)</b>   | 0.0026<br>(0.11)                          | 0.0252<br>(0.76)                       |
| CEO other country experience dummy   | 0.0074<br>(0.48)                | 0.0104<br>(0.47)                          | 0.0112<br>(0.90)                              | 0.1179<br><b>(1.99)</b>     | 0.0168<br>(0.53)                          | 0.0177<br>(0.53)                       |
| Past CEO experience dummy            | -0.0341<br><b>(-2.10)</b>       | -0.0323<br><b>(-1.39)</b>                 | -0.0175<br><b>(-1.33)</b>                     | -0.0334<br><b>(-0.62)</b>   | -0.0109<br><b>(-0.37)</b>                 | -0.0520<br><b>(-1.41)</b>              |
| CEO past board positions             | -0.0030<br><b>(-0.62)</b>       | 0.0007<br>(0.10)                          | -0.0041<br><b>(-1.06)</b>                     | -0.0483<br><b>(-3.92)</b>   | 0.0035<br>(0.38)                          | 0.0006<br>(0.06)                       |
| CEO current board positions          | -0.0023<br><b>(-0.37)</b>       | -0.0012<br><b>(-0.13)</b>                 | -0.0032<br><b>(-0.64)</b>                     | 0.0543<br><b>(2.11)</b>     | 0.0294<br><b>(2.40)</b>                   | -0.0131<br><b>(-0.96)</b>              |
| CEO college dummy                    | -0.0059<br><b>(-0.38)</b>       | 0.0095<br>(0.42)                          | -0.0035<br><b>(-0.28)</b>                     | 0.1302<br><b>(2.64)</b>     | 0.0401<br>(1.27)                          | 0.0196<br>(0.58)                       |
| CEO graduate dummy                   | 0.0072<br>(0.48)                | 0.0320<br>(1.50)                          | -0.0187<br><b>(-1.56)</b>                     | -0.1393<br><b>(-1.25)</b>   | 0.0715<br><b>(2.51)</b>                   | -0.0068<br><b>(-0.21)</b>              |
| CEO U.S. MBA dummy                   | 0.0279<br>(1.53)                | 0.0235<br>(0.92)                          | 0.0056<br>(0.38)                              | 0.2438<br><b>(3.65)</b>     | -0.0157<br><b>(-0.56)</b>                 | 0.0155<br>(0.24)                       |
| Industry dummies                     | Yes                             | Yes                                       | Yes   | Yes                         | Yes                                       | Yes                                    |
| Standard errors clustered by country | No                              | No  | No  | Yes                         | No  | No                                     |
| Observations                         | 2,474                           | 2,474                                     | 2,474   | 2,474                       | 1,138                                     | 1,336                                  |

**Table 9**  
**Country-Level Determinants of CEO Compensation Levels and Structure**

Estimates of cross-sectional regressions of CEO pay levels and pay structure as of 2006 are shown. Columns (1) and (2) show results for OLS cross-sectional regressions of the log CEO total compensation and include firm control and CEO variables as in Table 4 (column 3) and as in Table 5 (column 1) - coefficients not shown to conserve space. Columns (3) and (4) estimate Tobit regressions for different pay structure ratios as in Table 8 (columns 1 and 2). Refer to Appendix B for definitions of country variables. T-statistics are in parentheses. Coefficients significant at the 5% level are in boldface.

| Dependent variable:                  | (1)                       | (2)                       | (3)                       | (4)                              |
|--------------------------------------|---------------------------|---------------------------|---------------------------|----------------------------------|
|                                      | Total compensation        | Total compensation        | Tobit [Incentives /Total] | Tobit [Equity incentives /Total] |
| U.S. dummy                           | 0.1472<br>(1.70)          | -0.0096<br>(-0.11)        | 0.0762<br><b>(2.65)</b>   | -0.0358<br>(-0.87)               |
| Sales (log)                          | 0.2133<br><b>(11.46)</b>  | 0.1682<br><b>(10.63)</b>  | 0.0261<br><b>(5.76)</b>   | 0.0188<br><b>(2.89)</b>          |
| Incentives/Total compensation        |                           | 2.0345<br><b>(5.45)</b>   |                           |                                  |
| GDP per capita                       | 0.7303<br>(1.34)          | 0.8491<br><b>(1.97)</b>   | -0.0588<br>(-0.66)        | 0.2820<br><b>(2.11)</b>          |
| Market capitalization/GDP            | -0.3139<br>(-1.62)        | -0.2081<br>(-1.32)        | -0.0604<br>(-1.33)        | -0.0050<br>(-0.07)               |
| Common law dummy                     | -0.2222<br>(-0.82)        | -0.7526<br><b>(-2.62)</b> | 0.2915<br><b>(4.55)</b>   | 0.2655<br><b>(2.71)</b>          |
| Director enforce                     | 0.3273<br>(1.25)          | 0.6881<br><b>(2.59)</b>   | -0.1815<br><b>(-3.27)</b> | -0.2483<br><b>(-2.85)</b>        |
| Collective laws index                | -1.8148<br><b>(-2.59)</b> | -2.4630<br><b>(-3.29)</b> | 0.3566<br>(1.94)          | 0.3114<br>(1.10)                 |
| Personal marginal tax rate           | -2.6411<br><b>(-2.02)</b> | -2.5357<br><b>(-2.14)</b> | 0.0028<br>(0.01)          | -1.7826<br><b>(-4.13)</b>        |
| Firm characteristics                 | Yes                       | Yes                       | Yes                       | Yes                              |
| CEO characteristics                  | Yes                       | Yes                       | Yes                       | Yes                              |
| Industry dummies                     | Yes                       | Yes                       | Yes                       | Yes                              |
| Standard errors clustered by country | Yes                       | Yes                       | No                        | No                               |
| Observations                         | 2,461                     | 2,461                     | 2,461                     | 2,461                            |

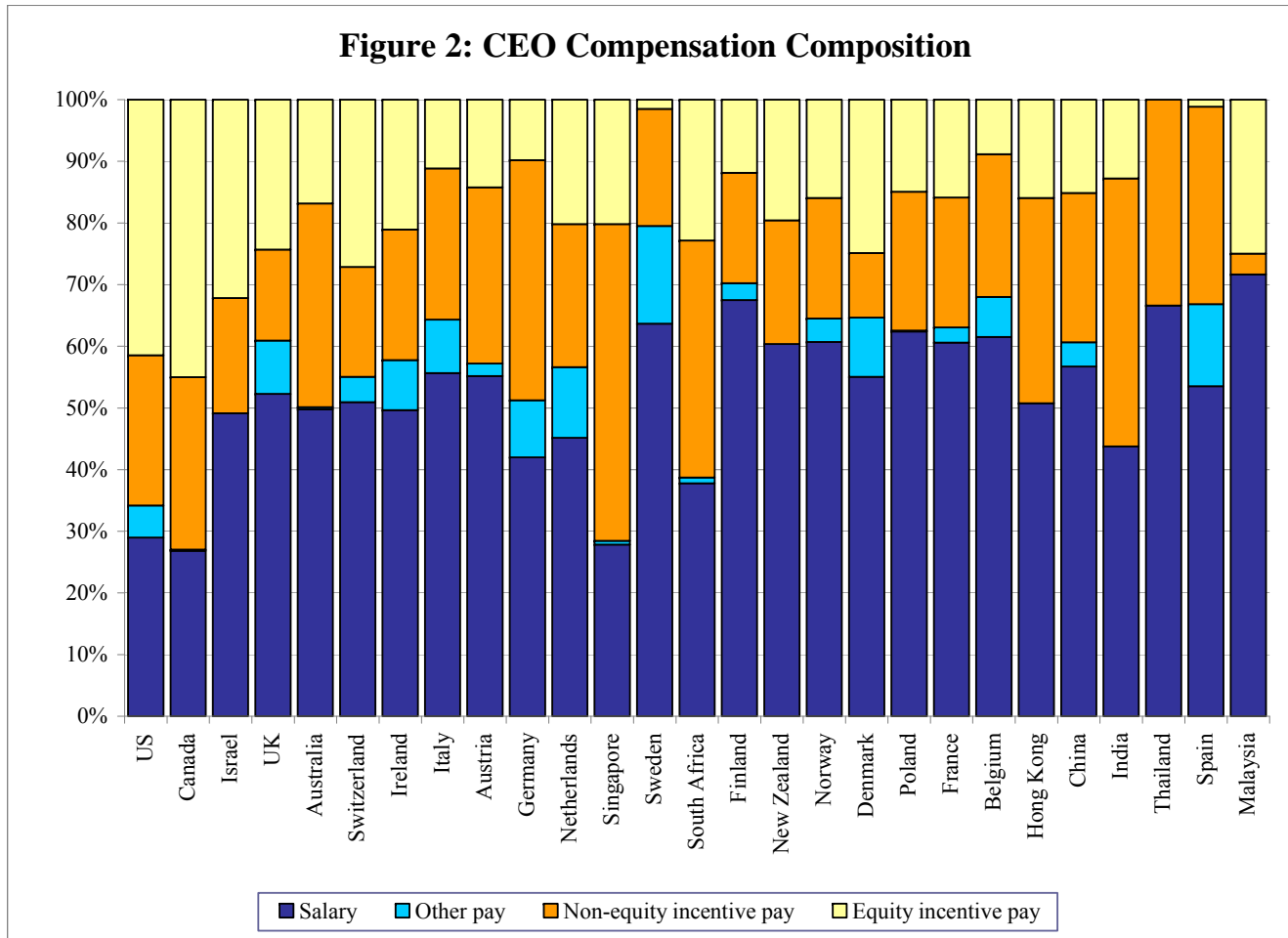
THE PAY DIVIDE: (WHY) ARE U.S. TOP EXECUTIVES PAID MORE?



**Figure 1: CEO Total Compensation in US\$ Controlling for Sales and Industry**

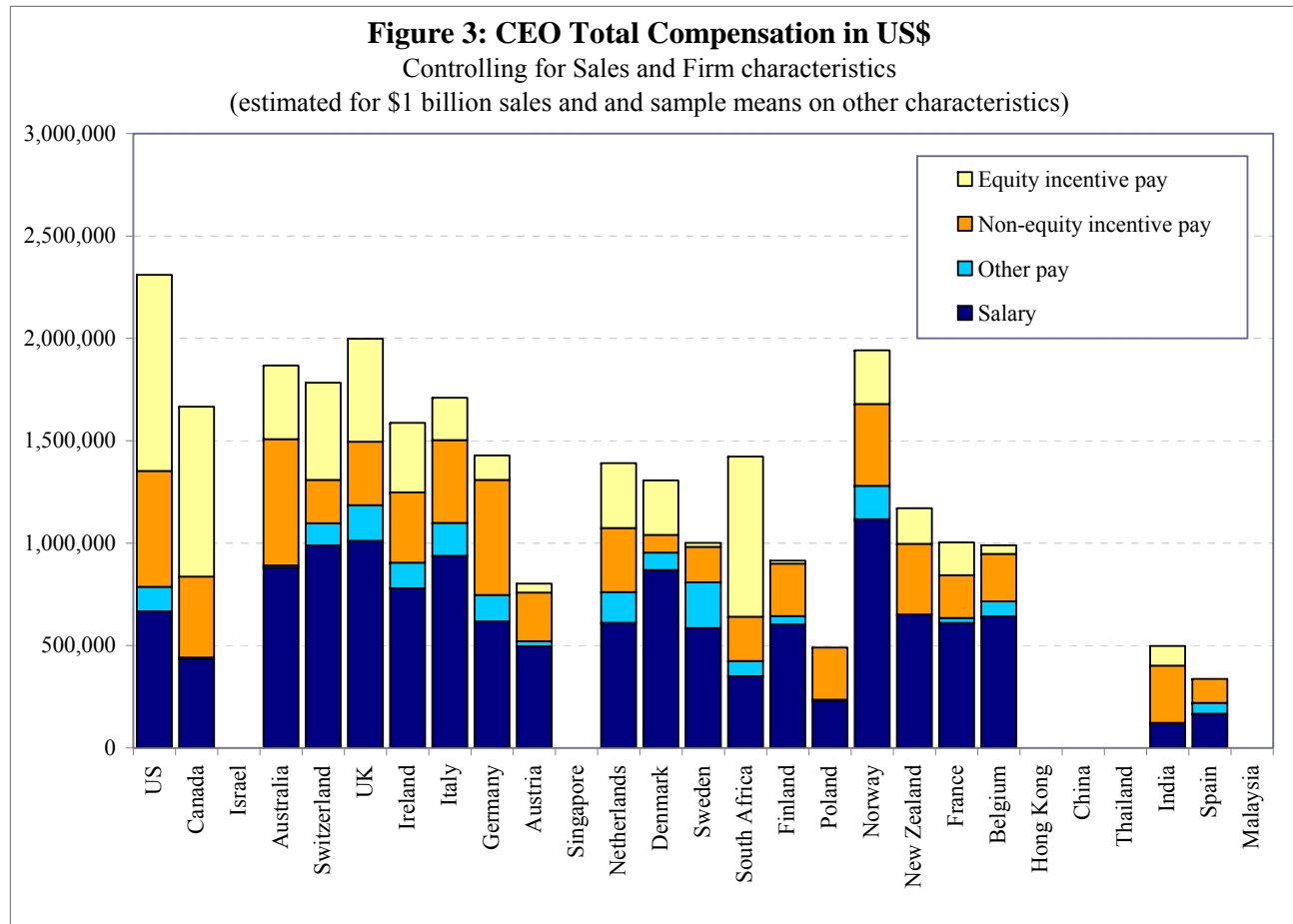
This figure compares average CEO pay in each country controlling for firm size and industry. We regress the logarithm of total compensation on the logarithm of sales and 12 industry and 27 country dummies. Then, for each country, we estimate the US\$ pay for a CEO running a hypothetical firm with \$1 billion sales and in an “average” industry using the estimated coefficient for that country’s dummy variable. Countries are sorted in descending order in terms of total estimated pay. The number of firms with compensation data in each country is shown in brackets .

THE PAY DIVIDE: (WHY) ARE U.S. TOP EXECUTIVES PAID MORE?



**Figure 2: CEO Compensation Composition**

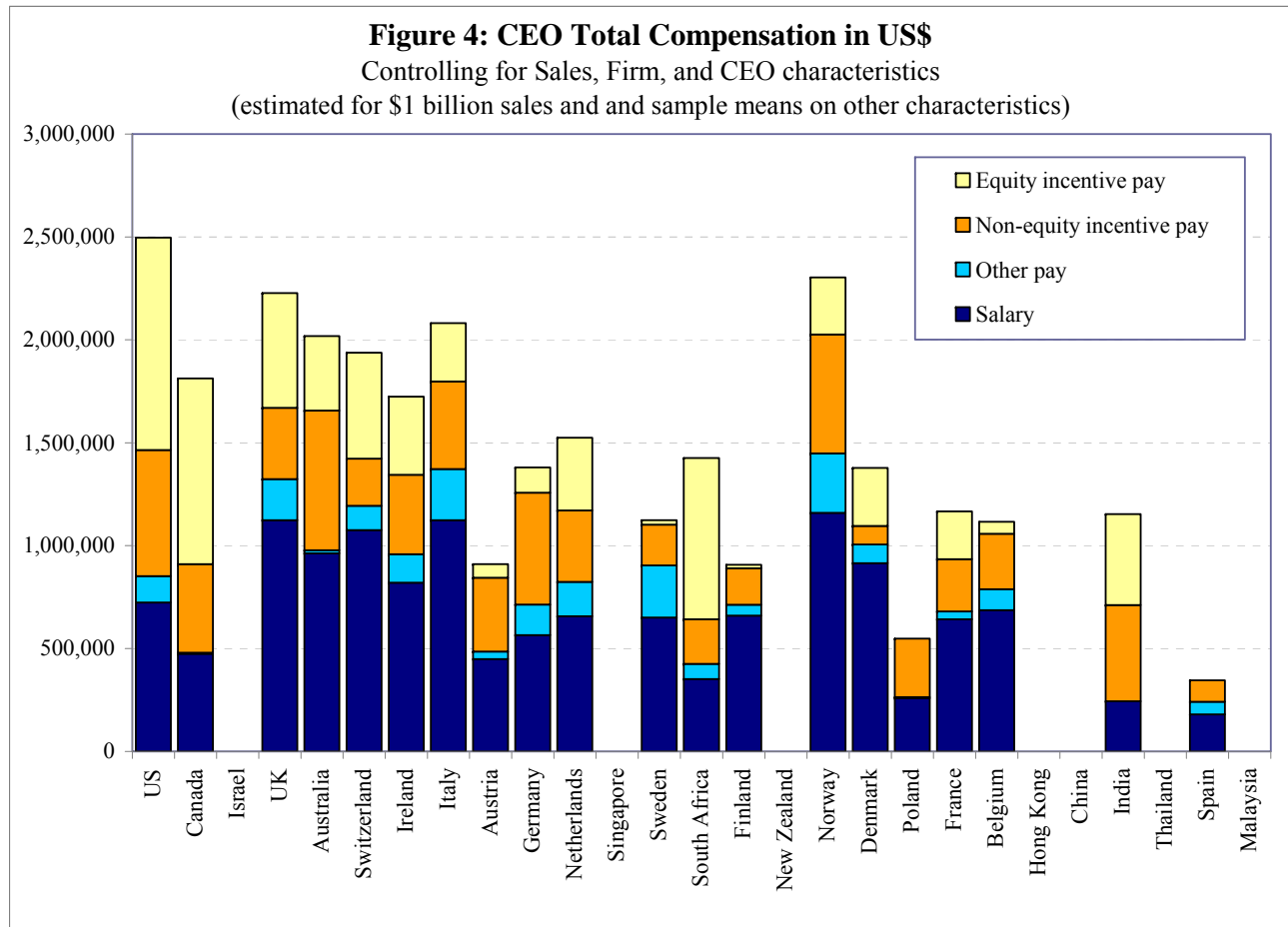
This figure presents average CEO pay decomposition in each country as of 2006. Annual salary and Other pay represent non-incentive pay. Non-equity incentive pay are bonuses and other cash payments awarded if company meets specified accounting or share price targets. Equity-incentive pay are plan awards of restricted stock and stock options. Refer to Appendix B for variables definition.



**Figure 3: CEO Total Compensation in US\$ Controlling for Sales, Firm Characteristics and Industry**

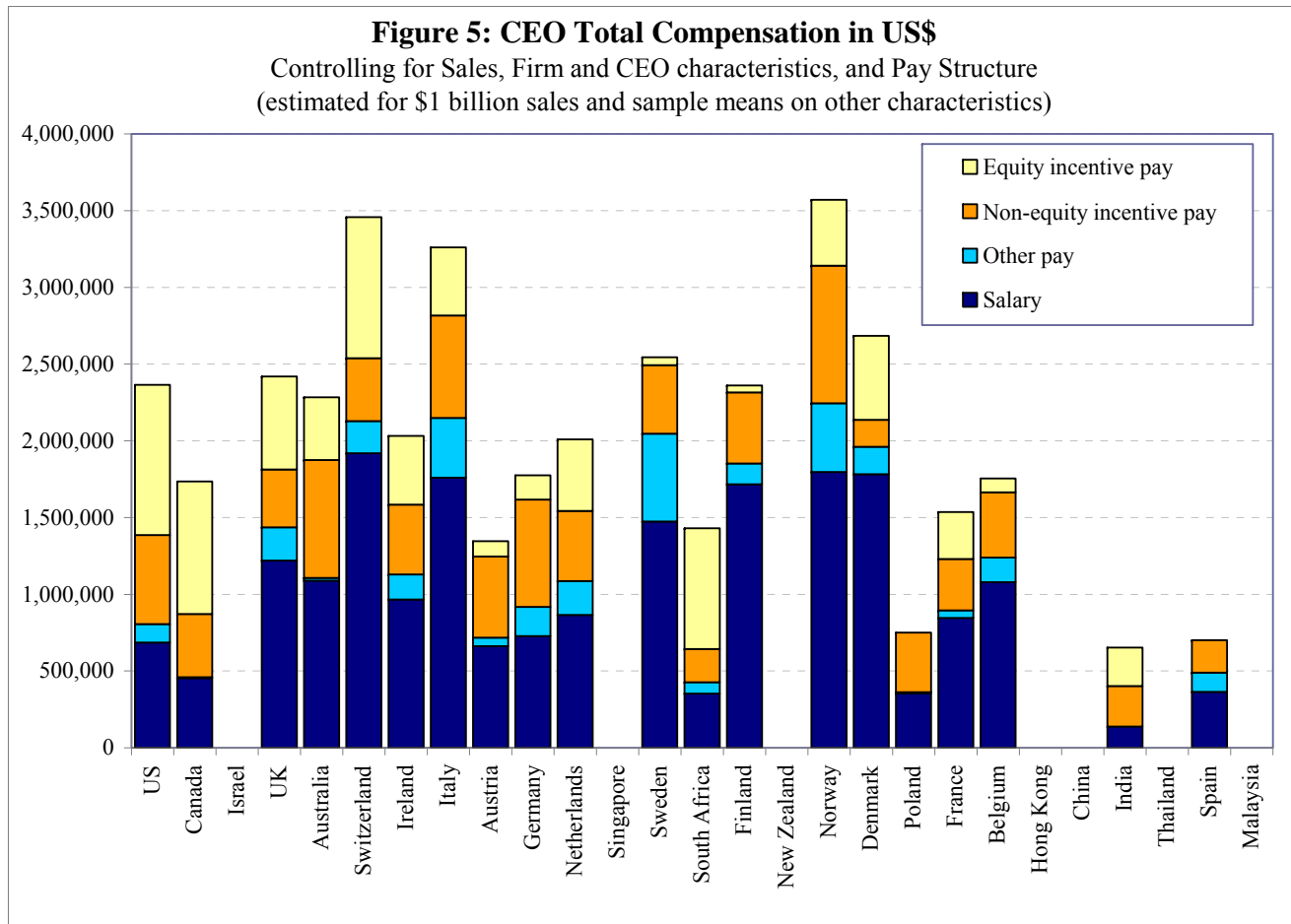
This figure compares average CEO pay in each country controlling for firm size, firm characteristics and industry. We regress the logarithm of total compensation on the logarithm of sales, firm characteristics, and 12 industry and 27 country dummies. See Table 2 for list of firm characteristics. Then, for each country, we estimate the US\$ pay for a CEO running a hypothetical firm with \$1 billion sales, with “average” firm characteristics and in an “average” industry using the estimated coefficient for that country’s dummy variable. Countries are sorted in descending order in terms of total estimated pay in Figure 1.

THE PAY DIVIDE: (WHY) ARE U.S. TOP EXECUTIVES PAID MORE?



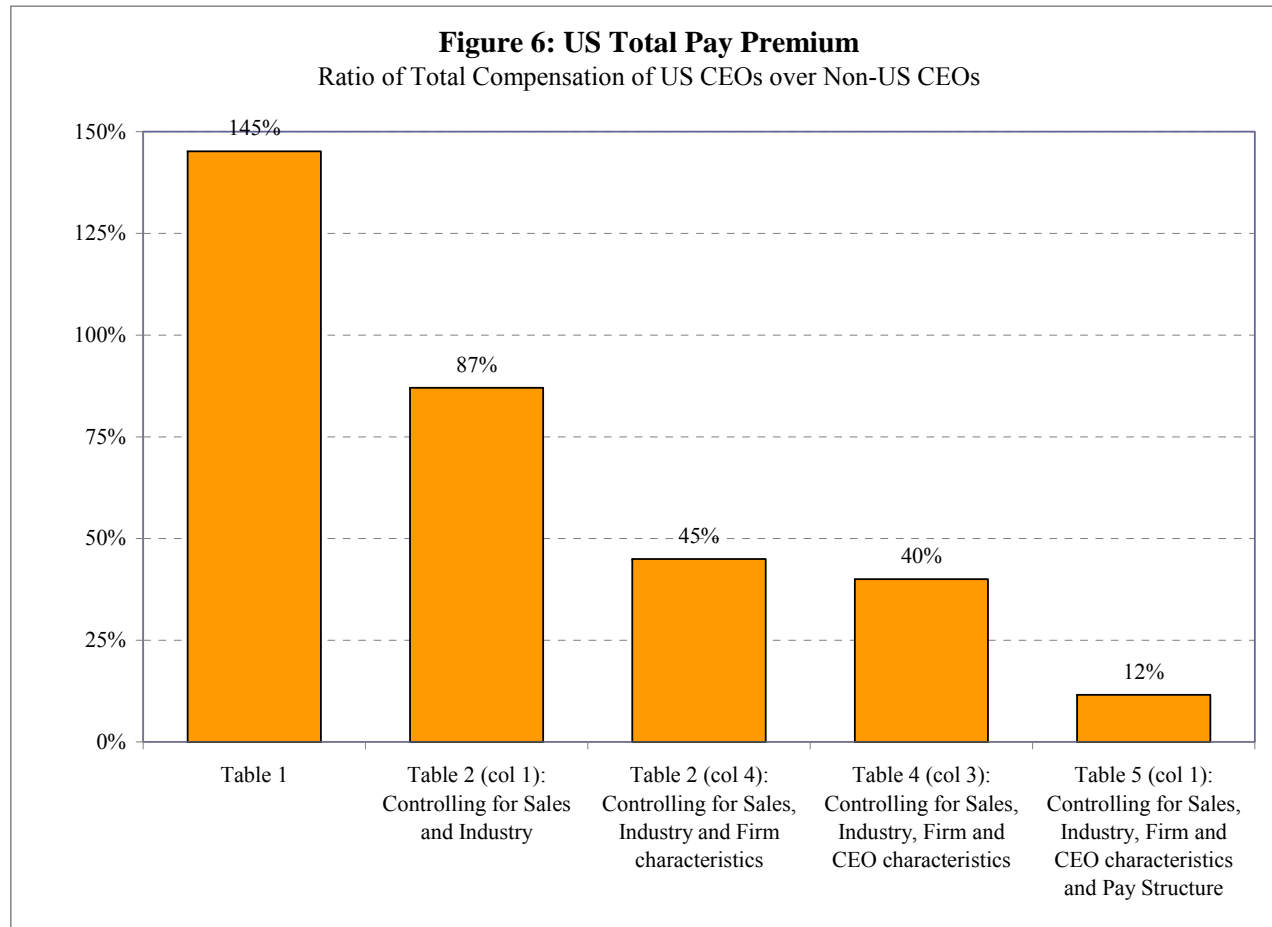
**Figure 4: CEO Total Compensation in US\$ Controlling for Sales, Firm and CEO Characteristics and Industry**

This figure compares average CEO pay in each country controlling for firm size, firm and CEO characteristics and industry. We regress the logarithm of total compensation on the logarithm of sales, firm and CEO characteristics, and 12 industry and 27 country dummies. See Table 4 for list of firm and CEO characteristics. Then, for each country, we estimate the US\$ pay for a CEO running a hypothetical firm with \$1 billion sales, with “average” firm characteristics, with “average” CEO characteristics and in an “average” industry using the estimated coefficient for that country’s dummy variable. Countries are sorted in descending order in terms of total estimated pay in Figure 1.



**Figure 5: CEO Total Compensation in US\$ Controlling for Sales, Firm, CEO Characteristics Pay Structure and Industry**

This figure compares average CEO pay in each country controlling for firm size, firm and CEO characteristics, ratio of incentive to total pay and industry. We regress the logarithm of total compensation on the logarithm of sales, firm and CEO characteristics, ratio of incentive to total pay, and 12 industry and 27 country dummies. See Table 4 for list of firm and CEO characteristics. Then, for each country, we estimate the US\$ pay for a CEO running a hypothetical firm with \$1 billion sales, with “average” firm characteristics, with “average” CEO characteristics, an “average” ratio of incentive to total pay and in an “average” industry using the estimated coefficient for that country’s dummy variable. Countries are sorted in descending order in terms of total estimated pay in Figure 1.



**Figure 6: Explaining the U.S. CEO Pay Premium**

This figure summarizes the results on contribution of each factor to explain the U.S. CEO pay premium, based on the estimated “U.S. dummy” coefficients from Tables 1-5. All values are statistically significantly different from zero at a 1% confidence level, except the 12% in Table 5 (column 1).



THE PAY DIVIDE: (WHY) ARE U.S. TOP EXECUTIVES PAID MORE?

Appendix A.1

Sample Means of Level and Composition of CEO Compensation by Country

This table presents sample means of level and composition of the level and composition of CEO compensation as of 2006. Refer to Appendix B for variables definition. The sample consists of 1,271 U.S. firms and 2,033 non-U.S. firms.

| Region        | Country      | Number of Firms     |                  |       | Coverage<br>(% of<br>Market<br>Cap) | Total<br>compen. | Non Incentive Pay |           |                          |                             | Incentive Pay     |                   |                  |                         |                               |                         |                                       |                  |                        |
|---------------|--------------|---------------------|------------------|-------|-------------------------------------|------------------|-------------------|-----------|--------------------------|-----------------------------|-------------------|-------------------|------------------|-------------------------|-------------------------------|-------------------------|---------------------------------------|------------------|------------------------|
|               |              | Execuc./<br>Boardex | Comp.<br>filings | Total |                                     |                  | Salary            | Other pay | Non-<br>incentive<br>pay | Non-<br>incentive/<br>Total | Equity Incentives |                   |                  | Non-Equity Incentives   |                               |                         |                                       |                  |                        |
|               |              |                     |                  |       |                                     |                  |                   |           |                          |                             | Options           | Options/<br>Total | Options<br>dummy | Equity<br>incentive pay | Equity<br>incentive/<br>Total | Non-equity<br>incentive | Non-<br>equity<br>Incentive/<br>Total | Incentive<br>pay | Incentive<br>pay/Total |
| North America | U.S.         | 1,271               | 0                | 1,271 | 0.741                               | 5,529,920        | 780,292           | 315,346   | 1,095,638                | 0.342                       | 1,481,021         | 0.201             | 0.570            | 3,130,290               | 0.414                         | 1,303,993               | 0.244                                 | 4,434,283        | 0.658                  |
|               | Canada       | 4                   | 70               | 74    | 0.569                               | 6,444,159        | 934,758           | 3,282     | 938,039                  | 0.270                       | 1,006,275         | 0.203             | 0.500            | 3,866,513               | 0.450                         | 1,639,607               | 0.280                                 | 5,506,120        | 0.730                  |
| U.K.          | U.K.         | 1,030               | 0                | 1,030 | 0.879                               | 1,742,719        | 516,647           | 107,985   | 624,631                  | 0.609                       | 52,017            | 0.050             | 0.164            | 770,329                 | 0.243                         | 347,759                 | 0.148                                 | 1,118,088        | 0.391                  |
| Euro Zone     | France       | 185                 | 0                | 185   | 0.814                               | 2,364,012        | 696,052           | 53,411    | 749,463                  | 0.631                       | 660,568           | 0.115             | 0.254            | 1,124,649               | 0.159                         | 489,900                 | 0.211                                 | 1,614,549        | 0.369                  |
|               | Germany      | 103                 | 0                | 103   | 0.664                               | 3,271,159        | 878,795           | 352,592   | 1,231,387                | 0.512                       | 27,903            | 0.010             | 0.049            | 776,630                 | 0.098                         | 1,263,141               | 0.389                                 | 2,039,772        | 0.488                  |
|               | Netherlands  | 75                  | 1                | 76    | 0.837                               | 2,333,763        | 702,254           | 228,776   | 931,030                  | 0.566                       | 142,191           | 0.050             | 0.184            | 816,362                 | 0.202                         | 586,371                 | 0.232                                 | 1,402,733        | 0.434                  |
|               | Italy        | 64                  | 1                | 65    | 0.757                               | 5,170,488        | 1,525,016         | 416,585   | 1,941,601                | 0.643                       | 1,592,800         | 0.080             | 0.185            | 2,224,369               | 0.112                         | 1,004,519               | 0.245                                 | 3,228,888        | 0.357                  |
|               | Ireland      | 42                  | 0                | 42    | 0.964                               | 1,840,714        | 649,619           | 123,000   | 772,619                  | 0.578                       | 18,476            | 0.044             | 0.119            | 617,881                 | 0.211                         | 450,214                 | 0.212                                 | 1,068,095        | 0.422                  |
|               | Belgium      | 38                  | 1                | 39    | 0.615                               | 1,473,618        | 601,680           | 129,667   | 731,346                  | 0.680                       | 120,356           | 0.063             | 0.077            | 261,782                 | 0.088                         | 480,490                 | 0.231                                 | 742,272          | 0.320                  |
|               | Spain        | 22                  | 0                | 22    | 0.654                               | 2,183,364        | 880,455           | 413,182   | 1,293,636                | 0.668                       | -                 | 0.000             | 0.000            | 54,591                  | 0.011                         | 835,136                 | 0.321                                 | 889,727          | 0.332                  |
|               | Finland      | 13                  | 6                | 19    | 0.436                               | 1,647,633        | 1,011,893         | 36,368    | 1,048,261                | 0.702                       | 28,511            | 0.028             | 0.105            | 321,819                 | 0.119                         | 277,553                 | 0.179                                 | 599,372          | 0.298                  |
|               | Austria      | 4                   | 2                | 6     | 0.335                               | 2,209,766        | 1,185,334         | 81,333    | 1,266,668                | 0.572                       | 287,911           | 0.142             | 0.333            | 287,911                 | 0.142                         | 655,188                 | 0.286                                 | 943,099          | 0.428                  |
|               | Nordic       | Sweden              | 96               | 1     | 97                                  | 0.770            | 1,393,445         | 749,684   | 327,103                  | 1,076,787                   | 0.795             | 24,639            | 0.014            | 0.052                   | 27,680                        | 0.015                   | 288,978                               | 0.190            | 316,658                |
| Norway        |              | 65                  | 0                | 65    | 0.872                               | 1,505,357        | 416,344           | 288,508   | 704,851                  | 0.645                       | 217,676           | 0.124             | 0.231            | 332,154                 | 0.160                         | 468,351                 | 0.195                                 | 800,505          | 0.355                  |
| Denmark       |              | 7                   | 0                | 7     | 0.351                               | 2,418,822        | 1,611,707         | 168,571   | 1,780,278                | 0.647                       | 376,143           | 0.122             | 0.286            | 447,973                 | 0.249                         | 190,571                 | 0.105                                 | 638,544          | 0.353                  |
| Oceania       | Australia    | 3                   | 65               | 68    | 0.604                               | 2,971,648        | 1,225,430         | 1,868     | 1,227,297                | 0.501                       | 228,440           | 0.067             | 0.397            | 564,427                 | 0.168                         | 1,179,924               | 0.330                                 | 1,744,351        | 0.499                  |
|               | New Zealand  | 2                   | 5                | 7     | 0.318                               | 696,761          | 405,667           | -         | 405,667                  | 0.604                       | 50,981            | 0.053             | 0.429            | 119,017                 | 0.196                         | 172,077                 | 0.201                                 | 291,094          | 0.396                  |
| Asia          | Hong Kong    | 0                   | 22               | 22    | 0.645                               | 1,921,208        | 581,364           | -         | 581,364                  | 0.508                       | 287,804           | 0.075             | 0.182            | 441,336                 | 0.159                         | 898,508                 | 0.333                                 | 1,339,844        | 0.492                  |
|               | Singapore    | 1                   | 19               | 20    | 0.468                               | 2,256,467        | 503,819           | 2,400     | 506,219                  | 0.285                       | 106,539           | 0.056             | 0.100            | 420,127                 | 0.202                         | 1,330,121               | 0.513                                 | 1,750,248        | 0.715                  |
|               | Thailand     | 0                   | 13               | 13    | 0.225                               | 709,627          | 381,567           | -         | 381,567                  | 0.666                       | -                 | 0.000             | 0.000            | -                       | 0.000                         | 328,059                 | 0.334                                 | 328,059          | 0.334                  |
|               | China        | 3                   | 5                | 8     | 0.217                               | 1,131,401        | 324,494           | 39,000    | 363,494                  | 0.606                       | -                 | 0.000             | 0.000            | 341,250                 | 0.152                         | 426,658                 | 0.242                                 | 767,908          | 0.394                  |
|               | India        | 1                   | 5                | 6     | 0.117                               | 918,380          | 402,489           | -         | 402,489                  | 0.437                       | 306,980           | 0.128             | 0.167            | 306,980                 | 0.128                         | 208,911                 | 0.435                                 | 515,891          | 0.563                  |
|               | Malaysia     | 2                   | 2                | 4     | 0.068                               | 2,738,089        | 73,668            | -         | 73,668                   | 0.717                       | 2,653,928         | 0.250             | 0.250            | 2,653,928               | 0.250                         | 10,494                  | 0.033                                 | 2,664,422        | 0.283                  |
|               | South Africa | 5                   | 17               | 22    | 0.542                               | 2,227,227        | 646,791           | 28,182    | 674,973                  | 0.387                       | 242,375           | 0.065             | 0.273            | 870,283                 | 0.229                         | 681,972                 | 0.384                                 | 1,552,254        | 0.613                  |
| Other         | Switzerland  | 18                  | 1                | 19    | 0.516                               | 7,441,226        | 2,069,218         | 584,737   | 2,653,955                | 0.550                       | 905,629           | 0.114             | 0.316            | 3,605,130               | 0.271                         | 1,182,142               | 0.179                                 | 4,787,272        | 0.450                  |
|               | Poland       | 1                   | 6                | 7     | 0.233                               | 1,297,848        | 562,185           | 1,429     | 563,613                  | 0.626                       | 64,494            | 0.067             | 0.143            | 438,400                 | 0.149                         | 295,834                 | 0.225                                 | 734,235          | 0.374                  |
|               | Israel       | 5                   | 2                | 7     | 0.073                               | 2,928,262        | 262,023           | -         | 262,023                  | 0.491                       | 2,316,760         | 0.322             | 0.429            | 2,316,760               | 0.322                         | 349,479                 | 0.187                                 | 2,666,239        | 0.509                  |
|               | Total        | 3,060               | 244              | 3,304 | 0.685                               | 3,515,281        | 711,558           | 208,025   | 919,583                  | 0.497                       | 712,097           | 0.116             | 0.332            | 1,756,930               | 0.284                         | 1,126,859               | 0.219                                 | 2,595,698        | 0.503                  |

THE PAY DIVIDE: (WHY) ARE U.S. TOP EXECUTIVES PAID MORE?

**Appendix A.2**  
**Sample Means of Firm Characteristics by Country**

This table presents sample means of firm characteristics as of 2006. Refer to Appendix B for variables definition. The sample consists of 1,271 U.S. firms and 2,033 non-U.S. firms.

| Region        | Country      | Financials            |          |         |                     |                               |                 |          | International Visibility |                                    |                  | Ownership         |                 | Corporate Governance |                                    |                           |                  |                         |                               |
|---------------|--------------|-----------------------|----------|---------|---------------------|-------------------------------|-----------------|----------|--------------------------|------------------------------------|------------------|-------------------|-----------------|----------------------|------------------------------------|---------------------------|------------------|-------------------------|-------------------------------|
|               |              | Sales<br>(billion \$) | Leverage | Tobin Q | Return<br>on assets | Stock<br>return<br>volatility | Stock<br>return | Turnover | MSCI<br>dummy            | U.S.<br>cross-<br>listing<br>dummy | Foreign<br>sales | Insider<br>owner. | Inst.<br>owner. | Board size           | Fraction<br>of indep.<br>directors | CEO-<br>chairman<br>dummy | National.<br>mix | Past board<br>positions | Current<br>board<br>positions |
| North America | U.S.         | 6.161                 | 0.208    | 2.088   | 0.061               | 0.296                         | 0.110           | 2.209    | 0.353                    | n.a.                               | 0.218            | 0.161             | 0.853           | 9.513                | 0.837                              | 0.596                     | 0.055            | 1.183                   | 1.975                         |
|               | Canada       | 6.683                 | 0.213    | 2.002   | 0.078               | 0.244                         | 0.329           | 0.758    | 0.838                    | 0.595                              | 0.334            | 0.152             | 0.576           | 12.259               | 0.726                              | 0.158                     | 0.264            | 1.184                   | 2.211                         |
| U.K.          | U.K.         | 2.191                 | 0.176    | 2.063   | -0.007              | 0.355                         | 0.170           | 0.883    | 0.128                    | 0.050                              | 0.266            | 0.315             | 0.242           | 7.111                | 0.457                              | 0.071                     | 0.119            | 1.150                   | 1.739                         |
| Euro Zone     | France       | 8.194                 | 0.242    | 1.628   | 0.054               | 0.259                         | 0.337           | 0.648    | 0.249                    | 0.103                              | 0.387            | 0.500             | 0.210           | 10.703               | 0.487                              | 0.605                     | 0.158            | 1.052                   | 2.008                         |
|               | Germany      | 12.384                | 0.210    | 1.770   | 0.039               | 0.288                         | 0.373           | 0.137    | 0.379                    | 0.175                              | 0.408            | 0.378             | 0.271           | 16.583               | 0.656                              | 0.320                     | 0.158            | 0.895                   | 1.717                         |
|               | Netherlands  | 8.959                 | 0.210    | 1.937   | 0.061               | 0.254                         | 0.430           | 1.048    | 0.368                    | 0.224                              | 0.523            | 0.320             | 0.300           | 9.132                | 0.565                              | 0.408                     | 0.334            | 1.050                   | 1.867                         |
|               | Italy        | 7.862                 | 0.321    | 1.490   | 0.041               | 0.235                         | 0.276           | 1.120    | 0.385                    | 0.077                              | 0.238            | 0.437             | 0.144           | 12.877               | 0.492                              | 0.141                     | 0.111            | 1.297                   | 2.128                         |
|               | Ireland      | 1.713                 | 0.243    | 1.883   | 0.024               | 0.349                         | 0.302           | 0.646    | 0.381                    | 0.190                              | 0.494            | 0.235             | 0.284           | 9.929                | 0.479                              | 0.071                     | 0.260            | 0.764                   | 1.576                         |
|               | Belgium      | 2.945                 | 0.235    | 1.645   | 0.081               | 0.210                         | 0.183           | 0.422    | 0.359                    | 0.051                              | 0.276            | 0.458             | 0.132           | 10.128               | 0.506                              | 0.053                     | 0.169            | 1.100                   | 2.346                         |
|               | Spain        | 13.668                | 0.388    | 1.595   | 0.063               | 0.204                         | 0.386           | 1.216    | 0.636                    | 0.227                              | 0.291            | 0.336             | 0.195           | 13.318               | 0.495                              | 0.364                     | 0.168            | 1.050                   | 1.886                         |
|               | Finland      | 4.103                 | 0.201    | 1.588   | 0.077               | 0.276                         | 0.505           | 1.009    | 0.632                    | 0.158                              | 0.586            | 0.254             | 0.286           | 12.632               | 0.612                              | 0.133                     | 0.375            | 1.486                   | 2.043                         |
|               | Austria      | 5.595                 | 0.226    | 3.595   | 0.078               | 0.368                         | 1.160           | 0.680    | 0.833                    | 0.000                              | 0.438            | 0.386             | 0.215           | 16.000               | 0.624                              | 0.500                     | 0.225            | 0.525                   | 1.650                         |
|               | Nordic       | Sweden                | 2.457    | 0.190   | 2.259               | 0.069                         | 0.296           | 0.603    | 0.885                    | 0.320                              | 0.072            | 0.406             | 0.287           | 0.307                | 9.670                              | 0.646                     | 0.010            | 0.144                   | 1.208                         |
| Norway        |              | 2.357                 | 0.229    | 2.241   | 0.055               | 0.379                         | 0.612           | 1.339    | 0.246                    | 0.062                              | 0.450            | 0.376             | 0.272           | 8.662                | 0.737                              | 0.015                     | 0.148            | 0.565                   | 1.457                         |
| Oceania       | Denmark      | 5.101                 | 0.299    | 2.332   | 0.095               | 0.212                         | 0.464           | 0.780    | 0.857                    | 0.143                              | 0.461            | 0.379             | 0.198           | 14.286               | 0.465                              | 0.143                     | 0.133            | 0.783                   | 1.717                         |
|               | Australia    | 3.822                 | 0.258    | 1.925   | 0.070               | 0.228                         | 0.276           | 0.814    | 0.779                    | 0.118                              | 0.280            | 0.344             | 0.116           | 8.542                | 0.641                              | 0.000                     | 0.195            | 0.984                   | 2.065                         |
| Asia          | New Zealand  | 0.828                 | 0.350    | 3.917   | 0.150               | 0.234                         | 0.099           | 0.503    | 0.714                    | 0.286                              | 0.343            | 0.397             | 0.169           | 7.714                | 0.661                              | 0.000                     | 0.000            | 0.100                   | 1.900                         |
|               | Hong Kong    | 5.209                 | 0.204    | 1.749   | 0.100               | 0.192                         | 0.132           | 0.425    | 0.955                    | 0.091                              | 0.321            | 0.593             | 0.123           | 14.619               | 0.542                              |                           |                  |                         |                               |
|               | Singapore    | 2.274                 | 0.187    | 1.654   | 0.073               | 0.214                         | 0.314           | 0.567    | 0.750                    | 0.000                              | 0.276            | 0.590             | 0.153           | 13.150               | 0.710                              | 0.000                     | 0.000            | 0.300                   | 1.000                         |
|               | Thailand     | 1.674                 | 0.300    | 1.266   | 0.078               | 0.232                         | 0.134           | 0.769    | 0.769                    | 0.000                              | 0.158            | 0.559             | 0.070           | 18.846               | 0.642                              |                           |                  |                         |                               |
|               | China        | 11.246                | 0.126    | 1.528   | 0.052               | 0.285                         | 0.089           | 2.219    | 0.375                    | 0.125                              | 0.006            | 0.619             | 0.228           | 15.750               | 0.705                              | 0.333                     | 0.433            | 0.500                   | 1.533                         |
|               | India        | 2.351                 | 0.163    | 4.681   | 0.182               | 0.359                         | 0.303           | 0.280    | 0.000                    | 0.500                              | 0.373            | 0.384             | 0.274           | 11.667               | 0.687                              | 0.000                     | 0.200            | 0.300                   | 2.425                         |
|               | Malaysia     | 1.324                 | 0.150    | 1.139   | 0.059               | 0.361                         | 0.616           | 0.330    | 0.500                    | 0.000                              | 0.221            | 0.530             | 0.119           | 6.250                | 0.656                              | 0.000                     | 0.000            | 0.000                   | 1.400                         |
| Other         | South Africa | 4.237                 | 0.103    | 1.946   | 0.104               | 0.254                         | 0.455           | 0.538    | 0.773                    | 0.182                              | 0.190            | 0.412             | 0.161           | 16.545               | 0.658                              | 0.000                     | 0.460            | 0.980                   | 2.280                         |
|               | Switzerland  | 12.628                | 0.151    | 2.608   | 0.085               | 0.221                         | 0.352           | 1.066    | 0.684                    | 0.421                              | 0.719            | 0.227             | 0.318           | 11.105               | 0.718                              | 0.278                     | 0.586            | 1.286                   | 2.114                         |
|               | Poland       | 0.717                 | 0.233    | 1.772   | 0.116               | 0.301                         | 0.498           | 0.186    | 0.714                    | 0.000                              | 0.000            | 0.734             | 0.178           | 16.857               | 0.582                              | 0.000                     | 0.700            | 0.500                   | 1.400                         |
|               | Israel       | 1.056                 | 0.045    | 1.740   | 0.019               | 0.418                         | 0.472           | 0.598    | 0.429                    | 0.143                              | 0.276            | 0.346             | 0.245           | 7.571                | 0.573                              | 0.200                     | 0.080            | 0.280                   | 1.460                         |
|               | Total        | 4.992                 | 0.204    | 2.020   | 0.040               | 0.305                         | 0.211           | 1.375    | 0.315                    | 0.064                              | 0.281            | 0.276             | 0.492           | 9.374                | 0.646                              | 0.331                     | 0.113            | 1.132                   | 1.892                         |

THE PAY DIVIDE: (WHY) ARE U.S. TOP EXECUTIVES PAID MORE?

**Appendix A.3**  
**Sample Means of CEO Characteristics by Country**

This table presents sample means of CEO characteristics as of 2006. Refer to Appendix B for variables definition. The sample consists of 1,271 U.S. firms and 2,033 non-U.S. firms.

| Region        | Country      | Personal |                |                   | Experience              |                  |                  |                    |                                     |                                    |                           | Other Boards             |                             | Education         |                    |                  |       |
|---------------|--------------|----------|----------------|-------------------|-------------------------|------------------|------------------|--------------------|-------------------------------------|------------------------------------|---------------------------|--------------------------|-----------------------------|-------------------|--------------------|------------------|-------|
|               |              | CEO age  | CEO male dummy | CEO foreign dummy | CEO external hire dummy | CEO time in role | CEO time in firm | CEO time in sector | CEO other industry experience dummy | CEO other country experience dummy | Past CEO experience dummy | CEO past board positions | CEO current board positions | CEO college dummy | CEO graduate dummy | CEO US MBA dummy |       |
| North America | U.S.         | 55.515   | 0.978          | 0.017             | 0.370                   | 8.537            | 16.535           | 20.438             | 0.329                               | 0.123                              | 0.178                     | 0.705                    | 1.660                       | 0.861             | 0.521              | 0.344            |       |
|               | Canada       | 54.647   | 0.986          | 0.027             | 0.419                   | 8.610            | 16.105           | 21.109             | 0.344                               | 0.500                              | 0.359                     | 0.855                    | 1.839                       | 0.784             | 0.365              | 0.108            |       |
| U.K.          | U.K.         | 51.263   | 0.974          | 0.083             | 0.544                   | 6.652            | 11.155           | 13.849             | 0.337                               | 0.292                              | 0.153                     | 0.676                    | 1.327                       | 0.554             | 0.278              | 0.030            |       |
| Euro Zone     | France       | 55.264   | 0.973          | 0.054             | 0.519                   | 8.520            | 13.490           | 16.072             | 0.303                               | 0.265                              | 0.270                     | 1.033                    | 2.190                       | 0.659             | 0.243              | 0.038            |       |
|               | Germany      | 53.122   | 1.000          | 0.068             | 0.447                   | 5.758            | 11.429           | 13.465             | 0.476                               | 0.282                              | 0.223                     | 0.881                    | 2.020                       | 0.786             | 0.515              | 0.029            |       |
|               | Netherlands  | 49.823   | 0.979          | 0.072             | 0.495                   | 5.982            | 11.129           | 12.927             | 0.330                               | 0.237                              | 0.196                     | 0.786                    | 1.757                       | 0.887             | 0.649              | 0.010            |       |
|               | Italy        | 53.192   | 0.961          | 0.276             | 0.421                   | 5.600            | 11.953           | 15.282             | 0.342                               | 0.395                              | 0.145                     | 0.355                    | 1.408                       | 0.658             | 0.329              | 0.053            |       |
|               | Ireland      | 49.490   | 1.000          | 0.046             | 0.538                   | 5.679            | 9.012            | 10.208             | 0.369                               | 0.323                              | 0.169                     | 0.409                    | 1.364                       | 0.754             | 0.400              | 0.046            |       |
|               | Belgium      | 59.200   | 0.969          | 0.046             | 0.585                   | 7.333            | 11.176           | 16.083             | 0.400                               | 0.323                              | 0.385                     | 1.787                    | 2.295                       | 0.723             | 0.185              | 0.062            |       |
|               | Spain        | 52.871   | 0.949          | 0.077             | 0.436                   | 7.739            | 13.386           | 17.475             | 0.282                               | 0.462                              | 0.205                     | 1.486                    | 2.486                       | 0.821             | 0.462              | 0.154            |       |
|               | Finland      | 50.450   | 0.976          | 0.143             | 0.310                   | 7.594            | 15.661           | 17.006             | 0.262                               | 0.286                              | 0.119                     | 0.500                    | 1.310                       | 0.786             | 0.357              | 0.024            |       |
|               | Austria      | 53.444   | 0.947          | 0.474             | 0.421                   | 7.042            | 11.935           | 17.833             | 0.389                               | 0.444                              | 0.222                     | 1.357                    | 1.786                       | 0.947             | 0.632              | 0.105            |       |
|               | Nordic       | Sweden   | 55.684         | 0.955             | 0.091                   | 0.318            | 7.851            | 14.209             | 16.587                              | 0.455                              | 0.409                     | 0.455                    | 1.818                       | 2.409             | 0.818              | 0.318            | 0.091 |
|               | Norway       | 52.579   | 1.000          | 0.000             | 0.632                   | 5.561            | 9.852            | 9.700              | 0.556                               | 0.278                              | 0.333                     | 2.143                    | 1.857                       | 0.895             | 0.842              | 0.000            |       |
|               | Denmark      | 58.143   | 1.000          | 0.000             | 0.429                   | 11.310           | 16.319           | 18.310             | 0.429                               | 0.429                              | 0.429                     | 2.000                    | 1.667                       | 0.714             | 0.571              | 0.000            |       |
| Oceania       | Australia    | 56.400   | 1.000          | 0.000             | 0.333                   | 7.503            | 14.064           | 20.130             | 0.250                               | 0.500                              | 0.250                     | 0.333                    | 1.667                       | 0.500             | 0.333              | 0.167            |       |
|               | New Zealand  | 46.667   | 1.000          | 0.143             | 0.143                   | 3.850            | 11.083           | 10.625             | 0.000                               | 0.500                              | 0.000                     | 0.000                    | 2.000                       | 0.286             | 0.143              | 0.000            |       |
| Asia          | Hong Kong    | 47.000   | 0.714          | 0.000             | 0.571                   | 11.893           | 12.577           | 12.577             | 0.000                               | 0.000                              | 0.000                     | 0.000                    | 1.200                       | 0.714             | 0.286              | 0.000            |       |
|               | Singapore    | 54.208   | 0.985          | 0.088             | 0.544                   | 6.649            | 10.777           | 14.357             | 0.403                               | 0.507                              | 0.313                     | 0.632                    | 1.404                       | 0.691             | 0.338              | 0.088            |       |
|               | Thailand     | 58.500   | 1.000          | 0.091             | 0.182                   | 11.441           | 23.329           | 12.542             | 0.250                               | 0.250                              | 0.250                     | .                        | .                           | 0.091             | 0.045              | 0.000            |       |
|               | China        | 45.667   | 1.000          | 0.125             | 0.125                   | 2.850            | 6.889            | 6.519              | 0.333                               | 0.333                              | 0.333                     | 0.333                    | 1.000                       | 0.250             | 0.250              | 0.000            |       |
|               | India        | 56.900   | 1.000          | 0.100             | 0.200                   | 9.422            | 14.823           | 16.147             | 0.200                               | 0.600                              | 0.000                     | 0.000                    | 1.000                       | 0.200             | 0.050              | 0.050            |       |
| Other         | Malaysia     | 48.500   | 0.857          | 0.000             | 0.286                   | 5.367            | 10.819           | 5.092              | 0.667                               | 0.667                              | 0.667                     | 0.000                    | 1.000                       | 0.143             | 0.000              | 0.000            |       |
|               | South Africa | 59.667   | 1.000          | 0.000             | 0.000                   | 5.460            | 34.121           | 34.121             | 0.250                               | 0.250                              | 0.000                     | 0.000                    | 1.333                       | 0.667             | 0.500              | 0.000            |       |
|               | Switzerland  | 54.889   | 0.923          | 0.077             | 0.077                   | 9.250            | 26.250           | 0.000              | 0.000                               | 0.000                              | 0.000                     | .                        | .                           | 0.000             | 0.000              | 0.000            |       |
|               | Poland       | 49.333   | 1.000          | 0.000             | 0.500                   | 10.767           | 11.750           | 13.278             | 0.333                               | 0.333                              | 0.333                     | 0.000                    | 1.500                       | 0.250             | 0.250              | 0.000            |       |
|               | Israel       | 51.333   | 1.000          | 0.091             | 0.409                   | 7.938            | 13.846           | 11.290             | 0.545                               | 0.727                              | 0.182                     | 1.200                    | 1.400                       | 0.455             | 0.318              | 0.091            |       |
|               | Total        |          | 53.594         | 0.976             | 0.059                   | 0.449            | 7.542            | 13.717             | 16.821                              | 0.340                              | 0.240                     | 0.190                    | 0.755                       | 1.606             | 0.715              | 0.398            | 0.157 |

THE PAY DIVIDE: (WHY) ARE U.S. TOP EXECUTIVES PAID MORE?

**Appendix B**  
**Definitions of Variables**

| Variable                             | Definition  |
|--------------------------------------|---|
| <b>Panel A: CEO Compensation</b>     |   |
| Total compensation                   | Total CEO Compensation in US\$ (Execucomp for U.S. firms, Boardex and company filings for non-U.S. firms)   |
| Salary                               | Salary in US\$ (Execucomp: salary, Boardex: salary)   |
| Other pay                            | Other compensation in US\$ (Execucomp: other compensation, Boardex: other + dc_pension)   |
| Non-incentive pay                    | Salary + other pay  |
| Options                              | Options value in US\$ (Execucomp: grant-date fair value of option awards, Boardex: Black-Scholes option value)  |
| Equity incentive pay                 | Stock and options awards in US\$ (Execucomp: grant-date fair value of stock awards + grant-date fair value of option awards, Boardex = market value of shares + long-term incentive plans + Black-Scholes option value)   |
| Non-equity incentive pay             | Non-equity incentive-plan compensation in US\$ (Execucomp: bonus + target value of non-equity incentive-plan compensation, Boardex: bonus)  |
| Incentive pay                        | Equity incentive pay + Non-equity incentive pay   |
| Non-incentive pay/Total              | Ratio of non-incentive pay to total compensation  |
| Options/Total                        | Ratio of options to total compensation  |
| Options dummy                        | Dummy that equals one if options value is positive, and zero otherwise  |
| Equity incentive pay/Total           | Ratio of equity incentive pay to total compensation   |
| Non-equity incentive pay/Total       | Ratio of non-equity incentive pay to total compensation   |
| Incentive pay/Total                  | Ratio of non-incentive pay to total compensation  |
| <b>Panel B: Firm Characteristics</b> |   |
| U.S. dummy                           | Equals one if firm is based in the United States (Worldscope)   |
| Sales (log)                          | Log of sales in thousands of US\$ at the end of the previous year (WS item 01001)   |
| Leverage                             | Total debt divided by total assets at the end of the previous year (WS item 03255 / WS item 02999)  |
| Tobin Q                              | Sum of total assets (WorldScope item 02999) plus market value of equity (Datastream item MV) minus book value of equity (WorldScope item 03501) divided by total assets at end of previous year   |
| Return on assets                     | Ratio of net income before extraordinary items (WorldScope item 01551) plus interest expenses (WorldScope item 01151) to total assets (WorldScope item 02999) at the end of the previous year   |
| Stock return volatility              | Annualized standard deviation of daily stock returns during the previous year (Datastream item RI)  |
| Stock return                         | Stock return during the previous year (Datastream item RI)  |
| Turnover                             | Share volume (Datastream item VO) divided by adjusted shares outstanding (Datastream items NOSH/AF) during the previous year  |
| MSCI dummy                           | MSCI member dummy, which equals one if a firm is a member of the MSCI All-country World Index   |
| U.S. cross-listing dummy             | U.S. cross-listing dummy, which equals one if a firm is cross-listed on a U.S. exchange through an American Depositary Receipts program (source: major depository institutions) or direct listing of ordinary shares (source: U.S. stock exchanges)             |
| Foreign sales                        | International annual net sales (WorldScope item 07101) as a proportion of net sales (WorldScope 01001) at the end of the previous year  |
| Insider ownership                    | Number of shares held by insiders (shareholders who hold 5% or more of the outstanding shares like officers & directors and immediate families, other corporations or individuals ) as a proportion of the number of shares outstanding (WorldScope item 08021) |
| Institutional ownership              | Institutional ownership by all institutions as a percentage of market capitalization (LionShares)   |
| Domestic institutional ownership     | Institutional ownership by foreign institutions as a percentage of market capitalization (LionShares)   |
| Foreign institutional ownership      | Institutional ownership by domestic institutions as a percentage of market capitalization (LionShares)  |
| Board size                           | Number of executive and non-executive directors (Boardex)   |
| Fraction of independent directors    | Ratio of the number of independent directors to board size (Boardex)  |
| CEO-chairman dummy                   | Dummy that equals one if CEO is also the Chairman (Boardex)   |
| Nationality mix                      | Ratio of the number of different nationalities of directors to board size (Boardex)   |
| Past board positions                 | Ratio of the number of past board positions (in other quoted firms) of board members to board size (Boardex)  |
| Current board positions              | Ratio of the number of current board positions (in quoted firms) of board members to board size (Boardex)   |

**Appendix B: Continued**

| Panel C: CEO Characteristics        |  |
|-------------------------------------|--|
| CEO age                             | Age of CEO (Boardex)   |
| CEO male dummy                      | Dummy that equals one if CEO is a male, and zero otherwise (Boardex)   |
| CEO foreign dummy                   | Dummy that equals one if the CEO nationality is different from the firm country headquarters, and zero otherwise (Boardex)   |
| CEO external hire dummy             | Dummy that equals one if CEO was externally hired, and zero otherwise (Boardex)  |
| CEO time in role                    | Time as top executive in the firm (Boardex)  |
| CEO time in firm                    | Time employed in the firm or one of its divisions or subsidiaries (Boardex)  |
| CEO time in sector                  | Time of experience in the same industry (Boardex)  |
| CEO other industry experience dummy | Dummy that equals one if CEO has worked in a different industry in the past, and zero otherwise (Boardex)  |
| CEO other country experience dummy  | Dummy that equals one if CEO has worked in different country in the past, and zero otherwise (Boardex)   |
| Past CEO experience dummy           | Dummy that equals one if CEO was top executive of a different quoted firm in the past, and zero otherwise (Boardex)  |
| CEO past board positions            | Number of past board positions (in other quoted firms) of the CEO (Boardex)  |
| CEO current board positions         | Number of current board positions (in quoted firms) of the CEO (Boardex)   |
| CEO college dummy                   | Dummy that equals one if CEO has a bachelors degree or higher, and zero otherwise (Boardex)  |
| CEO graduate dummy                  | Dummy that equals one if CEO has a MBA, Masters, JD or PhD degree, and zero otherwise (Boardex)  |
| CEO U.S. MBA dummy                  | Dummy that equals one if CEO has a MBA degree from a U.S. university (Boardex)   |
| Panel D: Country Variables          |  |
| GDP per capita                      | GDP per capita in US\$ (WDI)   |
| Market capitalization/GDP           | Stock market capitalization divided by gross domestic product (WDI)  |
| Common law dummy                    | Dummy that equals one for countries with common law legal origin (La Porta et al. (1997))  |
| Collective laws index               | Measures the protection of collective relations laws as the average of labor union power and the protection of workers during collective disputes. (Botero, Djankov, La Porta, Lopez-de-Silanes and Shleifer (2004))                           |
| Director enforce                    | Index of criminal sanctions applicable to the issuer's directors and key officers when the prospectus omits material information (La Porta, Lopez-de-Silanes, and Shleifer (2006))   |
| Personal marginal tax rate          | The all-in (top marginal) tax rate, calculated as the additional central and sub-central government personal income tax, plus employee social security contribution, resulting from a unit increase in gross wage earnings (OECD Tax Database) |

### Appendix C Codifying CEO Attributes: Example

This Appendix provides a snapshot of BoardEx profile data on one CEO in our sample – James Dimon, President/CEO at J P Morgan Chase & Co in December 2006.

| Details     |     |        |             |                 |          |                               |                       |                         |  |
|-------------|-----|--------|-------------|-----------------|----------|-------------------------------|-----------------------|-------------------------|--|
| DoB         | Age | Gender | Nationality | Committee Roles |          | Last Period's Comp USD (000s) | Limitation USD (000s) | Total Wealth USD (000s) |  |
|             |     |        |             | Current         | Historic |                               |                       |                         |  |
| 13 Mar 1956 | 50  | M      | American    | 0               | 5        | 50,277                        | n.a.                  | n.a.                    |  |

| Current Positions |             |                          |                          |                  |            |  |
|-------------------|-------------|--------------------------|--------------------------|------------------|------------|--|
| Start Date        | End Date    | Organisation Name        | Role                     | Role Description | Committees |  |
| 31 Dec 2006       | 31 Dec 2006 | JP MORGAN CHASE & CO (Q) | President/CEO (Brd - ED) |                  | n.a.       |  |

| Past Positions |             |   |                                 |                                   |                |  |
|----------------|-------------|---|---------------------------------|-----------------------------------|----------------|--|
| Start Date     | End Date    | Organisation Name   | Role                            | Role Description                  | Committees     |  |
| 01 Jul 2004    | 31 Dec 2005 | JP MORGAN CHASE & CO (Q)  | President/COO (Brd - ED)        |                                   | n.a.           |  |
| 07 Oct 1997    | 19 May 2005 | YUM! BRANDS INC (Tricon Global Restaurants Inc 05/2002) (Q)                 | Independent Director (Brd - SD) |                                   | A, N, Ex, F, G |  |
| 27 Mar 2000    | 01 Jul 2004 | BANK ONE CORP (De-listed 07/2004) (Q)                                       | Chairman/CEO (Brd - ED)         |                                   | Ex             |  |
| Nov 1997       | Mar 2000    | CITIGROUP GLOBAL MARKETS INC (Salomon Smith Barney Hldgs prior 04/2003) (Q) | Chairman/Co-CEO (Brd - ED)      |                                   | n.a.           |  |
| 1996           | 1998        | TRAVELERS-AETNA PROPERTY CASUALTY (Q)                                       | Director (Brd - SD)             |                                   | n.a.           |  |
| Oct 1998       | Nov 1998    | CITIGROUP INC (Q)   | President (Non-Brd)             |                                   | n.a.           |  |
| Jun 1995       | Oct 1998    | TRAVELERS GROUP INC (Q)   | President/COO (Brd - ED)        |                                   | n.a.           |  |
| Jan 1996       | Nov 1997    | SMITH BARNEY MUN FD INC (Q)   | Chairman/CEO (Brd - ED)         |                                   | n.a.           |  |
| Mar 1994       | Jan 1996    | SMITH BARNEY MUN FD INC (Q)   | COO (Non-Brd)                   | Also Chairman, Initiative Officer | n.a.           |  |
| May 1988       | Jun 1995    | TRAVELERS GROUP INC (Q)   | CFO (Brd - ED)                  |                                   | n.a.           |  |
| 1986           | 1988        | Commercial Credit Co (P)  | Senior VP/CFO (Non-Brd)         |                                   | n.a.           |  |
| 1982           | 1985        | AMERICAN EXPRESS CO (Q)   | Vice President (Non-Brd)        |                                   | n.a.           |  |

**Personal (in Dec/06):**

- . age = 50
- . male dummy = 1
- . foreign dummy = 0

**Professional Experience (as of Dec/06):**

- . time in role = 1
- . time in firm = 6.8
- . dummy external hire = 0
- . time in sector = 25
- . past CEO dummy = 1 (at Bank One)
- . other industry experience dummy = 0
- . other country experience dummy = 0

**Board Experience (as of Dec/06):**

- . past board positions = 6
- . current board positions = 1

Appendix C: Continued

| Current Other Activities |   |                  |
|--------------------------|---|------------------|
| Start Date               | Organisation  | Role             |
|                          | Harvard Business School                                       | Director         |
|                          | National Centre on Addiction and Substance Abuse (CASA) (USA) | Director         |
|                          | New York University School of Medicine                        | Trustee          |
|                          | United Negro College Fund (UNCF)                              | Director         |
|                          | University of Chicago   | Committee Member |

| Past Other Activities |          |   |               |
|-----------------------|----------|---|---------------|
| Start Date            | End Date | Organisation  | Role          |
| 15 Feb 2001           |          | University of Chicago                                   | Trustee       |
|                       |          | Chicago Community Trust (CCT)                           | Trustee       |
|                       |          | Financial Services Roundtable (FSR)                     | Director      |
|                       |          | Kennedy Center Corporate Fund                           | Vice Chairman |
|                       |          | National Association of Securities Dealers (NASD) (USA) | Board Member  |
|                       |          | New York University Medical Center                      | Trustee       |
|                       |          | Young Presidents' Organization (YPO)                    | Member        |

| Education |                         |               |
|-----------|-------------------------|---------------|
| Date      | Institute               | Qualification |
| 1982      | Harvard Business School | MBA           |
| 1978      | Tufts University        | BA            |

| Achievements |               |  |
|--------------|---------------|--|
| Date         | Organisation  | Award/Achievement                              |
| 2006         | Time Magazine | One of the World's 100 Most Influential People |
| 2002         | Morningstar   | CEO of the Year                                |

**Education degrees:**

- . college degree dummy = 1
- . graduate degree dummy = 1
- . US MBA dummy = 1