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This paper examines how different types of interactions with U.S. markets by non-U.S. firms are associated with higher levels of CEO pay, greater emphasis on incentive-based compensation, and smaller pay gaps with U.S. firms. Using a sample of CEOs of UK firms and using both broad cross-sectional and narrow event-window tests, we find that capital market relationship in the form of a U.S. exchange listing is related to higher UK CEO pay; however, the effect is similar when UK firms have a listing in any foreign country, implying a foreign listing effect not unique to the United States. Product market relationships measured by the extent of sales in the United States by UK companies are associated with higher pay, greater use of U.S.-style pay arrangements, and a reduction in the U.S.–UK pay gap. The product market effect is incremental to the effect of a U.S. exchange listing, the extent of the firm's non-U.S. foreign market interactions, and the characteristics of the executive. The U.S.–UK CEO pay gap reduces in UK firms that make U.S. acquisitions. Furthermore, the firm's use of a U.S. compensation consultant increases the sensitivity of UK pay practices to U.S. product market relationships.

Key words: CEO compensation; corporate governance; cross-listing; executive pay; globalization; incentives; international pay differences
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1. Introduction

Prior research shows that U.S. CEOs receive higher pay than do their foreign peers (Abowd and Bognanno 1995, Conyon and Murphy 2000, Fernandes et al. 2013). These differences are primarily due to U.S. firms' greater reliance on long-term, incentive-based compensation. Such incentive-based compensation leads to pay packages that are sensitive to firm performance and have the potential for large payouts (Hall and Liebman 1998). Despite these differences, recent worldwide evidence points to higher levels of CEO pay and a greater reliance globally on incentive pay (Thomas 2008; Conyon et al. 2011a, b; Fernandes et al. 2013). In this paper, we examine how different types of interactions with U.S. markets lead non-U.S. firms to increase their level of CEO pay, to rely more on incentive pay, and to close the pay gap with U.S. firms.

Cheffins (2003) posits that non-U.S. firms have an incentive to structure pay packages similar to those in U.S. firms if they possess U.S. operations, face U.S.-based competitors, are exposed to the U.S. legal and regulatory environment, or employ executives capable of managing a U.S. company. The incentive to

adopt U.S.-style pay arises from (1) the need to eliminate internal and external pay disparities arising from having U.S. operations and acquiring U.S. companies, (2) the impact of the U.S. legal regime on managerial responsibility and risk, and (3) competition to hire and retain global talent.

Local institutional factors can, however, mitigate the influence of these cross-border market forces on local pay practices (Bebchuk and Roe 1999). These factors include local governance mechanisms that differ from those in the United States; stakeholder pressure (e.g., labor unions); pay restrictions under corporate law; cultural and societal norms; media scrutiny and political outrage; and poorly developed capital markets that limit the use of option and equity-based pay.[1]

Using data on pay practices of 416 publicly traded UK firms from 2002 to 2007, we test the proposition

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[1] In many countries, provisions in corporate law, tax rules, and "soft law," such as corporate governance codes, can influence pay practices. For example, mandated shareholder voting on pay schemes (e.g., "say on pay" in the United Kingdom) allows for greater exercise of shareholder power, which can mitigate higher pay levels.

that exposure to U.S. markets influences compensation practices in foreign firms. We measure three forms of the UK firms' interactions with U.S. markets: exposure to U.S. capital markets measured by the presence of a U.S. exchange listing, exposure to U.S. product markets measured by the relative importance of U.S. sales to the firm, and operational exposure to the United States measured by the extent of prior U.S. acquisition activity. We also measure analogous variables relating to the firms' non-U.S. foreign market interactions.[2] Each construct captures a distinct channel by which the firm's U.S. and non-U.S. foreign market interactions can influence its pay practices. To the extent that U.S. market interactions create compensation-related pressures, pay practices at the UK firms should display stronger association with measures of U.S. market interactions than with the analogous non-U.S. foreign interactions.

Our main tests are cross-sectional—we examine the variation in UK CEO pay in relation to the three economic interactions mentioned above. We also conduct two other tests to corroborate the main findings. First, because the incentive to adopt U.S.-style pay is greatest around the initiation or expansion of U.S. activities, we examine pay around two distinct events, a U.S. acquisition and a U.S. listing. These tests allow us to better isolate the distinct events that are associated with the observed pay differences. Second, we implement a propensity score based matched sample design where we examine the difference in CEO pay between UK firms and comparable U.S. firms ("pay gap") as a function of the three types of economic interactions. If U.S. economic interactions make UK CEO pay similar to U.S. CEO pay, we would expect to observe a negative relation between the pay gap and proxies for U.S. exposure.

We find that the CEO pay practices of UK firms relate to their level of U.S. market exposure. First, total pay and incentive-based pay increase with the firm's exposure to U.S. product markets (U.S sales ratio) and the presence of U.S.-based operations (prior U.S. acquisitions). In contrast, non-U.S. foreign sales have only a limited impact on the cash-based pay of UK CEOs, and neither non-U.S. foreign sales nor non-U.S. foreign acquisitions are associated with observed levels of incentive-based pay. These results are notable given that non-U.S. foreign sales and non-U.S. foreign acquisitions are more prevalent than the corresponding U.S. activities in the sample. Second, in terms of capital market exposure, UK firms with a U.S. exchange listing award higher CEO pay (in the form of salary but not incentive pay) than do firms without a U.S. listing. However, this higher pay is statistically

similar to pay in firms with non-U.S. foreign exchange listings, suggesting a general foreign listing effect not unique to a U.S. listing. Third, we find that the difference between the pay of a UK CEO and the pay of a CEO at a comparable U.S. firm decreases with the level of the UK firm's U.S. sales and acquisition activity but not when there is a U.S. listing, consistent with the reduction of pay disparities arising from the firm's interaction with the U.S. markets via the product market and its operational activities.

In addition to these economic interactions, we examine CEO's personal and professional ties to the United States and other foreign countries. UK executives who serve on foreign boards earn more than their UK peers who do not; however, this premium is the same for both U.S. and non-U.S. foreign board service. Moreover, after controlling for other firm-level activities and CEO attributes, we find no significant associations between UK pay practices and the executives' educational background and nationality.

Next, we extend these analyses to examine the influence of four governance mechanisms by which U.S. pay practices can be transmitted to non-U.S. firms and potentially increase the sensitivity of UK pay to U.S. market activity. These channels are U.S. board experience of the firm's directors, use of U.S. compensation consultants, presence of U.S. institutional ownership, and use of U.S. companies in the compensation peer group. We find that the sensitivity of UK pay to the presence of U.S. activities is greater for firms that employ U.S. compensation consultants, consistent with this practice being a transmission mechanism for pay practices. In contrast, U.S. institutional ownership, U.S. board experience, and U.S. peer group companies do not alter the sensitivity of UK pay to U.S. interactions.

The event and matched sample tests confirm our basic findings. First, CEOs of UK firms experience an increase in both total pay and incentive-based pay after their firm makes a U.S. acquisition but not after non-U.S. foreign acquisitions. The matched sample tests show a smaller pay gap between UK and U.S. CEO pay when the U.S. sales ratio is higher but no relation with non-U.S. foreign sales. Further, U.S.–UK CEO pay gap reduces after U.S. acquisitions but not after other foreign acquisitions. Second, we see a significant increase in salary after a U.S. listing but, consistent with our cross-sectional results, a similar effect exists around non-U.S. foreign listings as well. In the matched sample tests, a U.S. listing does not cause a decline in the pay gap between UK and matched U.S. firm CEOs once we control for product market links. These findings corroborate the cross-sectional results and are robust to controlling for pay trends over the sample period and for firms without CEO turnover in the event window.

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[2] In all cases where we use the label "non-U.S. foreign" we refer to "non-U.S., non-UK" countries.

We contribute to a small set of papers that examines the influence of global market interactions on CEO compensation in foreign firms. Fernandes et al. (2013) examine the U.S. pay premium across 26 countries using one year of data. Our study complements that paper by examining, in greater depth, a sample of firms from one country. Our focus on one country allows us to use more granular data on the geography of foreign exposure (U.S. versus non-U.S. activity); the different types of market interactions (capital, product, and operational); individual characteristics (director and CEO board experience, nationality, and education); and potential channels by which governance practices are transferred (U.S. board experience, use of U.S. compensation consultants, U.S. institutional ownership, and peer groups). Furthermore, unlike their one year of data, our time series data allow us to conduct event studies that control for firm- and executive-level unobserved heterogeneity.

In a related study, Carter et al. (2009b) compare CEO compensation between U.S. firms and a sample of European companies from 2003 through 2007 and find that the pay gap shrinks over time. Similar to our study, they examine whether pay is higher when the CEO is an American and when the board includes U.S.-based directors. However, this paper does not examine the wider range of U.S. product market, capital market, and operational interactions included in our study, nor does it exploit time-series changes in firm-level U.S. market exposures; these limitations produce an incomplete picture of how U.S. market interactions shape foreign pay practices and increase the risk of their results arising from omitted firm- or executive-level characteristics.

Last, Sapp (2008), Southam and Sapp (2010), and Conyon et al. (2011a) document that U.S. listings by Canadian and UK firms are associated with an increase in foreign executives' pay. Our analysis extends their findings by examining the effect of U.S. product market and operating activities and CEO and board characteristics in addition to the U.S. listing. Furthermore, we benchmark the U.S. listing effect by comparing it with other non-U.S. foreign exchange listings. Although we confirm the U.S. listing result documented in these papers, we also show that a similar effect occurs for non-U.S. foreign listings. This result suggests that any foreign listing, not just a U.S. listing, contributes to higher pay. Unlike these papers, we examine product market interactions and find that U.S. product market interactions have an impact on pay that we do not observe when firms interact with non-U.S. foreign product markets.

We provide several important insights relative to this extant literature. First, we extend the literature by considering multiple dimensions of the firms' and CEOs' interactions with U.S. markets and by exploring the relative importance of different U.S. and foreign interactions. This feature of our research design also mitigates concerns about correlated omitted variables. Second, our cross-sectional and event-study tests produce consistent evidence that the existence and initiation of U.S. operations through acquisitions in the United States by UK firms are associated with a shift toward higher pay, greater use of incentive-based pay, and a reduction in the UK–U.S. pay gap. These effects are separable from the effect of U.S. listing and are not simply capturing an expansion of global business activity or operational complexity per se. Third, we benchmark each U.S. interaction effect with a non-U.S. foreign interaction. We show that both U.S. and non-U.S. foreign listings are associated with an increase in average salaries. Moreover, U.S. listings are not associated with greater incentive-based pay or with a reduction in the U.S.–UK pay gap once we control for the extent of U.S. product market exposure. Overall, the impact of U.S. listing is statistically indistinguishable from that of non-U.S. foreign listings, calling into question results in prior literature cited above on the unique impact of U.S. listings on foreign CEO pay. Fourth, we show that the use of U.S. compensation consultants increases the sensitivity of UK pay to U.S. operational activities. Taken together, our results are consistent with cross-border, foreign market interactions influencing home-country pay practices and highlight market-based channels through which U.S.-style pay practices may transfer worldwide.

2. Data and Research Design

Our principal research design examines the association between UK compensation practices and proxies for U.S. market interactions. We focus on UK firms for several reasons. First, the United States and United Kingdom have a long history of economic interdependencies, and a significant number of UK firms access U.S. capital and product markets and have U.S.-based operations. Second, the market for U.S. and UK executive talent likely spans both countries. Because the United States and United Kingdom share a common language, legal traditions, and customs, the costs associated with a U.S. executive living and working in the United Kingdom are lower relative to other countries and vice versa. The resulting executive mobility increases the likelihood that U.S. market forces affect the pay packages of UK executives.[3] Third, despite these strong ties, meaningful differences exist in executive pay practices. UK CEOs historically earn

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[3] Consistent with this greater mobility, the United Kingdom hosts more U.S. expatriates than any other country outside North America.

less than their U.S. counterparts do and receive less incentive-based pay, although more recent data suggest that UK pay packages are trending toward U.S. levels (Towers Perrin 2001, Conyon and Murphy 2000, Conyon et al. 2011a). Fourth, UK firms are required to disclose information on executive compensation packages, providing a source of high-quality compensation data.[4] Fifth, by focusing on one country, we hold constant the legal, regulatory, political, cultural, and economic factors that can lead to correlated omitted variable problems in multi-country studies. Sixth, we can collect more granular data without concerns about the cross-country availability, comparability, and quality of information.[5] Finally, many of the institutional arrangements in the United Kingdom, including strong legal systems and investor protections, diffuse ownership structures, and sophisticated financial markets, are amenable to the use of U.S.-style, performance-based pay arrangements; as such, several of the countervailing forces outlined in Bebchuk and Roe (1999) are likely to be attenuated in the UK setting.

Together, these factors suggest that the United Kingdom provides a good sample to test the effects of U.S. market interactions on non-U.S. executive pay practices. Moreover, the failure to document a relation in the UK setting would cast doubt on arguments that U.S. market interactions influence the compensation arrangements and governance practices of non-U.S. firms.

2.1. Sample Construction
Our data set on pay practices of publicly traded UK firms is from Hemscott (part of Morningstar, Inc.). It includes detailed data on CEO pay in 445 publicly traded UK firms from 2002 to 2007 (1,646 firm-year observations) as well as data on board composition, director and executive stock holdings, and corporate financial information. To be included in the final sample, we require each firm to have accounting, stock price, and governance data to implement our primary empirical tests. Firm-level financial data are from Hemscott, Datastream, and company annual reports. Stock price data are from Datastream. Data on U.S. and non-U.S. foreign board experience and CEO education background are from Boardex and hand-collected from annual reports. These data requirements result in a final sample of 1,543 firm-year observations from 416 unique UK firms over the period 2002–2007.

2.2. Measurement of Executive Compensation Practices
We identify five components of compensation for UK executives: salary, bonus, benefits-in-kind, option grants, and restricted stock grants. We define *Cash Compensation*$_{it}$ as the sum of *Salary*$_{it}$, *Benefits-in-Kind*$_{it}$, and *Bonus*$_{it}$; *Equity Compensation*$_{it}$ as the sum of the value of option grants and restricted stock grants; and *Total Compensation*$_{it}$ as the sum of *Cash Compensation*$_{it}$ and *Equity Compensation*$_{it}$. The value of option grants and restricted stock grants is the fair market value on the grant date. For option grants, we use the Black–Scholes formula assuming a 10-year life for the options. We use five-year UK government bond yields for the risk-free rate and estimate volatility using daily returns starting 260 calendar days after and ending 111 calendar days before the fiscal year-end of the grant. Dividend yields are from Datastream.[6]

To measure the extent of the use of incentive-based pay, we define *Equity Ratio*$_{it}$ as the ratio of *Equity Compensation*$_{it}$ to *Total Compensation*$_{it}$. Given the subjective nature of the assumptions in valuing option grants (e.g., time to exercise, vesting period, volatility, and potential for repricing), we also construct an indicator variable *Option Grant*$_{it}$ to equal 1 if the executives received an option grant in a given year and 0 otherwise to reflect the use of option-based pay by the firm.

2.3. Measurement of U.S. Market Interactions and Expected Impact on UK Compensation
This section discusses several potential paths by which firm-level U.S. interactions can shape pay practices and the variables we use to measure a UK firm's exposure to specific U.S. and global markets.

2.3.1. U.S. Product Markets. To attract and retain high-quality managerial talent, non-U.S. firms expanding into or selling in the United States must offer their U.S.-based executives competitive pay packages. However, if U.S.-based executives are paid more than their firm's home-country peers, pay disparities will arise within the organization. To alleviate adverse incentive, effort, and retention effects arising from internal pay disparities, non-U.S. firms would have to revise their home-country pay to better align with U.S. pay levels and composition. We capture the relative importance of foreign sales by the percentage of the firm's total sales generated in the U.S. and non-U.S. foreign markets each year, denoted as *U.S. Sales*

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[4] For example, even American depository receipt (ADR) firms are not required to comply with U.S. executive compensation disclosure requirements.

[5] A number of prior papers, including Kaplan (1994a, b), have adopted a single-country research design while exploring questions relating to comparative governance.

[6] As discussed by Carter et al. (2009a), many UK firms attach absolute or relative performance-vesting conditions to equity grants. Our estimates of the value of restricted stock and option grants may therefore be upwardly biased.

Ratio$_{it}$ and *Non-U.S. Sales Ratio*$_{it}$. Geographical sales data are obtained from each firm's annual report.[7]

2.3.2. U.S. Operations. A similar misalignment arises if a foreign firm acquires a U.S. company whose executives are compensated differently from those in the acquiring firm.[8] The acquiring firm would have an incentive to adopt U.S.-style pay to minimize pay inequalities across global business units. We predict that UK firms with greater levels of U.S. operations are more likely to align their compensation with U.S. practices, both in terms of the level of pay and the use of incentive-based pay (i.e., composition of pay). Moreover, we hypothesize that non-U.S. foreign operations do not produce similar pay effects because they are less likely to generate internal pay disparities.

We capture the relative size of the UK firms' foreign business units acquired through mergers and acquisitions (M&A) activity by the percentage of total assets derived from historical foreign M&A.[9] We define the variable *U.S. Acquisition Ratio*$_{it}$ as the cumulative value of all U.S. acquisitions made by the UK firm between 1985 and year t, scaled by the firm's total assets at the end of year t. We define *Non-U.S. Acquisition Ratio*$_{it}$ as the cumulative value of all non-U.S. foreign (non-U.S., non-UK) acquisitions made by the UK firm between 1985 and year t, scaled by the firm's total assets at the end of year t. All acquisition ratios are log transformed because of skewness in the data. M&A data are from Thomson's SDC database.[10]

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[7] We recognize that our sales measure is an imperfect proxy for the scope of sales operations in the United States. To the extent that the UK firm simply exports product to the U.S. market or has only limited selling operations (e.g., uses a foreign sales corporation for distribution purposes only), our sales variable captures the scope of product market interactions with the United States with error.

[8] The acquisition of Chrysler by DaimlerBenz AG is an example of such a transaction. The U.S. executives of Chrysler were paid substantially more than their German counterparts at DiamlerBenz. These differences in compensation practices created significant integration issues for the combined firm. See Blaško et al. (2000) for details.

[9] An alternative approach to measuring operational exposure to the United States is to identify the percent of the firm's total assets located in the U.S. and in non-U.S. foreign markets. Unfortunately, asset-based geographical data for UK firms have two limitations: (1) geographical asset data is provided with less frequency and more coarsely than geographic sales data; and (2) many UK firms report net assets (assets minus liabilities), not total identifiable assets, in their geographical segment reports. In robustness tests (not tabulated) we find that our results and inferences are robust to the use of both a U.S. asset ratio variable and an indicator variable denoting firms with more than 10% of net assets located in the United States.

[10] Ideally, our measurement of cumulative historical foreign acquisition activity would extend to the start of the firm; however, we are limited by a lack of complete, historical transaction data and transaction values before 1985. To the extent that U.S. and non-U.S. acquisition activity is measured with error, the presence

2.3.3. U.S. Stock Exchange Listing. Any foreign firm that lists on a U.S. exchange is required to comply with U.S. securities laws and related regulations, including the Sarbanes–Oxley Act and the Foreign Corrupt Practices Act; its executives are exposed to the potential civil and criminal penalties of the litigious U.S. legal environment.[11] Additionally, listing firms need to employ executives capable of navigating the reporting and governance requirements associated with a U.S. listing and the nuances of raising capital from U.S. investors. For these reasons, we expect CEOs of UK firms with a U.S. exchange listing to demand compensation similar to that of CEOs at publicly traded U.S. firms.[12]

We measure listing on a U.S. exchange by an indicator variable *U.S. Listing*$_{it}$ that equals 1 if the UK firm's equity shares are listed on a U.S. exchange in year t and 0 otherwise. An analogous indicator variable, *Non-U.S. Listing*$_{it}$, is set to equal 1 if the firm's equity shares are listed on a non-U.S. foreign stock exchange at the end of 2007 and 0 otherwise.[13] We obtain data on U.S. exchange listings from the Bank of New York ADR database. Data on non-U.S. exchange listings are from Datastream.

2.4. Measurement of CEO Characteristics and Expected Impact on UK Compensation

In addition to the firm's U.S. market interactions, the global personal and professional ties of the CEO could also influence the executive's pay package. To the extent that UK executives possess the skills to manage a U.S. company, are willing work in the United States, and have credible U.S. employment opportunities, we expect them to demand compensation arrangements similar to their U.S. counterparts'. We identify three individual characteristics that capture the executive's exposure to the United States: U.S. nationality, U.S. educational background, and U.S. board experience.

We set the indicator variable *U.S. Nationality*$_j$ equal to 1 if BoardEx identifies the executive's nationality/citizenship as American and 0 otherwise. We set

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of long-term foreign operations will also be captured by the firm's foreign sales ratios.

[11] Consistent with this greater litigation risk, Seetharaman et al. (2002) find that UK auditors charge higher fees when their clients cross-list in the United States, but not when the clients cross-list in non-U.S. markets.

[12] Similar reservation wage arguments exist to the extent that exposure to the U.S. product markets and U.S. operations subjects the non-U.S. executive to additional legal risks and responsibilities, such as product liability and discrimination laws.

[13] Our measure of the presence of non-U.S. foreign stock exchange listings is limited to firm-initiated listing decisions. We exclude listings on exchanges that can be investor initiated or that limit the firm's formal external reporting requirements, such as the Frankfurt Stock Exchange's Open (Unregulated) Market.

the indicator variable *U.S. Education$_j$* equal to 1 if the UK executive received a bachelor's degree or higher from a U.S. institution and 0 otherwise. The indicator variable *CEO U.S. Board Experience$_{it}$* is equal to 1 if the UK firm's CEO serves as a board member of a publicly traded U.S. corporation in year t and 0 otherwise. Analogous indicator variables, *CEO Non-U.S. Foreign Nationality$_j$*, *CEO Non-U.S. Foreign Education$_j$*, and *CEO Non-U.S. Board Experience$_{it}$*, equal 1 if, respectively, the executive's nationality/citizenship is neither UK nor U.S., the executive received a degree from a non-U.S. foreign institution, or the executive serves as a member of a non-U.S. foreign board in year t; they are 0 otherwise.

2.4.1. Descriptive Statistics. Table 1 presents descriptive statistics for our sample (see the appendix for the variable definitions). In terms of financial attributes (see panel A), firms tend to be both large and profitable, with mean (median) total assets of £16.67 billion (£1.35 billion), mean (median) market capitalizations of £4.89 billion (£1.10 billion), and mean (median) return on assets of 0.09 (0.08). There is, however, considerable variation in firm size and performance across our sample; more than 25% of the sample firms have total assets of greater than (less than) £4.5 billion (£600 million), and possess a return on assets greater than (less than) 0.13 (0.04). In terms of governance attributes, the mean board size is

Table 1   Descriptive Statistics

Panel A: Firm and CEO characteristics									
	Mean	Std. dev.	Min	5%	25%	Median	75%	95%	Max
Assets (in £ millions)	16,672	78,180	21	179	586	1,348	4,518	49,961	996,023
Ln(*Assets*)	14.42	1.70	9.94	12.10	13.28	14.11	15.32	17.73	20.72
MVE (in £ millions)	4,895	13,582	33	278	5,301	1,099	2,969	21,554	121,883
Ln(*MVE*)	14.17	1.34	10.40	12.54	13.18	13.91	14.90	16.89	18.62
Market-to-Book	3.24	2.86	0.44	0.61	1.39	2.35	3.93	10.92	12.68
ROA	0.09	0.09	−0.23	−0.01	0.04	0.08	0.13	0.26	0.40
CFO	0.09	0.08	−0.09	−0.01	0.03	0.08	0.13	0.24	0.40
Return	0.08	0.23	−0.49	−0.26	−0.05	0.06	0.19	0.49	0.93
Volatility	0.29	0.14	0.00	0.15	0.20	0.26	0.35	0.54	0.91
Percent Shares Held	1.38	5.27	0.00	0.00	0.01	0.05	0.25	8.48	36.24
Ln(*Percent Shares Held*)	0.33	0.71	0.00	0.00	0.01	0.05	0.22	2.25	3.62
Percent Inside Director	40.99	12.11	7.69	21.43	33.33	41.67	50.00	60.00	100.00
Board Size	9.68	2.67	3.00	6.00	8.00	9.00	11.00	15.00	21.00
Ln(*Board Size*)	2.23	0.27	1.10	1.79	2.08	2.20	2.40	2.71	3.04
CEO Age	51.87	6.83	31.00	41.00	47.00	52.00	57.00	62.00	77.00
CEO Tenure (*months*)	63.98	62.48	1.00	7.00	24.00	46.00	82.00	182.00	480.00
Ln(*CEO Tenure*)	3.76	0.97	0.69	2.08	3.22	3.85	4.42	5.21	6.18

Panel B: Foreign, U.S., and non-U.S. foreign market interactions									
	Mean	Std. dev.	Min	5%	25%	Median	75%	95%	Max
Foreign Sales Ratio	0.42	0.38	0.00	0.00	0.00	0.39	0.81	1.00	1.00
U.S. Sales Ratio	0.15	0.20	0.00	0.00	0.00	0.00	0.28	0.56	0.99
Non-U.S. Foreign Sales	0.28	0.30	0.00	0.00	0.00	0.17	0.50	0.85	1.00
Foreign Acquisitions	0.54	0.50	0.00	0.00	0.00	1.00	1.00	1.00	1.00
U.S. Acquisitions	0.38	0.49	0.00	0.00	0.00	0.00	1.00	1.00	1.00
Non-U.S. Foreign Acquisitions	0.50	0.50	0.00	0.00	0.00	0.00	1.00	1.00	1.00
Ln(*Foreign Acquisition Ratio*)	0.13	0.23	0.00	0.00	0.00	0.00	0.16	0.59	1.56
Ln(*U.S. Acquisition Ratio*)	0.07	0.18	0.00	0.00	0.00	0.00	0.03	0.39	1.55
Ln(*Non-U.S. Foreign Acquis. Ratio*)	0.07	0.14	0.00	0.00	0.00	0.00	0.07	0.37	0.96
Foreign Listing	0.29	0.45	0.00	0.00	0.00	0.00	1.00	1.00	1.00
U.S. Listing	0.26	0.44	0.00	0.00	0.00	0.00	1.00	1.00	1.00
Non-U.S. Foreign Listing	0.07	0.25	0.00	0.00	0.00	0.00	0.00	1.00	1.00
CEO Foreign Education	0.49	0.50	0.00	0.00	0.00	0.00	1.00	1.00	1.00
CEO U.S. Education	0.45	0.50	0.00	0.00	0.00	0.00	1.00	1.00	1.00
CEO Non-U.S. Foreign Educ.	0.15	0.36	0.00	0.00	0.00	0.00	0.00	1.00	1.00
CEO Foreign Board Experience	0.09	0.28	0.00	0.00	0.00	0.00	0.00	1.00	1.00
CEO U.S. Board Experience	0.04	0.21	0.00	0.00	0.00	0.00	0.00	0.00	1.00
CEO Non-U.S. Foreign Board	0.04	0.21	0.00	0.00	0.00	0.00	0.00	0.00	1.00
CEO Foreign Nationality	0.18	0.38	0.00	0.00	0.00	0.00	0.00	1.00	1.00
CEO U.S. Nationality	0.06	0.23	0.00	0.00	0.00	0.00	0.00	1.00	1.00
CEO Non-U.S. Foreign Nationality	0.12	0.33	0.00	0.00	0.00	0.00	0.00	1.00	1.00

Table 1   (Continued)

Panel C: Compensation variables (in £s thousand)								
	Mean	Std. dev.	Min	5%	25%	Median	75%	95%	Max
Total Compensation	1,511.73	1,897.92	14.74	321.00	621.00	971.32	1,696.45	42,833.38	27,021.01
Ln(Total Compensation)	13.86	0.82	9.60	12.68	13.34	13.79	14.34	15.27	17.11
Cash Compensation	921.80	714.55	0.00	269.28	501.00	714.00	1,097.00	2,357.66	7,613.00
Ln(Cash Compensation)	13.46	1.08	0.00	12.50	13.12	13.48	13.91	14.67	15.85
Salary	469.24	237.44	0.00	190.00	315.00	420.00	586.00	888.00	2,761.32
Ln(Salary)	12.88	1.07	0.00	12.15	12.66	12.95	13.28	13.70	14.83
Bonus	406.17	560.43	0.00	0.00	109.20	253.92	480.00	1,424.00	7,127.00
Ln(Bonus)	11.01	4.25	0.00	0.00	11.60	12.44	13.08	14.17	15.78
Equity Compensation	589.94	1,559.98	0.00	0.00	0.00	200.00	594.23	2,143.59	24,924.01
Ln(Equity Compensation)	8.63	6.16	0.00	0.00	0.00	12.21	13.30	14.58	17.03
Option Grant	0.39	0.49	0.00	0.00	0.00	0.00	1.00	1.00	1.00
Equity Ratio	0.25	0.24	0.00	0.00	0.00	0.23	0.42	0.65	1.00

Panel D: Mean compensation levels conditional on U.S. market exposure					
	Total compensation (in £s)	Cash compensation (in £s)	Equity compensation (in £s)	Equity ratio	Option grants	N
U.S. Sales	1,825,071***	1,083,569***	741,502***	0.271***	0.464***	756
No U.S. Sales	1,210,738	766,396	444,342	0.228	0.318	787
U.S. Acquisitions	1,928,837***	1,124,276***	804,561***	0.286***	0.485***	592
No U.S. Acquisitions	1,252,086	795,753	456,333	0.226	0.332	951
U.S. Exchange Listing	2,567,688***	1,382,714***	1,184,974***	0.307***	0.454***	403
No U.S. Exchange Listing	1,138,444	758,858	379,586	0.228	0.367	1,140
CEO U.S. Education	1,736,367***	1,033,783***	702,584**	0.264**	0.404	695
CEO No U.S. Education	1,327,629	830,016	497,614	0.237	0.377	848
CEO U.S. Board Exper.	3,299,679***	1,687,478***	1,612,200***	0.325***	0.464	69
CEO No U.S. Board Exper.	1,428,037	885,954	542,083	0.245	0.386	1,474
CEO U.S. Nationality	2,173,275***	1,293,850***	879,425*	0.280	0.456	90
CEO Non-U.S. Nationality	1,470,757	898,751	572,006	0.247	0.385	1,453

Notes. This table presents descriptive statistics on our sample of UK firm-years over the period 2002–2007. $N = 1,543$.

*, **, ***U.S. realization significantly different from no U.S. activity realization at the 1%, 5%, and 10% levels (two-tailed test), respectively.

9.7 directors; 41.0% of the directors are classified as insiders; and executives own, on average, 1.38% of outstanding shares. Finally, the mean (median) CEO is 52 (52) years old with a mean (median) tenure of approximately five (four) years.

Sample firms engage in extensive foreign market activity (see panel B). The mean firm generates 42% of total revenue from foreign product markets, 54% of firms have engaged in foreign M&A activity, and 29% list shares on a foreign exchange. Focusing on the United States, the average firm generates 15% of total revenue from the United States, yet more than half of the firms generate no U.S. revenue. Thirty-eight percent of firms have engaged in a U.S. acquisition and 26% are listed on a U.S. exchange.

Consistent with prior research, the compensation arrangements of our UK firms are heavily tilted toward cash-based pay (see panel C). The mean CEO earns a total annual sum of £1,511,730, of which £921,822 is cash compensation. The median CEO earns less than one million pounds; median cash and equity-based pay are £714,000 and £200,000, respectively. This composition is also reflected in the mean and median equity ratios of 0.25 and 0.23.[14]

Finally, panel D presents univariate comparisons of pay levels for firms with and without U.S. market exposure. Total pay, cash pay, equity pay, equity ratios, and option grant usage are all significantly higher along our three dimensions of the firm's U.S. interactions: U.S. sales activity, U.S. acquisitions, and U.S. exchange listing. Similarly, total pay, cash pay,

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[14] Consistent with prior findings, compensation levels are increasing for UK CEOs over the sample period (results not tabulated for parsimony). Except for the elevated levels reported for 2002, mean (median) total compensation increased steadily from £1.25 (£0.89) million in 2003 to £1.88 (£1.25) million in 2007. The trend arises mainly from increases in incentive-based pay, both in the form of cash bonuses and equity-based compensation. The spike in mean compensation levels in 2002 is influenced by five large option/equity grants (grants greater than £10 million). The Hemscott data are also subject to a potential large-firm bias in the first year (2002) of the database (e.g., mean and median market capitalizations are greater in 2002 than in 2003).

and equity pay are all significantly higher for CEOs with individual-level ties to the U.S. labor market: U.S. citizenship, U.S. education, and U.S. board experience. These descriptive statistics do not, however, take into account that firms with significant U.S. market interactions are likely to be larger, more complex organizations.

We also examine univariate correlations (untabulated) of firm-level attributes and the compensation practices of our UK firms and find that the latter are strongly correlated with firm size, board composition, stock ownership, and return volatility. Many of these firm-level attributes are also correlated with measures of U.S. market interactions; we control for these in the multivariate analysis.

In addition, the U.S. activities of UK firms tend to be correlated. For example, the correlation between *U.S. Sales Ratio$_{it}$* and *U.S. Acquisition Ratio$_{it}$* is 0.47, consistent with many firms establishing a U.S. product market presence through M&A activity. Similarly, the correlation between *U.S. Sales Ratio$_{it}$* and *U.S. Listing$_{it}$* is 0.26, consistent with prior evidence that foreign firms access the U.S. capital market for product market reasons (e.g., Pagano et al. 2002, Sarkissian and Schill 2004, Piotroski and Srinivasan 2008). The positive correlation of 0.18 (0.14) between *U.S. Sales Ratio$_{it}$* and *CEO U.S. Education$_j$* (*CEO U.S. Board Experience$_{it}$*) highlights the impact of product market activities on labor market choices; in this case, UK firms appear to hire executives with U.S. educational and professional backgrounds to manage global businesses with U.S. operations. Together, these correlations highlight the importance of examining specific U.S. market interactions while controlling for other U.S. market activities.

Finally, UK firms' pay practices are positively correlated with the extent of the firms' U.S. market interactions. However, as noted earlier, these positive relations could simply reflect the awarding of greater pay to executives who manage larger, more complex operations; as such, all tests examining the relations between UK pay and U.S. market interactions will control for both firm size and the level of the firm's non-U.S. foreign market interactions. We outline, report, and discuss these tests below.

3. Empirical Results

To validate our UK compensation data and establish baseline relations between pay and firm-level characteristics, we estimate several versions of the following pooled, cross-sectional model:

$$Ln(Compensation_{it})$$
$$= \alpha + \sum_{k=1}^{34} \gamma_k Industry_k + \sum_{t=1}^{4} Year_t + \beta_1 Ln(Assets_{it})$$

$$+ \beta_2 Market\text{-}to\text{-}Book_{it} + \beta_3 ROA_{it} + \beta_4 CFO_{it}$$

$$+ \beta_5 Stock\ Return_{it} + \beta_6 Return\ Volatility_{it}$$

$$+ \beta_7 Ln(Tenure_{it}) + \beta_8 Ln(Percent\ Shares\ Held_{it})$$

$$+ \beta_9 Percent\ Inside\ Directors_{it}$$

$$+ \beta_{10} Ln(Board\ Size_{it}) + \varepsilon_{it}. \tag{1}$$

In these estimations, the dependent variable captures a specific dimension of each firm's compensation practices.[15] For *Total Compensation$_{it}$*, *Cash Compensation$_{it}$*, *Salary$_{it}$*, *Bonus$_{it}$*, and *Equity Compensation$_{it}$*, the compensation variables are logarithmically transformed to control for the effects of heteroscedasticity and skewness. For estimations using *Equity Compensation$_{it}$* and *Equity Ratio$_{it}$* as the dependent variable, we use a Tobit model because of the substantial number of zero observations in the equity compensation data. For estimations using the indicator variable *Option Grant$_{it}$* as the dependent variable, we use a logistic model specification.

In these cross-sectional models, we include common measures of the determinants of the level and composition of CEO pay. All variables are defined in Table 1.[16] We include the natural logarithm of total assets because larger firms are expected to hire more able CEOs with higher reservation wages (Baker and Hall 2004). We include the firm's market-to-book ratio to proxy for growth opportunities following Smith and Watts (1992). To control for firm performance, we include the firm's annual return on assets and stock return. We include the volatility of the firm's stock returns because firm risk can lead risk-averse CEOs to demand premiums for performance-based pay. We also include annual cash flow because firms with cash flow difficulties may grant higher levels of equity to conserve cash (Core and Guay 1999, 2001).

Core et al. (1999) show that corporate governance is related to the level of CEO pay. We therefore include in the cross-sectional models the log of the percentage of shares held by the CEO and two measures of the firm's board structure: percentage of inside directors and log of board size (Yermack 1996). These and later regressions include industry and year fixed effects. Standard errors are clustered at the firm level. In untabulated results, these estimations corroborate basic relations between UK pay practices and firm

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[15] In these and subsequent analyses, we do not separately analyze benefits-in-kind. For our sample, this form of compensation is economically small (mean = £46,383; median = £23,346) and displays limited variation across firms and over time.

[16] To eliminate the effect of outliers in our analysis, we winsorize the following variables at the 1st and 99th percentiles: *Market-to-Book$_{it}$*, *ROA$_{it}$*, *CFO$_{it}$*, *Stock Return$_{it}$*, *Return Volatility$_{it}$*, and *Percent Shares Held$_{it}$*. All results are robust to winsorizing all variables at the 1st and 99th percentile.

attributes such as firm size and performance, as documented in prior research on U.S. firms.

3.1. Influence of U.S. and Non-U.S. Foreign Market Interactions on UK Total Compensation

Our first set of tests examines the association between the firm's aggregate foreign market interactions and its compensation practices. We expand Equation (1) to include variables that capture the extent of the firm's total foreign sales, foreign acquisition activity, and foreign exchange listings. We estimate several versions of the following pooled, cross-sectional model:

$$\text{Ln}(\textit{Total Compensation}_{it})$$
$$= \alpha + \sum_{k=1}^{34} \gamma_k \textit{Industry}_k + \sum_{t=1}^{4} \textit{Year}_t + \sum_{j=1}^{10} \beta_j \textit{Control Variables}_j$$
$$+ \beta_{11} \textit{Foreign Sales Ratio}_{it}$$
$$+ \beta_{12} \text{Ln}(\textit{Foreign Acquisition Ratio}_{it})$$
$$+ \beta_{13} \textit{Foreign Listing}_{it} + \varepsilon_{it}. \tag{2}$$

We present select coefficients and standard errors (in parentheses) from these estimations in Table 2, panel A. The first three columns present coefficients from the regression of total compensation on a specific dimension of each firm's foreign market interactions. The results reveal that the total pay for UK CEOs is significantly positively associated with the firm's level of foreign sales and listing on a foreign exchange. Estimated coefficients in the last column, where we include all three foreign market interaction variables, continue to exhibit significant positive relations between total compensation and the firm's foreign sales ratio and foreign listing decision.[17]

We next split our foreign market variables into measures of the firm's U.S. and non-U.S. foreign market interactions because we expect U.S. market interactions to have a more significant role in UK pay arrangements than non-U.S. foreign market interactions have. Specifically, we expand Equation (2) to include variables that capture the extent of the firm's

total U.S. and non-U.S. foreign sales, U.S. and non-U.S. foreign acquisition activity, and U.S. and non-U.S. foreign exchange listings as follows:

$$\text{Ln}(\textit{Total Compensation}_{it})$$
$$= \alpha + \sum_{k=1}^{34} \gamma_k \textit{Industry}_k + \sum_{t=1}^{4} \textit{Year}_t + \sum_{j=1}^{10} \beta_j \textit{Control Variables}_j$$
$$+ \beta_{11} \textit{U.S. Sales Ratio}_{it} + \beta_{12} \textit{Non-U.S. Sales Ratio}_{it}$$
$$+ \beta_{13} \text{Ln}(\textit{U.S. Acquisition Ratio}_{it})$$
$$+ \beta_{14} \text{Ln}(\textit{Non-U.S. Foreign Acquisition Ratio}_{it})$$
$$+ \beta_{15} \textit{U.S. Listing}_{it}$$
$$+ \beta_{16} \textit{Non-U.S. Foreign Listing}_{it} + \varepsilon_{it}. \tag{3}$$

Select coefficients and standard errors (in parentheses) from these estimations are presented in Table 2, panel B. The results show that two measures of the firm's U.S. market interactions—*U.S. Sales Ratio*$_{it}$ and *U.S. Listing*$_{it}$—have significant individual positive associations with the total compensation of UK CEOs. To control for the impact of greater global activities per se, the models also include measures of the firm's total non-U.S. foreign activities. Any compensation premium related to the scope of global activities should be related to both U.S. and non-U.S. foreign sales and acquisition variables. Of the non-U.S. foreign interactions, only non-U.S. foreign listings display a significant association with total compensation, and the non-U.S. listing coefficients are statistically indistinguishable from the U.S. listing coefficients. Neither of the other two non-U.S. foreign market interactions, sales ratio and acquisition ratio, displays a significant association with compensation practices, and the estimated coefficients on *U.S. Sales Ratio*$_{it}$ are significantly larger than the coefficients on *Non-U.S. Foreign Sales Ratio*$_{it}$.

The last column presents results in which we include all three market interactions; after controlling for all factors, we continue to observe significant positive relations between total compensation and the firm's U.S. sales ratio and U.S. exchange listing, mirroring the aggregate foreign market interaction effects observed in panel A. The full model estimation shows that the pay consequences of U.S. product market activities are incremental to the exchange listing effect documented in prior literature. Although *Non-U.S. Foreign Listing* is not significant at conventional levels, the coefficients on *U.S. listing* are statistically indistinguishable from those of *Non-U.S. Foreign Listing* (*p*-value = 0.972).

The differential sensitivity of UK pay to U.S. product market interactions versus analogous non-U.S. foreign product market interactions suggests that the positive coefficient on *U.S. Sales Ratio*$_{it}$ is not just capturing pay premiums for managing a more global or

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[17] Given the positive correlations between these three variables, it is difficult to interpret the ultimate source of these positive relations. As noted in Table 2, foreign acquisition-related activity and foreign exchange listings have correlations of 0.42 and 0.24, respectively, with the firm's foreign sales ratio. Therefore, individual relations documented in the first four columns could be the result of a spurious correlation with another of the firm's foreign activities. For instance, firms may list on a foreign exchange prior to making an acquisition to allow for a stock based transaction. The inclusion of all three variables in the model helps control for potentially omitted variables, but introduces concerns about multicollinearity. For completeness, we present all four models.

Table 2   Influence of Firm-Level Foreign Market Interactions on UK Compensation Practices

Foreign market interaction:	Sales	Acquisition	Listing	All market interactions
	Panel A: Foreign market interactions			
Ln(*Assets*)	0.318***	0.331***	0.297***	0.290***
	(0.023)	(0.023)	(0.026)	(0.025)
Market-to-Book	0.017**	0.018**	0.018**	0.016**
	(0.008)	(0.008)	(0.008)	(0.008)
ROA	0.620*	0.595*	0.527*	0.558*
	(0.319)	(0.323)	(0.314)	(0.314)
CFO	0.618	0.734*	0.621	0.536
	(0.398)	(0.405)	(0.398)	(0.393)
Stock Return	0.143*	0.158**	0.153**	0.143*
	(0.078)	(0.077)	(0.076)	(0.077)
Return Volatility	0.215	0.318	0.305	0.229
	(0.201)	(0.205)	(0.198)	(0.197)
Ln(*Tenure*)	0.089***	0.089***	0.085***	0.086***
	(0.024)	(0.025)	(0.024)	(0.024)
Ln(*Percent Shares Held*)	−0.066	−0.056	−0.051	−0.060
	(0.041)	(0.041)	(0.040)	(0.040)
Percent Inside Directors	−0.008***	−0.008***	−0.008***	−0.008***
	(0.002)	(0.002)	(0.002)	(0.002)
Ln(*Board Size*)	0.203*	0.233**	0.210*	0.182
	(0.119)	(0.118)	(0.117)	(0.119)
Foreign Sales Ratio	0.281***			0.228**
	(0.086)			(0.090)
Ln(*Foreign Acquisition Ratio*)		0.157		0.013
		(0.097)		(0.091)
Foreign Listing			0.249***	0.213***
			(0.070)	(0.074)
Intercept and fixed effects	Included	Included	Included	Included
Adjusted *R*-squared	0.458	0.450	0.460	0.465
	Panel B: U.S. and non-U.S. foreign market interactions			
U.S. Sales Ratio	0.624***			0.594***
	(0.129)			(0.143)
Non-U.S. Foreign Sales Ratio	0.101			0.077
	(0.111)			(0.112)
Ln(*U.S. Acquisition Ratio*)		0.188		−0.138
		(0.114)		(0.095)
Ln(*Non-U.S. Foreign Acquis. Ratio*)		0.089		0.082
		(0.159)		(0.136)
U.S. Listing			0.232***	0.170**
			(0.070)	(0.071)
Non-U.S. Foreign Listing			0.204*	0.174
			(0.109)	(0.111)
U.S. = Non-U.S. Sales p-value	0.001			0.004
U.S. = Non-U.S. Acquis. p-value		0.603		0.162
U.S. = Non-U.S. Listing p-value			0.826	0.972
Control variables and fixed effects	Included	Included	Included	Included
Adjusted *R*-squared	0.465	0.450	0.460	0.471

Notes. This table presents select coefficients from various pooled, cross-sectional estimations of Equation (2). The dependent variable, Ln(*Total Compensation*), equals the natural logarithm of the total annual compensation earned by the CEO of firm *i* in year *t*. In panel B, each of the firm's foreign market variables is replaced with the firm's U.S. and non-U.S. foreign analogues. All models are estimated using ordinary least squares. Standard errors (in parentheses) are clustered at the firm level. $N = 1,543$.

*, **, ***Significantly different from zero at the 1%, 5%, and 10% levels (two-tailed test), respectively, using standard errors clustered by firm.

complex business but instead reflects the unique compensation pressures created by participation in U.S. product markets. The failure to find an association between UK total pay and non-U.S. foreign activities,

as proxied by sales and acquisition ratios, is especially interesting given that, for our sample firms, non-U.S. foreign activities are more prevalent than U.S. activities are. For these firms, 28% of total revenue is

derived from non-U.S. foreign sources and 50% of the firms engaged in non-U.S. foreign acquisitions; the corresponding percentages for U.S.-related activity are 15% and 38%. These non-U.S. foreign results are also interesting in light of research suggesting that job complexity increases CEO compensation (e.g., Rose and Shepard 1997).[18]

In terms of economic significance, a 1% increase in U.S. sales is associated with a 0.65% increase in total compensation, which translates into a £9,751 increase when evaluated at the mean level of total compensation. On a relative basis, our estimations imply that a one percentage point increase in U.S. sales is associated with a 0.60% larger increase in total compensation than a corresponding similar increase in non-U.S. foreign sales. With respect to exchange listings, executives of firms that are cross-listed in the United States receive almost 23.6% more in total compensation than executives of firms not cross-listed on a foreign exchange, whereas executives of firms that cross-list in foreign locations other than the United States receive 19.0% more compensation than do the executives of non-cross-listed firms. At the mean level of total compensation, these effects represent increases of £356,768 and £287,229, respectively.

3.2. Influence of U.S. and Non-U.S. Market Interactions on the Components of UK Compensation

Next, we reestimate variations of Equation (3) using the different components of pay as our dependent variables. These estimations, presented in Table 3, yield two key findings. First, U.S. activities are associated with greater use of incentive-based pay. Firms with larger U.S. sales award greater levels of bonus pay. Firms with higher U.S. sales and those with greater levels of historical U.S. acquisition activity are more likely to grant stock options than are firms without corresponding U.S. product market or operational exposure. Greater levels of both U.S. and non-U.S. foreign sales are associated with greater total cash compensation, consistent with executives receiving a higher reservation wage for managing more complex, global businesses; however, the magnitude of the sensitivity of cash compensation to non-U.S.

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[18] One potential explanation for the difference in results between U.S. and non-U.S. foreign activities is that the task of managing a firm with U.S. activities is significantly more challenging than managing a firm operating in other foreign markets. Both U.S. and non-U.S. foreign markets require the executive to manage foreign exchange rate risk, overcome geographic distance (e.g., U.S. and Asian product markets are equally distant from the United Kingdom), navigate local regulations and institutional frictions, and understand local consumer preferences. On some dimensions, the U.S. environment may be more burdensome (e.g., litigation risk); on other dimensions, the United States offers fewer challenges (common language, property rights protection, less corruption).

foreign sales activity is only half of that observed for U.S. sales activities. More importantly, unlike firms with U.S. activities, UK firms with non-U.S. foreign activities use significantly lower levels of bonus- and equity-based compensation; coefficients on *U.S. Sales Ratio$_{it}$* (*U.S. Acquisition Ratio$_{it}$*) are significantly larger than the corresponding coefficients on *Non-U.S. Foreign Sales Ratio$_{it}$* (*Non-U.S. Foreign Acquisition Ratio$_{it}$*) in the bonus and equity ratio models (option grant model).

Second, U.S.-listed firms award executives higher salaries and cash-based pay than do their non-listed peers, but they do not increase incentive-based compensation. Moreover, we find a similar increase in cash compensation for other non-U.S. foreign exchange listings, with the magnitude of the compensation effects for U.S. listings statistically indistinguishable from non-U.S. foreign exchange listings. These results suggest that a U.S. listing does not create a demand for the use of U.S.-style incentive-based pay; instead, managers receive a higher reservation wage as compensation for bearing the risks and responsibilities associated with a foreign stock exchange listing.

Taken together, the results in Tables 2 and 3 suggest that interactions with U.S. product and capital markets are associated with higher levels of CEO pay for the sample UK companies. Each of these interactions has an incremental impact on total compensation, but the form of the additional pay depends upon the nature of the market interaction. U.S. sales are associated with a greater use of incentive-based pay. U.S. exchange listings are associated with greater levels of salary and cash-based pay, consistent with the firm's need to compensate the executive for bearing the additional risks and responsibilities associated with a U.S. exchange listing, but not creating a demand for U.S.-style incentive pay. Moreover, the listing effect appears to reflect a pay premium, or higher reservation wage, associated with managing a cross-listed entity in any foreign location, not just in the United States.

3.3. Influence of CEO Characteristics and U.S. Market Interactions on UK Compensation

To exploit CEO-level heterogeneity in our data, we next include CEO-level characteristics in our compensation models; this allows us to examine the incremental influence of CEO-specific personal and professional links to the United States on UK compensation practices and to address concerns that omitted CEO attributes drive the firm-level results. Because we hypothesize that U.S. linkages have a greater impact on UK pay than non-U.S. foreign linkages, we split our CEO-level measures into the executive's

Table 3   Influence of Firm-Level U.S. and Non-U.S. Foreign Market Interactions on the Components of UK Executive Compensation Packages

Dependent variable:	Cash compensation			Equity compensation		
	Ln(*Cash Comp.*)	Ln(*Salary*)	Ln(*Bonus*)	Ln(*Equity Comp.*)	Equity Ratio	Option Grant
U.S. Sales Ratio	0.537***	0.335**	1.161*	2.584	0.102	1.226**
	(0.134)	(0.141)	(0.695)	(2.079)	(0.076)	(0.543)
Non-U.S. Foreign Sales Ratio	0.210*	0.092	−0.520	0.469	−0.029	0.595
	(0.121)	(0.099)	(0.658)	(1.339)	(0.048)	(0.371)
Ln(*U.S. Acquisition Ratio*)	−0.503	−0.470	−0.276	0.792	0.024	0.847*
	(0.420)	(0.396)	(0.660)	(1.532)	(0.073)	(0.456)
Ln(*Non-U.S. Foreign Acquis. Ratio*)	0.103	0.069	−1.143	0.700	0.026	−0.475
	(0.154)	(0.249)	(0.951)	(2.413)	(0.083)	(0.640)
U.S. Listing	0.192***	0.123*	0.184	−0.662	−0.006	−0.097
	(0.072)	(0.069)	(0.378)	(0.866)	(0.033)	(0.244)
Non-U.S. Foreign Listing	0.170*	0.050	0.817	−0.118	0.016	−0.401
	(0.093)	(0.079)	(0.589)	(1.047)	(0.043)	(0.333)
U.S. = Non-U.S. Sales p-value	0.032	0.074	0.044	0.195	0.072	0.177
U.S. = Non-U.S. Acquis. p-value	0.113	0.147	0.237	0.974	0.984	0.056
U.S. = Non-U.S. Listing p-value	0.838	0.239	0.193	0.685	0.700	0.218
Controls and fixed effects	Included	Included	Included	Included	Included	Included
Adjusted R-squared	0.253	0.157	0.120	0.030	0.162	0.121

Notes. This table presents select coefficients from various pooled, cross-sectional estimations of the following models:

$$\text{Ln}(Compensation)_{it} = \alpha + \sum_{k=1}^{n} \gamma_k Industry_k + \sum_{t=1}^{4} Year_t + \beta_1 \text{Ln}(Assets_{it}) + \beta_2 Market\text{-}to\text{-}Book_{it} + \beta_3 ROA_{it} + \beta_4 CFO_{it} + \beta_5 Stock\ Return_{it} + \beta_6 Return\ Volatility_{it}$$

$$+ \beta_7 \text{Ln}(Tenure_{it}) + \beta_8 \text{Ln}(Percent\ Shares\ Held_{it}) + \beta_9 Percent\ Inside\ Directors_{it} + \beta_{10} \text{Ln}(Board\ Size_{it}) + \beta_{11} U.S.\ Sales\ Ratio_{it}$$

$$+ \beta_{12} Non\text{-}U.S.\ Foreign\ Sales\ Ratio_{it} + \beta_{13} \text{Ln}(U.S.\ Acquisition\ Ratio)_{it} + \beta_{14} \text{Ln}(Non\text{-}U.S.\ Foreign\ Acquisition\ Ratio)_{it}$$

$$+ \beta_{15} U.S.\ Listing_{it} + \beta_{16} Non\text{-}U.S.\ Foreign\ Listing_{it} + \varepsilon_{it},$$

where *U.S. Activity* and *Non-U.S. Foreign Activity* equal the specified measure of firm *i*'s U.S. and non-U.S. foreign market interactions in year *t*. All *Cash Compensation* models are estimated using ordinary least squares. All Ln(*Equity Compensation*) and *Equity Ratio* models are estimated using Tobit. The *Option Grant* model is estimated using logit. Standard errors (in parentheses) are clustered at the firm level. The *p*-values on the equality of the *U.S. Activity* and *Non-U.S. Foreign Activity* coefficients are from a *t*-test (one-sided). $N = 1,543$.

*, **, ***Significantly different from zero at the 1%, 5%, and 10% levels (two-tailed test), respectively, using standard errors clustered by firm.

U.S. and non-U.S. foreign characteristics. Specifically, we expand Equation (3) to include variables that capture the CEO's U.S. and non-U.S. foreign nationality, educational background, and board experience, and we estimate several versions of the following pooled, cross-sectional model:

$$\text{Ln}(Total\ Compensation_{it})$$

$$= \alpha + \sum_{k=1}^{34} \gamma_k Industry_k + \sum_{t=1}^{4} Year_t + \sum_{j=1}^{10} \beta_j Control\ Variables_j$$

$$+ \beta_{11} U.S.\ Sales\ Ratio_{it} + \beta_{12} Non\text{-}U.S.\ Sales\ Ratio_{it}$$

$$+ \beta_{13} \text{Ln}(U.S.\ Acquisition\ Ratio_{it})$$

$$+ \beta_{14} \text{Ln}(Non\text{-}U.S.\ Acquisition\ Ratio_{it})$$

$$+ \beta_{15} U.S.\ Listing_{it} + \beta_{16} Non\text{-}U.S.\ Listing_{it}$$

$$+ \beta_{17} CEO\ U.S.\ Nationality_{it}$$

$$+ \beta_{18} CEO\ Non\text{-}U.S.\ Foreign\ Nationality_{it}$$

$$+ \beta_{19} CEO\ U.S.\ Education_{it}$$

$$+ \beta_{20} CEO\ Non\text{-}U.S.\ Foreign\ Education_{it}$$

$$+ \beta_{21} CEO\ U.S.\ Board\ Experience_{it}$$

$$+ \beta_{22} CEO\ Non\text{-}U.S.\ Foreign\ Board\ Experience_{it}$$

$$+ \varepsilon_{it}. \tag{4}$$

We present select coefficients and standard errors (in parentheses) from these estimations in Table 4. The final column in this table includes the complete set of variables and best allows us to make inferences about total UK compensation. First, we find no association between UK compensation levels and the educational background of the firm's CEO. Second, we find that U.S. citizens receive greater compensation than do their non-American peers; however, this difference disappears after controlling for other CEO characteristics, similar to the results in Carter et al. (2009b). Third, CEOs with foreign board experience receive greater compensation than do executives lacking this background. This effect is observed regardless of whether the board experience was with a U.S. or

Table 4   Influence of CEO-Level Foreign Market Characteristics on UK Compensation Practices

	CEO education	CEO nationality	CEO board experience	All CEO characteristics	All market interactions
CEO U.S. Education	0.023 (0.054)			0.010 (0.053)	−0.023 (0.052)
CEO Non-U.S. Foreign Education	−0.043 (0.077)			−0.035 (0.078)	−0.034 (0.079)
CEO U.S. Nationality		0.194* (0.110)		0.157 (0.110)	0.076 (0.099)
CEO Non-U.S. Foreign Nationality		−0.075 (0.084)		−0.074 (0.090)	−0.088 (0.082)
CEO U.S. Board Experience			0.233** (0.108)	0.192* (0.102)	0.173* (0.091)
CEO Non-U.S. Foreign Board Experience			0.291** (0.114)	0.302*** (0.114)	0.248** (0.108)
U.S. Sales Ratio					0.537*** (0.142)
Non-U.S. Foreign Sales Ratio					0.107 (0.111)
Ln(*U.S. Acquisition Ratio*)					−0.126 (0.096)
Ln(*Non-U.S. Foreign Acquis. Ratio*)					0.136 (0.141)
U.S. Listing					0.156** (0.072)
Non-U.S. Foreign Listing					0.173 (0.116)
U.S. = Non-U.S. Sales p-value				—	0.014
U.S. = Non-U.S. Acquis. p-value					0.109
U.S. = Non-U.S. Listing p-value					0.896
Control variables and fixed effects	Included	Included	Included	Included	Included
Adjusted *R*-squared	0.449	0.452	0.456	0.458	0.476

Notes.

$$\text{Ln}(Total\ Compensation_{it}) = \alpha + \sum_{k=1}^{n} \gamma_k Industry_k + \sum_{t=1}^{4} Year_t + \beta_1 \text{Ln}(Assets_{it}) + \beta_2 Market\text{-}to\text{-}Book_{it} + \beta_3 ROA_{it} + \beta_4 CFO_{it} + \beta_5 Stock\ Return_{it}$$

$$+ \beta_6 Return\ Volatility_{it} + \beta_7 \text{Ln}(Tenure_{it}) + \beta_8 \text{Ln}(Percent\ Shares\ Held_{it}) + \beta_9 Percent\ Inside\ Directors_{it} + \beta_{10} \text{Ln}(Board\ Size_{it})$$

$$+ \beta_{11} U.S.\ Sales\ Ratio_{it} + \beta_{14} Non\text{-}U.S.\ Foreign\ Sales\ Ratio_{it} + \beta_{12} \text{Ln}(U.S.\ Acquisition\ Ratio)_{it}$$

$$+ \beta_{15} \text{Ln}(Non\text{-}U.S.\ Foreign\ Acquisition\ Ratio)_{it} + \beta_{13} U.S.\ Listing_{it} + \beta_{16} Non\text{-}U.S.\ Foreign\ Listing_{it} + \beta_{18} CEO\ U.S.\ Education_{it}$$

$$+ \beta_{21} CEO\ non\text{-}U.S.\ Foreign\ Education_{it} + \beta_{17} CEO\ U.S.\ Nationality_{it} + \beta_{20} CEO\ non\text{-}U.S.\ Foreign\ Nationality_{it}$$

$$+ \beta_{19} CEO\ U.S.\ Board\ Experience_{it} + \beta_{22} CEO\ non\text{-}U.S.\ Foreign\ Board\ Experience_{it} + \varepsilon_{it}.$$

The dependent variable, Ln(*Total Compensation*), equals the natural logarithm of the total annual compensation earned by the CEO of firm *i* in year *t*. All models are estimated using ordinary least squares. Standard errors (in parentheses) are clustered at the firm level. The *p*-values on the equality of the U.S. and Non-U.S. foreign variables' coefficients are from a *t*-test (one-sided). *N* = 1,543.

*, **, ***Significantly different from zero at the 1%, 5%, and 10% levels (two-tailed test), respectively, using standard errors clustered by firm.

non-U.S. foreign firm, suggesting that executives concurrently serving on foreign boards are simply more skilled than are non-serving executives—in fact, the board invitations may stem from their reputation—and as such, they earn higher pay.[19] Firm-level U.S.

[19] CEO foreign board service is a limited phenomenon in our UK data. Only 4% (4%) of our executives served on the board of a U.S. (non-U.S. foreign) company in our sample period. The board experience results are robust to the inclusion of a control for the executive's concurrent presence on another UK firm's board.

product market interaction measured by *U.S. Sales Ratio*$_{it}$ is related to higher UK CEO pay after controlling for all market interactions and individual characteristics (in the last column) and the effect is higher than the impact of *non-U.S. Foreign Sales Ratio* (*p*-value of difference in coefficients = 0.014). CEO pay is higher in firms with a U.S. listing, but the level is statistically no different from pay in firms with non-U.S. foreign listings (*p*-value of difference in coefficients = 0.896).

4. The Impact of U.S. Governance Dissemination Mechanisms on UK Compensation

We extend the preceding firm-level analysis to examine four potential mechanisms by which U.S.-style pay practices can be transmitted to UK firms: the U.S. board experience of the firm's directors, the use of U.S. compensation consultants, the explicit use of U.S. firms as peers groups for compensation benchmarking, and the presence of U.S. institutional ownership. We posit that these channels allow the boards of UK firms to benchmark against U.S. pay practices and provide justification for adopting U.S.-style pay arrangements. We expect the sensitivity of UK compensation to U.S. market activities to be greater in the presence of these dissemination mechanisms.

Directors with U.S. Board Experience. The globalization of corporate boards can increase executive visibility among a geographically widespread director pool thus increasing managerial mobility globally and also facilitating cross-border transmission of corporate governance practices. The first effect requires local firms with global executive talent to pay U.S. market wages to retain these individuals; the second effect implies that local directors gain familiarity with U.S.-style pay mechanisms through U.S. board service, and that they bring such practices back to their home firms. To gauge a sample firm's exposure to this channel, we identify whether any of the firm's directors serves on a U.S. board. We set the indicator variable *U.S. Board Experience$_{it}$* equal to 1 if any of the UK firm's nonexecutive directors serves as a board member of a publicly traded U.S. corporation in year t and 0 otherwise.

U.S. Compensation Consultants. Foreign firms can hire U.S.-based compensation consultants to help resolve internal pay disparities inside the company, to provide guidance on market pay given the executive's responsibilities, and to develop compensation programs capable of recruiting and retaining global executive talent. We set the indicator variable *U.S. Compensation Consultant$_{it}$* equal to 1 if the UK firm's proxy statements disclose the use of a U.S. compensation consultant in year t and 0 otherwise. Data on compensation consultants are taken from the Hemscott database.

U.S. Institutional Ownership: Large institutional investors have an incentive to monitor the activities of their portfolio firms. Through their holdings and influence, institutional investors can initiate governance changes that resolve agency conflicts between managers and shareholders. One such change is the adoption of performance-based pay. We define the variable *U.S. Institutions$_{it}$* as the percentage of shares outstanding held by U.S. institutions in year t. Institutional ownership data are from Hemscott.

U.S. Peer Group. Prior research finds that firms manage peer groups to adjust CEO pay for retention and rent extraction purposes (Bizjak et al. 2008, Faulkender and Yang 2010). A UK firm with U.S. activities can include U.S. companies in its peer group to benchmark and justify its CEO's pay. We set the indicator *U.S. Peer$_{it}$* equal to 1 if the UK firm includes a U.S. firm in its peer group in year t and 0 otherwise. Data are from remuneration committee reports in the company's annual report.

Finally, we create analogous non-U.S. foreign indicator variables for each of these four channels. Descriptive evidence on the prevalence of the channels is in Table 5, panel A. We find that in 48.3% of our firm-years, companies use U.S. compensation consultants and that 33% of the firms' boards have a director with U.S. board experience. More than half of the firms in our sample had U.S. institutional ownership. In 12.7% of our firm-years, companies include a U.S. firm in the peer group. The prevalence of these activities in our sample suggests that these mechanisms are plausible channels for the transfer of U.S. pay practices.

Panel B of Table 5 presents select coefficients from estimations of the following model:

$$
\begin{aligned}
\mathrm{Ln}&(Total\ Compensation_{it}) \\
&= \alpha + \sum_{k=1}^{34} \gamma_k Industry_k + \sum_{t=1}^{4} Year_t + \sum_{j=1}^{10} \beta_j Control\ Variables_j \\
&\quad + \beta_{11} U.S.\ Sales\ Ratio_{it} \\
&\quad + \beta_{12} Non\text{-}U.S.\ Foreign\ Sales\ Ratio_{it} \\
&\quad + \beta_{13} \mathrm{Ln}(U.S.\ Acquisition\ Ratio)_{it} \\
&\quad + \beta_{14} \mathrm{Ln}(Non\text{-}U.S.\ Foreign\ Acquisition\ Ratio)_{it} \\
&\quad + \beta_{15} U.S.\ Listing_{it} + \beta_{16} Non\text{-}U.S.\ Foreign\ Listing_{it} \\
&\quad + \beta_{17} U.S.\ Channel_{it} + \beta_{18} Non\text{-}U.S.\ Foreign\ Channel_{it} \\
&\quad + \beta_{19} U.S.\ Sales\ Ratio_{it} * U.S.\ Channel_{it} \\
&\quad + \beta_{20} Non\text{-}U.S.\ Foreign\ Sales\ Ratio_{it} \\
&\qquad * Non\text{-}U.S.\ Foreign\ Channel_{it} \\
&\quad + \beta_{21} \mathrm{Ln}(U.S.\ Acquisition\ Ratio)_{it} * U.S.\ Channel_{it} \\
&\quad + \beta_{22} \mathrm{Ln}(Non\text{-}U.S.\ Foreign\ Acquisition\ Ratio)_{it} \\
&\qquad * Non\text{-}U.S.\ Foreign\ Channel_{it} \\
&\quad + \beta_{23} U.S.\ Listing_{it} * U.S.\ Channel_{it} \\
&\quad + \beta_{24} Non\text{-}U.S.\ Foreign\ Listing_{it} \\
&\qquad * Non\text{-}U.S.\ Foreign\ Channel_{it} + \varepsilon_{it}.
\end{aligned}
\tag{5}
$$

Table 5   Evidence on Channels That Align U.S.–UK Compensation Practices

	U.S. and non-U.S. channel							
	Compensation consultants		Board background		Institutional investors		Peer group	
Panel A: Descriptive evidence								
All Foreign Activity	0.507		0.520		0.131		0.150	
U.S. Activity	0.483		0.330		0.083		0.127	
Non-U.S. Foreign Activity	0.024		0.420		0.048		0.112	
Panel B: Multivariate analysis								
U.S. Sales Ratio	0.587***	0.330*	0.570***	0.570***	0.593***	0.737***	0.539***	0.510***
	(0.138)	(0.187)	(0.134)	(0.160)	(0.140)	(0.171)	(0.139)	(0.151)
Non-U.S. Foreign Sales Ratio	0.016	0.032	0.022	−0.080	0.017	−0.004	0.029	0.027
	(0.107)	(0.107)	(0.108)	(0.131)	(0.107)	(0.121)	(0.106)	(0.115)
Ln(*U.S. Acquisition Ratio*)	−0.143	−0.035	−0.147	0.140	−0.127	−0.099	−0.142	−0.085
	(0.096)	(0.174)	(0.099)	(0.216)	(0.096)	(0.139)	(0.091)	(0.099)
Ln(*Non-U.S. Foreign Acquis. Ratio*)	0.077	0.058	0.071	0.259	0.066	0.062	0.057	0.138
	(0.135)	(0.137)	(0.136)	(0.193)	(0.137)	(0.157)	(0.133)	(0.153)
U.S. Listing	0.164**	0.135	0.164**	0.119	0.174**	0.122	0.175**	0.142*
	(0.073)	(0.114)	(0.075)	(0.104)	(0.073)	(0.082)	(0.073)	(0.080)
Non-U.S. Foreign Listing	0.152	0.172	0.145	0.251	0.154	0.136	0.167	0.294*
	(0.108)	(0.107)	(0.111)	(0.267)	(0.109)	(0.109)	(0.108)	(0.157)
U.S. Channel	0.086*	0.013	0.069	0.082	0.200	0.275	0.250***	0.159
	(0.044)	(0.057)	(0.055)	(0.073)	(0.186)	(0.234)	(0.090)	(0.148)
Non-U.S. Foreign Channel	0.092	0.155	0.015	−0.014	0.117	0.015	−0.217**	−0.128
	(0.109)	(0.119)	(0.050)	(0.068)	(0.209)	(0.350)	(0.099)	(0.132)
U.S. Sales Ratio ∗ U.S. Channel		0.491**		−0.108		−1.295		0.119
		(0.209)		(0.232)		(0.925)		(0.292)
Non-U.S. Foreign Sales Ratio ∗ Non-U.S. Channel		−0.142		0.205		0.154		−0.048
		(0.534)		(0.157)		(0.689)		(0.254)
Ln(*U.S. Acquisition Ratio*) ∗ *U.S. Channel*		−0.191		−0.374*		−0.288		−0.204
		(0.181)		(0.226)		(0.802)		(0.247)
Ln(*Non-U.S. Foreign Acquis.*) ∗ *Non-U.S. Channel*		0.375		−0.402		0.210		−0.152
		(1.063)		(0.267)		(1.530)		(0.270)
U.S. Listing ∗ U.S. Channel		0.042		0.115		0.463		0.178
		(0.113)		(0.120)		(0.447)		(0.130)
Non-U.S. Foreign Listing ∗ Non-U.S. Channel		−1.351***		−0.125		0.174		−0.286
		(0.473)		(0.266)		(0.604)		(0.191)
Adjusted *R*-squared	0.473	0.476	0.472	0.474	0.472	0.471	0.475	0.476

Notes. This table presents select coefficients from various pooled, cross-sectional estimations of the following model:

$$\text{Ln}(\textit{Total Compensation}_{it})$$

$$= \alpha + \sum_{k=1}^{n} \gamma_k \textit{Industry}_k + \sum_{t=1}^{4} \textit{Year}_t + \beta_1 \text{Ln}(\textit{Assets}_{it}) + \beta_2 \textit{Market-to-Book}_{it} + \beta_3 \textit{ROA}_{it} + \beta_4 \textit{CFO}_{it} + \beta_5 \textit{Stock Return}_{it}$$

$$+ \beta_6 \textit{Return Volatility}_{it} + \beta_7 \text{Ln}(\textit{Tenure}_{it}) + \beta_8 \text{Ln}(\textit{Percent Shares Held}_{it}) + \beta_9 \textit{Percent Inside Directors}_{it} + \beta_{10} \text{Ln}(\textit{Board Size}_{it})$$

$$+ \beta_{11} \textit{U.S. Sales Ratio}_{it} + \beta_{12} \textit{Non-U.S. Foreign Sales Ratio}_{it} + \beta_{13} \text{Ln}(\textit{U.S. Acquisition Ratio})_{it}$$

$$+ \beta_{14} \text{Ln}(\textit{Non-U.S. Foreign Acquisition Ratio})_{it} + \beta_{15} \textit{U.S. Listing}_{it} + \beta_{16} \textit{Non-U.S. Foreign Listing}_{it} + \beta_{17} \textit{U.S. Channel}_{it}$$

$$+ \beta_{18} \textit{Non-U.S. Foreign Channel}_{it} + \beta_{19} \textit{U.S. Sales Ratio}_{it} * \textit{U.S. Channel}_{it} + \beta_{20} \textit{Non-U.S. Foreign Sales Ratio}_{it} * \textit{Non-U.S. Foreign Channel}_{it}$$

$$+ \beta_{21} \text{Ln}(\textit{U.S. Acquisition Ratio})_{it} * \textit{U.S. Channel}_{it}$$

$$+ \beta_{22} \text{Ln}(\textit{Non-U.S. Foreign Acquisition Ratio})_{it} * \textit{Non-U.S. Foreign Channel}_{it} + \beta_{23} \textit{U.S. Listing}_{it} * \textit{U.S. Channel}_{it}$$

$$+ \beta_{24} \textit{Non-U.S. Foreign Listing}_{it} * \textit{Non-U.S. Foreign Channel}_{it} + \varepsilon_{it}.$$

The dependent variable, Ln(*Total Compensation*), equals the natural logarithm of the total annual compensation earned by the CEO of firm *i* in year *t*. *U.S. Channel* and *Non-U.S. Foreign Channel* are indicator variables equal to 1 if the firm uses or is associated with one of four different attributes: use of a U.S. or non-U.S. foreign compensation consultant, use of a U.S. or non-U.S. foreign peer, the presence of U.S. or non-U.S. foreign board experience among the firm's board of directors, or the presence of U.S. or non-U.S. foreign institutional shareholders. All models are estimated using ordinary least squares. Standard errors (in parentheses) are clustered at the firm level. $N = 1,543$.

*, **, *** Significantly different from zero at the 1%, 5%, and 10% levels (two-tailed test), respectively, using standard errors clustered by firm.

In this model, the relation between total compensation and the presence of U.S. activities is conditioned upon the presence or usage of a specific U.S. and non-U.S. foreign governance channel, as denoted by the interaction with the variables *U.S. Channel$_{it}$* and *Non-U.S. Foreign Channel$_{it}$*.

We find that the sensitivity of UK pay practices to the presence of U.S. operations is greater for firms that employ U.S. compensation consultants, consistent with this practice serving as a transmission mechanism for U.S. pay practices. Additionally, we find some evidence that the use of U.S. compensation consultants and the inclusion of a U.S. firm in the peer group are positively associated with higher levels of CEO compensation; however, U.S. institutional ownership, U.S. board experience, and U.S. peer group usage do not significantly alter the sensitivity of UK pay to U.S. activities. These results suggest that firms use compensation consultants as a channel to address pay disparities arising from U.S. activities.

5. Event Tests: Compensation Practices Around U.S. Market Events

The incentive for UK firms to adopt U.S.-style pay arrangements will be greatest around the initiation, or material expansion, of U.S. activities. To corroborate the preceding cross-sectional evidence, we examine the trend in CEO pay of UK firms around two distinct events: a U.S. M&A transaction and a U.S. exchange listing. Any observed shift in the amount and form of UK CEO pay around specific U.S. market events will sharpen the interpretation of our earlier results and mitigate concerns that the U.S. activity-level variables are simply capturing omitted firm and/or managerial characteristics. Moreover, by examining trends around an analogous set of non-U.S. foreign acquisition and listing events, we can better attribute the observed results to the unique compensation-related pressures created by U.S. markets.

5.1. U.S. and Non-U.S. Acquisition Events

The acquisition of a U.S. firm, especially one that is material in size relative to the acquiring UK firm, can create incentives to align both firms' compensation practices. To test for this acquisition effect, we identify all UK firms in the SDC database that made a U.S. acquisition over the sample period 2002–2007. We also identify the corresponding sample of UK firms that acquired non-U.S. foreign firms over the same period. To isolate the effect of a significant increase in foreign business activities via an acquisition, we include only those firms that did not engage in a foreign acquisition in the previous year. We require all event firms to have accounting and price data to measure our full set

of control variables and sufficient compensation data to measure salary, bonus, cash compensation, equity compensation, and total compensation around the acquisition event. Because this analysis also includes acquiring UK firms not included in the Hemscott database, we hand-collected data for these additional firms from the respective companies' annual reports and from Datastream. These criteria result in a final sample of 32 (59) UK firms acquiring a U.S. (non-U.S. foreign) firm over our sample period.[20]

For each firm, we measure compensation levels in the years before, during, and after the acquisition events. We trend-adjust the yearly compensation data by removing the mean compensation level reported for all firms in the Hemscott database for that given calendar year. Using these data, we test for a shift in compensation around the acquisition event using the following multivariate model:

$$\text{Ln}(\textit{Trend-Adjusted Compensation}_{it})$$

$$= \alpha + \sum_{i=1}^{j} \gamma_k \textit{Executive}_i + \sum_{j=1}^{10} \beta_j \textit{Control Variables}_j$$

$$+ \beta_{11} \text{Ln}(\textit{U.S. Acquisition Ratio}_{it})$$

$$+ \beta_{12} \text{Ln}(\textit{Non-U.S. Acquisition Ratio}_{it}). \quad (6)$$

In these estimations, the coefficients on *U.S. Acquisition Ratio$_{it}$* and *Non-U.S. Acquisition Ratio$_{it}$* capture the average, incremental increase in compensation around the identified U.S. and foreign acquisition event, after controlling for the executive; key firm-level characteristics (size, growth options, and performance); and earlier U.S. and non-U.S. foreign acquisition activity. *Executive$_i$* is the executive-level fixed effect to capture time-invariant firm- and executive-level unobserved heterogeneity. This fixed effect specification means that the estimation will capture the change in acquisition ratio over the event period (i.e., acquisitions made in the preceding year).

Consistent with the cross-sectional results, Table 6 documents that CEOs of firms making a U.S. acquisition experience a significant increase in total and incentive-based compensation in the year after the acquisition. A similar shift, however, does not exist around non-U.S. acquisitions.[21] The increase in both

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[20] Descriptive statistics reveal that these events represent a material change in the firm's operations. The mean (median) U.S. acquisition represents 11.3% (4.0%) of end-of-year total assets, whereas the mean (median) non-U.S. foreign acquisition represents 6.5% (2.4%) of ending total assets. This sample consists of 16 firms that engaged in both a U.S. and non-U.S. foreign acquisition during our sample period. The results of these event tests are robust to excluding these firms from the analysis.

[21] Additionally, the increases in salary, bonus, and option grants around U.S. acquisitions are significantly different from the estimated effects for non-U.S. foreign acquisitions.

Table 6   UK Compensation Practices Around U.S. and Non-U.S. Acquisition Events

Dependent variable:	Ln(*Total*)	Ln(*Cash*)	Ln(*Salary*)	Ln(*Bonus*)	Ln(*Equity*)	Equity Ratio	Option Grant
Panel A: All UK firms with a U.S. or non-U.S. foreign acquisition event (2002–2007)							
Ln(*U.S. Acquisition Ratio*)	0.693*	0.474*	0.255*	12.613***	7.078	0.182	0.758**
	(0.364)	(0.262)	(0.131)	(3.341)	(4.522)	(0.111)	(0.370)
Ln(*Non-U.S. Acquisition Ratio*)	0.132	−0.260	−0.394**	−3.407	1.546	0.123	−0.378
	(0.365)	(0.346)	(0.193)	(2.856)	(3.078)	(0.110)	(0.445)
U.S. = Non-U.S. p-value	0.133	0.041	0.001	0.001	0.166	0.722	0.031
Fixed effects	Included	Included	Included	Included	Included	Included	Included
N	243	243	243	243	243	243	243
Panel B: UK firms without CEO turnover around U.S. or non-U.S. acquisition event (2002–2007)							
Ln(*U.S. Acquisition Ratio*)	0.758***	0.502*	0.251	13.437***	7.364	0.228**	0.635
	(0.351)	(0.257)	(0.192)	(3.406)	(5.123)	(0.110)	(0.405)
Ln(*Non-U.S. Acquisition Ratio*)	−0.075	−0.400	−0.423**	−6.271*	3.059	0.119	−0.308
	(0.333)	(0.347)	(0.186)	(3.349)	(3.167)	(0.090)	(0.413)
U.S. = Non-U.S. p-value	0.032	0.019	0.006	0.001	0.249	0.220	0.066
Fixed effects and controls	Included	Included	Included	Included	Included	Included	Included
N	178	178	178	178	178	178	178

Notes. This table presents tests of compensation changes around U.S. and non-U.S. acquisitions by UK firms over the period 2002–2007. The panels present select coefficients from executive-level fixed effects estimations of the following models:

$$Ln(\textit{Trend-Adjusted Compensation}_{it}) = \alpha + \sum_{i=1}^{j} \gamma_k \textit{Executive}_i + \beta_1 Ln(\textit{Assets}_{it}) + \beta_2 \textit{Market-to-Book}_{it} + \beta_3 ROA_{it} + \beta_4 CFO_{it} + \beta_5 \textit{Stock Return}_{it}$$

$$+ \beta_6 \textit{Return Volatility}_{it} + \beta_7 Ln(\textit{Tenure}_{it}) + \beta_8 Ln(\textit{Percent Shares Held}_{it}) + \beta_9 \textit{Percent Inside Directors}_{it}$$

$$+ \beta_{10} Ln(\textit{Board Size}_{it}) + \beta_{11} Ln(\textit{U.S. Acquisition Ratio}_{it}) + \beta_{12} Ln(\textit{Non-U.S. Acquisition Ratio}_{it}).$$

The dependent variable, *Trend-Adjusted Compensation*, equals the specified measure of annual compensation earned by the CEO of firm i in year t less the mean corresponding level of compensation reported in the Hemscott database for year t. These tests use the three years of compensation data centered on a UK firm's U.S. or non-U.S. foreign acquisition event (years $t-1$ to $t+1$). *Executive$_i$* is an executive-level fixed effect to capture unobserved heterogeneity. Panel A presents tests of compensation changes around U.S. acquisition events. *Total Compensation, Cash Compensation, Salary*, and *Bonus* models are estimated using ordinary least squares. Ln(*Equity Compensation*) and *Equity Ratio* models are estimated using Tobit. *Option Grant* models are estimated using logit. Panel B repeats these estimations using a restricted sample of firms in which there were no CEO turnovers during the three-year window. Standard errors (in parentheses) are clustered at the executive-level. The p-values on the equality of the U.S. and non-U.S. foreign acquisition coefficients are from a t-test (one-sided).

*, **, ***Significantly different from zero at the 1%, 5%, and 10% levels (two-tailed test), respectively, using standard errors clustered by executive.

total and incentive-based pay around the U.S. event alone is consistent with UK acquirers attempting to resolve internal pay inequities arising from the acquisition. Finally, we reestimate these models after eliminating firms with CEO turnover during the acquisition event windows, allowing us to estimate the impact of acquisition activity after holding the manager and his/her human capital constant. This criterion reduces the sample to 24 U.S. acquisition events and 45 non-U.S. foreign acquisition events. Panel B results show that the preceding results and inferences are robust to this sample.

5.2. U.S. and Non-U.S. Exchange Listing Events
Foreign companies that list on a U.S. exchange are required to comply with the strict U.S. regulatory and governance environment; thus, their executives must assume greater risks and responsibilities. This exposure likely results in the demand for a higher reservation wage, reflecting an increase in the executive's

cash compensation and, in particular, salary-based compensation around a U.S. listing event. To examine this impact, we identify all publicly traded UK firms that engaged in the initial listing on a U.S. exchange over the period 1999–2006.[22] We also identify the analogous sample of UK firms that engaged in a non-U.S. foreign exchange listing over the same period. We require all listing firms to have accounting and price data to measure a parsimonious set of control variables and sufficient compensation data to measure salary, bonus, cash pay, equity pay, and total compensation around the listing event. For those listing firms not in the Hemscott database, we gather data from the companies' annual reports and from Datastream.

[22] Our sample includes three firms that previously delisted from a U.S. exchange for performance reasons. Because these firms have been absent from the U.S. regulatory and legal environment for at least seven years before their second listing, we include the latter as a new listing decision. The exclusion of these firms from our tests does not change the tenor of our results.

These criteria result in a final sample of 54 (8) UK firms engaging in a U.S. (non-U.S.) exchange listing over this period.[23]

For each firm, we measure compensation levels in the years before, during, and after the listing event. Cash pay, salary, and bonus amounts are trend-adjusted by removing the mean compensation level for all firms in the Hemscott database for that calendar year. Equity pay and total compensation are not trend-adjusted because we lack equity pay data in the Hemscott database for the early part of the event period. We test for a shift in compensation around the listing event with the following reduced-form model:

$$Ln(Compensation_{it})$$

$$= \alpha + \sum_{i=1}^{j} \gamma_k Executive_i + \beta_1 Log(Assets_{it})$$

$$+ \beta_2 Market\text{-}to\text{-}Book_{it} + \beta_3 ROA_{it}$$

$$+ \beta_4 U.S.\ Listing\ Event_{it}$$

$$+ \beta_5 Non\text{-}U.S.\ Foreign\ Listing\ Event_{it} + \varepsilon_{it}. \quad (7)$$

U.S. Listing Event_{it} and *Non-U.S. Listing Event_{it}* are indicator variables equal to 1 in the year after the U.S. and non-U.S. exchange listing and 0 otherwise. These indicator variables measure the mean, incremental increase in pay following the listing events, after controlling for executive- and firm-level characteristics, size, growth options, and performance over the three-year window. *Executive_i* is an executive-level fixed effect to capture time-invariant firm- and executive-level unobserved heterogeneity.

These estimations, tabulated in Table 7, confirm our earlier cross-sectional analyses; both U.S. and non-U.S. exchange listings are associated with a significant increase in salary-based compensation following the listing event, and the magnitude of the two listing effects are statistically equivalent. Because a foreign listing changes the CEO's responsibilities and required skill sets, we reestimate these models after eliminating firms with CEO turnover during the listing event windows (panel B). The preceding results are robust to this change; in this particular subsample of 56 firms (50 U.S. and 69 non-U.S. exchange), the executive, and therefore the manager's human capital, is held constant, yet he or she appears to

receive a higher salary upon exposure to foreign capital markets.[24]

This analysis confirms our earlier cross-sectional findings that UK executives receive a higher reservation wage in the form of higher salary for bearing the additional legal liability and personal risk associated with exposure to U.S. and non-U.S. foreign capital markets. Furthermore, a U.S. listing does not lead to the adoption of U.S.-style incentive-based pay. Instead, executives earn a salary premium for the risk and effort associated with a foreign exchange listing, regardless of the location of the listing.

6. Additional Analyses

6.1. Evidence on Alleviation of Pay Disparity: Matched Firm Research Design

If the observed positive relation between UK compensation and the extent of U.S. activities is a result of UK firms attempting to alleviate pay disparities upon entering the U.S. market (Cheffins 2003), then the observed compensation gap between the UK firm and the relevant U.S. benchmark should decrease following the initiation or expansion of U.S. exposure.

To test this argument, we match each UK firm-year observation with a similarly sized U.S. firm in that year using propensity scores based on the firm-level characteristics included as control variables in Equation (1).[25] Using the matched U.S. firm's pay as a benchmark, we calculate the pay disparity for each UK firm-year observation. This variable, *Pay Disparity_{it}*, is measured as the log of the matched U.S.

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[23] Our sample selection criteria identified an additional 17 firms that engaged in both U.S. and non-U.S. exchange listings during our sample period. In each case, the two listing events occurred essentially simultaneously (within one month of each other). To avoid the confounding effects associated with simultaneous multiple foreign listings, our event analysis excludes these firms.

[24] Foreign listing can also be related to foreign product market decisions, for example, M&A activity or foreign operations. Estimations including controls for a shift in U.S. and non-U.S. foreign operations (sales ratio and acquisition ratio) yield similar inferences.

[25] To implement the propensity score matches, we carry out a one-to-one nearest-neighbor match without replacement. To maximize sample size, we do not use a cut-off value. This approach yields no significant differences between the treatment and control firms along the major dimensions of the firm that affect compensation, namely, firm size, growth opportunities, accounting performance, and stock return performance. There are, however, significant differences on other dimensions, especially relating to corporate governance. In the tests in Table 8, we regress the differences in compensation (pay gap) on the U.S./non-U.S. interaction variables and include the differences in these control variables to capture any variation not picked up in the propensity score matches. We also implemented several additional analyses to evaluate the sensitivity of our results to the matching criteria. First, we performed a simple match based on size within industry and year. The results for these untabulated tests are quantitatively and qualitatively similar to those presented in Table 8. Second, we used a cut-off value of 0.02 in our propensity score algorithm. At this cut-off value, the sample size drops from 1,542 to 652 observations. The results for this test are similar to the results reported in Table 8 without the use of a cut-off value.

Table 7 **UK Compensation Practices Around U.S. and Non-U.S. Listing Events**

	Ln(*Total*)	Ln(*Cash*)	Ln(*Salary*)	Ln(*Bonus*)	Ln(*Equity*)	*Equity Ratio*	*Option Grant*
Panel A: All UK firms with a U.S. or non-U.S. foreign listing event (1998–2007)							
U.S. Listing	0.092	0.181***	0.144***	0.101	−0.487	−0.029	−0.102
	(0.059)	(0.056)	(0.039)	(0.709)	(0.746)	(0.032)	0.067
Non-U.S. Listing	−0.126	0.135	0.152**	1.218	−0.446	−0.154*	−0.002
	(0.182)	(0.175)	(0.068)	(1.821)	(2.039)	(0.088)	0.170
Fixed effects	Included	Included	Included	Included	Included	Included	Included
U.S. = Non-U.S. p-value	0.108	0.789	0.908	0.545	0.984	0.069	0.561
N	186	186	186	186	186	186	186
Panel B: UK firms without CEO turnover around U.S. or non-U.S. listing event (1998–2007)							
U.S. Listing	0.083	0.180***	0.144***	0.079	−0.573	−0.034	−0.110
	(0.059)	(0.057)	(0.038)	(0.723)	(0.765)	(0.033)	(0.069)
Non-U.S. Listing	−0.114	0.193	0.198**	1.608	−0.243	−0.163	0.013
	(0.201)	(0.198)	(0.076)	(2.012)	(2.208)	(0.098)	(0.184)
Fixed effects and controls	Included	Included	Included	Included	Included	Included	Included
U.S. = Non-U.S. p-value	0.158	0.949	0.239	0.228	0.879	0.085	0.505
N	168	168	168	168	168	168	168

Notes. This table presents tests of compensation changes around U.S. and non-U.S. listings of UK firms over the period 1998–2007. The panels present select coefficients from executive-level fixed effects estimations of the following models:

$$\text{Ln}(Compensation_{it}) = \alpha + \gamma_i Executive_i + \beta_1 \text{Ln}(Assets_{it}) + \beta_2 Market\text{-}to\text{-}Book_{it} + \beta_3 ROA_{it} + \beta_4 U.S.\ Listing\ Event_{it} + \beta_5 Non\text{-}U.S.\ Foreign\ Listing\ Event_{it} + \varepsilon_{it}.$$

For Ln(*Cash Compensation*), Ln(*Salary*), and Ln(*Bonus*), the dependent variable equals the specified measure of annual compensation earned by the CEO of firm *i* in year *t* less the mean corresponding level of compensation reported in the Hemscott database for year *t*. Because Hemscott does not provide equity compensation data for the first part of the sample (1998–2002), Ln(*Total Compensation*) and *Equity Ratio* are not trend-adjusted. *U.S. Listing Event_{it}* (*Non-U.S. Foreign Listing Event_{it}*) equals 1 if year *t* corresponds to the year after a U.S. (non-U.S.) foreign listing. *Executive_i* is an executive-level fixed effect to capture unobserved heterogeneity. These tests use three years of compensation data centered on the listing event (years $t-1$ to $t+1$). *Total Compensation, Cash Compensation, Salary*, and *Bonus* models are estimated using ordinary least squares. Ln(*Equity Compensation*) and *Equity Ratio* models are estimated using Tobit. *Option Grant* models are estimated using logit. Panel B repeats these tests using a restricted sample of firms in which there were no CEO turnovers during the three-year window. Standard errors (in parentheses) are clustered at the executive-level. The *p*-values on the equality of the U.S. and non-U.S. foreign listing coefficients are from a *t*-test (one-sided).

*, **, ***Significantly different from zero at the 1%, 5%, and 10% levels (two-tailed test), respectively, using standard errors clustered by executive.

firm's total compensation minus the log of the UK firm's total compensation; it is expected to be decreasing in the extent of the UK firm's U.S. market activities. Evidence of greater similarity in compensation would be consistent with the elimination of pay disparities.

Results in Table 8 suggest that the pay gap of UK firms relative to matched U.S. firms is decreasing with the extent of U.S. sales activity (i.e., *U.S. Sales Ratio_{it}*) in our full cross-sectional sample. Moreover, in the acquisition event tests (panel B), we observe greater similarity in pay levels between matched UK and U.S. firms following U.S. acquisitions. This significant decrease in the pay gap during the event window is notable because the matching process takes into account the effect of changes in size, profitability, and growth options on compensation in the UK firm following the acquisition event; as such, these matched sample event tests capture movement toward U.S. pay following an increase in the scope of U.S. operations. Finally, in contrast to the U.S. sales and acquisition results, we find that foreign listings

do not result in similarity in pay in our levels specification after we control for U.S. operational activity or in the event specification once we control for CEO turnover. The disappearance of the U.S. listing effect on the pay gap once we include the U.S. operations variables is noteworthy given the conclusions in Southam and Sapp (2010) and Conyon et al. (2011a) that U.S. listing causes UK firms to have U.S.-style pay. The lack of pay gap reduction is consistent with our earlier interpretation that pay simply appears to increase for all foreign listed firms in response to an increase in reservation wages.

6.2. Compensation Around CEO Turnover: Test of Agency Arguments
One plausible interpretation of our results is that entrenched executives engage in U.S. activities to capture the higher pay levels that U.S. executives receive. As discussed by Rose and Shepard (1997), if such rent-seeking behavior is the primary source of our positive association between compensation and U.S. activities, we would expect to see the sensitivity of our firms'

Table 8   Evidence on Relative Pay Disparity Between UK Firms and Propensity-Score Matched U.S. Firms Conditional Upon Extent of U.S. Market Activities

Panel A: Pooled, cross-sectional tests				
Foreign market interaction:	Sales	Acquisition	Listing	All market interactions
U.S. Sales Ratio	−0.813***			−0.784***
	(0.142)			(0.164)
Non-U.S. Foreign Sales Ratio	−0.057			−0.010
	(0.099)			(0.105)
Ln(*U.S. Acquisition Ratio*)		−0.391**		0.052
		(0.158)		(0.178)
Ln(*Non-U.S. Foreign Acquisition Ratio*)		−0.190		−0.111
		(0.204)		(0.216)
U.S. Listing			−0.187***	−0.086
			(0.069)	(0.072)
Non-U.S. Foreign Listing			−0.145	−0.108
			(0.115)	(0.117)
U.S. = Non-U.S. Sales p-value	0.001			0.002
U.S. = Non-U.S. Acquisition p-value		0.231		0.876
U.S. = Non-U.S. Listing p-value			0.761	0.577
Control variables and fixed effects	Included	Included	Included	Included
Adjusted *R*-squared	0.423	0.413	0.414	0.423
N	1,543	1,543	1,543	1,543

Panel B: Event tests				
Foreign event variable:	Ln(*Acquisition Ratio*)		*Listing*	
	All events	No turnover	All events	No turnover
U.S. Event Variable	−1.644*	−1.608*	0.271*	0.233
	(0.895)	(0.912)	(0.148)	(0.156)
Non-U.S. Foreign Event Variable	0.503	0.496	0.022	0.047
	(0.870)	(0.883)	(0.510)	(0.677)
U.S. = Non-U.S. p-value	0.047	0.059	0.643	0.790
Control variables and fixed effects	Included	Included	Included	Included
Adjusted *R*-squared	0.441	0.443	0.286	0.291
N	243	243	186	168

Notes. This table presents select coefficients from various pooled, cross-sectional estimations of the following model:

$$Pay\ Disparity_{it} = \alpha + \sum_{k=1}^{n} \gamma_k\ Industry_k + \sum_{t=1}^{4} Year_t + \beta_1 d\_Ln(Assets_{it}) + \beta_2 d\_Market\text{-}to\text{-}Book_{it} + \beta_3 d\_ROA_{it} + \beta_4 d\_CFO_{it} + \beta_5 d\_Stock\ Return_{it}$$

$$+ \beta_6 d\_Return\ Volatility_{it} + \beta_7 d\_Ln(Tenure_{it}) + \beta_8 d\_Ln(Percent\ Shares\ Held_{it}) + \beta_9 d\_Percent\ Inside\ Directors_{it} + \beta_{10} d\_Ln(Board\ Size_{it})$$

$$+ \beta_{11} d\_U.S.\ Sales\ Ratio_{it} + \beta_{12} d\_Non\text{-}U.S.\ Foreign\ Sales\ Ratio_{it} + \beta_{13} d\_Ln(U.S.\ Acquisition\ Ratio)_{it}$$

$$+ \beta_{14} d\_Ln(Non\text{-}U.S.\ Foreign\ Acquisition\ Ratio)_{it} + \beta_{15} d\_U.S.\ Listing_{it} + \beta_{16} d\_Non\text{-}U.S.\ Foreign\ Listing_{it} + \beta_{17} d\_U.S.\ Board\ Experience_{it}$$

$$+ \beta_{18} d\_Non\text{-}U.S.\ Foreign\ Board\ Experience_{it} + \varepsilon_{it}.$$

The dependent variable, *Pay Disparity*, equals the natural logarithm of the total annual compensation earned by the CEO of a propensity score-matched U.S. firm in year *t* minus the natural logarithm of the total annual compensation of UK firm *i* in year *t*. All independent variables are the difference between the realizations of the U.S. matched firm-year and the UK firm-year observation (denoted by the "*d_*" prefix). Panel B presents estimations analogous to Tables 6 and 7 using our sample of U.S. and non-U.S. acquisition and listing events. All models are estimated using ordinary least squares. Standard errors (in parentheses) are clustered at the firm level.

*, **, ***Significantly different from zero at the 1%, 5%, and 10% levels (two-tailed test), respectively, using standard errors clustered by firm.

compensation to the scope of U.S. operations shift following the departure of the conflicted executive. We examine the relations between total compensation and U.S. sales ratios, U.S. acquisition ratios, and U.S. listings before and after 80 CEO turnover events in our sample. These estimations (not tabulated) fail to find a shift in the sensitivity of total compensation to these U.S. market interaction variables around the turnover events, consistent with agency conflicts not being the primary driver of the observed association.

6.3. Effect of Geographic Proximity

If the non-U.S. product market exposure is mostly in countries that are closer to the United Kingdom, it would reduce the effort and risk in managing those activities compared to the more distant United States, resulting in lower pay when foreign exposure is in countries closer to the United Kingdom. To explore this potential explanation for the U.S. interaction results, we examine our earlier results separating geographic sales by proximity to the United Kingdom. Although segment disclosure information is not very detailed, we are able to identify sales to European Union (EU) countries that are geographically closer than other countries. We separate non-U.S. foreign sales into EU sales and rest of the world sales. In untabulated results we find that the coefficient on U.S. sales remains statistically significantly associated with compensation and similar to magnitude to the results presented in Table 2, panel B. By contrast, the coefficients on EU sales and rest-of-the-world sales are not significantly different from zero or from each other, implying that geographic distance does not drive our results. Moreover, the coefficient on EU sales is significantly smaller in magnitude than the one on U.S. sales.

7. Conclusions

We use broad cross-sectional and narrow event-window analyses to provide evidence that the presence of U.S. product market activities is associated with higher CEO pay, greater use of U.S.-style incentive pay, and a reduction in the U.S.–UK pay gap. These effects are incremental to U.S. capital market interactions measured as a U.S. exchange listing and to the CEO's personal and professional links to the United States. The associations are also robust to controls for the scope of the firm's non-U.S. foreign market interactions, as well as firm-level and executive characteristics, such as current firm performance, firm size, and executive age, which have been shown to influence pay in other studies. Additional analyses show that the use of U.S. pay consultants increases the sensitivity of UK pay practices to U.S. activities.

The documented associations are consistent with arguments that firms exposed to U.S. market competition have an incentive to adopt U.S. pay practices to alleviate internal and external pay disparities. However, we cannot rule out other mechanisms by which greater U.S. exposure can be associated with greater pay and a greater use of incentive-based pay. For example, UK executives wishing to increase their pay could undertake U.S. market activities to force the board to adopt U.S.-style pay arrangements. In that case, the initiation of U.S. activities does not create

the incentive per se but instead serves as the conduit by which UK executives transfer U.S. pay practices to their firm. Similarly, the likelihood of U.S.-based competitors operating in the UK market could be correlated with the extent to which the UK firm competes in the U.S. product market; the presence of such product market competition in the United Kingdom could increase pressures to adopt U.S.-style compensation for local managerial talent.

These alternative explanations cannot be refuted with our current research design; as such, our ability to assign causal mechanisms to our documented associations is limited. We acknowledge the likelihood of other mechanisms or paths by which local compensation practices can be influenced through cross-border transactions. Nevertheless, our evidence is relevant. Given our research design, a failure to document an association between UK compensation practices and our measures of U.S. market interactions would cast meaningful doubt on arguments that cross-border market interactions influence home-country compensation arrangements. Instead, our evidence is generally consistent with these arguments. As such, the paper contributes to the broader literature on the globalization of governance practices by showing how cross-country economic interactions can produce similarities in compensation practices (Bebchuk and Roe 1999, Hansmann and Kraakman 2001, Khanna et al. 2004). Taken together, our results are consistent with cross-border transactions and foreign market interactions influencing home-country compensation practices, and they provide new evidence on potential market-based channels through which U.S.-style compensation practices can spread worldwide.

Appendix. Variable Definitions (Firm and CEO Characteristics)

Assets	Total assets in thousands of pounds sterling at the end of year t
Ln(*Assets*)	Natural logarithm of total assets in thousands of pounds sterling at the end of year t
MVE	Number of shares outstanding in thousands times the firm's share price in pounds sterling at the end of year t
Ln(*MVE*)	Natural logarithm of the number of shares outstanding in thousands times the firm's share price in pounds sterling at the end of year t
Market-to-Book	Ratio of the market value of equity to the book value of equity at the end of year t
ROA	Ratio of earnings before interest and taxes to total assets for year t
CFO	Ratio of cash flow from operations to total assets for year t
Stock Return	Annual return including dividends on the firm's common stock for year t
Return Volatility	Annualized volatility of daily returns on the firm's common stock for year t
Percent Shares Held	Percentage of the firm's shares outstanding held by the CEO in the form of unrestricted shares at the end of year t
Ln(*Percent Shares Held*)	Natural logarithm of one plus the ratio of the firm's shares outstanding held by the CEO in the form of unrestricted shares at the end of year t to total shares outstanding at the end of year t
Percent Inside Director	Percentage of directors serving on the board who are insiders in year t
Board Size	Number of directors serving on the board in year t
Ln(*Board Size*)	Natural logarithm of the number of directors serving on the board in year t
CEO Age	Age of the CEO at the end of year t
CEO Tenure	The number of months that the CEO has been in office at the end of year t
Ln(*CEO Tenure*)	Natural logarithm of the number of months that the CEO has been in office at the end of year t

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