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The value of excess cash and corporate governance: Evidence from US cross-listings ☆

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ABSTRACT

We examine whether and how a US cross-listing mitigates the risk that insiders will turn their firm's cash holdings into private benefits. We find strong evidence that the value investors attach to excess cash reserves is substantially larger for foreign firms listed on US exchanges and over-the-counter than for their domestic peers. Further, we show that this excess-cash premium stems not only from the strength of US legal rules and disclosure requirements, but also from the greater informal monitoring pressure that accompanies a US listing. Overall, because investors' valuation of excess cash mirrors how they expect the cash to be used, our analysis shows that a US listing constrains insiders' inefficient allocation of corporate cash reserves significantly.

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1. Introduction

When minority shareholders anticipate that those who control the firm, whom we call insiders, will exploit some of its resources to derive private benefits, they discount firm value. That is the main conclusion of the literature examining the interplay between firm value and corporate governance (see La Porta, Lopez-de-Silanes, Shleifer, and Vishny, 2002; or Durnev and Kim, 2005).[2] Agency theories predict that the magnitude of the value shortfall depends not only on the existence and efficiency of mechanisms limiting the potential extraction of private benefits, but also to a large extent on the availability of resources that can be easily diverted. Although many kinds of assets can be turned into private benefits, Myers

[2] La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1999) show that non-US firms are classically controlled by large shareholders. On this ground, studies on the determinants and consequences of private benefits of control generally focus on the presence of large controlling shareholders as the source of agency conflicts. Yet corporate managers could also enjoy the private benefits of control (see Benos and Weisbach, 2004). In this paper, we refer to 'insiders' to denote those who hold control of the firm's decisions. In our setting, they can either be large shareholders or managers.

and Rajan (1998) argue that cash reserves are especially at risk. Because the cash not committed to operations and investment – the excess cash – can be used as insiders choose, it is a strong candidate for being turned into private benefits.[3] Existing empirical evidence is consistent with this prediction. In particular, recent studies show that when minority shareholders' legal protection is weak (Pinkowitz, Stulz, and Williamson, 2006) and when the monitoring pressure on insiders is limited (Dittmar and Mahrt-Smith, 2007), investors value cash holdings at a sizable discount. Consequently, a substantial source of value loss associated with weak governance seems to materialize through investors' markdown of liquid assets.

In this paper, we study how the combination of various governance mechanisms can mitigate insiders' ability to convert cash holdings into private benefits. To do so, we focus on the consequences of firms' decision to cross-list in the United States. A US cross-listing represents an important event that brings substantial changes in the legal, disclosure, and monitoring constraints faced by corporate insiders. In particular, firms cross-listing on a US exchange are exposed to enforcement procedures initiated by the Securities and Exchange Commission (SEC) or to class-action lawsuits filed in US courts and are required to comply with the demanding US disclosure standards. Foreign firms accessing US capital markets through over-the-counter (OTC) listings or via private placements (Rule 144a) also face governance constraints. Although these firms are not tied directly to US regulations, they could be subject to additional informal monitoring provided by diverse financial intermediaries such as analysts or large investors. As a result, exploring the impact of different cross-listing types on investors' valuation of excess cash represents a promising opportunity to expand understanding of the interplay between agency conflicts and cash holdings, and their combined effect on firm value.

To assess whether and how a specific US cross-listing shrinks the potential private benefits associated with cash reserves, we measure investors' valuation of excess cash.[4] Looking at a sample of firms from more than 40 countries over the period 1989–2005, we find compelling evidence that investors value the excess cash of cross-listed firms substantially more than that of non-cross-listed peers. On average, investors' valuation of excess cash is almost three times larger for foreign firms listed on a US exchange than for their domestic counterparts. More specifically, we estimate that the value of $1 of excess cash for a typical non-US firm is $0.58, while it is $1.61 for firms listed in the US via an exchange listing. Notably, we also find a sizable excess cash premium for foreign firms listed over-the-counter. For those firms an additional dollar of excess cash is worth $1.42, significantly less than that for exchanged listed firms. In contrast, we find no excess cash premium for firms conducting private placements. Overall, because investors' valuation of excess cash is ultimately determined by how they expect the cash to be used, the documented excess cash premium for exchange- and OTC-listed firms suggests that investors view both types of listing as limiting the potential private benefits that can be extracted from cash reserves.

Reassuringly, numerous robustness checks offer evidence that our estimates of the value of excess cash are not contaminated by uncaptured growth options that are specific to cross-listed firms. In particular, we identify positive excess cash premiums both for firms that do and do not increase their capital-raising activity around the cross-listing date. In essence, because we could expect that only firms that cross-list in the United States to exploit valuable growth options will raise capital upon listing, these results provide additional support for our governance interpretation.

Next, to reinforce the interpretation of the results, we exploit the temporal and cross-country dimension of our sample. First, we track investors' valuation of excess cash around the cross-listing date. Arguably, such an event-time analysis allows us to examine precisely whether investors perceive any change in the potential private benefits embedded in excess cash when insiders face tightened governance constraints. The results confirm that investors do raise the value they place on excess cash when firms access the US markets through an exchange or OTC listing. Moreover, we show that this increased valuation persists several years after the cross-listing event and is still present nowadays. Accordingly, investors seem to associate a US listing with a commitment that permanently lessens the risk that cash holdings will be converted to private benefits. Second, cross-sectional tests reveal that the excess cash premium is larger for firms located in countries where legal protection for minority shareholders is weak. Further, regardless of firms' country of incorporation, investors seem to equalize the value they attach to excess cash once firms access the US financial environment. Hence, cross-listed firms truly appear to benefit from similar governance quality.

Our results so far reveal a robust positive excess cash premium for foreign firms opting for an exchange or OTC listing. Insofar as OTC listings do not entail strong changes in legal and disclosure provisions, our findings suggest that informal constraints could also be at work. To further characterize this intuition, we examine whether part of the uncovered excess cash premium originates in the increased informal monitoring that accompanies most US listings (see Stulz, 1999). Specifically, we use the number of analysts following the firms as a proxy for the intensity of informal monitoring and find that investors' valuation of excess cash is magnified when a US listing is accompanied by a positive change of analyst coverage. Hence, the additional scrutiny offered by financial analysts seems to markedly impact the potential for private benefits embodied in cash holdings. Remarkably, the effect of financial analysts turns out to be particularly strong for OTC listings, suggesting that a fraction

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[3] In this paper, private benefits of control are defined as in Benos and Weisbach (2004), those accruing to managers or shareholders that have control of the corporation but not to minority shareholders'. Those benefits can be of diverse nature. On the one hand, insiders could directly tunnel the available cash out of the firm to their own benefit. On the other hand, insiders could use cash holdings to invest in under-performing ventures that benefit them personally. Thus, our definition of private benefits encompasses waste, dissipation, and misallocation of cash to insiders' own benefit.

[4] Specifically, we follow Dittmar and Mahrt-Smith (2007) and define excess cash as cash reserves exceeding those needed for operations and investment. Then, we estimate the value of this excess cash using the Fama and French (1998) model.

of the excess cash premium for OTC firms stems from increased monitoring intensity.[5] With analogous logic, we also consider the presence of large shareholders as an alternative way of measuring informal monitoring pressure. Mirroring the disciplining effect of financial analysts, we report suggestive evidence that investors seems to place greater value on excess cash when firms' ownership structure tilts toward larger shareholders or institutional shareholders after the cross-listing. Finally, we also show a positive and significant excess cash premium for firms that cross-list in London and attract additional analyst coverage. Because a listing on the London Stock Exchange does not subject firms to the UK legal rules and entails a weaker governance commitment than a US exchange listing, this result confirms that external monitoring substantially reduces the risk that insiders will turn cash resources into private benefits.

Putting all our findings together, our analysis provides clear-cut evidence that the more stringent legal and regulatory provisions as well as the increased monitoring intensity that accompany a US cross-listing complementarily help lessen investors' markdown of liquid assets and, in turn, safeguard investors' money. As such, our results make a contribution in two distinct areas. First, we add to the burgeoning literature on corporate cash holdings. By showing an excess cash premium for cross-listed firms, the analysis broadens understanding of the value implications of corporate cash reserves. Prior research suggests that the conjunction of large cash holdings and poor governance leads to value loss. In this paper, we first confirm that investors' valuation of cash holdings is largely determined by the existence of mechanisms putting boundaries on insiders' actions. More important, by focusing on changes in legal protection and monitoring forces inherent in a US listing, our analysis highlights the idea that firms can take actions to acquire effective governance devices and hence prune a substantial source of value shortfall. We also provide valuable insights into which governance mechanisms enhance the value of corporate cash holdings. Our results suggest that increased legal protection and transparency work hand-in-hand with better monitoring by market intermediaries to limit insiders' power to extract private benefits by tapping into their firms' cash reserves. From a different point of view, our panel data allow us to focus on cross-sectional as well as time series patterns. Despite many recent governance reforms, we observe that the value of excess cash remains remarkably stable over time. In addition, our experiment is in line with theoretical arguments and complements the work of Dittmar and Mahrt-Smith (2007) by providing estimates of the value of excess cash mainly outside the United States.

Second, this paper complements the literature showing that cross-listed firms trade at a premium compared with their domestic counterparts (see Karolyi, 2006). Although many authors argue that such a "cross-listing premium" stems from the better governance practices

prevailing in the United States, much less is known about the channels through which the US governance standards materially affect firm value.[6] In this paper, we demonstrate a direct channel by which the governance dimension of cross-listings operates. Through its effect in curbing the potential for private benefits embodied in cash holdings, a US cross-listing clearly helps preserve investors' money. As such, our results suggest that part of the valuation premium enjoyed by cross-listed firms can be attributed to a larger valuation of liquid assets. In a related perspective, our analysis pins down indirect mechanisms through which a US listing helps constrain insiders. Stulz (1999) first argues that different US financial intermediaries could play a critical role in monitoring cross-listed firms. Although this idea has been discussed frequently in the literature, the evidence remains relatively scarce. By highlighting the disciplining effects of greater analyst attention and, to a lower extent, of larger investors, our work empirically supports the existence and efficacy of nonlegal governance effects.

Finally, it is important to note several limitations of our investigation. First, we share many of the imperfections inherent in cross-country studies. Even though Worldscope makes efforts to adjust differences in reporting standards across countries, these adjustments might not be perfect and therefore could introduce systematic measurement biases in our estimates. Furthermore, we recognize that our use of the Worldscope's data item Closely Held Shares and the SEC 13(f) filings to identify the presence of large monitoring investors is debatable. Although we perform different tests to support our interpretation, we cannot completely exclude alternative stories. Finally, although our results indicate that various governance mechanisms reduce the private benefits embodied in cash holdings, we are not able to identify the exact nature of this reduction. In particular, we cannot separate the relative strength of different mechanisms to limit the expropriation of cash reserves vis-à-vis the inefficient use of cash to finance self-interested ventures.

In Section 2, we review the related literature, discuss the theoretical background, and outline our main hypothesis. In Section 3, we present the empirical methodology and describe the data. In Section 4, we present the results and show that investors' valuation of excess cash increases with cross-listings. We present our conclusions and discuss some implications for future research in Section 5.

2. Related literature and hypothesis development

The benefits of holding cash reserves, namely, mitigating risk and avoiding underinvestment, could be eroded if those who control corporate decisions act to further their

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[5] Bailey, Karolyi, and Salva (2006) find that firms listing OTC are the ones that experience the largest change in analyst coverage.

[6] The valuation premium of cross-listing firms has been related to an improvement in the information environment (Lang, Lins, and Miller, 2003), to an expanded shareholder base (King and Segal, 2009), and to a reduction in private benefits (Doidge, Karolyi, and Stulz, 2004 and King and Segal, 2009). The channels through which firm value is enhanced have been less explored. An exception is Doidge, Karolyi, and Stulz (2004), who show that the reduction of private benefits translates into a higher value for growth options. Also Hail and Leuz (2009) propose that legal bonding could affect firm value through a lower cost of capital.

own interests.[7] This idea emanates from the extensive literature on agency conflicts initiated by Jensen and Meckling (1976). Accordingly, when governance mechanisms are poor, self-interested insiders have the ability to use corporate resources to take actions that bring them substantial personal benefits at the expense of minority shareholders. Among the many types of assets that firms possess, cash holdings are particularly vulnerable. At least two reasons could explain why that is so. First, cash reserves are liquid assets that are easier to expropriate than harder assets. As pointed out by Myers and Rajan (1998), it is easier to make cash disappear than to make a plant disappear. Hence, when insiders have sufficient control rights over corporate decisions and are not constrained by legal provisions and their associated enforcement or by effective external monitoring or both, cash holdings are largely at risk of being diverted or siphoned out of the firm. Such a tunneling of cash reserves could take a variety of forms such as outright stealing, excessive salaries, perks, or transfer pricing.[8] Second, cash reserves are accessible to insiders with little scrutiny and much of their use is discretionary. As a result, even when insiders cannot directly expropriate cash holdings, they could still find it optimal to funnel them into negative net present value projects that benefit them personally.[9] For instance, insiders could use cash resources to finance value-destroying acquisitions or the pursuit of growth at the expense of profitability and value. In the following, we take the perspective of a minority investor and refer to these diverse value-destroying actions as the private benefits associated with cash holdings.

On this ground, several recent studies examine whether the risk that insiders turn cash reserves into ventures that benefit them personally is reflected into investors' valuation.[10] In particular, Pinkowitz, Stulz, and Williamson (2006) analyze how country-level legal protection affects the value investors place on cash holdings. Using several proxies for the quality of minority investor protection, they show that in countries where legal protection is weak, investors value cash reserves at a large discount. In contrast, they find no similar discount in countries where minority shareholders are well protected.

In a same vein but using detailed ownership data, Kalcheva and Lins (2007) report that firms' values are lower when ownership is concentrated in the hands of controlling insiders, when cash reserves are large, and when firms are located in countries where protection for minority investors is weak. From a different perspective, Dittmar and Mahrt-Smith (2007) provide evidence that cash holdings are worth less in firms with strong antitakeover protections and small institutional blockholdings. Overall, these results are consistent with the idea that when expected agency conflicts are large and cash reserves are freely accessible to insiders, investors identify the potential private benefits embedded in cash holdings and consequently discount their value.

On the whole, these studies highlight that investors recognize that the risk associated with cash reserves is substantial when institutions preventing controlling insiders from expropriating outsiders are weak or when external monitoring instruments are ineffective in aligning insiders' interests, or both. In this paper, we argue that cross-listing in the United States has several features that can shrink the potential private benefits associated with cash holdings and hence reduce or even eliminate the discount investors place on their valuation.[11] We draw our motivation from the recent literature that argues, with supporting evidence, that a US cross-listing enhances corporate governance.

First, as suggested by Coffee (1999, 2002) and Stulz (1999), a US cross-listing puts some legal bounds on the potential extraction of private benefits—by listing on a US stock exchange (NYSE, Nasdaq, or Amex), foreign firms become subject to US disclosure requirements, SEC enforcement, and the threat of shareholder litigation. In contrast, listing on the OTC market or conducting private placements (Rule 144a) allows substantial exemptions from these laws and regulations. On the empirical ground, several papers provide support for the claim that US cross-listings significantly enhance investor protection. Reese and Weisbach (2002) show that foreign firms that cross-list on US exchanges raise more equity capital after their listing and that this effect is magnified for firms located in countries with weak investor protection. Doidge, Karolyi, and Stulz (2004, 2009) find that cross-listed firms enjoy higher valuations than their home-country peers and, further, that the valuation differential is larger for firms located in countries with poor investor protection and for firms listed on US major exchanges. Doidge (2004) reports that exchange-listed firms have voting premiums that are significantly lower than those of their home-country counterparts. Dyck and Zingales (2004) obtain similar results with control premiums. Doidge, Karolyi, Lins, Miller, and Stulz (2009) show that the presence of a large controlling shareholder reduces the likelihood of a US listing. From a different angle, Lel and Miller (2008) estimate that foreign firms listed on a US exchange are more likely to replace

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[7] As described in footnote 1, we use the term "insiders" to denote the group that controls the firm. This can include large blockholders or managers (see Hwang, 2004).

[8] See La Porta, Lopez-de-Silanes, Shleifer, and Vishny (2002) for fuller typology of the insiders' actions that are socially inefficient.

[9] This situation can happen because insiders do not have sufficient control to expropriate outsiders or because legal protection granted to outsiders effectively constrains expropriation.

[10] Some papers look at how poor governance is linked to the level and use of corporate cash holdings. Harford (1999) shows that cash-rich firms are more likely to make value-decreasing acquisitions. Harford, Mansi, and Maxwell (2008) report that firms with expected poor governance hold less cash, but that, for a given set of firms with high cash reserves, firms with worse governance spend their cash more quickly, primarily on acquisitions. Dittmar, Mahrt-Smith, and Servaes (2003) show that firms hold more cash in countries where investor protection is weak. Caprio, Faccio, and McConnell (2008) report that corporate cash holdings are negatively related to measures of political corruption. For a more general presentation of the determinants and consequences of corporate cash holdings, see Bates, Kahle, and Stulz (2009).

[11] A large literature has developed seeking to understand the motivations and benefits of the corporate decision to list shares on overseas exchanges. See Karolyi (1998, 2006) for a detailed survey of the literature.

underperforming chief executive officers. Finally, King and Segal (2009) provide evidence that a larger shareholder base and the lower consumption of private benefits both explain the valuation premium of cross-listed firms.

On top of the effect of US regulatory environment, Stulz (1999) suggests that a US cross-listing also contains an informal monitoring dimension. As a matter of fact, besides their exposure to US securities laws, cross-listed firms become subject to extra scrutiny by large investors, journalists, and other financial market intermediaries such as financial analysts, underwriters, or auditors. Such an increase in monitoring by different market participants could also limit insiders' self-interested actions. Various studies provide empirical evidence that is consistent with the existence of this informal monitoring effect. In particular, Baker, Nofsinger, and Weaver (2002) show that US exchange listings are associated with more analyst coverage and heightened media attention. Lang, Lins, and Miller (2003) find that cross-listed firms obtain more coverage from analysts and enjoy better forecast accuracy than firms that are not cross-listed. Moreover, Lang, Lins, and Miller (2003) further show that this larger coverage contributes positively to firm value. Similarly, Bailey, Karolyi, and Salva (2006) show that cross-listing leads to an overall improvement in firms' informational environment.

By and large, all these pieces of evidence suggest that insiders in cross-listed companies face more constraints in their consumption of private benefits. Therefore, we hypothesize that investors will value more highly the assets that are particularly at risk of being wasted or expropriated – the excess cash – of foreign firms that cross-list in the United States. We also expect that excess cash should be valued more highly for firms that cross-list on a US exchange compared with other types of listings. Firms that list on US exchanges face more formal monitoring and constraints because they are subject to the ongoing requirements of the US federal securities laws (disclosure, threat of litigation, SEC supervision and compliance) compared with firms that pursue listings that do not imply substantial changes in legal exposure (OTC, Rule 144a, and London listings).

Following a similar argument, the magnitude of the additional constraints that US laws and regulation impose on insiders should depend on home-country institutions. Firms located in countries where legal protection is weak should benefit more from opting for the US legal environment. Consequently, we conjecture that investors' valuation of excess cash will be magnified for cross-listed firms located in countries with poor investor protection.

Finally, we expect that the ability of insiders to turn excess cash into private benefits will be reduced to a larger extent for firms that become subject to effective informal monitoring upon their listing, regardless of the avenue they choose.[12] Hence, we conjecture that

investors' valuation of excess cash will be larger for cross-listed firms that attract more analyst coverage and that become subject to additional monitoring by large investors subsequent to their US listing.

3. Methodology and data

This section describes the methodology we use to measure investors value of cash and details the construction of the sample.

3.1. Measuring investors' valuation of excess cash holdings

To assess the potential private benefits associated with cash holdings and to gauge whether and how US cross-listings help reduce the risk that insiders expropriate or waste cash resources, we measure investors' valuation of firms' excess cash holdings. Following Dittmar and Mahrt-Smith (2007), we define excess cash as the cash that is not needed for operations or investments. Specifically, we determine excess cash as the cash held above a predicted "normal" (or "optimal") level. To compute the normal level, we regress firms' total cash on variables that serve as proxies for genuine motives to hold cash such as hedging needs, growth options, or financing restrictions. Given that firms from different countries could have different reasons to hold cash, we estimate the normal cash specification independently for each country in our sample.[13] Then, we define XCash as the residual of these normal cash regressions. We further discuss in the Appendix the details and the technical motivations for using excess cash instead of total cash. However, the conclusions of the analysis below are robust to different ways of defining and computing excess cash and to the use of total cash instead of excess cash.

To measure investors' valuation of excess cash, we draw from the model of Fama and French (1998). Specifically, we regress firm value on our measure of excess cash holdings as well as control variables capturing other sources of value within the firm. Then, to determine whether investors perceive a US listing as a way to limit the private benefits embedded in cash reserves, we estimate whether their valuation of excess cash differs between cross-listed and non-cross-listed firms. Because we conjecture that the three different listing types place different constraints on insiders' actions, we make the distinction between firms that list shares on US exchanges, those that list in the OTC market, and those that access the US market through Rule 144a. Our basic specification is

$$MV_{i,t} = \alpha + \beta_1 Exchange_{i,t} + \beta_2 OTC_{i,t}$$
$$+ \beta_3 144a_{i,t} + \theta_1 XCash_{i,t} + \theta_2 (XCash_{i,t} \times Exchange_{i,t})$$
$$+ \theta_3 (XCash_{i,t} \times OTC_{i,t}) + \theta_4 (XCash_{i,t} \times 144a_{i,t})$$

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[12] Bailey, Karolyi, and Salva (2006) point out that increased monitoring sometimes can be more important for OTC listing firms than for exchange listings. That is, in addition to disclosure and legal implications associated with exchange listings, increased monitoring places bounds into what controlling shareholders can do with their firm's resources.

[13] For instance, firms from riskier countries could hold more cash because they require a larger buffer to protect themselves against adverse events. Alternatively, cash holdings could be affected by country-level governance variable see Dittmar, Mahrt-Smith, and Servaes (2003) or Caprio, Faccio, and McConnell (2008).

$$+ \delta_1 E_{i,t} + \delta_2\, dE_{i,t} + \delta_3\, dE_{i,t+2} \delta_4\, dNA_{i,t} + \delta_5\, dNA_{i,t+2}$$
$$+ \delta_6 RD_{i,t} + \delta_7\, dRD_{i,t} + \delta_8\, dRD_{i,t+2}$$
$$+ \delta_9 I_{i,t} + \delta_{10}\, dI_{i,t} + \delta_{11}\, dI_{i,t+2} + \delta_{12} DIV_{i,t} + \delta_{13}\, dDIV_{i,t}$$
$$+ \delta_{14}\, dDIV_{i,t+2} + \delta_{15}\, dMV_{i,t+2} + \mathbf{\eta} + \mathbf{\omega} + \varepsilon_{i,t}, \qquad (1)$$

where *MV* is the market value of the firm, computed as the sum of the market value of equity and the book value of short-term and long-term debt divided by total assets.[14] Our variable of interest, *XCash*, refers to cash held in excess, as defined above. *Exchange* equals one if a foreign firm is listed on a US exchange (levels 2 and 3) and zero otherwise. *OTC* equals one for firms listed over-the-counter (level 1) and zero otherwise and, by corollary, *144a* equals one for firms that are listed in the US through private placements (Rule 144a). Following Fama and French (1998), we include variables that control for investors' expectations about other sources that determine firm value. Specifically, *E* is defined as net income plus all noncash charges or credits, extraordinary items, and interest. *NA* is net assets, computed as the book value of assets minus cash and marketable securities. *RD* refers to research and development expenses. When *RD* is missing, we set its value to zero. *I* is interest expenses and *DIV* is common dividend paid. We further control for firm's profitability, financial, and investment policies by including changes in those variables' level. Precisely, the notation dX_t refers to the change in variable X_t from year $t-2$ to year t. Likewise, dX_{t+2} represents the change in variable X_t from year t to year $t+2$.[15] To make firm attributes comparable, we normalize all firm-specific control variables (as well as dX_t and dX_{t+2}) by the book value of total assets.

Importantly, the literature on cross-listings suggests that firms that cross-list in the US could have better growth opportunities than domestic firms (see Doidge, Karolyi, and Stulz, 2004). Hence, if the control variables in Eq. (1) fail to capture completely the effect of growth options on firm value, our estimates of the value of excess cash (θ_1–θ_4) could convey information about growth opportunities that are specific to cross-listed firms.[16] To mitigate this concern, we include two extra proxies for growth opportunities in our baseline regression Eq. (1): *Sales growth* and *Global industry q*.[17] *Sales growth* is the

percentage change in sales from $t-2$ to period t, and *Global industry q* is the median market-to-book ratio of all firms that share the same Standard Industrial Classification (SIC) code.[18] Moreover, we control for differences in firm value that stem from periods and countries' economic and institutional environments by including year ($\mathbf{\eta}$) and country ($\mathbf{\omega}$) fixed effects. Finally, because firm value could change with cross-listing for reasons other than the effect on excess cash and the control variables, we include separate intercepts for each cross-listing type (*Exchange*, *OTC*, and *144a*).

Theory predicts that insiders could turn excess cash into private benefits. In this spirit, we follow Dittmar and Mahrt-Smith (2007) and focus only on firms that hold too much cash that is easily accessible to insiders. Accordingly, we estimate our value regression Eq. (1) for all firms with positive excess cash.[19] To the extent that the control variables effectively capture investors' expectations about future net cash flows and firms' growth options, the coefficient on *XCash* (θ_1) measures investors' valuation of an additional dollar of excess cash. In other words, this coefficient reflects the magnitude of the potential for value destruction (or creation) perceived by investors. With a similar logic, the coefficients on the interaction between *XCash* and the cross-listing dummies (θ_2–θ_4) enable us to assess whether the value of excess cash differs between firms that are cross-listed in the United States and their domestic peers.

3.2. Data and descriptive statistics

The construction of our sample starts with all non-US firms covered by Worldscope. For each firm, we collect cash and marketable securities, market value, and variables that serve as proxies for firm profitability and financial and investment policy for the period 1989–2005. All variables are measured in local currency units and are translated into US dollars using historical exchange rates obtained from Datastream. Then, we exclude financial firms (SIC codes between 6000 and 6999) and utilities (SIC codes between 9000 and 9999) because their businesses imply holding marketable securities and statutory capital requirements that could affect their investment choices. We also exclude firms for which information on cash and marketable securities, market value of equity, earnings before interests and taxes, interest expenses, or total assets is missing. To reduce the effect of outliers, we trim our sample at 1% in each tail of each variable.

Next, we classify firms as firms cross-listing in the United States and benchmark firms that have never cross-listed their shares in the United States. We then differentiate between exchange listings (NYSE, Nasdaq,

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[14] For ease of notation, we drop the subscripts that refer to the firm *i* and respectively year *t*.

[15] We aim to capture firm profitability and expected profitability growth given firm existing assets with a cash flow variable and two-year lead and lag changes in cash flows. We include past and future changes in net assets to capture another dimension of profitability that is a consequence of net investment. We add *RD*, and the corresponding lead and lag changes, to pick up additional information on expected profits not captured by the earnings or investment variables. *I*, *D* and its past and future changes aim to capture the firm's financing policy, which also affects the value of the firm.

[16] This possibility is one benefit of using excess cash instead of total cash. As discussed in Dittmar and Mahrt-Smith (2007) and in the Appendix, when we estimate excess cash, we use instrumental variables to deal with the potential endogeneity between cash and growth options. Hence, our measure of excess cash is by construction orthogonal to investment opportunities.

[17] The use of these control variables for growth opportunities is motivated by studies such as Doidge, Karolyi, and Stulz (2004).

[18] In the following subsections, we implement additional robustness checks and show that our conclusions are not driven by the effect of growth options that could be specific to cross-listing firms.

[19] Predictions about the role of incentive and governance mechanisms for firms having negative excess cash, i.e., a cash shortage, remain a theoretical issue and hence are difficult to establish.

and Amex), over-the-counter listings (OTC), and private placements under Rule 144a. We obtain cross-listing information (whether a firm has a foreign listing in the United States at the end of each year and the type of listing) from the Bank of New York, JP Morgan, Citibank, NYSE, Nasdaq, and the Center for Research on Security Prices (CRSP).[20] Our initial cross-listing sample has 719 exchange, 643 OTC, and 300 144a cross-listings (securities). Next, as a single firm could have more than one security cross-listed in the US (i.e., different types of shares—type A, type B, ordinary, preferred, etc.), we consider each firm only once, regardless of the number of cross-listed securities it has. In addition, to mitigate the concern about survivorship bias, we keep track of both active and inactive listings using the data provided by Citibank and CRSP. We also trace the listing type upgrades or downgrades, from OTC to exchange listing, for instance, using the information provided by Citibank. We manually contrast and complete the cross-listing dates and types by searching on Lexis/Nexis. Finally, we match our sample of cross-listed firms to Worldscope. In this step, we further eliminate cross-listed firms with missing accounting information.[21] Our final cross-listing sample consists of 337 exchange, 354 OTC, and 177 144a foreign firms listed in the United States.

To characterize the effects of cross-listings on the value of excess cash, we employ several proxies for governance quality and monitoring intensity. First, we use a number of country-level variables. Specifically, we consider the anti-director rights index presented by La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998), which measures the quality of legal protection offered to minority investors. This index, based on laws prevailing in 1993, is available for 49 countries. From the same source, we take the accounting index to assess the effect of lack of transparency. In addition, we use two variables from Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2006). We consider the revised anti-director rights index, which is compiled using laws prevailing in 2003, and the anti-self-dealing index, which focuses on the expropriation that minority shareholders could suffer from insiders (self-dealing). This latter index focuses more on the protection that shareholders receive in case of expropriation by corporate insiders and gives special attention to the level of disclosure. Investor protection tends to be highly correlated with measures of economic development. Hence, we also use the classification scheme of Standard and Poor's Emerging Market Database to categorize countries as developed or emerging economies.[22]

At the firm level, we use analyst following to capture informal monitoring pressure; see Jensen and Meckling, 1976, Lang, Lins, and Miller, 2003, or Yu, 2008. We collect information on analyst coverage from the Institutional Broker's Estimate System (I/B/E/S) International Summary file. Specifically, we define Coverage as the average number of analysts issuing forecasts during a given year. Moreover, we consider two additional variables that proxy for the structure of a firm's ownership. First, an attempt to identify the presence of large shareholders, we use the data item reported as "Closely held shares" in Worldscope. Closely held shares (CHS) is defined as the percentage of shares held by senior corporate officers and directors, and their immediate families; shares held in trusts; shares held by another corporation (except shares held in a fiduciary capacity by financial institutions); shares held by pension and benefit plans; and shares held by individuals who hold 5% or more of shares outstanding.[23] Second, we gather information on US institutional ownership [SEC 13(f) filings] from the Spectrum database. Because US institutional investors rarely report by way of 13(f) filings on holdings of cross-listing firms before they list in the US, we obtain available information only for the three immediate years following the cross-listing event. Then, we define institutional ownership (IO) as the fraction of US institutional holdings of cross-listed shares to total shares outstanding. As we explain later in Section 4.5.1, our analysis focuses on changes in CHS and IO. Thus, we hypothesize that these changes measure how much additional monitoring insiders are subject to, with larger values indicating more intense monitoring.

Finally, in further tests, we consider the extent to which firms raise external capital around the cross-listing event. For that purpose, we gather information about security issuance from the Securities Data Corporation (SDC). SDC contains the date and type of issue, the market (country) in which the security was issued, and the proceeds from each issue. Because we are interested in tracking issuance activity around the US listing event, we follow Doidge, Karolyi, and Stulz (2009) and compare the issuance dates with the cross-listing dates and consider only issuances within 3 years around the listing. Further, we put together all capital-raising activity, that is, all public and private equity and debt issued at home and in the United States as well as in other markets.

Table 1, Panel A, describes the composition of our final sample for cross-listing firms and firms that never cross-list (the benchmark). The sample consists of 868 foreign firms (7,068 firm-years) listing shares in the United States. By type of listing, there are 337 firms listing directly on exchanges, 354 firms listing OTC, and 177 firms listing through private placements under Rule 144a. The benchmark sample contains 11,554 firms,

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[20] See, for example, www.adrbny.com, www.adr.com, and www.citibank.com/adr.

[21] Specifically, we require information on cash and marketable securities, market value of equity, earnings before interests and taxes, interest expenses, or total assets to be non-missing.

[22] The Standard and Poor's Emerging Market Database classifies a market as emerging if it meets at least one of two general criteria: (1) it is located in a low- or middle-income economy as defined by the World Bank, and (2) its investable market capitalization is low in relation to its most recent Gross National Product figures. This yields a few situations in which newly rich countries (such as Taiwan and Korea) are categorized as emerging markets. The classification is based on 1998 data.

[23] In Japan, closely held shares represent the holdings of the ten largest shareholders. For firms with more than one class of shares, closely held shares for each class are added together. We recognize the limitations of this ownership measure, because it relies on information disclosed by firms and this disclosure is often voluntary and unmonitored.

which represents 53,569 firm-years. The sample has considerable geographic dispersion. Firms are located in 44 countries, 22 of which are emerging markets, and span 16 years. There are 533 cross-listing firms (7,648 benchmark firms) from developed markets and

335 cross-listing firms (3,906 benchmark firms) from emerging markets.

Panel B provides information on the composition of our sample classified by measures of investor protection and by capital-raising activity around the cross-listing

Table 1
Descriptive statistics.

Panel A describes the number of non-US firms cross-listing in the US in our sample classified by the type of listing, the number of firm-years available for those cross-listing firms, and similar information for a benchmark sample of firms that do not list in the US. [+] denotes a country designated as an emerging market by Standard and Poor's Emerging Market Database. Panel B provides information on the composition of our sample classified by country-level measures of investor protection, by the degree of market development, and by the change in capital-raising activity around the cross-listing event. The country-level measures of investor protection are the anti-director-rights index and the accounting index from La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998), the anti-self-dealing index, and the revised anti-director-rights index from Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2006). Panel C presents mean and median value for *Excess Cash*, *Cash* (cash plus marketable securities divided by total assets), *Market Value* (sum of the market value of equity, the book value of short- and long-term debt, divided by total assets), *Coverage* (number of analysts following the firm), *Closely Held Shares* (percent of shares held by insiders including blockholders), *Institutional Ownership* (fraction of US institutional holdings of cross-listed shares to total shares outstanding), and *Capital Raised* for the periods before and after a US listing as well as for the benchmark sample. OTC stands for over-the-counter. We report "–" when information is missing. To test the differences between the groups before-after, before benchmark, and after benchmark, we compute two-sample Wilcoxon tests (W-test). For each group (before and after), below each grouping criterion, we compute Kruskal and Wallis tests (K-W test) to test whether there are significant differences across the grouping criteria. ** and * indicate statistical significance at the 1% and 5% test level, respectively.

Panel A: By country

Country	Number of firms				Number of firm-years			
	Exchange	OTC	144a	Benchmark	Exchange	OTC	144a	Benchmark
Argentina[+]	5	2	5	32	47	15	30	97
Australia	12	31	3	465	125	212	31	1,455
Austria	1	10	1	48	4	86	3	317
Belgium	1	2	–	76	13	26	–	524
Brazil[+]	15	21	2	127	64	95	7	379
Canada	64	–	–	475	538	–	–	2,132
Chile[+]	10	2	1	100	79	17	5	532
China[+]	7	5	4	406	29	25	26	931
Colombia[+]	–	–	2	17	–	–	5	83
Denmark	4	–	–	92	41	–	–	763
Finland	2	2	4	97	12	25	34	672
France	19	14	2	487	284	201	22	3,050
Germany	16	13	4	514	103	151	33	2,868
Greece[+]	1	–	3	75	4	–	12	175
Hong Kong	8	71	2	441	37	502	11	1,514
Hungary[+]	1	2	4	17	5	13	17	65
India[+]	3	–	46	301	15	–	222	1,157
Ireland	6	5	–	35	48	36	–	265
Israel	9	1	–	55	43	10	–	173
Italy	8	–	6	158	74	–	43	971
Japan	15	19	–	2,798	137	220	–	11,532
Korea[+]	2	–	4	569	4	–	18	1,998
Luxemburg	1	–	1	16	1	–	2	82
Malaysia[+]	–	9	–	551	–	86	–	2,557
Mexico[+]	17	12	5	58	158	46	43	253
Netherlands	14	4	1	111	152	57	1	870
New Zealand	3	–	–	58	30	–	–	265
Norway	4	3	2	92	34	29	13	537
Pakistan[+]	–	–	1	90	–	–	2	515
Peru[+]	1	3	1	47	6	10	10	154
Philippines[+]	1	2	5	94	16	24	35	362
Poland[+]	–	1	5	44	–	4	15	157
Portugal[+]	2	1	3	36	18	9	21	188
Russia[+]	4	5	2	2	17	10	5	2
Singapore	3	17	–	342	9	105	–	1,411
South Africa[+]	6	20	4	172	64	137	28	720
Spain	3	2	1	82	70	13	1	607
Sweden	9	4	1	197	95	34	8	990
Switzerland	7	6	1	149	67	59	14	1,125
Taiwan[+]	5	–	42	804	44	–	246	2,057
Thailand[+]	–	11	2	257	–	82	19	1,462
Turkey[+]	–	1	6	84	–	3	13	176

Table 1 (continued)

Panel A: By country

	Number of firms				Number of firm-years			
Country	Exchange	OTC	144a	Benchmark	Exchange	OTC	144a	Benchmark
UK	47	48	–	879	582	624	–	7,412
Venezuela[+]	1	5	1	4	2	33	3	14
Total	337	354	177	11,554	3,071	2,999	998	53,569

Panel B: By investor protection, economic development, and capital-raising activity

	Number of firms				Number of firm-years			
	Exchange	OTC	144a	Benchmark	Exchange	OTC	144a	Benchmark
By anti-director-rights index								
High protection	203	246	86	7,688	1,883	2,072	443	35,063
Low protection	134	108	91	3,866	1,188	927	555	18,506
Total	337	354	177	11,554	3,071	2,999	998	53,569
By accounting index								
High protection	224	266	83	8,907	2,174	2,346	509	40,564
Low protection	113	88	94	2,647	897	653	489	13,005
Total	337	354	177	11,554	3,071	2,999	998	53,569
By revised anti-director-rights index								
High protection	240	288	97	9,091	2,087	2,325	490	41,384
Low protection	97	66	80	2,463	984	674	508	12,185
Total	337	354	177	11,554	3,071	2,999	998	53,569
By anti-self-dealing index								
High protection	207	251	127	8,627	1,834	2,121	666	37,608
Low protection	130	103	50	2,927	1,237	878	332	15,961
Total	337	354	177	11,554	3,071	2,999	998	53,569
By economic development								
Developed	249	252	32	7,648	2,474	2,389	237	39,550
Emerging	88	102	145	3,906	597	610	761	14,019
Total	337	354	177	11,554	3,071	2,999	998	53,569
By capital-raising activity								
Increase	154	80	18	–	1,599	885	555	–
No increase	183	274	159	–	1,472	2,114	443	–
Total	337	354	177	–	3,071	2,999	998	–

Panel C: Summary statistics

	Before (1)			After (2)			Benchmark (3)			(1)-(2)	(1)-(3)	(2)-(3)
Variable	Number of obs.	Mean	Median	Number of obs.	Mean	Median	Number of obs.	Mean	Median	W-test	W-test	W-test
Excess cash												
All	1,249	0.027	0.008	5,819	0.029	0.085	53,569	−0.001	0.006	−2.06*	−1.43	−8.62**
Exchange	448	0.033	0.011	2,649	0.034	0.015				−0.28	−2.92**	−7.50**
OTC	693	0.024	0.007	2,285	0.024	0.015				−2.28*	0.54	−4.74**
144a	108	0.02	0.006	885	0.024	0.01				−0.35	−0.34	−2.12**
(K-W test)		5.2			6.59*							
Cash												
All	1,249	0.118	0.085	5,819	0.112	0.079	53,569	0.121	0.084	1.71	−0.71	2.13*
Exchange	448	0.115	0.076	2,649	0.116	0.097				−0.2	0.67	1.26
OTC	693	0.123	0.095	2,285	0.113	0.084				1.76	−2.22*	−0.86
144a	108	0.096	0.063	885	0.098	0.068				−0.08	1.87	5.04**
(K-W test)		8.54*			27.78**							
Market value												
All	1,249	1.181	0.881	5,819	0.99	0.705	53,569	0.766	0.503	7.78**	−20.00**	−25.06**
Exchange	448	1.216	0.89	2,649	1.179	0.834				1.27	−12.90**	−28.56**
OTC	693	1.175	0.895	2,285	0.82	0.594				9.81**	−15.17**	−8.46**
144a	108	1.076	0.735	885	0.857	0.567				2.41*	−3.66**	−2.77**
(K-W test)		4.09			259.04**							

Table 1 (*continued*)

Panel C: Summary statistics												
	Before (1)			After (2)			Benchmark (3)			(1)-(2)	(1)-(3)	(2)-(3)
Variable	Number of obs.	Mean	Median	Number of obs.	Mean	Median	Number of obs.	Mean	Median	W-test	W-test	W-test
Coverage												
All	1,142	15.5	14	5,219	17.6	17	35,172	6.8	4	−7.95**	−33.54**	−79.22**
Exchange	389	16.9	16	2,383	19.8	19				−6.31**	−21.26**	−63.53**
OTC	654	15.3	14	2,026	16.6	16				−3.61**	−25.16**	−46.48**
144a	99	10.7	10	810	13.4	13				−3.14**	−7.80**	−27.55**
(K-W test)		23.43**			263.98**							
Closely held shares												
All	965	34.01	33.7	4,551	33.18	31.86	40,055	46.27	46.6	3.72**	12.05**	34.14**
Exchange	311	29.96	30.03	2,055	27.99	24.58				4.23**	6.88**	32.06**
OTC	617	35.31	34.64	2,004	35.91	34.26				−0.20**	11.00**	18.58**
144a	37	46.23	36.62	492	43.76	43.57				3.33**	−2.74**	4.13**
(K-W test)		19.90**			159.99**							
Institutional ownership												
All	–	–	–	463	12.10%	8.10%	–	–	–	–	–	–
Exchange	–	–	–	323	14.99%	4.60%				–	–	–
OTC	–	–	–	115	9.01%	9.01%				–	–	
144a	–	–	–	25	5.01%	3.22%				–	–	–
(K-W test)					66.17**							
Capital raised												
All	183	130.9	106.2	1,606	226	155.4	–	–	–	−4.38**	–	–
Exchange	55	152.9	130	949	255.4	189				−2.42**	–	
OTC	112	123.4	95.4	512	190.4	122.6				−2.98**	–	–
144a	16	107.7	103.1	145	158.7	105.9				0.71**	–	–
(K-W test)		13.66**			55.85**							

event. Overall, our sample includes a broad cross section of firm-years and firm characteristics suitable for our empirical investigation.

In Panel C, we present descriptive statistics for the main variables used in the subsequent analysis: excess cash, total cash, market value, analyst coverage, closely held shares, institutional ownership, and capital raised. For cross-listing firms, we present the statistics for both the period before and after the US listing. A slight increase is seen in the level of excess cash after foreign firms access the US markets. In contrast, a significant difference appears in the level of excess cash between cross-listing firms and domestic firms. Looking at total cash, we observe no difference between cross-listing and benchmark firms. Those descriptive results are consistent with the view that cross-listing firms are the ones that use additional cash and hence need to signal to investors that their money will be used efficiently (see Doidge, Karolyi, Lins, Miller, and Stulz, 2009). Turning to firm value, we note several points. First, consistent with Doidge, Karolyi, and Stulz (2004), the average and median firms' market values are larger for cross-listed firms than for benchmark firms. Moreover, we observe a pecking order in market values by type of listing. The average and median market value of exchange-listed firms is larger than that of OTC firm and, finally, than that of firms listing through Rule 144a. Consistent with the figures reported in Bailey, Karolyi, and Salva (2006) or Lang, Lins, and Miller (2003), we observe an increase in analyst following once foreign firms access the US markets. Turning to ownership structure, we note a slight decrease in closely held shares for firms cross-listing on an exchange or OTC but a significant increase for firms choosing private placement. A Kruskal and Wallis test indicates that the ownership structure differs among the three types of listing both before and after the listing event. Also, there seems to be an increase in US institutional ownership for all types of listings. Finally, the last part of Panel C clearly shows that cross-listing firms increase their issuance activity after accessing US markets. On average, they raise 70% more capital once listed in the United States.

4. Main results

This section starts by outlining the main results and then presents several tests that strengthen the validity of our interpretation.

4.1. Comparison of cross-listed with non-cross-listed firms

To test the hypotheses that we delineate in Section 2, we start by estimating investors' valuation of excess cash for the whole sample and report the results in Table 2. We estimate Eq. (1) by pooled ordinary least square and report *t*-statistics based on heteroskedasticity-corrected standards errors that are clustered at the firm level. To preserve space, the following tables do not include the estimated coefficients on the control variables listed in Eq. (1).[24] Column 1 first reveals that the marginal

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[24] The complete tables are available upon request.

Table 2

Investors' valuation of excess cash holdings: cross-listed versus non-cross-listed firms.

This table reports cross-sectional pooled ordinary least squares regressions and coefficient estimates for the market value of excess cash. The dependent variable is the ratio of market value (sum of the market value of equity and the book value of short- and long-term debt) divided by total assets. The independent variables include excess cash holdings *XCash,* defined as the residual from regression Eq. (2) in the Appendix. To identify firms' cross-listing status, we use different binary variables: *Exchange* equals one for firms cross-listed on a US exchange and zero otherwise. *OTC* equals one for over-the-counter cross-listed firms and zero otherwise. *144a* equals one for firms cross-listed through private placements and zero otherwise. To assess whether investors' valuation of excess cash varies with the different cross-listing types, we interact *XCash* with the cross-listing dummies. To control for investment opportunities we include *Sales Growth* (the percentage change in sales from $t-2$ to period t) and *Global Industry q* (the median industry Tobin's *q*, defined as the median market-to-book ratio of all firms that share the same standard industrial classification code). In Column 2, we exclude observations from the U.K. and Japan, which represent an important part of our sample and could be driving our results. In Column 3, we include all observations and do not restrict ourselves to firm-years having positive *XCash*. More precisely, when a firm-year has a level of cash that is lower than the optimal level of cash, we set *XCash* equal to zero. In Column 4, we interact all slope parameters on the control variables with the listing dummy *Cross-list* to control for the potential effect of changes in discount rates. All specifications also include a set of (unreported) firm-specific variables that serve as proxies for firm profitability and financial and investment policy as defined in the text. F-test# 1 tests the hypothesis that the coefficient on *XCash* × *Exchange* is equal to the coefficient on *XCash OTC*. F-test# 2 tests the hypothesis that the coefficient on *XCash* × *Exchange* is equal to the coefficient on *XCash* × *144a*. F-test# 3 tests the hypothesis that the coefficient on *XCash* × *OTC* is equal to the coefficient on *XCash* × *144a*. All estimations include year and country fixed effects. We report heteroskedasticity and serial correlation robust *t*-statistics in brackets. ** and * indicate statistical significance at the 1% and 5% level, respectively.

Variable	Baseline model (1)	Exclude UK and Japan (2)	Include XCash $\leq$ 0 (3)	Changing slope parameters (4)
Exchange	0.183**	0.178**	0.155**	0.176**
	[6.72]	[5.32]	[8.30]	[3.40]
OTC	−0.025	−0.123**	−0.041*	−0.149*
	[0.89]	[3.74]	[2.25]	[2.61]
144a	0,034	0.018	0.048	−0.086
	[0.79]	[0.40]	[1.75]	[1.62]
XCash	0.589**	0.453**	0.611**	0.599**
	[12.18]	[7.64]	[16.29]	[12.24]
XCash × Exchange	1.023**	1.312**	0.953**	1.115**
	[4.51]	[4.84]	[5.23]	[4.79]
XCash × OTC	0.840**	1.120**	0.630**	0.599*
	[3.16]	[3.76]	[2.97]	[2.21]
XCash × 144a	0.177	0.297	−0.158	0.058
	[0.42]	[0.71]	[0.46]	[0.54]
Sales Growth	0.173**	0.106**	0.142**	0.173**
	[11.52]	[5.92]	[13.15]	[11.56]
Global industry q	1.333**	1.062**	1.268**	1.321**
	[19.09]	[12.10]	[24.36]	[18.96]
Number of observations	32,155	21,413	58,934	32,155
Adjusted R^2	0.28	0.25	0.26	0.28
F-test #1 (*p*-value)	0.09	0.12	0.08	0.08
F-test #2 (*p*-value)	0.01**	0.01**	0.01**	0.00**
F-test #3 (*p*-value)	0.03**	0.02**	0.01**	0.02**

value of excess cash is 0.589 for our benchmark sample. The magnitude of this estimate is in line with Pinkowitz, Stulz, and Williamson (2006) and confirms that liquid assets are valued at a discount worldwide (outside the United States).[25]

Next, we observe that US cross-listings have a significant effect on investors' valuation of excess cash. In particular, investors put a substantial premium on the excess cash of firms that cross-list on a US exchange. The coefficient on *XCash* × *Exchange* is large, positive, and statistically significant (coefficient of 1.023 with a *t*-statistic above 4.50). Consistent with our hypothesis, investors seem to recognize the constraining effect of the legal and disclosure requirements inherent in a US exchange listing and consequently

value excess cash reserves at a premium. Column 1 also displays a positive excess cash premium for OTC listings. The coefficient on *XCash* × *OTC* is estimated at 0.840 with a *t*-statistic of 3.16. Even though an *F*-test reveals that the premium for OTC listings is significantly smaller than that of exchange-listed firms (at a 9% confidence level), our estimates indicate that investors also consider this less constraining listing type as a tool to restrain the private benefits associated with cash reserves.

Overall, the estimates reveal an important effect. On average, investors' valuation of excess cash is almost three times larger for firms listed on a US exchange than for their domestic counterparts. More precisely, while the value of $1 of excess cash for a typical non-US firm is $0.58, it rises to $1.61 for firms with a US exchange listing and to $1.42 for firms with an OTC listing. Turning to Rule 144a listings, the coefficient is indistinguishable from zero. Accordingly, investors do not seem to perceive any reduction of private benefits for this type of listing. The economic interpretation of these coefficients is not straightforward. As discussed in Dittmar and Mahrt-Smith

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[25] Pinkowitz, Stulz, and Williamson (2006) do not report an estimate of the value of cash for their whole sample. Splitting their sample by the degree of country investor protection, they report estimates of 0.39 for the low anti-director-rights index and 1.17 for the high anti-director-rights index. Moreover, they report estimates of the value of cash, whereas we present estimates of the value of excess cash.

(2007) and described in the Appendix, even though our measure of excess cash is orthogonal to controls for growth opportunities, the imprecise nature of the instruments makes it possible that *XCash* is still slightly related to firm value due to growth options instead of due to direct governance implications.[26] To be safe, we follow Dittmar and Mahrt-Smith (2007) and focus our analysis on the relative influence of US cross-listings on the value of excess cash. Little reason exists to believe that the relative magnitude of the interaction of excess cash with the cross-listing dummies will be biased. In Section 4.2, we confirm the validity of our conclusions by further examining the potential effect of uncaptured growth options.

Taken as a whole, this first set of results supports the view that US cross-listings influence insiders' ability to extract private benefits by tapping into their firm's cash reserves. In particular, the strong excess cash premium we observe for exchange-listed firms corroborates recent findings that stringent laws and disclosure requirements put additional bounds on insiders' actions and hence help reduce the risk of cash diversion. A consequence is that by lessening investors' markdown of liquid assets, a US exchange listing reduces part of the value loss engendered by weak governance. Our results highlight that investors also perceive OTC listings as constraining insiders from diverting corporate liquid resources. Notably, because OTC listings have very few legal consequences and do not contain additional disclosure requirements, our findings suggest that investors associate OTC listings with alternative governance constraints.

Before exploring more in detail what could explain the excess cash premiums, and in particular why we observe such an effect for OTC firms, we want to make sure that our inference is not misstated. For that, we extend our analysis in several dimensions. First, in Column 2 of Table 2, we reestimate model Eq. (1) without firms from the UK and Japan. Given that those two countries comprise the greatest number of observations in our sample, a legitimate concern is that British and Japanese firms drive our results. In Column 2, our estimates are virtually unchanged when we exclude the UK and Japan. In Column 3, we extend our sample to include all firms and not only those with positive excess cash. Precisely, when a firm-year has negative excess cash we consider that the firm is operating at the optimal level (otherwise it could not operate) and set *XCash* equal to zero. Expanding our sample has no significant impact on our estimations. Next, in our model the slope parameters on the profitability variables could be viewed as discount rates, which could be subject to change around cross-listing (see Karolyi, 2006, and Hail and Leuz, 2009).[27] If this is the

case, imposing the same slopes on all variables, as we do in our basic specification, would be inadequate. As a correction, we interact all slope parameters on the control variables with a dummy variable that equals one if a firm is cross-listed in the US (irrespective of the type of listing) and zero otherwise. Alternatively, in unreported results, we interact this dummy with each cross-listing type separately. Column 4 indicates that this modification has no impact on our conclusions.[28]

In Table 3, we provide additional robustness checks by modifying our estimation procedure (panel A) and our definition of cash (Panel B). Specifically, in Column 1 of Panel A, we follow previous studies and reestimate the model using the Fama and Macbeth (1973) approach.[29] Although the magnitude of the excess cash estimates differs slightly, these changes have no bearing on our conclusions. Then, in Columns 2 and 3 we address concerns about the potential endogeneity of the cross-listing decision. Because firms choose to list in the United States, our sample of cross-listed firms cannot be random. To mitigate the possibility of self-selection biases, we estimate cross-sectional Heckman models, where the first stage characterizes a firm's decision to cross-list (selection equation) and the second stage refers to our baseline valuation specification Eq. (1) (outcome equation). For the first-stage estimation, we follow prior studies in our choice of instruments and include size, leverage, sales growth, the industry median market-to-book ratio, the anti-director-rights index, and year fixed effects (see for instance Doidge, Karolyi, and Stulz, 2004; or Bailey, Karolyi, and Salva, 2006). Column 2 reports the second-stage regression results in which the choice variable in the first stage equals one if a firm is cross-listed in the US, irrespective of the listing type. Alternatively, Column 3 presents results where *Exchange*, *OTC*, and *144a* are the first-stage choice variables.[30] Although the significance of the estimated Mills ratios indicates the presence of a selection bias, we still observe that investors value the excess cash of exchange and OTC listed firms at a premium.

Our cross-sectional Heckman models overlook two important econometric issues inherent in the correction for self-selection in panel settings. In our context, once a firm is cross-listed, it is difficult or costly to delist,

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[26] Coefficient larger than one could also reflect transaction costs (direct and indirect) that are incurred when accessing external capital markets, see Faulkender and Wang (2006).

[27] The estimated change reported in the literature is rather modest. Doidge, Karolyi, and Stulz (2004) argue that "there is some support in the event study literature for the argument that listing in the US reduces barriers to owning the stock and therefore decreases the listing firm's cost of capital, but this support is rather limited". Recently, Hail and Leuz (2009) show that the reduction in the cost of capital explains only part of the valuation premium of cross-listed firms.

[28] A potential drawback with our model is that it does not account explicitly for differences in capitalization rates across firms. However, the model has been shown to perform about as well as a model that relates abnormal returns to changes in firm characteristics (see Dittmar and Mahrt-Smith, 2007; Faulkender and Wang, 2006). In addition to letting the cost of capital change around cross-listing, we implement another test to see whether our specification poses a problem. We estimate regressions (where the variable of interest is the level of cash) separately for two groups of firms that are sorted to have more similar costs of capital. We sort by size (large versus small) and by firm-specific betas (high versus low). We observe that some of the slopes on control variables do differ across specifications, but the estimated responses of value to cash holdings are similar across groups and do not have any effect on our conclusions.

[29] See, for instance, Pinkowitz, Stulz, and Williamson (2006) and Pinkowitz and Williamson (2005). However, to the extent that our sample covers a short period (13 years) plus the fact that we have few observations for firms that have recently cross-listed, we think that pooled OLS is the appropriate estimation procedure.

[30] Results from the first-stage probit estimations are available upon request.

Table 3

Investors' valuation of excess cash holdings: cross-listed versus non-cross-listed firms (robustness).

This table reports cross-sectional regressions and coefficient estimates for the market value of excess cash. The dependent variable is the ratio of market value (sum of the market value of equity and the book value of short- and long-term debt) divided by total assets. The independent variables include excess cash holdings *XCash* defined as the residual from regression Eq. (2) in the Appendix. To identify firms' cross-listing status, we use different binary variables: *Exchange* equals one for firms cross-listed on a US exchange and zero otherwise. *OTC* equals one for over-the-counter cross-listed firms and zero otherwise. *144a* equals one for firms cross-listed through private placements and zero otherwise. To assess whether investors' valuation of excess cash varies with the different cross-listing types, we interact *XCash* with the cross-listing dummies. To control for investment opportunities we include *Sales Growth* (the percentage change in sales from $t-2$ to period t) and *Global Industry q* (the median industry Tobin's q, defined as the median market-to-book ratio of all firms that share the same standard industrial classification code). All specifications also include a set of (unreported) firm-specific variables that serve as proxies for firm profitability and financial and investment policies as defined in the text. In Panel A, we use alternative estimation methodologies. In Column 1, we use the Fama and MacBeth (1973) methodology to estimate the value of excess cash. In Columns 2 and 3, we use the Heckman specification to further assess the potential effect of self-selection. In Column 2 *Mills* refers to the inverse Mills ratio computed from the first step (unreported) probit estimation where the dependent variable equals one if a firm is cross-listed (irrespective of the cross-listing type) and zero otherwise. In Column 3, $Mills_{Exchange}$, $Mills_{OTC}$, and $Mills_{144a}$ refer to the inverse Mills ratios independently computed from (unreported) probit estimations where the dependent variables are respectively *Exchange*, *OTC*, and *144a*. All estimations include year and country fixed effects. In Panel B, we contrast our results with those in the existing literature by replacing *XCash* by the level and changes in normal cash. Specifically in Column 4, *Cash* is defined as cash plus marketable securities divided by total assets and in Column 5 *ΔCash* refers to the yearly change in *Cash*. We report heteroskedasticity and serial correlation robust *t*-statistics in brackets. ** and * indicate statistical significance at the 1% and 5% level, respectively.

Panel A: Alternative estimation methodologies

Variable	FM	Heckman	
	(1)	(2)	(3)
Exchange	0.09	1.914**	4.692**
	[1.38]	[36.27]	[51.00]
OTC	−0.042	1.844**	−0.147
	[1.83]	[33.09]	[1.23]
144a	0.008	1.723**	0.119
	[0.22]	[28.12]	[1.15]
XCash	0.616**	0.772**	0.768**
	[7.90]	[16.28]	[16.52]
XCash × Exchange	1.13**	1.374**	1.657**
	[4.56]	[8.85]	[12.98]
XCash × OTC	0.75**	1.087**	0.919**
	[4.23]	[6.47]	[3.57]
XCash × 144a	0.307	0.562	−0.371
	[1.12]	[1.37]	[0.91]
Mills		−0.999**	
		[9.32]	
Mills$_{Exchange}$			−1.662**
			[5.50]
Mills$_{OTC}$			−0.568
			[7.12]
Mills$_{144a}$			0.422**
			[6.67]
Sales growth	0.100**	0.185**	0.202**
	[2.57]	[12.66]	[14.07]
Global industry q	0.780**	1.291**	1.197**
	[3.25]	[18.93]	[17.86]
Number of observations	32,155	32,155	32,155
Adjusted R^2	0.32	0.31	0.34

Panel B: Different measure of cash

Variable	Total cash (1)	ΔCash (2)
Exchange	0.063**	0.191**
	[2.94]	[11.88]
OTC	−0,001	0,005
	[0.04]	[0.29]
144a	0.006	0.013
	[0.20]	[0.52]
Cash	0.842**	
	[35.07]	
Cash × Exchange	1.202**	
	[10.26]	
Cash × OTC	0.632**	

Table 3 (*continued*)

	Panel B: Different measure of cash	
Variable	**Total cash** (1)	**ΔCash** (2)
	[3.02]	
Cash × 144a	0,052	
	[0.24]	
ΔCash		0.644**
		[21.57]
ΔCash × Exchange		0.868**
		[5.68]
ΔCash × OTC		0.499**
		[2.86]
ΔCash × 144a		0.353
		[1.20]
Sales growth	0.149**	0.138**
	[13.95]	[12.66]
Global Industry q	1.066**	1.137
	[21.37]	[22.49]
Number of observations	65,376	65,067
Adjusted R^2	0.25	0.23

deregister, or terminate a depositary receipt program. Hence, we should account for the effect of state-dependency in the selection process. Also, we should consistently model the potential cross-sectional and temporal correlation between the error terms in cross-listing (selection) and outcome (valuation) equations. In unreported analyses, we address both of these issues directly by using the methodologies developed by Vella and Verbeek (1999) and Wooldrige (1995). Reassuringly, these ancillary specifications do not alter our estimates of investors' valuation of excess cash.[31]

Finally, we assess whether our conclusions are robust to changes in our variable of interest. Following Pinkowitz, Stulz, and Williamson (2006), we reestimate our valuation model by using the level of cash and changes in cash instead of excess cash. Specifically, Cash is defined as cash and marketable securities over total assets, while $\Delta Cash_t$ refers to the yearly change in total cash.[32] In Columns 4 and 5 of Panel B, our results are robust to this change. The value of cash is twice as large for exchange listings as for OTC listings, and, again, we find no premium for Rule 144a listings.[33]

Taken together, our conclusions remain robust to different measures of cash, different specifications, and different estimation techniques. Investors truly perceive that US exchange and OTC listings lessen the private benefits associated with cash holdings and hence protect their investment.

4.2. Further tests to control for growth options

A concern relates to the potential misleading effect of uncaptured growth options. We could be associating a higher value of excess cash with a lower risk of private benefits' extraction when, in fact, our results could also be driven by increased growth options that are particular to cross-listing firms (see Faulkender and Wang, 2006; and Pinkowitz and Williamson, 2005). To mitigate this concern, we already include explicit control variables (Sales growth and Global industry q) in our valuation regressions. Also, we explicitly use an instrumental variable for growth opportunities in our excess cash regression model. However, to truly rule out the possibility that uncaptured growth options contaminate our estimates, we perform an additional test.

Specifically, we draw from Faulkender and Wang (2006), who show that cash reserves are more valuable for financially constrained firms that have valuable growth opportunities. On this ground, to isolate the potential effect of growth opportunities, we split cross-listed firms into two groups based on whether they modify their capital-raising activity around the cross-listing event. In doing so, we presume that firms experiencing the largest expansion of their investment opportunity set and facing financing constraints are the ones that increase their capital-raising activity when accessing the US markets. Hence, if our excess-cash estimates reflect uncaptured growth options, we should find a premium on the value of excess cash only for firms that increase their capital issuance activity.

To identify modifications of capital raising activity around the listing event, we define the change in raising activity (ΔRaising) as the difference between the 3-year average total issuance proceeds pre- and post-listing. Table 4 displays the results. Noticeably, the estimates for the two partitions reported in Columns 1 and 2 mitigate the possibility that our conclusion reflects only uncaptured growth options. While investors' valuation of excess cash turns out to be larger for firms that increase their capital-raising activity around the cross-listing date, Column 2 reveals that the value of excess cash continues

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[31] These additional results are available upon request.
[32] From the univariate tests, we know that the level of cash decreases slightly subsequent to a US listing. So, using changes in cash turns out to be robust to the potential effects of cash-level variations.
[33] All estimations presented in this paper for XCash are computed also for Cash. Results are available upon request.

Table 4

Investors' valuation of excess cash holdings: the potential effect of growth options.

This table reports cross-sectional regressions and coefficient estimates for the value of excess cash. The dependent variable is the ratio of market value (sum of the market value of equity and the book value of short- and long-term debt) divided by total assets. The independent variables include excess cash holdings XCash defined as the residual from regression Eq. (2) in the Appendix. To identify firms' cross-listing status, we use different binary variables: Exchange equals one for firms cross-listing on a US exchange and zero otherwise. OTC equals one for over-the-counter cross-listed firms and zero otherwise. 144a equals one for firms that cross-list through private placements and zero otherwise. To assess whether investors' valuation of excess cash varies along with the different cross-listing types, we interact XCash with the cross-listing dummies. To control for investment opportunities we include Sales Growth (the percentage change in sales from $t-2$ to period t) and Global Industry q (the median industry Tobin's q, defined as the median market-to-book ratio of all firms that share the same standard industrial classification code). In Columns 1 and 2, we separate cross-listed firms according to their capital raising activity. Column (1) includes firms that increase their capital-raising activity from the three years prior to the cross-listing year to three years following the cross-listing year, and Column 2 includes firms that do not increase their capital-raising activity around the cross-listing event. For each group we also report the p-value of an F-test for the difference between 1 and 2. The standard errors for the differences between 1 and 2 are computed with a seemingly unrelated regression (SUR) system that estimates both groups jointly. Both specifications also include a set of (unreported) firm-specific variables that serve as proxies for firm profitability and financial and investment policies as defined in the text. All estimations only contain observations for which XCash is positive and include year and country fixed effects. We report heteroskedasticity and serial correlation robust t-statistics in brackets. ** and * indicate statistical significance at the 1% and 5% level, respectively.

Variable	Changes in capital-raising activity		
	Yes (1)	No (2)	F-test (1)–(2)
Exchange	0.112*	0.197**	0.230
	[1.98]	[5.34]	
OTC	−0.045	−0.043	0.974
	[0.66]	[1.30]	
144a	−0.055	0.053	0.176
	[0.71]	[0.94]	
XCash	0.665**	0.603**	0.124
	[17.47]	[12.48]	
XCash × Exchange	1.252**	0.544*	0.046*
	[3.82]	[2.01]	
XCash × OTC	0.902**	0.403	0.257
	[3.00]	[1.71]	
XCash × 144a	0.001	0.101	0.904
	[0.00]	[0.20]	
Sales growth	0.193**	0.176**	0.011**
	[12.23]	[11.68]	
Global industry q	1.394**	1.309**	0.046*
	[18.72]	[18.45]	
Number of observations	29,879	30,684	
Adjusted R^2	0.27	0.27	

Table 5

Investors' valuation of excess cash holdings: pre- versus post-cross-listing.

This table reports cross-sectional regressions and coefficient estimates for the market value of excess cash in event time for each cross-listing type. The dependent variable is the ratio of market value (sum of the market value of equity and the book value of short- and long-term debt) divided by total assets. The independent variables include excess cash holdings XCash defined as the residual from regression Eq. (2) in the Appendix. For each cross-listing type (Exchange, OTC, and Rule 144a), event-time dummy variables are created, where year 0 is the cross-listing year. The dummy variable > 3 years before listing equals one for years prior to year −3 and zero in all other years, 3 years before listing equals one in year −3, etc. Then, to assess whether investors change their valuation of excess cash around the cross-listing event, we interact XCash with the cross-listing type as well as with event-time dummies. To control for investment opportunities each regression includes Sales Growth (the percentage change in sales from $t-2$ to period t) and Global Industry q (the median industry Tobin's q, defined as the median market-to-book ratio of all firms that share the same standard industrial classification code). Also, each regression also includes a set of (unreported) firm-specific variables that serve as proxies for firm profitability and financial and investment policies as defined in the text. F-test #1 tests the hypothesis that the coefficient on $\times > 3$ years after listing is equal to the coefficient on XCash $\times > 3$ years before listing. OTC=over the counter. All estimations only contain observations for which XCash is positive and include year and country fixed effects. We report heteroskedasticity and serial correlation robust t-statistics in brackets. ** and * indicate statistical significance at the 1% and 5% level, respectively.

Variable	Exchange (1)	OTC (2)	144a (3)
XCash	0.582**	0.590**	0.586**
	[11.90]	[12.16]	[12.10]
XCash × > 3 years before listing	−0.221	−0.347	0.087
	[1.43]	[0.51]	[0.33]
XCash × 3 years before listing	0.515	0.696	−0.577
	[1.05]	[0.53]	[0.68]
XCash × 2 years before listing	1.346	0.447	−0.054
	[1.54]	[1.17]	[0.57]
XCash × 1 year before listing	1.235	0.816	−0.287
	[1.28]	[0.83]	[1.10]
XCash × listing year	1.673*	1.110*	−0.501
	[2.55]	[2.09]	[1.16]
XCash × 1 year after listing	1.471*	1.300**	−0.664
	[2.28]	[3.23]	[1.22]
XCash × 2 years after listing	1.566*	1.410*	−0.362
	[2.08]	[2.39]	[0.96]
XCash × 3 years after listing	1.235*	0.959**	0.41
	[2.11]	[3.29]	[1.03]
XCash × > 3 years after listing	0.914**	0.587**	−0.203
	[3.11]	[1.97]	[0.44]
Sales growth	0.182**	0.180**	0.184**
	[11.79]	[11.89]	[11.98]
Global industry q	1.285**	1.348**	1.321**
	[17.82]	[18.90]	[18.19]
Number of observations	29,995	30,055	28,970
Adjusted R^2	0.28	0.26	0.26
F-test #1 (p-value)	0.02**	0.03**	0.17

to be higher for exchange- and OTC-listed firms, even when they keep their issuance activity constant.[34] These results indicate that increased growth options do affect investors' valuation of excess cash, but they still highlight

the importance of governance constraints imposed by the US market environment. Notably, Column 2 reveals that the estimated excess cash premium for exchange cross-listed firms is 0.54. Because it is purged from the effect of growth options, this estimate can be considered as a cleaner measure of the premium that investors attach to excessive liquid assets. Similarly, the premium for OTC

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[34] We obtain similar results when our capital-raising variable includes only equity or public equity issues.

listings is 0.40, but it is only marginally significant (*t*-statistic equal to 1.71). While this marginal significance might translate a lack of statistical power, we cannot completely exclude the possibility that part of the significant effect previously uncovered for OTC listings in our base regressions could be attributable to uncaptured growth options.

All in all, our results are robust to the effect that uncaptured growth options could have on our estimated coefficients. In the following subsections, we explore supplementary predictions of our hypothesis and extend our analysis to embrace dynamic features.

4.3. Change in the value of excess cash (pre- versus post-cross-listing)

So far, our results indicate that, on average, investors place a higher value on the excess cash of foreign firms that have US exchange or OTC listings than on that of domestic firms. In this subsection, we further characterize this result by examining the dynamics of the relation between US cross-listings and investors' valuation of excess cash in event time. Looking at whether and how investors' change the way they expect excess cash to be used around the cross-listing event is important for at least two reasons. First, if investors perceive that US rules, disclosure requirements, and other features enhance governance quality, then the value they place on firms' excess cash should increase after the cross-listing date and be sustained in the long run. Second, looking at investors' valuation of excess cash mainly outside the window of years surrounding the listing event minimizes the concern that our estimates are contaminated by financing, investment, or operating events that occur contemporaneously with the cross-listing date and hence further mitigate the concern that our results are plagued by self-selection biases or uncaptured growth options or both.

We exploit the dynamic nature of our data set to create for each type of listing event-time dummy variables where year 0 represents the cross-listing year for a given firm. Hence, the dummy > *3 years before listing* equals one for years prior to year -3 and zero in all other years, *3 years before listing* equals one in year -3 and zero in all other years, etc. Then to assess whether investors' valuation of excess cash changes subsequently to the US listing, we reestimate our baseline model Eq. (1) and add the interactions of *XCash* with the event-time dummies. Our specification now stacks firm-year observations of cross-listing firms before and after they access US markets as well as those firms that never cross-list.

Table 5 presents the estimation results. In this table, each type of listing event is examined one at a time relative to the benchmark of firms that never cross-list. There are several notable findings. First, by looking at exchange and OTC listings, we observe an increase in the value of excess cash in the years leading up to the listing. However, none of the interacted coefficients is statistically significant before the cross-listing year. As a result, investors do not seem to distinguish between firms that are going to cross-list and those that never cross-list. Also and confirming our results

so far, a large and significant increase is evident in investors' valuation of excess cash during the listing year for firms listing on a US exchange and over-the-counter. The magnitude of the upsurge is especially large for exchange-listed firms (1.67 with a *t*-statistic of 2.55). Noticeably, the value of excess cash appears to decline in the years following the listing event. However, for exchange- and OTC-listed firms, the excess cash premium remains positive and statistically significant even beyond 3 years after the listing occurred. After this period, the excess cash premium is still 0.914 (with a *t*-statistic of 3.11) for exchange listed firms while it is 0.395 (*t*-statistic of 2.01) for firms opting for an OTC listing. Further, *F*-tests confirm that this long-term effect is significant for both exchange- and OTC-listed firms. In particular and for both types of listing, the coefficients for *Xcash* × > *3 years after listing* are significantly larger than the coefficients for "*Xcash* × > *3 years before listing*" at reasonable levels (2% and 3%, respectively, confidence level). In sharp contrast to the dynamics observed for exchange and OTC listing, no excess cash premium is detectable for Rule 144a listings any time around the listing event. Again, investors do not seem to perceive any governance benefit associated with this specific listing type.

In summary, we find that investors do raise the value they place on cash reserves when firms choose to benefit from the US market environment through exchange or OTC listings. Moreover, the change in investors' perception persists even several years following the cross-listing event. This suggests that investors envision that a US exchange and OTC listing permanently limits the extraction of private benefits and therefore really enhances the value of having cash on hand.

4.4. Does the country of origin matter?

In this subsection, we examine whether and how firms' home-country institutional traits drive investors' perceptions of the governance benefits created through a US cross-listing. Previous results show that the US financial environment reduces the risk that insiders extract private benefits from cash reserves. In this context, one might expect that such a risk reduction depends on the ability of home-market institutions to put constraints on insiders' inefficient actions. To investigate this claim, we split our sample into subgroups by using five proxies for home-country institutions' quality. The first partition divides the sample into firms from countries where investor protection is weak, that is, the anti-director-rights index is below three (*Low*), and those from countries where the index is greater to or equal to three (*High*). Concerning the accounting, anti-self-dealing, and revised anti-director-rights indices, we assign firms to the *Low* protection groups if these indices are below their median. Likewise, we assign firms to the *High* protection groups if the respective indices are above their median values. Finally, we consider the difference between developed and emerging countries. Then, for each of the five proxies, we estimate investors' valuation of excess cash across subgroups via a seemingly unrelated regression (SUR) system that combines the *High* and *Low*

Table 6

Investors' valuation of excess cash holdings: by home-country characteristics.

This table reports cross-sectional regressions and coefficient estimates for the market value of excess cash. The dependent variable is the ratio of market value (sum of the market value of equity and the book value of short- and long-term debt) divided by total assets. The independent variables include excess cash holdings *XCash* defined as the residual from regression Eq. (2) in the Appendix. To identify firms' cross-listing status, we use different binary variables: *Exchange* equals one for firms cross-listed on a US exchange and zero otherwise. *OTC* equals one for over-the-counter cross-listed firms and zero otherwise. *144a* equals one for firms cross-listed through private placements and zero otherwise. To assess whether investors' valuation of excess cash varies with the different cross-listing types, we interact *XCash* with the cross-listing dummies. To control for investment opportunities we include *Sales Growth* (the percentage change in sales from $t-2$ to period t) and *Global Industry q* (the median industry Tobin's q, defined as the median market-to-book ratio of all firms that share the same standard industrial classification code). All specifications also include a set of (unreported) firm-specific variables that serve as proxies for firm profitability, and financial and investment policies as defined in the text. Countries with a low level of investor protection (Low) are countries with an index of investor protection (anti-director rights and accounting quality index (from La Porta Lopez de Silanes, Shleifer and Vishny 1998), anti-self-dealing and revised anti-director rights index from Djankov, La Porta Lopez de Silanes, Shleifer and Vishny 2006) below the median and those with high levels (High) have indexes above the median. We use the Standard and Poor's Emerging Market Database to classify countries in emerging (low) or developed (high). All estimations only contain observations for which *XCash* is positive and include year and country fixed effects. We estimate investors' valuation of excess cash across subgroups via a seemingly unrelated regression (SUR) system that combines the *High* and *Low* subgroups. The SUR estimation provides the joint variance-covariance matrix that we use to construct F-tests to compare cross-equation restrictions. Specifically, F-test #1 tests whether $XCash + XCash \times Exchange$ is significantly different between the low and igh groups. Similarly, F-test #2 and F-test #3 test whether $XCash + XCash \times OTC$ and $XCash + XCash \times 144a$, respectively, are significantly different between the low and high groups. We report heteroskedasticity and serial correlation robust t-statistics in brackets. ** and * indicate statistical significance at the 1% and 5% level, respectively.

Variable	Anti director rights		Anti-self-dealing		Revised anti director rights		Accounting		Economic development	
	Low (1)	High (2)	Low (3)	High (4)	Low (5)	High (6)	Low (7)	High (8)	Low (9)	High (10)
Exchange	0.042	0.208**	0.01	0.230**	−0.063	0.207**	0.095	0.173**	0.143*	0.160**
	[0.92]	[5.69]	[0.20]	[6.34]	[1.11]	[6.17]	[1.87]	[5.02]	[2.30]	[4.95]
OTC	−0.205**	0.022	−0.209**	0.02	−0.330**	0.039	−0.106	−0.037	−0.016	−0.051
	[4.10]	[0.62]	[3.90]	[0.58]	[5.17]	[1.21]	[1.90]	[1.08]	[0.29]	[1.51]
144a	0.024	−0.05	−0.037	0	−0.078	−0.022	0.035	0.001	−0.016	0.07
	[0.41]	[0.74]	[0.50]	[0.00]	[1.24]	[0.35]	[0.57]	[0.02]	[0.31]	[0.89]
XCash	0.503**	0.700**	0.435**	0.733**	0.579**	0.722**	0.359**	0.697**	0.257**	0.723**
	[6.78]	[11.13]	[5.43]	[12.21]	[6.22]	[11.02]	[4.18]	[12.06]	[2.85]	[12.53]
XCash × Exchange	1.022**	0.897**	1.453**	0.595*	1.599**	0.884**	1.084**	0.875*	1.190**	0.755**
	[2.87]	[3.08]	[3.92]	[2.09]	[3.81]	[3.29]	[3.94]	[2.26]	[4.78]	[2.21]
XCash × OTC	0.734*	0.776	1.290*	0.503	1.250*	0.582*	1.029**	0.021	1.365**	0.659*
	[2.30]	[1.60]	[2.31]	[1.66]	[2.42]	[2.01]	[3.34]	[0.04]	[2.78]	[2.11]
XCash × 144a	0.555	0.177	0.597	0.337	0.454	0.486	0.607	−0.038	0.62	−0.325
	[1.08]	[0.26]	[1.04]	[0.55]	[0.89]	[0.67]	[0.75]	[0.08]	[1.17]	[0.51]
Sales growth	0.135**	0.192**	0.158**	0.181**	0.102**	0.190**	0.185**	0.173**	0.029	0.203**
	[5.52]	[10.09]	[6.07]	[9.89]	[3.35]	[11.00]	[6.56]	[9.84]	[1.04]	[11.39]
Global industry q	1.849**	1.068**	2.224**	0.928**	1.840**	1.184**	2.019**	1.098**	0.887**	1.296**
	[15.96]	[12.23]	[18.11]	[10.97]	[13.17]	[14.73]	[14.61]	[13.59]	[6.03]	[16.20]
Number of observations	11,592	20,563	10,052	22,103	7,976	24,179	8,177	23,978	8,568	23,199
Adjusted R^2	0.3	0.28	0.29	0.29	0.32	0.28	0.28	0.28	0.3	0.29
F-test #1 (*p*-value)	0.91		0.40		0.32		0.37		0.04	
	0.78		0.40		0.13		0.01		0.77	
	0.83		0.93		0.93		0.79		0.53	

subgroups. The SUR estimation provides us with the joint variance–covariance matrix that we use to construct F-tests to compare cross-equation restrictions.[35]

[Table 6](#) reveals which firms seem to benefit more from the US listing. Consistent with Pinkowitz, Stulz, and Williamson (2006), investors place a substantial discount on the value of excess cash for firms located in countries with weak institutional protection. However, unlike Pinkowitz, Stulz, and Williamson (2006), the value of excess cash is discounted below its face value in countries with higher investor protection and transparency. This discrepancy might originate in the fact that we consider

the investors' valuation of free cash flow, i.e., excess cash, while Pinkowitz, Stulz, and Williamson (2006) estimate the value of total and changes in cash.

Turning to the effect of cross-listing, all specifications provide evidence that the effect of a US listing on the value of excess cash is larger if firms are incorporated in a country characterized by weak institutions. More specifically, Column 1 presents regression results for poor-protection countries according to the anti-director-rights index. For non-cross-listed firms, the value of excess cash is 0.503, which is far below its face value. In sharp contrast, our estimates reveal that investors' valuation of excess cash is significantly larger for firms cross-listed on a US exchange or via OTC. Again, we continue to observe the largest effect for exchange-listed

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[35] See Wooldridge (2002, pp. 147–153).

firms but a significant effect for firms accessing the US markets through OTC listing. Columns 3, 5, 7, and 9 show similar patterns when we use the anti-self-dealing index, the revised anti-director-rights index, the accounting indices, and the level of economic development, respectively.

When we consider the group of firms located in countries with strong institutions, Columns 2, 4, 6, 8 and 10 offer a different picture. If we look at the estimates on *XCash × Exchange*, we see that investors also upgrade their valuation of excess cash for exchange-listed firms but to a lesser extent than for firms in the *Low* group. When we look at the estimates on *XCash × OTC*, the picture is not as clear-cut. In some specifications the coefficient is only marginally significant, while it is still positive and significant in others.

In term of economic magnitude, it is interesting to take a closer look at our estimates. In countries characterized by poor institutions, the value of an additional dollar of excess cash ranges between $0.25 and $0.57, while it is between $1.44 and $2.17 for firms that are listed on US exchanges and between $1.23 and $1.82 for OTC-listed firms.[36] Broadly speaking, in low quality countries, investors' valuation of excess cash is almost four times higher if firms are listed on a US exchange, whereas it is three times larger if they have an OTC listing. In comparison, these differences are much lower in countries where institutions are strong. In those countries, the value of one additional dollar of excess cash is around two times larger if firms have a US exchange listing and one and a half times higher if they list OTC.[37]

Given that the value investors place on excess cash holdings appears to be related to the quality of the home-market institutions, a relevant question is whether cross-listing eliminates the pre-existing differences. To examine this question we construct *F*-tests that compare the differences between estimates from subgroups using the robust standard errors provided by the joint SUR estimation. More precisely, we test whether *XCash+ XCash × Exchange* is significantly different between the *Low* and *High* groups. A similar test is computed for OTC and 144a listings. We find no significant difference in investors' valuation of excess cash between the *Low* and *High* groups across the various cross-listing avenues. This indicates that investors perceive the risk of private benefits embedded in cash holdings to be similar across cross-listed firms regardless of the quality of their home-market institutions. In essence, cross-listed firms subject to the same US requirements are viewed as facing a similar level of governance constraints.

Our findings confirm the view that the US financial markets provide mechanisms for limiting inefficient

actions of corporate insiders. We report that the effect of cross-listing is magnified for firms located in poorly protected environments. From a different perspective, our results highlight that country characteristics are important determinants of corporate governance. As a matter of fact, by pulling themselves out of their legal environment, firms listing on a US exchange or via OTC seem to partially sidestep their home-country institutions. Our analysis shows that investors associate this positive signal with a reduced risk of private benefits' extraction.

4.5. What are the governance mechanisms at work?

Hitherto, we have found evidence that investors associate US exchange and OTC listings with a cutback in the risk that insiders use cash reserves to derive private benefits. However, unlike those listing on exchanges, foreign firms opting for an OTC listing are not subject to US disclosure requirements, SEC enforcement, or shareholders' litigation threat. Hence, in line with the Stulz (1999) argument, our results could indirectly suggest that US cross-listings might also discipline insiders through the pressure of informal monitoring and scrutiny by various market participants. To assess whether part of the excess cash premium can be attributed to informal monitoring and scrutiny, we perform two analyses. First, we explore the monitoring role of financial analysts and large investors. Second, we look at investors' valuation of excess cash when foreign firms cross-list in a different market environment by examining cross-listings in London.

4.5.1. The monitoring effects of financial analysts and large investors

To explore further the nature of our results, we first consider the potential effect of financial analysts. As shown in Lang, Lins, and Miller (2003) and Yu (2008), by providing coverage and information, analysts play a significant role in disciplining corporate insiders. In this spirit, we use the change in the number of analysts following firms as a proxy for change in firms' monitoring intensity. We construct the variable *ΔCoverage* as the difference between the 3-year average coverage after the cross-listing event and before the cross-listing event.[38] Then, to assess whether investors' valuation of excess cash reflects the potential monitoring role of financial analysts, we reestimate our valuation regression Eq. (1) but add the interaction between *ΔCoverage, XCash,* and our three cross-listing dummies. We report the results in Panel A of Table 7. Remarkably, in Column 1, the estimated coefficients on *XCash* interacted with all cross-listing types and *ΔCoverage* are significantly positive. Also, we observe that all the interactions between *Xcash* and the cross-listing dummies decrease. As such, the results in Column 1 highlight that part of the reduction in the private benefits associated with cash holdings is triggered by the additional analyst coverage that characterizes a US listing. The largest effect is for OTC

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[36] These numbers are obtained by adding the coefficients on *XCash* and *XCash × Exchange* (*XCash × OTC*).

[37] To preserve statistical power, we cannot estimate the full event-time regression as in Table 5 for each of the ten subgroups. If we were to do so, some of the categories would not have enough observations to obtain meaningful estimates. Instead, we also reestimate the regressions in Table 6 by interacting *XCash* with the cross-listing dummies and with the two event-time dummies *Before* (equal to one before cross-listing) and *After* (equal to one after cross-listing). Our conclusions remain unaffected.

[38] We also define this variable by considering only one and two years before and one and two years after the listing. Our results are not affected by how we define the change in analyst coverage.

Table 7

Investors' valuation of excess cash: legal (formal) versus monitoring (informal) effects.

This table reports cross-sectional regressions and coefficient estimates for the market value of excess cash. The dependent variable is the ratio of market value (sum of the market value of equity and the book value of short- and long-term debt) divided by total assets. The independent variables include excess cash holdings *XCash* defined as the residual from regression Eq. (2) in the Appendix. To control for investment opportunities we include *Sales Growth* (the percentage change in sales from $t-2$ to period t) and *Global Industry q* (the median industry Tobin's q, defined as the median market-to-book ratio of all firms that share the same standard industrial classification code). All specifications also include a set of (unreported) firm-specific variables that serve as proxies for firm profitability, financial and investment policies as defined in the text. All estimations only contain observations for which *XCash* is positive and include year and country fixed effects. In Panel A, we identify firms' cross-listing status using use different binary variables: *Exchange* equals one for firms cross-listed on a US exchange and zero otherwise. *OTC* equals one for over-the-counter cross-listed firms and zero otherwise. *144a* equals one for firms cross-listed through private placements and zero otherwise. *ΔCoverage* is the difference between the three-year average number of analysts following the firm after the cross-listing event and prior the event. *ΔCHS* is similarly computed as the difference between the three-year average closely held shares post- and pre-cross-listing. *ΔIO* refers to the change in the number of US institutional investors over the three years after the listing event. To assess whether investors' valuation of excess cash varies along with the different cross-listing types and with change in analyst following and ownership structure, we interact *XCash* with the cross-listing dummies, *ΔCoverage*, *ΔCHS, and ΔIO*. In Panel B, *London* equals one if a firm has a London cross-listing and no US exchange listing and zero otherwise. We report heteroskedasticity and serial correlation robust *t*-statistics in brackets. ** and * indicate statistical significance at the 1% and 5% level, respectively.

Panel A: Analysts coverage and large investors			
Variable	**(1)**	**(2)**	**(3)**
Exchange	0.161**	0.153**	0.181**
	[5.58]	[5.30]	[6.12]
OTC	−0.04	−0.056	−0.076*
	[1.39]	[1.92]	[1.63]
144a	0.013	0.01	0.006
	[0.30]	[0.24]	[0.16]
XCash	0.589**	0.590**	0.542**
	[12.21]	[12.22]	[11.25]
XCash × Exchange	0.894**	0.863**	1.048**
	[3.90]	[3.73]	[4.02]
XCash × OTC	0.746**	0.645*	0.485*
	[2.80]	[2.39]	[1.85]
XCash × 144a	−0.245	0.238	0.035
	[0.54]	[0.56]	[0.38]
XCash × Exchange × ΔCoverage	0.151**		
	[3.71]		
XCash × OTC × ΔCoverage	0.313**		
	[5.23]		
XCash × 144a × ΔCoverage	0.187**		
	[2.68]		
XCash × Exchange × ΔCHS		1.735**	
		[3.54]	
XCash × OTC × ΔCHS		2.382**	
		[4.41]	
XCash × 144a × ΔCHS		−0.051	
		[0.70]	
XCash × Exchange × ΔIO			−0.255
			[1.45]
XCash × OTC × ΔIO			3.169**
			[5.86]
XCash × 144a × ΔIO			0.231
			[1.33]
Sales growth	0.172**	0.173**	0.164**
	[11.51]	[11.55]	[11.03]
Global industry q	1.337**	1.327**	1.318**
	[19.15]	[18.99]	[18.96]
Number of observations	32,155	32,155	32,155
Adjusted R^2	0.28	0.28	0.28

Panel B: London listings			
London	0.116	0.035	0.104
	[0.79]	[0.24]	[0.70]
XCash	0.578**	0.583**	0.579**
	[11.41]	[11.51]	[11.42]
XCash × London	0.625	0.211	0.514
	[1.89]	[1.54]	[1.48]
XCash × London × ΔΔcoverage		0.749**	
		[4.62]	

Table 7 (*continued*)

Panel B: London listings			
XCash × London × ΔCHS			0.022
			[1.08]
Sales growth	0.174**	0.174**	0.174**
	[10.66]	[10.64]	[10.66]
Global industry q	1.318**	1.316**	1.316**
	[16.89]	[16.86]	[16.85]
Number of observations	24,666	24,666	24,666
Adjusted R^2	0.24	0.24	0.24

listings (coefficient of 0.313 with a *t*-statistics well above 5). This could suggest that part of the excess cash premium for this specific listing type originates in the increased monitoring by analysts.

Notably, the coefficient on *XCash × 144a × ΔCoverage* is also statistically significant. At first glance, this result could appear contradictory because, on average, we did not detect any significant excess cash premium for this type of listing but nevertheless observe a significant increase in analyst coverage. However, unreported tests reveal that the effect of analysts is only significant when Rule 144a-listed firms attract a very large number of supplementary analysts (more than seven new analysts on average).[39] Hence, despite the absence of an unconditional premium on excess cash for this type of listing, we spot a sizable effect when we condition on the number of analysts following the firm. While these findings provide additional support in favor of the monitoring role of financial analysts, they underline that investors require a substantial increase in analyst coverage to raise the value they place on the excess cash of firms that opt for a Rule 144a listing.

In Columns 2 and 3, we perform an exploratory analysis by considering the presence of large shareholders as an alternative measure of monitoring intensity. Prior research suggests that large shareholders have enough capital at stake to have strong incentives to monitor and discipline insiders (see, for example, Gillian and Starks, 2000; or Gompers and Metrick, 2001). On this ground, if firms' ownership structure shifts toward larger shareholders when they cross-list in the United States, investors could feel that their money is better protected, even if no legal or institutional constraints tie insiders' hands. In our setting, identifying the ownership of large investors that monitor firms' decisions is a difficult task because one needs to differentiate the holdings of controlling insiders who act on their own interest from those of large investors who have the incentive and ability to put bound on value destroying actions. As a first attempt to identify the presence of large shareholders, we consider the data item reported as "Closely held shares" in Worldscope (*CHS*). This variable is defined as the percentage of shares held by investors who hold 5% or more of the outstanding shares. We capture changes in ownership structure by taking the difference between the

3-year average pre- and post-listing to create *ΔCHS*.[40] Alternatively, we use the US institutional holdings from SEC 13(f) filings as a complementary proxy for the presence of large shareholders. Specifically, we define institutional ownership (*IO*) as the fraction of cross-listed shares held by US institutions to total shares outstanding. Because the SEC 13(f) filings are available mostly during the post-listing period, we define *ΔIO* as the change in institutional ownership over the 3 years that follows the US listing. Moreover, we set *ΔIO* equal to zero when institutional ownership data are not available.[41] Implicitly, we hypothesize that both *ΔCHS* and *ΔIO* can be considered measures of how much additional monitoring corporate insiders are subject to, with a larger percentage indicating more intense monitoring.

Looking at the effect of *ΔCHS* on the value of excess cash, Column 2 displays positive and significant estimates for exchange- and OTC-listed firms. In contrast, the interaction between *XCash*, *144a,* and *ΔCHS* is not distinguishable from zero. Column 3 reports similar results when we substitute *ΔCHS* by *ΔIO*. We observe a positive and significant coefficient of *ΔIO* only on the value of excess cash for OTC-listed firms.[42] Overall, these findings suggest that part of the excess cash premium for exchange and, specially, OTC listings stems from changes in ownership occurring around the cross-listing period. Nevertheless, although the

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[39] The detailed results of these additional tests are available upon request.

[40] We acknowledge that this measure is only approximate because it does not allow us to make a clear-cut distinction between shares owned by controlling insiders and shares owned by large outside investors. To alleviate this concern, we focus on changes of closely held shares around the cross-listing event. In fact, Doidge (2005) analyses a sample of firms from emerging countries and finds no significant change in the holdings of controlling shareholders after US cross-listings. Therefore, we believe that (at least part of) the information contained in Δ *CHS* captures the increased holdings by large institutional investors, not increased holding by controlling shareholders.

[41] We also acknowledge that Δ *IO* has its shortcomings as a proxy for the presence of large shareholders. Under Rule 13(f), institutions are required to report only the holdings in foreign securities that are exchange traded. This rule does not require firms to report securities traded directly on domestic markets, OTC, or through rule 144A. Thus, with the exception of exchange-traded American Deposition Receipt shares, institutions voluntarily report holdings in securities of non-US firms. This implies that our Δ *IO* measure is imperfect and likely understates institutional investment in some non-US firms. Still, we believe that, as long as institutions are not strategic in their voluntary reports, these incomplete data should not systematically bias our results. A priori there is no reason to believe that the willingness to report shareholdings is related to the quality of firm governance.

[42] We also consider the number of US institutional investors instead of *IO* and obtain virtually the same results.

estimates are in line with the idea that the presence of large investors mitigates the agency problem associated with cash holdings, it is fair to say that we cannot completely rule out the possibility that our findings are biased by our imperfect proxies for investors' monitoring.

4.5.2. Evidence from London listings

Listing shares on the London Stock Exchange does not subject firms to the UK legal rules and requires a weaker governance commitment than a US exchange listing (see Doidge, Karolyi and Stulz, 2009). In essence, a London listing can be compared with an OTC listing in terms of requirements. Hence, to further refine our conclusions regarding the disciplining role of increased monitoring we ask whether and how investors' valuation of excess cash is altered when firms cross-list in London.

To do so, we gather cross-listing information from the London Stock Exchange.[43] Some firms in our sample have both a London listing and some type of US listing. Because US listings are more restrictive, we consider only firms that are not simultaneously cross-listed in the US. We have 671 firm-year observations, representing 99 firms from 23 countries that meet our data requirements. Then, to measure whether the value of excess cash differs between firms cross-listed in London and their domestic peers, we adapt our baseline specification Eq. (1) and replace the three cross-listing indicators by the variable *London*, a dummy that equals one if a firm is cross-listed in London and zero otherwise. For this test, we exclude UK firms as well as all firms cross-listed in the US from the benchmark sample. Panel B of Table 7 shows the results. As with OTC listings, we observe that investors value the excess cash of firms cross-listed in London at a premium compared with their home-country peers. As expected, the magnitude of the coefficient on $XCash \times London$ is much smaller than the one we obtain for US exchange-listed firms, but it is still significant at the 10% level (coefficient of 0.625 with a t-statistics of 1.89). Likewise the OTC results, investors seem to view cross-listing in London as restraining insiders, even when no legal rules and public enforcement are at work.[44]

Next, we perform ancillary tests to assess whether, similarly to US cross-listings, increased monitoring pressure is behind the excess cash premium observed for London listings. First, in line with the patterns uncovered for US cross-listings and Baker, Nofsinger, and Weaver (2002), we find a significant increase in the number of analysts issuing forecasts when firms cross-list in London. In particular, a test (unreported) reveals that prior to the listing, the average (median) coverage is 10.96 (10) and rises to 16.13 (15) once firms are listed in London.[45]

Furthermore, regression results in Column 2 provide corroborating evidence that such an increase in analyst coverage explains a considerable fraction of the excess cash premium for firms cross-listed in London. The coefficient on $XCash \times London \times \Delta Coverage$ is positive and significant (coefficient of 0.749 with a t-statistics of 4.62). In contrast, Column 3 reveals no significant effect on $XCash \times London \times \Delta CHS$. The results in Panel B of Table 7 point out that investors place a premium on excess cash of London listed firms only when the listing comes along with an increased coverage by financial analysts.

Taken together, the findings in this subsection suggest that the additional monitoring provided by financial analysts and, to lower extent, by the presence of large investors plays a role in alleviating the agency problems related to excess cash. In this respect, our analysis complements the evidence of Dittmar and Mahrt-Smith (2007). While these authors show that the value of excess cash of US firms is positively related to firm-level monitoring proxies, we show that changes in monitoring intensity that characterize a US cross-listing also help restrain insiders and in turn preserve firm value. On a different level, our results indicate that stricter legal protection for minority investors and more intense monitoring together enhance investors' confidence in insiders' actions, because investors update their valuation of excess cash holdings around the cross-listing event.

4.6. Is there still an effect today?

In recent years, new laws and regulations aimed at enhancing corporate governance have been introduced in many countries. Since 1998, some 30 codes or principles have been established in Organization for Economic Cooperation and Development (OECD) countries.[46] Corporate governance reforms have also been a priority in many emerging markets. De Nicolo, Laeven, and Ueda (2006) show that this effort has translated into a real improvement in governance quality in many developed and emerging markets, although with varying intensity. In particular, they show that, in 2003, emerging-market corporate governance still ranked behind that of developed economies.

The efforts by governments to strengthen shareholder rights together with the pressure on business to improve governance practices could have led to an increase in investors' valuation of excess cash through time for non-cross-listed firms. Simultaneously, the Sarbanes-Oxley Act (SOX) of 2002 reinforced US legal rules and disclosure and governance standards. Hence, if non-US initiatives are economically more relevant than US ones, we could observe a convergence of corporate governance practices and a reduction or elimination of the relative efficiency of US cross-listing for securing investors' money. Some evidence exists that convergence, as measured by the Corporate

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[43] The list of international firms listed in London is available at www.londonstockexchange.com

[44] In an unreported table we perform a dynamic analysis similar to Section 4.3. However, due to the limited number of observations, we create only two time dummies that capture the pre- and post-listing periods. The results indicate no effect before the London listing and a significant increase in the value of excess cash after the London listing. Results are available upon request.

[45] A Wilcoxon test indicates that this increase is statistically significant at the 1% level (p-value equal to 0.01).

[46] The "Survey of Corporate Governance Developments in OECD Countries" summarizes the codes and principles adopted by OECD countries that imply changes in law and regulation and that are designed to enhance corporate governance. See http://www.oecd.org/dataoecd/58/27/21755678.pdf.

Table 8
Investors' valuation of excess cash holdings: temporal evolution.

This table reports cross-sectional regressions and coefficient estimates for the market value of excess cash. The dependent variable is the ratio of market value (sum of the market value of equity and the book value of short- and long-term debt) divided by total assets. The independent variables include excess cash holdings *XCash* defined as the residual from regression Eq. (2) in the Appendix. To identify firms' cross-listing status, we use different binary variables: *Exchange* equals one for firms cross-listed on a US exchange and zero otherwise. *OTC* equals one for over-the-counter cross-listed firms and zero otherwise. *144a* equals one for firms cross-listed through private placements and zero otherwise. To assess whether investors' valuation of excess cash varies along with the different cross-listing types, we interact *XCash* with the cross-listing dummies. To control for investment opportunities we include *Sales Growth* (the percentage change in sales from $t-2$ to period t) and *Global Industry q* (the median industry Tobin's q, defined as the median market-to-book ratio of all firms that share the same standard industrial classification code). All specifications also include a set of (unreported) firm-specific variables that serve as proxies for firm profitability, financial and investment policies as defined in the text. To assess the evolution of the marginal value of excess cash and whether there is still an effect today, we use different subperiods that correspond to distinct market periods. In Column 1, the period 1991–1999 spans the phase preceding the bursting of the Internet bubble. In Column 2, the period 2000–2001 corresponds to a bear market. In Column 3, the period 2002–2003 maps the post Sarbanes Oxley Act period but encompasses 2002, which still corresponds to a bear market episode. Column 4 considers only year 2003. That is the last year for which we can estimate our full model as specified in Eq. 1. To estimate our model for 2003 we need data until 2005 because we are including two-year lead changes on earnings and investment variables as controls. To evaluate the recent period as much as we can we replace in Columns 5, 6 and 7 the two-year lead control variables by only one-year leads. This enables us to expand our estimation window. Finally, in Columns 6 and 7 we split our sample in firms from developed and emerging markets, respectively. All estimations only contain observations for which *XCash* is positive and include year and country fixed effects. We report heteroskedasticity and serial correlation robust t-statistics in brackets. ** and * indicate statistical significance at the 1% & 5% level, respectively.

	Full model				One-year lead control variables		
Variable	1991–1999 (1)	2000–2001 (2)	2002–2003 (3)	2003 (4)	2003–2004 (5)	Developed 2003–2004 (6)	Emerging 2003–2004 (7)
Exchange	0.025	0.513**	0.223**	0.188**	0.208**	0.318**	0.189**
	[0.59]	[9.23]	[4.27]	[2.68]	[6.58]	[6.22]	[2.82]
OTC	−0.08	0.047	−0.003	−0.001	−0.011	−0.018	−0.028
	[1.84]	[0.85]	[0.06]	[0.02]	[0.38]	[0.38]	[0.55]
144a	0.046	0.139	−0.05	−0.076	0.049	0.092	0.028
	[0.67]	[1.70]	[0.64]	[0.68]	[0.80]	[0.96]	[0.60]
XCash	0.583**	0.401**	0.495**	0.527**	0.555**	0.875**	0.318*
	[7.09]	[4.52]	[7.03]	[5.58]	[5.18]	[11.55]	[2.52]
XCash × Exchange	1.582**	0.601	0.881*	1.053*	0.913*	0.288	1.155*
	[4.59]	[1.47]	[2.24]	[2.15]	[2.21]	[1.55]	[3.12]
XCash × OTC	1.222**	0.101	0.574	0.508	0.497	0.302	0.588*
	[3.19]	[0.18]	[1.89]	[1.84]	[1.72]	[1.62]	[2.02]
XCash × 144a	−0.144	−0.044	0.02	0.093	0.068	0.122	0.038
	[0.26]	[1.01]	[0.58]	[0.57]	[0.42]	[0.83]	[0.38]
Sales growth	0.168**	1.151**	0.121**	0.098**	0.112**	0.182**	0.087*
	[6.42]	[5.34]	[5.86]	[3.51]	[4.02]	[6.45]	[2.32]
Global industry q	1.235**	1.286**	0.576**	0.611**	0.667**	1.077**	0.388**
	[10.38]	[9.79]	[5.69]	[4.47]	[7.33]	[10.27]	[3.12]
Number of observations	13,810	7,411	10,934	5,747	12,742	9,423	3,049
Adjusted R^2	0.28	0.46	0.23	0.27	0.24	0.26	0.19

Governance Quality Index developed by De Nicolo, Laeven, and Ueda (2006), could have taken place. Yet Aggarwal, Erel, Stulz, and Williamson (2009) find that, on average, foreign firms have poorer governance than matching US firms. These findings suggest that cross-listed firms, which benefit from the overall US standards and environment, should still enjoy a higher valuation of their excess cash.

Given the recent changes in international governance practices, a natural question is whether investors still associate a US listing with a reduction of the risk that insiders turn cash reserves into private benefits. In this subsection, we aim at shedding light on this question and examine how the premium investors place on the excess cash of cross-listed firms varies across different subperiods. The first period ranges from 1991 to 1999, which coincides with an upward market. Then we consider the period 2000–2001, which corresponds to a bear market. The third period follows the SOX enactment, that is, 2002 and 2003. The last period contains only 2003, which is the last year for which we can estimate our full model as specified in Eq. (1). To estimate our model for 2003, we need data until 2005, because we are including 2-year lead changes on earnings and investment variables as controls. However, to evaluate the recent period as thoroughly as we can, we also replace the 2-year lead control variables by 1-year leads. This enables us to include 2004 in our estimation window. Finally, for the most recent period, we split our sample into subgroups of high and low quality of home country institutions using the same country level indices as in Section 4.4.

Table 8 reports the results. Looking at the evolution of the coefficients on *XCash × Exchange*, we see that the premium that investors place on the excess cash of cross-listed firms is positive and significant even in the most recent period. The only exception is the estimated coefficient for the period 2000–2001.[47] During those years, investors did not seem to perceive cross-listing as

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[47] A similar result is shown in Wojcik, Clark, and Bauer (2005). Following a different experiment, they observe that in 2003 US cross-listed firms enjoyed a governance advantage over non-cross-listed peers, but this effect was weaker in 2000.

a mechanism that ties insiders' hands. Interestingly, this period corresponds to the bursting of the Internet bubble and the rise of corporate scandals, when investors could have lost some trust in US governance. In response, the US Congress passed the Sarbanes-Oxley Act of 2002, which aimed to offer enhanced transparency, accountability, and investor protection. When we consider the post-SOX period, we note that the excess cash of cross-listed firms is worth more than that of their domestic peers. In Columns 6 and 7, we report the results for the most recent period by subgroup of firms from emerging and developed markets. In unreported tables, we obtain a similar outcome when we use any of the proxies for the quality of home-country institutions. We observe that the excess cash premium comes mostly from firms in emerging markets or poorly protected environments, while the value of the excess cash premium for firms in developed and better protected markets is no longer statistically significant.

Even though our temporal analysis could be limited by the lack of statistical power due to very short time periods, it provides suggestive insights. First, we observe that during the period including the bursting of the Internet bubble and the subsequent corporate scandals, such as those at Enron and WorldCom, investors did not place a premium on the excess cash of cross-listed firms. Although we cannot exclude the possibility that this trend stems from disappearing growth options during this troubled period, another interpretation could be that the scandals, which involved fraud and accounting irregularities, weakened investors' trust in the effectiveness of cross-listing to limit insiders' actions. In the recent period, investors again associate cross-listing with reduced risk of inefficient insiders' actions and consequently put a premium on the cash of firms that subject themselves to the US financial system. This result is consistent with a recent study by Doidge, Karolyi, and Stulz (2009), who show that non-US firms cross-listing on the New York Stock Exchange enjoy a valuation premium that is still present. Our results could indicate that this valuation premium is partly explained by the efficacy of US cross-listings in improving the efficient use of firms' liquid assets, especially for firms in emerging markets.

5. Conclusion

Recent research has shown that investors discount the value of corporate cash reserves when they are at high risk of being turned into private benefits. In this paper, we examine whether and how the stricter legal rules, the greater transparency, and the increased monitoring that accompany a US cross-listing help mitigate this risk. Our analysis reveals that investors do associate a US listing with a reduction of insiders' inefficient actions. In particular, we find that investors systematically place a valuation premium on the excess cash of foreign firms that cross-list on US exchanges or over-the-counter compared with that of their domestic peers. Moreover, the excess cash premium turns out to be magnified for firms located in countries in which shareholder protection is weak. Also, despite many initiatives to improve governance practices worldwide, the valuation

differential appears to be permanent and is still present. Exploring in more detail the origin of the reduction in the private benefits associated with cash reserves, we find that two complementary forces are at work. On the one hand, investors perceive the strength of US legal enforcement and disclosure requirements as effective mechanisms for tying insiders' hands. On the other hand, the additional scrutiny by financial analysts and large investors that accompanies a US listing also enhances investors' confidence that cash reserves will not feed insiders' personal interests.

In a nutshell, our results highlight that the potential for private benefits embodied in corporate cash holdings is significantly lessened when foreign firms are subject to US institutions and monitoring environment. As such, this paper provides at least two insights. First, we confirm that the value contained in cash holdings is largely determined by the existence and efficacy of mechanisms putting bounds on insiders' actions. In this spirit, our results suggest that firms can take effective actions to acquire such mechanisms and hence cut back a substantial source of value loss. We provide evidence that a US cross-listing turns out to be a valid option. Second, our analyses underline that legal constraints and external monitoring pressure operate hand-in-hand in securing the adequate use of cash reserves and, in turn, safeguarding firm value.

Yet our work leaves some questions unanswered. In particular and despite our best efforts, we are not able to fully explain the premium that investors place on the excess cash of firms that list over-the-counter. Although we show that part of the valuation premium is due to increased external monitoring, we believe that the unexplained portion could be attributed to additional disclosure and corporate governance rules that firms could voluntarily choose to implement even if not required to do so. Also, our effort has been directed at understanding the impact of US regulations and monitoring on the value of excess cash, but those elements could also affect firm value positively or negatively through other channels. However, assessing the overall net impact on firm value is beyond the scope of this paper. Finally, our analysis does not address whether it would be better for certain firms, those with no investment opportunities, to unload their cash balances via dividends, stock repurchases, or paying off debt. These are relevant questions that we leave for future research.

Appendix. Computing excess cash holdings

This appendix describes the methodology for computing excess cash holdings. We follow and adapt the approach of Dittmar and Mahrt-Smith (2007) and Opler, Pinkowitz, Stulz, and Williamson (1999). Specifically, for each country, we first estimate regressions to determine the normal level of cash holdings.[48] This choice is justified by the results in Dittmar, Mahrt-Smith, and Servaes

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[48] We also estimate one regression for all countries including country fixed effects. This way of computing excess cash delivers similar results concerning the effects of cross-listing on the value of excess cash.

(2003), who show that the level of cash depends crucially on country factors. We then define excess cash as the difference between actual cash and the predicted normal cash obtained from each country estimation.

The excess cash measure that we use throughout the paper comes from the specification

$$\ln(Cash_{i,t}) = \beta_1 \ln(TA_{i,t}) + \beta_2\,CF_{i,t} + \beta_3\,NWC_{i,t}$$
$$+ \beta_4\,MV_{i,t} + \beta_5\,Capex_{i,t} + \beta_6\,Leverage_{i,t} + \beta_7\,RD_{i,t}$$
$$+ \beta_8\,DIV_{i,t} + \alpha_i + \phi + \eta_t + \upsilon_{i,t}, \qquad (2)$$

where $Cash$[49] is cash and marketable securities over total assets, TA is total assets in US dollars, and CF is operating income minus interest and taxes over total assets. NWC is current assets minus current liabilities minus cash over total assets, and MV is the market value of the firm, computed as the sum of the market value of equity and the book value of short-term and long-term debt divided by total assets. This variable is further made instrumental using past sales growth. $Capex$ refers to capital expenditures over total assets. $Leverage$ is the sum of short- and long-term debt scaled by total assets. RD refers to research and development expenses over total assets. When RD is missing, we set its value to zero. DIV represents common dividend paid over total assets. We also include firm (α_i), industry (ϕ), and time (η_t) fixed effects.[50]

Several aspects of model Eq. (2) deserve additional comments. First, as noted in Dittmar and Mahrt-Smith (2007), the proxy for investment opportunities in Eq. (2), MV, presents a potential problem. In the paper, we conjecture and provide evidence that excess cash affects firm value. Accordingly, it is problematic to also use this variable as a proxy for investment opportunities in regressions predicting cash levels. To address this concern, we follow Dittmar and Mahrt-Smith (2007) and employ an instrumental variable to control for investment opportunities. Specifically, we use 2 years lagged sales growth as an instrument for MV. As it is difficult to argue that current cash levels affect past sales growth, this measure is exogenous to cash decisions. This instrument consistently identifies model Eq. (2) parameters.

Second, we include firm fixed effects in model Eq. (2), because some firms could genuinely hold larger cash balances than required for economic reasons.[51] Following the arguments of Dittmar and Mahrt-Smith (2007), we do not deduct the estimated specific firm effects when computing excess cash. Because firm fixed effects do not capture traditional determinants of cash holdings such as investment, hedging, and operational needs, they should be counted as excess cash.[52]

In Panel A of Table A1, we present the estimation of model Eq. (2). In Columns 1–5, the reported coefficients (t-statistics) correspond to the averages of the coefficients (t-statistics) obtained from the country-by-country regressions. First, Columns 1 and 2 report OLS results, where we do not account for the endogeneity of MV. In Column 2, we replace MV by past sales growth as a proxy for investment opportunities. In Columns 3–7, we apply an instrumental-variables approach to estimate model Eq. (2). The coefficient estimates are generally in line with previous related literature. We also report the results from the first-stage regression of the instrumental variable estimation in the last column. The strong positive association between past sales growth and market value supports of our instrument choice. Our estimates of excess cash throughout the paper are computed from the country-by-country estimations of the specification presented in Column 3. The results of the effect of cross-listing on the value of excess cash remain qualitatively the same if instead we use excess cash estimates based on the specification reported in Columns 1 and 2.

For robustness, we also estimate different alternative specifications of the normal cash regression where we include governance proxies as additional controls. Previous literature indicates a link between governance proxies and cash levels. In this spirit, we first consider our two firm-level governance (monitoring) variables as predictors of cash level. In Column 4, we include closely held shares and in Column 5 we add analyst coverage. Our objective is to find a measure that represents the amount of cash that is at risk of being turned into insiders' private benefits. Although governance quality affects firms' cash level, this channel is not justified for genuinely operational reasons. Accordingly, to have an accurate measure, we do not take into account the governance-variables estimates when computing the excess cash residuals. Alternatively, we follow the insights of Dittmar, Mahrt-Smith, and Servaes (2003) and include country-level governance variables. Specifically, we include the revised anti-director-rights index (Column 6) as well as a dummy for the common-law legal origin (Column 7). Because we cannot run country-by-country regressions when using country-level variables, we run pooled estimations instead. Reassuringly, those alternative specifications lead to the same conclusions on the interaction between cross-listing and cash and their effect on firm value presented in the body of the paper. Consistent with Dittmar and Mahrt-Smith (2007), the robustness of the results to different excess cash measures could be partly explained by the high correlation of the estimated excess cash across the different specifications and estimation techniques for the normal cash regression.

Panel B of Table A1 displays the correlation coefficients between the seven specifications reported earlier. The magnitude of the correlation estimates ranges between 0.78 and 0.99. Finally, as we show in Table 3, using total cash and changes in cash instead of the excess cash measure defined in this Appendix also confirms the robustness of our value results.

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[49] For ease of notation, we drop the subscripts that refer to the firm i and respectively year t.

[50] We obtain virtually the same results if we compute excess cash excluding industry fixed effects.

[51] An F-test on the joint significance of firm fixed effect confirms the need to account for firm invariant effects (p-value equal to 0.001).

[52] See Dittmar and Mahrt-Smith (2007) for an illustrative example.

Table A1
Predicting the normal level of cash.

This table reports the regression results for the level of cash used to compute excess cash and the correlation between different measures of excess cash. In Panel A, the dependent variable is the natural logarithm of the ratio of cash divided by total assets. The regressors include firm size (ln(*TA*)) or total assets in U.S dollars, earnings before interest and taxes to total assets (*CF*), net working capital to total assets (*NWC*), research and development to total assets (*RD*), market value to total assets (*MV*), capital expenditures to total assets (*Capex*), total debt to total assets (*Leverage*), total dividend paid over total assets (*Div*) and two-years lagged sales growth (*Sales Growth*). In Columns 1 to 6, the displayed coefficients (*t*-statistics) correspond to the averages of the coefficients (*t*-statistics) obtained from the country-by-country estimations. Column 1 and 2 report ordinary least squares estimates. Column 2 replaces *MV* by past sales growth as a proxy for investment opportunities. Columns 3 to 7 is estimated using an instrumental variable (IV) approach with past sales growth as an instrument for *MV*. The results of the first stage of the IV model (*MV* as dependent variable) are also reported. *CHS* represents the percentage ownership by large shareholders, and insiders and *Coverage* is the number of analyst following the firm. All estimations include firm, industry, and time fixed effects. *Revised Antidirector Rights* is an index measuring country-level investor protection (from Djankov et al. 2006). *Common Law* is a dummy that equals one for common law countries and zero otherwise (from la Porta, Lopez-de-Silanes, Shleifer and Vishny, 1998). Because there is no time variation in the variables *Revised Antidirector Rights* and *Common Law*, we estimate specifications 6 and 7 as a pooled cross section and include country fixed effects to control for country-specific unobservables. We report heteroskedasticity and serial correlation robust *t*-statistics in brackets. ** and * indicate statistical significance at the 1% and 5% levels, respectively. Panel B presents the correlation coefficients between the excess cash obtained via the seven specifications 1 to 7.

Panel A: Regression results

Variable	Country-by-country estimations						Pooled estimations	
	OLS (1)	OLS (2)	IV (3)	First stage	IV (4)	IV (5)	IV (6)	IV (7)
ln(*TA*)	0.092**	0.083**	0.123**	−0.019	0.043**	0.059**	0.054**	0.050**
	[5.35]	[6.66]	[3.17]	[1.68]	[4.61]	[6.03]	[6.33]	[6.06]
CF	2.484**	2.537**	2.438**	2.247**	2.651**	2.852**	2.622**	2.688**
	[17.70]	[19.74]	[16.03]	[9.86]	[12.66]	[17.05]	[18.62]	[19.27]
NWC	−0.591	−0.722**	−1.099**	−0.153*	−0.672**	−0.702**	−0.491**	−0.446**
	[1.92]	[2.33]	[2.12]	[2.07]	[2.24]	[7.20]	[6.05]	[5.45]
RD	0.049**	0.114*	0.034	2.790**	0.042**	0.041**	0.029	0.029
	[2.28]	[2.08]	[1.72]	[3.46]	[2.33]	[2.48]	[1.68]	[1.70]
MV	0.170**		−0.078**		−0.139**	−0.135**	−0.077**	−0.080**
	[5.35]		[2.00]		[5.07]	[5.09]	[3.30]	[3.45]
Sales growth		0.024**		0.254**				
		[3.40]		[7.98]				
Capex	−0.083**	−0.088**	−0.088**		−0.480**	−0.506**	−0.394**	−0.345**
	[3.26]	[2.86]	[2.65]		[5.29]	[5.57]	[4.99]	[4.33]
Div	−0.078**	−0.072**	−0.072		−0.054**	−0.051**	−0.047**	−0.050**
	[2.78]	[2.54]	[1.54]		[4.02]	[3.73]	[4.12]	[4.28]
Leverage	−0.691**	−0.518**	−0.518**		−0.245**	−0.195**	−0.205**	−0.229**
	[3.93]	[2.70]	[2.70]		[5.67]	[4.36]	[5.35]	[5.92]
CHS					−0.001**			
					[2.56]			
Coverage						−0.005**		
						[4.91]		
Revised antidirector rights						−0.751**		
						[2.96]		
Common law								−0.165**
								[12.36]
Number of observations	58,184	59,323	59,323	59,323	44,212	40,309	57,486	56,863
Adjusted R^2	0.30	0.29	0.29	0.17	0.26	0.23	0.25	0.26
F-test: $\alpha_i=0$ (*p*-value)	0	0	0		0	0	0	0

Panel B: Correlations between the seven excess cash measures

Specifications	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1)	1						
(2)	0.8823	1					
(3)	0.8494	0.9579	1				
(4)	0.9955	0.8922	0.8441	1			
(5)	0.8128	0.8465	0.8756	0.8007	1		
(6)	0.7981	0.8256	0.9623	0.7699	0.9741	1	
(7)	0.8012	0.8698	0.8874	0.8312	0.9354	0.9298	1

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