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# Evolution of Control of Cross-listed Companies

Wissam Abdallah\*

Cardiff Business School, Cardiff University, Aberconway Building, Colum Drive, CF10 3EU, Cardiff, UK; email:  
abdallahw@cardiff.ac.uk

Marc Goergen

Cardiff Business School, Cardiff University, Aberconway Building, Colum Drive, CF10 3EU, Cardiff, UK; and European Corporate  
Governance Institute, Brussels, Belgium; email: goergenM@cardiff.ac.uk

## ABSTRACT

There are two theories on the determinants of the control structure of the firm. The first theory postulates that the control structure is determined by company-specific characteristics. The second theory emphasizes the importance of institutional characteristics in shaping this structure. In this paper, we test the validity of both theories in the context of a cross-listing, which causes a change to the company's legal environment. We find that the initial control structure, risk and size determine the control structure post cross-listing and that cross-listing on better quality markets facilitates the evolution of control towards more dispersed control. To conclude, company characteristics have a greater impact than country characteristics on the company's decision to cross-list and are also better at explaining the change in the control structure post cross-listing.

**Keywords:** Cross-listing, corporate governance, corporate control

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\* Corresponding author: *Tel:* +44 (0)29 2087 5839; *Email address:* [abdallahw@cardiff.ac.uk](mailto:abdallahw@cardiff.ac.uk)

## 1. Introduction

There is as yet no agreement in the literature as to whether corporate ownership and control is mainly determined by company characteristics or whether it is mainly the result of the national institutional setting. The body of literature that considers that company characteristics are the main driver of the ownership and control structure have advanced size and regulation (Demsetz and Lehn, 1985), performance (Leland and Pyle, 1977), risk (Admati et al., 1994; Kahn and Winton, 1998) and liquidity (Maug, 1998; Bolton and von Thadden, 1998) as such drivers. According to this body of literature ownership and control is likely to vary across companies as well as within countries. The body of the literature (e.g. Modigliani and Perotti, 1997; Bebchuk, 1999; La Porta et al., 1999; Black, 2000, 2001; Djankov et al., 2008) that argues that country characteristics are the main determinants of the ownership and control structure postulates that such country characteristics are the quality as well as the enforcement of laws, in particular securities laws. In other words, this body of literature argues that companies from the same country are likely to have similar ownership and control.

What is difficult to reconcile with the latter body of literature is the fact that some, *but not all*, companies voluntarily choose to cross-list on a foreign stock exchange with better securities laws. If the latter body of literature were to be correct, then one would expect either *all* companies from countries with weak securities laws to cross-list in better markets or *none* at all. The fact that *some*, but not *all*, companies make this choice suggests that there are company-specific characteristics that drive this decision. Bebchuk and Roe (1999) argue that some companies opt into a different legal system<sup>1</sup> to achieve their optimal control structure which they would not be able to achieve at home. When companies cross-list in a stricter legal regime than their home country legal system, they

are expected to abide by the securities laws and regulation of the host market. As a result, these companies bond themselves not to expropriate their minority shareholders; this is the so called bonding hypothesis (Coffee, 2002; Reese and Weisbach, 2002). John and Kedia (2006) predict that companies that cross-list in a system with better investor protection will experience a reduction in the concentration of ownership and control as there is no longer a need for shareholders to keep substantial stakes to protect themselves from being expropriated by the management or the controlling shareholder. Several empirical studies provide evidence in support of this argument (Pagano, Röell, and Zechner, 2002; Doidge et al., 2004; Abdallah and Goergen, 2008; Lel and Miller, 2008; Boubakri et al., 2010). The reading of the above literature leads to two predictions. First, some companies are more likely to cross-list in a better system than others given that the benefits they derive from less concentrated ownership and control are more substantial. Second, once cross-listed such companies experience a substantial reduction in their ownership and control.

We attempt to test the validity of these two predictions by investigating the determinants that drive the decision to cross-list and by investigating the evolution of control over the five years post cross-listing. Using univariate and multivariate analyses, we find that company characteristics are the main determinants of the evolution of control and that cross-listing on a better market facilitates the reduction in control concentration. Our analysis shows that company characteristics determine not only the change in control structure, but also influence the company's decision as to where to cross-list its shares. Our findings are consistent with Abdallah and Goergen (2008) who

find that a range of company characteristics influence the likelihood of the company cross-listing on a better market.

To date, the relation between cross-listing and the control structure is as yet very limited. Ayyagari and Doidge (2010) find that foreign companies that list on the U.S. stock markets experience a reduction in control. However, this study as well as the majority of the other studies on cross-listing is limited to the study of non-U.S. companies cross-listing in the U.S. In contrast, our paper is based on a sample of 128 companies from 17 countries cross-listing on 14 different stock markets around the world. Roosenboom and van Dijk (2009) argue that ignoring cross-listing on non-U.S. markets leads to an incomplete understanding of the effects of cross-listing. Our paper does not suffer from this flaw. Our paper also improves on Ayyagari and Doidge (2010) by using more appropriate measures of the strength of the improvement in the legal protection of investors via cross-listing. Indeed, Ayyagari and Doidge (2010) use La Porta et al.'s (1998) shareholder rights index, which measures investor protection stemming from corporate law. However, when a firm cross-lists on a foreign market it exposes itself to the securities laws of that market and not to its corporate law.<sup>2</sup> Hence, the La Porta et al. shareholder rights index is not the right metric to assess a change in shareholder protection brought about by a cross-listing. The index has also been criticised for suffering from errors in encoding law given the use of secondary rather than primary legal sources (see Spamann, 2010). We use indices measuring accounting standards and the quality of securities laws. Securities laws indices include the disclosure requirements, liability, and public enforcement from La Porta et al. (2006), and the staffing and the budget of the securities regulator which measure public and private enforcement of

securities laws as per Jackson and Roe (2009). A more detailed description of these measures is provided in our methodology section (see section 4.2).

The rest of the paper proceeds as follows. Section 2 explains the relation between the national setting, more specifically law, and the control structure. In the first part of that section we discuss the effect of legal rules on the control structures prevailing in the home country. Thereafter we discuss how cross-listing affects the control structure of the firm and how changes in the legal environment of the company via cross-listing affect its control structure. Section 3 reviews the literature on the relation between company characteristics and the control structure. Section 4 describes the methodology, sources of data and variables used in this study. Section 5 discusses the evolution of control post cross-listing. We examine the determinants of control post cross-listing in Section 6. Section 7 contains the sensitivity analysis, and Section 8 concludes.

## **2. The National Setting and the Control Structure**

### *2.1 Corporate Law as a Determinant of Control*

The seminal work of La Porta et al. (1998, 1999) investigates the relation between the control and ownership structure and the legal system. They find that common law countries offer greater shareholder protection compared to civil law countries, and as a consequence dispersed control is more likely in the former whereas in the latter concentrated control is more likely. A number of empirical studies on the ownership and control structure for individual countries<sup>3</sup> confirm La Porta et al.'s (1999) findings. The question arises as to how these differences in the legal rules shape the observed patterns

of control across countries. There are a set of rules that encourage certain types of control structures. Below we will discuss some of these rules.

Among the legal rules that differ across countries are the takeover provisions. In some countries the takeover code includes a rule with a mandatory offer to be made to all remaining shareholders if a share block above a certain threshold has been acquired in a firm. The higher the threshold, the greater the control that can be accumulated before a mandatory offer has to be made. In 2004 the European Council approved the EU Takeover Directive, introducing the mandatory offer rule across the entire EU (see Goergen et al., 2005). However, member states were allowed to determine the percentage of voting rights that would trigger the mandatory offer. According to the assessment report on the Takeover Directive,<sup>4</sup> most of the member states introduced a threshold somewhere between 30% and 33.3% of the voting rights. For example, in France the threshold is 33.3%. This means that an investor can acquire up to 33.2% of the voting rights of the company without taking the risk of ending up holding all shares in the company. In contrast, Canada has a threshold of only 20%. Therefore, an investor with limited wealth is reluctant to acquire more than 20% of the shares of a Canadian company, because s/he will end up having to make a bid for the whole company if this threshold is exceeded. This illustrates how the mandatory offer rule enables higher control concentration in France, while discouraging the building up of control blocks in Canada.<sup>5 6</sup>

Another legal difference between countries is the application or violation of the one-share-one-vote principle (Grossman and Hart, 1988). In some countries company law and securities regulation permit the use of devices to separate control rights from cash

flow rights. There are several ways to separate control from ownership such as dual-class shares, cross-shareholdings and pyramid structures. These devices enable the initial owner to maintain control over the company, but with little contribution to the capital. The lawmakers in Sweden literally encourage dual-class shares. They view them as having significant advantages and as a necessary condition for “*an efficient management as well as for the long-term planning of the firm’s activities*” and hence these shares can “*significantly promote the efficiency and development of individual firms as well as of the business sector in general.*”<sup>7</sup> Holmén and Högfeldt (2004) report that 90% of their sample of Swedish privately controlled initial public offerings (IPOs) have dual-class shares outstanding with only low-voting B-shares in the hands of outside investors.<sup>8</sup> In addition, Goergen and Renneboog (2003) report that 38% of the German family-controlled IPO companies they study have non-voting shares outstanding. Nevertheless, it would be wrong to conclude that breaches of the one-share-one-vote principle are limited to civil law countries. Indeed, there are many US companies with dual-class shares (e.g. Ford Motor Company, Facebook and Google).

Furthermore, a legal system that allows the separation of ownership rights from control rights enables the initial owner to retain a controlling block after the IPO and to bargain the transfer of control with a potential new controlling shareholder later on. As a consequence control will remain concentrated over time as predicted by the path dependence theory of Bebchuk and Roe (1999). Empirical evidence from Pagano et al. (1996) and Goergen (1998) reveals that the initial owners of Italian and German IPO firms, respectively, maintain a controlling block a long time after the IPO.<sup>9</sup> On the



contrary, in the U.K. the majority of shares owned by the pre-IPO shareholders are sold in the IPO or during the subsequent years (Brennan and Franks, 1997; Goergen, 1998).<sup>10</sup>

To summarise, it appears that legal rules influence the ownership and control structure within the country and that differences in these rules may explain cross-country differences in control. Countries with better laws, in particular securities laws, adopt rules that encourage the dispersion of control by providing protection for outside investors. In contrast, other countries implement rules that support existing controlling stakes and/or incentivise the building up of new controlling stakes given the weak protection of minority shareholders.

## *2.2 The Effects of Cross-listing on Corporate Control*

Survey evidence reveals that managers consider growth in the shareholder base and dispersion of share ownership as a major benefit of cross-listing (see Mittoo, 1992; Fatemi and Rad, 1996; Yamori and Baba, 1999; Bancel and Mittoo, 2001). Cross-listing the company's shares abroad makes it easier for foreign investors to acquire and trade the shares since holding shares in a foreign company listed on the company's domestic market is riskier and also costlier than holding shares in a company listed on the local market. This is because of the informational barriers resulting from differences in language, currency, financial reporting and auditing practices, and lack of interest of local security analysts and the financial press in foreign companies. These barriers create a home bias, whereby investors allocate a larger than optimal proportion of their portfolio weights to domestic stocks.<sup>11</sup> Cross-listing diminishes these barriers as the company has to prepare periodically information complying with local requirements, in particular

securities laws. In addition, the company gains local media coverage and interest by local security analysts. Accordingly, it will be easier for the local investors to obtain timely and relevant information about the company. This will reduce the risk borne by them, hence encouraging them to trade in the shares. Therefore we expect a decrease in control concentration post cross-listing.

Further, the impact of cross-listing on the control structure may vary across cross-listing locations. According to the discussion in Section 2.1 legal rules influence the optimal ownership and control structure in a given country. Therefore changes in these legal rules, via exposure to another country's securities laws, are likely to trigger a change in the ownership and control structure as predicted by John and Kedia (2006). Companies that cross-list in a better legal environment than their home market subject themselves to stricter securities laws, which in turn may affect their control structure post cross-listing. Thus *ceteris-paribus*, companies may choose the market for their cross-listing in accordance with their control structure. There are three possible choices of markets: i) the company cross-lists on a market with the same level of shareholder protection as on its home market, ii) it cross-lists on a market with better shareholder protection, or iii) it cross-lists on a market with lower shareholder protection.

Each of these choices are likely to have different implications for the control structure. If the company cross-lists on a market with a similar level of shareholder protection, we do not expect it to undergo a major change in control because the legal rules in the host and home market are similar. Cross-listing on markets with better shareholder protection is expected to result in a reduction in control concentration after the cross-listing. In contrast, we do not expect companies that cross-list on markets with

lower levels of shareholder protection than their home markets to be affected by the legal rules of the host market. Hence, we do not expect these firms to experience major changes in their control structure after the cross-listing.

The discussion from this sub-section as well as the previous one implies that companies from countries with weaker securities laws are more likely to cross-list as these firms are prevented from achieving their desired control structure on their home market. Moreover, once they are cross-listed, the evolution of their control structure is mainly determined by the improvement in investor protection brought about by the cross-listing. This leads us to our first two hypotheses.

*Hypothesis 1a: Companies from home markets with weak legal investor protection are more likely to cross-list.*

*Hypothesis 2a: The evolution of control post cross-listing is mainly determined by the securities laws of the host market.*

### **3. Corporate Characteristics as Determinants of Control**

Although the legal environment in general and securities laws in particular may be an important determinant of the ownership and control structure, they do not explain differences in that structure across companies from the same country. In fact, company characteristics may not only be the main determinants of the ownership and control structure, but may also be the reason why some companies cross-list in a better legal system. Indeed, doing so may be the only way for such companies to achieve their

optimal ownership and control structure, which they would not be able to achieve in their home market. Below we discuss these company characteristics in more detail.

### *3.1 Company Risk*

The instability of the company's environment may influence its optimal control structure. In general, investors are risk averse and they prefer to invest in companies with relatively stable returns. Although investing in a risky company comes hand in hand with a higher expected return, compensating for the additional risk, investors may be reluctant to allocate a large proportion of their wealth to a single high-risk company. Kahn and Winton's (1998) model predicts that ownership concentration is lower in relatively "opaque" or risky companies. Himmelberg et al. (1999) find evidence that managerial ownership in U.S. companies decreases with idiosyncratic risk. Therefore risky companies are more likely to cross-list, if they cannot achieve dispersed ownership and control in their home market, and they will experience a reduction in control concentration post cross-listing as their owners will proceed with diversifying their portfolios.

### *3.2 Company Size*

A company's size affects its optimal control and ownership structure. Large companies need substantial funds and the wealth of the controlling shareholder may not be sufficient to meet these needs. Therefore, wealth constraints and the diversification motive constrain the holding of major stakes in large companies (Demsetz and Lehn, 1985). This suggests that large firms from weak legal systems are more likely to cross-list

and that the decrease in control post cross-listing increases with firm size. It must be pointed out, however, that this inverse relation between size and control is likely to be weaker for companies where the controlling shareholders can maintain control of the company with a relatively small amount of capital investment. This can be achieved by using devices that separate control rights from cash flow rights, such as dual-class shares and pyramidal structures.

### *3.3 Company Profitability*

A large body of literature maintains that the current control and ownership structure depends on company performance (Short, 1994; Franks et al., 2001; and Holderness, 2003). Poor performance signals poor monitoring, and hence bad performance may trigger a transfer of control and the removal of the underperforming managers. Furthermore, insiders acting on private information may change their holdings in the company according to their expectations about the future performance. Gilson (1990) presents evidence that banks and creditors increase their common stock ownership in companies that are financially distressed. Kole (1996) finds evidence that past performance has an effect on current managerial ownership.<sup>12</sup> This suggests that companies with weak performance are less likely to see a reduction in their ownership and control concentration post cross-listing.

### *3.4 Company Growth*

Company growth may also influence corporate control. High-growth companies are more likely to cross-list in order to tap into new capital markets and raise more

capital; consequently control by the initial shareholders may become diluted once the company is cross listed. Although companies can finance their growth by issuing non-voting shares, there is a limit to this as the total face value of these shares may not exceed a certain percentage of the total face value of the share capital. For instance, in France non-voting shares cannot represent more than 25% of the capital (see Bloch and Kremp, 2001) whereas in Germany they cannot exceed 50% of the capital (Goergen and Renneboog, 2003). Therefore, we still expect a negative relation between growth and the initial shareholders' control post cross-listing.

To sum up this section, financial theory and the results from empirical studies suggest that the decision to cross-list is driven by company characteristics and that the evolution of control after cross-listing is mainly driven by company characteristics. This leads us to our final two hypotheses, which contrast with the above two hypotheses.

*Hypothesis 1b: The company's characteristics are the main drivers of the decision to cross-list.*

*Hypothesis 2b: The evolution of control post cross-listing is mainly determined by the company's characteristics.*

## **4. Methodology and Sample Selection**

### *4.1 Sample Selection*

Our sample consists of 128 companies from 17 countries that cross-list on 14 different stock exchanges during the period of 1990 to 2006.<sup>13</sup> The stock exchanges

represent the main stock exchanges in the U.S. and Western Europe as well as the Tokyo and Johannesburg stock exchanges. In order to identify cross-listed companies, we compare the lists of foreign companies and those of domestic companies listed on these 14 stock exchanges.<sup>14</sup> The lists of the domestic companies are from the first and second tier markets of each individual stock exchange. After comparing the lists of foreign and domestic companies, we are able to identify 984 cross-listed companies. To keep the data collection effort within reasonable limits,<sup>15</sup> we randomly select 204 companies which represent 20% of the population of cross-listed companies among the 14 stock markets during the sample period.<sup>16</sup> We use stratified random sampling to obtain a representative sample of the population, thus reducing sampling error (see Cortinhas and Black, 2012, p.240). The population of cross-listed firms is stratified by country and a random sample of firms is taken from each country. We eliminate 17 companies because they were listed on a foreign market before being listed on their home market. We require companies to obtain their cross-listing during our sample period. This criterion eliminates 10 firms which cross-listed before 1990. We drop 49 companies due to a lack of ownership and control data. Table 1 reports the distribution of our sample by country of origin.<sup>17</sup> In unreported descriptive statistics we find that 56% of our sample firms cross-list in the U.S., i.e. on NYSE or NASDAQ. Further, 59 (i.e. 46%) of the 128 cross-listed firms in our sample are from the U.K., the U.S. and Canada.<sup>18</sup>

[Insert Table 1 about here]

We then construct a control sample of non-cross-listed companies by matching the sample companies by country, industry and size (measured by total assets at the time of cross-listing), or by country and size only if no match can be found in the same

industry<sup>19</sup> Due to ownership data availability we were able to match only 119 of the sample companies. However, when we perform the analysis based on only those cross-listed firms that have a non-cross-listed matched firm we find similar results.

We collect the data on control structures mainly from company annual reports, IPO prospectuses and 20-F filings, all obtained from Thomson One Banker. Several internet resources such as the company websites, the Edgar database for U.S. companies, SEDAR for Canadian companies, Consob for Italian companies, Paris Bourse for French companies, and the Copenhagen Stock Exchange for Danish companies, are also useful sources for control data. In some cases control data are obtained directly from the company via email. Accounting and financial data are obtained from Datastream, Thomson One Banker and Worldscope.

#### *4.2 Methodology, Variables and Data Sources*

We conduct a univariate as well as a multivariate analysis. The univariate analysis examines the evolution of control over the seven-year period from the pre cross-listing year to five years after the cross-listing. The multivariate analysis consists of a Heckman (1979) two-step model.<sup>20</sup> The first step of the Heckman model is a probit regression that models the likelihood to cross-list (i.e. the selection equation) as well as providing the inverse of Mills' ratio (LAMBDA). The second step is the OLS regression that models the determinants of the control structure, with LAMBDA as an additional variable. The probit or selection equation is given by:

$$CL_i = \alpha_{0,i} + \beta_{0,i} X_i + \varepsilon_i \quad (1)$$



where the dependent variable  $CL_i$  is a dummy variable that is equal to 1 if company  $i$  is cross-listed and zero otherwise.  $X_i$  is the set of variables that influence the cross-listing decision.

The independent variables in the probit regression are the control structure as well as SIZE, GROWTH, RISK and LEVERAGE. We use the following two measures of the control structure: (i) the largest shareholder's voting stake (LSH); and (ii) the largest initial shareholder's<sup>21</sup> voting stake (LIN). While the first measure of control is oblivious to a *change in control*, i.e. the transfer of the largest stake in the company to a new shareholder, the second measure does account for this. Company size (SIZE) is measured by the natural logarithm of the annual average market capitalisation. The growth rate (GROWTH) is measured by the natural logarithm of the annual growth rate of total assets. The level of a company's risk (RISK) is measured by the natural logarithm of the standard deviation of stock returns over 12 months. LEVERAGE is measured by the logarithm of one plus the ratio of long term debt to total share capital and reserves. All of these variables are measured in the pre cross-listing year.

We also include a measure of the quality of investor protection in the home country in the probit regression in order to test the validity of Hypothesis 1a versus Hypothesis 1b. We use the following six measures of investor protection. The first measure is the accounting standards index which measures the quality of accounting in each country. The value of the index for each country is obtained by rating its companies based on the inclusion or omission of 85 items in their 1993 annual reports.<sup>22</sup> The ranking is obtained from International Accounting and Auditing Trends published by the Centre for International Financial Analysis and Research. The second measure is the disclosure

requirements index from La Porta et al. (2006).<sup>23</sup> The third measure is the La Porta et al. (2006) liability index which measures the procedural difficulty in recovering losses from the issuer and its directors, distributors, and accountants.<sup>24</sup> The fourth measure is La Porta et al.'s (2006) public enforcement index which measures the enforcement of securities laws.<sup>25</sup> The fifth measure is the staff index from Jackson and Roe (2009) which is the 2005 size of the securities regulator's staff divided by the country's population in millions. Finally, we use the budget index from Jackson and Roe (2009) which is the securities regulator's 2005 budget divided by the country's GDP.

Table 2 reports the values of the above six measures of investor protection for the countries covered by this study. Although the ranking of the countries varies somewhat across the six measures, the same four countries tend to rank at the top. These countries are the U.S., Canada, Australia and the U.K. The U.S. and Canada are just below the average in terms of their accounting standards.

[Insert Table 2 about here]

The second equation of the Heckman model is the following pooled OLS model:

$$\begin{aligned}
 CONTROL_{i,t} = & \alpha + \beta_1 CONTROL_{i,t-1} + \beta_2 POST*IMP_i + \beta_3 SIZE_{i,t-1} + \beta_4 ROA_{i,t-1} + \\
 & \beta_5 GROWTH_{i,t-1} + \beta_6 RISK_{i,t-1} + \beta_7 CAPITAL_{i,t-1} + \beta_8 IPO_i + \beta_9 LAMBDA_i \\
 & + \varepsilon_i \qquad (2)
 \end{aligned}$$

where the dependent variable  $CONTROL_{i,t}$  is the control level for company  $i$  in year  $t$  as defined above;  $t$  ranges from the year preceding the year of the cross-listing to year 5 after the cross-listing. As the annual observations for a given firm are not independent of

each other we cluster the errors by firm. Equation (2) includes the interaction between the post cross-listing dummy (POST) and the improvement in investor protection due to the cross-listing (IMP). POST is a dummy variable that is equal to one for the year of the cross-listing as well as all subsequent years, and zero otherwise. IMP is equal to the difference in investor protection, via better securities laws, between the host market and the home market if this difference is positive and zero otherwise. The remaining independent variables are as follows. SIZE, GROWTH and RISK are defined as above. Return on assets (ROA) is measured as net income divided by the previous year's total assets.<sup>26</sup> Capital issuance (CAPITAL) is a dummy variable that equals one if the company issues shares during year  $t$ , and zero otherwise. IPO is an indicator variable that equals one if the company has its IPO at the time of cross-listing and zero otherwise.

## **5. Evolution of Control Structure Post Cross-listing**

Table 3 compares the evolution of the control structure for cross-listed companies with that for the non-cross-listed companies over the seven-year period ranging from the year preceding the cross-listing year and ending five years post cross-listing. The table displays the largest shareholder's voting stake (LSH), and the largest initial shareholder's voting stake (LIN). Panel A exhibits the evolution of control for cross-listed firms and their matched non-cross-listed firms. The panel shows that control held by the largest shareholder decreases by 15% from the pre cross-listing year to 5 years post cross-listing and the decrease is statistically significant at the 1% level. In contrast, we find a slight increase in control held by the largest shareholder in the matched, non-cross-listed

firms.<sup>27</sup> This increase is significant at the 10% level. The results indicate that cross-listing *per se* does affect the control structure of the firms.

[Insert Table 3 about here]

Panels B, C, D, E and F compare the evolution of control between the companies that cross-list on a market with higher investor protection – according to one of our six measures – than their home market and those that cross-list on a market with similar or lower investor protection than their home market. In Panels B, C, D, E and F we classify the location of the cross-listing according to the accounting standards index, La Porta et al.'s (2006) disclosure requirements index, La Porta et al.'s (2006) liability index, La Porta et al.'s (2006) public enforcement index, Jackson and Roe's (2009) staff index, and Jackson and Roe's (2009) budget index, respectively.

The panels reveal a clear pattern for the evolution of control in cross-listed companies. We find that there is a significant decrease in control for all cross-listed companies, regardless of the quality of investor protection in the host market, and the bulk of this decline occurs during the year of the cross-listing. Nevertheless, we observe that five years post cross-listing the reduction in control concentration is greatest for companies cross-listing on a market with higher investor protection than their home market. Interestingly, the companies that cross-list on a better market also have a greater concentration of control in the year preceding the cross-listing, suggesting that these companies may be prevented from achieving their optimal ownership and control structure on their home market. The findings lend support to Hypothesis 2a that the evolution in the control structure of the company post cross-listing is determined by the securities laws of the host market.<sup>28</sup> A similar conclusion is reached for the stake held by

the largest initial shareholder. However, the above analysis does not control for the impact of company characteristics on the control structure. Hence in the next section, we perform a multivariate regression analysis which includes company characteristics in addition to the country characteristics.

## **6. Determinants of the Control Structure Post Cross-listing**

In this section we discuss the results of the determinants of the largest shareholder's voting power (LSH, Table 4), and the largest initial shareholder's voting power (LIN, Table 5) held in year  $t$  – where  $t$  ranges from the pre cross-listing year to five years post cross-listing – after controlling for the likelihood of cross-listing. Table 4 displays the results for the Heckman selection model explaining the level of the largest shareholder's control power in year  $t$ . The dependent variable in the main regression is the largest shareholder's voting stake (LSH), and the dependent variable in the selection regression is the cross-listing dummy which takes the value of one for cross-listed companies and zero otherwise. We run two types of main regressions: the first one (“Main-1”) contains the interaction term measuring the improvement in investor protection brought about by the cross-listing whereas the second one (“Main-2”) does not include this interaction term. Comparing the  $R^2$ 's of these two regressions enables us to evaluate the explanatory power added by including the interaction term, and hence the effect of the host country's securities laws on the ownership and control structure.

The results from the estimation of the selection equation suggest that firm characteristics explain the decision to cross-list. In detail, the likelihood to cross-list decreases with the stake held by the largest shareholder, and increases with the size of the

company, its growth rate and its level of risk. All four company characteristics are consistently significant at the 1% and 5% level, respectively, in all five Heckman selection regressions. The negative coefficient on the lagged LSH can be explained as evidence of high private benefits controlling shareholders enjoy, which may discourage them from cross-listing their firm's shares on a foreign market. The level of investor protection on the home market is not significant at any reasonable level in any of the selection regressions. This suggests that the motives for cross-listing are mainly firm characteristics. The regression results provide support for hypothesis 1b and call for the rejection of hypothesis 1a.

Moving on to the results for the estimation of the main regression in the Heckman model, we find that the company characteristics CAPITAL and the lagged dependent variable are consistently significant at the 1% level and significant at the 10% level or better, respectively. This suggests that company characteristics still drive the evolution of control post cross-listing. The other variables of interest in the "Main-1" regressions are the interaction terms between POST, the post cross-listing dummy, on one side and the six measures of the improvement in investor protection brought about by the cross-listing, i.e. ACCST, DISCREQ, LIABILITY, PUBENFOR, STAFF and BUDGET on the other side. ACCST, DISCREQ, LIABILITY, PUBENFOR, STAFF and BUDGET are equal, respectively, to the difference between the host and home markets in the accounting standards index, La Porta et al.'s (2006) disclosure requirements index, La Porta et al.'s (2006) liability index, La Porta et al.'s (2006) public enforcement index, Jackson and Roe's (2009) staff index, and Jackson and Roe's (2009) budget index if the difference is positive and zero otherwise.

[Insert Table 4 about here]

The interaction term is not significant at any reasonable level in any of the “Main-1” regressions. Further, when this interaction term is dropped (see the “Main-2” regressions) the  $R^2$  of the regression remains virtually unchanged. All in all, this suggests that firm characteristics, in particular CAPITAL and the past level of control held by the large shareholder, are the main determinants of the evolution of control post cross-listing. This provides support for hypothesis 2b and calls for the rejection of hypothesis 2a.

Table 5 shows the results for the Heckman selection model explaining the voting stake held by the largest initial shareholder held in year  $t$ . We find results similar to those from Table 4 for the selection regressions. We find that the likelihood to cross-list decreases with the stake held by the initial largest shareholder, and increases with the size of the company and its growth rate. Again, there is no evidence that the level of investor protection on the home market has an impact on the decision to cross-list. Moving onto the main regressions, the patterns uncovered by Table 4 are still upheld. The improvement in investor protection brought about by the cross-listing is also always insignificant in Table 5. In line with Table 4, company characteristics, i.e. the past control held by the largest initial shareholder, have a significant impact on the evolution of control post cross-listing. To sum up, Table 5 provides further support for hypothesis 1b and hypothesis 2b.

[Insert Table 5 about here]

In summary, we find that company characteristics are the main determinants of the decision to cross-list and they are also the main drivers of the evolution of corporate control post cross-listing. In other words, our analysis shows that company characteristics

affect the change in control structure and also influence the company's decision on where to cross-list its shares. This finding complements Abdallah and Goergen (2008) who find that the control structure pre cross-listing is one of the determinants of the choice of the market for the cross-listing.

## **7. Sensitivity analysis**

Since some of our sample countries have a small number of cross-listed firms, we check whether our results are sensitive to the exclusion of these countries from the analysis. We re-run the regressions in Tables 4 and 5 based on the sub-sample of countries with at least 5 cross-listed firms. This criterion results in dropping the following countries: Belgium (2 firms), Denmark (1 firm), Italy (3 firms), Norway (4 firms) and South Africa (2 firms). Our results are upheld when excluding these firms. Moreover, we re-run the regressions for the sub-sample of firms that cross-list in the US or the UK. Again, the results (untabulated) confirm our conclusion that firm characteristics are more important than country characteristics in determining the cross-listing decision and explaining the change in control post cross-listing.

We also check the validity of our specification of the Heckman model. The implementation of the Heckman model requires identifying two sets of variables: those used in the selection equation (the  $Z$ 's) and those used in the outcome equation (the  $X$ 's). The question arises as to whether these two sets of variables can be identical or whether there should be exclusion restrictions such that some variables from the first stage are not to be included in the second stage. The orthodox answer is that the variables used in both equations should be determined by theory. It may be the case that the same variables



drive both the dependent variable in the selection equation and the dependent variable in the outcome equation. Li and Prabhala (2007) argue that exclusion restrictions are not necessary in a Heckman selection model because the model is identified by non-linearity (i.e. the inverse Mills ratio is non-linear in the Zs and the Xs). Nevertheless, if the assumption of non-linearity does not hold, it is more likely that the selection model suffers from multicollinearity when there are no exclusion restrictions (Li and Prabhala, 2007; Lennox et al., 2012). Therefore, there should be at least one variable that is included in the first equation but not in the second equation. Although it is a challenge to find good Z variables that are not correlated with the dependent variable in the second equation, our model does not suffer from the exclusion restrictions problem because we exclude LEVERAGE and the country characteristics from the second equation. To verify the robustness of our models, we run a diagnostic test for multicollinearity by computing the Variance of Inflation Factors (VIFs). Each regression has a VIF of maximum 3.62 indicating that our models do not suffer from a multicollinearity problem. Further, Puhani (2000) maintains that in the presence of multicollinearity Ordinary Least Squares (OLS) provides more robust estimates than a Heckman model. Therefore, we also estimate the determinants of the control model using OLS (untabulated) and our results are upheld. Moreover, we test the sensitivity of our model to different exclusion restrictions. We re-run our analysis using the market value to control for SIZE in the first equation and using total assets as an alternative proxy for SIZE in the second equation. The results (not reported) confirm our conclusions.

## 8. Conclusion

Over the last three decades the academic community has been debating the importance of legal rules, including securities laws, in shaping the control structure of companies. In this paper we examine whether a change in the legal environment of the company brought about via a cross-listing affects its control structure. Unlike most of the existing literature on cross-listings (e.g. Ayyagari and Doidge, 2010) that is limited to the study of non-U.S. companies cross-listing in the U.S., our paper is based on a sample of 128 companies cross-listing on 14 different stock markets around the world. Roosenboom and van Dijk (2009) argue that ignoring cross-listing on markets other than the U.S. leads to an incomplete understanding of the effects of cross-listing. Moreover, our paper also improves on Ayyagari and Doidge (2010) by using more appropriate measures of the improvement in the legal protection of investors via cross-listing. They use the La Porta et al. (1998) shareholder rights index, which measures investor protection stemming from *corporate* law. However, a cross-listing exposes the firm to the *securities* laws of the foreign market and not to that market's corporate law. The measures we use include La Porta et al.'s (2006) disclosure requirements index, La Porta et al.'s (2006) liability index, La Porta et al.'s (2006) public enforcement index, Jackson and Roe's (2009) staff index, and Jackson and Roe's (2009) budget index. In addition, we use the accounting standard index.

Our univariate analysis reveals that there is a significant decrease in control concentration for cross-listed companies compared to non-cross-listed companies. In addition, for the former, those that cross-list on better markets – as evidenced by better securities laws – than their home markets tend to experience a greater decrease in control.

Although cross-listing on a better market facilitates the evolution towards more dispersed control, the results from our multivariate analysis suggest that company characteristics do not only determine the likelihood to cross-list, but are also the main determinants of the control structure post cross-listing. Overall, we find that company characteristics explain the change in the control structure and also influence the company's decision to cross-list.

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## Notes

<sup>1</sup> In contrast to La Porta et al. (1997, 1998, 1999), Bebchuk and Roe (1999) do not focus on corporate law. Indeed, they write that “the corporate rules system includes not only the rules of corporate law as conventionally defined but also securities laws and the relevant parts of the law governing insolvency, labor relations, and financial institutions” (p.155).

<sup>2</sup> We are grateful to an anonymous referee for point this out.

<sup>3</sup> See Becht and Böhmer (2001) for Germany, Bianchi et al. (2001) for Italy, Bloch and Kremp (2001) for France, Becht et al. (2001) for Belgium, De Jong et al. (2001) for the Netherlands, Agnblad, et al. (2001) for Sweden, Goergen and Renneboog (2001) for the U.K. and Becht (2001) for the U.S. See also Faccio and Lang (2002) for Western Europe.

<sup>4</sup> For detailed information about the mandatory bid rule for individual member states see the “Takeover bids directive assessment report”, page 38, available at [http://ec.europa.eu/internal\\_market/company/docs/takeoverbids/study/study\\_en.pdf](http://ec.europa.eu/internal_market/company/docs/takeoverbids/study/study_en.pdf).

<sup>5</sup> Bloch and Kemp (2001) study the concentration of voting power in the CAC40 French firms. They find that the largest shareholder holds on average 29.4%. Further, for 34.2% of the CAC40 firms the largest voting stake is in the range of 20 to 30%. In Germany, there is clustering at 25%, 50% and 75% (see Becht and Böhmer, 2001), in Austria at 10% and 25% (Gugler et al., 2001), in Belgium there is clustering at 20% (Becht et al., 2001), in Spain at 25% (Crespí-Cladera and García-Cestona, 2001); all these percentages correspond to thresholds relating to mandatory bids and/ or those that confer specific control rights.

<sup>6</sup> Although a common law country, it is interesting to note that control in Canada is still exercised through pyramid structures and cross-shareholdings between firms. For a detailed discussion about the exercise of control in Canada, the reader should refer to Buckley (1997) who equates Canadian banking and corporate structures to Japanese-style keiretsus.

<sup>7</sup> Holmén and Högfeldt (2004, p.7) citing a preamble to the new Swedish corporate law (proposition 1997/98: p.120).

<sup>8</sup> Privately controlled companies are companies that are controlled by the founder (CEO), founder family, employees or another individual. Holmén and Högfeldt (2004) find that these initial controlling shareholders keep all the high voting A-shares and do not sell any of these shares in the IPO.

<sup>9</sup> Pagano et al. (1996) find that on average the initial owners retain 58% of their company's shares 3 years after the IPO, but they also find a high incidence of transfers of controlling stakes. Goergen (1998, p. 45) finds that the initial owners of German companies on average retain 50% of their voting rights 5 years after the IPO.

<sup>10</sup> Brennan and Franks (1997) find that on average, over the seven years after going public, the initial shareholders other than the pre-IPO directors reduce their holdings to less than 5%, while the pre-IPO directors retain 29%.

<sup>11</sup> Other international investment barriers that also induce home bias are explicit barriers such as withholding tax on dividends or restrictions on foreign exchange transactions. For more information about home bias see Tesar and Werner (1995) and Kang and Stulz (1997). Another explanation for the home bias is advanced by Lauterbach and Reisman (2004) who argue that investors who care about their consumption relative to that of their neighbours (their country residents) favour investing in domestic stocks because it provides a better link to the local economy and to their countrymen's wealth.

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<sup>12</sup> There is some controversy in the literature as to the direction of causality between the ownership and control structure and company performance. Earlier studies such as Morck et al. (1988) argued that the direction of causality flows from the former to the latter, but failed to adjust for the potential endogeneity of ownership and control. More recent studies such as Kole (1996), Agrawal and Knoeber (1996), Himmelberg et al. (1999) and Demsetz and Villalonga (2001) do not find any evidence that firm value depends on the ownership and control structure when allowing for the endogeneity of the latter and adjusting for unobserved firm heterogeneity.

<sup>13</sup> There was a significant increase in cross-listings during the 1990s. Cross-listing activity was fostered by the deregulation and liberalisation of financial markets, and major advances in communications and information technology which enabled timely and cost-effective flows of information between the various market places. According to the World Federation of Exchanges (WFE), the number of foreign firms listed on local stock markets reached its highest number of 4703 in 1997. In contrast, there was a decrease in foreign listing activity in the second half of 2000 and by the end of 2002 there were 2335 foreign firms listed on local markets. By the end of 2013 there were 2381 foreign firms (see <http://www.world-exchanges.org/>).

<sup>14</sup> The lists of companies are either provided by the stock exchanges via email or obtained from their web pages.

<sup>15</sup> The reason why we limit our sample to 20% of cross-listed firms is the colossal effort required to collect detailed data on ownership and control on the sample firms (as well as the matched firms). In addition, our period of study is 1990 to 2006. Collecting ownership and control data for the first half of the 1990s is very time consuming and needs to be done by hand as extensive coverage by commercial databases such as Thomson One Banker typically only starts in the second half of the 1990s. It is also important to bear in mind that commercial databases frequently confuse ownership with control by e.g. ignoring the impact of dual class shares on the distribution of votes (i.e. control) across shareholders.

<sup>16</sup> Those domestic companies that are cross-listed on exchanges other than the 14 stock markets covered by this study are excluded from the population of cross-listed companies.

<sup>17</sup> The small size of our population relative to that of other researchers (e.g. Doidge et al. 2004) is due to the fact that our starting point is the population of cross-listed companies and not the population of companies with a foreign listing. Note that a cross-listed company is a company whose shares are listed both on its home market and a foreign market, whereas a company with a foreign listing is a company whose shares are listed on a foreign market but not necessarily on its home market.

<sup>18</sup> This analysis is available upon request from the authors.

<sup>19</sup> We have 58 sample firms that could only be matched by country and size. As a robustness check we re-run our analysis based on the firms that are matched by country, industry as well as size. The results are qualitatively the same.

<sup>20</sup> When we estimate the Heckman (1979) model using a maximum likelihood procedure, our results (not reported in a table) are similar. These results are available upon request from the authors.

<sup>21</sup> This is defined as the stake of the largest shareholder who is in place in the year preceding the cross-listing.

<sup>22</sup> The items fall into seven categories which are: general information, income statements, balance sheets, funds flow statement, accounting policies, share data, and supplementary items. For companies that cross-listed before 1993, we use the 1991 index.

<sup>23</sup> The index is the average of six proxies for the strength of specific disclosure requirements. The proxies are: (1) Prospectus which equals one if the securities laws requires delivering of prospectus to sell new securities, and zero otherwise; (2) compensation which a prospectus requirement related to the disclosing of compensation of the issuer's directors and key officers; (3) Shareholders which is an index of disclosure requirement related to the issuer's equity ownership structure; (4) Insider ownership is an index of prospectus disclosure regarding the equity ownership of the issuer's shares by directors and key officers; (5) Irregular contracts which is an index of prospectus disclosure regarding the issuer's contracts outside the ordinary course of business; (6) Transactions which is an index of the prospectus disclosure requirements regarding transaction between the issuer and its directors, officers, and/or large shareholders. The proxies two to six each assigned a value of one, one half or zero depending on the extent of disclosure, with one being highest level of disclosure requirement.

<sup>24</sup> The index is the average of three liability standards. The standards are: (1) liability standard for the issuer and its directors which is an index for the procedural difficulty in recovering losses from the issuer and its

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directors in civil liability case for losses due to misleading statements in the prospectus; (2) liability standard for distributors which is an index of the procedural difficulty in recovering losses from distributor in civil liability case for losses due to misleading statements in the prospectus; (3) liability standard for accountant which is an index of the procedural difficulty in recovering losses from accountant in civil liability case for losses due to misleading statements in audited financial information accompanying the prospectus. Each standard is assigned a value of one, two third, one third, and zero depending on the requirements needed to prove the prospectus contains misleading information with the value of one indicates the minimum requirements.

<sup>25</sup> The index is the mean of five enforcement indices. The indices are: (1) supervisor characteristic index; (2) rule-marking power index; (3) investigative powers index; (4) orders index; and (5) criminal index. A detailed explanation of these indices is available in La Porta et al. (2006).

<sup>26</sup>  $ROA = (\text{Net Income before Preferred Dividends} + ((\text{Interest Expense on Debt-Interest Capitalized}) * (1 - \text{Tax Rate}))) / \text{Last Year's Total Assets} * 100.$

<sup>27</sup> Further analysis reveals that 35% of our matched firms experience an average increase of 26% in control held by the largest shareholder during the cross-listing year, whereas 33% experience a decrease of 0.13%. The rest of the matched firms do not experience any change in their control structure.

<sup>28</sup> In unreported results we conduct a univariate analysis by distinguishing between companies cross-listing in the U.K. or the U.S. and those cross-listing elsewhere. Similar to what we observed previously, overall we find that cross-listed companies experience a decrease in their control concentration five years after the cross-listing. Also in line with our previous results, the largest shareholder's voting power declines by 19% for companies that cross-list in the U.S. and the U.K. compared to only 7% for those companies that cross-list elsewhere.

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**Table 1. Distribution of population and final sample by country of origin**

Country of origin	No. of companies from the country of origin					
	Population	% of the total	Initial sample	% of total	Final sample	% of total
Austria	5	1%	2	1%	0	0%
Australia	68	7%	16	8%	10	8%
Belgium	10	1%	3	1%	2	2%
Canada	170	17%	38	19%	19	15%
Denmark	5	1%	1	0.49%	1	1%
France	50	5%	11	5%	5	4%
Germany	46	5%	11	5%	9	7%
Ireland	58	6%	12	6%	6	5%
Italy	15	2%	3	1%	3	2%
Japan	84	9%	15	7%	6	5%
Netherlands	41	4%	9	4%	5	4%
New Zealand	29	3%	6	3%	6	5%
Norway	13	1%	4	2%	4	3%
South Africa	30	3%	6	3%	2	2%
Sweden	24	2%	5	2%	5	4%
Switzerland	22	2%	5	2%	5	4%
United Kingdom	150	15%	29	14%	21	16%
United States	164	17%	28	14%	19	15%
<b>TOTAL</b>	<b>984</b>	<b>100%</b>	<b>204</b>	<b>100%</b>	<b>128</b>	<b>100%</b>

**Table 2. Ranking of countries**

<b>Accounting standards index</b>	<b>Disclosure requirements index</b>	<b>Liability index</b>	<b>Public enforcement index</b>	<b>Staff (per million of population)</b>	<b>Budget (per billion of US\$ of GDP)</b>
U.K. (84)	U.S. (1)	U.S. (1)	U.S. (0.9)	Canada (38.93)	Netherlands (131,285)
Sweden (83)	Canada (0.92)	Canada (1)	Australia (0.9)	Australia (34.44)	Australia (89,217)
Ireland (81)	U.K. (0.92)	Netherlands (0.89)	Canada (0.8)	U.S. (23.75)	US (83,232)
New Zealand (80)	South Africa(0.83)	Australia (0.66)	France (0.77)	Netherlands (23.53)	Canada (82,706)
Switzerland (80)	Australia (0.75)	South Africa (0.66)	UK (0.68)	Ireland (23.32)	UK (80,902)
Australia (79.73)		UK (0.66)	Sweden (0.5)	Norway (20.78)	Ireland (72,639)
South Africa (79)		Japan (0.66)	Italy (0.48)	UK (19.04)	Italy (61,239)
France (78)		Denmark (0.55)	Netherlands (0.47)		
<b>Sample Average (75.84)</b>	<b>Sample Average (0.68)</b>	<b>Sample Average (0.53)</b>	<b>Sample Average (0.46)</b>	<b>Sample Average (15.23)</b>	<b>Sample Average (51,483)</b>
U.S. (75.26)	Ireland (0.67)	Ireland (0.44)	Ireland (0.37)	Belgium (13.76)	South Africa (49,291)
Denmark (75)	New Zealand (0.67)	New Zealand (0.44)	Denmark (0.37)	Denmark (10.85)	New Zealand (37,539)
Norway (75)	Italy (0.67)	Belgium (0.44)	New Zealand (0.33)	New Zealand (8.95)	Switzerland (29,340)
Canada (74.41)	Switzerland (0.67)	Switzerland (0.44)	Switzerland (0.33)	Switzerland (8.87)	France (28,851)
Netherlands (73.29)	Denmark (0.58)	Norway (0.39)	Norway (0.32)	Italy (7.25)	Belgium (27,276)
Japan (70.71)	Norway (0.58)	Sweden (0.28)	South Africa (0.25)	Sweden (7.19)	Denmark (25,940)
Belgium (68)	Sweden (0.58)	France (0.22)	Germany (0.22)	France (5.91)	Norway (25,109)
Germany (66.80)	Netherlands (0.5)	Italy (0.22)	Belgium (0.15)	Germany (4.43)	Sweden (21,988)
Italy (66)	Belgium (0.42)	Germany (0)	Japan (0)	Japan (4.32)	Japan (15,754)
	Germany (0.42)			South Africa (3.52)	Germany (12,903)

Note: The table displays the ranking of countries according to the six measures of market quality: the accounting standards index, the La Porta et al. securities market laws indices (disclosure requirement index, liability index, and public enforcement index), and Jackson and Roe's securities markets laws enforcement indices (staff and budget of the securities exchange regulator). The numbers in parentheses are the actual values of the corresponding index for each country.

**Table 3. Evolution of control**

<b>Panel A</b>						
	Cross-listed firms			Non-cross-listed firms		
	N	LSH	LIN	N	LSH	LIN
CLS-1	126	32.51	32.51	100	9.76	9.76
CLS	127	23.39	22.24	117	12.17	7.60
CLS+1	117	22.72	20.65	118	14.37	6.16
CLS+2	115	21.32	17.97	119	14.68	3.82
CLS+3	116	20.36	14.89	119	14.94	3.37
CLS+4	115	18.71	12.54	119	14.92	3.19
CLS+5	113	18.07	10.46	118	13.02	2.86
$\Delta(CLS, CLS-1)$		-9.12***	-10.26***		2.41	-2.16
$\Delta(CLS+1, CLS)$		-0.67	-1.59		2.20	-1.44
$\Delta(CLS+2, CLS)$		-2.07	-4.27		2.51	-3.78**
$\Delta(CLS+5, CLS)$		-5.32	-11.78**		0.85	-4.75***
$\Delta(CLS+5, CLS-1)$		-14.44***	-22.05***		3.26*	-6.90***
<b>Panel B</b>						
	Firms cross-listing on a market with a better accounting standards index value			Firms cross-listing on a market with an equal/ lower accounting standards index value		
	N	LSH	LIN	N	LSH	LIN
CLS-1	55	35.25	35.25	71	30.39	30.39
CLS	55	27.42	27.57	72	20.31	18.18
CLS+1	52	26.81	26.55	65	19.45	15.93
CLS+2	54	25.59	23.69	61	17.54	12.91
CLS+3	52	22.71	19.33	64	18.45	11.28
CLS+4	51	20.33	15.35	64	17.42	10.30
CLS+5	48	18.33	13.05	65	17.88	8.55
$\Delta(CLS, CLS-1)$		-7.83	-7.68		-10.08**	-12.21***
$\Delta(CLS+1, CLS)$		-0.60	-1.02		-0.86	-2.25
$\Delta(CLS+2, CLS)$		-1.83	-3.88		-2.77	-5.26**
$\Delta(CLS+5, CLS)$		-9.09**	-14.52***		-2.43	-9.63***
$\Delta(CLS+5, CLS-1)$		-16.92***	-22.20***		-12.51***	-21.83***
<b>Panel C</b>						
	Firms cross-listing on a market with a better disclosure requirements index			Firms cross-listing on a market with an equal/ lower disclosure requirements index		
	N	LSH	LIN	N	LSH	LIN
CLS-1	83	39.07	39.07	43	19.83	19.83
CLS	83	27.49	26.20	44	15.65	14.78
CLS+1	79	26.62	23.93	38	14.62	13.84
CLS+2	79	24.72	20.48	36	13.86	12.48
CLS+3	78	23.06	17.14	38	14.80	10.28

CLS+4	75	22.13	15.57	40	12.29	6.86
CLS+5	71	21.54	13.37	42	12.19	5.54
$\Delta(CLS,CLS-1)$		-11.58***	-12.87***		-4.19	-5.05
$\Delta(CLS+1,CLS)$		-0.88	-2.28		-1.02	-0.94
$\Delta(CLS+2,CLS)$		-2.77	-5.72		-1.79	-2.30
$\Delta(CLS+5,CLS)$		-5.95*	-12.83***		-3.46	-9.24***
$\Delta(CLS+5,CLS-1)$		-17.53***	-25.70***		-7.64**	-14.30***

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**Table 3 (continued)**

	Firms cross-listing on a market with a better liability index value			Firms cross-listing on a market with an equal/ lower liability index value		
	N	LSH	LIN	N	LSH	LIN
	CLS-1	66	39.50	39.50	60	24.81
CLS	67	27.70	26.31	60	18.57	17.71
CLS+1	63	27.05	23.72	54	17.68	17.08
CLS+2	62	24.78	19.87	53	17.27	15.75
CLS+3	61	23.32	16.88	55	17.07	12.69
CLS+4	58	22.94	15.92	57	14.40	9.10
CLS+5	54	22.84	13.49	59	13.70	7.69
$\Delta(CLS, CLS-1)$		-11.80**	-13.20***		-6.24	-7.10*
$\Delta(CLS+1, CLS)$		-0.66	-2.59		-0.90	-0.63
$\Delta(CLS+2, CLS)$		-2.92	-6.43*		-1.30	-1.96
$\Delta(CLS+5, CLS)$		-4.86	-12.81***		-4.87	-10.02***
$\Delta(CLS+5, CLS-1)$		-16.66***	-26.01***		-11.11***	-17.13***



**Table 3 (continued)**

<i>Panel E</i>						
	Firms cross-listing on a market with a better public enforcement index value			Firms cross-listing on a market with an equal/lower public enforcement index value		
	N	LSH	LIN	N	LSH	LIN
CLS-1	85	39.48	39.48	41	18.05	18.05
CLS	85	27.21	26.28	42	15.65	14.08
CLS+1	81	26.54	24.39	36	14.14	12.23
CLS+2	81	24.70	21.04	34	13.26	10.66
CLS+3	80	22.63	17.42	36	15.30	9.27
CLS+4	77	21.02	15.26	38	14.03	7.02
CLS+5	74	20.22	12.92	39	13.99	5.79
$\Delta(\text{CLS}, \text{CLS}-1)$		-12.27***	-13.20***		-2.40	-3.97
$\Delta(\text{CLS}+1, \text{CLS})$		-0.68	-1.89		-1.51	-1.85
$\Delta(\text{CLS}+2, \text{CLS})$		-2.51	-5.24		-2.39	-3.42
$\Delta(\text{CLS}+5, \text{CLS})$		-7.00**	-13.36***		-1.66	-8.29***
$\Delta(\text{CLS}+5, \text{CLS}-1)$		-19.27***	-26.56***		-4.06	-12.26***
<i>Panel F</i>						
	Firms cross-listing on a market with a better staff index value			Firms cross-listing on a market with an equal/lower staff index value		
	N	LSH	LIN	N	LSH	LIN
CLS-1	76	36.84	36.84	50	25.93	25.93
CLS	77	25.91	25.00	50	19.51	18.00
CLS+1	71	25.32	22.86	46	18.71	17.25
CLS+2	70	23.55	19.40	45	17.85	15.76
CLS+3	72	22.18	15.99	44	17.37	13.10
CLS+4	69	20.47	14.30	46	16.06	9.90
CLS+5	65	19.94	11.87	48	15.53	8.55
$\Delta(\text{CLS}, \text{CLS}-1)$		-10.93**	-11.83***		-6.42	-7.93*
$\Delta(\text{CLS}+1, \text{CLS})$		-0.59	-2.14		-0.80	-0.75
$\Delta(\text{CLS}+2, \text{CLS})$		-2.36	-5.60		-1.66	-2.24
$\Delta(\text{CLS}+5, \text{CLS})$		-5.97*	-13.13***		-3.97	-9.45**
$\Delta(\text{CLS}+5, \text{CLS}-1)$		-16.90***	-24.96***		-10.39**	-17.38***
	Firms cross-listing on a market with a higher budget index value			Firms cross-listing on a market with an equal/lower budget index value		
	N	LSH	LIN	N	LSH	LIN
CLS-1	82	36.23	36.23	44	25.57	25.57
CLS	83	26.30	25.35	44	17.89	16.40
CLS+1	78	25.85	23.54	39	16.46	14.88
CLS+2	77	24.24	20.26	38	15.40	13.33
CLS+3	78	23.09	18.08	38	14.75	8.35
CLS+4	77	21.22	15.73	38	13.62	6.07
CLS+5	75	20.07	13.26	38	14.11	4.93

$\Delta(CLS,CLS-1)$	-9.93**	-10.88*	-7.68*	-9.18**
$\Delta(CLS+1,CLS)$	-0.45	-1.81	-1.44	-1.52
$\Delta(CLS+2,CLS)$	-2.06	-5.08	-2.50	-3.06
$\Delta(CLS+5,CLS)$	-6.23*	-12.08***	-3.79	-11.47***
$\Delta(CLS+5,CLS-1)$	-16.15***	-22.96***	-11.47**	-20.64***

Note: The table presents the evolution of control for the cross-listed firms and the non-cross-listed firms over the seven-year period ranging from the pre-cross-listing year to year five after the cross-listing. Panel A compares the evolution of control for the cross-listed firms with that for the non-cross-listed firms. Panels B, C, D, E and F display the evolution of control distinguishing between firms cross-listing on a better market and those cross-listing on a market of the same or worse quality where the quality of the host market is measured by one of the six measures of investor protection. LSH is the control held by the largest shareholder; LIN is the control held by the initial largest shareholder; CLS is the cross-listing year and CLS-1, CLS+1, CLS+3, CLS+4 and CLS+5 are the years relative to the cross-listing year.  $\Delta$  denotes the change. N is the number of firms. \*\*\*, \* and \* represent significance at the 1%, 5% and 10% level, respectively.

**Table 4. Results from the Heckman selection model for the largest shareholder's voting stake (LSH)**

	Model set 1			Model set 2			Model set 3		
	Selection	Main-1	Main-2	Selection	Main-1	Main-2	Selection	Main-1	Main-2
LSH <sub>t-1</sub>	-1.203*** (-8.46)	0.861*** (15.04)	0.850*** (14.36)	-1.236*** (-8.54)	0.864*** (15.96)	0.874*** (17.75)	-1.207*** (-8.47)	0.845*** (13.40)	0.849*** (13.97)
SIZE <sub>t-1</sub>	0.210*** (3.94)	0.005 (0.87)	0.006 (0.97)	0.211*** (3.98)	0.003 (0.66)	0.001 (0.29)	0.213*** (4.04)	0.007 (0.94)	0.006 (0.91)
ROA <sub>t-1</sub>		0.005 (0.82)	0.006 (0.97)		0.005 (0.84)	0.005 (0.83)		0.006 (0.94)	0.006 (0.97)
GROWTH <sub>t-1</sub>	0.214*** (3.80)	0.000 (0.22)	0.001 (0.63)	0.202*** (3.77)	-0.000 (-0.04)	-0.001 (-0.69)	0.206*** (3.73)	0.001 (0.70)	0.000 (0.43)
RISK <sub>t-1</sub>	6.423** (2.09)	0.364 (1.49)	0.378 (1.52)	6.161** (1.98)	0.322 (1.37)	0.228 (1.22)	6.224** (1.99)	0.389 (1.49)	0.356 (1.50)
CAPITAL		-0.017** (-2.55)	-0.014** (-2.16)		-0.015** (-2.04)	-0.013* (-1.88)		-0.013* (-1.86)	-0.012* (-1.66)
IPO		0.009 (1.34)	0.008 (1.30)		0.012 (1.48)	0.008 (1.20)		0.010 (1.29)	0.007 (1.20)
POST*ACCST		-0.002** (-2.06)							
POST*DISCREQ					-0.038 (-1.19)				
POST*LIABILITY								-0.012 (-0.81)	
LEVERAGE	-0.001 (-0.00)			-0.007 (-0.02)			-0.013 (-0.05)		
ACCOUNTING STANDARDS INDEX	-0.011 (-0.58)								
DISCLOSURE REQUIREMENTS INDEX				0.989 (1.56)					
LIABILITY INDEX							0.221 (0.65)		

LAMBDA		0.065	0.077		0.051	0.028		0.081	0.070
		(1.07)	(1.22)		(0.98)	(0.76)		(1.17)	(1.17)
CONSTANT	-0.110	-0.054	-0.070	-1.685***	-0.032	-0.008	-1.106***	-0.073	-0.061
	(-0.07)	(-0.73)	(-0.90)	(-2.81)	(-0.54)	(-0.18)	(-2.69)	(-0.88)	(-0.84)
Pseudo-R <sup>2</sup> /R <sup>2</sup>	0.365	0.845	0.844	0.373	0.844	0.842	0.365	0.844	0.843
N	1135	512	512	1135	512	512	1135	512	512

**Table 4. (continued) Results from the Heckman selection model for the largest shareholder's voting stake (LSH)**

	Model set 4			Model set 5			Model set 6		
	Selection	Main-1	Main-2	Selection	Main-1	Main-2	Selection	Main-1	Main-2
LSH <sub>t-1</sub>	-1.207*** (-8.53)	0.839*** (13.03)	0.848*** (13.57)	-1.207*** (-8.50)	0.844*** (13.25)	0.844*** (13.20)	-1.207*** (-8.51)	0.848*** (13.90)	0.847*** (13.41)
SIZE <sub>t-1</sub>	0.216*** (4.06)	0.008 (1.09)	0.006 (0.89)	0.217*** (4.05)	0.007 (0.94)	0.007 (0.96)	0.218*** (4.07)	0.007 (0.95)	0.007 (0.94)
ROA <sub>t-1</sub>		0.006 (0.92)	0.006 (0.94)		0.006 (0.96)	0.006 (0.96)		0.006 (0.94)	0.006 (0.94)
GROWTH <sub>t-1</sub>	0.202*** (3.77)	0.001 (0.97)	0.001 (0.49)	0.206*** (3.74)	0.001 (0.70)	0.001 (0.69)	0.213*** (3.77)	0.001 (0.65)	0.001 (0.67)
RISK <sub>t-1</sub>	6.438** (2.07)	0.416 (1.57)	0.364 (1.46)	6.475** (2.09)	0.385 (1.50)	0.384 (1.51)	6.664** (2.16)	0.369 (1.52)	0.373 (1.50)
CAPITAL		-0.016** (-2.09)	-0.013* (-1.68)		-0.013* (-1.81)	-0.013* (-1.76)		-0.015** (-2.13)	-0.014** (-2.12)
IPO		0.011 (1.57)	0.009 (1.31)		0.009 (1.24)	0.009 (1.31)		0.010 (1.25)	0.009 (1.38)
POST*PUBENFOR		-0.025 (-1.35)							
POST*STAFF					-0.000 (-0.19)				
POST*BUDGET								-0.000 (-0.32)	
LEVERAGE	-0.002 (-0.01)			-0.007 (-0.03)			0.006 (0.02)		
PUBLIC ENFORCEMENT INDEX		0.154 (0.42)							

STAFF				0.002					
				(0.21)					
BUDGET							-0.000		
							(-0.36)		
LAMBDA		0.093	0.074		0.083	0.081		0.078	0.079
		(1.29)	(1.12)		(1.16)	(1.19)		(1.19)	(1.17)
CONSTANT	-1.087**	-0.085	-0.066	-1.041**	-0.076	-0.076	-0.944**	-0.071	-0.073
	(-2.49)	(-0.98)	(-0.82)	(-2.50)	(-0.89)	(-0.90)	(-2.23)	(-0.89)	(-0.88)
Pseudo-R <sup>2</sup> /R <sup>2</sup>	0.365	0.845	0.844	0.365	0.844	0.844	0.365	0.844	0.844
N	1135	512	512	1135	512	512	1135	512	512

Note: The table displays the results of the Heckman regression model for the determinants of the largest shareholder's voting stake. The dependent variable in the main regression is the voting stake of the largest shareholder (LSH), and the dependent variable in the selection regression is the cross-listing dummy which equals 1 for cross-listed companies and zero otherwise. SIZE is the natural logarithm of market capitalisation. ROA is the return on assets measured as net income divided by lagged total assets. GROWTH is the natural logarithm of the two-year growth rate of total assets during the two years preceding the cross-listing year. RISK is the natural logarithm of the standard deviation of the stock return over the 12 months during the pre cross-listing year. CAPITAL is a dummy variable that equals one if the company issues shares in the cross-listing year and zero otherwise. IPO is a dummy variable that equals one if the company has its IPO at the time of cross-listing and zero otherwise. LEVERAGE is the logarithm of one plus the ratio of long-term debt to total share capital and reserves measured in the pre cross-listing year. POST is a dummy variable that equals one for the years post cross-listing and zero otherwise. ACCST is equal to the difference in the accounting standards index between host and home markets if the difference is positive and zero otherwise. DISCREQ is equal to the difference in La Porta et al.'s disclosure requirements index between the host and home markets if the difference is positive and zero otherwise. LIABILITY is equal to the difference in La Porta et al.'s liability index between host and home markets if the difference is positive and zero otherwise. PUBENFOR is equal to the difference in La Porta et al.'s public enforcement index between the host and home markets if the difference is positive and zero otherwise. STAFF is equal to the difference in Jackson and Roe's staff measure between host and home markets if the difference is positive and zero otherwise. BUDGET is equal to the difference in Jackson and Roe's budget measure between host and home markets if the difference is positive and zero otherwise. ACCOUNTING STANDARDS INDEX, DISCLOSURE REQUIREMENTS INDEX, LIABILITY INDEX, PUBLIC ENFORCEMENT INDEX, STAFF INDEX and BUDGET INDEX measure investor protection in the home market. Lambda is the inverse of Mills' ratio. NOBS is the number of observations. Z-statistics/t-statistics are in parentheses. Standard errors are clustered by firm. \*\*\*, \*\*, \* denote significance at the 1%, 5% and 10% level, respectively.

**Table 5. Results from the Heckman selection model for the largest initial shareholder's voting stake (LIN)**

	Model set 1			Model set 2			Model set 3		
	Selection	Main-1	Main-2	Selection	Main-1	Main-2	Selection	Main-1	Main-2
LIN <sub>t-1</sub>	-0.782*** (-8.42)	0.913*** (33.78)	0.908*** (33.82)	-0.792*** (-8.46)	0.909*** (33.03)	0.909*** (33.10)	-0.781*** (-8.48)	0.899*** (32.53)	0.901*** (33.85)
SIZE <sub>t-1</sub>	0.182*** (3.67)	0.003 (1.00)	0.004 (1.15)	0.187*** (3.86)	0.003 (0.82)	0.003 (0.95)	0.189*** (3.85)	0.005 (1.55)	0.005 (1.58)
ROA <sub>t-1</sub>		-0.005 (-0.90)	-0.004 (-0.77)		-0.004 (-0.89)	-0.004 (-0.88)		-0.003 (-0.58)	-0.003 (-0.65)
GROWTH <sub>t-1</sub>	0.252*** (4.89)	-0.000 (-0.28)	0.000 (0.13)	0.243*** (4.90)	-0.000 (-0.28)	-0.000 (-0.20)	0.245*** (4.83)	0.001 (0.66)	0.001 (0.71)
RISK <sub>t-1</sub>	-3.301 (-1.30)	0.026 (0.18)	0.001 (0.01)	-3.804 (-1.46)	0.013 (0.08)	0.011 (0.07)	-3.487 (-1.35)	-0.025 (-0.16)	-0.028 (-0.19)
CAPITAL		-0.004 (-0.68)	-0.002 (-0.41)		-0.002 (-0.29)	-0.002 (-0.32)		-0.000 (-0.04)	-0.001 (-0.21)
IPO		0.009 (1.55)	0.009 (1.52)		0.008 (1.30)	0.009 (1.48)		0.007 (1.09)	0.008 (1.50)
POST*ACCST		-0.001 (-1.07)							
POST*DISCREQ					0.004 (0.25)				
POST*LIABILITY								0.007 (0.75)	
LEVERAGE	0.093 (0.35)			0.113 (0.42)			0.100 (0.38)		
ACCOUNTING STANDARDS INDEX	-0.018 (-1.04)								
DISCLOSURE REQUIREMENTS INDEX				0.645 (1.13)					
LIABILITY INDEX							0.048 (0.15)		
LAMBDA		0.009 (0.34)	0.016 (0.62)		0.007 (0.25)	0.009 (0.34)		0.029 (0.99)	0.029 (1.02)

CONSTANT	0.605 (0.43)	-0.032 (-0.85)	-0.041 (-1.11)	-1.290** (-2.35)	-0.030 (-0.81)	-0.032 (-0.91)	-0.852** (-2.22)	-0.060 (-1.50)	-0.059 (-1.48)
Pseudo-R <sup>2</sup> /R <sup>2</sup>	0.216	0.881	0.881	0.218	0.881	0.881	0.213	0.881	0.881
N	1135	512	512	1135	512	512	1135	512	512

**Table 5. (Continued) Results from the Heckman selection model for the largest initial shareholder's voting stake (LIN)**

	Model set 4			Model set 5			Model set 6		
	Selection	Main-1	Main-2	Selection	Main-1	Main-2	Selection	Main-1	Main-2
LIN <sub>t-1</sub>	-0.781*** (-8.50)	0.901*** (34.42)	0.901*** (34.12)	-0.782*** (-8.55)	0.901*** (35.26)	0.901*** (34.50)	-0.779*** (-8.67)	0.900*** (33.25)	0.904*** (33.46)
SIZE <sub>t-1</sub>	0.189*** (3.86)	0.005 (1.60)	0.005 (1.57)	0.186*** (3.75)	0.005 (1.59)	0.005 (1.64)	0.193*** (3.88)	0.005* (1.73)	0.005 (1.46)
ROA <sub>t-1</sub>		-0.004 (-0.66)	-0.003 (-0.65)		-0.004 (-0.66)	-0.003 (-0.65)		-0.003 (-0.62)	-0.004 (-0.75)
GROWTH <sub>t-1</sub>	0.245*** (4.91)	0.001 (0.77)	0.001 (0.72)	0.249*** (4.85)	0.001 (0.74)	0.001 (0.80)	0.255*** (4.90)	0.001 (0.89)	0.001 (0.52)
RISK <sub>t-1</sub>	-3.452 (-1.33)	-0.032 (-0.21)	-0.030 (-0.20)	-3.360 (-1.30)	-0.034 (-0.23)	-0.034 (-0.23)	-2.943 (-1.13)	-0.029 (-0.19)	-0.020 (-0.14)
CAPITAL		-0.002 (-0.28)	-0.001 (-0.22)		-0.002 (-0.32)	-0.002 (-0.30)		-0.001 (-0.09)	-0.002 (-0.45)
IPO		0.009 (1.57)	0.009 (1.53)		0.009 (1.58)	0.009 (1.58)		0.007 (1.09)	0.009 (1.62)
POST*PUBENFOR		-0.003 (-0.23)							
POST*STAFF					-0.000 (-0.15)				
POST*BUDGET								0.000 (0.98)	
LEVERAGE	0.101 (0.38)			0.110 (0.42)			0.104 (0.39)		
PUBLIC ENFORCEMENT INDEX	0.022 (0.06)								
STAFF				-0.004 (-0.55)					
BUDGET							-0.000 (-1.07)		
LAMBDA		0.030 (1.04)	0.030 (1.02)		0.030 (1.06)	0.031 (1.14)		0.031 (1.23)	0.024 (0.98)



CONSTANT	-0.840**	-0.059	-0.059	-0.730*	-0.058	-0.060	-0.669*	-0.064*	-0.051
	(-2.08)	(-1.46)	(-1.47)	(-1.86)	(-1.43)	(-1.56)	(-1.74)	(-1.71)	(-1.44)
Pseudo-R <sup>2</sup> /R <sup>2</sup>	0.213	0.881	0.881	0.214	0.881	0.881	0.216	0.881	0.881
N	1135	512	512	1135	512	512	1135	512	512

Note: The table displays the results of the Heckman regression model for the determinants of largest initial shareholder's voting stake. The dependent variable in the main regression is the voting stake of the initial largest shareholder (LIN), and the dependent variable in the selection regression is the cross-listing dummy which equals 1 for cross-listed companies and zero otherwise. SIZE is the natural logarithm of market capitalisation. ROA is the return on assets measured as net income divided by lagged total assets. GROWTH is the natural logarithm of the two-year growth rate of total assets during the two years preceding the cross-listing year. RISK is the natural logarithm of the standard deviation of the stock return over the 12 months during the pre cross-listing year. CAPITAL is a dummy variable that equals one if the company issues shares in the cross-listing year and zero otherwise. IPO is a dummy variable that equals one if the company has its IPO at the time of cross-listing and zero otherwise. LEVERAGE is the logarithm of one plus the ratio of long-term debt to total share capital and reserves measured in the pre cross-listing year. POST is a dummy variable that equals one for the years post cross-listing and zero otherwise. ACCST is equal to the difference in the accounting standards index between host and home markets if the difference is positive and zero otherwise. DISCREQ is equal to the difference in La Porta et al.'s disclosure requirements index between the host and home markets if the difference is positive and zero otherwise. LIABILITY is equal to the difference in La Porta et al.'s liability index between host and home markets if the difference is positive and zero otherwise. PUBENFOR is equal to the difference in La Porta et al.'s public enforcement index between the host and home markets if the difference is positive and zero otherwise. STAFF is equal to the difference in Jackson and Roe's staff measure between host and home markets if the difference is positive and zero otherwise. BUDGET is equal to the difference in Jackson and Roe's budget measure between host and home markets if the difference is positive and zero otherwise. ACCOUNTING STANDARDS INDEX, DISCLOSURE REQUIREMENTS INDEX, LIABILITY INDEX, PUBLIC ENFORCEMENT INDEX STAFF INDEX and BUDGET INDEX measure investor protection in the home market. NOBS is the number of observations. Z-statistics/t-statistics are in parentheses. Standard errors are clustered by firm. \*\*\*, \*\*, \* denote significance at the 1%, 5% and 10% level, respectively.