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Do Cross-Listed Firms Have a Better Governance Structure and Lower Agency Costs? Evidence from Chinese Firms

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Abstract: This study examines whether an influence from a difference in corporate governance structure exists on firms' agency costs between Chinese companies cross-listed on the Hong Kong Stock Exchange (HKSE) and those that are domestically listed ones. We determine that, overall, companies with an HKSE cross-listing had better corporate governance than those without. The corporate governance advantage of the HKSE cross-listed firms holds if we control for firm fixed effects and resolve the potential endogeneity problem between corporate governance and agency costs by using two-stage least square (2SLS) regression analysis with instrumental variables. Specifically, the HKSE cross-listed firms had better corporate governance in terms of board size and institutional ownership. By contrast, domestically listed firms experienced the adverse effects of institutional owner's roles and higher board pay. The advantages of HKSE cross-listed firms may stem from the benefits of having a larger board size and the effective monitoring of the management by the institutional stockholders. Implications are drawn for the debate on cross-listing and the future challenges of Chinese firms, and a more robust monitoring is necessary for sustainable finance of their stock markets.

Keywords: cross-listing; corporate governance; agency costs; Chinese firms

1. Introduction

Along with the globalization of the world economy, interdependence among local financial markets has greatly increased. International capital flows and opportunities for international financing have been expanded for firms' sustainable growth. However, at the beginning of the 21st century, we witnessed the continuous decline of the Chinese A-share listed domestic market despite the open-door policy and its sound economic fundamentals. Since 2005, the Chinese government has been initiating a major stock market reform to revitalize the market. (The reform is on an equity split-off or circulation system, a unique system of the Chinese stock market. Although Chinese firms are listed, many of their stocks are neither circulated nor traded publicly. The reform is designed to build a system that promotes the circulation of non-traded shares, such as those of state-owned enterprises and corporations.) However, despite this reform, initial public offerings (IPOs) in the Chinese A-share market were few. Chinese firms turned to foreign markets for sustainable finance, and many of them submitted listing applications to the Hong Kong Stock Exchange (hereafter the HKSE). (The exchange has a long history compared with the mainland stock exchanges, established in 1947 by the U.K. statutory law: the Shanghai Stock Exchange (established on 26 November 1990) and the Shenzhen Stock Exchange (established on 11 April 1991)).

Specifically, the HKSE has been an attractive market for foreign and institutional investors due to its adoption of international accounting standards and the free exchange of information and capital. In terms of political, geographical, cultural, and linguistic aspects, the HKSE is the most preferred market for Chinese firms. In addition, Chinese-listed firms wish to overcome a short history of domestic market development by listing on the HKSE.

(For example, on 15 July 1993, Qingdao Beer was listed for the first time on the HKSE; it was listed on the Chinese A-share domestic market one month later and became the first A-plus H-share cross-listed firm. Since then, fueled by the Chinese government's active promotion, many Chinese firms have also been listed on the HKSE. By the end of 2017, a total of 94 companies were listed on both the HKSE and Chinese A-share market. The Chinese regulatory authorities have been implementing capital market internationalization and open-door policies; therefore, more firms are expected to be cross-listed in foreign exchanges in addition to the HKSE). By contrast, neither the market supervisory regulation nor the firms' internal control system is well established in China, causing huge concerns for foreign and institutional investors.

The cross-listing (cross-listing is when a company lists its shares on more than one stock exchange, relying heavily on information from the depository banks to create depository receipt programs) strategy confirms firms' competitive status and enables investors to purchase Chinese firms' equity shares not previously possible in non-Chinese markets. Firms pursue overseas listings because they seek such opportunities to benefit from a lower cost of capital arising from their shares that have become more accessible to global investors. Thus, cross-listings achieve great importance in the international financial markets, and studies in correlation with them are a significant theme in the financial field [1,2].

This study examines the HKSE cross-listing effects of Chinese firms on corporate governance and agency costs. We view corporate governance from an agency perspective, in which there is a separation of ownership and control to ensure that investors compel the managers to return their investments [3]. We show that cross-listing reduces agency costs, and this reduction is associated with significant improvement in corporate governance structures.

We expanded on prior related studies demonstrating the reduction of agency costs through cross-listing by investigating the direct relationship between agency costs and corporate governance structure. Specifically, we investigated the effect of cross-listing on corporate governance in the following stages: (1) whether cross-listing affects corporate governance structure, such as ownership, board structure, and monitoring; and (2) how the improvement of corporate governance reduces agency costs. Thus, we directly examined the effect of cross-listing by comparing the governance characteristics of cross-listed firms with those of non-cross-listed firms based on the concept that a firm's corporate governance is a mechanism to adjust the various interests of a firm's stakeholders, including the owner(s) of the firms and managers. This study included 132 sample firms comprising 66 Chinese firms cross-listed on the HKSE and 66 firms listed only on the A-share local exchange; these were matched manually by considering the financial aspects of each firm in 2013–2015. In particular, we investigated whether the effect on corporate governance varies between two groups, thus affecting agency costs that are measured by using a proxy for the loss in revenues attributable to inefficient asset utilization.

Since the pioneering work of Stapleton and Subrahmanyam [4], previous research has paid attention to cross-listing issues. Coffee [5,6] pointed out that cross-listing provides a strict legal environment that can improve the corporate governance structure. (To interpret companies' cross-listing behavior from the perspective of improving corporate governance structure, the bonding hypothesis is the most prevailing one. For the theoretical background of the hypothesis, see La Porta et al. [7], Stulz [8], and Coffee [5,6]). Specifically, Coffee [6] argued that one way to protect minority shareholders from being expropriated by large shareholders or managers is to cross-list firms in developed markets that have a more sound legal system than the domestic markets. Reese and Weisbach [9] provided evidence of the strengthened protection of minority shareholders' interests by 2038 cross-listings between 1985 and 1995. Meanwhile, Wojcik, Clark, and Bauer [10] found that foreign companies cross-listed in the U.S. market showed higher corporate governance ratings in terms of corporate information disclosure, board structure, and function compared with their counterparts in local markets. Moreover, Doidge et al. [11] discussed the bonding effect and stated that the U.S. market cross-listing restrains large shareholders of foreign firms

from expropriating minority shareholders. Therefore, when the private incentives of large shareholders are enormous, they will not want to apply for U.S. market cross-listing. This direct or indirect bonding effect includes transparent disclosure of corporate information and monitoring by external supervisory agencies. Boubakri et al. [12] examined the dynamics of cross-listing and corporate social responsibility, arguing that cross-listed firms have better corporate social responsibility (CSR) performance than non-cross-listed ones.

Meanwhile, as more Chinese firms list abroad, related studies on the effect of cross-listing on corporate governance in the Chinese context have increased rapidly. From a corporate standpoint, cross-listing helps companies improve their corporate governance, reduce capital costs, and strengthen their competitiveness. Lu [13] documented that cross-listing heightens management transparency and investor protection, thus improving corporate governance. Cui [14] and Qiu [15] showed that cross-listing's main motive is to reduce capital costs. (In particular, Qiu [15] analyzed the relationship between cross-listing and listing markets and found that Chinese firms listed on the HKSE were more effective in reducing capital costs by mitigating the information asymmetry problem and raising more money than those cross-listed in U.S. markets). Moreover, Xiao and Shen [16] found that the cost of equity was lower for Chinese firms that had already listed in the HKSE list than those listed in A-shares in the mainland market. Zhao [17] pointed out that cross-listed Chinese companies are superior in terms of their external governance structure compared with the non-cross-listed ones. Meanwhile, He et al. [18] argued that the bonding effect of the stricter legal system and other regulations of the HKSE lowered the information cost for investors because of A- and H-share cross-listing.

In a comparative study of A- and H-share cross-listed companies versus A-share listed companies in 2006–2009, Ji and Liu [19], found that cross-listed firms have a superior board structure and more independent outside directors; the board plays a vital role in controlling shareholders. Their work is a close work to this present study. Moreover, Li and Han [20] showed that A- and H-share cross-listed companies in 1998–2008 had seen an increase in their firm's values by improving investor protection and disclosure quality. Shi et al. [21] found a statistically significant and economically meaningful increase in CSR performance in terms of CSR ratings for the A- and H-share cross-listed firms in China.

With cross-listings and corporate governance being hot topics, the intersection between the two, especially in an emerging market, unsurprisingly attracts much interest. Cross-listing is a contact between the corporate governance of a listing company's home and host environments. Few studies examine the difference in corporate governance effect on agency costs between Chinese cross-listed and domestic ones. Contributing to the existing literature, we shed some light on the effects of cross-listing on agency costs through the improved corporate governance of Chinese firms for their sustainable finance.

The rest of this paper is organized as follows. Section 2 provides some background and develops the hypotheses. Section 3 explains data and the research methodology used to test the hypotheses. Section 4 describes the summary statistics and empirical results; Section 5 concludes the paper by mentioning limitations and providing implications for policy, business practices, and future research.

2. Background and Hypotheses Development

2.1. Cross-Listing Motives

The cross-listing literature suggests several hypotheses for corporate motives. Firstly, the market segmentation hypothesis states that firms in underdeveloped markets with entry barriers are more likely to cross-list in developed markets and reduce the company's cost of capital. (The market segmentation hypothesis (MSH) is the oldest hypothesis related to cross-listing; it discusses the situation when the entry barrier to international investment was very high in the past. According to the cross-listed case study in the U.S. stock market, the company's capital cost was reduced due to cross-listing (Miller [22]), but there was still disagreement over whether the result was directly from the MSH. Instead, the consensus seems to be that more parts cannot be explained by MSH than can be explained by it [1,23].

Meanwhile, Kim and Ahn [24], who verified the MSH for cross-listing of Korean companies' depository receipts (DRs), argued that the Korean companies which were cross-listed to the New York Stock Exchange experienced some positive effects of being integrated into the global capital market, whereas for those that were cross-listed to the London Stock Exchange or Luxembourg Stock Exchange, cross-listing had no meaningful effect). In other words, they listed shares in developed markets to broaden the investor base and lower the required rates of return. Foerster and Karolyi [23] found that after cross-listing in the U.S. market, foreign firms saw a sharp rise in stock prices; moreover, firms' stock prices from the segmented emerging markets increased more sharply.

Secondly, liquidity is one of the factors that determine stock investment risk. Highly liquid stocks have lower risk and have relatively high stock values. For companies cross-listed in other markets, liquidity is increased by having diverse investors. Amihud and Mendelson [25] argued that stock trading takes place swiftly in highly liquid markets, wherein the price impact risk is lowered, and the transaction cost is reduced. Therefore, companies should issue their shares in liquid markets, thereby achieving expected returns and eliminating risk due to a lack of liquidity.

Thirdly, according to Merton's investor recognition hypothesis [26], a firm can make its presence more widely known to the market, and the corporate ownership structure becomes broader after cross-listing. Therefore, the required return is decreased because of the reduction in shadow costs. Kadlec and McConnell [27] and Foerster and Karolyi [23] showed that cross-listing is an effective way to diversify investment risk by increasing the base of investors.

Additionally, cross-listing has a positive signaling effect. The investment risk increases, the expected return increases, and the cost of financing eventually increases because of information asymmetry. However, disclosure of corporate information under regulations that are stricter than the home market somewhat solves the information asymmetry problem and therefore reduces the cost of capital. Thus, cross-listing, in line with stricter disclosure standards and higher investor protection delivers a positive signal to the home market. Cantale [28], Fuerst [29], and Moel [30] found that when a firm from a country with a non-well-established disclosure system and low degree of investor protection cross-lists its shares in developed markets, it sends a positive signal to its home market. King and Segal [31] also reported that Canadian firms' values have risen since cross-listing their shares on the U.S. market.

The Chinese literature on cross-listing motives argues that Chinese companies' cross-listing is a choice driven from their financial market characteristics. The main motives for the cross-listing of Chinese companies can be seen from the following two perspectives. Firstly, China's domestic capital market is still at an immature stage along with many regulations, and the new issuance of stocks and investors' investment choices are limited. Wang et al. [32] found that the Chinese domestic capital market is still undeveloped because no corporate financing or seasoned issuance system have been completely established; thus, Chinese firms need to move abroad to finance. Chinese companies listed on the HKSE commonly enjoy the "equity premium effects" of their stocks upon their subsequent listing in the home market. Yi [33] argued that combining corporate financing demand and the government's austerity measures with the credit crunch of financial institutions drives Chinese firms to list overseas.

Secondly, from a corporate standpoint, cross-listing helps companies improve their corporate governance, reduce the cost of capital, and strengthen their competitiveness. Lu [34] showed that the improvement of corporate governance is the major reason to choose cross-listing. Much related Chinese literature documents that cross-listing heightens management transparency and investor protection, thus improving corporate governance [13,17–20,34]). (Cui [14] and Qiu [15] showed that the motivation for cross-listing is to reduce the company cost of capital. Xiao and Shen [16] found that for Chinese firms that were already listed on the HKSE list in A-shares in the mainland market, the cost of equity was lower.)

2.2. Corporate Governance and Agency Costs

Our perspective on corporate governance is an agency perspective or separation of ownership and control to ensure that investors compel the managers to give their money back [3]. (A corporate governance structure is defined as a mechanism for coordinating the relationship among all stakeholders surrounding a firm and can be categorized into internal and external structures. The external governance structure is an external control mechanism, and its control is achieved through the product, capital, and labor markets. Meanwhile, the internal governance structure consists of shareholder meetings, the board of directors, including outside directors, and the audit committee. It is intended to control the firm, monitor and advise management, and maximize firm value). According to Brown and Caylor [35], efficient corporate governance can reduce agency problems and help management make more profitable investment decisions. Thus, it mitigates moral hazard and adverse selection problems, thereby maximizing the wealth of shareholders and corporations.

Much research on listed companies' corporate governance in developed countries has been conducted for a long time; however, discussion of this only began in China after the so-called "Reform and Market Opening" in 1978. (On December 29, 1993, the Company Act was enacted to formally introduce the legal definition of a company. However, the act was limited in its design, and in particular, it has not played a role in monitoring management because of the imperfect corporate governance structure. Thus, it became clear that coordination has been lacking among corporate stakeholders. The Chinese government has made several legal amendments to solve this problem, but most have informal operation and lack effectiveness). Some previous studies found that Chinese firms could improve their governance structures, such as by better aligning them with the interests of minority shareholders, increasing firm value, and reducing agent costs, when they were listed on a stock market that has a well-established and rigorous market operation system and investor protection system. Zhang [36] argued that the ownership of China's state-owned enterprises is concentrated in the government. Hence, with the largest shareholder's substantial ownership rights, the government has taken over the audit committee and distorted or neutralized the function of corporate governance. However, Lu [37] suggested that corporate governance structure can be seen as a substitute for governmental oversight, and instead of the government, individual and institutional investors can play similar supervisory roles. Li [38] discussed ways to improve firms' corporate governance structure and argued that switching to the "economic type" governance structure appropriate for Chinese economic characteristics is necessary; it should not be an "administrative type" that allows excessive government intervention. Moreover, he emphasized the roles of external stakeholders and market participants. Therefore, corporate governance structure improvement has become an urgent issue faced by both Chinese firms and Chinese financial regulatory authorities.

We examine the effect of governance structure on agency costs by developing hypotheses from the agency perspective. (Prior literature on cross-listing and corporate governance has mainly focused on two aspects. The first aspect involves improving external governance structure by strengthening laws and regulations through cross-listing in developed markets that have stricter and more advanced legal systems than the home market. The second aspect is about the change in internal governance structure, including the board of directors and outside directors). Firstly, the lower a managers' ownership in the firm, the more likely they will have higher incentives to make decisions for their own private benefits, thus increasing agency costs. Jensen and Meckling [39] proposed the convergence-of-interest hypothesis to explain the positive effect of managerial ownership. They argued that as managerial ownership increases, the interests of minority shareholders and controlling shareholders become more aligned, thereby reducing agency costs. At the initial stage of operation, a firm is wholly owned by its founder where neither agency problems nor information asymmetry exists. Even in the case of professional managers who are separate from the owners, they tend to follow controlling shareholders' decisions. Although the CEO seems to have authority over operations, management activities can be carried out

according to the controlling shareholders' intention. The controlling shareholder hires executives following his/her own management philosophy and monitors the management. Accordingly, firms with higher equity ownership of controlling and/or large shareholders have a low degree of the agency problem. With high controlling shareholder ownership, management's discretionary expenditure for their own private benefits is expected to be lower. However, when managerial ownership is high, managers have an aligned incentive to maximize firm value. Thus, we have formulated the following hypotheses:

Hypothesis 1 (H1). *The equity ownership of majority shareholders is negatively associated with the agency cost.*

Hypothesis 2 (H2). *The managerial equity ownership has a negative relationship with the agency cost.*

Next, according to Volpin [40], for a firm with several large shareholders, when corporate performance is poor, replacing the management is easy, thus lowering the agency cost. Meanwhile, Maury and Pajuste [41] showed that a more equal distribution of votes among large blockholders has a positive effect on firm value because the private benefit extraction of a large blockholder can be monitored by another strong blockholders. By contrast, Xiao [42] found that because the equity ownership of the largest shareholder in Chinese firms is too high and the shareholder has absolute control rights, it is unrealistic to reduce agency costs through large shareholders' alliance in China. Rather, the higher the degree of monitoring of large shareholders' alliances on the largest shareholder, the lower corporate governance efficiency, and the higher the agency cost. This implies that the results of previous research on the degree of ownership containment are mixed; thus, we set the following hypothesis:

Hypothesis 3 (H3). *The degree of ownership check has an indeterminate relationship with agent costs.*

The independence of directors and efficiency of the board of directors mainly constituting good corporate governance can reduce the agency cost. In this study, board's efficiency is determined by its size and board meeting frequency, and the independence of directors is measured by the ratio of outside directors to board size and the separation of chairman and CEO (i.e., CEO duality).

Firstly, the board of directors plays an advisory role in management decision-making, and control over decision-making occurs in board meetings. A board will monitor decision-making processes and determine managers' compensation commensurate with their performance. Therefore, revitalizing the function of a board can resolve the agency problem.

The size of a board can affect the choice of management strategy and firm value. Lipton and Lorsch [43] suggested an efficient monitoring hypothesis that the larger a board, the more efficiently the role of surveillance can be performed and the lower the agency costs. Meanwhile, as a board is taken over by management or as its size increases, the board operation will become inefficient or the monitoring function will be weakened, and the agent cost will increase. Jensen [44] found that firms with a larger board size tend to have higher agency costs and are not efficient. Yermack [45] also concluded that as the number of directors increases, the hassle of coordinating and operating procedures tends to make the board less efficient.

If efficient monitoring and control of management's decision-making processes are done from the shareholders' standpoint, the independence of directors is essential. The independence of directors might depend on the ratio of outside directors and whether the board chairman and CEO are separated. Fama and Jensen [46] claimed that most outside directors are experts in their field, and thus, they can perform their advisory and supervisory roles in the decision-making process better than internal directors. In Chinese literature, Wang [47] found that from 2000 to 2006, a negative relationship existed between

the ratio of outside directors and agency costs, and that when the board chairman was also the CEO, independence of the board significantly declined. Choi and Lee [48] argued that companies whose CEO serves as the chairman of the board of directors are less effective in management activities than those who do not. Therefore, we formulated the following related hypotheses:

Hypothesis 4 (H4). *The size of the board has an indeterminate relationship with agency costs.*

Hypothesis 5 (H5). *The ratio of outside directors is negatively related to agency costs.*

Hypothesis 6 (H6). *Agency costs are higher for firms where the chairman and CEO are the same person.*

Meanwhile, Vafeas [49] showed that firm value is increased when directors frequently attend board meetings. In other words, active monitoring through board meetings reduces agency costs. In addition, the more frequently board meetings are held, the more communications there is among directors, and managers can be monitored periodically. Therefore, we set up the following hypothesis:

Hypothesis 7 (H7). *There is a negative relationship between agency costs and board activities.*

As an effective external governance structure, institutional investors are expected to play a monitoring role as active shareholders [50]. Morck et al. [51] asserted that institutional investors can conduct monitoring on managers objectively. Testing the efficient monitoring hypothesis, Pound [52] claimed that because institutional investors have professional analytical skills and information, they could perform monitoring functions well, unlike minority shareholders. In China, Li and Zhang [53] found that firms with higher institutional investor ownership sent a signal of a positive stock price premium to the market. Thus, we set the following hypothesis:

Hypothesis 8 (H8). *Institutional investors' equity ownership has a negative relationship with agency costs.*

Another factor affecting agency costs is managerial compensation. Gul et al. [54] found that the higher the managerial compensation, the more managers actively maximized shareholder wealth to maintain their positions. That is, managerial compensation can reduce agency costs. However, Henry [55] argued that managerial compensation can be positively related to agency costs. That is, giving the board higher pay does not lead to improved performance, at least when measured using asset utilization ratios, asset liquidity ratios, and total asset-controlled free cash flow. This is regarded as the overconfident bias of management mentioned by Paredes [56]. Therefore, the effect of managerial compensation on agent costs can be either positive or negative:

Hypothesis 9 (H9). *Managerial compensation has an indeterminate relationship with agency costs.*

3. Data and Methodology

3.1. Sample Selection and Data Description

This section may be divided by subheadings. It should provide a concise and precise description of the experimental results, their interpretation as well as the experimental conclusions that can be drawn. In this study, we construct two groups of sample firms. The first group is composed of A- and H-share cross-listed firms that are simultaneously listed on the HKSE and either the Shanghai or Shenzhen Stock Exchange. The other is A-share-listed domestic firms, which are listed on either the Shanghai or Shenzhen Stock Exchange.

Qingdao Beer was first cross-listed on the HKSE in 1993. Since then, a total of 94 companies were cross-listed by the end of 2017. The sample meets the following conditions:

1.　Only December-closing firms;
2.　Companies that have not changed their industries during the sample period;
3.　Companies that are not designated as Special Treatment (ST) companies during the sample period;
4.　Companies from which we can collect data on all variables in the China Stock Market & Accounting Research (CSMAR) database;
5.　Excluded firms in the financial and insurance sectors because they differ greatly from non-financial firms in many respects.

The final sample included 66 cross-listed firms across seven industrial sectors. Moreover, we selected 66 A-share domestic firms in the same sector with a similar firm size (market capitalization value) in a one-to-one matching manner. The sample period was 2013–2015. The sample firms' Chinese industry-standard classifications are shown below in Table 1. All data—including financial data and corporate governance data—were extracted from the CSMAR database.

Table 1. Sample firms' industry classification.

Code	Industry Standard Classification	Number of Firms
B	Mining	18
C	Manufacturing	70
D	Electricity, heating, and gas	8
E	construction	8
F	Wholesale and retail trade	2
G	Communication, transportation, and post	24
K	Real estate	2
Total	-	132

3.2. Measurement of Agency Costs

Various measures have been employed in the prior literature to proxy for the level of agency costs present in firms. This paper employs two different proxy measures that relate to various aspects of firm operations in an attempt to provide a comprehensive and robust representation of the agency cost environment for cross-listed Chinese firms, denoted AC1 and AC2. Following Ang et al. [57], Singh and Davidson [58], McKnight and Weir [59] and Henry [55], the first measure of agency costs is calculated as the ratio of annual sales to total assets, an efficiency ratio, denoted by AC1. AC1 represents asset turnover ratio; it has been used as a relative measure of agency costs. This is a proxy for the loss in revenues attributable to inefficient asset utilization, which can result from poor investment decisions [57]. Asset turnover is a measure of how much sales an asset generates and an activity indicator that can reflect costs incurred by wrong investment decisions, investment in inefficient assets, etc. In other words, managers may invest in negative net present valued assets or make insufficient efforts in investment for their own private benefits, thereby decreasing the asset turnover ratio.

The second proxy for agency costs is denoted AC2, defined as the ratio of selling and administrative expenses to sales, which is an index of cost efficiency. This has been also used by many previous studies [55,57,58,60,61]. Specifically, Singh and Davidson [58] argued that the selling, general, and administrative expense ratio used as a proxy for agency costs can capture superfluous or perquisite expenditure over what is required to operate firms efficiently. The ratio increases because of the management's discretionary decision; therefore, agency costs also increase.

3.3. Definition of Independent and Control Variables

In this study, the independent variables related to corporate governance included the board size (BodSize), board's activities (BodAct), the duality of CEO and chairman (Dual-

ity), the ratio of outside directors on the board (OutDir), largest shareholder ownership (Own), managerial ownership (DirOwn), institutional investor ownership (InsHold), and managerial compensation (BodComp).

The board size may have a nonlinear relationship with the agency cost; therefore, we take the natural logarithm of the total number of directors. The board's activity is measured by taking the natural logarithm of the number of annual board meetings. The board activity is a function of management monitoring; if holding board meetings frequently is a criterion for judging whether management decisions are appropriate, it would highly likely reduce agency costs.

The ratio of outside directors was used as an indicator of board independence. The activation of the outside director system in the governance structure is a global trend; if the proportion of outside directors who are independent of management is high, the board's monitoring function can be strengthened. Another indicator of board independence is a representation of the CEO and chairman of the board. In previous studies, the separation of CEO and board chairperson increased the corporate value and reduced agency costs; thus, we analyzed this by generating a dummy variable. If the CEO and chairman of the board were the same person, the dummy variable took the value of 1, and 0 otherwise.

The largest shareholder's equity ownership is the number of shares held by the largest shareholder divided by the total number of shares outstanding. The managerial ownership was measured by dividing the number of shares held by managers by the total number of shares outstanding. Likewise, institutional investors' ownership was measured by dividing the number of shares owned by institutional investors by the total number of shares outstanding. Finally, board pay (BodComp) refers to the total annual remuneration of all directors and auditors; we took its natural logarithm.

In addition to the explanatory variables, we used firm size (Size), debt ratio (Lev), cash ratio (cash), year dummy (YD), and industry dummy (ID) as control variables. The larger the firm, the more stakeholders are interested in management information; they can play a monitoring role that reduces the management's discretionary expenses [62]. However, if a firm size grows because of many delegations, the agency problem can worsen. Firm size is measured by taking the natural logarithm of total assets.

Many studies on agency costs have shown that debt ratios reduce agency costs. Creditors of a firm with a high debt ratio are more likely to secure debt repayment and therefore enhance the monitoring of managers to minimize their risks and losses from debts. The higher the debt ratio, the lower the agency cost [63]. Meanwhile, a high debt ratio increases the risk of bankruptcy and the potential unemployment of managers. In this case, managers try their best to enhance management efficiency [64]. We measured the debt ratio by dividing the total liabilities by total assets.

Management can reduce dividend payouts or debt payments and use their excess free cash flows for their private benefits, thereby increasing agency costs [65]. Thus, a negative relationship may exist between agency costs and free cash flows. We used the ratio of cash flows to debts as a control variable. In other words, the sum of cash and cash equivalents was divided by the total debts. Finally, the economic situation of each year and the type of investment of assets varies according to industries; therefore, we included year and industry dummies. Variable definitions and measurements are presented in Table 2.

Table 2. Variable definitions and measurements.

Variable	Definition and Measurement
Agency costs (AC1)	Measured as annual total revenue divided by annual total assets. This provides a relative quantitative measure of the effectiveness of firm investment decisions and the ability of the firm's management to direct assets to their most productive use. Firms with lower asset utilization ratios make sub-optimal investment decisions or use funds to purchase unproductive (non-revenue-generating) assets and creating agency costs for shareholders. This is similar to the variables used by Ang et al. [53]) and Singh and Davidson [54].

Table 2. *Cont.*

Variable	Definition and Measurement
Agency costs (AC2)	Measured as the selling, general, and administrative expense divided by the annual total revenue. Firms with higher selling, general, and administrate expense ratios make sub-optimal investment decisions when unnecessary costs occur as a result of management's discretionary decisions, thus indicating that the agent cost increases. This is similar to variables used by Ang et al. [53], Singh and Davidson [54]), Park and Noh [56], and Du [57].
Board size (persons)	Measured as the natural logarithm of the total number of board members
Board activity (times)	Measured as the natural logarithm the total frequency of board meetings during a specific year
CEO Duality	Defined by an indicator variable coded 1 if the CEO is also the chairperson of the board of directors and 0 otherwise
Outside director ratio	Measured as the proportion of the total board comprised of independent directors
Largest shareholder ownership	Measured as the proportion of the largest shareholders' ownership
Managerial ownership	Measured as the proportion of total firm equity capital held by all company directors
Institutional ownership	Measured as the total shareholding ratio of all institutional shareholders
Control right restraint (times)	Measured as the sum of the number of shares from the second-largest shareholder to the fifth-largest shareholder divided by that of the largest shareholder.
Board Compensation (RMB 10,000)	Measured as the natural logarithm of the sum of total annual benefits paid to all board members (including directors and auditors)
Firm size (RMB 100 million)	Measured as the natural logarithm of total assets at the end of the financial year
Debt ratio	Measured as the total debt divided by the total assets
Market-to-book ratio (MB ratio)	Measured as the market capitalization divided by the total book value
Return on equity (ROE)	Measured as net income divided by the total value of shareholders' equity
Cash ratio	Measured as the cash and cash equivalents divided by current liabilities

3.4. Methodology

We studied the effect of corporate governance structure on agency costs between cross-listed and domestic firms. Firstly, we examined whether any difference occurred in corporate governance attributes between cross-listed and domestic firms. Next, we examined how agency costs are related to those governance variables. We used the following specification via a fixed-effects controlled model for firm *i* and year *t*:

$$AC_{i,t}^{1\,or\,2} = \beta_0 + \sum_{j=1}^{n} \beta_j(Gov_{ji,t}) + \sum_{k=n+1}^{n+m} \beta_k(Fin_{ki,t}) + \sum_{l=n+m+1}^{n+m+o} \beta_l(Dum_{li,t}) + c_i + u_{it}$$

where *AC* refers to a proxy variable for agency cost; *Gov* denotes to the board size, board activity, CEO duality, outside director ratio, largest shareholder ownership, managerial ownership, institutional ownership, control right restraint, and managerial compensation; *Fin* denotes the firm size, debt ratio, ROE, and cash ratio; *Dum* denotes the year and industry dummy variables; and c_i refers to the firm-specific fixed effect.

We used two different dependent variables as proxies for agency costs: asset turnover or asset utilization ratio as an indicator of asset use efficiency and the selling, general, and administrative expenses ratio. Note that the level effects for the ownership and size portfolios are subsumed into the firm fixed effects. Firm fixed effects also control for any time-invariant industry or firm characteristics across firms.

4. Empirical Results

4.1. Descriptive Statistics

Table 3 Panel A presents the descriptive statistics of the major variables for the overall sample period of 2013–2015. The asset turnover ratio (AC1), a proxy for agency costs, was 0.6023 times, on average. The average selling, general, and administrative expenses ratio, which is the second proxy for agency costs (AC2), was 10.99%. Board size (BodSize) was 5 at the minimum and 18 at the maximum, with an average of 9.76. The number of annual board activities or meetings (BodAct) was twice at the minimum and 18 times at the maximum, with an average of 2.2590.

Table 3. Descriptive statistics for the overall sample period 2013–2015.

Variable	Mean	SD	Min.	Max.	*n*
Panel A: Overall period of 2013–2015					
Agency costs (AC1)	0.6023	0.4576	0.0863	3.2808	396
Agency costs (AC2)	0.1099	0.0735	0.0120	0.4944	396
Board size (persons)	9.7625	2.1558	5.0000	18.0000	396
Board activity (times)	10.6490	5.5411	2.0000	48.0000	396
Duality	0.1591	0.3662	0.0000	1.0000	396
Outside director ratio	0.3799	0.0639	0.2500	0.8000	396
Largest shareholder ownership	0.4389	0.1515	0.0180	0.8635	396
Managerial ownership	0.0381	0.1145	0.0000	0.5342	396
Institutional ownership	0.2813	0.2060	0.0008	0.9506	396
Control right Restraint (times)	0.6872	0.8560	0.0057	13.7000	396
Board Compensation (RMB 10,000)	978.28	967.82	120.40	8222.40	396
Firm size (RMB 100 million)	1159.73	2791.60	4.6273	24,053.78	396
Debt ratio	0.5632	0.1874	0.0103	1.1037	396
MB ratio	0.7824	0.2404	0.0744	1.2795	396
ROE	0.0779	0.2153	−1.6125	2.9567	396
Cash ratio	0.5440	1.8112	0.0014	33.2261	396
Panel B: Annual mean values of 2013–2015					
	2013		2014		2015
AC1	0.6466		0.6128		0.5476
AC2	0.1050		0.1094		0.1152
Board size (persons)	9.9620		9.8333		9.4923
Board activity (times)	9.7196		10.7803		11.4469
Duality	0.1515		0.1591		0.1667
Outside director ratio	0.3785		0.3728		0.3886
Largest shareholder ownership	0.4433		0.4426		0.4307
Managerial ownership	0.03930		0.03715		0.03790
Institutional ownership	0.2918		0.2763		0.2758
Control right Restraint (times)	0.6553		0.7211		0.6852
Board Compensation (RMB 10,000)	919.75		982.31		1032.79
Firm size (RMB 100 million)	1024.26		1195.61		1259.32
Debt ratio	0.5615		0.5683		0.5597
MB ratio	0.8560		0.7638		0.7274
ROE	0.06544		0.11074		0.05744
Cash ratio	0.6980		0.4672		0.5818

Note: Panel A provides the summary statistics for all firms in 2013–2015 used in our analysis. Meanwhile, Panel B provides means in an annual panel of these firms for 2013–2015. Table 2 provides the variable definitions and measurements.

The ratio of outside directors (OutDir) was 25–80% with an average of 37.99%. The largest shareholder's equity ownership was widespread at 1.8–86.35%, with an average of 43.89%. The managerial ownership (DirOwn) was 0–53.42% and the average was small at 3.81%. Institutional ownership (InstHold) was also widespread, at 0.08–95.06% with an average of 28.13%. Board compensation (BodComp) was RMB 1.204–82.24 million with an average of RMB 9.87281 million. Firm size (Size) was RMB 0.44314–2405.38 billion, and the average was RMB 113.101 billion. The debt ratio (Lev) was 1.03–110.37% and the average was 56.32%. The cash asset ratio (cash) was 0.14–3322.61% and the average was 54.40%. The market-to-book ratio (MB ratio) was 0.0744–1.2795 and the average was 0.7824. The return on equity (ROE) as an index for profitability was −1.6125–2.9567, with the average value of 0.0779.

Table 3 Panel B reports the annual means of all firms used in our analysis for 2013–2015. Note that the agency cost problem was somewhat exacerbated for the sample period, inferring from the fact that AC1 (the asset efficiency ratio) decreased from 0.647 to 0.548, whereas AC2 (selling, general, and administrative cost ratios) increased from 0.105 to 0.115. Moreover, for the same period, board size decreased, whereas board activity increased. CEO duality and board compensation increased, whereas the largest shareholder ownership and institutional ownership decreased for the same period.

4.2. Student's t-Test Results

Table 4 presents descriptive statistics between the cross-listed group and domestically listed group and the *t*-test results. We wished to examine whether any difference occurred in the descriptive statistics between the cross-listed and domestically listed groups. Firstly, the asset turnover ratios of the cross-listed firms and A-share domestic firms were 0.6573 times and 0.5473 times, respectively; the former is 0.1100 times higher than the latter, which was statistically significant at the 5% level. Therefore, cross-listed firms use assets more efficiently, which means they have lower agency costs. However, there was no significant difference in the ratio of sales and general administrative expenses for the two groups.

For the board structure, we found that board activity and outside director ratios in cross-listed firms were more active and higher at the 5% and 1% significance levels, respectively, but there was no difference in board size. Neither was there a difference in the duality of the CEO and board chairman; the duality rarely exists. Thus, we can claim that the governance structure of cross-listed firms is somewhat superior.

Regarding the ownership structure, the largest shareholder's equity ownership showed no significant difference between the two groups. However, managerial ownership was significantly higher for domestic firms, although its mean was only a single-digit percent with 1.87% and 5.76% in cross-listed and domestic firms, respectively. This is partly because of the situation where managerial compensation in the form of stock grants and options is not attractive due to the lower valuation of the Chinese stocks. By contrast, institutional ownership and managerial pay are higher for cross-listed firms. We can conjecture that institutional investors prefer firms with a better governance structure and are inclined to pay the board more.

As a control or monitoring mechanism on the largest shareholder, we analyzed the ratio of the equity ownership ranging from the second-largest shareholder to the fifth-largest shareholder relative to the largest shareholder ownership. The ratio was significantly higher for cross-listed firms, so the largest shareholder seemed to be monitored by the other largest shareholder group. Thus, in terms of governance structure, the largest shareholder cannot easily abuse their control right.

For the other control variables, firm size was significantly larger for cross-listed firms, whereas the cash ratio was significantly higher for domestically listed ones. Similar to firm size, the market-to-book ratio (MB ratio) was significantly larger in cross-listed firms than in domestically listed ones. However, domestically listed firms show a significantly higher return on equity (ROE) than cross-listed firms.

Table 4. Descriptive statistics and *t*-test results for cross-listed and domestically listed firms.

Variable	Cross-Listed Firms				A-Share Listed Firms				Diff.	*t*-Value
	Mean (A)	SD	Min	Max	Mean (B)	SD	Min	Max	(A − B)	
AC1	0.6573	0.5076	0.1080	3.2808	0.5473	0.3952	0.0863	2.1089	0.1100	2.41 ***
AC2	0.1085	0.0747	0.0120	0.3744	0.1112	0.0724	0.0131	0.4944	−0.0027	−0.36
BodSize	2.2724	0.2342	1.6094	2.8904	2.2376	0.1979	1.6094	2.8332	0.0348	1.60
BodAct	2.3096	0.5081	0.6931	3.8712	2.2083	0.3860	1.0986	3.4657	0.1013	2.24 **
Duality	0.1364	0.3440	0.0000	1.0000	0.1818	0.3867	0.0000	1.0000	−0.0454	−1.24
OutDir	0.3884	0.0664	0.2857	0.6667	0.3714	0.0602	0.2500	0.8000	0.0170	2.67 ***
Own	0.4434	0.1415	0.1513	0.8635	0.4343	0.1612	0.0180	0.8034	0.0091	0.59
DirOwn	0.0187	0.0798	0.0000	0.4604	0.0576	0.1385	0.0000	0.5342	−0.0389	−3.42 ***
InsHold	0.3630	0.1875	0.0008	0.9506	0.1996	0.1910	0.0021	0.7378	0.1634	8.59 ***
CR2-5-1	0.8311	0.4540	0.1300	2.0920	0.5433	1.1051	0.0057	13.700	0.2878	3.39 ***
BodComp	15.9208	0.8363	14.0012	18.2250	15.6161	0.7093	14.1815	17.8575	0.3047	3.91 ***
Size	24.6667	1.6860	20.0000	29.0000	23.7677	1.4728	20.0000	28.0000	0.8990	6.06 ***
MB ratio	0.8313	0.0147	0.0744	1.2795	0.7335	0.0185	0.088	1.1243	0.0978	4.13 ***
ROE	0.0590	0.0113	−1.1978	0.5876	0.0967	0.0184	−1.6125	2.9567	−0.0377	−1.75 **
Lev	0.5776	0.1763	0.1228	1.0373	0.5487	0.1972	0.0103	1.1037	0.0289	1.54
Cash	0.3514	0.3287	0.0014	1.8753	0.7366	2.5288	0.0154	33.2261	−0.3852	−2.13 **

Note: This table reports summary statistics between cross-listed and domestically listed firms and presents results from the *t*-test between the two groups. Table 2 provides the variable definitions and measurements. ** and *** indicate statistical significance at 5% and 1% levels, respectively.

4.3. Correlation Analysis

We present the Pearson pairwise correlation analysis for the major variables and the correlations between dependent and explanatory variables for cross-listed companies in Table A1. Asset turnover ratio (AC1)—a measure of asset efficiency—and the selling, general, and administrative expense ratio (AC2)—a cost-effectiveness measure—reflect the results of management's discretionary decision-making. They both had a significant correlation with the largest shareholder ownership and cash ratio. In particular, the largest shareholder ownership had a negative correlation with AC2 and a positive relationship with AC1, which implies that agency costs are reduced when the largest shareholder ownership is high. By contrast, the cash ratio was negatively and positively correlated with AC1 and AC2, respectively. This suggests that sufficient cash holdings will increase the agency's costs because the company does not need to finance from external creditors, thus reducing the chances of being monitored and making no effort to generate cash from active management activities.

Table A2 shows the correlations between major variables for domestically listed companies. Firstly, both board activity and largest shareholder ownership were significantly correlated with AC1 and AC2, respectively. Board activity was positively correlated with AC1 and negatively with AC2. Therefore, the more frequent the board activity, the more actively the board can monitor management, thereby lowering agency costs. The largest shareholder ownership had a similar relationship for cross-listed firms. Thus, the largest shareholder ownership plays a good monitoring role. In addition, the outside director ratio was negatively correlated with AC2, thus reducing agency costs.

To confirm that no multi-collinearity problem existed in the analysis, we calculated the variance inflation factor (VIF). Indeed, no multi-collinearity problem existed because the coefficients of VIF values were very low between 1 and 3 (Note that the market-to-book ratio is highly significantly correlated with the size variable with a coefficient of 0.64. Thus, we included one variable at a time in the following regression analyses due to the multi-collinearity issue.). Finally, based on the results of the Hausman test, we used the fixed-effect controlled model.

4.4. Regression Results

As shown in the *t*-test analysis in the previous subsection, the governance structure of A- and H-share cross-listed firms differs from that of A-share-only domestically listed firms. Then, how the difference in governance structure affects firm agency costs is an important question. Table 5 presents the results of fixed-effect controlled panel regression analysis using the proxies for agency costs AC1 and AC2. Note that AC1 and AC2 move in opposite directions when agency costs increase. For example, when the agency costs are higher, the asset turnover ratio will be lower, whereas the selling, general, and administrative expense ratios will be higher.

Table 5. Fixed-effect controlled regressions of corporate governance and agency costs.

Dependent Variable: Agency Costs	Cross-Listed Firms		Domestically Listed Firms	
	AC1	AC2	AC1	AC2
Board size	0.2305 **	−0.0084	−0.2650 **	0.0132
	(2.30)	(−0.54)	(−2.24)	(0.24)
Board activity	0.0209	0.0033	−0.0047	−0.0051
	(0.55)	(0.56)	(−0.16)	(−0.39)
Duality	0.0505	−0.0124 *	0.0414	−0.0256
	(1.12)	(−1.79)	(0.69)	(−0.94)
Outside director ratio	0.2596	−0.0310	−0.1554	0.0496
	(1.16)	(−0.90)	(−0.52)	(0.36)
Largest shareholder ownership	0.5798	−0.0880	−0.0764	−0.0198
	(1.44)	(−1.41)	(−0.45)	(−0.26)
Managerial ownership	−1.8919	−0.4399	−0.4213	−0.4245 *
	(−1.03)	(−1.56)	(−0.80)	(−1.75)
Institutional ownership	0.1309 *	−0.0288 **	−0.1021	0.0980 **
	(1.70)	(−2.43)	(−1.11)	(2.33)
Control right restraint	0.2587 ***	−0.0144	0.0087	−0.0017
	(2.98)	(−1.08)	(0.96)	(−0.43)
Board compensation	0.0872 ***	−0.0100 **	−0.0018	0.0414 **
	(2.73)	(−2.05)	(−0.05)	(2.62)
Firm size	−0.1424 **	−0.0022 **	−0.0043	−0.0285 ***
	(−2.02)	(−2.06)	(−0.20)	(−2.91)
Debt ratio	0.0262	0.0874 ***	−0.5583 ***	0.0906
	(0.13)	(2.82)	(−4.39)	(1.56)
ROE	0.1353 **	−0.0707 ***	0.0258	−0.0077
	(2.07)	(−7.02)	(1.08)	(−0.71)
Cash ratio	−0.0780 *	0.0026	−0.0059 *	−0.00054
	(−1.68)	(0.36)	(−1.75)	(−0.35)
Constant	1.5980	0.8743 ***	1.6268 **	0.0876
	(1.01)	(3.58)	(2.24)	(0.26)
Adjusted R^2	0.42	0.51	0.46	0.26
Wald statistic	5.72 ***	8.14 ***	5.68 ***	2.41 ***

Note: Although year dummy variables are included in the regression models, their coefficients are not reported in Table 5. We calculated Z-statistics using robust standard errors and reported them in parentheses. Table 2 provides the variable definitions and measurements. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Firstly, in cross-listed firms, the explanatory variables are significantly associated with the agency costs, and the board size, institutional ownership, control right restraint, and managerial compensation are proxied by the asset turnover ratio. By contrast, we find a significant relationship between the asset turnover ratio of A-share domestic firms and board size, which is the only governance variable.

In particular, in cross-listed firms, the board size has a positive association with the asset turnover ratio at the 5% significance level. However, the relationship turns out to be negative for domestically listed firms. As noted in the theoretical background, the board size will only have a positive effect on firm value if the board operation is efficient. Therefore, for cross-listed firms, the board operation seems more efficient as its

size increases, thereby reducing the agency costs. By contrast, it becomes more inefficient with size in domestic firms. The board activity or frequency of board meetings per year has no association with the asset turnover and thus the agency costs.

In the aforementioned *t*-test results, the number of cases in which the CEO is also the chairman of the board of directors in cross-listed companies was fewer than that in domestic companies. Therefore, cross-listed firms have a more effective board control system. However, we did not find any significant association between asset turnover and the CEO's duality.

The ratio of outside directors had no significant association with asset turnover for either group. Therefore, outside directors seemingly fail to perform their proper role in the board, which is consistent with previous studies' findings. This may be because most outside directors of Chinese companies are recommended by the board or internal members of the company; hence, they cannot perform their duties independently.

The largest shareholder's ownership and managerial ownership for both cross-listed and Chinese domestically listed firms have no significant relationship with the asset turnover ratio. Meanwhile, institutional ownership for cross-listed firms had a positive relationship with asset turnover at the 5% significance level. Thus, institutional investors have monitored management effectively, thereby reducing agency costs. However, no such relationship existed for domestically listed firms. Similarly, managerial compensation was positively related to asset turnover for cross-listed firms at the 1% significance level but not related to domestically listed firms.

For the control variables, the debt ratio and cash ratio had a significantly negative relationship with asset turnover for domestically listed firms. In particular, although the debt ratio is expected to perform an external supervisory function and act as a discipline for management behavior, it does not reduce agency costs. In other words, a higher debt ratio reduces asset efficiency and increases agency costs, so creditors seem not to play a monitoring role as the theory expects. In addition, more cash might make managers pursue private benefits, thereby increasing agency costs. This is also the case with cross-listed firms, for which the cash ratio had a negative relationship with asset turnover.

We used another proxy for agency costs, i.e., the selling, general, and administrative expense ratios (AC2). Table 5 shows the results of fixed-effect controlled panel regression analysis using this proxy. First, the duality was negatively related to the agency cost in cross-listed companies, but it was not significant to the agency cost in domestically listed companies. In other words, the separation of CEO and chairman increases the board's independence from management and thus leads to better monitoring and overseeing for cross-listed firms only.

Institutional ownership was negatively associated with the agency cost for cross-listed firms at the 5% significance level, whereas it was positively related for domestically listed firms. Therefore, institutional investors investing in cross-listed firms are monitoring management effectively compared with matched domestically listed firms.

The board compensation has a negative (positive) relationship with the agency cost for cross-listed firms (domestically listed firms). For cross-listed firms only, the compensation acts as an incentive for managers to use internal resources efficiently. Despite high compensation, managers in domestically listed firms seem to waste resources, consistent with the findings of Henry [55], who documented that management remuneration has a positive relationship with agency costs.

Firm size as a control variable is negatively related to the agency cost for both cross-listed and domestically listed firms. Moreover, the debt ratio has a positive relationship with agency costs for cross-listed firms only, which implies that creditors do not play a monitoring role. Moreover, a negative relationship exists between ROE and agency costs for cross-listed firms only.

4.5. Robustness Tests

The potential endogeneity issue of corporate governance structure is addressed directly because the nature of firm agency environments may influence their corporate governance development. Following Henry [55], we employed the strict exogeneity test for panel data suggested by Wooldridge [66] based on the estimation of the following fixed-effects model with the future values of explanatory variables for firm *i* and year *t*:

$$AC_{i,t}^{1\ or\ 2} = \alpha + \beta X_{i,t} + \gamma W_{i,t+1} + c_i + u_{it}$$

where *AC* refers to a proxy variable for agency cost, $X_{i,t}$ refers to the vector of governance, financial, and dummy variables in year *t*, $W_{i,t+1}$ refers to a subset of $X_{i,t+1}$, the vector future values of the governance, financial, and dummy variables in year *t* + 1, and c_i refers to the firm-specific fixed effect.

This model examines whether the future values of the explanatory variables dynamically respond to changes in the agency cost proxies AC1 and AC2. Under the null hypothesis of the strict exogeneity of explanatory variables, $\gamma = 0$. Table 6 provides the results from testing the strict exogeneity of the individual governance attributes and other control variables. Moreover, Table 6 provides minimal evidence indicating that the various individual governance variables of sample firms, in particular in the case of AC1 for cross-listed firms, are not exogenously determined.

Specifically, when employing the asset efficiency for agency costs in cross-listed firms, some future values of board activity, board independence, CEO duality, the largest shareholders' ownership, and board pay are statistically significant, which suggests that they adjust in response to changes in asset efficiency. This is unsurprising with regard to board compensation that is set by firm boards. For domestically listed firms, no future values of governance attributes are statistically significant, implying that we can carry out the test using fixed-effects estimations.

Moreover, when employing the selling, general, and administrative cost ratios for agency costs, no future values of governance attributes are statistically significant for either cross-listed or domestically listed firms. This suggests that, using fixed-effects estimation, we can carry out the tests.

Note that endogenous relationships were observed between asset efficiency proxies for agency costs and certain governance attributes and other control variables, but only for cross-listed firms. An instrumental variables estimation approach was employed to correct for any bias in the contemporaneous relationship between agency costs and corporate governance introduced by this observed endogeneity. Following Hermalin and Weisbach [67], Coles et al. [68], McKnight and Weir [59], and Henry [55], we used the lagged values of the identified endogenous variables as appropriate instruments because of the difficulty in locating different instruments for the various separate endogenous variables.

For cross-listed firms only, we estimated the two-stage least squares (2SLS) using the one-year lagged value of the critical endogenous explanatory variables, such as largest shareholder ownership and board compensation as instruments when employing an asset efficiency proxy for agency costs. Table 7 presents the regression coefficients and test statistics using 2SLS with instrumental variables, which are reported in italics corresponding to the instrumental variables. The results are immune to both the under-identifying and over-identifying restrictions tests. The regression results provide that board size and institutional ownership have statistically significant influences on reducing agency costs. Note that the main results are similar when using the market-to-book ratio instead of the firm size variable.

Table 6. Strict exogeneity tests using fixed effects for the relationship between corporate governance and agency costs.

Dependent Variable: Agency Costs	Cross-Listed Firms		Domestically Listed Firms	
	AC1	AC2	AC1	AC2
Board size $_t$	0.0509	0.00692	−0.4544 **	−0.01324
	(0.20)	(0.21)	(−2.48)	(−0.19)
Board activity $_t$	−0.0818 **	0.00545	0.02034	0.00709
	(−2.15)	(0.52)	(0.52)	(0.48)
Duality $_t$	−0.0261	−0.00772	0.1392	−0.08358 **
	(−0.47)	(−0.51)	(1.35)	(−2.14)
Outside director ratio $_t$	0.3270	−0.07125	0.1205	0.09318
	(1.61)	(−1.29)	(0.27)	(0.56)
Largest shareholder ownership $_t$	−0.7277	−0.02906	−0.5180 *	0.08482
	(−1.27)	(−0.19)	(−1.86)	(0.81)
Managerial ownership $_t$	−0.1431	−0.2622	−0.6525	−1.3483 ***
	(−0.10)	(−0.69)	(0.56)	(−3.06)
Institutional ownership $_t$	−0.00456	−0.01088	0.03251	−0.0206
	(−0.03)	(−0.30)	(0.57)	(−0.45)
Control right restraint $_t$	−0.1909	0.02291	−0.0510	0.00141
	(−1.00)	(0.44)	(−0.68)	(0.05)
Board compensation $_t$	0.0405	−0.01285	0.02548	0.04395 **
	(1.21)	(−1.41)	(0.54)	(2.48)
Firm size $_t$	−0.2406 ***	0.02182	−0.00290	−0.00037
	(−2.78)	(0.92)	(−0.10)	(−0.03)
Debt ratio $_t$	0.2606	0.03678	−0.4127 *	0.00509
	(0.85)	(0.44)	(−1.76)	(0.06)
Cash ratio $_t$	−0.0371	0.00582	−0.00612	−0.000010
	(−0.72)	(0.41)	(−1.56)	(−0.01)
Board size $_{t+1}$	0.1256	0.03417	−0.1897	0.00322
	(1.04)	(1.04)	(−1.06)	(0.05)
Board activity $_{t+1}$	−0.1061 **	0.00973	0.06192	−0.00451
	(−2.28)	(0.77)	(1.61)	(−0.31)
Duality $_{t+1}$	0.1244 ***	−0.01351	−0.03898	−0.01421
	(2.91)	(−1.16)	(−0.43)	(−0.41)
Outside director ratio $_{t+1}$	0.4868*	0.02715	−0.02623	0.1178
	(1.81)	(0.37)	(−0.06)	(0.74)
Largest shareholder ownership $_{t+1}$	0.5931 *	0.06671	0.1585	−0.1606
	(1.70)	(0.70)	(0.42)	(−1.13)
Managerial ownership $_{t+1}$	2.9451	−0.9044	−1.1659	−0.2638
	(0.82)	(−0.93)	(−1.28)	(−0.77)
Institutional ownership $_{t+1}$	0.02800	−0.00777	0.2718	−0.02423
	(0.45)	(−0.46)	(1.56)	(−0.37)
Control right restraint $_{t+1}$	0.05333	0.00830	−0.07409	0.00031
	(0.69)	(0.39)	(−0.78)	(−0.01)
Board compensation $_{t+1}$	0.09271 **	−0.01010	−0.02802	0.000092
	(2.66)	(−1.06)	(−0.55)	(0.00)
Firm size $_{t+1}$	0.09538	−0.05850 **	0.0401	−0.03098 **
	(1.00)	(−2.25)	(0.43)	(−2.54)
Debt ratio $_{t+1}$	−0.4455 **	0.1618 ***	−0.1883	−0.1014
	(−2.61)	(3.47)	(−1.08)	(−1.54)
Cash ratio $_{t+1}$	0.02238	0.00876	−0.01957	0.00465
	(0.41)	(0.59)	(−0.67)	(0.42)
Adjusted R^2	0.72	0.43	0.56	0.61
Wald statistic	4.29 ***	1.25	1.93 **	2.34 ***

Note: Although year dummy variables are included in the regression models, Table 6 does not report their coefficients. T-statistics are calculated using robust standard errors and reported in parentheses. Table 2 provides variable definitions and measurements. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 7. Instrumental variable regressions of corporate governance and agency costs using two-stage least squares (2SLS).

Dependent Variable Agency Costs	Cross-Listed Firms
	AC1
Board size	0.5400 *** (3.12)
Largest shareholder ownership	*0.6853* *(1.17)*
Managerial ownership	−0.3229 (−0.65)
Institutional ownership	0.6274 *** (3.06)
Control right restraint	0.0734 (0.46)
Board compensation	*−0.0383* *(−0.59)*
Firm size	0.0366 (0.98)
ROE	0.3480 (1.08)
Debt ratio	*−0.5305* ** *(−2.32)*
Cash ratio	−0.4533 *** (−3.56)
R^2	0.39
Under-identifying restrictions test (Anderson cannon. corr. LM statistic)	95.49 (0.00)
Over-identifying restrictions test (Sargan statistic)	1.14 (0.77)

Note: Although year dummy variables are included in the regression models, Table 7 does not report their coefficients. Z-statistics were calculated using robust standard errors and are reported in parentheses. Table 2 provides the variable definitions and measurements. ** and *** indicate statistical significance at the 5% and 1% levels, respectively.

The significance of board size implies an efficient monitoring hypothesis that the larger the board, the more efficiently the role of surveillance can be performed and the lower the agency costs, thereby providing a supporting evidence of Lipton and Lorsch [43] findings. The positive influence of institutional ownership on lowering the agency costs provides supporting evidence of the results of Chung and Zhang [69], who showed that the fraction of a company's shares that are held by institutional investors increases as the quality of its governance structure increases. None of the other individual governance attributes exhibited statistically significant relationships with the agency cost proxy. However, certain control variables, such as debt ratio and cash ratio, have negative effects on agency costs.

We examined whether the listing path may affect agency costs. That is, there are two paths: in one, the Chinese domestic firms first list H-shares on the HKSE and then A-shares on the Shanghai or Shenzhen Stock Exchange; in the other, firms first list A-shares on the domestic exchanges and then H-shares on the HKSE. Thus, we investigated how the order of listing matters in reducing agency costs. We used a dummy variable that took the value of 1 if a firm adopted the former path, and 0 otherwise. We found that the relationship between the dummy and asset turnover ratio was significantly positive, meaning that when Chinese domestic firms cross-list first H-shares and then A-shares, they see increased asset turnover and thus decreased agency cost. However, we did not find any significant results from the difference in listing paths.

We further conducted the complete regression analysis with a new dependent variable that was interacted with cross-listing dummy variables to capture some endogeneity issues embedded in cross-listing decisions. Table 8 presents the results of the panel regression analysis using dependent variables of AC1 × cross dummy and AC2 × cross dummy, respectively. For AC1, the fixed-effect-controlled model was adopted, whereas for AC2, the random effect model was adopted based on the Hausman test. The main results remained similar to those in the separate analyses. As in Table 5, board size, institutional ownership, and board compensation had significant relationships with agency costs in

terms of AC1. For AC2, the largest shareholders' ownership and board compensation had positive associations with lowering agency costs.

Table 8. Panel regression of corporate governance and agency costs.

Dependent Variable Agency Costs × Cross Dummy	AC1 × Cross Dummy	AC2 × Cross Dummy
	Fixed-Effect Controlled	**Random-Effect Controlled**
Board size	0.1982 ***	−0.0080
	(3.13)	(−0.75)
Board activity	0.0034	0.0042
	(0.17)	(1.22)
Duality	0.0384	−0.0082
	(1.29)	(−1.63)
Outside director ratio	0.2867 *	−0.0173
	(1.92)	(−0.67)
Largest shareholder ownership	−0.0956	−0.0553 ***
	(−0.73)	(−2.62)
Managerial ownership	0.0990	−0.098
	(0.22)	(−2.16)
Institutional ownership	0.1218 **	−0.0091
	(2.48)	(−1.09)
Control right restraint	0.0027	−0.0005
	(0.32)	(−0.36)
Board compensation	0.0441 **	−0.0054 *
	(2.31)	(−1.68)
Firm size	−0.0158	−0.0017
	(−0.87)	(−0.63)
Debt ratio	−0.1040	0.0343 **
	(−1.19)	(2.40)
ROE	0.0190	−0.0136 ***
	(0.92)	(−3.75)
Cash ratio	−0.0023	0.0001
	(−0.74)	(0.26)
Constant	−0.5462	0.2347 ***
	(−1.08)	(3.19)
Adjusted R^2	0.23	0.51
Wald statistic	4.54 ***	63.34 ***

Note: Although year dummy variables are included in the regression models, Table 8 does not report their coefficients. Z-statistics were calculated using robust standard errors and are reported in parentheses. Table 2 provides the variable definitions and measurements. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Lastly, we conducted some robustness tests by excluding manufacturing industry firms in the sample, consisting of 248 of the total 396. The results of the fixed-effect-controlled panel regression reveal that the board size still has a positive influence on lowering agency cost, proxied by AC1 for cross-listed companies, whereas it has a negative influence for domestically listed firms. For AC2, the board size negatively influences lowering agency costs only for domestically listed companies, implying that larger board size plays a monitoring role on the management to be applied only for cross-listed companies. The main results remained the same when the manufacturing industry firms were excluded.

5. Conclusions

We analyzed the effects of the Chinese companies cross-listed on the HKSE compared with the domestically listed firms on agency costs for 2013–2015. We used two proxy variables for agency costs: the asset turnover ratio and the selling, general, and administrative cost ratios. We selected 66 Chinese firms listed on the A-share market in China and 66 Chinese firms with cross-listed H-shares on the HKSE. They were matched with similar asset sizes in the same sector or industry based on the industry classification codes.

We found that companies with an HKSE cross-listing generally had better corporate governance than companies without the cross-listing. The corporate governance advantage of the HKSE cross-listed firms holds if we controlled for the firm fixed effects and resolved the potential endogeneity problem between corporate governance and agency costs. Specifically, the HKSE cross-listed firms had better corporate governance in terms of the largest shareholder ownership,

institutional ownership, and managerial compensation. By contrast, domestically listed firms experienced the adverse effects of institutional blockholders' roles and higher board pay.

To check the potential endogeneity problem between agency costs and corporate governance variables, we estimated a strict exogeneity test for both cross-listed and domestically listed firms across two different proxy variables for agency costs. The results showed that endogenous relationships exist between the asset efficiency proxy for agency costs and some governance attributes; other control variables only existed for cross-listed firms. To correct for any bias in the contemporaneous relationship between agency costs and corporate governance introduced by this observed endogeneity, we estimated the 2SLS using the one-year lagged value of the endogenous explanatory variables as instruments for the cross-listed firms using asset efficiency for agency costs. The results confirmed that board size and institutional ownership have statistically significant influences on reducing agency costs for cross-listed firms only. The results are immune to both the under-identifying and over-identifying restrictions tests.

We provide evidence to support that the governance structure of A- and H-share cross-listed corporations perform better in reducing agency costs than that of domestically listed companies. Furthermore, the difference in their performance is due to the effect of cross-listing on corporate governance improvement, in that they are listed in more developed capital markets with better legal and institutional frameworks than their home markets. Our study implies that the advantage of the HKSE cross-listed firms may stem from the benefits of having a large board size and institutional stockholders to monitor the management effectively.

This study suggests that many issues remain to be resolved with domestic companies' governance structure in China. Future research would be worth extending the overall sample period by including coverage of more firms and developing better agency cost proxies that reflect the specific incentives of managers in Chinese firms. Moreover, to capture the changes in the cross-listed firms' ownerships or other governance structure characteristics, some dynamic model could be employed to better investigate the changes in corporate governance structures of the firms before and after the cross-listing. Some event studies can be conducted to test the endogeneity issue of cross-listing decisions. For example, conducting a pre-listing and post-listing comparison would be worthwhile in a future related study, similarly to Charitou et al. [70].

Although this study's subject was Chinese firms, its implications can be helpful to any firms in emerging markets that are preparing to cross-list abroad for their sustainable financing in the future. We suggest that companies preparing to cross-list on overseas stock exchanges should put more effort into improving their internal corporate governance structure. This means that the corporate governance structure between Chinese and other developing countries' companies are somewhat different. However, if companies want to secure sustainable financing, they must keep higher foreign and institutional ownership and better alignment of managers' incentives with those of shareholders to achieve a more transparent and superior corporate governance structure.

Appendix A

Table A1. Pearson pairwise correlations between the major variables for cross-listed firms.

.	AC1	AC2	BodSize	BodAct	Duality	OutDir	Own	DirOwn	InsHold	CR251	BodComp	Size	Lev	MB Ratio	ROE	Cash
AC1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AC2	−0.0847 (0.2356)	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BodSize	0.1031 (0.1484)	−0.0554 (0.4387)	1	-	-	-	-	-	-	-	-	-	-	-	-	-
BodAct	−0.0815 (0.2537)	0.1650 (0.0202 **)	0.1476 (0.038)	1	-	-	-	-	-	-	-	-	-	-	-	-
Duality	0.1288 * (0.0705)	0.0158 (0.8257)	0.0325 (0.6494)	−0.1146 (0.108)	1	-	-	-	-	-	-	-	-	-	-	-
OutDir	0.0164 (0.8187)	0.0070 (0.9217)	−0.5569 *** (<0.0001)	−0.0005 (0.9948)	0.1044 (0.1433)	1	-	-	-	-	-	-	-	-	-	-
Own	0.1728 ** (0.0149)	−0.2225 *** (0.0016)	−0.0550 (0.4418)	0.0238 (0.7395)	−0.1627 ** (0.022)	0.1223 * (0.0861)	1	-	-	-	-	-	-	-	-	-
DirOwn	−0.0813 (0.2549)	0.0769 (0.2817)	−0.2226 *** (0.0016)	0.0048 (0.9463)	0.1443 ** (0.0425)	0.0730 (0.307)	−0.2342 *** (0.0009)	1	-	-	-	-	-	-	-	-
InsHold	0.1426 ** (0.045)	−0.0660 (0.3555)	0.1181 * (0.0975)	−0.0554 (0.4382)	0.0934 (0.1907)	−0.1505 ** (0.0343)	−0.2984 *** (<0.0001)	−0.0306 (0.6692)	1	-	-	-	-	-	-	-
CR251	−0.1345 * (0.0588)	0.004 (0.9558)	0.1144 (0.1084)	−0.0377 (0.5981)	0.1256 * (0.078)	−0.1412 ** (0.0473)	−0.7819 *** (<0.0001)	0.2953 *** (<0.0001)	0.3073 *** (<0.0001)	1	-	-	-	-	-	-
BodComp	0.0765 (0.284)	0.0905 (0.2048)	0.1494 ** (0.0356)	0.2510 *** (0.0004)	0.1207 * (0.0904)	0.0908 (0.2035)	−0.1416 ** (0.0467)	0.0075 (0.9168)	0.0664 (0.3529)	0.1094 (0.1249)	1	-	-	-	-	-
Size	0.0792 (0.2676)	−0.4366 *** (<0.0001)	0.1207 * (0.0903)	0.0590 (0.4087)	−0.0525 (0.4625)	0.1869 *** (0.0084)	0.4217 *** (<0.0001)	−0.2045 *** (0.0039)	−0.2415 *** (0.0006)	−0.2291 *** (0.0012)	0.4438 *** (<0.0001)	1	-	-	-	-
Lev	−0.0679 (0.3421)	−0.0455 (0.5241)	0.0782 (0.2733)	0.2436 *** (0.0005)	−0.0084 (0.9063)	0.0731 (0.3058)	0.0769 (0.2814)	−0.048 (0.5018)	−0.1016 (0.1558)	−0.0766 (0.2834)	0.1750 (0.0137)	0.3840 *** (<0.0001)	1	-	-	-
MB ratio	−0.0185 (0.7960)	−0.4821 *** (<0.0001)	0.1193 * (0.0942)	−0.0923 (0.1961)	0.1169 (0.1009)	0.0210 (0.7690)	0.1892 * (0.0076)	−0.1181 * (0.0975)	−0.1667 ** (0.0189)	−0.0722 (0.3118)	0.1425 ** (0.0453)	0.6225 *** (<0.0001)	0.2301 ** (0.0011)	1	-	-
ROE	0.1503 ** (0.0345)	−0.1223 * (0.0860)	0.0682 (0.3398)	0.0392 (0.5839)	−0.0240 (0.7377)	0.0246 (0.7308)	−0.0248 (0.7287)	−0.0397 (0.5783)	0.0677 (0.3434)	0.0788 (0.2695)	0.3516 *** (<0.0001)	0.1837 *** (0.009)	−0.1754 ** (0.0135)	−0.0096 (0.8937))	1	-
Cash	−0.2295 *** (0.0011)	0.1391 (0.0506*)	0.0014 (0.9845)	0.0262 (0.7142)	−0.0628 (0.3797)	−0.011 (0.8774)	−0.226 *** (0.0014)	0.0062 (0.9307)	0.1275* (0.0734)	0.2305 *** (0.0011)	0.0788 (0.869)	−0.0118 (<0.0001)	−0.3041 *** (<0.0001)	−0.4402 *** (<0.0001)	−0.2973 *** (0.2222)	1

Note: The variable definitions and measurements are provided in Table 2. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. *p*-values are presented in parentheses.

Table A2. Pearson pairwise correlations between the major variables for domestically listed firms.

	AC1	AC2	BodSize	BodAct	Duality	OutDir	Own	DirOwn	InsHold	CR251	BodComp	Size	Lev	MB Ratio	ROE	Cash
AC1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AC2	−0.2026 *** (0.0042)	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BodSize	−0.0222 (0.7558)	−0.1057 (0.1382)	1	-	-	-	-	-	-	-	-	-	-	-	-	-
BodAct	0.1339 * (0.0600)	−0.1607 ** (0.0237)	0.0272 (0.7034)	1	-	-	-	-	-	-	-	-	-	-	-	-
Duality	−0.0946 (0.185)	0.0621 (0.3845)	−0.2715 *** (0.0001)	0.0345 (0.6296)	1	-	-	-	-	-	-	-	-	-	-	-
OutDir	0.003 (0.967)	−0.1498 ** (0.0351)	−0.4819 *** (<0.0001)	0.0945 (0.1855)	0.212 (0.0027)	1	-	-	-	-	-	-	-	-	-	-
Own	0.118 (0.0977)	−0.5025 *** (<0.0001)	0.0382 (0.5935)	−0.2572 (0.0003)	−0.1253 (0.0785)	0.0517 (0.4693)	1	-	-	-	-	-	-	-	-	-
DirOwn	−0.1191 * (0.0946)	0.3178 *** (<0.0001)	−0.2021 *** (0.0043)	0.0571 (0.4241)	0.4045 *** (<0.0001)	−0.0404 (0.5723)	−0.3136 *** (<0.0001)	1	-	-	-	-	-	-	-	-
InsHold	−0.1306 * (0.0667)	0.1982 *** (0.0051)	0.0199 (0.7807)	0.1683 ** (0.0178)	−0.154 ** (0.0303)	−0.1322 * (0.0634)	−0.2361 *** (0.0008)	−0.1202 * (0.0916)	1	-	-	-	-	-	-	-
CR2–5	0.0083 (0.9072)	0.2062 (0.0036 **)	0.0449 (0.5299)	0.1006 (0.1587)	0.0031 (0.9654)	−0.0435 (0.5433)	−0.5265 (<0.0001)	0.0719 (0.3142)	0.0439 (0.5392)	1	-	-	-	-	-	-
BodComp	0.2227 (0.0016 **)	0.0576 (0.4205)	0.0877 (0.219)	0.0928 (0.1933)	−0.1583 (0.026)	0.0232 (0.7455)	−0.0086 (0.9041)	−0.1209 (0.0897)	0.1933 (0.0064)	0.021 (0.7695)	1	-	-	-	-	-
Size	0.1593 ** (0.025)	−0.5533 *** (<0.0001)	0.1243 (0.081)	−0.0536 (0.4536)	−0.2463 *** (0.0005)	−0.2433 *** (0.0006)	0.4797 *** (<0.0001)	−0.4193 *** (<0.0001)	−0.0368 (0.6071)	−0.1985 *** (0.0051)	0.3554 *** (<0.0001)	1	-	-	-	-
Lev	0.2106 *** (0.0029)	−0.345 *** (<0.0001)	0.0697 (0.3292)	0.1236 * (0.0827)	−0.1525 ** (0.032)	0.0883 (0.216)	0.1351 * (0.0578)	−0.3146 *** (<0.0001)	0.1353 * (0.0574)	−0.028 (0.6958)	0.1329 * (0.062)	0.479 *** (<0.0001)	1	-	-	-
MB ratio	0.0475 (0.5066)	−0.4848 *** (<0.0001)	0.1841 *** (0.0094)	−0.0257 (0.7195)	−0.1435 (0.0438)	0.0834 (0.2428)	0.4268 *** (<0.0001)	−0.2905 *** (<0.0001)	−0.0184 (0.7969)	−0.1803 ** (0.0110)	0.1573 ** (0.0269)	0.6655 *** (<0.0001)	0.0458 (0.5215)	1	-	-
ROE	0.0459 (0.5205)	0.0386 (0.5897)	−0.1073 (0.1323)	0.0122 (0.8650)	−0.0571 (0.4241)	0.0376 (0.5988)	−0.0229 (0.7490)	0.0364 (0.6111)	0.1059 (0.1375)	−0.0154 (0.8292)	0.0507 (0.4787)	−0.0505 (0.4795)	0.0458 (0.5215)	−0.1525 ** (0.0320)	1	-
Cash	−0.1179 * (0.0981)	0.0719 (0.3141)	−00.0272 (0.7033)	−0.0067 (0.9251)	−0.0267 (0.7068)	0.0187 (0.7937)	−0.0094 (0.8958)	−0.0168 (0.8140)	−0.0129 (0.8572)	0.0026 (0.9709)	−0.1007 (0.1581)	−0.2207 *** (0.0018)	−0.4027 *** (<0.0001)	−0.1830 *** (0.0099)	−0.0167 (0.8158)	1
Cash	−0.1179 * (0.0981)	0.0719 (0.3141)	−0.0272 (0.7033)	−0.0067 (0.9251)	−0.0269 (0.7068)	0.0187 (0.7937)	−0.0094 (0.8958)	−0.0168 (0.814)	−0.0129 (0.8572)	0.0026 (0.9709)	−0.1007 (0.1581)	−0.2207 (0.0018)	−0.4027 (<0.0001)	−0.1830 (0.0099)	−0.0167 (0.8158)	1

Note: The variable definition and measurements are provided in Table 2. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. *p*-values are presented in parentheses.

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