Managerial ownership, corporate governance and firms' exporting decisions: evidence from Chinese listed companies

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Managerial Ownership, Corporate Governance, and Firms' Exporting Decisions: Evidence from Chinese listed companies

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Using a large panel of Chinese listed companies over the period 2004-2010, we document that both export propensity and intensity increase with managerial ownership up to a point of around 23%-27%, and decrease thereafter. In addition, we find a negative association between state ownership and export intensity. Finally, we observe that the larger the board size, the lower the firm's export propensity and intensity, and that firms with a higher proportion of independent directors in the board are generally less likely to export. These findings are mainly driven by privately-controlled firms during the post-2006 period.

Keywords: Managerial ownership; corporate governance; export propensity; export intensity; firm heterogeneity; China.

JEL Classification: F14; G32; G34; L25

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1. Introduction

For many decades, the internationalization of firms' operations has been a widely researched phenomenon in both developed and developing countries. Internationalization encompasses a wide variety of activities including exporting, foreign direct investment, global outsourcing and licensing. Recently, there has been a rapid growth in the internationalization of firms in transition economies such as China, India, Russia and East European countries. Exporting has been the dominant mode of foreign market participation, and a number of firm-level studies provide evidence that participation in export markets improves firms' economic performance, financial health and long-run survival prospects (Greenaway et al., 2007; Park et al., 2010).

Encouraging the internationalization of domestic firms has been a prominent policy choice in many countries, especially developing and transition economies (Buck et al., 2000). This has been done particularly via exports, following the example of the export-led growth achievement of the Asian tigers such as Singapore, South Korea, and Taiwan (World Bank, 1993)[1]. Participation in export markets is often viewed as helpful for economic growth, especially in emerging economies, as evidenced by a large number of cross-country studies at the aggregate level, which report a positive relationship between international trade and economic growth (Frankel and Romer, 1999). The desire to promote international sales is not limited to transition and emerging economies. Bernard and Jensen (2004) note that all fifty U.S states have offices to assist firms' overseas sales, and document a considerable rise in the resources committed to export promotion in the US.

Considering that expansion to international markets offers many advantages to firms, one can ask why not all firms engage in international trade. One possible reason is that venturing into international markets for the first time involves large initial fixed and

sunk start-up costs, and a considerable risk and uncertainty (Roberts and Tybout, 1997; Bernard and Jensen, 2004; Caggese and Cuñat, 2013). Recent developments in international trade theory have used a combination of these fixed and once-and-for-all start-up costs and heterogeneity in productivity to explain variations in firms' export market participation decisions (Bernard et al., 2003; Melitz, 2003; Bernard and Jensen, 2004)[2]. In a similar vein, following the pioneering empirical work of Greenaway et al. (2007), a number of recent papers study how financial factors influence exporting decisions (Berman and Héricout, 2010; Minetti and Zhu, 2011; Caggese and Cuñat, 2013).

Yet, the trade literature has largely neglected the effects of managerial incentives and other corporate governance mechanisms, which have been shown to significantly affect other aspects of firm behavior in the corporate finance literature. A large body of theoretical and empirical studies investigate the effects of managerial incentives and governance mechanisms on firm performance and various types of corporate decisions including investment in physical assets and research and development (R&D). For example, Jensen and Meckling's (1976) interest-alignment hypothesis suggests that managerial ownership aligns the incentives of managers with the interests of shareholders and provides top management with incentives to undertake risky investments and make decisions in the best interest of shareholders[3]. A counter-argument is proposed by Amihud and Lev (1981) and May (1995) who show that when managers' shareholding is sufficiently large, they become entrenched, and tend to adopt investment and financing policy choices which reduce firms' idiosyncratic risk at the expense of shareholders' interests. In addition to managerial incentives, other corporate governance related variables such as state or foreign ownership, or board structure have been shown to significantly affect firm performance (see Brown et al., 2011, for a survey).

In this paper, we connect the international trade literature on the determinants of firms' exporting activities, with the corporate finance literature which has shown the

importance of managerial ownership and other corporate governance mechanisms on firm behavior. The primary governance attribute we consider is managerial ownership. Additionally, we examine the effects of other forms of corporate ownership such as state, legal person, and foreign shareholding, as well as the characteristics of the board of directors on firms' internationalization decisions. We build on existing literature (Filatotchev et al., 2001 and 2007; Lu et al., 2009; Fu et al., 2010), which has typically analyzed the effects of a single or few specific corporate governance mechanisms on firm exporting behavior, by considering the simultaneous effect of several mechanisms. This approach mitigates omitted-variable bias and enables us to control for possible interactions between mechanisms. Our analysis focuses on both export propensity and intensity, which in our view, gives readers a thorough overview of the extent to which managerial ownership and other corporate governance variables affect firms' overall export strategy

Our study is based on a large panel of Chinese listed firms over the period 2004-2010, which we differentiate into state- and privately-controlled. We believe that China represents an interesting case study for the analysis of the links between corporate exporting decisions and corporate governance mechanisms for the following two reasons. First, its accession to the WTO in late 2001 opened up tremendous business opportunities for Chinese firms worldwide. A large number of Chinese firms have consequently internationalized their operations, and the country has now become the first exporter in the world. Second, China's corporate governance has been evolving and improving rapidly so as to cope with its fast economic growth and the desire to integrate with the global economy. For instance, after June 2003, companies were required to appoint one third of independent directors to their boards. In addition, following the 2005-2006 split-share structure reform, agency problems were significantly reduced, and restrictions on managerial stock ownership were removed (Li et al., 2011; Conyon and He, 2011). To the best of our knowledge, ours is the first study looking at the links between corporate

governance and firm exporting decisions in China, focusing on the differences between the pre- and post-reform period. Additionally, we are also the first to investigate differences in these links between state-controlled and privately-controlled firms,

Using a dynamic modelling framework to control for the persistence in exporting (due to sunk costs), and controlling for firm heterogeneity and endogeneity, we document a strong non-monotonic relationship between managerial shareholding and export propensity and intensity. This implies that as managerial ownership increases, managers are provided with the incentive to align their interest with that of shareholders, which reduces agency costs and contributes towards shareholder-value maximization. Yet, after a threshold level is reached, managers become risk adverse and entrenchment effects become prominent, affecting firms' behavior in a manner that is not conducive for international expansion. In addition, we find a negative association between state ownership and export intensity. Finally, we observe that the larger the board size, the lower the firm's export propensity and intensity, and that firms with a higher proportion of independent directors in the board are generally less likely to export. These findings are mainly driven by privately-controlled firms during the post-2006 period and suggest that in the Chinese context, in order to promote the international presence of Chinese firms, company shares should be included in the compensation package of managers, state ownership should be further reduced, and firms should be encouraged to have smaller boards and to pay particular attention to the quality of the independent directors in their boards.

The remainder of the paper proceeds as follows. Section 2 provides a description of the institutional environment in China. In Section 3, we present some theoretical background on the links between managerial ownership and other corporate governance variables, on the one hand, and internationalization decisions, on the other; review the related existing empirical evidence; and develop our hypotheses. Section 4 discusses our baseline specification and estimation methodology. Section 5 describes the data and

provides descriptive statistics. We discuss our empirical results in Section 6. Section 7 concludes.

2. Institutional environment in China

2.1. Internationalization

Since its accession to the WTO in 2001, China's export performance has been phenomenal. In 2007, the Chinese government has set up the China Investment Corporation (CIC), with the aim of actively encouraging Chinese firms to expand operations abroad (Brainard and Fenby, 2007). China's economic expansion overseas is occurring at different levels of engagement using various modes of internationalization. Exporting is by far the most significant aspect of internationalization in terms of economic value (Child and Rodrigues, 2005). In particular, China's total exports increased tremendously during the last three decades: from US$8 billion (around 1 percent of world exports) in 1978-89 to US$1,442 billion (13.4 percent) in 2005-06 (Athukorala, 2009). In 2006, China became the world's second largest exporter after Germany, and in 2010, the largest exporter (CIA, 2010). In 2007, its exports to GDP ratio was at 37.5 per cent, more than three times higher than the average level of around 10 per cent characterizing the other major economies such as the US, Japan, India, and Brazil (Athukorala, 2009). The technological sophistication of Chinese exports has also increased substantially and these exports now show significant overlap with the products of OECD countries (Schott, 2008). China is therefore clearly an ideal laboratory to explore the internationalization behavior of firms.

2.2 Managerial incentives

Despite these achievements, the corporate governance systems of Chinese listed firms and the institutions that support them have long been criticised for their ineffectiveness

(Clarke, 2003; Allen et al., 2005). In particular, despite the numerous ownership reforms that took place during the last decades, the Chinese government not only dominates over economic affairs, but also retains a substantial portion of ownership in a large number of listed corporations.

Given that most of the assets in China are owned by the state, historically, the government adopted various incentive systems to make the management of these assets more efficient. In addition to the partial privatization and corporatization of former SOEs, these mainly include managerial autonomy and a management responsibility system (Su, 2005). During the 1980s, the Chinese government introduced managerial autonomy by decentralizing managerial decision rights of state-owned enterprises (SOEs) from the central government down to the firm level. In addition, as discussed in Bai and Xu (2005), as part of the economic reform process in the 1980s, the Chinese central government delegated some of its decision rights (including exporting) to SOE managers, in order to induce them to become more efficient. This exercise was motivated by the central government's willingness to promote markets and to gradually phase out its central planning function (Fan et al., 2007). Groves et al. (1994) provide evidence that managerial autonomy improved corporate productivity[4].

Subsequently, other forms of managerial incentives such as CEO pay-performance sensitivities and CEO turnover-performance sensitivities were introduced. Yet, large government ownership and control have been found to weaken the positive effects of these managerial incentives (Kato and Long, 2006 a, b, c; Conyon and He, 2011)[5].

More recently, following the 2005-2006 split-share structure reform, which removed restrictions on managerial stock ownership, the literature has considered managerial ownership as another type of managerial incentive. A number of studies document that, with the deepening of market-oriented reforms, the introduction of foreign investment and the global pay benchmark, managers' ownership shares in Chinese publicly

listed corporations have considerably increased in recent years[6]. For example, average managerial ownership rose from less than 1% before 2000 (Tian and Estrin, 2008) to around 8% in 2010[7]. Furthermore, Conyon and He (2011, 2012) report that the worth of CEO share ownership is much higher than their executive pay (greater than 400 times in 2010). Since the state imposes a ceiling on how much SOE managers can be paid, some managers may choose to shirk instead of being productive, while other productive managers may enjoy on-the job consumption or perquisites (Fan et al., 2011). By contrast, equity ownership directly links managers' efforts to their wealth, giving them strong incentives to work hard[8].

In addition, considering that Chinese firms are characterized by severe agency problems due to the separation of ownership and control (Qian, 1996; Xu et al., 2005)[9], equity ownership provides an important mechanism to align the top management's interests with those of shareholders and to focus managers' efforts on value-increasing decisions (Jensen and Meckling, 1976).

Lin et al. (2009) show a large and significant effect of insiders' equity ownership on the efficiency of Chinese corporations. Along similar lines, Chow (1997) observes that whatever the type of managerial incentive system adopted by the government, there is a positive association between the profit of the enterprise and the economic benefits to the management. Therefore, he rightly stresses that "providing incentives for the management of publicly owned assets is a key to China's success" (Chow, 1997, p. 321).

In the light of these developments, it is increasingly interesting to see how internationalization and managerial ownership, which are two constantly evolving phenomena, interact with each other in the Chinese context. This is the main objective of our study.

3. Literature review and hypotheses

In this section, we review the literature on the agency theory of managerial decision-making and its impact on firms' export market participation decisions, and develop testable hypotheses.

As we discussed in the introduction, the international trade literature has made significant progress in explaining firms' export market participation decisions. Sunk costs such as gathering information on foreign markets, developing marketing channels, adapting products and packaging to foreign taste, and learning to deal with new bureaucratic procedures play an important role in determining these decisions (Greenaway and Kneller, 2007). As such, only large and productive firms can achieve a net present value of profits from exports sufficiently large to offset the entry sunk costs. Other studies have also shown how financial factors affect firm export market participation decisions (see, for instance, Greenaway et al., 2007).

Yet, the literature on firm heterogeneity and exporting has largely neglected the importance of managerial ownership and other corporate governance characteristics, which have been found to be pervasive in other aspects of firm behavior, such as financing and investment in fixed capital (Jensen and Meckling, 1976; Fama, 1980; and Fama and Jensen, 1983; Shleifer and Vishny, 1997). Entering foreign markets engenders large ex-ante fixed sunk costs, which can be seen as a form of investment in intangible assets, as modelled in Melitz (2003). This investment involves risk and uncertainty (Dixit, 1989; Roberts and Tybout, 1997), including a potential bankruptcy risk (Caggese and Cuñat, 2013)[10]. It also reflects complexity and information asymmetry between owners and managers (Morck and Yeung, 1991), and between firms and lenders such as banks (Caggese and Cuñat, 2013). Given the association between the decision to enter export markets and an investment decision, it can be argued that managerial incentives, and, more in general, corporate governance mechanisms, which have been found to have significant

effects on corporate investment, may have important bearings on this decision as well. This suggests that differences in corporate governance may explain observed differences in firms' export behavior: it is possible that only firms with robust governance structures are able to engage in international activities. Alternatively, suboptimal governance structures may prevent top managers from participating in export markets. Thus, by exploring how governance issues in general and managerial ownership in particular affect exporting decisions, a new dimension —corporate governance— is added to the firm heterogeneity theory of international trade.

Only a few studies have analyzed the relationship between corporate governance and firms' internationalization decisions. Examples of these are Hobdari et al. (2011) who, focusing on Slovenian and Estonian firms, find that firms under the control of employees and/or managers tend to export more, whilst state control tends to have a negative effect on firms' export orientation. Along similar lines, Filatotchev et al. (2007) show that managers' independence and board participation of foreign stakeholders are positively associated with the internationalization decisions of Polish and Hungarian companies. Buck et al. (2000) and Filatotchev et al. (2001, 2008) conclude that managerial ownership and managers' decision making independence enhance both the export propensity and intensity of firms in transition economies. Furthermore, Calabro et al. (2009) and Calabro and Mussolino (2013) show that board characteristics have an important impact on the internationalization decisions of family businesses in Norway.

To the best of our knowledge, only a handful of studies have focused on links between internationalization and corporate governance in the Chinese context. Among these, Lu et al. (2009) use data on listed companies over the period 2002 to 2005 and find that CEO share ownership and the ratio of outside directors in the board are positively associated with firms' exporting decisions, whilst ownership concentration is negatively associated with it. Fu et al. (2010) use data on Chinese non-listed manufacturing firms over

the period 1999 to 2003 and show that wholly foreign owned firms and joint-ventures with foreign control have higher export propensity and intensity than domestic firms or joint-ventures with domestic control. Yi (2014) and Yi and Wang (2012) use data on approximately 30,000 firms operating in the Zhejiang province over the period 2001-2003 and find that especially for small and medium-sized enterprises, foreign ownership is positively associated with firms' export decisions, while state ownership appears to make exporting less likely. We build on these studies by making use of a larger and more representative dataset for a much more recent post-split-share structure reform time period, by analyzing the effects of a broader range of corporate governance variables on firms' export propensity and intensity, and by differentiating firms into state-controlled and privately-controlled. We next turn to how specific internal governance mechanisms can be used to provide managers with the incentives necessary to make investment decisions, including the decision to enter export markets.

3.1 Managerial ownership

In a situation where managerial actions and/or the details of the investment opportunities are not perfectly observable by shareholders, there will be an incomplete contracting against managerial policy choices. One way to solve this problem is to give managers incentives in the form of equity stakes in the firm (Jensen and Meckling, 1976). This helps to resolve managers' moral hazard problems by aligning their incentives with the interests of the shareholders. We refer to this as the interest alignment effect. Consistent with this prediction, Agrawal and Mandelker (1987) argue that managers' holdings of common stock and options in the firm reduce incentive problems by motivating managers to make value-increasing investment decisions. Along similar lines, Denis et al. (1997) find that managerial equity ownership is positively associated with value-increasing corporate decisions. More recently, Coles et al. (2006) provide evidence that managerial holdings of

shares and stock options provide managers with incentives to implement riskier policy choices, including more investment in R&D. Although these studies are based on US data, their findings are likely to apply to the Chinese case as well. This is confirmed by Lin et al. (2009), who show that the level of firm efficiency in China is positively associated with insiders' ownership. Similarly, using data from 970 Chinese listed firms over the period of 2007-2008, Liu et al. (2012) argue that managerial ownership is positively related to the performance of state-owned enterprises (SOEs).

A counter-argument is provided by Amihud and Lev (1981) and May (1995) who show that when managers' shareholding is sufficiently large, they will become entrenched and engage in risk-reduction activities, adopting investment and financing policy choices which reduce firms' idiosyncratic risk at the expense of shareholders' interests. Similarly, John et al. (2008) argue that managers with large insider ownership stakes in firms may opt for conservative investment policies, even to the extent of passing up risky projects with high positive net present value to the detriment of shareholders. Furthermore, according to La Porta et al. (1999), when managerial ownership reaches a threshold, further increasing it is likely to make managers entrenched, which may lead them to abuse power and exploit small shareholders instead of undertaking value-enhancing investment projects. We refer to this as the entrenchment effect.

In a seminal work based on US data, Morck et al. (1988) provide the first empirical evidence for a non-monotonic relationship between managerial shareholding and performance. Using a piecewise linear model, they find that until inside ownership reaches 5%, increasing ownership results in higher firm value (i.e. Tobin's Q increases); between 5% and 25%, increasing ownership negatively affects firm value; and finally firm value rises with inside ownership thereafter (but the effects are small). The rationale suggested by Morck et al. (1988) for this non-monotonic relationship is as follows. Managers have a natural tendency to indulge their preferences to the detriment of other shareholders.

Consistent with Jensen and Meckling's (1976) alignment hypothesis, at lower levels of managerial ownership, further increases in managers' ownership align their interest with that of other shareholders, and thus, they work hard to maximize firm value, benefitting all shareholders (shared benefits). Yet, increasing managers' stock ownership not only gives them a residual claim on profit, but also increases their voting power, insulating them from other disciplinary forces, and making them more entrenched. This provides managers with incentives to use corporate assets for their own (private) benefits. Similarly, McConnell and Servaes (1990) examine the relationship between insider ownership and performance measured by Tobin's Q using a quadratic model for insider ownership, and find an inverted U-shaped relation for insider ownership. More recently, Kim and Lu (2011) report evidence suggesting a hump-shaped relation between managerial ownership and R&D expenditure of US firms. Along similar lines, some recent studies show that in the Chinese context, managerial ownership is positively associated with corporate performance. Yet, very high levels of ownership show negative performance effects (Li et al., 2007b, and Hu and Zhou, 2008).

Moving the above literature forward, we investigate the extent to which managerial ownership affects Chinese listed firms' export market participation decisions. We expect the alignment and entrenchment effects to apply to these decisions in the same way as they have been found to apply to firm performance, in general, and other risky corporate activities such as R&D expenditure, in particular. We therefore hypothesize that:

H1: There is a non-monotonic (inverted U-shaped) relationship between managerial ownership and firms' export propensity and intensity. Specifically, at low levels of managerial ownership, increases of the latter will rise export propensity and intensity, thanks to the alignment between managers' and shareholders' interests. Yet, at high levels of managerial ownership, further increases of the latter will lower export propensity and intensity, due to the managerial entrenchment effect.

3.2 Other ownership types

We next examine the extent to which other ownership types, in addition to managerial ownership, affect export propensity and intensity. In particular, we focus in turn on the effects of state, legal person, and foreign ownership.

3.2.1 State ownership

Research from both developed countries and developing countries (including China) often shows that state ownership contributes to operational inefficiency and poor performance in firms (Megginson et al., 1994; Shleifer, 1998; Dewenter and Malatesta, 2001; Kato & Long, 2006a, b, c). This can be due to the following reasons: (i) poor motivation of the top management team, (ii) excess labor and wages, (iii) appointment of people with political influence to senior positions by government without considering their expertise, (iv) pursuit of multi-goals, namely social and political goals, and (v) higher transaction costs, (vi) divergence between cash flow rights and control rights for the controlling shareholder: while government agents/bureaucrats have control over SOEs, the cash flow rights of SOEs belong to the state or the Treasury.

In the Chinese context, substantial state ownership is observed in transformed SOEs, which are generally inefficient and reluctant to undertake risky value-enhancing investments such as venturing into international markets. The reluctance of SOEs to export can be explained as follows. First, SOE managers in Chinese listed corporations face complex agency problems, soft budget constraints, corruption, and have weaker incentives than their counterparts at privately-controlled firms (Sun and Tong, 2003; Wei et al., 2005; Yi and Wang, 2012) [11]. This explains why innovation activities, which are typically risky and value-enhancing, are significantly lower in SOEs than in non-SOEs (Guariglia and Liu, 2014), and why SOEs' participation in export markets is limited.

Second, Chinese SOEs are generally expected to pursue several political and social objectives (Bai and Xu, 2005), which often do not go hand in hand with profit maximization, and hence, make these companies less competitive in export markets. Third, state-owned firms typically have lower productivity than firms owned by other agents, which provides an additional barrier to export entry (Yi and Wang, 2012). Finally, considering that the state holds shares in strategically important resources and energy industries, such as petroleum, nuclear fuel, raw chemical material, mining and supply of electric and heat power, gas and water, which are less export-oriented industries in China (Lee, 2009), it is reasonable to expect that firms with considerable state-owned shares are less likely to export[12]. We therefore hypothesize that:

H2: There is a negative relationship between state ownership and firms' export propensity and intensity.

3.2.2 Legal person ownership

Legal person shareholders in China are represented by domestic institutions such as mutual funds, government agents, or insurance companies. Several studies suggest that these shareholders have the opportunity, necessary capacity, and incentives (due to their large stake in a firm) to monitor managers' activities in order to enhance firm performance (Cornett, et al, 2007), and are likely to support risky policy choices including internationalization (George and Prabhu, 2000). Institutional investors can also influence a firm's strategic behavior through persuasion and private or public activism (Tihanyi et al., 2003). In general, institutional shareholders also tend to have a longer tenure, which leads them to adopt longer investment horizons. This can mitigate the incentives for myopic investment decisions and thus lead to greater investment efficiency.

In the case of Chinese listed firms, some studies show that legal person shareholding is positively associated with firm performance since institutional shareholders

have diverse professional backgrounds and are usually the largest shareholder of the firm (Sun and Tong, 2003). Among these, using a sample of 1211 listed firms over the period of 2001-2005, Yuan et al. (2008) document a positive impact of mutual funds' ownership on corporate performance. In contrast, other researchers point out that mutual funds and insurance companies are often owned wholly or partially by different levels of government, which may lead to agency problems, which in turn may imply that fewer risky and value-enhancing investment choices are made[13]. Among these, Wei et al. (2005) report a negative relationship between legal person shareholding and firm value measured using Tobin's Q. Given the contrasting findings in the literature, we make no ex-ante prediction on the effects of legal persons' shareholding on firms' internationalization decisions.

3.2.3 Foreign ownership

The literature has traditionally argued that in emerging economies, the participation of foreign capital in domestic firms increases the probability of internationalizing their operations. Five main mechanisms can explain this conjecture. First, firms with foreign investors are more likely to adopt international standards of governance and business practices, which facilitate entry into international markets (Jackson and Strange, 2008). Second, these firms generally possess intangible firm-specific assets, such as advanced technology, marketing skills, brand name, and market networks, which provide them with a competitive advantage in the international market. Third, because they typically have well-diversified portfolios and superior monitoring abilities, foreign institutional investors are more likely to encourage firms in emerging markets to invest in risky ventures such as internationalization (Filatotchev, 2007). Fourth, foreign shareholders are more likely to pressure firms to employ better qualified CEOs/managers with international experience, who may favor exporting activities. Finally, multinational enterprises often take emerging

economies like China, as the export platform to serve their home market or other markets (Fu et al., 2010).

In the Chinese context, Fu et al. (2010) use data on Chinese non-listed manufacturing firms over the period 1999 to 2003, to show that wholly foreign owned firms and joint-ventures with foreign control have a higher propensity to export and a higher export intensity than domestic firms or joint-ventures with domestic control. Similarly, Yi (2014) and Yi and Wang (2012) use data on approximately 30,000 firms operating in the Zhejiang province over the period 2001-2003 and find that especially for small and medium-sized enterprises, foreign ownership is positively associated with firms' export decisions. In line with their findings, we hypothesize that:

H3: There is a positive relationship between foreign ownership and firms' export propensity and intensity.

3.3 Board of directors characteristics and exporting decisions

Traditional theoretical arguments (Fama, 1980; Fama and Jensen, 1983; Jensen, 1993), recent advances in the development of formal economic theories of boards of directors (Raheja, 2005; Harris and Raviv, 2008), and numerous empirical studies assert that boards of directors should help to resolve governance issues inherent in the management of a firm. Boards of directors are in fact entrusted with the power to hire, fire, evaluate, and compensate top management teams and curb their non-shareholder wealth-maximizing behavior. Thus, it is expected that boards of directors mitigate agency costs associated with the separation of ownership and control, enhancing the performance of the firms and, consequently, shareholders' wealth. In this spirit, in most countries, corporate laws require that firms should be governed by a board of directors. The question of how size and composition of the board are effective in curbing managerial opportunistic behavior and, thus, improving corporate performance dominates empirical studies in a substantial part of

the corporate governance literature. However, this empirical research provides mixed results.

3.3.1 Board size

Research indicates that the size of the board is an important governance mechanism as it affects its ability to be an effective monitor and guide. Monks and Minow (2004) suggest that since larger boards are able to commit more time and effort to overseeing management, board monitoring can improve the quality of managerial decision-making and lead to better firm performance. Adams and Mehran (2003) provide evidence suggesting that larger boards increase monitoring effectiveness and provide for greater board expertise. Recently, Coles et al. (2008) argue that complex firms (as proxied by size and business diversification) can benefit by having larger number of directors on their boards, since large and complex firms need directors' advise, counsel and expertise. They provide empirical support for their argument in that, in the case of complex firms, Tobin's Q increases with board size. Yet, it is negatively related with board size in small firms.

By contrast, Lipton and Lorsch (1992) and Jensen (1993) theoretically argue that larger boards are less effective in group decision-making and strategy formulation, and contribute to the entrenchment of CEOs. The reason for this is that large boards hardly reach consensus on their decisions, and agency problems such as directors' free-riding may increase within large boards. Prior studies also suggest that larger boards may lead to a low level of individual motivation and thus adversely affect their members' commitment and effective participation in decision making (Dalton et al., 1999). Yermack (1996) and Eisenberg et al. (1998) support this argument by providing empirical evidence that firm performance is enhanced by smaller boards.

We believe this last set of arguments is likely to apply to the Chinese case. In line with this conjecture, Li et al. (2007a) and Conyon and He (2012) show evidence that in the

Chinese context, larger boards are inconsequential or less effective in specific actions such as the determination of CEO compensation. Huyghebaert and Wang (2012) argue that large boards risk being dominated by powerful shareholders. They provide empirical evidence that although board size does not influence related-party transactions, it is associated with larger labor redundancies in Chinese listed SOEs. They conclude that large boards might favor the expropriation of minority investors. The increased agency problems associated with large boards (e.g. managers' entrenchment, directors' free riding, tunneling) are therefore likely to have a negative impact on Chinese firms' export propensity and intensity. We therefore hypothesize that:

H4: There is a negative relationship between the size of the board of directors and firms' export propensity and intensity.

3.3.2 Board independence

Because of their independence and concern to maintain their reputation in the external labor market , non-executive directors will effectively monitor the actions of the executive directors and managers so as to ensure that they are pursuing policies congruent with interests of shareholders and complement expert knowledge of top management (Fama, 1980; Fama and Jensen, 1983; Cadbury, 1992). Researchers suggest that because of their education and broad knowledge, experience, reputation and networks with other institutions, outside directors may play an information and service role, as well as a resource role, and also assist in making important strategic decisions (Zahra, 2003).

However, since an institutional environment which facilitates the effective functioning of outside directors has not yet been well established in China, some researchers cast doubt on the qualities and independence of outside directors. They also argue that outside directors are appointed merely to meet the requirements of the regulations and for the prestige of their value and, consequently, do not play their role as

effectively as their counterparts in developed countries (Clarke, 2003; Lau et al., 2007). They also point out that in China, independent directors are either lacking necessary financial and practical business knowledge or too busy to care about problems of listed companies and, consequently, find it difficult to provide a significant contribution to, and exert any substantial influence on the important decisions other than ornamenting the board[14]. We therefore pose the following hypothesis:

H5: There is no association/a negative association between the proportion of outside directors in the board and firms' export propensity and intensity.

3.4 Our contribution

Our main aim in this paper is to study the effect of managerial ownership on export propensity and intensity of Chinese listed companies, allowing for the relationship to be non-linear, controlling for a wide range of other corporate governance variables, using a more representative data sample and a more recent time period than previous studies, and differentiating firms into state- and privately-controlled. Our paper contributes to the trade literature by including governance components as new elements of firm heterogeneity, with the aim of better explaining the determinants of both export propensity and intensity. It also contributes to the growing literature on managerial incentives, and in particular managerial ownership, in the context of transition economies (Kato and Long, 2011). Furthermore, as our dataset spans the period 2004-2010, our study provides empirical evidence on some not previously documented consequences of the 2005-2006 split-share structure reform, through which non-tradable shares were floated in the open markets, and following which restrictions on managerial stock ownership were removed.

4. Baseline specifications and estimation methodology

4.1 Baseline specification

Our baseline model links firms' export decisions with corporate governance factors and firm characteristics, as follows:

$$\begin{aligned}
&EXPDUM_{it} \text{ or } EXPINT_{it} = \beta_0 + \beta_1 (EXPDUM_{i(t-1)} \text{ or } EXPINT_{i(t-1)}) + \beta_2 DOS_{i(t-1)} + \beta_3 DOS^2_{i(t-1)} + \beta_4 SOS_{i(t-1)} + \\
&+ \beta_5 LPS_{i(t-1)} + \beta_6 FOWNS_{i(t-1)} + \beta_7 BODSIZE_{(t-1))} + \beta_8 INDIR_{i(t-1)} + \beta_9 SIZE_{i(t-1)} + \beta_{10} AGE_{it} + \\
&+ \beta_{11} PROD_{i(t-1)} + \beta_{12} CIR_{i(t-1)} + \beta_{13} MBR_{i(t-1)} + \beta_{14} LEV_{i(t-1)} + \beta_{15} LIQTY_{i(t-1)} + \\
&+ v_i + v_t + v_j + v_r + \varepsilon_{it} \qquad (1)
\end{aligned}$$

where *i* indexes firms, *t* years. Table A1 in the Appendix provides definitions and expected signs for all variables used in this paper. When examining the probability of exporting, the dependent variable is export propensity (EXPDUM), i.e a binary variable taking the value of one if the firm exports, and zero otherwise. When we consider export intensity, on the other hand, the dependent variable (EXPINT) is a censored variable, which is zero if the firm does not export, and takes the actual value of the ratio of exports to total sales, otherwise.

Since previous studies provide strong evidence that exporting activity is characterized by high persistence due to the sunk start-up cost a firm needs to pay to enter export markets (Roberts and Tybout, 1997; Bernard and Jensen, 1999, 2004), we include the lagged dependent variable among our explanatory variables. Its coefficient can be interpreted as a measure for the path dependency of exporting activities.

The other independent variables in Equation (1) include proxies aimed at testing the effects of corporate governance mechanisms and other control variables proved by previous studies to be influential determinants of firms' exporting decisions.

Focusing on corporate governance mechanisms, we include managerial shareholding (DOS) and its square[15]. We also include legal person shareholding (LPS), foreign shareholding (FOWNS)[16], and state shareholding (SOS)[17]. Furthermore, we

include board size (BOARDSIZE) and the proportion of independent directors in the board (INDIR). We include these corporate governance variables first one by one, then in groups, and finally all together.

In line with previous studies, Equation (1) also includes several additional variables to control for a set of firm-specific characteristics that are likely to be correlated with firms' internationalization decisions. These are firm size (SIZE), labor productivity (PROD), the capital intensity ratio (CIR), firm age (AGE), the market-to-book ratio (MBR), the leverage ratio (LEV) and the liquidity ratio (LIQTY).

Firm size is measured by the natural logarithm of total real sales at the firm level. A positive relationship between firm size and foreign activities such as exporting is often considered as a stylized fact, as several studies found that both the probability of exporting and export intensity rise with firm size (see, for instance, Greenaway et al., 2007; and Wagner, 2010). A larger size reflects firms' ability to attract and deploy resources (such as finance, expertise, and so on) needed for international operations; economies of scale in production; and also a higher capacity for taking risks (e.g. investment in R&D and development of new products) due to internal diversification. Consequently, large firms produce at lower average cost and may display higher productivity than smaller firms, and are, as such, more likely to export. Firm age is expected to have a positive association with export propensity and intensity, given that older firms are likely to suffer less from asymmetric information problems, which may make it easier for them to obtain the financing necessary to venture abroad. Labor productivity is measured as the ratio of real sales to the number of employees. A higher productivity reflects firms' success in generating the profits necessary to recover the sunk costs that need to be faced when entering export markets. Consequently, we expect more productive firms to be more likely to export (Bernard and Jensen 2004). Capital intensity is calculated as the ratio of real fixed assets to the number of employees. More capital intensive firms are expected to be

more likely to engage in export activity. Growth opportunities are proxied by the market-to-book ratio. If managers' decisions to invest in export activities reflect a real growth opportunity, we would expect a positive relationship between the market-to-book ratio and international expansion decisions. Leverage, which is defined as the total debt to total assets ratio, is used to capture the effect of capital structure. As in Greenaway et al. (2007), we expect a negative relationship between leverage and export market participation decisions, as high leverage is generally associated with unhealthy balance sheets. Liquidity is given by the ratio of current assets minus current liabilities to total assets. Firms with higher liquidity have been proved in previous literature to have a higher probability to export and a higher export intensity (Greenaway et al., 2007).

The error term in Equation (1) is made up of five components. v_i is a firm-specific effect; $v_{t,}$ a time-specific effect, which we control for by including time dummies capturing business cycle effects; $v_{j,}$ an industry-specific effect, which we take into account by including industry dummies; and $v_{r,}$ a region-specific effect, which we control for by including a full-set of regional dummies. Finally, ε_{it} is an idiosyncratic component.

4.2 Estimation methodology

4.2.1 Random- effects probit and tobit models

To examine the extent to which corporate governance factors determine export propensity and intensity, we use two estimation methods. The first is a random-effects probit model used to estimate the probability of exporting. The second is a random-effects tobit model used for export intensity (measured as the ratio of foreign sales to total sales). Since the export ratio is characterized by a large number of zeroes, the tobit model is appropriate. We use random-effects probit and tobit models to control for unobserved heterogeneity: unobserved attributes, such as managers' skills, and attitudes towards risk are in fact likely to affect both the probability of exporting and the amounts exported.

4.2.2 Endogeneity

Our estimates may be affected by reverse causality. The relationship between governance mechanisms and exporting may in fact be dynamic, in the sense that on the one hand, robust governance systems may facilitate exporting decisions. Yet, on the other hand, a firm's increased participation in international markets may require additional equity ownership to be awarded to managers to compensate their efforts in dealing with the additional complexities, information asymmetries, and agency problems arising from entering into international markets (Rose and Shepard, 1997). In addition, stronger governance structures may become necessary to ensure firm survival in the more competitive global environment. It is therefore crucial to control for "dynamic endogeneity" in our study.

We address the potential endogeneity issue in two main ways. First, we include one-period lag of all corporate governance and other explanatory variables, with the exception of firm age and dummy variables, in all our specifications. A similar approach is also used in many previous studies (see, among others, Roberts and Tybout, 1997; and Coles et al., 2006).

Second, following Bernard and Jensen, (2004) and Greenaway et al. (2007), we use the Generalized Method of Moments (GMM) estimator in addition to the random-effects probit and tobit estimators. However, unlike these authors, we use the system GMM estimator (Arellano and Bover, 1995; Blundell and Bond, 1998) instead of the first-difference estimator (Arellano and Bond, 1991). The system GMM estimator estimates the relevant equation both in levels and in first-differences. First-differencing is used to control for unobserved heterogeneity. We use all right-hand side variables (except age and the dummies) lagged twice or more as instruments in the first-differenced equation, and first-differences of these same variables lagged once as instruments in the level equation. The

system GMM estimator addresses the potential weak instrument problem. It should be noted, however, that being a linear probability model, the system GMM estimator is problematic in our particular case, as it fails to properly capture the curvature of the regression function in the proximity of 0 and 1.

5. Data and descriptive statistics

5.1 Sample and dataset

The data used in this study are obtained from two Chinese databases namely, the China Stock Market Accounting Database (CSMAR) and Sino-fin for the period of 2004-2010[18]. The sample is composed of publicly listed firms traded on the Shanghai and Shenzhen stock exchanges. As listed companies are typically seen as the best performers in the Chinese economy, we believe that looking at their export behavior represents an interesting research question. Additionally, as our objective is to assess the extent to which corporate governance variables affect firms' export behavior, the analysis can only be performed on listed companies, as information on corporate governance characteristics is only available for these firms.

Financial and utility industries are excluded. To reduce the influence of potential outliers, we exclude observations in the one percent tails of each of the regression variables. Since we lag all our independent variables once, we end up with a panel of 6315 firm-year observations on 1420 companies over the period 2005-2010 for our empirical analysis. The panel has an unbalanced structure, with an average of 6 observations per firm.

5.2 Descriptive statistics

Table 1 presents descriptive statistics for the variables used in the analysis for our pooled sample. We observe that, on average, over one third of the listed firms (38.0%) are

involved in exporting activities. The average export to total sales ratio is 8.7 %. However, the average exporting intensity amongst exporters is 22.8 % (as shown in Table 4).

The pooled mean (median) value of managerial ownership is 3.1% (0%). The state and legal persons hold 25.6% (25%) and 16.7% (5.2%) of the shares, respectively. Foreign shareholders, on average, hold 4 % (0%) of total issued shares. The average board size is 9.4 (9.0) with a proportion of independent outside directors of 35.2% (33.3%).

With respect to the control variables included in our baseline model, the average (median) firm size is about 1 billion RMB (0.43), and the average firm age, measured by the number of years since the establishment of the firm, is 11.52 (11)[19]. Productivity, measured as real sales per employee, is 0.55 million RMB (0.24). Capital intensity, proxied by the ratio of real fixed assets to the number of employees of the firm, is given by 0.19 (0.095) million RMB fixed assets per employee. The average debt to asset ratio and the market-to-book ratio are 50.5% (51.2%) and 1.52 (1.22), respectively. Finally, the average liquidity, measured as net working capital over total assets, is 11.1% (10.6%).

These summary statistics indicate that the sample employed in this study is comparable to others used in prior research on corporate governance and on corporate internationalization decisions. For example, the average export-sales ratio in our sample is similar to the averages (7%) reported by Lu et al. (2009) for the period 2002-2005. Similarly, the average foreign ownership is comparable to the average (4%) reported in Yuan et al. (2008) for the years 2001-2005. This also indicates that the level of foreign ownership has not changed significantly during the last decade. In addition, corporate governance and other firm characteristics are similar to those reported in recent studies on corporate governance in China, such as Conyon and He (2012) among others.

Table 2 reports the Pearson correlation coefficients between variables. It is worth noting that both managerial and foreign shareholdings show a positive and statistically significant correlation with firms' exporting activities, as suggested by our hypotheses H1

and H3. The results also highlight that state shareholding exhibits a negative and significant correlation with export propensity. This is consistent with the prediction of hypothesis H2. Legal person shareholding exhibits a negative and significant correlation with both export propensity and intensity. In line with hypothesis H4, board size has a significant negative relationship with international market expansion. Finally, the proportion of outside directors does not have any significant association with export propensity and intensity, which is consistent with hypothesis H5.

Turning to the control variables, as expected, firm size has a significant positive correlation with internationalization. It is interesting to note that productivity has a negative but statistically insignificant correlation with exporting decisions, while the capital intensity ratio shows a significant negative correlation. These findings are opposite to what has been observed in developed countries and other emerging markets (Wakeling, 1998). However, Lu et al. (2009) also show a negative relationship between exporting and the capital intensity ratio for Chinese firms. Furthermore, the leverage ratio exhibits a significant negative correlation with international sales expansion, while liquidity is positively related to both export intensity and propensity. Table 2 also suggests that given that the observed correlation coefficients are relatively low, multicollinearity should not be a serious problem in our study[20].

6. Evaluation of the results

6.1. Univariate analysis

Table 3 shows the distribution of observations across various categories of managerial ownership. We observe that out of a total of 6315 observations, 4829 are characterized by managerial ownership lower than 0.1%. 533 observations have managerial ownership between 0.1% and 5%; 239, between 5% and 25%; and 714, above 25%. The Table also shows that both export propensity and intensity tend to increase with managerial

ownership up to a 25% threshold, and decline thereafter. This is in line with our hypothesis H1, which posits an inverted U-shaped relationship between managerial ownership and export intensity and propensity.

In Table 4, we report univariate mean comparisons of governance and firm characteristics between non-exporters and exporters. The statistics in the table show that, in line with our hypotheses H1 and H3, the fractions of managerial and foreign ownership are significantly higher for exporters. In addition, consistent with our hypothesis H2, non-exporting firms have higher average state and legal person shareholding than exporting firms, the differences being significant. As predicted by our hypothesis H4, we observe that board size is higher for non-exporters. In line with hypothesis H5, we do not observe much difference in terms of proportion of outside directors between exporters and non-exporters.

Moving to firm characteristics, we observe that non-exporting firms display significantly higher capital intensity and lower market-to-book ratios than their exporting counterparts. In terms of productivity, there is no significant difference between exporters and non-exporters. These findings suggest that the self-selection hypothesis that the most efficient (productive) firms self-select into the export market (Bernard and Jensen, 1999; Aw et al., 2000) may not be true for Chinese exporters[21]. The results also show that exporters are slightly larger and younger than non-exporters. The larger liquidity ratio and lower leverage ratio in the exporting firms suggests that, in line with Greenaway et al. (2007) for UK firms, financially constrained firms are less likely to participate in export markets.

This univariate analysis highlights some differences between non-exporters and exporters. The observed differences in the governance factors provide some preliminary evidence supporting our hypotheses. A potential problem in the univariate analysis is that since observations within a firm are unlikely to be independent, the statistical significance

is overstated (Anderson et. al., 2000). Another important problem is that the univariate tests do not control for several factors that may systematically affect the variables of interest. These factors include geographic location, industry membership, business cycle effects and so on (Dewenter and Malatesta, 2001). We address these issues in the multivariate analysis that follows in the next section.

6.2 Multivariate analysis

6.2.1 The decision to export, corporate governance, and firm characteristics

Table 5 presents random-effects probit estimation results of our baseline model (1), where the dependent variable is the export dummy, equal to 1 if the firm exports, and 0 otherwise. To facilitate economic interpretation, we report marginal effects for those explanatory variables which display statistically significant coefficients.

In column 1 of Table 5, we first estimate a naïve model in which the export propensity is regressed on managerial ownership, managerial ownership squared and a set of control variables including lagged export propensity, firm size, age, productivity, capital intensity, leverage, market-to-book ratio, liquidity and regional, industry, and year dummies. In subsequent columns, we then include other ownership and board structure variables one by one and in groups, to reach our baseline model in column 7. Firstly, the coefficients on managerial ownership and its square are consistently highly significant (at the 1% level) throughout all of the models. The former is positive, and the latter, negative. In line with hypothesis H1, these findings suggest there is strong evidence of a curvilinear relationship between managerial equity ownership and the probability of participating in export markets. Specifically, the probability of exporting first increases, then decreases as managerial ownership rises. At lower levels of managerial ownership, the positive effect of ownership strongly dominates any negative effects, consistent with Jensen and Meckling's

(1976) incentive alignment hypothesis. The average turning point in managerial ownership ranges between 23% and 27%[22].

In columns 2, 3, and 4 of Table 5, state ownership, legal person ownership, and foreign ownership are introduced respectively in to the models as additional independent variables. The results show that none of these additional ownership variables influences firms' decisions to enter foreign markets. Even when all additional ownership variables are included together in column 5, none of them is significant at conventional levels. Our hypotheses H2 and H3 are therefore not supported[23].

In column 6, board size and the proportion of independent directors are included together with the managerial ownership variables. Both these additional variables exhibit negative and significant coefficients, supporting therefore our hypotheses H4 and H5. Our results are consistent with Clarke (2003) and Lau et al. (2007), who show that outside directors in the Chinese market do not contribute to strategic decisions and are just appointed to meet regulatory and legal requirements.

Column 7 of Table 5 shows estimates for our baseline model (1), which includes all the independent and control variables. Even after introducing all other ownership and governance variables, the coefficient on the managerial ownership variable remains positive and precisely determined, and the coefficient on its squared value, negative and significant. Board size and the proportion of independent directors in the board retain their negative signs.

As for the effects of the control variables, the results show that in all specifications, the coefficient on lagged export status is positive and significant at the 1% level, suggesting that Chinese exporting decisions are highly persistent, probably due to the high sunk costs, which need to be paid upfront to enter export markets[24]. Additionally, larger firms are more likely to be exporters. This is consistent with the prediction that large firms have more resources, experience economies of scale, and have access to external finance

which facilitate exporting decisions. The coefficient on firm age is negative and statistically significant at conventional levels. This is not consistent with our initial prediction, but can be explained considering that those state-owned enterprises with a long history of operations, which were then converted into listed companies might be less efficient, less dynamic, and hence, less likely to become exporters. This result also provides support for the born-global firm hypothesis, which suggests that it is young firms which are more likely to rapidly internationalize.

The coefficient associated with labor productivity is never statistically significant, which is inconsistent with the common wisdom that more productive firms are likely to enter foreign markets (Bernard and Jensen, 1995, 1999 and 2004). Similarly, the coefficient on the capital intensity ratio is negative, but not statistically significant[25]. The market-to-book ratio does not have a statistically significant association with exporting decisions, which is probably due to the fact that in the Chinese context, it is an imperfect measure of investment opportunities (Allen et al., 2005; Wang et al., 2009). This may be due to the fact that stock market-based measures of growth opportunities are not reliable in the Chinese financial markets (Wang et al., 2009; Conyon and He, 2012)[26]. In line with Greenaway at al. (2007), liquidity always attracts a positive and significant coefficient, suggesting that having more internal finance at hand facilitates firms' entry in export markets. Finally, contrary to Greenaway et al. (2007), leverage displays an insignificant coefficient in columns 1 to 5, and a positive and significant coefficient in columns 6 and 7. The insignificant coefficients can be explained considering that our panel is made up of listed companies, all of which are relatively large and financially healthy. Hence, leverage should not make a big difference for these firms. The positive coefficients can be explained in the light of the fact that having obtained debt in previous years, these firms may be considered more creditworthy by banks, and may consequently obtain more loans in the present, which they can use to finance the sunk costs. Thus, they are more likely to become

exporters. It should be noted, however, that in columns 6 and 7, the coefficients on leverage are only marginally significant.

So far, the results show that managerial ownership has an important influence on the export markets participation decisions of Chinese listed corporations. However, except for managerial ownership, we generally do not find significant effects for any other ownership variables. In addition, both board size and the proportion of independent directors in the board negatively affect firms' internationalization decisions.

6.2.3 Export intensity, corporate governance, and firm characteristics

We now turn to export intensity measured as export sales over total sales, another measure of international involvement of firms. We investigate how managerial ownership and other governance mechanisms affect the volume of exports after entering the export markets. To this end, we replicate the specifications used in columns 1 to 7 of Table 5, using a random-effects tobit model. Table 6 reports the results. Consistent with our previous findings, managerial ownership and its square attract a positive and a negative coefficient, respectively, in all models. Focusing on column 1, the marginal effects suggest that export intensity increases with managerial ownership up to a threshold of 26.85%, and then declines.

Focusing on columns 2 to 7, we observe that other ownership variables do not influence export intensity, with the exception of state ownership, which, in accordance with our hypothesis H2, exhibits a negative coefficient in columns 5 and 7, and legal person shareholding, which also displays a negative coefficient in those same columns. Moving on to board characteristics, we observe that in line with our hypothesis H4, board size is negatively related to export intensity, whilst the percentage of independent directors has a statistically insignificant coefficient.

Furthermore, we observe that, once again, past exporting experience has strong large effects on firms' export intensity. The coefficients on the other control variables indicate that, as in the probit regressions, young, large firms, with a higher liquidity show a higher export intensity. Finally, we can see that in most specifications, compared to firms in the Central region (which represent the excluded category), firms in the Coastal region tend to export more, whereas firms in the Western region are characterized by a lower export intensity.

6.3 Robustness tests

In this sub-section we verify whether our results are robust to using alternative estimation methods and specifications.

6.3.1 Using alternative estimation methods

First, columns 1 and 8 of Table 7 report system GMM estimates of our export propensity and intensity regressions. We use the system GMM estimator to control for the possible endogeneity of the regressors. We use all right-hand side variables, except age and the dummies, lagged twice or more as instruments in the first-differenced equation, and first-differences of these same variables lagged once as instruments in the level equation. It should be noted, however, that being a linear probability model, the system GMM estimator is problematic in our particular case as it fails to properly capture the curvature of the regression function in the proximity of 0 and 1. The results show that once again, managerial ownership and it square display a positive and negative coefficient, respectively, and are both precisely determined. This confirms that managerial ownership and export propensity and intensity are linked by an inverted U-shaped relationship, with turning point of 27.47% in the former case and 24.24% in the latter.

Furthermore, following Aggarwal and Samwick (2006), in columns 2 and 9 of Table 7, we report estimates of our models for export propensity and intensity respectively, obtained using a piecewise regression. To this end, we allow for one change in the slope coefficient of managerial ownership at 25% (first quartile), which is close to the turning point identified in the regressions reported in Tables 5 and 6. With reference to Equation (1), we replace the managerial ownership variable and its square with the following two variables: the first (DOS025) is equal to the actual managerial ownership if this number is less than 0.25, and to 0.25 otherwise. The second (DOS25) is equal to (managerial ownership – 0.25) if managerial ownership is greater than 0.25, and equal to 0 otherwise. The results show that the first variable exhibits a positive and significant coefficient, whilst the second displays a negative and precisely determined coefficient. These findings suggest that at levels of managerial ownership lower than 25%, the likelihood and intensity of exporting increase with managerial ownership, whilst a negative relationship between managerial ownership and exporting appears beyond the 25% threshold of managerial ownership. These new results confirm therefore our main findings and are in line with our hypothesis H1[27].

Our results in Tables 5 and 6 are also robust to using a pooled probit, pooled fractional probit (Papke and Wooldridge, 1996), and pooled tobit estimators with cluster-robust standard errors. In addition, our results are robust to using OLS and the "orthogonal deviations" variant of the GMM estimator, in which the fixed effects are eliminated by subtracting the forward means of each regression variable (Arellano and Bover, 1995)[28]. All these results, which are not reported for brevity, but available upon request, confirm the curvilinear dependence of exporting decisions on managerial ownership predicted by our hypothesis H1.

6.3.2 Using dummy variable for managerial ownership and foreign ownership

In columns 3 and 10 of Table 7, we provide estimates of our export propensity and export intensity regressions, which include a dummy equal to one if managerial ownership is greater than 0, and 0 otherwise; and a dummy equal to 1 if foreign ownership is greater than zero, and 0 otherwise. These dummies replace the continuous managerial and foreign ownership variables, which both exhibit medians equal to 0. The results show that the coefficient on the managerial ownership dummy is positive and precisely determined, whilst the coefficient on the foreign ownership dummy is also positive, but not statistically significant. This suggests that managerial ownership plays a more significant role than foreign ownership in firms' internationalization decisions.

6.3.3 Estimating separate regressions for state- and privately-controlled firms

We next aim at verifying the extent to which our results hold for the subsamples of state- and privately-controlled firms. This exercise is motivated considering that top executives in the state sector are often appointed by party and government agencies and are typically party secretaries, government officials or veteran socialist managers (Walder, 2011). Additionally, appointments to top managerial posts in these companies are generally controlled by the state, and managerial autonomy is limited (Walder, 2011). As such, managers in state-controlled companies might have limited power as regards to the firms' internationalization decisions[29].

In contrast, top executives in the privately-controlled sector may have begun their careers in the state sector, but are no longer appointed by the state. The managers of these firms also have greater autonomy from state agencies than their counterparts in state-controlled companies. Furthermore, their executives enjoy much higher levels of compensation and are more likely to hold significant ownership stakes (Walder, 2011). As a consequence of these developments, managers play a major role in all corporate

decisions, including those related to entry in export markets. Managerial incentives are therefore likely to affect firms' internationalization decisions[30].

In the light of these considerations, in columns 4/5 and 11/12 of Table 7, we provide separate estimates of Equation (1) for state-controlled and privately-controlled firms. The results show that managerial ownership only affects the exporting decisions of non-state firms. These results are consistent with a number of studies, which provide empirical evidence for the differential effects of other forms of managerial incentives, such as the sensitivities of top management compensation and turnover to firm performance and promotion tournaments, among state-controlled and privately-controlled Chinese listed firms (Kato and Long, 2006a, b, c, and 2011). Specifically, these studies suggest that managerial incentives derived from these incentive mechanisms are weakened by state ownership and control. We also observe that whilst board size has a negative and significant effect on the export propensity and intensity of both state- and privately controlled firms, the proportion of independent directors in the board is negatively related to the export decisions of privately-controlled firms only.

6.3.4 Estimating separate regressions for the pre- and post-2006 period

It is important to take into account differences in our results before and after the 2005-2006 split-share structure reform, following which non-tradable shares were floated through the open markets, for the following reasons. First, agency costs were significantly reduced following the reform (Li et al., 2011; Hou et al., 2013; Hou and Lee, 2014). Second, from 2006 onwards, corporations were allowed to incentivize their top management with stocks (Conyon and He, 2011). As a consequence of this, average managerial ownership rose from 1.1% in 2004 to 8.2% in 2010, managers' interests became more aligned on average with stock market performance, and their conflicts of interest with outsider investors were reduced.

To take this into account, in columns 6/7 and 13/14 of Table 7, we provide separate estimates of Equation (1) for the pre- and post-2006 period[31]. The results show that managerial ownership and its square are only significant in the post-reform period. This suggests that, by removing restrictions on managerial stock ownership, the reform played an indirect role in enhancing Chinese firms' internationalization activities. Furthermore, with the exception of board size which has a negative and marginally significant effect on export propensity in the pre-reform period, all other corporate governance variables only affect firms' exporting decisions in the post-reform period.

7. Conclusions

In this paper we use a dataset made up of 1240 Chinese listed companies over the period 2004-2010 to examine the effects of managerial ownership, other ownership types, and board characteristics on firms' exporting decisions, distinguishing firms into state- and privately-controlled. This is the first study conducted on the topic on a dataset including the post-split-share structure reform period in China, the first to analyze differences between state-owned and other companies, and the first to include all relevant corporate governance variables in a unified framework.

We find that increasing managerial ownership is linked with a higher probability to enter export markets, and higher export intensity. Yet, after a threshold level of ownership of 23%-27% is reached, managers' entrenchment tendencies become prominent, discouraging internationalization activities. We also observe that state ownership is negatively associated with export intensity; that the larger the board size, the lower the firm's export propensity and intensity; and that firms with a higher proportion of independent directors in the board are generally less likely to export. Finally, larger, younger firms with higher liquidity are more likely to export and are also more likely to display higher export intensity. Our findings, which are robust to using different estimation

methods, are mainly driven by non-state firms in the post-reform period.

Our paper contributes to the international trade literature by taking into account corporate governance components as new elements of firm heterogeneity, with the aim of better explaining the determinants of both export propensity and intensity. It also contributes to the corporate finance literature, which has looked at the effects of managerial ownership and corporate governance mechanisms on various aspects of corporate behavior, neglecting, however, firms' exporting decisions.

Our findings have policy implications. In order to promote the international presence of Chinese firms, the government should encourage a rise in managerial ownership up to its optimal level, through a revision of the compensation contracts of management teams, aimed at including company shares. Furthermore, given the concave relationship between managerial ownership and risk-taking activities such as international expansion, excessive managerial ownership should be avoided. In addition, in order to raise export propensity and intensity, companies should be encouraged to have smaller boards and to pay particular attention to the quality of the independent directors in their boards. Finally, state ownership should be further reduced.

Our study suffers from a number of limitations. Firstly, since a limited number of firms have been involved in Outbound Foreign Direct Investment (OFDI) during our sample period (Morck et al., 2008), we only use exports as a measure of firms' degree of internationalization. In the future, we aim at complementing our study by also employing other measures of internationalization, such as OFDI.

Secondly, we do not focus on the qualities of the CEOs/top management team, such as their international experience and education. Yet, these may have an important bearing on firms' efforts in venturing abroad. As these data are not available in standard databases, a questionnaire-based survey would have to be conducted in order to complement this study. This is on the agenda for future research.

Finally, in future research, we plan to undertake a comparative analysis of the effects of managerial ownership and other forms of corporate governance on a range of different corporate activities in China, other emerging economies, and developed countries.

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Appendix

Table A1 in the Appendix provides variable names, definitions, and expected signs.

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Table 1. Summary statistics of governance and firm characteristics for the pooled sample of companies.

Variables	Obs	Mean	Std. Dev.	Median	Min	Max
Dependent variables						
Export dummy (EXPDUM)	6315	0.380	0.485	0.000	0.000	1.000
Export intensity (EXPINT)	6315	0.087	0.177	0.000	0.000	0.869
Governance characteristics						
Managerial shareholding (DOS)	6315	0.031	0.107	0.000	0.000	0.748
Legal person shareholding (LPS)	6315	0.167	0.207	0.052	0.000	0.869
State shareholding (SOS)	6315	0.256	0.238	0.250	0.000	0.812
Foreign shareholding (FOWNS)	6315	0.040	0.109	0.000	0.000	0.736
Board size (BODSIZE)	6315	9.392	1.947	9.000	3.000	19.000
Independent directors (INDIR)	6315	0.352	0.045	0.333	0.000	0.667
Firm characteristics						
Firm size (billion RMB)(SIZE)	6315	1.007	1.828	0.433	0.000	21.023
Firm age (AGE)	6315	11.520	4.006	11.000	2.000	26.000
Productivity (million RMB) (PROD)	6315	0.551	2.005	0.243	0.000	134.479
Capital intensity (million RMB) (CIR)	6315	0.190	0.736	0.095	0.000	37.074
Market –to- book ratio (MBR)	6315	1.516	0.854	1.218	0.477	11.222
Leverage ratio (LEV)	6315	0.505	0.204	0.512	0.013	5.494
Liquidity ratio (LIQTY)	6315	0.111	0.247	0.106	-3.437	0.915

Notes: This table reports summary statistics of the main variables used in our study. All variables are defined in Table A1 in the Appendix.

Table 2. Correlation matrix.

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	EXPDUM	1.00															
2	EXPINT	0.63*	1.00														
3	$DOS_{i(t-1)}$	0.10*	0.10*	1.00													
4	$DOS^2_{i(t-1)}$	0.07*	0.07*	0.86*	1.00												
5	$LPS_{i(t-1)}$	-0.08*	-0.08*	-0.28*	-0.23*	1.00											
6	$SOS_{i(t-1)}$	-0.05*	0.00	-0.01	-0.05*	-0.56*	1.00										
7	$FOWNS_{i(t-1)}$	0.08*	0.10*	-0.07*	-0.05*	-0.01	-0.05*	1.00									
8	$BODSIZE_{(t-1)}$	-0.03*	-0.04*	-0.09*	-0.09*	0.14*	-0.08*	0.07*	1.00								
9.	$INDIR_{i(t-1)}$	0.00	-0.00	0.08*	0.07*	-0.11*	0.02	0.01	-0.24*	1.00							
10	$SIZE_{i(t-1)}$	0.11*	0.03*	-0.12*	-0.10*	0.15*	-0.21*	0.14*	-0.02	0.21*	1.00						
11	AGE_{it}	-0.07*	-0.09*	-0.34*	-0.30*	-0.14*	-0.06*	0.06*	0.00	-0.03*	0.10*	1.00					
12	$PROD_{i(t-1)}$	-0.01	-0.01	-0.02	-0.01	0.03*	-0.03*	0.02	0.02	-0.02	0.14*	0.06*	1.00				
13	$CIR_{i(t-1)}$	-0.04*	-0.03*	-0.04*	-0.03*	0.04*	-0.02	0.02	0.01	0.01	0.04*	0.06*	0.52*	1.00			
14	$MBR_{i(t-1)}$	0.05*	0.02	0.07*	0.05*	-0.24*	-0.09*	-0.08*	0.05*	-0.08*	-0.15*	0.11*	-0.02	-0.02	1.00		
15	$LEV_{i(t-1)}$	-0.04*	-0.07*	-0.17*	-0.14*	0.04*	-0.00	-0.01	-0.01	0.05*	0.21*	0.21*	0.06*	0.10*	-0.16*	1.00	
16	$LIQTY_{i(t-1)}$	0.06*	0.07*	0.24*	0.21*	-0.09*	0.06*	-0.02	0.04*	-0.07*	-0.12*	-0.24*	0.05*	-0.13*	-0.64*	0.14*	1.00

Notes: This table reports Pearson correlation coefficients. * denotes significance at the 5% level. See Table A1 in the Appendix for definitions of all variables.

Table 3. Average export propensity and intensity for different degrees of managerial ownership.

Managerial ownership	Observations	Export propensity	Export intensity
DOS < .001	4829	0.35	0.08
0.001 =< DOS < .05	533	0.42	0.12
0.05 =< DOS < .25	239	0.60	0.17
DOS > .25	714	0.47	0.10
	6315		

Source: Authors' calculations based on the dataset used in the revised paper. DOS represents managerial shareholding. See Table A1 in the Appendix for the precise definitions of this variable.

Table 4. Mean comparison of corporate governance and firm characteristics for non-exporters and exporters.

Variables	Non-exporters			Exporters			Mean difference (t-statistic)	
	Count	Mean	S.E.	Count	Mean	S.E.		
Export Dummy	3915	0.000	0.000	2400	1.000	0.000		
Exports/Total sales	3915	0.000	0.000	2400	0.228	0.224	-0.228***	(-63.63)
Governance characteristics								
Managerial shareholding (DOS)	3915	0.022	0.094	2400	0.045	0.124	-0.023***	(-8.22)
Legal person shareholding (LPS)	3915	0.174	0.210	2400	0.155	0.202	0.019***	(3.62)
State shareholding (SOS)	3915	0.272	0.240	2400	0.231	0.234	0.040***	(6.54)
Foreign shareholding (FOWNS)	3915	0.033	0.098	2400	0.051	0.124	-0.018***	(-6.38)
Board size (BODSIZE)	3915	9.442	2.022	2400	9.310	1.814	0.132**	(2.62)
Independent directors (INDIR)	3915	0.352	0.046	2400	0.352	0.042	-0.000	(-0.30)
Firm characteristics								
Firm size (billion RMB) (SIZE)	3915	0.942	1.733	2400	1.115	1.970	-0.173***	(-8.43)
Firm age (AGE)	3915	2.397	0.376	2400	2.341	0.400	0.056***	(5.59)
Productivity (million RMB) (PROD)	3915	0.575	1.195	2400	0.513	2.872	6.189	(1.19)
Capital intensity (million RMB)(CIR)	3915	0.213	0.847	2400	0.153	0.506	5.989**	(3.14)
Market- to-book ratio (MBR)	3915	1.479	0.851	2400	1.576	0.855	-0.096***	(-4.37)
Leverage ratio (LEV)	3915	0.512	0.195	2400	0.494	0.218	0.018***	(3.47)
Liquidity ratio (LIQTY)	3915	0.100	0.253	2400	0.129	0.237	-0.029***	(-4.58)

Notes: ***, **, and* denote, respectively, significance levels of 1%, 5% and 10% for a two-tailed two sample t-test. t-statistics are in parentheses. See Table A1 in the Appendix for definitions of all variables.

Table 5. The decision to export, corporate governance and firm characteristics.

	Dynamic random-effects probit models						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Governance variables							
$DOS_{i(t-1)}$	2.139***	2.006***	2.129***	2.139***	1.968**	2.159***	2.011***
	(0.743)	(0.761)	(0.747)	(0.744)	(0.764)	(0.750)	(0.771)
	[0.391]	[0.348]	[0.399]	[0.396]	[0.327]	[0.399]	[0.332]
$DOS^2_{i(t-1)}$	-3.758***	-3.601***	-3.737***	-3.759***	-3.625***	-3.877***	-3.763***
	(1.376)	(1.389)	(1.386)	(1.376)	(1.390)	(1.391)	(1.406)
	[-0.727]	[-0.675]	-0.743]	[-0.733]	[-0.693]	-0.756]	[-0.718]
$SOS_{i(t-1)}$		-0.091			-0.163		-0.150
		(0.113)			(0.160)		(0.162)
$LPS_{i(t-1)}$			0.015		-0.108		-0.098
			(0.121)		(0.171)		(0.172)
$FOWNS_{i(t-1)}$				0.006	-0.014		0.049
				(0.222)	(0.223)		(0.225)
$BODSIZE_{(t-1)}$						-0.412***	-0.412***
						(0.123)	(0.123)
						[-0.060]	[-0.060]
$INDIR_{i(t-1)}$						-1.026*	-1.050*
						(0.551)	(0.552)
						[-0.143]	[-0.154]
Control variables							
$EXPDUM_{i(t-1)}$	2.741***	2.739***	2.741***	2.741***	2.738***	2.748***	2.744***
	(0.052)	(0.052)	(0.052)	(0.052)	(0.052)	(0.053)	(0.053)
	[1.822]	[1.821]	[1.822]	[1.821]	[1.818]	[1.817]	[1.812]
$SIZE_{i(t-1)}$	0.069***	0.071***	0.069***	0.069***	0.069***	0.079***	0.079***
	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.022)
	[0.020]	[0.021]	[0.020]	[0.020]	[0.019]	[0.022]	[0.021]
AGE_{it}	-0.137*	-0.148**	-0.137*	-0.137*	-0.155**	-0.149**	-0.166**
	(0.072)	(0.073)	(0.072)	(0.072)	(0.074)	(0.072)	(0.075)
	[-0.022]	[-0.021]	[-0.022]	[-0.022]	[-0.030]	[-0.022]	[-0.031]
$PROD_{i(t-1)}$	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002
	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)
$CIR_{i(t-1)}$	-0.016	-0.015	-0.016	-0.016	-0.015	-0.023	-0.023
	(0.045)	(0.045)	(0.045)	(0.045)	(0.045)	(0.049)	(0.049)
$MBR_{i(t-1)}$	-0.039	-0.042	-0.039	-0.039	-0.045	-0.020	-0.024
	(0.033)	(0.033)	(0.033)	(0.033)	(0.034)	(0.034)	(0.035)
$LEV_{i(t-1)}$	0.201	0.201	0.200	0.201	0.209	0.293*	0.301*
	(0.151)	(0.151)	(0.152)	(0.152)	(0.152)	(0.159)	(0.159)
						[0.028]	[0.033]
$LIQTY_{i(t-1)}$	0.298**	0.299**	0.297**	0.298**	0.307**	0.323**	0.331**
	(0.142)	(0.142)	(0.142)	(0.142)	(0.142)	(0.143)	(0.144)
	[0.062]	[0.063]	[0.063]	[0.062]	[0.068]	[0.063]	[0.069]
COASTAL dummy	0.059	0.056	0.059	0.059	0.059	0.064	0.062
	(0.058)	(0.058)	(0.058)	(0.058)	(0.059)	(0.059)	(0.059)
WESTERN dummy	-0.059	-0.057	-0.059	-0.059	-0.054	-0.034	-0.029
	(0.077)	(0.077)	(0.077)	(0.077)	(0.077)	(0.077)	(0.077)
Industry dummies	yes	yes	yes	yes	yes	yes	yes
Year dummies	yes	yes	yes	yes	yes	yes	yes
Inflection points	26.89%	25.78%	26.85%	27.01%	23.59%	26.39%	23.12%
Observations	6315	6315	6315	6315	6315	6315	6315
Log-likelihood	-1758.55	-1758.23	-1758.55	-1758.55	-1758.03	-1731.40	-1730.92
Wald χ^2 (P value)	3126.55	3126.67	3126.62	3126.53	3126.36	3079.50	3079.00
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)

Notes: The dependent variable (EXPDUM) is a binary variable which takes value of one if the firm exports, and 0 otherwise. Standard errors are in parentheses. Marginal effects are in square brackets for those coefficients that are statistically significant. The Wald statistic is aimed at testing the null hypothesis that the regression coefficients are jointly equal to zero. ***, **, and * denote significance at the 1%, 5%, and 10%, levels respectively. See Table A1 in the Appendix for definitions of all variables.

Table 6. Export intensity, corporate governance, and firm characteristics.

	Dynamic random-effects tobit models						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Governance variables							
$DOS_{i(t-1)}$	0.233***	0.207***	0.237***	0.235***	0.194**	0.238***	0.197***
	(0.074)	(0.076)	(0.074)	(0.074)	(0.076)	(0.074)	(0.077)
	[0.080]	[0.071]	[0.082]	[0.081]	[0.067]	[0.082]	[0.068]
$DOS^2_{i(t-1)}$	-0.432***	-0.401***	-0.442***	-0.435***	-0.412***	-0.450***	-0.427***
	(0.139)	(0.140)	(0.140)	(0.139)	(0.141)	(0.140)	(0.142)
	[-0.149]	[-0.138]	[-0.152]	[-0.150]	[-0.142]	[-0.155]	[-0.147]
$SOS_{i(t-1)}$		-0.018			-0.043***		-0.045***
		(0.012)			(0.017)		(0.017)
					[-0.015]		[-0.034]
$LPS_{i(t-1)}$			-0.007		-0.039**		-0.039**
			(0.013)		(0.018)		(0.018)
					[-0.013]		[-0.012]
$FOWNS_{i(t-1)}$				0.012	0.003		0.008
				(0.022)	(0.022)		(0.022)
$BODSIZE_{(t-1)}$						-0.035***	-0.036***
						(0.013)	(0.013)
						[-0.012]	[-0.012]
$INDIR_{i(t-1)}$						-0.085	-0.092
						(0.058)	(0.058)
Control variables							
$EXPINT_{i(t-1)}$	1.083***	1.081***	1.083***	1.082***	1.080***	1.081***	1.078***
	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)
	[0.373]	[0.372]	[0.373]	[0.372]	[0.372]	[0.372]	[0.372]
$SIZE_{i(t-1)}$	0.012***	0.012***	0.012***	0.012***	0.012***	0.013***	0.013***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
	[0.004]	[0.004]	[0.004]	[0.004]	[0.004]	[0.004]	[0.004]
AGE_{it}	-0.013*	-0.015**	-0.013*	-0.013*	-0.018**	-0.013*	-0.019**
	(0.007)	(0.007)	(0.007)	(0.007)	(0.008)	(0.007)	(0.008)
	[-0.004]	[-0.005]	[-0.004]	[-0.004]	[-0.006]	[-0.005]	[-0.006]
$PROD_{i(t-1)}$	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
$CIR_{i(t-1)}$	-0.011	-0.011	-0.011	-0.011*	-0.011	-0.011	-0.011
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
$MBR_{i(t-1)}$	0.001	0.000	0.001	0.001	-0.001	0.002	-0.000
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
$LEV_{i(t-1)}$	0.016	0.016	0.017	0.017	0.019	0.017	0.020
	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)
$LIQTY_{i(t-1)}$	0.037**	0.037**	0.038**	0.037**	0.040***	0.038**	0.041***
	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)
	[0.013]	[0.013]	[0.013]	[0.013]	[0.014]	[0.013]	[0.014]
COASTAL dummy	0.010*	0.009	0.010*	0.010	0.010*	0.010*	0.010*
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
	[0.004]	[0.003]	[0.004]	[0.003]	[0.004]	[0.004]	[0.004]
WESTERN dummy	-0.015*	-0.015*	-0.015*	-0.015*	-0.013	-0.013	-0.011
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
	[-0.005]	[-0.005]	[-0.005]	[-0.005]			
Industry dummies	yes	yes	yes	yes	yes	yes	yes
Year dummies	yes	yes	yes	yes	yes	yes	yes
Inflection points	26.85%	25.72%	26.97%	27.0%	23.59%	26.45%	23.13%
Observations	6315	6315	6315	6315	6315	6315	6315
Proportion > 0	37.99%	37.99%	37.99%	37.99%	37.99%	37.99%	37.99%
Log-likelihood	-300.58	-263.96	-236.35	-205.97	-272.25	-336.27	262.74
Wald χ^2 (P value)	8535.29	8540.77	8535.16	8535.94	8548.34	8447.01	8460.69
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)

Notes: The dependent variable (EXPINT) is a censored variable which is equal to zero if the firm does not export, and takes the value of the actual exports to total sales ratio, otherwise. Standard errors are in parentheses. Marginal effects are in square brackets for those coefficients that are statistically significant. The Wald statistic is aimed at testing the null hypothesis that the regression coefficients are jointly equal to zero. ***, **, and * denote significance levels of 1%, 5% and 10%, respectively. See Table A1 in the Appendix for definitions of all variables.

Table 7. Robustness tests.

	Export propensity							Export intensity						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	System GMM	Piecewise	Dummies	Non-state	State	Post-reform	Pre-reform	System GMM	Piecewise	Dummies	Non-state	State	Post-reform	Pre-reform
Governance variables														
$DOS_{i(t-1)}$	1.483**			2.059**	-1.572	2.024**	-0.042	0.271**			0.247***	-0.322	0.183**	0.237
	(0.628)			(0.855)	(4.807)	(0.800)	(3.255)	(0.131)			(0.085)	(0.416)	(0.083)	(0.215)
				[0.403]		[0.320]					[0.092]		[0.068]	
$DOS^2_{i(t-1)}$	-2.699**			-3.935***	12.942	-3.711**	-1.848	-0.559*			-0.481***	1.421	-0.393***	-0.666
	(1.300)			(1.466)	(27.352)	(1.444)	(6.734)	(0.310)			(0.148)	(1.690)	(0.152)	(0.445)
				[-0.786]		[-0.688]					[-0.180]		[-0.145]	
$DOS025_{i(t-1)}$		1.274**							0.112**					
		(0.606)							(0.051)					
		[0.188]							[0.038]					
$DOS25_{i(t-1)}$		-1.240*							-0.167**					
		(0.648)							(0.066)					
		[-0.281]							[-0.057]					
$DOS\text{-}Dummy_{i(t-1)}$			0.151**							0.021**				
			(0.071)							(0.010)				
			[0.021]							[0.007]				
$SOS_{i(t-1)}$	0.074	-0.159	-0.118	-0.447	-0.036	-0.186	-0.170	0.015	-0.046***	-0.038**	-0.064	-0.031	-0.047**	-0.043
	(0.071)	(0.162)	(0.156)	(0.408)	(0.218)	(0.174)	(0.513)	(0.025)	(0.017)	(0.016)	(0.042)	(0.022)	(0.019)	(0.040)
									[-0.016]	[-0.013]			[-0.017]	
$LPS_{i(t-1)}$	0.021	-0.102	-0.063	-0.167	-0.145	-0.072	-0.354	0.020	-0.039**	-0.031*	-0.033	-0.032	-0.035*	-0.052
	(0.071)	(0.172)	(0.165)	(0.242)	(0.295)	(0.186)	(0.542)	(0.025)	(0.018)	(0.017)	(0.025)	(0.030)	(0.020)	(0.042)
									[-0.014]	[-0.011]			[-0.013]	
$FOWNS_{i(t-1)}$	0.187	0.045		-0.005	0.094	0.013	0.086	-0.008	0.007		0.014	0.023	-0.010	0.050
	(0.366)	(0.225)		(0.416)	(0.323)	(0.256)	(0.563)	(0.134)	(0.022)		(0.039)	(0.030)	(0.026)	(0.042)
$FOWNS\text{-}Dummy_{i(t-1)}$			0.113							0.012				
			(0.138)							(0.014)				
$BODSIZE_{(t-1)}$	0.109	-0.407***	-0.399***	-0.509**	-0.317**	-0.394***	-0.539*	-0.007	-0.035***	-0.034***	-0.039*	-0.032**	-0.043***	-0.011
	(0.112)	(0.123)	(0.123)	(0.220)	(0.156)	(0.143)	(0.278)	(0.032)	(0.013)	(0.013)	(0.023)	(0.016)	(0.016)	(0.023)
		[-0.059]	[-0.058]	[-0.064]	[-0.054]	[-0.076]	[-0.016]		[-0.012]	[-0.012]	[-0.015]	[-0.011]	[-0.016]	
$INDIR_{i(t-1)}$	0.594	-1.044*	-1.045*	-2.240**	-0.307	-1.114*	-1.488	-0.054	-0.091	-0.094	-0.266***	0.012	-0.144**	0.014
	(0.606)	(0.552)	(0.552)	(0.925)	(0.723)	(0.643)	(1.212)	(0.182)	(0.058)	(0.058)	(0.097)	(0.073)	(0.070)	(0.103)
		[-0.152]	[-0.158]	[-0.435]		[-0.253]					[-0.099]		[-0.053]	
Control variables														
$EXPDUM_{i(t-1)}$ / $EXPINT_{i(t-1)}$	0.716***	2.744***	2.745***	2.578***	2.880***	2.448***	3.762***	0.799***	1.079***	1.079***	1.007***	1.137***	1.023***	1.226***
	(0.051)	(0.053)	(0.053)	(0.085)	(0.070)	(0.059)	(0.136)	(0.050)	(0.012)	(0.012)	(0.018)	(0.017)	(0.014)	(0.025)
		[1.813]	[1.814]	[1.645]	[1.921]	[1.791]	[1.840]		[0.372]	[0.372]	[0.376]	[0.374]	[0.378]	[0.358]
$SIZE_{i(t-1)}$	0.011	0.079***	0.080***	0.152***	0.057**	0.098***	0.004	-0.002	0.013***	0.013***	0.023***	0.009***	0.013***	0.009**
	(0.013)	(0.022)	(0.022)	(0.038)	(0.029)	(0.025)	(0.056)	(0.004)	(0.002)	(0.002)	(0.004)	(0.003)	(0.003)	(0.005)
		[0.021]	[0.022]	[0.037]	[0.016]	[0.023]			[0.004]	[0.004]	[0.008]	[0.003]	[0.005]	[0.003]

AGE_{it}	-0.011	-0.170**	-0.149**	-0.173	-0.124	-0.148*	-0.385**	-0.003	-0.019**	-0.015*	-0.020*	-0.019*	-0.020**	-0.019
	(0.028)	(0.075)	(0.075)	(0.108)	(0.110)	(0.084)	(0.183)	(0.008)	(0.008)	(0.008)	(0.011)	(0.011)	(0.009)	(0.015)
		[-0.032]	[-0.025]			[-0.035]	[-0.029]		[-0.007]	[-0.005]	[-0.007]	[-0.006]	[-0.007]	
$PROD_{i(t-1)}$	0.010	-0.002	-0.002	-0.134**	0.051**	-0.001	0.024	0.006	0.001	0.001	-0.017**	0.006***	0.001	0.005
	(0.012)	(0.014)	(0.014)	(0.063)	(0.025)	(0.014)	(0.083)	(0.007)	(0.001)	(0.001)	(0.007)	(0.002)	(0.001)	(0.006)
				[-0.028]							[-0.006]	[0.002]		
$CIR_{i(t-1)}$	-0.009	-0.023	-0.025	0.070	-0.408***	-0.022	-0.439	-0.020	-0.011	-0.011	0.007	-0.050***	-0.009	-0.051**
	(0.047)	(0.049)	(0.050)	(0.064)	(0.155)	(0.048)	(0.299)	(0.012)	(0.007)	(0.007)	(0.008)	(0.016)	(0.007)	(0.025)
					[-0.084]							[-0.016]		[-0.015]
$MBR_{i(t-1)}$	-0.001	-0.024	-0.021	0.023	-0.069	-0.024	0.153	-0.003	-0.000	0.001	0.002	-0.001	-0.001	0.019
	(0.010)	(0.035)	(0.035)	(0.053)	(0.047)	(0.034)	(0.267)	(0.003)	(0.004)	(0.004)	(0.005)	(0.005)	(0.004)	(0.022)
$LEV_{i(t-1)}$	0.082	0.304*	0.302*	0.624**	-0.159	0.411**	-0.136	0.002	0.020	0.019	0.030	-0.007	0.025	0.002
	(0.089)	(0.159)	(0.159)	(0.250)	(0.230)	(0.177)	(0.419)	(0.026)	(0.017)	(0.017)	(0.027)	(0.023)	(0.019)	(0.035)
		[0.033]	[0.033]	[0.049]		[0.043]								
$LIQTY_{i(t-1)}$	0.039	0.337**	0.315**	0.471**	0.155	0.475***	-0.329	0.007	0.041***	0.038**	0.049**	0.020	0.048***	0.024
	(0.069)	(0.144)	(0.143)	(0.233)	(0.196)	(0.161)	(0.382)	(0.017)	(0.015)	(0.015)	(0.025)	(0.020)	(0.017)	(0.031)
		[0.070]	[0.064]	[0.080]		[0.084]			[0.014]	[0.013]	[0.018]		[0.018]	
COASTAL dummy	0.003	0.063	0.059	0.104	0.027	0.058	0.088	0.005	0.010*	0.010	0.011	0.008	0.009	0.016
	(0.015)	(0.059)	(0.059)	(0.105)	(0.074)	(0.067)	(0.143)	(0.005)	(0.006)	(0.006)	(0.011)	(0.008)	(0.007)	(0.012)
									[0.004]					
WESTERN dummy	-0.011	-0.030	-0.030	-0.103	-0.009	-0.054	0.004	-0.002	-0.012	-0.012	-0.019	-0.010	-0.014	-0.003
	(0.019)	(0.077)	(0.077)	(0.145)	(0.094)	(0.088)	(0.175)	(0.005)	(0.008)	(0.008)	(0.015)	(0.010)	(0.010)	(0.015)
Industry dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Year dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Inflection point	27.47%	N/A	N/A	25.64%	N/A	23.26%	N/A	24.24%	N/A	N/A	25.56%	N/A	23.45%	N/A
Observations	6315	6315	6315	2281	3941	4275	2040	6315	6315	6315	2281	3941	4275	2040
Proportion > 0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	37.99%	37.99%	42.04%	35.70%	42.74%	28.04%
Log-likelihood	N/A	-1732.07	-1732.87	-650.08	-1025.60	-1392.87	-280.44	N/A	-226.08	-1732.87	26.60	461.2	1153.05	1654.23
Wald χ^2 (P value)	N/A	3081.27	3082.52	1108.77	1879.83	2013.49	806.80	N/A	8452.33	3082.52	3891.71	4577.62	5888.92	2576.07
	N/A	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	N/A	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Sagan test (p values)	59.30(0.173)							40.95(0.429)						
AR1 (p values)	-9.55(0.000)							-5.73(0.000)						
AR2 (p values)	0.71(0.477)							0.77(0.442)						

Notes: In columns 1 to 7, the dependent variable (EXPDUM) is a binary variable which takes value of one if the firm exports, and 0 otherwise. In columns 8 to 14, the dependent variable (EXPINT) is a censored variable which is equal to zero if the firm does not export, and takes the value of the actual exports to total sales ratio, otherwise. Estimates in columns 1 and 8 are obtained using a system GMM estimator; those in columns 2 and 9, using a piecewise specification; those in columns 3 to 7, using a random-effects probit estimator; and those in columns 10 to 14, using a random-effects tobit estimator. In the random-effects probit and tobit models, the Wald statistic is aimed at testing the null hypothesis that the regression coefficients are jointly equal to zero. For the system GMM regressions reported in columns 1 and 8, *AR1 (AR2)* is a test for first- (second-) order serial correlation of the differenced residuals, asymptotically distributed as $N(0,1)$ under the null of no serial correlation. The Hansen *J* test of over-identifying restrictions is distributed as *Chi*-square under the null of instrument validity. We treat all right-hand side variables except firm age as potentially endogenous variables: levels of these variables dated *t*-2 and further are used as instruments in the first-differenced equations and first-differences of these same variables lagged once are used as additional instruments in the level equations. In columns 4/5 and 11/12, a firm is defined as state-owned if the state is identified as its ultimate owner. In columns 2-7 and 9-14, marginal effects are in square brackets for those coefficients that are statistically significant. Standard errors are in parentheses. ***, **, and * denote significance levels of 1%, 5% and 10%, respectively. See Table A1 in the Appendix for definitions of all variables.

Table A1. Variables' names, definitions, and expected signs.

Variables	Name	Definition	Expected sign
Dependent variables			
Export propensity	EXPDUM	Dummy variable equal to 1 if the firm exports, and 0 otherwise	
Export intensity	EXPINT	Ratio of exports to total sales	
Corporate governance variables			
Managerial shareholding	DOS	Percentage of shares owned by managers, directors and supervisors	+ (H1)
	DOS^2	Square of DOS	- (H1)
	DOS-dummy	Dummy variable equal to 1 if DOS>0, and 0 otherwise	
	DOS025	Variable equal to DOS if DOS<0.25, and equal to 0.25 if DOS≥0.25	
	DOS25	Variable equal to DOS-0.25 if DOS>0.25, and 0 otherwise.	
State shareholding	SOS	Percentage of shares owned by the central government, local governments, or any entity representing the central or local governments.	- (H2)
Legal person shareholding	LPS	Percentage of shares owned by non-individual legal entities or institutions	?
Foreign shareholding	FOWNS	Percentage of shares owned by foreign investors	+ (H3)
	FOWNS-dummy	Dummy variable equal to 1 if FOWNS>0, and 0 otherwise	
Board size	BODSIZE	Total number of directors on the board of directors	- (H4)
Independent directors	INDIR	Proportion of independent directors on the board of directors.	-/no (H5)
Control variables			
Firm size	SIZE	Logarithm of the firm's total real sales	+
Firm age	AGE	Logarithm of the number of years since the establishment of the firm	+
Labor productivity	PROD	Ratio of real sales to the number of employees	+
Capital intensity	CIR	Ratio of real fixed assets to the number of employees	+
Market- to-book ratio	MBR	Ratio of the sum of the market value of equity and the book value of debt to the book value of total assets	+
Leverage ratio	LEV	Ratio of total debt to total assets	-
Liquidity ratio	LIQTY	Ratio of the difference between current assets and current liabilities to total assets	+
Regional dummies	REGION	Dummies indicating whether the firm is located in the Coastal, Western, or Central region of China	
Year dummies	YEAR	Year dummies for the years 2005 to 2010.	
Industry dummies	INDTRY	Dummies for the following four industrial groups based on the CSMAR B classification: Properties, Conglomerates, Industry, Commerce. Utilities and financial industries are excluded.	

Note: Real variables are derived from nominal ones using China's GDP deflator.

Notes

[1] Firms have endeavored in outward foreign direct investments (OFDI) via acquisitions or greenfield investment only very recently, as these forms of internationalization require a considerably greater resource commitment and risk taking than exporting (Morck et al., 2008). For instance, although China is the world's largest exporter, its OFDI is still tiny and a limited number of firms are involved in it (Morck et al., 2008).
[2] See Greenaway and Kneller (2007) for a detailed review.
[3] Several papers have shown that corporate risk-taking is generally positively related to performance, thereby enhancing shareholder value (see, for instance, John et al., 2008). Looking specifically at the decision to enter export markets, which can be seen as a risky investment (Verhoeven, 1988), there is a huge literature which has shown that exporting is positively linked to corporate performance in general and productivity in particular (see, for instance, Park et al., 2010).
[4] By contrast, Lin et al. (1988) argue that, although the reforms initiated by the government have increased managerial autonomy and intensified competition, due to policy burdens and soft budget constraints, instead of enhancing economic efficiency, they have worsened agency problems in SOEs.
[5] Research focused on Chinese listed firms reaches similar conclusions using managerial tournament theory (Chen et al., 2011; Kato and Long, 2011). Specifically, these studies provide evidence suggesting that the winner's price (executive pay) and the pay gap between the highest executive positions (i.e. the first- and second-tier executives) improve firm performance due to enhanced managerial efforts, but that the performance effects of managerial incentives derived from these corporate tournaments is weakened by state ownership and control (Chen et al., 2011; Kato and Long, 2011).
[6] Although these changes were gradual and evolutionary compared with those experienced in other transition countries, Walder (2011, p. 23) refers to this as a Chinese version of "managerial revolution". It should be noted, however, that the rise in managerial ownership has been slower in China compared to market economies (Walder, 2011; Chen et al., 2011; Conyon and He, 2012).
[7] The latter figure is based on the data used in our empirical analysis.
[8] This effect is likely to be more significant for Chinese managers than for their counterparts in Western countries, since their personal wealth is much lower (Walder, 2011).
[9] Even though ownership concentration is high in China, there often exists a separation between ownership and control. This can be explained by the dominance of pyramidal ownership structures among Chinese listed companies. Agency problems in China can also take the form of tunneling, whereby the listed companies transfer resources through related-party transactions to benefit the controlling shareholders at the cost of smaller investors (Jiang et al., 2010).
[10] Bankruptcy risks are associated with possible non-payment, late payment, or fraud by foreign buyers. These risks may stem from the difficulty in verifying buyers' creditworthiness and reputation when buyers reside in distant countries. They could also derive from buyers' poor financial conditions, insolvency, or bankruptcy, and/or from their unwillingness to keep their contractual payment obligations. Firms who start exporting also face several challenges in terms of language, legal threats, conforming to foreign regulations, and cultural differences. In addition, there are risks in terms of legal security, reliability of trade partners, and exchange rates (Verhoeven, 1988). Transportation risks, which involve the risks of transferring goods from one country to another, also need to be taken into account. They may include theft and/or damage of goods during transportation. Finally, there may be risks caused by natural catastrophes, coup d'état, terrorism, civil war, revolution, insurrection and so on, in the buyer's country.
[11] This happens because managers at SOEs are generally not rewarded on the basis of performance.
[12] It should be noted, however, that, as discussed in Morck et al. (2008), a few large SOEs with lucrative state-enforced monopolies in natural resources or infrastructure sectors are actively involved in overseas mergers and acquisitions and outward foreign direct investment, seeking to acquire strategic resources. Yet, these types of companies are very few and the majority of SOEs are inefficiently run, highly unprofitable, and mainly engaged in domestic markets (Sun and Tong, 2003, Wei et al., 2005).
[13] Specifically, legal persons may expropriate assets or cash flows from the listed firms, harming the interest of minority shareholders.
[14] By contrast, Peng (2004) argues that the introduction of independent directors in Chinese boards of directors has contributed to improving corporate governance.
[15] All shareholding variables are calculated as the percentage of shares owned by various agents. For instance, following the finance literature (Anderson et al., 2000; Yuan et al., 2008), we define managerial shareholding (DOS) as the percentage of shares owned by managers, directors, and supervisors (including members of the supervisory board). It is noteworthy that most of the studies based on U.S. data also investigate the effects of high powered incentives such as holding of common stocks and options on investment decisions. Given that in China stock options are still an underdeveloped incentive mechanism for

managers, we consider stock holdings and non-stock options as the main incentive mechanisms for managers.

[16] Following Yuan et al. (2008), foreign ownership includes non-tradable foreign-founder shares, tradable B-shares, and tradable H-shares.

[17] We also estimated alternative specifications, which included the squares of state, legal person, and foreign ownership, but these terms were never statistically significant. The results are not reported for brevity, but available upon request.

[18] We separately purchased export data by listed firms from GCCET LTD. The data file includes export value as well export sales ratios for all exporting firms. We then merged these export data with our main CSMAR database, which contains governance and other firm characteristics.

[19] It should be noted that although firm size is measured as the logarithm of total real sales in the regression analysis, the figures reported in the descriptive statistics Tables are not in logarithms as actual values are easier to interpret.

[20] There is, however, one exception: we observe in fact a high correlation between managerial ownership and its square (0.86). For this reason, following Kennedy (2008), we calculate the variance inflation factor (VIF), which is a standard test for multicollinearity. We note that the VIF does not exceed the threshold of 10, which suggests that the observed high correlation coefficient between managerial shareholding and its square should not cause problems in our regressions.

[21] This can be explained considering that several exporters in China are engaged in processing trade: they import parts and input labor to assemble final products, which they then export (Dai et al., 2014). These exporters are therefore not necessarily more productive than non-exporters. In addition, according to the trade theory of comparative advantage, labor-intensive firms in China are more likely to become exporters (Lu et al., 2009). This explains why average capital intensity appears to be higher for non-exporters.

[22] The turning points are calculated setting the first derivative of Equation (1) with respect to DOS equal to 0, and solving for DOS.

[23] The insignificant coefficients on foreign ownership that we found in most of our specifications can be explained considering that foreign ownership is very small in our sample of Chinese listed companies (see Table 1). This suggests that foreign ownership is not very common among listed Chinese companies, which could explain why it does not significantly affect firms' decisions to enter export markets. The fact that other papers which also focused on China (e.g. Yi and Wang, 2012; Yi, 2014) found opposite results could be due to the fact that they estimated specifications much more parsimonious than ours. The positive coefficients they found on foreign ownership may therefore simply reflect an omitted variable bias.

[24] It should be noted, however, that the coefficient on the lagged dependent variable should be interpreted with caution as it is likely to be biased due to the correlation between lagged export propensity and the firm-specific component of the error term.

[25] See footnote 21 for an explanation for these findings.

[26] All our results were robust to replacing the market-to-book-ratio with sales growth as an alternative measure for the firm's investment opportunities.

[27] As in Aggarwal and Samwick (2006), we have also estimated regressions using two break points (at 5% and 25 % respectively) and found a positive relationship between managerial ownership and exporting within the range of 0-25% and a negative relationship thereafter. This finding is consistent with the descriptive statistics presented in Table 4. We have also undertaken an additional robustness test replacing managerial ownership and its square with dummies for managerial ownership less than 5%; between 5% and 10%; between 10% and 20%; between 20% and 30%; and higher than 30%. We found that that increasing managerial ownership from 0% to 10% enhances both export propensity and intensity. Yet increasing managerial ownership more has no effect on both dimensions of exporting, up to a threshold of around 30%, after which further increases in managerial ownership are detrimental to export propensity and intensity. These results are not reported for brevity, but available upon request.

[28] The results for export intensity were also robust to estimating a system-GMM model augmented with the inverse Mills ratio on the subsample of exporters (see Minetti and Zhu, 2011, for a similar approach). These results are not reported for brevity, but available upon request.

[29] It should also be noted that managerial ownership in state-controlled firms is very low: According to our data, it is in fact equal to 0.22% for state-controlled firms, and to 8.1% for privately-controlled firms.

[30] In line with this argument, Todo et al. (2012) show that privatized Chinese companies are more likely to engage in exports than SOEs.

[31] It should be noted that the year 2006 is actually included in the pre-2006 period.