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Board Restructuring and Successful Demutualization: the Stock Exchanges

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Abstract

Purpose – The purpose of this paper is to study corporate governance restructuring strategies of companies to adapt to new market conditions following conversion into a for-profit structure. It focuses on the changes in the composition of the board of directors.

Design/methodology/approach – The paper conducts a field experiment using stock exchanges, which have become more international over time, and many of which have been forced to demutualize and convert to for-profit structures to compete more efficiently. The paper does a fine-grained analysis of restructuring in the composition of the board using the ANOVA technique. The paper also examines the impact of this board composition restructuring on the reputation of the exchanges using a regression technique.

Findings – The authors find that the stock exchanges restructured board composition and refocused them to create better value. Results suggest that the conversion of a company to a for-profit structure brings efficiencies when accompanied by changes in the governing

bodies. The authors also find that converting to for-profit firms had a positive impact on the reputation of the exchanges. The positive impact was even greater when accompanied by changes in board composition.

Research limitations/implications – A stronger focus on the corporate governance dimension to understand the successful demutualization of stock exchanges is needed.

Originality/value – The authors analyze the corporate governance dimension during demutualization processes of an under examined sector. The financial performance of the stock exchanges the authors study significantly improved after their conversion to for-profit organizations and provide an example of successful corporate governance restructuring.

Keywords: Board of directors, Reputation, Strategy, Corporate governance, Demutualization, Stock exchanges, For-profit firm

JEL classification: G34; G15; L14

1. Introduction

The environment in which stock exchanges operate has dramatically changed during the past 20 years. Globalization, financial integration and advances in technology have increased competition and affected how financial markets function. Such changes have forced a growing number of stock exchanges to shift from mutually owned not-for-profit organizations to for-profit, investor-owned firms through demutualization in order to obtain the flexibility and financing needed for increased competition (Domowitz and Steil, 1999; Mendiola and O'Hara, 2003). The number of demutualized exchanges has dramatically increased during the last two decades. In 2015, more than 82 percent of stock exchanges in the world included for-profit companies, compared to only 37 percent in 1998 (WFE).

The conversion of stock exchanges into for-profit firms has mainly been successful, with an overall improvement in financial performance (Otchere, 2006; Otchere and Abou-Zied, 2008) and efficiency (Oldford and Otchere, 2011). However, the conversion has also been accompanied by changes in corporate governance, and while these changes may contribute to a better understanding of successful conversion in exchanges to for-profit firms, this dimension has been overlooked in the literature.

The objective of this paper is to fill this gap in the literature by investigating changes in exchange board composition during their conversion to for-profit firms. Additionally, we analyse the impact of such changes on exchange reputation and attractiveness, which are key elements in an increasingly competitive environment.

This article contributes to the literature in several ways. First, it contributes to the limited literature on corporate boards in the stock exchange industry (e.g., Hart and Moore, 1996; Aggarwall, 2002). Second, it is the first study to consider the corporate governance dimension of stock exchanges in detail when they convert to for-profit organizations. Our results may be

applicable to companies in other sectors that are considering a similar conversion to for-profit status. Third, we examine different dimensions of board composition, whereas previous studies have tended to focus on size and independence (see Adams et al., 2010 and Johnson *et al.* 2013 for a survey). The value of investigating board composition beyond size and independence when examining the impact on firm outcomes has already been explored in the literature (Johnson *et al.* 2013; Hillman, 2015). Fourth, to the best of our knowledge, this is the first study to examine the influence of board composition on firm reputation in the context of conversion to for-profit status.

We use a unique firm-level data set covering a 17-year period with detailed data on exchange corporate governance that enables us to conduct a fine-grained analysis of changes in corporate governance strategies after changes in organizational structure. Based on resource dependence theory (Pfeffer, 1972; Pfeffer and Salancik, 1978), we examine board composition by looking at demographic, human and social capital dimensions. Once we identify major and significant changes in board composition, we examine the impact of demutualization and related changes on the reputation of the exchanges.

We find that exchanges have usually restructured corporate governance after conversion to for-profit status. Firms have reorganized their boards by reducing the representation of trading members and by diversifying, favouring competences better adapted to new market conditions. We also find that board restructuring is significant in the long rather than short term. Finally, we show a positive relationship between demutualization and reputation. This positive relationship is even stronger when demutualization is accompanied by board composition changes, especially fewer board trading members.

The paper is organized as follows. Section 2 provides a review of the literature on the relationship between board composition, organizational form and corporate reputation and develops our

testable hypotheses. Section 3 describes our data and empirical methodology. Section 4 presents the main empirical results and links them to previous literature, and Section 5 concludes and offers recommendations for future research and practical implications.

2. Literature review

The conversion from a mutual to a for-profit organization, usually known as demutualization, involves changes in the ownership structure (Chaddad and Cook, 2004; Karmel, 2000), implying a separation of ownership and membership *(*Domowitz and Steil, 1999). In contrast to that in a mutual form, the owners and managers of a demutualized organization are different from its customers (Lai and Limpaphayom, 2003).

Numerous companies have demutualized in many sectors, including finance, especially in the insurance and stock exchange industries, and a growing literature focuses on explaining the demutualization process and its determinants. This literature, which mainly focuses on insurance companies, outlines various factors explaining the decision to demutualize, including better access to external financing (e.g., Butler, Cui, and Whitman, 2000), tax advantages (e.g., Erhemjamts and Phillips, 2012) and increased efficiency (e.g., Erhemjamts and Leverty, 2010)1. Considering the stock exchange industry, most of the studies show that demutualized exchanges are more efficient (Hart and Moore, 1996; Oldford and Otchere, 2011) and better performing (Otchere, 2006; Otchere and Abou-Zied, 2008) than mutual exchanges. Steil (2002) adds that such exchanges are also more adaptable to a changing financial environment. In a mutual stock exchange, brokers are also owners, and they are usually reluctant to changes in the exchange functioning that could affect their monopoly position in intermediation and decrease their revenues (Lee, 1998). As shown by Steil (2002), the interests of exchange members considerably influence the decisions of the exchange board. By detaching ownership from membership,

[1] For more details, please refer to Erhemjamts and Phillips (2012) and Chaddad and Cook (2004).

demutualization pushes exchanges and their boards to be run as a for-profit organization, and they put the interests of the exchange before those of interest groups (Cybo-Ottone et al., 2000).

However, as already mentioned, this growing literature on demutualization has not examined in detail the corporate governance dimension, which is an important aspect of the demutualization process. In effect, after demutualization, exchanges usually make changes in their governance structure, especially in their boards of directors, to better represent outside shareholders (Aggarwall, 2002). The literature acknowledges these corporate governance changes, but to the best of our knowledge, it has never examined such changes empirically. Moreover, as mentioned by Steil (2002), all demutualized exchanges are not the same with respect to governance practices. In some exchanges, governance practices do not significantly differ from those of mutual exchanges.

The objective of this study is to fill this gap in the literature by investigating corporate governance changes after the demutualization of stock exchanges.

3. Research Questions

3.1 Presence of members in the board versus other categories of directors

In a mutual structure, trading members have ownership and control under the principle of one member, one vote. These mutual exchanges function like clubs since only members can access the trading platform based on the payment of fees. In return, members enjoy a monopoly position in trading, and they are likely to be resistant to changes (Akhtar, 2002; Domowitz and Steil, 1999), especially if the changes would lessen demand for their intermediation services. Following demutualization, exchanges should be inclined to decrease the proportion of their members to gain flexibility and to reduce their influence (Akhtar, 2002).

Theorists argue that the presence of stakeholder directors on corporate boards is one of the most direct ways in which stakeholders can influence firm decisions (Luoma and Goodstein, 1999). After demutualization, stock exchanges should add directors with social capital that adds more value to the new more competitive environment. In addition to trading members, we identify three other main stakeholder groups: customers, new investors (shareholders) after demutualization, and government. Customers represent critical resource holders (Rindova, 1999), and their presence on the board should reflect their needs and their desire to make strategic decisions in line with their concerns (Hill and Jones, 1992). When exchanges convert, they give a more prominent role to customer orientation (Aggarwal, 2002; Steil, 2002). Hence, after demutualization, customers should be better represented on exchange boards.

Demutualization usually goes through two progressive stages. The first stage covers the conversion to a private, limited status, where a portion of capital is held by outside investors. The second stage consists of publicly listing shares on the exchange (Aggarwal, 2002). The presence of outside investors ensures that decisions are taken in line with shareholder values rather than member interests (Mendiola and O'Hara, 2003; Steil, 2002). For this reason, outside investors are key stakeholders after demutualization and listing; they should join exchange boards after conversion to for-profit firms.

Macey and O'Hara (2005), among others, add that the new governance model needs to be accompanied by regulatory reforms. Accordingly, we expect that stock exchanges increase the number of members with connections to government and regulatory bodies after demutualization. In sum, we propose the following hypothesis:

H1 - *Following demutualization, stock exchanges decrease the proportion of trading members in their board and add more customers, outside investors and directors who are politically connected to government and regulatory bodies.*

3.2 Restructuring board demographic attributes

A number of studies show that board demographic attributes are linked to firms' environment and that they can affect firm outcomes and strategy (Adams et al. 2010; Johnson et al. 2013; Schmidt and Bauer, 2006). Given the major changes in the business environment in which exchanges operate, we expect to observe changes in the demographic attributes of stock exchanges' boards after demutualization.

For example, based on the resource dependence theory (Pfeffer, 1972; Pfeffer and Salancik, 1978), studies show that board size helps firms deal with the external environment better and relate to more strategic change (Dalton et al. 1999; Golden and Zajac, 2001). Accordingly, we expect to observe an increase in the size of the board of stock exchanges after demutualization to better face the new business environment, requiring new strategies and product innovation to increase competitiveness. Research also shows that board tenure and age are also positively associated with strategic change related to new products and markets (e.g., Golden and Zajac, 2001). In line with these findings, we also expect to observe an increase in board tenure and age. Studies demonstrate that network board diversity (which can be acquired with directors' appointments in other boards, also known as board busyness) positively relates to strategic change (e.g., Wincent et al. 2010). Accordingly, we expect to observe an increase in board busyness after demutualization.

Additionally, based on agency theory (Jensen and Meckling, 1976), research highlights the need to increase the number of independent directors (e.g., Dehaene et al. 2001). An independent board helps legitimize the compliance role of the board, which tends to dominate once companies go public. Independent directors are expected to provide effective supervision of management activities and help compliance with corporate governance requirements. In line with this reasoning, we expect to observe an increase in the number of independent directors in the board after demutualization.

In sum, based on the resource dependence theory and the above empirical evidence, we propose the following hypothesis:

H2 - *Following demutualization, stock exchanges increase their board size, tenure, age, busyness and number of independent directors.*

3.3. *Changes in the human capital of board members*

Diversity allows a board with different perspectives to take a broader view of strategic decisions (Kosnik, 1990), especially when the firm operates in a turbulent and competitive environment. Directors representing a broad range of expertise contribute to widening the knowledge base of the board and reducing uncertainty, which may make decision making more efficient (Rindova, 1999). For stock exchanges, the most useful knowledge and skills in the board of directors have been previously linked to traditional areas such as stock brokerage, finance, banking, funds and investment management. However, demutualization pushes exchanges to maximize profits, to innovate and to diversify products in order to attract more investors. Competences other than the traditional ones in financial markets become especially relevant, including knowledge of information systems, financial product development and commercial experience (Holthouse, 2002).

In particular, we classify directors experience as follows: (1) traditional competences in financial markets (stock brokerage; finance; banking; and funds and investment management) and (2) new-environment related competences that we believe are particularly valuable for implementing strategies that maximize profits and that are better adapted to the more competitive environment (technical and information systems; product development; commercial aspects, including marketing and sales; business administration; corporate communications; diverse business experience; regulatory and international). Experience in diverse businesses relates to the concept

of “board capital breadth,” (Haynes and Hillman, 2010), which captures, among other measures of board diversity, work experience in different sectors. Haynes and Hillman (2010) find a positive relationship between board capital breadth and strategic change. We believe that board capital breath is valuable for exchanges when they change strategies after demutualization. Additionally, the functioning of a financial institution is inextricably linked to the regulatory climate. To promote favourable regulation, financial firms need directors with political and regulatory influence (Pfeffer, 1972). Based on resource dependence theory, we hypothesize that*:*

H3 *Stock exchanges increase the proportion of board members with technical and information systems; product development; commercial; business administration; corporate communications; diverse business experience; regulatory and international competences and background.*

3.4. The moderating role of changes in the board of directors on the impact of demutualization on exchange reputation

Reputation reflects the attractiveness and visibility of the firm and the quality of its products (Shapiro, 1983). It also informs the market on the exchange prospects (Alchian and Demsetz, 1972; Weigelt and Camerer, 1988). Few researchers investigate the link between corporate ownership form and reputation. Fergusson et al. (2000), for example, focus on the insurance industry and find that firms with different ownership forms have different reputation levels.

Considering the exchange industry, in a mutual structure, the roles of exchange trading and ownership are combined. However, demutualization forces exchanges to separate trading from ownership functions (Fergusson et al., 2000). This difference is very important, and it considerably affects managerial decisions. In a mutual exchange, managers are incited to act in their own interest (Akhtar, 2002; Domowitz and Steil, 1999), whereas in demutualized exchanges, they are more profit oriented (Akhtar, 2002). In a competitive environment, stock exchanges are incited to change their strategy to better adapt to this new environment. These

changes tend to include the adoption of sophisticated and more efficient trading systems and the introduction of new financial products to attract more firms and investors (Domowitz and Steil, 1999). We expect that such changes after demutualization will positively affect the reputation of exchanges. We thus propose the following hypotheses:

H4: *Demutualization has a positive impact on exchange reputation.*

There is limited research on the link between board characteristics and corporate reputation (Musteen *et al.* 2010). Signalling theory says that the actions of firms send signals to the market about firms' strategy, intentions and ability to create value (Rindova and Fombrun, 1999). Based on such signals, the market forms impressions on firms (Weigelt and Camerer, 1988) that contribute to their reputation (Basdeo et al., 2006). Musteen *et al.* (2010) add that board composition communicates useful information on firm strategy and represents important signals affecting corporate reputation. Their findings indicate that firms with a high proportion of outside directors and large boards enjoy better reputation. Consistent with these studies, we expect that if we verify H1 to H3 (i.e., exchanges restructure board composition to become closer to the ideal standard of governance), such changes should enhance exchange reputation.

H5: *Changes in board composition moderate the positive impact of demutualization on exchange reputation.*

Table 1 provides a summary of the main literature used to develop our hypotheses:

Theme	Hypothesis	Article
Influence of members in the board, Potential conflict of interests	H1: Following demutualization, stock exchanges decrease the proportion of trading members in their board and add more customers, outside investors and directors politically connected to government and regulatory bodies.	Akhtar (2002); Domowitz and Steil (1999)
Influence of stakeholders in the board	H1: Following demutualization, stock exchanges decrease the proportion of trading members in their board and add more customers, outside investors and directors politically connected to government and regulatory bodies.	Luoma and Goodstein (1999); Hill and Jones (1992)
Influence of outside investors in the board	H1: Following demutualization, stock exchanges decrease the proportion of trading members in their board and add more customers, outside investors and directors politically connected to government and regulatory bodies.	Mendiola and O'Hara (2003); Steil (2002)
Board demographic attributes and firm outcomes and strategy: - Board size - Board tenure and age - Board Busyness - Independent directors	H2: Following demutualization, stock exchanges increase their board size, tenure, age, busyness and number of independent directors.	Pfeffer (1972); Pfeffer and Salancik (1978) Golden and Zajac (2001) Wincent et al. (2010) Jensen and Meckling (1976); Dehaene *et al.* (2001)
Board human capital and firm strategy	H3: Stock exchanges increase the proportion of board members with technical and information systems; product development; commercial; business administration; corporate communications; diverse business experience; regulatory and international competences and background.	Kosnik (1990); Rindova (1999); Holthouse (2002); Haynes and Hillman (2010); Pfeffer (1972)
Demutualization and stock exchanges strategies and objectives	H4: Demutualization has a positive impact on exchange reputation.	Fergusson et al. (2000); Akhtar (2002); Domowitz and Steil (1999); Domowitz and Steil (1999)
Board characteristics and firm reputation	H5: Changes in board composition moderate the positive impact of demutualization on exchange reputation.	Musteen *et al.* (2010); Rindova and Fombrun (1999); Weigelt and Camerer (1988); Basdeo et al.(2006)

4. Methodology and data

4.1 Methodology and sample selection

We focus on demutualized stock exchanges. According to the World Federation of Exchanges, in 2012, there were 28 demutualized equity stock exchanges. We withdraw from our sample exchanges that were involved in international merging processes during our period of study, mainly, Nasdaq OMX Group and NYSE Euronext. We finally retain only exchanges with complete board data available during the whole period from 1995 to 2012. These variables were manually collected from exchange annual reports, and they were supplemented with information from Bloomberg and Reuters databases. We finally retain 14 equity stock exchanges (see Table A.1 for details).

4.2 Variables and summary statistics

To test H1 to H3, we compare board composition before and after demutualization. Specifically, we consider different windows to obtain information regarding the timing of changes in board composition.

We examine three dimensions of board composition. The first dimension is board social capital. We focus on four groups of stakeholders (in percentage): *trading members; outside investors*, which are new investors (shareholders) after demutualization; *customers*, measured by the proportion of directors affiliated with companies listed on the exchanges and government, measured by the proportion of directors politically connected to government and regulatory bodies (*Politically Connected*; including directors with current or past positions in government or regulatory bodies).

The second dimension concerns board demographic attributes widely discussed in the literature: *board size* (e.g., Jensen, 1993), which is the number of directors in the board; number of board

appointments (*Busyness*; e.g., Fich and Shivdasani, 2006), which is the average number of directors' board appointments; *independent directors*, which is the percentage of independent directors on the board (e.g., Bhagat and Black, 2002), defined as 'independent of management and free from any business or other relationship which could ultimately interfere with the exercise of independent judgment (…)' (UK's Cadbury Report, 1992); *directors age* (e.g., Ahn and Walker, 2007); and *directors' tenure* (Fich and Shivdasani, 2006; Muth and Donaldson, 1998), which is the average tenure of directors on the board.

The third dimension is board human capital. We examine directors' experience and background. In particular, we calculate the percentage of directors with experience in technical and information systems; product development; commerce; business administration and corporate communications competences; with experiences in diverse business (that is, directors who have worked in a variety of sectors/companies); with regulatory experience (that is, directors with experience in regulatory bodies) and with international experience (that is, directors with experience in international companies).

Table 2 provides descriptive statistics for board composition.

Table 2 about here

To test H4, we regress stock exchange reputation on a dummy for demutualization (DEM), demutualization interacted with the changes in the board of directors that were significant according to our analysis (BOARDCOMP), and other control variables that the literature on competition among exchanges and on reputation suggests can affect the reputation of such exchanges. In particular, we control for size (measured by total assets in logs) since some empirical research finds that it can influence firm reputation (e.g., Fergusson et al. 2000) and age (in logs), since some studies show that firm age is a good indicator of firm credibility and ability to provide quality products and is hence linked with its reputation (e.g., Anderson and Formisano,

1988). We also use other controls that have been extensively used, such as financial performance (e.g., Deephouse and Carter, 2005), measured by return on assets (ROA), and country specificities, which can also affect exchange reputation (e.g., Lo, 2013). In particular, we control for economic growth and inflationary level by using annual GDP growth rate and the consumer price index. We assume that exchanges operating in a country with favourable economic conditions with a stable inflationary environment will tend to attract more firms than other countries (Cetorelli and Peristiani, 2012). We also control for countries' regulatory environment by using the World Bank's Worldwide Governance Indicators. These indicators represent the views of a large number of actors (enterprises, citizens and experts) on six dimensions of governance (voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, rule of law, control of corruption). In line with the study of Cetorelli and Peristiani (2013), we do not use all these indexes; rather, we use only the rule of law and political stability indexes, which are more correlated with market reputation. The variable country regime used in our empirical regression is the average of these two indexes.

Regarding reputation, in the literature, depending on the discipline, one can find both qualitative and quantitative measures (see Dowling, 2016). Most of them are reputation *perceptions* provided by the Fortune magazine and the Reputation Institute, but unfortunately, these two annual studies do not include stock exchanges. In finance, some research uses market share as a proxy for reputation (e.g., Carter and Manaster, 1990; Megginson and Weiss, 1991)[2]. Following this literature, we use the number of listed companies (in logs) in the exchange as a proxy for exchange reputation, since this number is *a barometer* of the exchanges market share and health (Mendiola and O'Hara, 2003) and an indicator of exchange attractiveness for firms (Lo, 2013). We consider the number of all listed firms (domestic and foreign) and not only foreign companies

[2] - For more details, please see the study of Baden-Fuller et al. (2000) that summarizes the methods of reputation measurement used in the literature.

as a proxy for reputation to fully account for important aspects of the "new" exchange environment and the recent changes affecting financial centres. These changes include the increasing integration and internationalization of financial markets around the world, regulatory reforms and innovative technology. More specifically, technological progress has contributed to a decrease in the home bias of investors, reducing the interest of firms to list in domestic markets. It has also facilitated the introduction of alternative trading platforms that directly compete with domestic exchanges (Macey and O'Hara, 2002), even in listing activity (Cantilllon and Yin, 2011). Exchanges are struggling to improve their reputation by attracting not only foreign but also domestic firms.

We use panel data (unbalanced) for the analysis. Our basic model is a one-way, fixed effect. The stock exchange fixed effect is meant to capture unobservable stock exchange characteristics, such as managers' abilities.

Table 3 provides the means, standard deviations and zero-order correlations among the regression variables. The correlations between the independent variables are not very high, indicating that multicollinearity is not a problem in our model.

Table 3 about here

5. Empirical results

5.1 Changes in board composition after demutualization

Tables 4 and 5 compare sample statistics for board composition before and after demutualization.

Table 4 about here

Table 5 about here

We consider the five years preceding conversion (Period 1) and three, five and seven years after conversion (Periods 2, 3 and 4). The analysis of different windows allows us to track the timing

of changes, to distinguish between short- and long-term effects and to choose the best window of study to capture changes. The first surprising result is that some changes are significant only when considering Period 4, such as the decrease in trading members, while they are weakly or not significant before this period. These results suggest that changes in board composition may take a relatively long time to be implemented.

After demutualization, exchanges decreased the board representation of trading members after demutualization, but the change is significant only when considering Period 3 or 4, suggesting that trading members have considerable power on the board and that the decrease in their number is a process that can be long and complex for exchanges (Akhtar, 2002). Meanwhile, exchanges incorporated new investors (exchange shareholders) on their boards (7.5% after demutualization). Exchanges also significantly increased the proportion of politically connected directors (from about 14.22 % to 20 %). Overall, the results are consistent with H1. These results confirm that the conversion to a for-profit firm pushes exchanges to diversify their boards to account for political and investors' interests. However, surprisingly, the proportion of directors affiliated with listed companies has not significantly changed after demutualization. This finding may be explained by the fact that these firms were already well represented on the board of directors before exchange demutualization (around 30% prior to the conversion), so there was no need to increase their presence – contrary to the other categories of directors (politically connected and outside investors).

Moreover, most exchanges decreased the size of boards, suggesting that demutualization helps to simplify their governance structure. We also observe a significant increase in directors tenure, and we find that exchanges appoint older directors who sit on the boards of more companies after demutualization suggesting that after demutualization, exchanges have an interest in having directors with diverse experiences in various sectors and not only in the stock exchange industry (Golden and Zajac, 2001). These results confirm H2.

The proportion of independent directors (about 22%), however, remains nearly unchanged. Previous studies have also reported similar levels of inertia regarding independent directors after important institutional changes (see, for instance, Cuevas-Rodriguez et al., 2016, in a privatization context). This result suggest that the exchanges may not consider that independent directors improve their value and that they prefer to give priority to adding to their boards other categories of directors dependent but better contributing to improve their financial performance. This result is in line with other empirical studies that are not conclusive regarding whether independent directors improve corporate performance (e.g., Bhagat and Black, 2002).

For directors' experience, there is evidence of significant changes in the proportion of directors with traditional competences in financial markets only in Period 4. We also find significant changes in the proportion of directors with new-environment related competences: business administration (from 17.41% to about 25%), international (from 15.29% to about 22%), and diverse businesses (from 6.69% to about 14%), all significant at the one-percent level for periods 3 and 4. The exchanges opted for a more international board, in line with the internationalization strategies adopted by most of the exchanges after demutualization. The internationalization of companies may lead to a higher demand for directors with knowledge of foreign markets (Carpenter *et al.* 2001). We also find a significant increase in the proportion of directors with regulatory experience (from 8.90% to 13.24% in Period 4). All these results provide evidence of important board recomposition after demutualization, which is consistent with H3.[3]

[3] In addition, stock exchanges significantly restructured the composition of their top management teams and changed their payment schemes. Table A.2 in the Appendix shows the results of a complementary analysis on changes in top management human capital and remuneration packages following demutualization.

5.2 How board changes affect exchange reputation

Table 6 shows the results of panel data analysis for five different models.

Table 6 about here

Model 1 tests for the effect of an exchange demutualization strategy on reputation without taking into account the interaction with changes in exchange corporate governance. Model 2 considers the combined effects of demutualization with changes in board demographic attributes. Model 3 considers the combined effects of demutualization with changes in a board's social capital. Model 4 considers the combined effects of demutualization with changes in a board's human capital. The full model (Model 5) incorporates all the independent variables simultaneously.

One of the most remarkable results is the positive and highly significant coefficient for demutualization, which is consistent across all models except for model 2, suggesting that demutualization contributes to enhance exchange reputation. This result confirms and adds to the results by Fergusson et al. (2000), which indicate that there is a link between a firm's organizational form and its reputation in insurance industry. In the exchange industry, the demutualized structure seems to help exchanges become closer to an ideal standard of governance. The demutualized structure provides exchanges with more flexibility to compete efficiently in the new business environment, which is highly valued by the market. The results are consistent with H4.

Regarding the combined effects of demutualization with changes in board demographic attributes, the only significant effect on exchange reputation consistent across models is a negative and significant coefficient for director tenure ($p < .05$). This result suggests that the increase in director tenure after demutualization harms reputation. One possible explanation is that the public might consider tenure to be an impediment for strategic choices involving new terrain, for example, product innovation and diversification. In effect, in the management

literature, long organization tenure tends to be associated with commitment to the organizational status quo (Michel and Hambrick, 1992; Staw and Ross, 1980).

The results show a non-significant relationship between the cross-effect of demutualization and the proportion of directors who are new investors (shareholders) and directors politically connected and exchange reputation. However, the results show a negative and highly significant coefficient for the cross effect of demutualization with the proportion of directors who are trading members ($p < .01$, $p < .05$, in Models 3 and 5, respectively). These findings suggest that the positive impact of demutualization on reputation is greater when combined with a decrease in the number of board trading members.

Finally, in contrast to expectations, the results suggest that the increase in directors with other new-environment-related competences does not strengthen the positive impact of demutualization on reputation.

In sum, the demutualization strategy sends signals to the market about the willingness of exchanges to better respond to the changing competitive environment (e.g., Domowitz and Steil, 1999; Otchere and Abou-Zied, 2008), and our results indicate that this enhances reputation. However, the changes in board composition after demutualization have different effects on reputation. Our findings show that except for director tenure in Models 2 and 5 and board size in only Model 2, there is no significant relationship between changes in board demographic attributes and reputation. The lack of significance in the relationship between director age and exchange reputation may occur because the average age of directors and the size of the board are similar to the average of financial firms (e.g., Kesner, 1988), even prior to the conversion to for-profit structure. This situation may make it more difficult for the market to perceive any positive effects from changes in average age of directors. Our analyses show that having fewer board trading members after demutualization improves exchange reputation. This result is in line with

the literature on reputation and corporate organizational form, which shows that one of the most important changes after the conversion to a for-profit firm is a decrease in the number of members on the board, which has a positive effect on demutualized firms (e.g., Hart and Moore, 1996; Domowitz and Steil, 1999). This change sends a positive signal to the market and contributes to enhance reputation.

Our findings also suggest that the market does not perceive changes in the human capital of board members as valuable in reinforcing the positive effect of demutualization on stock exchanges reputation. One possible explanation for this result may be the lack of visibility of such changes due to insufficient communication on their value, making them difficult for the market to identify and evaluate. Also, some of the directors' competences, the more specific, may be difficult to evaluate in the resume of a director. However, the presence of directors with international experience *per se* has a positive and significant impact on reputation in Models 4 and 5. This competence is more visible than other more specific competences and relatively easy for the market to identify. Results suggest that, to the market, the increase in the presence of directors with international experience is valuable for the reputation of the exchanges, but that the increase is not particularly valuable to reinforce the positive effect of demutualization on exchanges reputation. Table 7 provides a summary of the main findings in connection with each hypothesis:

Table 7: Summary of Main Findings

Hypothesis	Main Findings
H1: Following demutualization, stock exchanges decrease the proportion of trading members in their board and add more customers, outside investors and directors politically connected to government and regulatory bodies.	• Decrease in the proportion of trading members in the board • Inclusion of outside investors in the board • Increase in the proportion of directors politically connected in the board
H2: Following demutualization, stock exchanges increase their board size, tenure, age, busyness and number of independent directors.	• Decrease in board size • Increase in board busyness • Increase in directors age • Increase in directors tenure
H3: Stock exchanges increase the proportion of board members with technical and information systems; product development; commercial; business administration; corporate communications; diverse business experience; regulatory and international competences and background.	• Increase in the proportion of board members with financial product development competences • Increase in the proportion of board members with business administration competences • Increase in the proportion of board members with diverse business competences • Increase in the proportion of board members with diverse business competences • Increase in the proportion of board members with international experience
H4: Demutualization has a positive impact on exchange reputation.	• Positive and highly significant impact of demutualization on stock exchanges reputation
H5: Changes in board composition moderate the positive impact of demutualization on exchange reputation.	• The decrease in the presence of trading members in the board reinforces the positive impact of demutualization on stock exchanges reputation • The increase in the tenure of directors in the board weakens the positive impact of demutualization on stock exchanges reputation

6. Policy implications, limitations, and conclusions

This study analyses the demutualization strategy adopted by a large number of firms, including stock exchanges, during the last 20 years. In contrast with previous literature, which mainly focuses on the impact of demutualization on firm financial performance, we analyse firm corporate governance restructuring following its conversion to for-profit firm. We show that to have a complete understanding of the main drivers behind a successful conversion from a non-profit to a for-profit structure, it is important to take into account changes in corporate governance. Our findings also emphasize the importance of considering changes in corporate governance strategy in not only the short term, as previous research tends to do, but also in the long term. As we show in this study, in the context of conversion to a for-profit firm, corporate

governance restructuring takes a relatively long time and most changes start to be visible only five years after demutualization.

We find that different director attributes, including demographics, human capital and social capital, should be added to the mix for a more complete overview, in line with other research on the benefits of boardroom diversity (e.g. Hillman, 2015). We find that stock exchanges significantly restructured the composition of their boards following demutualization in many dimensions. Our results also show that the conversion to a for-profit firm positively affects reputation to a greater degree for exchanges that most restructured their boards by decreasing the presence of trading members.

Our findings contribute to the existing literature that in general shows a positive impact of demutualization strategy on exchanges' financial performance. In particular, our results suggest that changes in corporate governance following the demutualization contribute to explain the improvement of exchanges' financial performance following demutualization shown by the previous literature.

While our study provides interesting insights on corporate governance strategy after a conversion to for-profit status and its effect on corporate reputation, the results should be interpreted with caution in light of the study limitations giving the opportunities for future research. For example, our study focuses on one sector, the exchange industry. Future research could compare differences in boards around the demutualization process in other financial sectors, including the insurance industry and banks.

Another limitation of this study relates to our measure of corporate reputation. Following previous research in financial markets, we use market share as a proxy for reputation (e.g., Carter and Manaster, 1990; Megginson and Weiss, 1991). This indicator can be assessed by different variables including the number of listed firms (Mendiola and O'Hara, 2005; Lo, 2013). In this

study we consider the total number of listed firms, including foreign and domestic, because we want to assess the potential effect of demutualization, moderated by corporate governance changes, on their reputation at both national and international levels. However, it is difficult to find a good proxy for reputation, and we acknowledge that our measures has its weaknesses and other measures and methods could also be used. These methods could include qualitative analyses such as interviews on the perceptions of firms' reputation and attractiveness or surveys sent to key financial actors asking them to rank exchanges according to reputation criteria.

Another limitation of our study is that we focus on changes in the board of directors. Future research could incorporate into the analysis of corporate governance restructuring following the conversion to for profit status other elements and mechanisms, such as ownership structure, compensation schemes (see, for instance, Cuevas-Rodriguez et al., 2016, in an analysis of corporate governance changes in a privatization context) and top management teams in more detail.

In conclusion, our study offers some policy implications for practitioners. To successfully convert to a for-profit organization, financial institutions should rethink the composition of their corporate boards. Structuring a board with directors whose competences are better adapted to profit goals and strategies and who have appropriate representation of the new key stakeholders is a basic condition for moving forward.

In addition, our findings make some suggestions regarding how firms should communicate their strategy of conversion to for-profit firm in order to enhance their reputation. Firms should devote more effort in better communicating the changes in board human capital by emphasizing director competences. Effective communication is crucial to ensure that a good strategy is also perceived as such by the market.

Our results may be useful for firms considering cross-listing their shares. As noted in the literature, firms should list on prominent stock exchanges with good reputation (e.g., Doidge et al., 2004; 2009). According to our findings, they should opt for demutualized international exchanges engaged in better corporate governance practices.

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Table 2- Descriptive Statistics of Board Composition

	N	Mean	Std. Dev.	Min	Max
Social Capital:					
Trading Members (%)	214	38.76	0.24	0.00	100.00
Outside Investors (%)	214	4.81	0.11	0.00	50.00
Customers (%)	214	30.12	0.21	0.00	83.33
Politically Connected (%)	214	19.83	0.19	0.00	76.92
Demographic Attributes:					
Board Size	214	13.35	5.30	6.00	31.00
Busyness	214	2.67	1.72	0.17	10.54
Independent (%)	214	25.92	0.19	0.00	88.89
Directors Age	214	53.14	4.63	41.29	62.70
Directors Tenure	214	3.35	1.89	0.00	9.44
Human Capital:					
Traditional Competences					
DtorsStock Brokerage (%)	214	35.05	0.246	0.00	100
New Environment-related Competences					
DtorsInformation Systems (%)	214	3.58	0.084	0.00	85.71
DtorsFinancial Product Development (%)	214	1.34	0.036	0.00	25.00
DtorsCommercial (%)	214	1.26	0.040	0.00	23.08
DtorsBusiness Administration (%)	214	23.78	0.215	0.00	85.71
DtorsInternational Experience (%)	214	21.58	0.167	0.00	64.29
DtorsCorporate Communications (%)	214	0.99	0.032	0.00	25.00
DtorsDiverse Business (%)	214	11.21	0.145	0.00	62.50
DtorsRegulatory Experience (%)	214	12.27	0.101	0.00	42.86

This table presents descriptive statistics for a sample of 14 stock exchanges that demutualized during the period 1995-2012.

Table 3. Bivariate correlations

Variables	Mean	St.Dev	1	2	3	4	5	6	7
1. Reputation	6.13	1.39							
2. ROA	9.62	9.20	-.18***						
3. Size	5.77	2.89	.79***	-.39***					
4.GDPGrowth	0.07	0.10	.04	.15**	.05				
5. Inflation	3.61	4.26	-.11	-.06	-.02	.15**			
6.Country Regime	0.60	0.88	.08	-.15**	.18**	-.17**	-.45***		
7.Age	4.35	1.06	.55***	-.11	.67***	-.03	-.15**	.23***	
8. DEM	0.64	0.48	.26***	.14**	.36***	.17**	-.23***	-.04	.40***

Pearson correlations. * Significant at 10% ** Significant at 5% *** Significant at 1%

Table 4- Differences in Board Composition – Directors' type

	Period 1	Period 2	Period 3	Period 4	Changes in means					
					Period 2 relative to Period 1		Period 3 relative to Period 1		Period 4 relative to Period 1	
	Mean				Difference	T-test p-value	Difference	T-test p-value	Difference	T-test p-value
	Period 1	Period 2	Period 3	Period 4						
Social Capital:										
Trading Members (%)	47.04	43.16	40.09	38.33	-3.88	0.405	-6.95*	0.089	-8.71**	0.030
Outside Investors (%)	0.00	7.66	8.24	7.50	7.66***	0.000	8.24***	0.000	7.50***	0.000
Customers (%)	29.36	32.74	33.48	33.27	3.38	0.419	4.12	0.268	3.91	0.261
Politically Connected (%)	14.22	20.87	19.71	20.18	6.65*	0.052	5.49*	0.081	5.96*	0.058
Demographic Attributes:										
Board Size	14.92	12.64	12.75	12.78	-2.27*	0.075	-2.17**	0.040	-2.14**	0.024
Busyness	2.02	2.34	2.41	2.71	0.32	0.206	0.39*	0.100	0.69***	0.010
Independent	22.31	22.29	21.57	23.06	-0.02	-0.603	-0.74	0.778	0.74	0.785
Directors Age	50.50	52.51	53.17	53.98	2.01**	0.012	2.67***	0.000	3.48***	0.000
Directors Tenure	2.52	3.80	3.96	3.91	1.28***	0.000	1.44***	0.000	1.3***	0.000

*This table shows the mean values and the difference in means for a sample of 14 stock exchanges during the period 1995 to 2012. We consider four different windows for periods after the conversion. Period 1 covers from -5Y to -1Y. Period 2 covers from +1Y to +3Y. Period 3 covers from +1Y to +5Y and period 4 covers from +1Y to +7Y, where Y (Year) refers to the year of conversion of the stock exchange to for profit firm. Year -5 is the fifth year preceding the demutualization of the stock exchange, +7Y is the seventh year after, and so on. p-values are for the difference in means. *, ** and *** means statistically significant at 10%, 5% and 1% level respectively.*

Table 5- Differences in Board Composition - Directors' experience

					Changes in means					
	Period 1	Period 2	Period 3	Period 4	Period 2 relative to Period 1		Period 3 relative to Period 1		Period 4 relative to Period 1	
	Mean				Difference	T-test p-value	Difference	T-test p-value	Difference	T-test p-value
	Period 1	Period 2	Period 3	Period 4						
Traditional Competences										
DtorsStock Brokerage (%)	41.56	38.43	35.62	34.25	-3.13	0.544	-5.93	0.196	-7.30*	0.084
New Environment-related Competences										
DtorsInformation Systems (%)	4.84	4.20	3.85	3.66	-0.64	0.781	-0.99	0.591	-1.17	0.468
DtorsFinancial Product Development (%)	0.726	2.13	1.94	1.91	1.40*	0.075	1.21*	0.076	1.18*	0.067
DtorsCommercial (%)	1.321	1.59	1.64	1.46	0.27	0.757	0.31	0.706	0.14	0.854
DtorsBusiness Administration (%)	17.4	24.27	25.35	26.65	6.85*	0.098	7.93**	0.031	9.23***	0.009
DtorsInternational Experience (%)	15.30	19.33	21.22	22.78	4.04	0.146	5.92**	0.024	7.48***	0.003
DtorsCorporate Communications (%)	0.73	0.86	1.75	1.40	0.13	0.758	1.02	0.126	0.67	0.258
DtorsDiverse Business (%)	6.70	11.47	13.28	14.75	4.77*	0.055	6.58***	0.007	8.06***	0.001
DtorsRegulatory Experience (%)	8.90	11.6	12.13	13.24	2.75	0.157	3.22*	0.058	4.34***	0.007

*This table shows the mean values and the difference in means for a sample of 14 stock exchanges during the period 1995 to 2012. We consider four different windows for periods after the conversion. Period 1 covers from -5Y to -1Y. Period 2 covers from +1Y to +3Y. Period 3 covers from +1Y to +5Y and period 4 covers from +1Y to +7Y, where Y (Year) refers to the year of conversion of the stock exchange to for profit firm. Year -5 is the fifth year preceding the demutualization of the stock exchange, +7Y is the seventh year after, and so on. p-values are for the difference in means. *, ** and *** means statistically significant at 10%, 5% and 1% level respectively.*

Table 6. Results of fixed effects regression analysis of exchange reputation

Variable	Model 1 (control variables)	Model 2 (general board characteristics)	Model 3 (board social capital)	Model 4 (board human capital)	Model 5 (full model)
Intercept	2.490***	2.491***	2.706***	2.801***	2.784***
	(0.404)	(0.697)	(0.413)	(0.444)	(0.683)
Financial performance	0.001	0.003	-0.001	0.000	0.002
	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)
Size	0.010	0.026	-0.027	-0.011	0.009
	(0.015)	(0.018)	(0.018)	(0.018)	(0.022)
GDP growth	-0.139	0.005	-0.014	-0.054	0.064
	(0.139)	(0.155)	(0.150)	(0.140)	(0.140)
Inflation	-0.014**	-0.010	-0.017**	-0.016**	-0.011
	(0.007)	(0.008)	(0.007)	(0.007)	(0.008)
Country Regime	0.391***	0.442***	0.423***	0.376***	0.440***
	(0.098)	(0.105)	(0.098)	(0.096)	(0.104)
Age	0.747***	0.703***	0.740***	0.684***	0.682***
	(0.104)	(0.119)	(0.100)	(0.105)	(0.128)
DEM	0.214***	0.537	0.485***	0.531***	1.242**
	(0.043)	(0.483)	(0.113)	(0.127)	(0.573)
Directors age		-0.006			-0.002
		(0.009)			(0.009)
Directors tenure		0.060**			0.074**
		(0.028)			(0.029)
Board size		-0.015**			-0.017*
		(0.006)			(0.009)
Busyness		0.066			0.020
		(0.042)			(0.051)
Trading Members			0.132		0.514
			(0.146)		(0.343)
Politically Connected			-0.355		-0.193
			(0.287)		(0.334)
Outside Investors			-0.083		-0.173
			(-0.56)		(-1.01)
Diverse business experience				0.546	0.094
				(0.430)	(0.661)
Stock brokerage experience				-0.336	-0.535*
				(0.213)	(0.295)
Financial product development experience				3.398	-0.981
				(2.969)	(4.844)
Business administration experience				0.041	-0.236
				(0.313)	(0.390)
Regulatory experience				0.088	-0.132
				(0.337)	(0.381)
International experience				0.986***	1.100**
				(0.365)	(0.522)

Sample size = 170. Standard errors are in parentheses. *** p < 0.01; ** p < 0.05; * p < 0.10.

Table 6 (cont.). Results of fixed effects regression analysis of exchange reputation

Variable	Model 1 (control variables)	Model 2 (board demographic attributes)	Model 3 (board social capital)	Model 4 (board human capital)	Model 5 (full model)
DEM * Directors age		-0.006			-0.015
		(0.009)			(0.011)
DEM * Directors tenure		-0.060**			-0.074**
		(0.027)			(0.030)
DEM * Board size		0.021**			0.020
		(0.009)			(0.013)
DEM * Busyness		-0.064			-0.015
		(0.040)			(0.050)
DEM * Trading Members			-0.622***		-0.785**
			(0.160)		(0.376)
DEM * Politically Connected			0.146		0.098
			(0.275)		(0.58)
DEM * Outside Investors			-0.193		-0.264
			(0.169)		(0.180)
DEM * Diverse business experience				-0.815*	-0.231
				(0.427)	(0.665)
DEM * Stock brokerage experience				-0.203	-0.326
				(-2.21)	(0.312)
DEM * Financial product development experience				-3.998	0.209
				(2.982)	(4.845)
DEM * Business administration experience				-0.192	0.167
				(0.303)	(0.391)
DEM * Regulatory experience				-0.343	0.072
				(0.374)	(0.316)
DEM * International experience				-0.630	-0.646
				(0.368)	(0.557)
R-squared	0.231	0.257	0.229	0.204	0.209
F test for no Fixed Effects	348.18	270.39	360.64	256.51	187.41
Pr > F	0.000	0.000	0.000	0.000	0.000

Sample size = 170. Standard errors are in parentheses. *** p < 0.01; ** p < 0.05; * p < 0.10.

Appendix A Table A.1- Sample overview

Stock exchange	*Year of demutualization*	*Region*
Australian Stock Exchange	1998	Asia/Pacific
Deutsche Börse	2000	Europe
London Stock Exchange	2000	Europe
Hong Kong Exchanges and Clearing	2000	Asia/Pacific
Bolsa Mexicana de Valores	2001	America
Oslo Børs	2001	Europe
Philippine Stock Exchange	2001	Asia/Pacific
Tokyo Stock Exchange	2001	Asia/Pacific
SIX Swiss Exchange	2002	Europe
Bolsa de Valores de Lima	2003	America
Bursa Malaysia	2004	Asia/Pacific
Korea Exchange	2005	Asia/Pacific
Malta Stock Exchange	2007	Europe
Warsaw Stock Exchange	2010	Europe

The table presents the sample consisting of 14 stock exchanges, the year of their demutualization and the region where they are situated. We obtained the dates of demutualization from four sources: the World Federation of Exchanges (WFE), stock exchanges' official websites, stock exchanges annual reports and from the Sustainable Stock Exchanges Initiative website.

Table A.2.- Differences in Top Management Human Capital and Remuneration Package

	Pre-conversion	Post-conversion	Difference	T-test p-value
Traditional Competences:				
Stock Brokerage (%)	18.08	17.16	-0.92	0.752
Finance (%)	72.90	73.29	0.39	0.908
Banking (%)	19.74	26.78	7.04**	0.027
Funds and investment Management (%)	14.99	19.61	4.62*	0.071
New Environment-related Competences:				
Information Systems (%)	5.12	8.07	2.95**	0.047
Financial Product development (%)	3.23	9.79	6.56***	0.005
Marketing and Sales (%)	1.18	6.26	5.09***	0.007
Business Administration (%)	15.98	25.32	9.35***	0.006
International Experience (%)	13.50	28.13	14.63***	0.000
Corporate Communications (%)	0.57	2.24	1.67***	0.000
Diverse Business (%)	2.17	4.19	2.03*	0.087
Regulatory Experience (%)	9.37	15.96	6.59***	0.010
Remuneration Package:	Frequency	Frequency		
Incentive Payment	22.03	80.00		

This table presents descriptive statistics for a sample of 14 stock exchanges that demutualized during the period 1995-2012. The pre-demutualization values are the mean values for the 5-year period (-5 to -1 relative to year 0) and the post-demutualization values are the mean values for years +1 to +7. The p-values are for the difference in means.

Table A.2. shows the results for differences in top management human capital and remuneration packages before and after demutualization. We focus on long-term effects over a seven-year period following the conversion. In line with the results for directors, there is a significant increase in the proportion of managers with new environment-related competences, and the increase is more significant than for directors: information systems (from 5.11 % to 8.06 %); marketing and sales (from 1.18% to 6.26 %); international experience, which more than doubles (from 13.50 % to 28.13 %) and corporate communications (from 0.56 % to 2.23 %), all significant at the one percent level. There is also an increase in the proportion of managers with competences in financial product development, more than doubling (from 3.22 % to 9.78 %); business

administration (from 15.97 % to 25.32 %) and regulatory experience (from 9.36% to 15.95%), all significant at the one percent level. The stock exchanges significantly reorganized their top management teams to promote strategic development, favoring management competences better adapted to meet technology-driven marketplace demands, focus on customer needs, and promote internationalization.

Additionally, the proportion of exchanges granting incentive payments to top management more than tripled following demutualization, going from 22.03 percent to 80 percent of the exchanges in our sample, a result in line with Shiwakoti's work (2012), which shows that executive pay increases significantly following demutualization in the UK financial sector.