



Universidade do Minho

Documentos de Trabalho
Working Paper Series

**“Post-Operating Performance of Cross-Delisted Firms
From U.S. Stock Exchanges”**

Gilberto Loureiro
Sónia Silva

NIPE WP 17/ 2015

NÚCLEO DE INVESTIGAÇÃO EM POLÍTICAS ECONÓMICAS
UNIVERSIDADE DO MINHO

“Post-Operating Performance of Cross-Delisted Firms From U.S. Stock Exchanges”

Gilberto Loureiro
Sónia Silva

NIPE* WP 17/ 2015

URL:

<http://www.eeg.uminho.pt/economia/nipe>



POST-OPERATING PERFORMANCE OF CROSS-DELISTED FIRMS FROM U.S. STOCK EXCHANGES

Gilberto Loureiro^{*} and Sónia Silva[†]

October 2015

ABSTRACT

We investigate the long-term performance of cross-delisted firms from U.S. stock markets. Using a sample of foreign firms listed and delisted from U.S. stock exchange markets over 2000-2012, we examine the operating performance and the long-run stock returns performance of firms post-cross-delisting. Our results suggest that cross-delisted firms have less growth opportunities than matched cross-listed firms in the long run. Moreover, firms that cross-delist after the passage of Rule 12h-6 of 2007 exhibit a significant decline in operating performance. In contrast, before the adoption of the Rule 12h-6, cross-delisted firms seem to be affected by the cost of a U.S. listing in the pre-cross-delisting period. In addition, we provide evidence that cross-delisted firms underperform their cross-listed peers; cross-delisted firms experience negative average abnormal returns, especially in the post-delisting period.

JEL Classifications: F30; F31; G15; G30

Keywords: Cross-Delisting; Long-run Stock Returns; Post-Operating Performance

^{*} University of Minho, School of Economics and Management & NIPE (Economic Policies Research Unit), Campus de Gualtar, 4710-057 Braga, Portugal. Email: gilberto@eeg.uminho.pt. Phone: +351 253 601940.

[†] Corresponding author. University of Minho, School of Economics and Management, Campus de Gualtar, 4710-057 Braga, Portugal. Email: sonia@eeg.uminho.pt. Phone: +351 253 604510.

1. INTRODUCTION

The United States (U.S.) stock exchanges, namely the New York Stock Exchange (NYSE) and the NASDAQ together, have the largest number of foreign listings for a given country. Foreign companies can access to the U.S. exchange markets by obtaining or issuing American Depositary Receipts (ADRs)¹ and are required to register with the Securities and Exchange Commission (SEC)². In fact, the motivation and effects of cross-listings equity in U.S. exchanges have been extensively analyzed (e.g., Karolyi (2012)).

However, the number of foreign firms on U.S. exchanges has been decreasing in the last decade. According to the World Federation of Exchanges³ statistics bureau, in 2000 there were registered about 970 foreign firms and in 2012 there were only about 814, meaning that more foreign firms delisted than listed on U.S. markets during that period.

Therefore, our study contributes with new evidence about post-operating performance and long-run stock returns performance of cross-delisted firms from U.S. exchange markets. A foreign firm will delist and terminate the SEC registration when the costs of a cross-listing outweigh the benefits. However, the SEC deregistration process was very difficult before the passage of Rule 12h-6 of March 21, 2007, which made it easier for a foreign firm to deregister. Consistent with the notion of balancing costs and benefits of a U.S. exchange listing, previous studies reveal that foreign firms with specific characteristics are more likely to delist and to deregister. For example, Marosi and Massoud (2008) provide evidence that small foreign firms with low trading volume, with relatively low cross-listing premium, firms from industries in which takeover activity by foreign acquirers of U.S. targets is also relatively low, and with

¹ Foreign firms can obtain or issue equity financing by using Level 1, 2 or 3 ADRs. Level-1 ADR it is the only ADR' Level that may be unsponsored and, as a result, may be quoted only on the OTC market, such as OTCBB, OTCQX or Pink Sheets. A level-2 ADR provides shares listed and traded on the U.S. exchange markets. The Level-3 ADR is used when a company has made a public offering in the U.S. See <http://www.sec.gov/divisions/corpfin/internatl/foreign-private-issuers-overview.shtml>.

² Foreign firms that have its securities listed on a U.S. exchange market and on the Over-The-Counter Bulletin Board (OTCBB) are required (under Section 12 (b) of the Securities Exchange Act of 1934) to fill periodically the Form 20-F (or 40-F for Canadian companies) and to fill Form 6-K for any relevant public information (i.e., relevant by any stock exchange on which a company's securities are traded) with the SEC. Furthermore, companies must register securities under the 1933 Securities Act when offering to sell securities in U.S. exchanges. In addition, a public offering demands to fill forms F-1, F-3, F-4, F-6 and F-8. Companies can register without any active listing and can delist without deregister. See <http://www.sec.gov/divisions/corpfin/internatl/foreign-private-issuers-overview.shtml>.

³ <http://www.world-exchanges.org>.

greater degree of insider control are more likely to deregister. Doidge, Karolyi and Stulz (2010) find that firms that deregister should have poor growth opportunities and hence raise few or no external funds at the time of deregistration and are not expected to do so in the future. Overall, much of this previous evidence is still consistent with the predictions of the “bonding” theory (e.g., Marosi and Massoud (2008), Doidge, Karolyi and Stulz (2010), Fernandes, Lel and Miller (2010)).

However, research is still scarce regarding the determinants of cross-delisting and little is known about the economic aftermath of cross-delisting. Thus, our study adds to the literature by providing evidence on the long-term performance of firms post-cross-delisting. Using a sample of foreign firms that listed and delisted from U.S. exchange markets over 2000-2012, we first investigate the motivations for cross-delisting and deregistration to identify the characteristics of firms that delisted in the pre- and in the post-Rule 12h-6, since it changed the procedure to terminate registration with the SEC. Cross-delisting and deregistration may be voluntary or involuntary. Obviously, the most relevant group is the voluntary one, since the involuntary group includes firms that were forced to leave the U.S. exchanges and to terminate the SEC registration. Foreign firms, like U.S.-based firms, can be suspended and delisted for not filling the requirements imposed by SEC regulations and other rules established by the U.S. exchange markets⁴. Therefore, those firms belong to the involuntary group. We will focus our analysis on cross-delisted firms because delisting is usually a first step prior to deregistration and the motivations are basically the same.

We conduct our empirical tests using a treatment group of 583 cross-delisted firms and a control sample of 564 firms that remaining cross-listed on U.S. markets. We implement the propensity score matching (PSM) technique to reduce the selection bias and make both treatment and control groups more similar. We find that cross-delisted firms have less growth opportunities than a matched group of cross-listed firms, in the long-run. This result is significant for firms that voluntarily cross-delisted after the passage the Rule 12h-6, but is insignificant for firms that cross-delisted before. Moreover, voluntary cross-delisted firms after the Rule 12h-6 underperform cross-listed firms regarding operating efficiency and profitability. However, before the passage of

⁴ According to NYSE and NASDAQ Rules, a foreign stock can be suspended or delisted for falling below certain quantitative and qualitative continued listing criteria, such as the number of total shareholders, average monthly trading volume, number of publicly-held shares, average global market capitalization, and minimum bid price.

the Rule 12h-6, our results suggest that there is a cost that foreign companies bear while cross-listed in a U.S. exchange market: one year after delisting, cross-delisted firms (before the Rule 12h-6) show higher profitability growth rates than comparable cross-listed firms, and this evidence remains up three years after delisting. A reasonable explanation for this evidence is that for this group of cross-delisted firms the cost of a U.S. listing outweighs the benefit.

In addition to the operating analysis, we also investigate the long-run stock returns performance of cross-delisted firms. We therefore follow Barber and Lyon (1997) and measure abnormal returns as the difference in one-year holding period returns between cross-delisted firms and a matched group of cross-listed firms. Consistent with prior research (e.g., Loughran and Vijh (1997)) we apply a matching approach based on the market value of equity and the book-to-market ratio. We find that cross-delisted firms underperform their comparable cross-listed firms; cross-delisted firms experience negative average abnormal return, especially in the post-delisting period.

The remaining of this study is organized as follows. Section 2 provides a review of literature pointing out the main hypotheses that explain the benefits and costs of cross-listing and about the determinants of cross-delisting and deregistration. Section 3 outlines the data and describes the sample. Section 4 presents and describes methodology and empirical results. Finally, section 5 presents the main findings and concludes.

2. LITERATURE REVIEW

Prior research on cross-listing provides evidence that a U.S. listing creates more incentives for firms to access external finance. Among several reasons for non-U.S. firms to cross-list into U.S. markets, some authors highlight that cross-listing overcomes barriers that segment capital markets, thus lowering information asymmetries (e.g., Stapleton and Subrahmanyam (1977), Errunza and Losq (1985), Eun and Janakirananan (1986), Alexander, Eun and Janakirananan (1987)), others stress the benefits from a lower cost of capital (e.g., Mittoo (1992), Fanto and Karmel (1997), Errunza and Miller (2000), Bancel and Mittoo (2001), Reese and Weisbach (2002), Hail and Leuz (2009)), and others point out that firms raise more external funds after they enter in the U.S. markets (e.g., Lins, Strickland and Zenner (2005), Doidge, Karolyi and Stulz (2009)).

Nevertheless, Coffee (1999, 2002) and Stulz (1999) argue that the main motivation for a firm to cross-list in a U.S. exchange market is driven by shareholders' legal protection. To overcome their corporate governance problems, firms can cross-list in capital markets with stronger legal and financial institutions, such as U.S. exchange markets that are subject to the public enforcement of the SEC; these mandatory regulations reduce the ability of controlling shareholders to extract private benefits at the expense of minority shareholders. Hence, corporate boards "bond" themselves to better governance which benefits minority shareholders. In sum, the "bonding" hypothesis postulates that a legal regime that protects minority shareholders provides a decrease in information asymmetries costs, thus lowering the cost of capital. Furthermore, the "bonding" effect may arise at both legal and reputational levels. Coffee (1999, 2002) emphasized the evidence of a legal "bonding" based on the argument that better enforcement of legal requirements provided by U.S. Institutions results in better corporate governance mechanisms due to a more demanding litigation environment increased by SEC's enforcement, which in turn demands enhanced disclosure and reconciliation to U.S. generally accepted accounting principles (GAAP). In addition, firms may also adopt a set of "bonding" activities that help the firm building its image of a well-governed corporation. Hence, the prospect of creating reputational capital (Stulz, 1999) induces the firm to observe certain standards that it is not forced to follow, as hiring reputable intermediaries such as investment bankers (e.g., Loureiro (2010)), auditors (e.g., Coffee (2002)), analyst coverage (e.g., Baker, Nofsinger and Weaver (2002), Lang, Lins and Miller (2003), Bushman, Piotroski and Smith (2005; 2004), Bailey, Karolyi and Salva (2006)), institutional investors (e.g., Bradshaw, Bushee and Miller (2004), Aggarwal, Dahiya and Klapper (2007)), and other capital market participants. Therefore, firms from countries with weaker investor protection regimes (e.g., from Civil Law countries) benefit more and are more likely to cross-list in countries such as the U.S. (e.g., La Porta *et al.* (1997; 1998)). The likelihood of cross-listing on a U.S. stock exchange is also higher for firms that have higher growth opportunities, which results in higher cross-list premium (Doidge, Karolyi and Stulz, 2004). On the other side, a U.S. listing represents a cost for corporate insiders because it restricts their ability to consume private benefits (Karolyi, 2012). This argument is consistent with the lower likelihood of firms with a large controlling shareholder to cross-list in U.S. markets (e.g., Doidge (2004), Djankov *et al.* (2008), Doidge *et al.* (2009), Ayyagari and Doidge (2010)).

Nevertheless, since the passage of the Sarbanes-Oxley⁵ (SOX) Act in 2002, the debate is more centered on whether higher compliance costs, redundancies with home market requirements and difficulties in the SEC deregistration process was driving to a loss of competitiveness of U.S. stock exchanges. The adoption of SOX augmented the number of foreign firms that move from U.S. exchange markets to London and Hong Kong exchanges. Moreover, after the adoption of SOX, more foreign firms simply choose to market under the rule 144A (only among institutional investors), avoiding all the disclosure and compliance requirements associated with a public offering. Under the predictions of “bonding” hypothesis, SOX requirements can be seen as a boost to investor confidence, improving investor protection and increasing the premium for a U.S. listing (e.g., Berger, Li and Wong (2005)). This suggests that SOX should affect positively larger firms with a higher level of pre-SOX disclosure, while might affect in a negative way less fast-growing, more financially-constrained, large dominant shareholder block, riskier and smaller firms originated from countries with underdeveloped capital markets and with weaker shareholder protection (Karolyi, 2012). On the other side of this debate, Zingales (2007) argues that for some foreign firms the compliance costs with SOX requirements outweigh the net benefits of a U.S. listing, which led those firms to choose to delist. He calls to this hypothesis the “loss of competitiveness hypothesis”, which suggests that firms that are negatively affected by SOX tend to delist from U.S. markets. However, delisting may be relatively costly from a reputational perspective due to the potential risk of alienating firms’ international investor base (Lang, Lins and Miller, 2003). Furthermore, delisting process does not remove the obligation to meet the SEC requirements, only deregistration⁶ process removes such obligation. Deregistering firms have characteristics that reduce the value of a cross-listing according to the “bonding” theory and generally market reacts negatively to deregistration announcements. Liu (2004) has investigated stock-price reactions of 103 foreign firms that involuntarily cross-delisted from U.S. markets over the 1990-2003 period and finds a 4.5% significant average decline. In the same period,

⁵ Sarbanes-Oxley Act (SOX) is a U.S. federal law that predicts enhanced standards for all public companies in U.S.

⁶ Before Rule 12h-6 of 2007, issuers can voluntarily apply for deregistration if a company is eligible for it, i.e., if a company no longer meets the requirements of Section 12 (g)-4: (1) a foreign company may deregister if there are fewer than 300 U.S. resident shareholders; (2) or, alternatively, if the company’s total assets in each of the three previous fiscal years are less than \$US10 million, the security class may be deregistered if there are fewer than 500 U.S. resident shareholders. To voluntarily terminate a listing, the NYSE requires that a firm gain the approval of its audit committee and Board of Directors before delisting, while NASDAQ simply requires a letter stating the reasons for delisting. See <https://www.sec.gov/about/laws/sea34-12g.pdf>.

Witmer (2005) finds a 6% decline for a sample of 116 foreign firms that cross-delisted from U.S. exchange markets. Contrarily, Li (2014) and Smith (2008) show a positive post-SOX stock-price reaction, in contrast with an insignificant negative pre-SOX stock-price reaction around cross-delisting announcement. Chaplinsky and Ramchand (2009) provide the most extensive study about the characteristics of cross-delisted firms. The authors considered a total of 724 foreign firms that delisted over the period from 1961 to 2004, 48 of which are considered as voluntary cross-delistings. Their findings reveal that those firms delisting after SOX have lower profitability, are smaller, have lower median assets and market capitalization, poorer preceding stock-price performance, and lower analyst coverage; the only exception are firms that delist due to mergers and acquisitions processes, which are closer in profitability and growth opportunities to foreign firms that remained cross-listed. Their results also suggest that larger, more profitable firms, with proportionally more U.S. trading volume, and more capacity to raise capital are more likely to remain cross-listed. Voluntary cross-delistings are more likely to occur for smaller, NASDAQ⁷ quoted firms, and in circumstances where there are more firms from the same country cross-listed. In their published version⁸, Chaplinsky and Ramchand (2012) show that the majority of firms that cross-delisted after SOX are from countries with stronger governance, and that have lower volume trading, lower analyst coverage and lower capital raising activity when comparing with cross-listed firms. Also Daugherty and Georgieva (2011) investigate the impact of SOX on the cross-delisting behavior and point out that the potential gains resulting from growth opportunities, country's legal environment and the length of presence in the U.S. are the main determinants of the cross-delisting decision.

On the side of deregistration, Marosi and Massoud (2008) concluded that post-SOX deregistration announcements have a less negative stock price effect than deregistration announcements in the pre-SOX period, consistent with stockholders recognizing the costs of SOX compliance. Their findings also suggest that the passage of SOX has reduced the net benefits of a U.S. exchange listing. This evidence is stronger for smaller firms, with lower trading volume and stronger inside control; those firms are more likely to deregister. Hostak *et al.* (2013) considered a sample of 84 voluntary foreign

⁷ The NYSE is often considered to be more regulated, and more liquid than the NASDAQ exchange. NASDAQ may not provide the necessary "bonding" to justify the costs of cross-listing (Chaplinsky and Ramchand, 2009).

⁸ We refer to the working paper version of 2009 of this paper because the published version does not contain so much information about delisted foreign firms' characteristics in the pre- and the post-SOX.

firms that deregistered after SOX and found a statistically significant negative stock-price reaction around deregistration announcement. Their findings suggest that firms with weaker corporate governance deregister to avoid the governance requirements of SOX; they concluded that the decision of deregistration did not benefit minority shareholders.

In the spirit of the legal “bonding”, an easier deregistration process decreases the value of “bonding” since it increases the chance that insiders will force a firm to deregister in order to consume more private benefits (Fernandes, Lel and Miller, 2010). And if listing costs are not considered to be relevant, minority shareholders of firms that deregistered are expected to be hurt by deregistration once it increases a corporate insider’s discretion to extract private benefits at the expense of minority shareholders (Hostak *et al.*, 2013). On the other side, costs imposed on foreign firms by SOX outweigh the benefits of a U.S. listing for a significant part of cross-listed companies. In order to “release” those companies from such significant costs, on March 21, 2007, the Rule 12h-6⁹ made it easier the deregistration process, which triggered a wave of foreign firms that decided to leave U.S. exchange markets. More firms deregister after Rule 12h-6 in 2007 than after SOX in 2002. In this context, Doidge, Karolyi and Stulz (2010) investigate the drivers and motivations of deregistration after the passage of Rule 12h-6. Their study identified 141 firms that deregistered from U.S. exchanges between 2002 and 2008, 75 of which deregistered after the passage of Rule 12h-6 in 2007. They concluded that, overall, their findings are consistent with the “bonding” hypothesis; firms that deregister are expected to have low growth opportunities, a low financing deficit or a surplus, and evidence of agency costs. Moreover, they also investigate the market reactions to deregistration announcements and found that those reactions are negative before Rule 12h-6, but less negative after the passage of the Rule. In addition, they find no evidence supporting the prediction of the loss of competitiveness

⁹ Under Rule 12h-6 of March, 21, 2007, foreign companies that have and maintain a foreign listing which is its primary trading market (for at least 12 months preceding deregistration), can qualify for deregistration if the average daily trading volume of the subject class in the U.S. for a recent 12-month period is no more than 5 percent of the average daily trading volume of that class of securities on a worldwide basis for the same period. Moreover, the registrant must not have sold securities in a registered offering in the U.S. during the 12 months preceding deregistration, except for specified exceptions noted in the Rule. In addition, a registrant must have at least one year of Exchange Act reporting, be current in filing all reports under the Exchange Act, and have filed at least one Exchange Act annual report. Previous Rule 12g-4 applies (with an easier method of counting U.S.-resident holders), but the new eligibility conditions also apply. See <http://www.sec.gov/divisions/corpfin/international/foreign-private-issuers-overview.shtml>.

hypothesis, i.e., that stock price reactions to SOX affect the deregistration decision. Also Fernandes, Lel and Miller (2010) provide evidence supporting “bonding” hypothesis. They find that stock price reactions to the passage of Rule 12h-6 are significantly negative for firms from countries with weaker investor protection and poor disclosure requirements. In contrast, they find no significant market reaction for deregistered firms from strong investor protection regimes.

Overall, previous findings indicate that cross-delisting and deregistration from U.S. stock markets are decisions driven by a combination of country’s legal origin, informational environment, and also of firm-level characteristics such as operating performance variables. Those performance drivers appear to be related with changes in investment activity, growth and profitability of operating activities, and the size and scope of capital-raising activities occurring during the listing. Taken as together, previous results reveal that greater size and stronger U.S. market conditions decrease the probability of a delisting and deregistration (Chaplinsky and Ramchand, 2012). According to Karolyi (2012), larger firms seeking “bonding” benefits from a U.S. listing continue to pursue a U.S. exchange listing; although the costs of a U.S. listing have increased, the benefits of “bonding” continued to outweigh the costs of compliance with the SEC regulations.

3. SAMPLE CONSTRUCTION AND DATA

Our dataset consists of the universe of U.S. listed foreign firms on NYSE and NASDAQ over the period 2000 to 2012. We focus on U.S. exchange markets (NYSE and NASDAQ) to ensure better data availability and more uniform listing requirements. We include all firms that were already cross-listed and those that decided to cross-delist from U.S. exchanges markets¹⁰, and terminate SEC registration over 2000-2012. We also include new listings that occurred during the same period. Our sample period starts in 2000 because information about foreign firms registered and reporting with the SEC is not available in 1995 and in 1999. However, as our analysis requires the use of lagged variables, and to avoid reducing our sample period, we collect data prior to 2000 for all foreign firms included in our sample. Foreign firms that move from one major exchange

¹⁰ We only include in our sample Level-2 and Level-3 ADRs.

to another are not treated as delists, whereas firms that move to the Over the Counter (OTC) market, OTCBB, or to the “Pink Sheets” are treated as delists.

We obtained a list of all foreign firms with equity shares registered and reporting with the SEC from the SEC’s website¹¹. That information was complemented and cross-checked with data obtained from other sources (namely, the list of ADRs provided by the depository banks and the exchanges or OTC markets’ websites). In fact, most foreign firms traded in the U.S. issue ADRs managed by a U.S. depository banks such as the Bank of New York and Citibank. However, because not all foreign issuers with U.S. traded equity securities use ADR programs (Canadian and Israeli firms, for example, are able to list their securities directly on U.S. exchanges), we also collected data directly from the NYSE, NASDAQ, OTCBB and OTC Markets Portal.

We then matched cross-listings with Datastream/ Worldscope database to collect market variables and accounting data¹². Mergers and acquisitions data are from the Securities Data Corporation (SDC) database. Detailed information about all variables, including firm-, industry-, and country-level variables, is provided in Appendix A.

To identify and understand the cross-delisting and deregistration reasons, we used SEC’s database, namely EDGAR’s¹³ archive, and searched for all cross-delisting and deregistration announcements, and also for all Form 15’s filed between 2000 and 2012.

We exclude financial firms (SIC codes between 6000 and 6999) and utilities (SIC codes between 4900 and 4949) because their accounting values are largely dependent on statutory rules. We also exclude firms with total assets lower than \$10 million to make firms more comparable across countries (e.g., Loureiro and Taboada (2015)), and for firms that are domiciled in tax off-shores¹⁴, we find their “true” country of origin, i.e., the management headquarters. Furthermore, we exclude observations with missing information on total assets, total sales, market capitalization, book value of equity and debt. Also, we require that firms have, at least, two years of observations. Thus, new listings in 2012 were dropped from the final sample. We winsorize the continuous variables (excluding the country-level variables) at both the bottom and top one percent

¹¹ <http://www.sec.gov/edgar/searchedgar/companysearch.html>.

¹² Missing data from the primary databases was complemented with hand-collected data from stock exchanges, depository banks, SEC and cross-listed firms’ websites.

¹³ Electronic Data Gathering, Analysis, and Retrieval system (EDGAR’s) provided by the SEC

¹⁴ We exclude all firms domiciled and managed in tax off-shores (e.g., Cayman Islands).

tails to limit the effect of outliers. All variables expressed in U.S. dollars are Consumer Price Index (CPI) adjusted considering 2000 prices.

After the sample screening, we end up with 9,092 firm-year observations that correspond to 1,147 firms, 583 of which have cross-delisted during the 2000-2012 period.

3.1 Reasons of cross-delisting and deregistration

Although being different processes, cross-delisting is a first step prior to deregistration process. The time gap between delisting and deregistration is mainly due to administrative reasons. For example, an ADR program will be closed within four or five months after the written notice of termination (Chaplinsky and Ramchand, 2012). However, the motivations are basically the same. Hence, prior research differentiates cross-delisting and deregistration between involuntary and voluntary. Involuntary cross-delisting or deregistration is due to reasons such as bankruptcy and disqualification to continue listed on U.S. exchange markets¹⁵. Foreign firms, like U.S.-based firms, can be suspended and deregistered by the SEC for rule violations. In contrast, voluntary delisting or deregistration can occur if firms meet the requirements imposed by SEC¹⁶ to delist and terminate registration. After the passage of Rule 12h-6 of March 21, 2007, it became easier for those firms to deregister and managers usually point out several reasons why they decided to leave U.S. exchange markets. After analyzing those announcements¹⁷ of firms that voluntarily cross-delisted and deregistered from U.S. exchange markets, we can summarize the reasons as follows: i) the significant costs, both direct and indirect, of preparing and filing the reports and forms that companies are required to; ii) the overall cost of a U.S. listing has increased substantially after SOX; iii) the costs of an ADR program outweigh the benefits due to the continued globalization of the capital markets; iv) the relatively small proportion of trading that takes place in the form of ADRs; v) the NYSE-Euronext markets' integration; vi) the adoption of International Financial Reporting Standards (IFRS) that makes compliance with GAAP redundant; vii) the reduced number of common shareholders of record; viii)

¹⁵ See footnote 4.

¹⁶ SEC rules for deregistration process are described in footnotes 6 and 9.

¹⁷ We obtained the press release of delisting announcements for the most part of firms included in our dataset from the SEC's website.

the volatile economic conditions that have affected the firms' value in the last decade; ix) the increased sophistication and transparency of the capital markets worldwide is a substitute for the greater degree of shareholder protection offered by U.S. stock markets.

Taken together, all these reasons imply that being cross-listed on a U.S. stock exchange is not reasonable if costs outweigh the benefits of doing it.

In this context, firstly and according to Chaplinsky and Ramchand (2012), we classify delisting and deregistration in three main groups: 1) involuntary, 2) as result of mergers and acquisitions (M&A) activities, 3) and voluntary. Involuntary delistings correspond to those foreign firms that went bankrupt and were disqualified by NYSE or NASDAQ to maintain their listing or did not meet SEC registration requirements. M&As are considered as a single type independent from the strategy that originated those activities and in some analysis are included in the voluntary group. The voluntary group corresponds to those companies that made the decision to cross-delisted, and then to deregister. These firms were eligible under the SEC rules to deregister (see footnotes 6 and 9). Foreign firms that voluntarily cross-delisted fit into the following three categories: 1) firms that cross-delisted before March 21, 2007, and deregister under Rule 12g-4¹⁸; 2) firms that cross-delisted after March 21, 2007, and deregister under Rule 12h-6; 3) "other reasons" includes firms that changed its headquarters to U.S.¹⁹, went private or moved to OTCBB or to another OTC market. All reasons for delisting and deregistration are summarized in Appendix B and the groups of cross-delisted firms used in descriptive and empirical analysis are summarized in Appendix C.

Table 1 describes, by country, industry and year our final sample. The sample of cross-delisted firms is segmented by the reason of delisting. Panel A of Table 1 reports a total of 583 cross-delisted firms, 555 of which deregister over 2000-2012, what indicates that most of the cross-delisted firms effectively terminate their registration with the SEC. At the end of 2012, there were about 564 cross-listed firms. By cross-listed firms we mean foreign firms that do not delist over the course of our study and we will refer to them simply as cross-listed (in opposition to cross-delisted firms).

[Insert Table 1 here]

¹⁸ Rule 12g-4 is prior to Rule 12h-6 concerning deregistration process.

¹⁹ These foreign firms are removed from the sample after delisting.

As observed in Panel A of Table 1, about 204 firms were removed by U.S. stock markets (7 of which declared bankruptcy), 131 delists result from M&As processes, 106 firms cross-delisted voluntarily before the passage of Rule 12h-6 of 2007, whereas 109 firms cross-delisted after the Rule 12h-6 (after March, 2007), and 33 delisted due to “other reasons” already mentioned. The final sample includes 42 countries, 19 of which are considered emerging markets²⁰. The number of delisted firms from Common Law²¹ countries is 360 (61.8%) and the number of cross-listed firms from those countries is 291 (51.6%), although Canada alone counts 194 delistings and 159 cross-listed firms in 2012. Civil Law countries exhibit 125 (21.4%) cross-delisted firms and 113 (20.0%) cross-listings in 2012. Regarding German and Scandinavian Law countries, we identify 98 (16.8%) cross-delistings and 160 (28.4%) cross-listed firms in 2012. In sum, even after removing Canada from the list of Common Law countries, those countries represent the highest number of delistings (42.7%), followed by Civil Law countries (32.1%).

Panel B of Table 1 reports, by industry, the number of cross-delisted, deregistered, and cross-listed firms included in our sample. We assign firms to industries using the classification of Fama and French (1997) of 48 industry portfolios. This industry classification scheme is based on the four-digit SIC code available on Datastream/ Worscope. For brevity reasons of presentation, we aggregate industries according to Massachusetts Department of Workforce Development²². Altogether, Mining, Communication, High Tech Manufacturing²³ (level I), and Services are the most dynamic activity sectors, representing 63.3% of cross-listed and 62.8% of cross-delisted firms over 2000-2012.

Panel C of Table 1 describes the final sample by year. It is important to stress that 2007 is the record year with the highest number of firms leaving the U.S. exchanges; about 59 foreign firms voluntarily cross-delisted and 61 firms deregistered.

²⁰ This classification is in accordance with the Standard and Poor’s Emerging Market Database for the year of 2000 and was collected from Standard & Poor’s, Emerging Markets Factbook, 2001.

²¹ We follow La Porta, Lopez-De-Silanes and Shleifer (2008) and assign firms according to the legal origin of domestic markets.

²² We follow the Massachusetts Department of Workforce Development, Division of Career Services, Economic Analysis Office, July 2007.

²³ High Tech Manufacturing (Level I) includes: Printing and Publishing; Healthcare; Medical Equipment; Pharmaceutical Products; Aircraft; Computers; Electronic Equipment; Measuring and Control Equipment. Communication is classified in the group of High Tech Manufacturing (level I), but in this analysis is considered alone.

3.2 Descriptive Statistics

Cross-delisting creates a quasi-experiment where we can identify a treatment group of firms that cross-delist at some point in time over 2000-2012, and a control group composed by cross-listed firms. Thus, Table 2 compares characteristics of both treatment and control groups. The passage of the Rule 12h-6 of 2007 imposes a regime shift that is important to explore (Doidge, Karolyi and Stulz, 2010). Thus, our sample is divided in two subsets according two different periods of time. To differentiate the period before and after the passage of the Rule 12h-6, the first subset covers the 2000-2006 years (Panel A) and the second covers the 2007-2012 years (Panel B). We follow Doidge, Karolyi and Stulz (2010) and measure the characteristics of cross-delisted firms in the year before delisting takes place.

[Insert Table 2 here]

Panel A of Table 2 shows that treatment (cross-delisted) firms are smaller in size (*Total Assets*), have fewer growth opportunities (*Q* and *Sales Growth*), smaller profitability (*ROA*), appear to be from more developed countries (*Gross Domestic Product (GDP) per capita*) and with stronger private enforcement of investor rights (*Anti-Self-Dealing Index*). Over the same period, involuntary group of cross-delisted firms is revealed to be smaller in many dimensions when comparing with the cross-listed firms and the other groups of treatment firms. However, involuntary cross-delisted firms are originated, on average, from countries with higher *GDP per capita*, and with stronger investor protection rules (*Anti-Self-Dealing Index*). On the side of voluntary firms, they are smaller (*Total Assets*), but more levered (*Leverage*) than listed firms, display smaller growth opportunities (*Q* and *Sales Growth*), are less profitable (*ROA*) and are originated, on average, from countries with higher *GDP per capita*, but with investor protection regimes similar to cross-listed firms.

Taken together the results of Panel B of Table 2, the characteristics of cross-delisted firms have changed over the time, particularly the characteristics of voluntary group of treatment firms. Voluntary group overcome the control group of cross-listed firms in terms of *Total Assets* across the 2007-2012 period. However, voluntary treatment firms have a significant lower market capitalization than listed and seem to have lower growth opportunities (regarding *Sales Growth*). It is also interesting to notice that both groups

of firms, treatment and control, present lower indicators of growth opportunities (*Q* and *Sales Growth*) in the post-Rule 12h-6, which may be related somehow with the economic slowdown caused, mainly, by the financial crisis of 2007-2008.

4. EMPIRICAL RESULTS

Some previous research studied the determinants of delisting (e.g., Chaplinsky and Ramchand (2012)), but little is known about the economic consequences of cross-delisting.

In this study, we contribute to the literature by providing evidence on the long-term performance of firms post-cross-delisting. First, we examine the post-operating performance of cross-delisted firms by comparing with a control group of matched cross-listed firms. Second, we analyze the long-run stock returns performance of cross-delisted firms relative to the same control group.

4.1 Post-Cross-Delisting Operating Performance

To measure operating performance, we use accounting-based variables commonly used in prior literature, as: i) *Sales Growth* to capture growth opportunities; ii) *Fixed Assets Ratio* (fixed assets to total assets) to measure changes in fixed investments; iii) *Turnover Ratio* (total sales to total assets) as a proxy for operating efficiency; iv) and *ROA* and *ROE* as measures of profitability. This analysis of performance is conducted to identify significant differences between the treatment group of cross-delisted firms and a control group of cross-listed firms over a period of three years following the cross-delisting year. Therefore, we estimate the average effect of the treatment (i.e., the cross-delisting event) on firms' operating performance in the post-delisting period. One problem that usually affects quasi-experimental studies is that individuals are not randomly assigned to treatment, meaning that firms with some type of characteristics may be more likely to cross-delist. If this is the case, our results may be affected by selection bias and endogeneity issues. To overcome this problem, we will use the propensity score matching (PSM) technique proposed by Rosenbaum and Rubin (1983). Therefore, each individual of the treatment group will be matched to an individual of the control group with identical pre-treatment characteristics. This means that each

cross-delisted (treatment) firm will be matched with a cross-listed (control) firm with a similar propensity to cross-delist before treatment start (in the pre-treatment period). Thus, we perform PSM selecting the nearest neighbour²⁴ with replacement. The nearest neighbour algorithm with replacement allows that a control (cross-listed) firm can be used more than once as a match. This technique can often decrease bias because control firms that look similar to many treatment firms can be used multiple times (Caliendo and Kopeinig, 2008).

The first step of the PSM technique consists in estimating the probability of delisting using a probabilistic model. From this estimation we obtain, for each firm, the propensity scores that are used to match each treated firm with the closest non-treated firm. We estimate the propensity scores using the following probit model:

$$prob(Treat_i = 1) = \alpha_i + \varphi Z_{i,t-1} + \lambda_k + \eta_j + \gamma_t + \varepsilon_{it} \quad (1)$$

where $Treat_i$ is a binary variable that takes one if a firm is exposed to the treatment, i.e., a firm that cross-delists at some point over 2000-2012, and zero otherwise. $Z_{i,t-1}$ is a set of control variables (covariates) that affect the delisting decision. All covariates are lagged one period because we want to match treatment and control firms prior to the cross-delisting event. The set of covariates used to estimate the propensity scores are supposed to affect both the cross-delisting decision and the operating performance. Hence, we need to identify the drivers that impact the firm performance of both treatment and control groups. Based on the previous literature (Marosi and Massoud (2008), Doidge, Karolyi and Stulz (2010), Chaplinsky and Ramchand (2012)), we select the following set of covariates²⁵ $Z_{i,t-1}$: i) $SIZE_{i,t-1}$, the logarithm of total assets that controls for the impact of firm size on cross-delisting decision; ii) $Q_{i,t-1}$, a proxy for

²⁴ There are several algorithms to establish the matching process, which differ due to the different weighting regimes to evaluate the importance of each control for each treatment firm. In general, the choice for specific matching algorithms should be of minor importance and different algorithms should lead to similar results if the sample size is large enough (Smith and Todd, 2005). Therefore, we apply matching technique with nearest neighbor and caliper, which corresponds to a propensity score range. Applying caliper matching means that a control firm will be matched with a treatment firm that lies within the range. The proper caliper was computed following Wang *et al.* (2013), and corresponds to 0.2 of propensity score standard deviation.

²⁵ These covariates ensure the quality of matching. The quality of matching is tested using the Likelihood-Ratio (LR) chi² test, which tests the goodness-of-fit of the probit model used in the propensity score estimation; if the propensity score is the most suitable one, the coefficients of such specification should be zero or close to zero. In this case, the p -value of Likelihood-ratio test (described in Table 3) is 0.526.

growth opportunities, measured as the market value of equity plus the book value of assets minus the book value of equity scaled by the book value of total assets; iii) *Financing Deficit*_{*i,t-1*}, a proxy for needs of external financing, is the sum of dividends, net investments and net changes in working capital minus internal cash flows, scaled by lagged total assets (see Frank and Goyal, 2003); *Leverage*_{*i,t-1*} is the ratio of total debt to total assets and is motivated by earlier evidence (e.g., Healy and Palepu (1990)) showing that highly levered firms are more prone to make decisions (such as cross-delisting) to preserve cash. We also include dummies to adjust the propensity score for country (λ_k), industry (η_j), and year (γ_t) effects. Table 3 reports the results.

[Insert Table 3 here]

Table 3 reports marginal effects from the estimation of the probit model represented in equation (1). All coefficients are statistically significant at the one percent level, except *Financing Deficit*_{*i,t-1*} that is insignificant. Results suggest that smaller firms are more likely to delist (*SIZE*_{*i,t-1*}), as firms with lower growth opportunities (*Q*_{*i,t-1*}), and higher debt ratios (*Leverage*_{*i,t-1*}).

In the second step, we match each firm from the treatment group (cross-delisted firms) with a firm from the control group (firms that remained cross-listed), from the same country, industry and year and with the closest propensity score. We then analyze the average treatment effects by computing the relative changes in operating performance from year *t-1* to *t*, *t+1*, *t+2* and *t+3*. We report differences in means and in medians of changes in operating performance for the group of cross-delisted firms (*All*) and also for groups of involuntary and voluntary (before and after the passage of Rule 12h-6). Table 4 shows the results.

[Insert Table 4 here]

We observe in Table 4 insignificant differences between treatment and control firms, except for $\Delta Sales Growth$ and ΔROA . Differences of $\Delta Sales Growth$ (which captures growth opportunities) are negative and significant in year *t+3* (relative to *t-1*), which suggests that cross-delisted firms decreased their growth opportunities post-cross-delisting compared to the control firms. Differences in means between treatment and control firms of changes in *ROA* show a significant increase from year one up three years after cross-delisting. These differences seem to be driven by voluntary group of firms that cross-delisted before the passage of the Rule 12h-6 in 2007 (“Pre-Rule”). In

fact, regarding the results for that group, differences in means and medians of ΔROA are significant over time. Moreover, differences are only significant one year after the cross-delisting takes place and not before, which could suggest that the cost of a U.S. listing exceeds the benefit for that group of cross-delisted firms. Hence, cross-delisting “release” those firms from costs that affect *ROA* negatively. However, this performance measure is based on accounting data, which are vulnerable to distortion by managers because accounting principles might be (somehow) subjective (e.g., when to recognize revenues or costs). Previous evidence provided by Lang, Lins and Miller (2003) show that managers of cross-listed firms in U.S. stock exchanges are less prone to engage in earnings management than managers of a matched sample of purely domestic firms. Therefore, it is expected that strong regulatory enforcement and disclosure standards provided by a cross-listing in U.S. exchanges should reduce managers’ capacity to manipulate information. On the other side, managers of cross-delisted firms might be motivated to engage in earnings manipulation because these firms are no longer under the surveillance of the SEC (and other U.S. Institutions).

In contrast, the voluntary group of firms that cross-delisted after Rule 12h-6 (“Post-Rule”) reveals significant negative differences relative to the matched group of control firms. From $t-1$ to $t+3$, changes in *Sales Growth* display a significant negative difference in mean (median) of 10.34 percentage points (pp) (16.43pp), whereas $\Delta Turnover Ratio$ also shows a significant negative difference of 6.75pp (3.89pp) in mean (median). There are no significant differences of changes in *ROA*, but ΔROE is about 12.89pp (5.44pp) lower in mean (median) for the treatment firms three years following cross-delisting. Overall, our results suggest that firms that cross-delisted after Rule 12h-6 have less growth opportunities, are less efficient, and profitability (measured by ΔROE) grows less than that of control firms; these effects persists up to three years following cross-delisting. Overall, we consider our last results consistent with the argument that firms cross-delist because they have less growth opportunities and this is persistent in the long run.

Concerning the performance of involuntary group, we only observe significant differences in $\Delta Fixed Assets Ratio$, which means that involuntary cross-delisted firms invest less in fixed assets (in proportion of total assets) than its cross-listed peers.

4.2 Long-term Returns Performance

In addition to the previous analysis, we also investigate the long-run returns performance of cross-delisted firms. We analyze long-term performance using buy-and-hold abnormal returns (BHARs), following the approach of Barber and Lyon (1997). The authors argue that BHARs are closer to the actual investment experience because investors usually invest in assets and hold them for a certain period of time. We estimate abnormal buy-and-hold returns as the difference between the buy-and-hold return of a treatment firm and the buy-and-hold return of a matched control firm. Thus, the counterfactual is what an investor would have earned if he had invested the same amount of cash over the same period of time in the control firm. Furthermore, previous research document that long-run return performance is very sensitive to the benchmark used to estimate abnormal buy-and-hold returns (e.g., Barber and Lyon²⁶ (1997), Kothari and Warner (1997), Lyon, Barber and Tsai (1999)), thus using a matching-firm approach instead of benchmark indices reduces significant bias.

Following the literature (e.g., Loughran and Vijh (1997)), we match each treatment firm with a firm from the control group (cross-listed firms) from the same country, year, and industry that has the closest market value of equity and the closest book-to-market. To obtain the best match and generate single pairs of matched firms, we use the PSM procedure without replacement and select the nearest neighbour. Buy-and-hold returns are compounded using monthly returns over a period of one year as follows:

$$BHAR_{i,T} = \prod_{t=1}^T [1 + R_{i,t}] - \prod_{t=1}^T [1 + E(R_{Matched,t})] \quad (2)$$

where $BHAR_{i,t}$ is buy-and-hold abnormal return for firm i . $\prod_{t=1}^T [1 + R_{i,t}]$ is the monthly compounded return of a one-year buy-and-hold investment in the stocks of treatment firm i . $\prod_{t=1}^T [1 + E(R_{Matched,t})]$ is the monthly compounded return of a one-

²⁶ Barber and Lyon (1997) identify three main sources of biases in calculating abnormal buy-and-hold returns: 1) “new listing bias”, which arises since new listings tend to underperform benchmark indices, thus adding new firms to the index results in a positive bias to abnormal returns; 2) “rebalancing bias”, which occurs because benchmark indices are periodically rebalanced whereas treatment firms are not, hence leading to a negative bias; 3) abnormal buy-and-hold returns are positively skewed and therefore the use of statistical t -test drives to incorrect inferences. Hence, these sources of bias can be reduced if matched firms are used instead of benchmark indexes.

year buy-and-hold investment in the stocks of the corresponding matched (control) firm. Table 5 reports the results.

[Insert Table 5 here]

Panel A of Table 5 reports the mean and the median of buy-and-hold returns for matched pairs of treatment and control firms. Differences in means and medians are statistically significant at the 10 percent level. On average, investors that hold the investment for one year in treatment firms earn 7 percentage points less than what they would have earned if they had invested in the control firms.

Panel B of Table 5 provides the mean and the median of abnormal buy-and-hold returns for treatment firms in the pre- and in the post-cross-delisting period. We observe that the mean and median abnormal buy-and hold return are negative both in the pre- and in the post-cross-delisting period, being more negative in the post-delisting period. Moreover, the difference between pre- and post-cross-delisting is, on average, significant.

In addition to the univariate analysis, we also examine the pre- and the post-cross-delisting abnormal buy-and-hold return by estimating equation (3).

$$BHAR_{i,t} = \alpha_i + \beta_1 Delist_{i,t} + \lambda_k + \eta_j + \gamma_t + \varepsilon_{it} \quad (3)$$

where $BHAR_{i,t}$ is buy-and-hold abnormal return from equation (2). $Delist_{i,t}$ is an indicator variable equal to one if treatment firm i is delisted in year t , and zero otherwise. We also include dummies to control for country, λ_k , industry, η_j , and year, γ_t . Table 6 shows the results.

[Insert Table 6 here]

As we observe in Table 6, the coefficient β_1 is negative and statistically significant in all models. In model (1) we cluster standard errors at firm- and year-level, and in model (2) standard errors are clustered at country- and year-level. In model (3) we estimate equation (3) using the Fama and MacBeth's (1973) procedure. As an example, in model (1) the abnormal buy-and-hold return declines 20.48 percentage points relative to the pre-delisting period. This result suggests that cross-delisted firms underperform their matching pairs, especially in the post-delisting period.

5. MAIN CONCLUSIONS

In this study we examine the post-operating performance and the long-run stock returns performance of cross-delisted firms from U.S. stock markets. Using a sample of foreign firms listed and delisted on U.S. exchange markets over 2000-2012, we end up with 583 cross-delisted firms used as a treatment sample and 564 cross-listed firms used as a control sample.

Our results provide evidence that cross-delisted firms have less growth opportunities than a matched group of cross-listed firms in the long run. Moreover, we document a significant decline in operating performance for the voluntary group of firms that delisted after the passage of Rule 12h-6 in 2007. Thus, that group of voluntary delistings (after Rule 12h-6) seems to have lower growth opportunities in the long run than a matched group of cross-listed firms, which is consistent with the evidence provided by Doidge, Karolyi and Stulz, (2010). Furthermore, cross-delisted firms after the Rule seem to be less efficient and less profitable than their cross-listed counterparts. However, results for the group of firms that cross-delisted before the passage of the Rule 12h-6 are different. Our findings suggest that the cost of a U.S. listing affect negatively those cross-delisted firms' profitability in the pre-cross-delisting period; one year after delisting, cross-delisted firms exhibit higher profitability growth rates than comparable cross-listed firms and this result persists until three years after delisting. This evidence supports the argument that if a U.S. listing is no longer valuable so the costs outweigh the benefits.

In addition, we also provide evidence of a negative abnormal buy-and-hold return, in the pre- and post-cross-delisting period, for the treatment group of cross-delisted firms. Results from multivariate analysis show that the abnormal buy-and-hold return declines 20.48 percentage points in the post-cross-delisting. This last evidence suggests that cross-delisted firms underperform their matched pairs, mainly in the post-delisting period.

REFERENCES

- AGGARWAL, R., DAHIYA, S. and KLAPPER, L. (2007) ADR holdings of U.S. based emerging market funds. *Journal of Banking & Finance*. 31 (6). p. 1649–1667.
- ALEXANDER, G., EUN, C. and JANAKIRAMANAN, S. (1987) Asset pricing and dual listing on foreign capital markets: A note. *The Journal of Finance*. 42 (1). p. 151–158.
- AYYAGARI, M., and DOIDGE, C. (2010) Does cross-listing facilitate changes in corporate ownership and control? *Journal of Banking and Finance*. 34 (1). p. 208–223.
- BAILEY, W., KAROLYI, G. and SALVA, C. (2006) The economic consequences of increased disclosure: Evidence from international cross-listings. *Journal of Financial Economics*. 81 (1). p. 175–213.
- BAKER, W., NOFSINGER, J. and WEAVER, D. (2002) International cross-listing and visibility. *Journal of Financial and Quantitative Analysis*. 37 (3). p. 495–521.
- BANCEL, F. and MITTOO, U. (2001) European managerial perceptions of the net benefits of foreign listing: European evidence. *European Financial Management*. 7 (2). p. 213–236.
- BARBER, B. and LYON, J. (1997) Detecting long run abnormal stock returns: The empirical power and specification of test statistics. *Journal of Financial Economics*. 41 (3). p. 341–372.
- BERGER, P., LI, F. and WONG, M. (2005) *The impact of Sarbanes-Oxley on cross-listed companies*. Working paper. University of Chicago.
- BRADSHAW, M. BUSHEE, B. and MILLER, G. (2004) Accounting choice, home bias and U.S. investment in non-U.S. firms. *Journal of Accounting Research*. 42 (5). p. 795–841.
- BUSHMAN, R., PIOTROSKI, J. and SMITH, A. (2004) What determines corporate transparency? *Journal of Accounting Research*. 42 (2). p. 207–252.
- BUSHMAN, R., PIOTROSKI, J. and SMITH, A. (2005) Insider trading restrictions and analysts' incentives to follow firms. *The Journal of Finance*. 60 (1). p. 35–66.
- CALIENDO, M. and KOPEINIG, S. (2008) Some practical guidance for the implementation of propensity score matching. *Journal of Economic Surveys*. 22 (1). p. 31–72.

- CHAPLINSKY, S. and RAMCHAND, L. (2009) *From listing to de-listing: foreign firms' entry and exit from the U.S.* Working paper. University of Virginia.
- CHAPLINSKY, S. and RAMCHAND, L. (2012) What drives delistings of foreign firms from U.S. Exchanges? *Journal of International Financial Markets, Institutions and Money*. 22 (5). p. 1126– 1148.
- COFFEE, J. (1999) The future as history: the prospects for global convergence in corporate governance and its implications. *Northwestern University Law Review*. 93 (3). p. 641–708.
- COFFEE, J. (2002) Racing towards the top? The impact of cross-listing and stock market competition on international corporate governance. *University of Pennsylvania Law Review*. 102 (7). p. 1757–1831.
- DAUGHERTY, M. and GEORGIEVA, D. (2011) Foreign cultures, Sarbanes-Oxley Act and cross-delisting. *Journal of Multinational Financial Management*. 21. p. 208-223.
- DJANKOV, S., La PORTA, R., LOPEZ-De-SILANES, F. and SHLEIFER, A. (2008) The law and economics of self-dealing. *Journal of Financial Economics*. 88 (3). p. 430–465.
- DOIDGE, C. (2004) U.S. Cross-listings and the private benefits of control: Evidence from dual class firms. *Journal of Financial Economics*. 72 (3). p. 519–554.
- DOIDGE, C., KAROLYI, A. and STULZ, R. (2004) Why are foreign firms listed in the U.S. worth more? *Journal of Financial Economics*. 71 (2). p. 205–238.
- DOIDGE, C., KAROLYI, A., LINS, K., MILLER, D. and STULZ, R. (2009) Private benefits of control, ownership, and the cross-listing decision. *The Journal of Finance*. 64 (1). p. 425–466.
- DOIDGE, C., KAROLYI, A. and STULZ, R. (2009) Has New York become less competitive than London in global markets? Evaluating Foreign Listing Choices over Time. *Journal of Financial Economics*. 91 (3). p. 253-277.
- DOIDGE, C., KAROLYI, A. and STULZ, R. (2010) Why do foreign firms leave U.S. equity markets? *The Journal of Finance*. 65 (4). p. 1507-1553.
- ERRUNZA, V. and LOSQ, E. (1985) International asset pricing under mild segmentation: Theory and test. *The Journal of Finance*. 40 (1). p. 105–124.

- ERRUNZA, V. and MILLER, D.P. (2000) Market segmentation and the cost of capital in international markets. *Journal of Financial and Quantitative Analysis*. 35 (4). p. 577-600.
- EUN, C. and JANAKIRAMANAN, S. (1986) A model of international asset pricing with a constraint on the foreign equity ownership. *The Journal of Finance*. 41 (4). p. 897– 914.
- FAMA, E. and FRENCH, K. (1997) Industry costs of equity. *Journal of Financial Economics*. 43 (2). p. 153-193.
- FAMA, E. and MACBETH, J. (1973) Risk, return, and equilibrium: empirical tests. *The Journal of Political Economy*. 81 (3). p. 607-636.
- FANTO, J. and KARMELE, R. (1997) A report on the attitudes of foreign companies regarding a U.S. listing. *Stanford Journal of Law, Business & Finance*. 3. p. 51–83.
- FERNANDES, N., LEL, U. and MILLER, D. (2010) Escape from New York: The market impact of loosening disclosure requirements. *Journal of Financial Economics*. 95 (2). p. 129–147.
- FRANK, M. and GOYAL, V. (2003) Testing the pecking order theory of capital structure. *Journal of Financial Economics*. 67. p. 217–248.
- HAIL, L. and LEUZ, C. (2009) Cost of capital effects and changes in growth expectations around U.S. cross-listings. *Journal of Financial Economics*. 93 (3). p. 428–454.
- HEALY, P. and PALEPU, K. (1990) Effectiveness of accounting-based dividend covenants. *Journal of Accounting and Economics*. 12 (1-3). p. 97–124.
- HOSTAK, P., LYS, T., YANG, Y. and CARR, E. (2013) An examination of the impact of the Sarbanes-Oxley Act on the attractiveness of U.S. capital markets for foreign firms. *Journal of Accounting Studies*. 18 (2). p. 522-559.
- KAROLYI, G. (2012) Corporate governance, agency problems and international cross-listings: A defense of the bonding hypothesis. *Emerging Markets Review*. 13 (4). p. 516-547.
- KOTHARI, S. and WARNER, J. (1997) Measuring long-horizon security price performance. *Journal of Financial Economics*. 43(3). p. 301-339
- La PORTA, R., LOPEZ-De-SILANES, F. and SHLEIFER, A. (2008) The Economic Consequences of Legal Origins. *Journal of Economic Literature*. 46 (2). p. 285-332.

- La PORTA, R., LOPEZ-De-SILANES F., SHLEIFER, A. and VISHNY, R. (1997) Legal determinants of external finance. *The Journal of Finance*. 52 (3). p. 1131-1150.
- La PORTA, R., LOPEZ-De-SILANES, F., SHLEIFER, A. and VISHNY, R. (1998) Law and finance, *Journal of Political Economy*. 106 (6). p. 1113–1155.
- LANG, M., LINS, K. and MILLER, D. (2003) ADRs, analysts and accuracy: does cross-listing in the U.S. improve a firm's information environment and increase market value? *Journal of Accounting Research*. 41 (2). p. 317–345.
- LI, X. (2014) The Sarbanes-Oxley Act and cross-listed foreign private issuers. *Journal of Accounting and Economics*. 58 (1). p. 21–40
- LINS, K., STRICKLAND, D. and ZENNER, M. (2005) Do non-U.S. firms issue equity on U.S. exchanges to relax capital constraints? *Journal of Financial and Quantitative Analysis*. 40 (1). p. 109–133.
- LIU, S. (2004) The impacts of foreign involuntary delistings: An empirical analysis. *Journal of Emerging Markets*. 10 (3). p. 22-39.
- LOUGHRAN, T. and VIJH, A. (1997) Do long-term shareholders benefit from corporate acquisitions? *The Journal of Finance*. 52 (5). p. 1765 – 1790.
- LOUREIRO, G. (2010) The reputation of underwriters: A test of the bonding hypothesis. *Journal of Corporate Finance*. 16 (4). p. 516–532.
- LOUREIRO, G. and TABOADA, A. (2015) Do improvements in the information environment enhance insiders' ability to learn from outsiders? *Journal of Accounting Research*. 53 (4). p. 863-905.
- LYON, J., BARBER, B. and TSAI, C. (1999) Improved methods for tests of long-run abnormal stock returns. *The Journal of Finance*. 54 (1). p. 165-201.
- MAROSI, A. and MASSOUD, N. (2008) You can enter, but you cannot leave . . .— U.S. securities markets and foreign firms. *The Journal of Finance*. 63 (5). p. 2477–2506.
- MITTOO, U. (1992) Managerial perceptions of the net benefits of foreign listing; Canadian evidence. *Journal of International Financial Management and Accounting*. 4 (1). p. 40–62.
- REESE, W. and WEISBACH, M. (2002). Protection of minority shareholder interests, cross-listings in the United States, and subsequent equity offerings. *Journal of Financial Economics*. 66 (1). p. 65–104.

- ROSENBAUM, P. and RUBIN, D. (1983) The central role of the propensity score in observational studies for causal effects. *Biometrika*. 70 (1). p. 41–55.
- SMITH, G. (2008) *A look at the impact of Sarbanes-Oxley on cross-listed firms*, Working paper. University of Illinois.
- SMITH, J. and TODD, P. (2005) Does matching overcome Lalonde's critique of nonexperimental estimators? *Journal of Econometrics*. 125(1-2). p. 305-353.
- STAPLETON, R. and SUBRAHMANYAM, M. (1977) Market imperfections, capital market equilibrium and corporate finance. *The Journal of Finance*. 32 (2). p. 307–319.
- STULZ, R. (1999) Globalization, corporate finance, and the cost of capital. *Journal of Applied Corporate Finance*. 12 (3). p. 8–25.
- WANG, Y., CAI, H., LI, C., JIANG, Z., WANG, L., SONG, J. and XIA, J. (2013) Optimal caliper width for propensity score matching of three treatment groups: A Monte Carlo Study. PLoS ONE 8(12): e81045. doi:10.1371/journal.pone.0081045.
- WITMER, J. (2005) Why do firms cross-(de)list? An examination of the determinants and effects of cross-delisting, *Working paper, Bank of Canada*. Available at SSRN: <http://ssrn.com/abstract=885503> or <http://dx.doi.org/10.2139/ssrn.885503>.
- ZINGALES, L. (2007) Is the U.S. capital market losing its competitive edge? *ECCI - Finance Working Paper No. 192/2007, University of Chicago*.

APPENDIX A – Definitions and Sources of the variables

VARIABLE	DEFINITION	SOURCE
<u>Firm-level</u>		
Book-to-Market	The book value of equity divided by the market value of equity.	Worldscope and Datastream
Buy-and-hold abnormal returns (BHARs)	Monthly compounded return of a one-year buy-and-hold investment in the stocks of treatment firms less monthly compounded return of a one-year buy-and-hold investment in the stocks of the corresponding matched firms.	Datastream
Delist	Indicator variable that takes one if a treatment firm delisted in a given year over 2000-2012, and zero otherwise.	SEC website, Datastream and Citibank
Financing Deficit	Numerator: the sum of cash dividends, net investments, and net changes in working capital, less internal cash flows (net income, depreciation and amortization expenses, and deferred taxes). Denominator: lagged total assets (see Frank and Goyal, 2003). Deferred taxes are set to zero when they are missing.	Worldscope
Fixed Assets Ratio	Property, Plant and Equipment (PPE) divided by total assets.	Worldscope
Leverage	Total debt (short-term plus long-term debt) divided by total assets.	Worldscope
Market Capitalization	Market price (year-end) multiplied by the number of common shares outstanding, denominated in U.S. dollars and converted at fiscal year-end exchange rates.	Datastream
Market value of equity	Logarithm of the market value of equity.	Datastream
Return on Assets (ROA)	Earnings before interest and taxes (EBIT) divided by total assets.	Worldscope
Return on Equity (ROE)	Net income after preferred dividends divided by book value of equity.	Worldscope
Sales Growth	Percentage change in sales over a given period.	Worldscope
SIZE	Logarithm of total assets.	Worldscope
(Tobin's) Q	Numerator: market value of equity plus book value of assets minus book value of equity. Denominator: book value of assets.	Worldscope
Total Assets	Total Assets in U.S. dollars, converted at fiscal year-end exchange rates.	Worldscope
Treat	Binary variable that takes one if a firm cross-delist at some point over 2000-2012, i.e., if a firm is included in the treatment group, and zero otherwise.	SEC website, Datastream and Citibank
Turnover Ratio	Total sales divided by total assets.	Worldscope
<u>Industry-Level</u>		
INDUSTRY	Classification scheme proposed by Fama and French (1997), based on 48 Industry Portfolios.	Fama and French (1997)
SIC CODE	Four-digit Standard Industrial Classification (SIC) Code.	Datastream
<u>Country-Level</u>		

VARIABLE	DEFINITION	SOURCE
Anti-Self-Dealing Index	Index that measures shareholder's rights. This index ranges between 0 and 0.66.	Djankov <i>et al.</i> (2008)
GDP per Capita (GDP/PC)	Logarithm of GDP per capita.	Worldbank
Market Capitalization to GDP (%)	Market capitalization divided by Gross domestic product (GDP), expressed in percentage.	Worldbank

APPENDIX 1.B – Reasons for cross-delisting and deregistration

CATEGORY	REASON
<u>INVOLUNTARY</u>	
Bankruptcy	Firms that declared bankruptcy.
Revoked by SEC	Registration was revoked by SEC for not fill the imposed requirements.
Removed by NYSE	Listing removed by NYSE for not meet the imposed requirements.
Removed by NASDAQ	Listing removed by NASDAQ for not meet the imposed requirements.
 <u>MERGERS & ACQUISITIONS</u>	
M&A	Firms delisted following a merger or acquisition process.
 <u>VOLUNTARY</u>	
Pre-Rule 12h-6	Firms delisted and then deregistered before the passage of the Rule 12h-6 (deregistration under the Rule 12g-4).
Post-Rule 12h-6	Firms delisted and then deregistered under the Rule 12h-6 (became effective on March 21, 2007).
Changed its headquarters to U.S.	Firms that moved their headquarters to U.S. and are no longer considered as foreign.
Going private	Firms that went private.
Moved to OTCBB	Firms that delisted from U.S. exchange markets and moved to OTCBB.
Moved to OTC	Firms that delisted from U.S. exchange markets and moved to another OTC.

APPENDIX 1.C – Groups of Cross-delisted firms

GROUP	REASON
<u>INVOLUNTARY</u>	
Involuntary	Firms that declared bankruptcy or whose listings were removed by U.S. markets - NYSE or NASDAQ - for not meet the imposed requirements.
 <u>MERGERS & ACQUISITIONS</u>	
M&A	Firms delisted following a merger or acquisition process.
 <u>VOLUNTARY</u>	
Pre-Rule 12h-6	Firms delisted before the passage of the Rule 12h-6 (deregistration under the Rule 12g-4).
Post-Rule 12h-6	Firms delisted under the Rule 12h-6 (became effective on March 21, 2007).
Other reasons	Firms that moved their headquarters to U.S., went private or moved to OTCBB or to another OTC.

TABLE 1: Sample Description

Table 1 describes the sample by country of origin, industry and year over 2000-2012, excluding financial firms (SIC Code 6000-6999) and strictly regulated firms (SIC Code 4900-4949). Each panel reports the number of firms that cross-delisted and that deregistered, and also the number of cross-listed (control) firms included in the sample. Cross-delisted firms are divided by the reason of delisting according to the segmentation described in Appendix C. Involuntary group of cross-delisted firms comprises firms that were removed by U.S. markets (7 of which declared bankruptcy). M&A group of cross-delisted firms includes mergers and acquisitions. Voluntary group of cross-delisted includes firms that delisted before and after the passage of the Rule 12h-6 in 2007. "Other" includes other reasons as firms that moved their headquarters to U.S., went private or moved to OTC. Deregistered group reports the number of firms that deregistered after delisting by involuntary, M&A and voluntary reasons. Reasons of cross-delisting and deregistration are described in Appendix B. Panel A describes by country of origin the number of firms that cross-delisted and that deregistered, and the number of cross-listed firms included in the sample. Panel B describes by industry the number of firms that cross-delisted and that deregistered, and the number of cross-listed firms. We assign firms to industries using the classification scheme of Fama and French (1997) of 48 industry portfolios. We then aggregate industries according to Massachusetts Department of Workforce Development (document of 2007). Industry (low) includes: Food Products; Candy and Soda; Beverages; Tobacco; Textiles. Industry (med) includes: Consumer Goods; Apparel; Steel; Paper Supplies; Other Fabricated Products. High Tech Manufacturing (Level I) includes: Printing and Publishing; Healthcare; Medical Equipment; Pharmaceutical Products; Aircraft; Computers; Electronic Equipment; Measuring and Control Equipment. Communication is classified as High Tech Manufacturing level I but is considered alone. High Tech Manufacturing (Level II) includes: Chemicals; Rubber and Plastic Products; Machinery. Oil is classified as High Tech level Manufacturing II but is considered alone. High Tech Manufacturing (Level III) includes: Electrical Equipment; Automobiles and Trucks. Coal is classified as High Tech Manufacturing level III but is considered in the mining group. Panel C describes by year the number of firms that cross-delisted and that deregistered, and also the number of firm-year observations of cross-listed firms included in the sample over 2000-2012. *Denotes a country designated as an emerging market by Standard and Poor's Emerging Market Database.

Panel A – Sample Description by Country

	Cross-Delisted						Deregistered				Control
	Involuntary	M&A	Voluntary			Total	Involuntary	M&A	Voluntary	Total	Cross-listed
			Pre-Rule 12h-6	Post-Rule 12h-6	Other						
Argentina*	1	1	0	0	0	2	1	1	0	2	5
Australia	6	2	3	5	3	19	3	2	11	16	7
Austria	0	0	0	1	0	1	0	0	1	1	0
Belgium	1	0	0	1	0	2	1	0	1	2	2
Brazil*	8	4	0	0	1	13	8	4	1	13	17
Canada	91	55	19	10	19	194	86	55	39	180	159
Chile*	1	2	2	3	1	9	1	2	6	9	5
China*	18	1	1	2	1	23	17	1	4	22	108
Colombia*	0	0	0	0	0	0	0	0	0	0	1
Denmark	0	0	1	1	0	2	0	0	2	2	2
Finland	0	2	1	3	0	6	0	2	4	6	1
France	2	6	5	10	0	23	2	6	15	23	9
Germany	3	1	5	10	1	20	3	1	16	20	5
Greece*	2	2	1	1	0	6	1	2	2	5	24
Hong Kong	10	1	2	6	1	20	9	1	8	18	18
Hungary*	0	0	0	1	0	1	0	0	1	1	0
India*	2	0	0	2	0	4	2	0	2	4	9
Indonesia*	0	0	0	0	0	0	0	0	0	0	2
Ireland	4	2	3	0	0	9	4	2	3	9	8
Israel	23	3	7	4	1	38	18	3	12	33	53
Italy	0	0	3	3	0	6	0	0	6	6	5
Japan	1	0	3	4	1	9	1	0	8	9	15
Korea*	1	3	0	3	0	7	1	3	3	7	5
Luxembourg	1	2	3	2	0	8	1	2	5	8	5
Mexico*	7	2	6	1	0	16	7	2	7	16	17
Netherlands	4	6	9	7	0	26	3	6	16	25	11
New Zealand	0	1	2	0	0	3	0	1	2	3	1
Norway	0	3	0	3	1	7	0	3	4	7	8
Peru*	0	0	0	1	0	1	0	0	1	1	1

Panel A – Sample Description by Country											
	Cross-Delisted					Deregistered				Control	
	Involuntary	M&A	Voluntary			Total	Involuntary	M&A	Voluntary	Total	Cross-listed
			Pre-Rule 12h-6	Post-Rule 12h-6	Other						
Philippines*	1	0	0	0	0	1	1	0	0	1	1
Poland*	0	0	1	0	0	1	0	0	1	1	0
Portugal	0	0	0	0	0	0	0	0	0	0	1
Russia*	0	2	1	1	0	4	0	2	2	4	3
Singapore	1	1	0	2	0	4	1	1	2	4	2
South Africa*	1	0	0	2	0	3	1	0	2	3	6
Spain	0	3	0	1	0	4	0	3	1	4	3
Sweden	0	3	8	1	1	13	0	3	9	12	1
Switzerland	1	1	1	4	0	7	1	1	5	7	5
Taiwan*	0	0	0	1	0	1	0	0	1	1	10
Turkey*	0	0	0	0	0	0	0	0	0	0	1
United Kingdom	13	21	18	13	1	66	13	21	32	66	28
Venezuela*	1	1	1	0	1	4	1	1	2	4	0
<i>Total</i>	204	131	106	109	33	583	187	131	237	555	564

Panel B – Sample Description by Industry

	Cross-Delisted						Deregistered				Control
	Involuntary	M&A	Voluntary			Total	Involuntary	M&A	Voluntary	Total	Cross-listed
			Pre-Rule 12h-6	Post-Rule 12h-6	Other						
Agriculture	0	2	1	1	0	4	0	2	2	4	4
Mining	26	9	3	3	3	44	25	9	7	41	84
Construction	4	1	0	4	0	9	4	1	4	9	10
Transportation	5	9	2	6	1	23	4	9	9	22	53
Oil	14	16	4	4	3	41	13	16	11	40	37
Communication	20	16	23	23	3	85	20	16	48	84	47
Manufacturing (low)	3	4	5	2	2	16	3	4	9	16	15
Manufacturing (med)	15	7	11	10	2	45	15	7	22	44	32
Manufacturing (Level I)	51	25	20	23	12	131	45	25	50	120	131
Manufacturing (Level II)	10	6	6	8	0	30	9	6	14	29	20
Manufacturing (Level III)	5	5	6	5	0	21	2	5	11	18	14
Services	39	27	20	15	5	106	35	27	38	100	95
Wholesale	6	2	2	3	1	14	6	2	6	14	10
Retail	5	2	2	2	1	12	5	2	5	12	10
Other	1	0	1	0	0	2	1	0	1	2	2
<i>Total</i>	204	131	106	109	33	583	187	131	237	555	564

Panel C – Sample Description by Year

	Cross-Delisted						Deregistered				Control
	Involuntary	M&A	Voluntary			Total	Involuntary	M&A	Voluntary	Total	Cross-listed
			Pre-Rule 12h-6	Post-Rule 12h-6	Other						
2000	3	8	0		2	13	3	8	2	13	232
2001	8	20	2		5	35	8	20	7	35	243
2002	13	21	15		5	54	13	21	19	53	265
2003	3	16	21		4	44	3	16	23	42	296
2004	3	10	18		3	34	2	10	20	32	325
2005	6	25	26		1	58	6	25	26	57	352
2006	19	13	24		1	57	19	13	24	56	387
2007	26	6		59	1	92	24	6	61	91	389
2008	28	0		15	5	48	27	0	18	45	399
2009	26	3		15	2	46	25	3	15	43	405
2010	20	3		9	1	33	17	3	9	29	479
2011	22	5		6	2	35	18	5	7	30	564
2012	27	1		5	1	34	22	1	6	29	564
<i>Total</i>	204	131	106	109	33	583	187	131	237	555	4900

TABLE 2: Summary Descriptive Statistics

Table 2 provides descriptive statistics for the control group of cross-listed firms and for the treatment group of firms, which includes all firms in our sample that have cross-delisted at some point in time between 2000 and 2012. The treatment group is described as “All” and segmented by involuntary and voluntary before (“Pre-Rule”) and after (“Post-Rule”) the passage of the Rule 12h-6. Panel A covers the 2000-2006 years before the passage of the Rule 12h-6, and Panel B covers the 2007-2012 years after the passage of the Rule 12h-6. Descriptive statistics are measured in the year before cross-delisting takes place. *Total assets* are in US\$ million, reflecting 2000 prices. *Market capitalization* is in US\$ million, reflecting 2000 prices, and is calculated as the year-end market price multiplied by the number of common shares outstanding. *Fixed Assets Ratio* is property, plant, and equipment scaled by total assets. *Turnover Ratio* is total sales scaled by total assets. *Q* is measured as the market value of equity plus book value of assets minus book value of equity scaled by the book value of assets. *Sales Growth* is the percentage change in sales over a one-year period. *ROA* is earnings before interest and taxes scaled by total assets. *ROE* is net income after preferred dividends scaled by book value of equity. *Financing deficit* is the sum of dividends, net investments and net changes in working capital minus internal cash flows, scaled by lagged total assets (see Frank and Goyal, 2003). *Leverage* is the ratio of total debt to total assets. *Book-to-Market* is the book value of equity divided by the market value of equity. *Anti-Self-Dealing Index* measures shareholder’s rights and ranges between 0 and 0.66 (see Djankov *et al.*, 2008). *GDP per capita* is the logarithm of GDP per capita. *Market Cap/GDP* is market capitalization divided by GDP, and expressed in percentage. All variables are defined in Appendix A. Means, medians and the number of observations (“N”) are reported for each variable. Differences in means are tested using *t*-statistic test (not reported) and differences in medians are tested using Wilcoxon rank sum test (not reported). ***, ** and * mean statistical significance at the 1 percent level, 5 percent level and 10 percent level, respectively.

Panel A - Descriptive Statistics 2000-2006

	<u>Control</u>			<u>Treatment</u>														
	Mean	Median	N	All			Involuntary			Voluntary: Pre-Rule								
				Mean	Median	N	Mean	Median	N	Mean	Median	N						
<i>Total Assets</i>	10,200.00	1,732.93	2100	2,385.25	***	441.96	***	295	1,094.18	***	306.85	***	55	3,209.70	***	509.68	***	106
<i>Market Capitalization</i>	11,300.00	1,763.52	2100	2,033.15	***	335.51	***	295	1,329.56	***	246.28	***	55	2,685.84	***	298.8	***	106
<i>Fixed Assets</i>	0.38	0.35	2100	0.35	*	0.29	**	295	0.39		0.36		55	0.32	**	0.28	**	106
<i>Turnover</i>	0.67	0.60	2100	0.71		0.63		295	0.65		0.61		55	0.74	*	0.69	*	106
<i>Q</i>	2.18	1.56	2100	1.81	***	1.34	***	295	2.11		1.54		55	1.74	***	1.32	***	106
<i>Sales Growth</i>	0.12	0.09	2100	0.08		0.08		295	0.04		0.08		55	0.02	**	0.04	***	106
<i>ROA</i>	0.06	0.08	2100	-0.05	***	0.01	***	295	-0.04	***	0.00	***	55	-0.08	***	0.02	***	106
<i>ROE</i>	0.06	0.10	2100	-0.12	***	0.02	***	295	-0.08	**	0.02	***	55	-0.17	***	0.01	***	106
<i>Financing Deficit</i>	0.05	0.00	2100	0.09	**	0.01	*	295	0.10	*	0.03		55	0.04		-0.02		106
<i>Leverage</i>	0.23	0.21	2100	0.25	**	0.21		295	0.28	*	0.26	*	55	0.24		0.20		106
<i>Book-to-Market</i>	0.60	0.44	2100	0.80	***	0.57	***	295	0.82	*	0.51		55	0.77	**	0.58	***	106
<i>Anti-Self-Dealing Index</i>	0.52	0.66	2100	0.55	***	0.66	***	295	0.59	***	0.66	***	55	0.51		0.66		106
<i>GDP per capita</i>	9.58	10.02	2100	9.96	***	10.10	***	295	9.83	**	10.07		55	10.03	***	10.20	***	106
<i>Market Cap/GDP (%)</i>	98.21	89.43	2100	102.31		103.24	***	295	105.66		101.16	*	55	94.98		92.86		106

Panel B – Descriptive Statistics 2007-2012

	<u>Control</u>			<u>Treatment</u>								
	Mean	Median	N	All			Involuntary			Voluntary: Post-Rule		
				Mean	Median	N	Mean	Median	N	Mean	Median	N
<i>Total Assets</i>	10,200.00	945.84	2800	5,731.80 ***	627.91 ***	288	2,399.62 ***	262.58 ***	149	10,800.00	2,569.89 ***	109
<i>Market Capitalization</i>	9,587.73	882.39	2800	3,704.61 ***	630.49 ***	288	1,795.03 ***	211.58 ***	149	6,517.27 ***	1,906.10 **	109
<i>Fixed Assets</i>	0.36	0.31	2800	0.31 ***	0.24 ***	288	0.31 **	0.24 **	149	0.30 ***	0.25 *	109
<i>Turnover</i>	0.62	0.57	2800	0.69 **	0.66 ***	288	0.66	0.64	149	0.73 **	0.68 ***	109
<i>Q</i>	1.93	1.44	2800	1.81	1.37	288	1.76 *	1.28 *	149	1.87	1.45	109
<i>Sales Growth</i>	0.09	0.09	2800	0.04 *	0.01 ***	288	0.08	0.06 *	149	-0.04 ***	-0.03 ***	109
<i>ROA</i>	0.04	0.06	2800	-0.01 ***	0.04 ***	288	-0.02 ***	0.03 ***	149	0.02	0.06	109
<i>ROE</i>	0.04	0.08	2800	-0.02 *	0.06 **	288	-0.07 **	0.03 ***	149	0.09	0.10	109
<i>Financing Deficit</i>	0.07	0.01	2800	0.08	0.03 *	288	0.10	0.04 *	149	0.05	0.02	109
<i>Leverage</i>	0.20	0.16	2800	0.24 ***	0.23 ***	288	0.21	0.15	149	0.27 ***	0.28 ***	109
<i>Book-to-Market</i>	0.76	0.53	2800	0.73	0.52	288	0.85	0.62	149	0.56 ***	0.43 **	109
<i>Anti-Self-Dealing Index</i>	0.52	0.66	2800	0.53	0.66	288	0.57 ***	0.66 ***	149	0.48 ***	0.38 ***	109
<i>GDP per capita</i>	9.76	10.15	2800	10.02 ***	10.42 ***	288	9.93 **	10.42 *	149	10.10 ***	10.37 ***	109
<i>Market Cap/GDP (%)</i>	102.76	92.14	2800	124.80 ***	107.66 ***	288	123.83 **	107.31 ***	149	130.00 ***	107.66 ***	109

TABLE 3: The Propensity Score Estimation

Table 3 provides the marginal effects for the probit model set in equation (1). $Treat_i$ is a binary variable that takes one if a firm is exposed to the treatment (i.e., cross-delisting), and zero otherwise. Covariates are lagged one period. $SIZE_{i,t-1}$ is the logarithm of total assets. $Q_{i,t-1}$ is measured as the market value of equity plus book value of assets minus book value of equity scaled by the book value of assets. $Financing\ Deficit_{i,t-1}$ is the sum of dividends, net investments and net changes in working capital minus internal cash flows, scaled by lagged total assets (see Frank and Goyal, 2003). $Leverage_{i,t-1}$ is the ratio of total debt to total assets. All variables are defined in Appendix A. Robust z -statistic in parentheses. Model (1) includes year, country and industry fixed effects. The p -value of Likelihood-ratio (LR) test is also reported (in parentheses). ***, ** and * mean statistical significance at the 1 percent level, 5 percent level and 10 percent level, respectively.

	Dependent Variable: $Treat_i$
	(1)
$SIZE_{i,t-1}$	-0.0839*** (-20.16)
$Q_{i,t-1}$	-0.0569*** (-11.21)
$Financing\ Deficit_{i,t-1}$	0.0086 (0.32)
$Leverage_{i,t-1}$	0.3375*** (8.79)
Year Fixed Effects	Yes
Industry Fixed Effects	Yes
Country Fixed Effects	Yes
Pseudo R-squared	0.2483
Observations	7,692
PROPENSITY SCORE	
LR χ^2 (p value)	(0.526)

TABLE 4: Differences in Operating Performance between Matched Groups of Treatment and Control

Table 4 provides the differences in means and medians, between cross-delisted firms and their matched control group, of changes in operating performance variables before and after the cross-delisting event. Matched samples are constructed using the PSM technique, where each treatment firm is matched to a control firm in the same country, industry and year and with the closest propensity score (nearest neighbor with replacement) estimated from equation (1). Percentage changes in operating performance are calculated cumulatively from year $t-1$ to years t , $t+1$, $t+2$ and $t+3$, respectively. This analysis is provided for the entire group of cross-delisted firms (“All”) and for the following groups: involuntary and voluntary before (“Pre-Rule”) and after (“Post-Rule”) the passage of the Rule 12h-6. For each group we compute the differences in means and medians between the treatment firms and their corresponding matched controls. *Sales Growth* is the percentage change in sales. *Fixed Assets Ratio* is property, plant, and equipment scaled by total assets. *Turnover Ratio* is total sales scaled by total assets. *ROA* is earnings before interest and taxes scaled by total assets. *ROE* is net income after preferred dividends scaled by book value of equity. Differences in means are tested using t -statistic test (t -statistics in parentheses) and differences in medians are tested using Wilcoxon rank sum test (z -statistics in parentheses). The number of observations (“#”) is reported for both treatment and control groups. ***, ** and * mean statistical significance at the 1 percent level, 5 percent level and 10 percent level, respectively.

	All				Involuntary				Voluntary: Pre-Rule				Voluntary: Post-Rule			
	From <i>t-1</i> to:				From <i>t-1</i> to:				From <i>t-1</i> to:				From <i>t-1</i> to:			
	<i>t</i>	<i>t+1</i>	<i>t+2</i>	<i>t+3</i>	<i>t</i>	<i>t+1</i>	<i>t+2</i>	<i>t+3</i>	<i>t</i>	<i>t+1</i>	<i>t+2</i>	<i>t+3</i>	<i>t</i>	<i>t+1</i>	<i>t+2</i>	<i>t+3</i>
<u><i>% Δ Sales Growth</i></u>																
Mean (Treat-Control)	-2.18	-6.71	-2.00	-11.64*	-1.79	12.60	1.99	18.24	-0.48	-1.18	-2.98	-7.70	-6.97	-37.05**	-6.31	-10.34**
<i>t</i> -test	(0.26)	(0.66)	(0.20)	(1.72)	(0.10)	(0.52)	(0.08)	(1.27)	(0.03)	(0.07)	(0.19)	(0.42)	(0.46)	(1.98)	(0.38)	(1.96)
Median (Treat-Control)	-3.23	-0.41	-7.54	-13.74*	-4.40	3.77	7.92	17.14	5.13	-13.43	1.07	-21.29	-8.14	-15.34	-9.13	-16.43*
<i>z</i> -test	(0.58)	(0.54)	(0.04)	(1.66)	(0.16)	(0.36)	(0.45)	(1.54)	(0.12)	(0.57)	(0.00)	(0.85)	(0.51)	(1.39)	(0.63)	(1.75)
<u><i>% Δ Fixed Assets</i></u>																
Mean (Treat-Control)	-0.18	-0.21	-0.47	-0.59	-0.65	-2.48**	-4.11***	-4.52**	-0.23	0.13	-0.08	-0.09	0.37	0.65	0.94	0.78
<i>t</i> -test	(0.55)	(0.44)	(0.77)	(0.77)	(0.67)	(2.12)	(2.79)	(2.42)	(0.45)	(0.17)	(0.10)	(0.09)	(0.82)	(1.10)	(1.28)	(0.87)
Median (Treat-Control)	0.06	0.13	0.17	0.55	-0.03	-0.79***	-1.58**	-1.85**	-0.01	-0.04	0.04	-0.08	0.08	0.28	0.32	0.89
<i>z</i> -test	(0.29)	(0.42)	(0.64)	(1.12)	(1.61)	(3.08)	(2.56)	(2.04)	(0.61)	(0.40)	(0.60)	(0.56)	(0.59)	(1.06)	(1.61)	(1.55)
<u><i>% Δ Turnover Ratio</i></u>																
Mean (Treat-Control)	0.55	0.55	-0.32	-0.61	0.08	-0.52	-0.13	-0.03	1.89	3.21	3.13	2.27	0.51	-0.52	-4.54**	-6.75***
<i>t</i> -test	(0.66)	(0.50)	(0.25)	(0.43)	(0.03)	(0.14)	(0.03)	(0.01)	(1.53)	(1.62)	(1.49)	(0.84)	(0.42)	(0.32)	(2.41)	(2.88)
Median (Treat-Control)	-0.88	-0.86	-0.46	-1.03	-0.23	-0.59	0.69	0.62	1.09	1.43	1.42	2.24	-1.02	-1.14	-3.02**	-3.89***
<i>z</i> -test	(0.57)	(0.25)	(0.35)	(0.31)	(0.97)	(0.59)	(0.45)	(0.34)	(1.53)	(1.63)	(1.45)	(1.08)	(1.11)	(1.08)	(2.29)	(2.62)
<u><i>% Δ ROA</i></u>																
Mean (Treat-Control)	1.22	1.79**	1.99**	2.40**	2.80	3.68	3.89	1.99	1.59	3.37**	5.12***	7.38***	0.47	-0.19	0.48	-0.15
<i>t</i> -test	(1.62)	(2.27)	(2.28)	(2.38)	(1.25)	(1.57)	(1.33)	(0.64)	(1.36)	(2.54)	(3.39)	(4.35)	(0.59)	(0.21)	(0.45)	(0.11)
Median (Treat-Control)	0.09	0.51	0.37	0.27	0.20	1.16	1.86	0.92	0.37	1.00**	2.38***	2.42***	-0.20	-0.26	-0.44	-1.00
<i>z</i> -test	(0.82)	(1.15)	(1.40)	(1.27)	(0.45)	(1.48)	(1.42)	(0.51)	(1.39)	(2.36)	(3.71)	(4.23)	(0.37)	(1.05)	(0.46)	(1.49)
<u><i>% Δ ROE</i></u>																
Mean (Treat-Control)	3.00	1.77	2.30	0.93	2.80	2.97	-4.70	-7.03	3.92	7.27	9.37	16.32**	0.67	-5.26	-2.00	-12.89***
<i>t</i> -test	(0.98)	(0.53)	(0.61)	(0.32)	(0.28)	(0.25)	(0.37)	(0.48)	(0.73)	(1.23)	(1.44)	(2.24)	(0.19)	(1.62)	(0.50)	(2.76)
Median (Treat-Control)	-0.20	-0.22	0.21	0.00	-2.42	0.16	-0.37	-2.47	0.77	1.43	4.08*	6.25***	-0.31	-2.87***	-2.73*	-5.44***
<i>z</i> -test	(0.57)	(0.05)	(0.13)	(0.25)	(1.53)	(0.26)	(0.07)	(0.40)	(1.55)	(1.64)	(1.82)	(3.40)	(0.20)	(2.66)	(1.80)	(3.81)
# Treated	1191	934	728	554	175	124	93	69	292	249	236	223	381	307	222	148
# Control	1191	1073	1011	933	607	564	537	497	466	396	333	276	401	318	291	266

TABLE 5: Pre- and Post-Cross-Delisting Return Performance

Table 5 reports mean and median statistics for buy-and-hold return and buy-and-hold abnormal returns. Matched samples are constructed using the PSM technique, where each treatment firm is matched to a control firm by year, country, industry, and with the closest propensity score (nearest neighbor without replacement) based on the logarithm of the market value of equity and the book-to-market ratio. Buy-and-hold returns are monthly returns compounded over a one-year period. Abnormal returns are monthly returns compounded over a one-year buy-and-hold investment in treatment firms less monthly returns compounded over a one-year buy-and-hold investment of the corresponding matching firms. Differences in means are tested using *t*-statistic test (*t*-statistic in parentheses) and differences in medians are tested using Wilcoxon rank sum test (*z*-statistic in parentheses). Panel A shows mean and median buy-and-hold returns for treatment and control firms. The number of matched pairs (“#”) is also reported. Panel B reports the mean and median for abnormal buy-and-hold returns for the treatment group of firms, in the pre- and the post-cross-delisting period. The number of observations (“No. Obs”) is also reported. ***, ** and * mean statistical significance at the 1 percent level, 5 percent level and 10 percent level, respectively.

Panel A – Buy-and-hold returns for treatment and control firms			
	Buy-and-hold return		
MEAN			
Treatment	0.1236		
Control	0.1943		
Difference	-0.0707*		
<i>t</i> -test	1.72		
MEDIAN			
Treatment	0.0017		
Control	0.0435		
Difference	-0.0418*		
<i>z</i> -test	1.80		
# Matched Pairs	571		
Panel B – Pre- and Post-Cross-Delisting Abnormal Returns			
	Buy-and-hold abnormal return		
	Pre-Delisting	Post-Delisting	Difference (<i>Post-Pre</i>)
Mean	-0.0551	-0.1631	-0.1080*
<i>t</i> -test			(1.79)
Median	-0.0512	-0.1052	-0.0540
<i>z</i> -test			(1.29)
No. Obs	389	182	

TABLE 6: Abnormal Return Performance

Table 6 reports regression estimates of equation (3) using different specifications. The dependent variable is *buy-and-hold abnormal return* and is measured as monthly returns compounded over a one-year buy-and-hold investment in treatment firms less monthly returns compounded over a one-year buy-and-hold investment in matching firms. *Delist*_{*i,t*} is an indicator variable equal to one if a treatment firm is delisted in year *t*, and zero otherwise. In model (1) we cluster standard errors at firm- and year-level, and in model (2) standard errors are clustered at country- and year-level. In model (3) we estimate equation (3) using Fama and MacBeth's (1973) procedure. Regressions include year, industry, and country fixed effects. ***, ** and * mean statistical significance at the 1 percent level, 5 percent level and 10 percent level, respectively.

	Dependent Variable: Buy-and-hold abnormal return		
	(1)	(2)	(3)
<i>Delist</i> _{<i>i,t</i>}	-0.2048** (-1.98)	-0.2048* (-1.80)	-0.2477* (-1.83)
<i>Constant</i>	0.4777** (2.35)	0.4777* (1.67)	-0.0718** (-2.06)
Year Fixed Effects	Yes	Yes	No
Industry Fixed Effects	Yes	Yes	No
Country Fixed Effects	Yes	Yes	No
Observations	571	571	571
R-squared	0.104	0.104	0.021

Most Recent Working Paper

NIPE WP 17/2015	Gilberto Loureiro e Sónia Silva, "Post-Operating Performance Of Cross-Delisted Firms From U.S. Stock Exchanges", 2015
NIPE WP 16/2015	Gilberto Loureiro e Sónia Silva, "Earnings Management and Stock Price Crashes Post Crossdelisting", 2015
NIPE WP 15/2015	Gilberto Loureiro e Sónia Silva, "Cross-Delisting, Financial Constraints and Investment Sensitivities", 2015
NIPE WP 14/2015	Fauver, Larry, Gilberto Loureiro e Alvaro G. Taboada, "Equity Offerings, Stock Price Crash Risk, and the Impact of Securities Regulation: International Evidence", 2015
NIPE WP 13/2015	Pereira, Paulo J. e Artur Rodrigues , "A theory on merger timing and announcement returns", 2015
NIPE WP 12/2015	Bernardino, Susana e Santos, J. Freitas , "Financing social ventures by crowdfunding: The influence of entrepreneurs' personality traits", 2015
NIPE WP 11/2015	D'Almeida, André Corrêa e Paulo Reis Mourão , "The Irrelevance of Political Parties' Differences for Public Finances - Evidence from Public Deficit and Debt in Portugal (1974-2012)", 2015
NIPE WP 10/2015	Santos, José Freitas , Laurentina Vareiro, Paula Remoaldo e J. Cadima Ribeiro , "Mega cultural events: Does attendance affect residents' perceptions of a city's identity?", 2015
NIPE WP 09/2015	Brekke, Kurt R., Rosella Levaggi, Luigi Siciliani e Odd Rune Straume, "Patient Mobility and Health Care Quality when Regions and Patients Differ in Income", 2015
NIPE WP 08/2015	Cellini, Roberto, Luigi Siciliani e Odd Rune Straume , "A dynamic model of quality competition with endogenous prices", 2015
NIPE WP 07/2015	Brekke, Kurt R., Tor Helge Holmås, Karin Monstad e Odd Rune Straume , "Do Treatment Decisions Depend on Physicians' Financial Incentives?", 2015
NIPE WP 06/2015	Brekke, Kurt R., Chiara Canta e Odd Rune Straume , "Does Reference Pricing Drive Out Generic Competition in Pharmaceutical Markets? Evidence from a Policy Reform", 2015
NIPE WP 05/2015	Brekke, Kurt R., Tor Helge Holmås, Karin Monstad e Odd Rune Straume , "Socioeconomic Status and Physicians' Treatment Decisions", 2015
NIPE WP 04/2015	Castro, Vítor e Rodrigo Martins, "Budget, expenditures composition and political manipulation: Evidence from Portugal", 2015
NIPE WP 03/2015	Maria Thompson , "Social Capital, Innovation and Economic Growth", 2015
NIPE WP 02/2015	Kurt R. Brekke, Chiara Canta, Odd Rune Straume , "Reference pricing with endogenous generic entry", 2015
NIPE WP 01/2015	Aguiar-Conraria, Luís , Pedro Brinca, Haukur Viðar Guðjónsson e Maria Joana Soares "Optimum Currency Area and Business Cycle Synchronization Across U.S. States", 2015
NIPE WP 23/2014	Morozumi, Atsuyoshi, Francisco José Veiga e Linda Gonçalves Veiga , "Electoral effects on the composition of public spending and revenue: evidence from a large panel of countries", 2014
NIPE WP 22/2014	Castro, Vítor e Rodrigo Martins, "Are there political cycles hidden inside government expenditures?", 2014
NIPE WP 21/2014	Conceição, Oscarina e Ana Paula Faria , "Determinants of research-based spin-offs survival", 2014
NIPE WP 20/2014	Conceição, Oscarina, Ana Paula Faria e Margarida Fontes, "Location of research-based spin-offs: how relevant are regional effects?", 2014
NIPE WP 19/2014	Sousa, Rita, Luís Aguiar-Conraria e Maria Joana Soares , "Carbon and Energy Prices: Surfing the Wavelets of California", 2014
NIPE WP 18/2014	Aguiar-Conraria, Luís , Manuel M. F. Martins e Maria Joana Soares , "Analyzing the Taylor Rule with Wavelet Lenses", 2014
NIPE WP 17/2014	Veiga, Linda Gonçalves , "Descentralização orçamental: questões de autonomia e responsabilização", 2014
NIPE WP 16/2014	Veiga, Linda Gonçalves e Francisco José Veiga , "Determinants of Portuguese local governments' indebtedness", 2014
NIPE WP 15/2014	Baleiras, Rui Nuno , "Em prol da previsibilidade e da sustentabilidade das finanças públicas: um comentário a 'Controlo da Execução Orçamental no Estado'", 2014