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Published in:
Australian Journal of Management

DOI:
10.1177/0312896212437622

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The Long and Short Run Financial Impacts of Cross Listing on Australian Firms

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Abstract:
This paper investigates the short-run and long-run performance of Australian cross-listed firms relative to their rivals. The role of share trading liquidity in explaining abnormal returns is also investigated. In the short run, the mean cumulative abnormal returns of between 0.65% to 1.02% are statistically significant for the cross-listed firms during the event window. For the long-run analysis, rival firms experience negative abnormal returns. Further analysis reveals that rival firms tend to have a greater level of negative abnormal returns compared to their cross-listed counterparts. Lastly, liquidity gains are generally found not to be a determinant for cross listed firms' abnormal returns.

Keywords: Financial performance, cross border listing, listed firms, rivals, internationalization

EFM Classification Codes: 230, 330, 210, 630

1. Introduction

With the advent of globalisation and deregulation of the financial landscape in the past decade, there has been a surge in cross-border listings by firms. In 1997, nearly 4700 firms cross listed on overseas exchanges globally, with the number of new foreign listings of around 1000 for that year (World Federation of Exchanges, 2008). Popular locations for foreign listing included the UK, the US and Japan. A decade later, the number of cross-listed firms had declined to 2837 firms in 2006, while the number of new foreign listings fell to 299, nearly a third of the 1997 levels.

Several key questions arise from this interesting trend. What motivates firms to go overseas to raise capital? Researchers have debated this question since the early 1990s when international equity listing or 'cross listing' was gaining popularity. Among the argued benefits that cross listings create are reduced cost of capital, broadening of the shareholder base, increased liquidity and the bonding of firms to a stronger legal framework (Karolyi, 2006; King & Mittoo, 2007). However, international equity raising attracts costs as well. These include those associated with adherence to the overseas exchange's regulatory and accounting framework, additional reporting costs and underwriting fees.

If there are net positive benefits of cross-listing which accrue to these firms, the number of international equity listings should be increasing over the years. The declining trend of cross-listing highlighted above raises the question of whether the benefits of internationalisation are enduring in the long term or are they transitory in nature. In other words, are there permanent gains to cross-list overseas?

Another perspective on cross-listing is the potential effects that it has on the other firms in the industry. While it is clear that seeking shareholder interest overseas could possibly bring benefits to the cross-listed firm, there could be spillover effects on the other domestic firms in the industry of the cross-lister. According to Melvin & Valero (2008), the act of going overseas could possibly alter the competitive landscape of the industry as cross-listing firms are perceived to be at an advantage relative to non-cross listed rivals in the home market. It is therefore reasonable to conjecture that the remaining firms in the industry would be affected to a certain extent as prior studies have shown.[1] Accordingly, the aim of this paper is to examine the impact of cross listing on the short- and long-run performances of cross listed firms in comparison to their rival firms in the Australian context. Additionally, this paper also investigates the impact of cross listing on liquidity. Given that Australia is a small domestic capital market, any change in liquidity is expected to be advantageous for cross-listed Australian firms.

This study will contribute to the literature in several ways. First, the Australian market is an interesting research setting because, despite being a developed economy, gains are still expected from cross listing due to the shallower nature of its capital markets compared to the US and London markets.[2] Yet, studies on Australian firms' cross listing activity are relatively scarce. Second, this study will contribute to the growing body of literature on the long-run impact of cross listing. This allows a comparison of both short- and long-run benefits of cross listing and shed some light on the possible reasons behind the recent trend reversal in cross listing. Third, studies on cross listing emphasise the effects of cross listing on listing firm and often do not seek to

[1] See Bradford *et al.* (2002) and Melvin & Valero (2008).
[2] This is evident from the cross listing of Australian firms overseas. Firms such as BHP Billiton and major banks such as National Australia Bank have gone overseas in search of more capital (Ahmed *et al*., 2006) .

compare the effect with rival firms. To date, only a few studies (Bradford *et al.*, 2002; Melvin & Valero, 2008) document the spillover impact of cross listing on rival firms and are limited to the US context. This study provides a more complete picture of the benefits and costs of cross listing by comparing the impact of cross listing on cross listed firms versus their rival firms both in the short-run and long-run in the Australian context.

The findings of this study will be relevant to the management of both cross-listed and rival firms. If cross listing gains are found to be transitory in nature, Australian firms seeking to raise funds overseas might have to reconsider cross listing motives. Managers of firms intending to cross list would have to weigh up the cost and benefits of cross listing. Domestic rival firms need to consider if the competitive landscape in the industry would change due to the cross listing of their competitor and whether it is beneficial for their firm to follow suit to cross list overseas. From the investors' perspectives, they could benefit from better understanding of the effect of cross listing. For example, if it is found that cross listing gains are temporary in nature, investors should not overreact upon cross listing of a firm.

The remained of this paper is organised as follows. Section 2 provides a literature review, while Section 3 outlines the data and research method. Section 4 presents and discusses the empirical results. Finally, Section 5 concludes.

2. Literature Review

2.1 Performance of Cross-Listed Firms

Prior literature on cross listing focuses on the short-run performance of the listing firms. Foerster & Karolyi (1999) utilise a sample of 183 American Depository Receipts (ADR) and ordinary listings in the US and find a listing week abnormal return of 1%. Mittoo (2003) analyses Canadian firms which cross listed in the US markets during the period 1976 to 1998 and finds a 1.9% mean abnormal return during listing week.

In the long run, however, the performance of cross-listed firms tells a different story. Foreign firms listing in the US are found to underperform the local market benchmarks by 8 to 15% in the following three years of cross listing (Foerster & Karolyi, 2000). A similar result is evident in the study of Canadian firms by Mittoo (2003). In a similar vein, Sarkissian & Schill (2009) fail to find any permanent valuation gains for a global sample of firms 10 years pre- and post-cross listing.[3] King & Segal (2009), utilising a sample of cross-listed Canadian firms between 1988 and 2005, find mixed evidence for permanent valuation gains in terms of 'visibility'. They argue that increased visibility upon cross listing is not permanent unless the shareholder base increment is maintained over time. All these findings lead to uncertainty as to whether cross listing benefits are enduring.

[3] Although covering a global sample, Sarkissian & Schill (2009)'s focus is on the listing firms and not on the spillover effects to the rival firms.

2.2 Theories on the Benefits of Cross Listing

2.2.1 Market Segmentation

One of the theories developed to explain the abnormal performance of cross-listed firms is the market segmentation theory. Firms internationalise to overcome investment barriers that they face in domestic markets and to diversify risk (Mittoo, 1992; Bancel & Mittoo, 2001). The presence of investment barriers in domestic markets hinders access to overseas capital thereby limiting growth of the firms. By listing in an overseas market, firms are able to access foreign capital and increase exposure to global market factors. The ultimate result is diversification through risk sharing thereby reducing the cost of raising capital.

2.2.2 Liquidity and Multi-market Trading

Amihud & Mendelson (1986) develop an asset pricing model which shows that returns of securities are an increasing concave function of liquidity. Consequently, increasing liquidity results in higher valuation and returns. By listing in multiple and larger markets, firms are able to enjoy more liquidity due to increased trading volume, exposure and reduced trading costs (Hargis, 2000; Domowitz *et al.*, 1998). In fact, managers have cited increased liquidity as one of the motivations to list in foreign markets (Mittoo, 1992; Bancel & Mittoo, 2001). Foerster & Karolyi (1998) find a 30% increase in trading volume for 52 Canadian firms listed in the US markets between 1981 and 1990. Mittoo (2003) finds a reduction in trading costs by 1.46% for Canadian firms in the US between 1990 and 1998. Increased liquidity can be an advantage for firms coming from small domestic markets.

2.2.3 Investor Recognition

Merton (1987) proposes an equilibrium pricing model of incomplete information. A shadow cost exists due to incomplete information leading to higher expected return for securities due to the higher premium attributed to incomplete information. Cross listing in multiple markets can widen the shareholder base and increase the 'visibility' of firms. As investors become aware of these firms, the premium or shadow cost is reduced leading to higher valuations. Foerster and Karolyi (1999) and Baker *et al.* (2002) document results consistent with this investor recognition theory. A wider shareholder base and increased profile enhances liquidity and price discovery in markets.

2.2.4 Bonding and Corporate Governance

The bonding theory postulates that cross listing can enhance corporate governance and better protect the rights of minority shareholders (Coffee Jr., 2002; Doidge *et al.*, 2004). Firms list in markets covered by tougher legal frameworks and disclosure rules thereby 'bonding' themselves to more effective legal institutions. This attracts more investors especially those concerned with tunneling and disclosure issues. According to Doidge *et al*. (2004), investors in the US are well protected relative to other countries globally. Reduced expropriation of minority shareholders by the dominant shareholders frees up resources for growth funding, thereby leading to higher firm valuation.

2.3 Home Market Rivals and Spill-over Effects

Cross listing is argued to confer positive effects onto the listing firm and is perceived to affect the competitive landscape of industries. Since these proposed advantages only accrue to firms that internationalize, non-cross listing firms in the same industry are

perceived to be disadvantaged. Stulz (1999) argues that firms cross list to signal to investors and distinguish themselves from 'losers'. Prior studies document support for the existence of adverse spillover effects brought about by cross listing. Levine & Schmukler (2007) find a negative spillover effect of liquidity on remaining non-cross listed home market firms. Melvin & Valero (2008) analyse the spillover effects of cross listing on the home market rivals using a sample of 14 US cross-listed firms between 1986 and 2002 and find that rival firms in the home markets declined in performance.

2.4 Australian Firms and Cross Listing

On the Australian front, cross listing studies are limited. Faff *et al.* (2002) analyse the performance 1 year pre and post cross listing for 22 Australian firms cross listed overseas as at 1996. They utilise a multivariate GARCH model in computing abnormal returns. For the 20-day period post listing, they find significant negative abnormal returns and no significant return in the 1 year post listing. Mixed results for cost of capital reduction are also documented. They offer market timing and insider knowledge as explanations. Ahmed *et al.* (2006) utilising bootstrapping methods, study Australian firms cross listing overseas from 1980 to 2000, they find results that are consistent with Faff *et al*. (2002). This highlights the potential influence of country specific factors on performance related to cross listing. The impact of cross listing appears to be complex and could differ if overseas exchanges other than US are the cross listing destination. As such, it would be interesting to analyse cross listing using the Australian firms to ascertain whether there is value creation for firms to cross list overseas.

3. Data and Method

3.1 Data

A search is performed on Datastream to identify all possible listings of Australian firms' on various exchanges. Then, the host exchange websites are searched for cross-listed firms and listing dates. However, not all exchange websites provide foreign firm statistics.[4] For these exchanges, the research department of the exchange is contacted directly to obtain the required data.

If the cross listing dates are unavailable from the host exchange website, the dates are identified from Aspect Huntley's DatAnalysis database, annual reports, online news articles or company web pages. Foerster and Karolyi (1999) find no significant difference between using announcement and listing dates in their cross listing study. As such, the listing dates are used for this study due to data constraints. The initial sample is 192 cross-listed firms. The initial sample is then filtered against several criteria. Specifically, to be included in the sample, a firm must have: (1) the Australia Securities Exchange (ASX) as the home exchange and (2) a foreign market listing that is exchange traded. Over-the-counter listings, level 1 ADRs,[5] and other non-exchange traded listings are excluded to be consistent with prior research (Foerster & Karolyi, 1999). The primary reason for exclusion is that non-exchange traded foreign listings do not have disclosure and reporting obligations that are as high as the main or second board exchange listings. The sample of cross-listed firms is also filtered for investment funds and preference shares due to differing operating activities.

[4] For example, the Toronto (Canada) stock exchange's website neither provides foreign firm listings nor listing dates over an historical period.

[5] For a detailed explanation of depository receipts such as ADRs, see Karolyi (1998, 2006).

The next stage involves matching each cross listing firm with a rival firm. The criteria for matching are that the rival firm must be a domestic firm listed on the ASX[6] and is not cross listed during the three years post cross listing of the listing firm. Each firm is matched with a domestic rival which has the closest market capitalisation at the cross listing date. To identify the domestic rival, Datastream Level 4 Industry/Sector Classification is used.

The final stage in constructing the sample of matched pairs cross listed firms and rivals involves screening for data availability. Daily closing share prices for the sample firms, risk free rate, local equity market and global equity indices, price-to-book value ratios and total assets data are sourced from Datastream. Daily closing bid-ask prices are obtained from Bloomberg. Other company level accounting data such as foreign sales are sourced from annual company reports available online via Aspect Huntley and Connect 4 Databases. Each cross listed and rival firm is then filtered for one year pre and three years post cross listing share price and market capitalisation availability on Datastream. Firms that were delisted during the period are eliminated. The final sample consists of 89 matched pairs of cross listed and rival firms covering a period from September 1989 to August 2005.

Table 1 Panel A provides the distribution of the cross-listed firms across years and host exchanges. New Zealand was the most popular cross listing destination for Australian firms with nearly 33% of all cross listing in New Zealand. The popularity of New Zealand as a cross listing destination for Australian firms may be due to proximity preference. Sarkissian & Schill (2004) suggested that such preference is due to familiarity

[6] Melvin & Valero (2008) argue that the primary domestic rivals are more affected by the cross listing and is thus a more suitable sample for analysis.

because there is additional information flow between countries with similar culture and close geographical proximity. Table 1 Panel B groups the cross-listed firms in the sample according to Datastream Industry sectors. Mining firms represent about a third of the cross listing firms. This is likely due to the high capital requirements for mining ventures which drive these firms to raise capital overseas.

3.2 Method

3.2.1 Short Run Analysis

Following Foerster & Karolyi (1999) and Melvin & Valero (2008), an event study approach is employed to examine the share price reaction of firms surrounding the cross-listing event. Cross listing dates are used as the event dates. An event window of (-15, +15) is used with a 100-day estimation period to proxy for 1 month performance. To estimate abnormal returns, a domestic market model is employed. The market model is given in Eq.(1):

$$R_i = \alpha_i + \beta_i R_m + \acute{\varepsilon}_i \quad (1)$$

where R_i is the return of the firm, and R_m is the market return proxied by the returns on the All Ordinaries Index.[7]

To test the significance of the cumulative abnormal returns, a Z-test is employed. However, there is potential for the Z-test statistic to be misspecified if returns are not normally distributed. Thus, the non-parametric Cowan sign test is also employed to complement the analysis. The event study analysis is then repeated for the rival firms.

[7] The non-synchronous and infrequent trading of securities presents misspecification problems (Maynes & Rumsey, 1993; Scholes & Williams, 1977). Accordingly, the Dimson (1979) method is employed to account for thin trading, with two lead and lag terms.

3.2.2 Long Run Analysis - Calendar Time Approach

According to Mitchell & Stafford (2000) using Buy Hold Abnormal Returns (BHAR) or Cumulative Abnormal Returns (CARS) in measuring long-term performance is flawed because these methods assume independence of cross sectional returns. Therefore, a calendar time approach is employed in this study.

The calendar time approach involves the creation and rebalancing of a portfolio of the firms relevant to the given research question. The period covered is from the earliest cross listing event until the latest within the sample. The portfolio of cross listed firms is rebalanced every month to include firms that have just experienced an event (cross listing) while firms that have been in the portfolio for 36 months (3 years) are dropped. The monthly returns on the portfolio are calculated on a value weighted basis. Returns are defined as returns in excess of risk free rate. To test the post 36 months cross listing performance, the monthly returns over the period of analysis (earliest cross listing to the latest) is then regressed on a constant (alpha) and the domestic market's excess return (All Ordinaries Index), as shown in Eq.(2). The alpha is interpreted as the abnormal returns. The analysis is repeated for the rival firms.

$$R_i - R_f = \alpha_i + \beta_1(R_m - R_f) + \acute{\varepsilon}_i \qquad (2)$$

3.2.3 Two-factor International Asset Pricing Model (IAPM)

Foerster & Karolyi (1999) argued that by cross listing overseas, a firm is exposed to global market factors that could alter their risk behaviour, cost of capital and ultimately their share prices, in addition to domestic market factors. Following Foerster & Karolyi (1999) and Mittoo (2003), a firm's pre-listing, listing and post-listing abnormal returns

(captured by alpha pre, alpha list and alpha post) are estimated from the following equation:

$$R_{it} - R_{ft} = \alpha_i^{Pre} + \beta_1^{Pre}(R_{Aus\,t} - R_{ft}) + \beta_2^{Pre}(R_{Worldt} - R_{fwt}) + \alpha_i^{List} D_i^{List} + \alpha_i^{Post} D_i^{Post} +$$

$$\beta_3^{Post}(R_{Aus\,t} - R_{ft})\, D_t^{Post} + \beta_4^{Post}(R_{Worldt} - R_{fwt})\, D_t^{Post} + \acute{\varepsilon}_{it} \quad \textbf{(3)}$$

where:

$R_{it} - R_{ft}$ = stock i returns in excess of Australian risk free-rate for month t.

$R_{Aus\,t} - R_{ft}$ = home market excess return (Australia)

$R_{Worldt} - R_{fwt}$ = world excess return

D_i^{List} =1 if observations are from listing month, 0 otherwise.

D_i^{Post} =1 if observations are from post-listing months (+1, +36), 0 otherwise.

All returns are denominated in Australian dollars and are in excess of the risk-free rate. The risk-free rate of return is proxied by the yield on the JP Morgan Australian Government Bond Index sourced from Datastream. The global excess return is the excess returns on Datastream International World Index. For the global risk-free rate, the yield on the JPMorgan global government bond index (excluding Australia) is used.

The estimation of the pooled cross section and time series of returns is performed using the Schipper & Thompson (1983) method. The abnormal returns are the alphas which are split into the listing and post listing period. Using this method, both short-run and long-run abnormal performances are observed in a single regression. This analysis is repeated for the rival firms. Newey-West heteroskedasticitiy & autocorrelation consistent

standard errors & covariance adjustment is applied in the regression. The χ^2 -statistic for the Chow test of structural break for pre and post cross listing coefficients on the Australian and world returns are calculated.

3.2.4 Cross Sectional Analysis on the Abnormal Returns of Cross Listed Firms

The cross section model is defined in Eq.(4). Eq(3) is regressed for each individual firm to obtain the dependent variables for the cross section analysis. For the short-run analysis, the dependent variable employed in Eq.(4) is the excess abnormal returns for the listing month (α_i^{List} from the two-factor IAPM regression). For the long-run analysis, the dependent variable is the excess abnormal returns for the post-listing period (α_i^{Post} from the two-factor IAPM regression).

$$\alpha_i = c_i + \beta_1 \Delta SPREAD + \beta_2 GROWTH + \beta_3 SIZE + \beta_4 FOREIGN + \delta_1 MNG + \delta_2 CTRY + \acute{\varepsilon}_i \quad (4)$$

The test variable in the cross sectional regression is $\Delta SPREAD$. To document the effects of changes in liquidity, if any, in explaining the possible gains or declines of cross listing, $\Delta SPREAD$ is constructed following Kadlec & McConnell (1994). $\Delta SPREAD$ represents the change in spread percentage (SP%) before and after cross listing. The spread percentage is calculated as:

$$SP\% = (Ask - Bid) / [(Ask + Bid)/2] \quad (5)$$

where Bid and Ask is the daily closing bid and ask prices of a firm's stock. (Ask-bid) represents the absolute bid-ask spread which is essentially the transaction cost. It is then divided by the midpoint which is assumed to approximate the actual share price. The aim is to obtain the percentage of the transaction cost relative to the most likely share price.

To construct *ΔSPREAD* for the short run, the average spread percentage for the month before the listing month is subtracted from the average spread percentage of the month following listing month as in Kadlec and McConnell (1994). For the long-run cross sectional analysis, the *ΔSPREAD* is estimated as the 12 months average spread percentage before listing (months -12 to -1) subtracted from the average spread percentage for the third year (months +25 to +36) following cross listing month. The more liquid a security is, the higher the price (Amihud & Mendelson, 1986). As a particular stock experiences increased liquidity, the bid-ask spread would tighten to reflect the decline in trading costs, leading to higher valuation. Thus, a negative relation is expected between *ΔSPREAD* and the firms abnormal returns because a negative *ΔSPREAD* would be interpreted as higher liquidity.

Following prior research in cross listing,[8] there are some endogenous factors involved in the cross listing decision. The control variable *GROWTH* controls for high growth firms in cross listing as higher growth firms are more likely to go overseas to raise funds. This study uses the price to book ratio as a proxy for growth. To control for size effects, the natural log of total assets (SIZE) is used. To control for foreign sales, the proportion of foreign sales to total sales for the fiscal year prior to cross listing is used as per prior literature (Pagano *et al.*, 2002; Melvin & Valero, 2008).

This study controls for resource stocks cross listing in the cross sectional regression by including a mining dummy (MNG) of 1 for mining (resource) stock and 0 otherwise. Given the close proximity of New Zealand in terms of geography, culture and corporate governance regulation, this study controls for New Zealand listings in the

[8] Bailey *et al* (2006), Melvin & Valero (2008), Doidge *et al* (2004) controlled for factors that affect a firm's decision to cross list. Such factors include size, foreign sales and growth.

regression by including a country dummy (CTRY) of 1 for any cross listing event involving New Zealand and zero otherwise. The cross sectional regression is adjusted for Newey-West heteroskedasticitiy & autocorrelation consistent standard errors & covariance. Due to data limitations, the regression is run on a sample of 57 cross-listed firms.

4. Results and Discussions

4.1 Short-run Analysis

Table 2 presents the event study results for cross-listed and rival firms. Panel A presents results for the (-15, +15) event window while Panel B displays results for the (-30, +30) event window. The mean cumulative abnormal return of the cross-listed firm, 1 day before the listing date of 102 basis points, is significant at the 5 % level according to the Z-test. Foreign listing studies such as Foerster & Karolyi (1999) similarly documented a small significant abnormal performance within the cross listing month or 1 week around the listing date.

Due to potential stock illiquidity and non-normality of sample return distribution problems which are highlighted in the event study methodology literature (MacKinlay, 1997), the non-parametric Cowan's sign test is reported in Table 2. The Cowan sign tests indicate that the mean CARs on day -1 (1.02%) and on day 0 (0.9%) are statistically significant at the 1 % and 5% levels, respectively. Furthermore, for the 3 days surrounding the cross listing date (-1, +1) the sign test indicates significance of mean cumulative abnormal returns of 0.65% at the 5% level. This finding is consistent with Foerster & Karolyi (1999) and Melvin & Valero (2008) in which a small gain of approximately 1% around the time of listing is experienced by cross-listing firms.

The event study is also conducted on the rival firms and the results are also reported in Table 2. No significant abnormal returns were recorded across the whole event window for the rival firms. The results for the rival firms are inconsistent with the findings in Melvin & Valero (2008) where they find that home market rivals of the cross-listed firms in their US study experience a negative impact when firms cross list. Rival firms are perceived to be negatively affected as they are not in a position to experience the benefits that cross listing is purported to bring. One possible explanation for the Australian results is that while investors react positively to cross listing news, they generally do not view non-cross listed rivals firms as at a disadvantage in the short run.

For a robustness test, the event window is widened to cover 15 more days on either side (-30, +30) of the original event window. The results of the robustness test on the short-run analysis are shown in Table 2 Panel B. For the cross-listed firms, there is a prelisting Mean CAR run up of about 10 basis points captured by the (-30, -4) window period. This abnormal performance is insignificant according to the parametric z-stat test. However, the non-parametric test indicates that the 0.1% mean CAR is significant at the 5% level. For the rival firms, the robustness event study results are relatively similar to the (-15 +15) main event study with no significant mean CARs with either parametric or non-parametric tests.

4.2 Long-run Analysis

Table 3 Panel A reports the outcome from estimating the market model. The coefficient of interest is the alpha coefficient which is interpreted as the excess abnormal returns in the long run. The alpha is not statistically significant for the cross-listed firms. In the short-run analysis, a small significantly positive abnormal return was identified one day

before and on the listing date. The positive abnormal returns seem to have disappeared when a longer time horizon is investigated. This finding is also consistent with the long-run hypothesis that gains are transitory. Sarkissian & Schill (2009) in their long-term focus study of cross-listed firms, document similar results for a global sample 10 years post cross listing using CARs from a market model.

For the rival firms, the long-run analysis indicates that the domestic rival firms suffer a negative abnormal return of 1.7% post cross listing 36 months, which is significant at the 5% level. One possible explanation is that increased visibility or profile of the company as a result of cross listing has a negative impact on the rival firms. Rival firms that are not cross listed are seen as missing out on the increased visibility and broader shareholder base in the long run. Kadlec & McConnell (1994) finds strong support for the investor recognition hypothesis proposed by Merton (1987). This suggests that investors' recognition could be a reason for the negative abnormal returns for rivals in the long run.

As a robustness check of the long-run analysis, Fama & French Factors are incorporated into the calendar time portfolio regression (Eq. 2). The results are reported in Table 3 Panel B. The results are robust and consistent with the main market model regression. The calendar time portfolio alpha does not alter much and is still insignificant at the 5% level. For the rival firms, the negative alpha remains quite similar (now -1.87%) and significant.

For both the market and Fama & French models, the alphas for both cross listed and rival firms were tested for significant difference with a Wald test. The Chi square test statistics indicate rejection of the null hypothesis of no statistical difference in both cases

at the 1% level. This indicates that in both cases, there are significant differences between the abnormal returns of the cross listed firms and the rivals.

4.3 Two-factor International Asset Pricing Model (IAPM)

Table 4 reports pre-listing, listing month and post-listing month performance estimates) by employing the two-factor International Asset Pricing Model (Eq. 3). The significant Chow Test χ^2-statistics suggest that there is a significant structural break in the pre-cross listing (months -12, -1) and post-cross listing (months +1, +36) coefficients for both the cross listed firms and their rivals. For both the cross-listed and rival firms, the 1-year prelisting performance (alpha pre) and listing month performance (alpha list) are not statistically significant. The post-cross listing alphas (months +1, +36) indicate that cross-listed firms experience a decline of 2.4%, while the rivals firms in the long run experience a decline of 3.4%.[9]

To further examine any possible risk reductions and for robustness purposes, the full sample was divided into sub-samples. Given that firms which cross listed in New Zealand make up a large proportion of the sample, the analysis is repeated for these firms only. There is a post-listing alpha decline of 3.31% for the New Zealand sample. Surprisingly, the global beta of Australian firms cross listing in New Zealand seems to have decreased significantly at the 5% level. This is surprising given that cross listing should reduce the local beta and increase the global beta as firms become internationally exposed to international market factors. One of the possible explanations for this decline is that New Zealand and Australia have close proximity of market factors in terms of

[9] As an aside, this study finds that the post cross listing local and world beta is not significant when the full sample is employed. This result is similar to Faff *et al.'s* (2002) finding of no significant reduction in the firms' exposure to local market betas after cross listing.

culture, geography and legal framework efficiency as found by La Porta *et al.* (1998) and Sarkissian & Schill (2004). The results for the other countries sub-sample are relatively similar to the full sample. Most notably, there is a significant post-listing decline of 4% (significant at the 1% level) for the rival firms for the subsample of cross listing in other countries excluding New Zealand.

4.4 Cross-Sectional Analysis

Table 5 provides the average changes in liquidity for the short run and long run for the cross listed firm sample.[10] The pre cross listing average spread change in the short run (1 month average daily spread %) is 2.9% across 57 firms. The long-run spread (12 months average daily spread %) is 3.5% pre cross listing and 4.03% post cross listing. There is an increase in the average spread % of 28 basis points from 2.92% to 3.2% for the short run and in the long run the increase is 48 basis points. By making the firms' shares available to overseas investors via cross listing, cross-listed firms stand to increase their profile, leading to greater visibility and liquidity of their shares. Tinic & West (1974) and Mittoo (2003) show that bid-ask spread tightens for Canadian firms cross listed in the US. While the increase in Spread % is inconsistent with prior findings of studies conducted in the US and Canada, the changes are not statistically significant.

Table 6 provides the cross sectional regression analysis. The results are divided into two panels: Panel A (Panel B) presents the cross sectional regression on the short run (long run) abnormal performance alpha. In the short run (listing month), the ΔSPREAD is not statistically significant. There is a negative relationship between growth and the

[10] The cross sectional regression is limited to the cross listed firms as cross sectional data required for rivals is not available.

abnormal performance of the cross listed firms in the short run. This is inconsistent with the extant literature with regard to foreign listing, in which firms with higher growth opportunities are more likely to go overseas to cross list (Doidge *et al*, 2004, King & Segal, 2009, Bailey *et al.,* 2006).

In the long run univariate analysis (36 month post listing), ΔSPREAD is negative and significant at the 5% level, indicating that lower ΔSPREAD (trading cost) leads to higher liquidity and, hence, higher abnormal returns. However, when control variables are included in the regression, ΔSPREAD becomes statistically insignificant. This finding is inconsistent with Mittoo's (2003) study where a liquidity gain was a determinant of cross-listing performance in the short run for Canadian firms cross listing in US. A possible reason for this finding in the Australian sample is that varying global cross listing destinations were used and it is likely that different exchanges would have differing liquidity levels leading to different association between liquidity and abnormal returns. For example, firms are expected to benefit from liquidity gain to a greater extent if they cross list in the US as compared to in New Zealand. Australian firms might have different motivations for going overseas such as increasing profile and raising capital.

5. Conclusions

This paper seeks to examine the impact of cross listing on Australian firms in the short and long run and spillover effects on domestic rivals. The role of liquidity as a determinant of abnormal performance of cross listing is also investigated. The short run event study analysis indicates that there is a small listing gain of between 0.65% to 1.02% during the event window. For the long run analysis, cross listed firms are found to have no significant abnormal returns. This is in line with the current literature on long-term

performance that finds no permanent gains arising from cross listing. Rival firms on the other hand, experience negative abnormal returns in the long run. For the analysis based on an international asset pricing model, there are no significant abnormal returns for both cross-listed and rival firms during the listing month. However, both cross-listed and rival firms have significant negative abnormal returns in the long run, with rival firms displaying a greater level of negative abnormal returns.

A cross-sectional analysis is also conducted to investigate whether liquidity change is one of the determinants of cross-listing performance (abnormal returns). Results from the cross sectional regression suggest that liquidity gain is not a significant factor in explaining abnormal returns for cross listing in either the short run or the long run.

Overall, the results suggest that Australian firms seeking to raise funds overseas should reconsider their cross-listing motives by weighing up the costs and benefits of cross listing. Since the cross listing gains are temporary in nature, investors should not overreact and bid up the stock prices beyond the fair value upon cross listing of a firm. Also, the findings of our study indicate that domestic rival managers might need to consider changes in the competitive landscape within the industry as there is evidence that non-cross listed home market rivals are negatively affected in the long run.

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Table 1: Sample Description

Panel A: Frequency of Cross Listings across Various Exchanges

Year\Host Country	US	UK	Luxembourg	Canada	Singapore	New Zealand	South Africa	Germany	Switzerland	Totals
1989						2				2
1990	1								1	2
1991	1									1
1992						1				1
1993	1									1
1994	2					1				3
1995						1				1
1996				2		2				4
1997	1		1	3		10				15
1998						5		1		6
1999	1							1		2
2000		2		1	1					4
2001	1	4			1		1			7
2002	1	3				2				6
2003	1	2								3
2004		6		3		5	1	2		17
2005	4	6		2				2		14
Totals	14	23	1	11	2	29	2	6	1	89

Panel B: Industry Sector Distribution

Industry Sector	Frequency	Industry Sector	Frequency
Banks	1	General Retailers	2
Beverages	1	Industrial Engineering	1
Chemicals	1	Industrial Metals & Mining	6
Construction & Materials	4	Industrial Transportation	1
Electronic & Electrical Equipment	1	Media	2
Financial Services (Sector)	3	Mining	28
Fixed Line Telecommunications	1	Oil & Gas Producers	17
Food & Drug Retailers	1	Pharmaceuticals & Biotechnology	9
Food Producers	2	Software & Computer Services	2
General Industrials	2	Support Services	4

Table 2: Event Study Results for Cross-listed and Rival Firms

Panel A: Event Window of (-15, +15)

	Cross-listed Firms				Rivals			
Period	Positive Fraction	Mean CAR	Z- Stat	Cowan's Sign Test	Positive Fraction	Mean CAR	Z- Stat	Cowan's Sign Test
(-15, -2)	0.489	0.0009	0.3457	0.7066	0.457	-0.0009	0.0200	-1.7757
(-1,-1)	0.607	0.0102	2.1752*	2.4169**	0.506	0.0029	0.3746	0.4497
(0, 0)	0.584	0.0090	1.5090	1.9925*	0.506	-0.0001	0.1185	0.4497
(+1,+1)	0.438	0.0003	-0.0402	-0.7660	0.494	-0.0049	-1.2837	0.2376
(-1, +1)	0.543	0.0065	1.2147	2.1035*	0.502	-0.0007	-0.2635	0.6565
(+2, +15)	0.464	-0.0035	-0.6839	-1.0514	0.481	0.0004	0.0331	-0.0748
(-15, +15)	0.483	-0.0005	-0.0352	0.4226	0.4719	-0.0003	-0.0015	-1.039

Panel B : Event Window of (-30, +30)

	Cross-listed Firms				Rivals			
Period	Positive Fraction	Mean CAR	Z- Stat	Cowan's Sign Test	Positive Fraction	Mean CAR	Z- Stat	Cowan's Sign Test
(-30, -4)	0.506	0.0011	0.3593	2.0940*	0.474	-0.0006	0.0896	-0.3096
(-3,-1)	0.479	0.0023	0.2389	-0.1592	0.464	-0.0009	-0.4099	-0.4435
(0,0)	0.528	0.0084	1.4622	0.8272	0.494	-0.0008	-0.1309	0.3098
(+1,+3)	0.449	-0.0040	-0.9519	-1.1389	0.491	-0.0013	-0.4317	0.4141
(-3, +3)	0.473	0.0005	-0.0967	-0.5371	0.480	-0.0009	-0.3420	0.0979
(+4, +30)	0.642	-0.0018	-0.2202	1.3593	0.633	-0.0002	0.0926	1.1606
(-30, +30)	0.562	-0.0003	0.0505	2.1155*	0.545	-0.0004	0.0414	0.599

Note: This table presents the mean cumulative abnormal returns (CAR) around the listing date for 89 matched pais of cross-listed firms and rivals in the sample. The results in Panel A are for the event window (-15, +15), while Panel B reports the results for event window (-30, +30) as a robustness check. The positive fraction column indicates the fraction of the firms in the sample that had positive cumulative abnormal returns in the window. The Z-test statistic is the test of significance of the mean cumulative abnormal return. Cowan's Sign test statistic is reported in the final column. ** and * indicates statistical significance at the 1% level and 5% level, respectively.

Table 3: Long-run Performance Analysis Using the Calendar Time approach from September 1989 to July 2008

Panel A : Market Model (Months +1, +36)

	alpha	Rm-Rf	Adjusted R^2	Chi Sq-Test (p-value)
Cross-listed	0.010	1.068**	0.5532	14.9020**
Firms	(1.507)	(11.6788)		(0.0001)
Rivals	-0.017*	0.849**	0.3105	
	(-2.3169)	(9.0567)		

Panel B : Fama & French 3 Factor Model (Months +1, +36)

	alpha	Rm-Rf	SMB	HML	Adjusted R^2	Chi Sq-Test (p-value)
Cross-listed	0.0111	1.0838**	0.0003	4.8765	0.5545	17.8410**
Firms	(1.7127)	(11.9149)	(0.0001)	(1.5521)		(0.0000)
Rivals	-0.0187**	0.8230**	5.5787*	-3.0825	0.3180	
	(-2.6306)	(9.3835)	(2.0787)	(-0.5460)		

Note: This table presents the estimated coefficients and t-statistics (in parentheses) of the market model (Eq.2) and Fama French model in Panel A and Panel B, respectively. ** and * indicates statistical significance at the 1% level and 5% level, respectively.

Table 4: Risk-adjusted Return Performance Analysis with Two-factor International Asset Pricing Model

	Pre-Cross Listing Period (Months -12, -1)			Listing Month	Post Cross Listing Period (+1, +36)			Adjusted	χ^2
	α_i^{Pre}	β_1^{Pre} (Aus)	β_2^{Pre} (World)	α_i^{List}	α_i^{Post}	β_3^{Post} (Aus)	β_4^{Post} (World)	R^2	(p-value)
Full Sample									
Cross Listed	0.0101	1.1597**	-0.3958**	0.0043	-0.0239*	0.0986	0.1772	0.0852	59.9264**
	(1.0710)	(8.9060)	(-3.1612)	(0.2695)	(-2.2026)	(0.6572)	(1.2241)		0.0000
Rivals	0.0152	1.0624**	-0.0464	-0.0159	-0.0339**	0.0053	-0.1371	0.0574	29.6540**
	(1.5393	(7.8010)	(-0.3542)	(-0.9584)	(-2.9932)	(0.0338)	(-0.9053)		0.0000
New Zealand									
Cross Listed	0.0171	1.1516**	0.0978	0.0055	-0.0331*	0.1023	-0.4486*	0.1160	13.4542**
	(1.2333)	(6.1027)	(0.5535)	(0.2357)	(-2.1275)	(0.4742)	(-2.2176)		0.0093
Rivals	-0.0059	0.7287**	-0.0322	-0.0001	-0.0164	0.1347	-0.0399	0.0369	7.0439
	(-0.3453)	(3.1210)	(-0.1474)	(-0.002)	(-0.8501)	(0.5046)	(-0.1595)		0.1336
Other Countries									
Cross Listed	-0.002	1.0339**	-0.6915**	0.0005	-0.0078	0.2604	0.5609**	0.0787	61.0831**
	(-0.1647)	(5.9494)	(-4.1312)	(0.0248)	(-0.5376)	(1.2955)	(2.8737)		0.0000
Rivals	0.0262*	1.2470**	-0.0218	-0.0227	-0.0427**	-0.0686	-0.2004	0.0673	23.3424**
	(2.1400)	(7.2810)	(-0.1323)	(-1.1180)	(-2.9790)	(-0.3462)	(-1.0420)		0.0001

Note: This table presents the coefficients and t-statistics (in parentheses) of the two-factor international asset pricing model with dummy list and dummy post:

$$R_{it}-R_{ft} = \alpha_i^{Pre} + \beta_1^{Pre}(R_{Aust}-R_{ft}) + \beta_2^{Pre}(R_{Worldt}-R_{fwt}) + \alpha_i^{List}D_i^{List} + \alpha_i^{Post}D_i^{Post} + \beta_3^{Post}(R_{Aust}-R_{ft})\,D_t^{Post} + \beta_4^{Post}(R_{Worldt}-R_{fwt})\,D_t^{Post} + \acute{\varepsilon}_{it} \quad \text{(Eq.4)}$$

** and * indicates statistical significance at the 1% level and 5% level, respectively.

Table 5: Change in Trading Costs (Spread %)

	Pre Cross Listing Average	Post Cross Listing Average	Change in Spread %	t-test	W-Sign Rank Test
Short Run	0.0292	0.0320	0.0029	0.5340	0.2927
Long Run	0.0355	0.0403	0.0049	-0.7074	0.3562

Table 6: Cross-Sectional Regression of Risk-adjusted Abnormal Returns on Firm-specific Variables

Model	Two-factor International Asset Pricing Model													
Variable	Panel A: Listing Month Abnormal Returns (0,0)							Panel B: Post-listing Months Abnormal Returns (months +1, +36)						
Regression	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Constant	0.0230	0.0395*	0.2440	0.0212	0.0287	0.0341	0.4458*	-0.0322*	-0.0328	-0.0854	-0.0515*	-0.0505**	-0.0418*	-0.0749
	(1.3627)	(2.2038)	(1.6369)	(1.1918)	(1.4812)	(1.6688)	(2.2490)	(-2.4064)	(-1.6195)	(-0.7595)	(-2.6250)	(-3.1074)	(-2.3555)	(-0.5664)
ΔSPREAD	-0.3149						-0.9555	-1.2974*						-1.2543
	(-0.8642)						(-1.9624)	(-2.1355)						(-1.8175)
GROWTH		-0.0058					-0.0156**		-0.0016					0.0012
		(-1.2658)					(-3.4110)		-0.2252)					(0.1765)
SIZE			-0.0122				-0.0186			0.0026				0.0002
			(-1.5486)				(-1.8380)			(0.4456)				(0.0289)
FOREIGN				0.0045			0.0113				0.0561			0.0682
				(0.1361)			(0.3457)				(1.1382)			(1.4481)
MNG					-0.0190		-0.0682					0.0394		0.0371
					(-0.6180)		(-1.8312)					(1.0559)		(1.0107)
CTRY						-0.0513	-0.0752*						0.0192	0.0262
						(-1.8585)	(-2.2804)						(0.5207)	(0.5182)
Adjusted R^2	-0.0160	-0.0023	0.0318	-0.0180	-0.0129	0.0126	0.0893	0.0944	-0.0171	-0.0160	0.0055	0.0030	-0.0142	0.0586

Note: This table reports the coefficient and t-statistics (in parentheses) from the cross sectional regression $\alpha_i = c_i + \beta_1 \Delta SPREAD + \beta_2 GROWTH + \beta_3 SIZE + \beta_4 FOREIGN + \delta_1 MNG + \delta_2 CTRY + \acute{\varepsilon}_i$ where ΔSPREAD is the test variable while growth, size, foreign sales (FOREIGN), mining dummy (MNG) and country dummy (CTRY) are included as control variables. The regression is performed on 57 observations. ** denotes significance at the 1% level and * denotes significance at the 5% level.