

Research Note

Does Cross-Listing Signal Quality?

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Abstract

The literature on cross-listing generally conveys the impression that cross-listing is good news about a firm. This paper focuses on returns following cross-listing where evidence of positive results from cross-listing is mixed. Considering 81 Australian firms, we find that cross-listed firms are less profitable with higher debt levels prior to cross-listing and that they achieve significant negative abnormal returns in the three years following cross-listing. This result holds even for firms seeking the benefits of “bonding” to US disclosure requirements by cross-listing in the more regulated US markets. Our study suggests cross-listing is not an unambiguous positive signal about a firm.

JEL Classifications: G39, G15

Keywords: cross-listing, long-run abnormal returns

1. Introduction

Could any corporate event be as clear a signal of firm quality as cross-listing, especially cross-listing in the United States? Growing firms, particularly those from smaller or less-developed capital markets, gain access to new and potentially cheaper sources of capital (Biddle and Saudagaran, 1991; Pagano et al., 2002). Foreign listing may assist firms overcome market segmentation.¹ Foreign listings may also increase stock liquidity (Kyle, 1985; Admati and Pfleiderer, 1998)² and reduce the cost of equity capital (Foerster and Karolyi, 1993; Karolyi, 1997).³ There are bonding benefits for foreign firms listing in the US: being subject to US legal and accounting requirements sends a positive signal about the firm (Coffee, 2002). Benefits appear even to extend to firms choosing the lowest degree of bonding possible – those firms establishing a Level I ADR program via the over-the-counter (OTC) market (Durand et al., 2005).⁴

Miller (1999) presents a short-run event study showing investors respond positively to cross-listing, demonstrating that investors seem to “buy into” the good news stories which we have summarized in the preceding paragraph. However, theory and some empirical studies suggest cross-listing may not be a positive signal for all firms.

What are the implications of cross-listing for firm quality? Consider the argument that cross-listing involves “bonding”, which is causing firms to adhere to superior regulatory and governance standards. In doing so, firms provide a clear signal to shareholders that they intend to abide by higher standards than they would otherwise in their home market. Cross-listing, in the US in particular, may also expose firms to potential class action suits (which may lead to a wealth transfer from domestic shareholders to ADR shareholders). Therefore, bonding may signal that management believes their standards of behavior are sufficiently high that the chance of litigation is low. If the bonding argument holds, cross-listing should be good news for investors and be associated with positive abnormal returns. Yet the bonding argument is not initially obvious for Australian firms. The Australian regulatory framework is similar to that in the US, the UK and other developed markets (Brown and Tarca, 2005),⁵ suggesting limited benefits from bonding in the US.

¹ Market segmentation arises when expected returns on risk equivalent securities differ in different capital markets (Bekaert and Harvey, 1995; Sundaram and Logue, 1996). Stapleton and Subrahmanyam (1977) show that the effect of market segmentation is to reduce security prices and increase the cost of capital and suggest foreign listing can be used to mitigate negative effects of market segmentation. Errunza and Losq (1985) argue that foreign listing increases the opportunity set for domestic investors, reducing “super” risk *premia* on the previously held portfolio and reducing the required rate of equity return.

² Foerster and Karolyi (1993) find an increase in trading volume for Canadian stocks that cross-listed in the US. Theoretical and empirical support for increased liquidity reducing the cost of capital may be found in Amihud and Mendelson (1986), Diamond and Verrecchia (1991) and Chordia et al. (2001).

³ On the other hand, Jayaraman et al. (1993) provide evidence that this may not occur.

⁴ Level I ADRs are over-the-counter instruments rather than exchange traded. Firms entering Level I ADR programs do not raise new equity capital, do not provide additional accounting information (such as reconciliation to the US GAAP) and are not subject to the same level of scrutiny from analysts and regulators.

⁵ It features stock exchange listing rules, a recommended corporate governance code of best practice, company law, accounting standards developed by an independent standard setting board and a securities regulator responsible for promoting compliance with financial reporting requirements and oversight of auditors.

However, a substantial number of firms do cross-list, so there may be those with a greater need to convince stakeholders of their financial reporting and governance standards. If so, bonding may be a smokescreen for an absence of firm quality. In an efficient market, investors should not be misled by this strategy and, as such, cross-listing might be associated with negative abnormal returns as additional firm information is revealed to the market post cross-listing.

Cross-listing may also be good news about a firm if it is associated with an international growth strategy. It might be the case that cross-listing attracts positive publicity in the foreign market; of course, a good marketing campaign may bring about the same outcome. As we have noted, international expansion may require additional capital and, consequently, cross-listing may be part of the financial strategy of a firm. Myers and Majluf (1984) propose a hierarchy, or pecking order, of funding choices and, while they do not directly examine cross-listing in their considerations of the pecking order, their theory informs our arguments. If cross-listing involves raising equity capital, it may at least rank with equity issuance at the bottom of the pecking order. However, while cross-listing makes equity available for trading, it need not involve raising equity capital. For example, Durand et al. (2005) consider if establishing a Level I ADR is a precursor to subsequent equity raising and find that only 3.9% of their sample of Level I ADRs subsequently made seasoned equity offerings (SEOs). Indeed, none of the firms in our sample cross-listed at the time of their initial public offering although a number raised equity capital afterwards (and we will consider the relationship of SEOs and abnormal returns later in this paper). If cross-listing is not a direct means of raising equity, then it may then be a way to facilitate raising debt (Durand and Tarca, 2005); if so, such a strategy may also be lower in a firm's pecking order of financing choices. We might suppose that those firms seeking capital through a more costly process (that is, by cross-listing on a foreign stock exchange) may be, other things being equal, more "desperate" than those firms raising equity capital in their home market. This might especially be the case in a country such as Australia as it is open to foreign investment and is host to many major foreign financial institutions. If this is the case, cross-listing may be associated with negative abnormal returns.

Therefore, rather than being good news, cross-listing might be a strategy undertaken by firms with greater need to improve their image or by firms forced to obtain finance at the bottom of the pecking order. While there are indicators that cross-listing is a "good news" story, there is also evidence that it provides a mixed signal about firm quality. Karolyi (1997), after reviewing prior studies, conclude that while share price appears to react favorably to cross-listing in the first month after listing, longer term post-listing performance is highly variable across companies depending on the home and listing market, the company's capitalization, capital raising needs and other company specific factors. Alexander et al. (1988) and Foerster and Karolyi (1999, 2000) report that many firms experienced a post-listing decline in cumulative annual returns in the long-term.⁶ The

⁶ Foerster and Karolyi (2000) report that non-US firms raising capital in the US underperformed local benchmarks of comparable firms over three years following issuance. However, underperformance varied between firms in accordance with the scope and magnitude of investment barriers that induce segmentation in capital markets around the world.

observance of negative returns runs counter to other indicators of positive effects from cross-listing and thus warrants further investigation. We add to prior research by considering 81 Australian firms, a larger sample than other single-country studies. We use the bootstrapped skewness-adjusted *t*-statistic in the study to ensure that our statistical methodology is appropriate to the long-run returns. This is the first study to use this technique to analyze the long-run returns of cross-listing firms.

The bottom-line of our analysis is clear. For firms in our sample, cross-listing is not good news in the long-run. At best, the evidence presented in this paper suggests that cross-listing is not associated with any long-run abnormal positive returns. Indeed, much of the evidence reported in this paper points to cross-listing being the harbinger of abnormal returns that are significantly negative.

2. Data and Methodology

We focus on 81 Australian firms (from an initial population of 118) and analyze the monthly returns in the three years following cross-listing. Our population firms are all Australian Stock Exchange (ASX) based firms that cross-listed during the period 1990-1999. We impose six filters on our data to reach our final sample (Table 1): the first filter excludes firms for which the cross-listing date can not be found; the second filter excludes firms for which information is not compiled by the Aspect Financial databases; the third filter excludes firms that are not listed on the ASX as at the cross-listing date; the fourth filter excludes firms that are de-listed from the ASX within three years of the cross-listing date; the fifth filter excludes firms that are cross-listed preference shares; and the last filter excludes firms that are cross-listed more than once during the study period.

Table 1

Sample Selection

	Observations
Population firms	118
Less: Listing date not available	(7)
Less: Data not available from Aspect Financial	(2)
Less: Non-ASX listed firms during event	(3)
Less: Firms delisted from ASX within three years of event	(7)
Less: Preference shares event	(4)
Less: Multiple cross-listing	(14)
Final sample for the study	81

From our initial population of 118 Australian firms cross-listing between 1990 and 1999, we exclude firms for which the cross-listing date could not be found; for which information is not compiled by the Aspect Financial databases; firms which were not listed on the ASX as at the cross-listing date; firms which were delisted from the ASX within three years of the cross-listing date; firms that cross-listed preference shares; and firms which cross-listed more than once during the study period.

Among sample firms, the US is the most popular destination for cross-listing, followed by New Zealand. The majority of firms selecting the US prefer an OTC listing, which does not subject firms to additional accounting and legal requirements. Among the larger Australian firms, Sims Group Ltd is a good example of the type of firms which seeks an OTC listing. At the time of listing, it was one of the largest metal recycling firms in the world with global operations and facilities in Australia, New Zealand, the US, Europe and China (Simsmetal Ltd, 1995). Other well-known ASX 200 firms listed on the OTC include Coca-Cola Amatil, CSR Ltd, and Woodside Petroleum Ltd. It has been suggested that these firms seek at least some of the benefits of cross-listing without incurring the additional costs of a NYSE or NASDAQ listing (Durand and Tarca, 2005). The choice of the NASDAQ exchange is also prompted by international activities. Memtec Ltd listed in 1992, citing the US capital market as important to the firm because of the worldwide nature of its business and the currencies in which it trades (Memtec Ltd, 1992). Transcom International Ltd listed in 1997 and secured investment from US institutional investors in the following year, illustrating the importance of the US capital market as a source of finance (Transcom International Ltd, 1997). The OTC market was also popular with smaller Australian firms, particularly those from the resources sector. In addition, extractive industry firms listed on German and Canadian exchanges. An illustration of the motivation for listing was provided by Grange Resources Ltd, which obtained an OTC listing on the Berlin Stock Exchange in 1996. The firm stated that this event was a significant corporate development as it provided a useful facility for European investors and had been successful in attracting a large number of new European investors (Grange Resources Ltd, 1996).

The experience of Australian firms provides an excellent opportunity to learn about the long-run wealth effect of cross-listing. Our sample is sufficiently large to make statistically sound inferences and, as can be seen in Table 2, our sample firms initial dates of cross-listing are not concentrated at a particular time. In focusing on one country, we hold institutional features, such as the home country's legal and financing framework, constant for all firms in our sample. Furthermore, while the ASX is home to many internationally active firms, it is relatively small by international standards. In 2001, it was only roughly 3% of the size of the NYSE. With around 60% of the number of NYSE listed firms and 75% of its turnover rate, there is considerably less liquidity to be shared amongst firms (Harris, 2003, 51). If cross-listing is a way to tap extra liquidity, then Australian firms, unlike firms from other countries where cross-listing has been popular (e.g., the United Kingdom and Japan), appear to have a market structure that makes such a strategy compelling.

Table 2**Selected Characteristics of the Sample**

Event Year	Sample	US	Non-US	20-F
1990	4	4	0	1
1991	5	5	0	1
1992	13	3	10	1
1993	10	10	0	1
1994	4	3	1	0
1995	2	1	1	0
1996	12	5	7	2
1997	17	4	13	1
1998	6	2	4	0
1999	8	2	6	1
Total (%)	81 (100%)	39 (48%)	42 (52%)	8 (10%)

The first column of this table (event year) refers to a cross-listing date between 1 January and 31 December of the stated year. The sample column shows the number of firms from the full sample that cross-listed in the stated year. The US column shows the total number of firms that cross-listed in the US each year (includes firms in NYSE, AMEX, NASDAQ, OTC - the over-the-counter market where Level I ADRs are traded - and Portal - the market for Rule 144A private placements). The Non-US column shows the total number of firms that cross-listed to non-US exchanges each year. The 20-F column shows the number of firms reconciling their accounts to US GAAP using Form 20-F and is a subset of the US column.

We examine the long-run abnormal returns (calculated using cumulative abnormal returns (CARs) and buy-and-hold abnormal returns (BHARs)) using three benchmarks: a value-weighted index of the returns of all equities listed on the Australian market (VW), an equal-weighted index of all firms listed on the Australian market (EW) and a matched-firm control group matched on market capitalization, book-to-market and industry (CTR). The value- and equal-weighted indices are sourced from the Share Price & Price Relative Database from the Centre for Research in Finance at the Australian Graduate School of Management. Our firm return data is taken from the Securities Industry Research Centre of Asia-Pacific (SIRCA) Core Research Database. We discuss the control group selection procedure in more detail below. For each of the six abnormal return metrics we examine, we report the mean and median monthly returns and standard deviations and utilize the standard *t*-statistic; the Wilcoxon signed ranks test (Siegel and Castellan, 1988, 87-95); and the bootstrapped skewness adjusted *t*-statistic (Johnson, 1978; Sutton, 1993; Barber et al., 1999). The use of the skewness-adjusted *t*-statistic recognizes that skewness may be a feature of long-run abnormal returns and that inferences using conventional *t*-statistics may be biased. The use of the bootstrap recognizes that even with the skewness adjustment, use of the *t*-distribution to determine critical values may not be appropriate. Our critical values for the bootstrapped skewness-adjusted *t*-statistic were derived by drawing 10,000 samples.

As we noted in the preceding paragraph, in addition to the value- and equal-weighted market benchmarks, we also create a matched control for each firm. In order to qualify for inclusion as a control, firms had to remain listed on the ASX up to three years following the sample firm cross-listing month. Secondly, the market capitalization (market value of equity) at the end of the cross-listing month (month 0) for the control firm must be within 70% to 130% of the sample firm's market capitalization at that time. Thirdly, the control firm had to be in the same major industry group as the sample firm. Finally, the book-to-market ratio⁷ of the control firm had to be between 70% and 130% of the sample firm's ratio.

Creating a control group of matched firms such as we attempt is problematic in a market of Australia's size. There are often gaps in the data. There is also "thinness" in the number of potential candidate firms fitting the matching criteria. Where there was no suitable control firm available for a sample firm due to the above filters, the filters are relaxed starting from the last filter.⁸ Consequently, 49 firms (61%) are matched on all three criteria (size, industry and book to market); eight firms (10%) are matched on the first two criteria and book to market ratio at the date of the first annual report after cross-listing; seven firms (8%) are matched on the size and industry criteria; and 17 firms (21%) are matched on the size and book to market ratio.

In order to consider the robustness of any inferences we make about abnormal returns calculated using the above-mentioned benchmarks and the bootstrapped skewness-adjusted *t*-statistic methodology, we also utilize a calendar-time portfolio approach. The calendar-time approach implements an investment strategy that might be followed by adopting a rule based on investing in cross-listed firms. In adopting this methodology, we can examine the alpha (α) of a portfolio created from the firms in our sample. The calendar-time methodology allows us to control for the market, size and book to market using the well known Fama-French Three-Factor Model (Fama and French, 1993) which has been shown to be applicable to Australian data (Gaunt, 2004). If cross-listing is good news, the intercept term (the alpha) should be positive and statistically significant. That is to say, after controlling for known sources of systematic risk, investors following such a strategy would have earned positive abnormal returns. Conversely, if cross-listing is bad news, the alpha should be negative and statistically significant. If cross-listing is neither good nor bad news, there should be no abnormal performance and we cannot reject the null hypothesis that the alpha is equal to zero.

To implement the calendar-time approach, we form a portfolio at the beginning of each month from February 1990 to December 2001 of firms that cross-listed three years prior to the date the portfolio was formed. A sample firm enters this calendar-time portfolio at a given month if it cross-listed in the previous 36 months relative to the formation date of that month's portfolio; a sample firm exits when the cross-listing date is more than 36 months before the formation date of that month's portfolio. We use the market risk premium ($R_m - R_f$), the size premium (SMB) and the value premium (HML) from Durack et al. (2004). Durack et al.'s data is available only to the end of 2001. Finish-

⁷ The book value of equity at the date of the last annual report before cross-listing, divided by market capitalization at the end of the cross-listing month.

⁸ Durack et al. (2004) argue that the evidence that book-to-market is priced in the Australian market is, at best, mixed.

ing our calendar-time analysis at this time, however, has the benefit of reducing noise in the dependent variable as fewer securities are available for inclusion in the portfolio in these later months.⁹ In addition, we consider variants of Fama-French Three-Factor Model to consider factors which may be priced in the Australian market. Chan and Faff (2003) argue that liquidity is priced in the Australian market and we form a spanning portfolio of illiquid minus liquid stocks based on the number of shares (LIQD), and the percentage of listed shares (LIQP), traded in the previous month. We also recognize the strong links between the Australian and US markets (Ragunathan et al., 1999; Di Iorio and Faff, 2001, 2002; Durand et al., 2001; Durand and Scott, 2003) by augmenting the model with the change in the S & P 500 index (measured in Australian dollars) (SNP). We form both a value weighted and equal weighted portfolio of stocks in the calendar-time portfolio and examine them using both value and equal weighted versions of the spanning portfolios (denoted using the superscripts V and E in Table 5).

3. Analysis

Table 3 presents summary statistics on accounting data, taken from a firm's last annual report before cross-listing, for the firms in our sample for which such data was available.¹⁰ The firms are large by Australian standards, for example, the mean total assets is A\$3.7 billion. In contrast to Lang et al. (2003a) who find that cross-listed firms are more profitable, our sample firms are less profitable (as measured by ROA, ROE and operating cash flow/total assets) with higher debt levels than the control sample firms.¹¹

Our findings for long-run abnormal returns for the full sample of 81 Australian firms are presented in Panel A of Table 4.¹² Abnormal returns are statistically significant and negative for all metrics other than the cumulative abnormal returns calculated using matched firms (CTRCAR). For CTCAR, the bootstrapped skewness adjusted *t*-statistic also rejects the null that abnormal returns are equal to zero. Consistent with Fama (1998), larger abnormal returns appeared under BHAR measures and measures using the equal weighted market as the benchmark. Contrary to the expectations generated by the cross-listing literature, cross-listing appears to be associated with wealth destruction rather than wealth creation for shareholders of the firms in our sample.

⁹ Empirical work in asset pricing has focused on tests of portfolios rather than individual stocks to avoid unclear and/or misleading empirical analyses.

¹⁰ Our accounting data is collected from the Aspect Financial Fin-Analysis Database. Some data are reported in Australian dollars which had an average value of \$US0.76 but ranged between \$US0.56 and \$US0.84.

¹¹ Short and long-term Australian interest rates fell to historic lows during the sample period although it need not have been the case that the firms in our sample borrowed solely in Australian dollars. It does not appear that the relatively high levels of leverage of sample firms are related to the negative abnormal returns. We also considered the effect of leverage on abnormal returns but failed to find a significant relationship. As we discuss in the paper and also in footnote 18, cross-sectional analyses did not uncover any significant relationship.

¹² Analyses for sub-periods do not vary the conclusions we make.

Table 3

Descriptive Statistics						
Variables	Mean	Minimum	Median	Maximum	Standard Deviation	Number of firms
Total Revenue (A\$)	887,505,415	20,772	7,675,498	15,113,400,000	2,767,144,735	58
Total Assets (A\$)	3,759,982,818	1,324,000	44,463,185	106,019,000,000	17,271,772,312	64
Issued and Paid up Capital (A\$)	84,362,119	2,570,000	17,711,640	1,181,600,000	199,109,497	57
Book Value of Equity (A\$)	564,014,245	489,858	32,749,318	7,223,000,000	1,333,653,351	64
Market Value of Equity (A\$)	752,320,120	3,067,920	64,905,693	7,148,092,200	1,497,520,154	72
Book-to-Market	0.768	0.037	0.526	3.793	0.77	64
Tobin's q	2.799	0.301	1.498	23.25	3.771	64
Return on Assets	-8.07%	-124.37%	-1.25%	24.48%	24.19%	60
Return on Equity	-15.65%	-518.54%	-1.29%	34.24%	71.83%	60
Operating Cash Flow/ Total Assets	-3.57%	-55.49%	0.00%	38.90%	17.54%	64
Total Liabilities/ Market Value of Equity	1.248	0.003	0.165	3.814	5.250	64
Total Liabilities/ Book Value of Equity	1.119	0.006	0.301	15.326	2.997	64
Total Liabilities (A\$)	3,194,637,323	17,447	6,160,500	98,774,000,000	16,149,633,277	64

The table provides the descriptive statistics for 13 accounting variables for firms for which data is available. The data used in this table are derived from firms' last annual reports before cross-listing.

Figure 1 illustrates the abnormal returns analyzed in Table 4. It shows that cross-listed firms underperformed on all three benchmarks in the 36 months following cross-listing. The underperformance exists in both CAR and BHAR measures although the magnitude of the underperformance does vary across measures. Furthermore, Figure 1 suggests that there is no abnormal performance even in the first month after listing which is, *prima facie*, at odds with Miller (1999). Accordingly, it is worth highlighting why that might be the case. First, we focus on monthly returns and Miller focuses on daily returns. Any short-run positive announcement may not be evident when looked at using a monthly window as it may be too small. Second, the event we study, the actual cross-listing, is different to the event that Miller has studied (the first announcement of a depository receipt program). Third, our study differs from Miller's in that we examine only Australian firms while Miller includes firms from all countries (including developing countries for which positive abnormal returns are greatest at the announcement date). Finally, our sample of Australian firms is larger than that of Miller. During 1985-1995 Miller finds 13 Australian firms initiating a depository receipt program. In contrast, we include 26 Australian firms cross-listed in the US from 1990 to 1995 (the period our study overlaps with Miller's) thus our results are based on a larger sample.

Table 4

Abnormal Returns in the 36 Months Following Cross-Listing

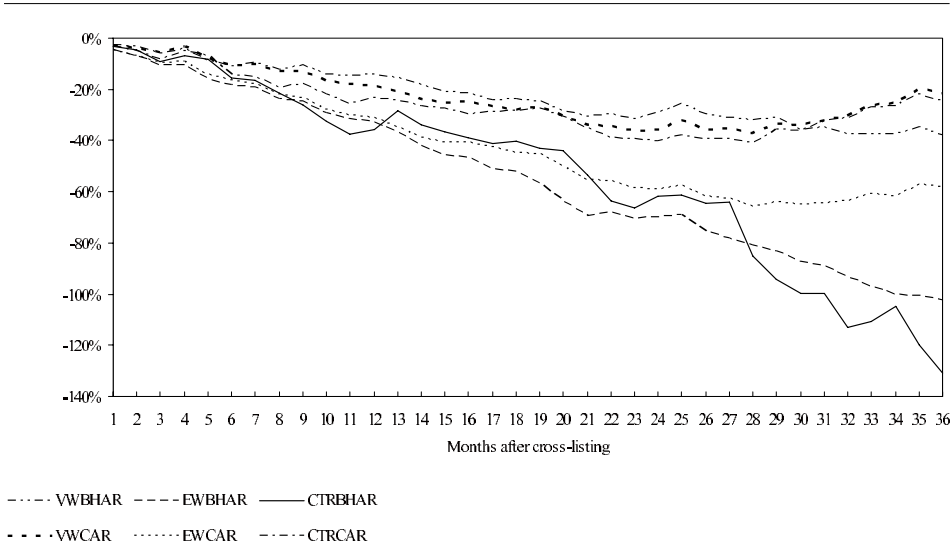
	VWBHAR	EWBHAR	CTRBHAR	VWCAR	EWCAR	CTRCAR
<i>Panel A: Full sample abnormal returns</i>						
Mean	-0.38	-1.023	-1.307	-0.215	-0.581	-0.245
Median	-0.516	-1.048	-0.142	-0.068	-0.604	-0.165
Standard Deviation	0.774	1.134	6.807	0.949	0.970	1.733
T	-4.421***	-8.117***	-1.728**	-2.043**	-5.395***	-1.274
Bootstrapped TSA	-3.408**	-10.645***	-2.646**	-2.091**	-5.443***	-1.323*
WSR Z	-4.616***	-6.646***	-1.490*	-1.721**	-4.786***	-0.864
<i>Panel B: US sub-sample abnormal returns</i>						
Mean	-0.512	-1.425	-0.953	-0.355	-0.805	-0.411
Median	-0.647	-1.273	-0.716	-0.075	-0.686	-0.406
Standard Deviation	0.632	1.221	2.288	0.854	0.869	1.806
T	-5.060***	-7.289***	-2.601***	-2.597***	-5.784***	-1.422*
Bootstrapped TSA	-4.563***	-13.079***	-3.166**	-2.863**	-6.680***	-1.427
WSR Z	-3.893***	-5.401***	-2.079**	-1.884**	-4.535***	-1.270
<i>Panel C: Non-US sub-sample abnormal returns</i>						
Mean	-0.257	-0.649	-1.636	-0.086	-0.374	-0.091
Median	-0.434	-0.918	-0.030	-0.056	-0.501	-0.018
Standard Deviation	0.875	0.911	9.238	1.023	1.022	1.669
T	-1.905**	-4.617***	-1.148	-0.544	-2.372**	-0.354
Bootstrapped TSA	-1.587	-2.748*	-1.649**	-0.550	-2.357**	-0.394
WSR Z	-2.632**	-3.907***	-0.056	-0.494	-2.182**	-0.106
<i>Panel D: 20-F sub-sample abnormal returns</i>						
Mean	-0.699	-1.373	-1.254	-0.539	-0.964	-0.932
Median	-0.688	-1.320	-0.784	-0.392	-0.969	-1.123
Standard Deviation	0.371	0.575	2.290	0.710	0.764	1.484
T	-5.330***	-6.755***	-1.548*	-2.147**	-3.571***	-1.777*
Bootstrapped TSA	-5.493***	-11.075***	-1.989***	-2.160**	-3.419***	-1.932*
WSR Z	-2.521***	-2.521***	-1.400*	-1.680**	-2.240**	-1.680**

* Test statistic is significant at the 10% level
 ** Test statistic is significant at the 5% level
 *** Test statistic is significant at the 1% level

This table presents the results of the analysis of buy and hold (*_BHAR*) and cumulative abnormal returns (*_CAR*) calculated using a value-weighted index (VWBHAR and VWCAR), an equal-weighted index (EWBHAR and EWCAR) and a matched-firm control (CTRBHAR and CTCAR). Each panel presents the mean, median and standard deviation of the abnormal returns. Three tests are used to examine the null hypothesis that abnormal returns equal zero: T reports the conventional *t*-test, Bootstrapped TSA reports the bootstrapped skewness-adjusted *t*-test (Johnson, 1978; Sutton, 1993; Barber et al., 1999) and WSR Z refers to the Wilcoxon signed ranks test Z-statistic (Siegel and Castellan, 87-95).

Figure 1

Abnormal Returns in the 36 Months Following Cross-Listing



This figure illustrates the buy and hold ($_BHAR$) and cumulative abnormal returns ($_CAR$) calculated using a value-weighted index (VWBHAR and VWCAR respectively), an equal-weighted index (EWBHAR and EWCAR respectively) and a matched-firm control (CTRBHAR and CTCRAR)

We investigate the results further by considering if there is a difference between the abnormal returns of firms listing in the US (39 firms) and those listing elsewhere (42 firms). Miller (1999), Coffee (2002), Lang et al. (2003b) and Doidge et al. (2004) suggest that the US’s arguably superior regulation framework and reporting standards provide benefits to shareholders by firms “bonding” to the system through a cross-listing. Our analysis for those firms cross-listing in the US is reported in Panel B of Table 4 and the analysis for those listing elsewhere is reported in Panel C. In both Panels B and C we find that abnormal returns are statistically significant and negative for all metrics save cumulative abnormal returns calculated using matched firms (CTRCAR). The negative returns of cross-listing appear to be experienced by investors regardless of whether firms list in the US or in other markets.¹³

¹³ It could be that firms may cross-list at a time of unusually good news, or an unusual foreign market interest in a cross-listing firm’s industry (like “tech” firms in the nineties) and that “unusual” conditions yield, perhaps by definition, to more ordinary ones. However, it should be noted that the returns we study are abnormal returns and, in ordinary conditions, should be insignificantly different from zero. Controlling for industry will control for any sectoral fads (such as a “tech” bubble). Furthermore, the events we study are not concentrated at a particular time (Table 2) nor are our results driven by a particular sub-period (as we note in footnote 12); some relationship of abnormal returns to a particular period of time might be expected if our findings were driven by fashion.

The evidence of negative US abnormal returns reported in Panel B is at odds with the bonding story which would predict that a firm experiences positive abnormal returns after cross-listing. There is a further aspect of the bonding story we wish to explore. Not all of the firms choosing to list in the US are required to reconcile their home financial statements to US GAAP. That is, they do not complete a Form 20-F. In addition to bonding themselves to comply with US law and standards, 20-F firms receive more publicity and are likely to have greater analyst following than firms that do not prepare a Form 20-F (Botosan and Frost, 1998; Lang et al., 2003b). If a firm enters a foreign market which offers a menu of disclosure options, the choice of a lower disclosure option (say a 144-A ADR listing rather than a level II or III) may cause the market to draw negative inferences about the quality of the firm's reporting. Conversely, choosing a high disclosure option may lead the market to draw positive inferences about the quality of a firm's reporting. Even with the positive signaling benefits of complying with US GAAP, only eight of the firms in our sample chose to do so (Table 2). For other firms, the costs of complying with US listing requirements would appear to outweigh the benefits.¹⁴ In relation to firms listed on US exchanges with 20-F reconciliation requirements, the results are clear: for each of the six metrics we examine, abnormal returns are still negative and statistically significant.

The results presented in Table 4 are striking. No matter what benchmark is used, the analyses indicate that foreign listing is bad news for investors. As we foreshadowed in the preceding section, it may be appropriate to check the robustness of these inferences by "putting ourselves into the shoes" by following an investment rule of buying stocks that have cross-listed. We do this by implementing the calendar-time methodology discussed above in section 2. If cross-listing is indeed bad news, the alpha (α) of the calendar-time portfolio should be negative and statistically significant. If cross-listing is good news, the alpha should be positive and if cross-listing is neither good nor bad news, the alpha should be zero.

The results of the calendar-time analysis are presented in Table 5. The analyses for a range of models using a value-weighted portfolio of cross-listed firms as the dependent variable in the regression and value-weighted control portfolios as the independent variables, are presented in Panel A. Results for the value-weighted portfolio of cross-listed firms and value-weighted control variables are presented in Panel B. Given the limited study of the three-factor model (and extensions to it) in Australia, some general findings are worth noting before we discuss the findings for the calendar-time portfolios. In both panels, the adjusted R^2 are lower than might be expected given results in seminal US studies,¹⁵ but are in keeping with the major Australian work on the three-factor model (Gaunt, 2004). The value-weighted analysis in Panel A provides different findings on the role of SMB and HML to the equal-weighted analysis reported in Panel B. In Panel A, HML is found to be statistically significant in all the analyses in which it is used. However, it is insignificant in all the analyses reported in Panel B. If HML is priced in the Australian market, its effect is not as strong as might be expected given

¹⁴ This result is consistent with Durand and Tarca (2005) who report that larger, more profitable firms from the UK, France, Germany, Japan and Australia are more likely to select exchanges without Form 20-F reconciliation requirements when cross-listing.

¹⁵ See, for example, Table 6 of Fama and French (1993, 24) where the values of adjusted R^2 are mostly greater than 0.90 and no less than 0.83.

US studies. Indeed, in Australia, Durack et al. (2004) have found at best mixed evidence that HML is priced (and they recommend further research in this area). Gaunt (2004) find HML is priced in only 12 of the 25 portfolios used. Our finding that HML is priced only for the value-weighted portfolios suggests that the value-premium may be related to market capitalization. For SMB, we find the opposite: it is not priced in Panel A (the value-weighted analysis) but is priced in two of the four equations in which it is used in the equal-weighted analysis (Panel B). This finding is somewhat surprising given the pronounced small firm effect in Australia (Gaunt et al., 2000; Durack et al., 2004; Durand et al., 2006). However, the significance and negative sign of the coefficients for the spanning portfolios capturing liquidity risk (LIQD and LIQP) — indicating that more liquid firms earn, on average, lower returns than less liquid firms - are consistent with the notion that any size premium is proxying for liquidity risk.

Table 5

Calendar-Time Portfolio Analysis

Panel A: Value-weighted calendar-time portfolio

	α	RM ^V	SMB ^V	HML ^V	LIQD ^V	LIQP ^V	SNP	Adj R ²	F Stat
(a)	0.000	1.117***						0.449	116.751***
(b)	-0.003	1.121***	-0.004	0.25***				0.479	44.439***
(c)	-0.003	1.106***	0.001	0.251***	-0.023			0.475	33.114***
(d)	-0.001	1.073***	-0.075	0.238**		-0.092		0.483	34.161***
(e)	-0.003	1.096***	-0.003	0.255***			0.056	0.476	33.282***

Panel B: Equal-weighted calendar-time portfolio

	α	RM ^E	SMB ^E	HML ^E	LIQD ^E	LIQP ^E	SNP	Adj R ²	F Stat
(f)	-0.018***	0.917***						0.642	255.748***
(g)	-0.009	1.062***	-0.164**	-0.037				0.661	93.431***
(h)	-0.015***	0.867***	0.023	0.011	-0.338***			0.701	84.149***
(i)	-0.010**	0.879***	-0.278***	-0.046		-0.189**		0.670	72.961***
(j)	-0.012**	1.042***	-0.155	-0.030			0.173**	0.671	73.248***

* Test statistic is significant at the 10% level

** Test statistic is significant at the 5% level

*** Test statistic is significant at the 1% level

This table presents results of an analysis of returns of a portfolio formed by investing in firms cross-listing in the previous 36 months relative to the formation date of that month's portfolio and exiting the portfolio when the cross-listing date is more than 36 months before the portfolio's formation date. Two portfolios are analyzed for the period beginning February 1990 and ending in December 2001. The dependent variables are the value-weighted calendar time portfolio return in excess of the risk free rate (Panel A) and the equal-weighted portfolio return in excess of the risk free rate (Panel B). The independent variables are: RM, the market portfolio return in excess of the risk free rate; SMB, the risk premium for the size factor; HML, the risk premium on book to market factor (RM, SMB and HML are taken from Durack, et al. (2004)); LIQD, the risk premium of a liquidity factor measured by dollar turnover; LIQP, the risk premium on liquidity factor measured by percentage of outstanding shares; and SNP, the Australian dollar return of the S & P 500. Value and equal-weighted portfolios are denoted by the superscripts V and E respectively. T-statistics are adjusted for heteroscedasticity (White, 1980).

Focusing on any abnormal performance for the calendar-time portfolios, we find that the alphas reported in Panel A of Table 5 are not significantly different from zero. Therefore, using a value-weighted investment strategy and value-weighted benchmarks, the evidence indicates that investing in cross-listed firms did not result in abnormal risk-adjusted performance.¹⁶ Thus, this further analysis is not supportive of our conclusions about underperformance of cross-listing stocks on the basis of the analysis of abnormal returns (Table 4). The alphas in Panel B, however, tell a different story. For all but one benchmark model — the unaugmented Fama-French Three-Factor Model — the alphas are negative and statistically significant. Using an equal-weighted portfolio and equal-weighted benchmarks, investing in cross-listed firms generated negative risk adjusted returns. Given our expectations that smaller firms might outperform larger firms, *ceteris paribus*,¹⁷ the equal-weighted analysis reported in Panel B is perhaps surprising. The value-weighted analysis reported in Panel A might simply be a result of the returns of smaller firms being dominated by value-weighting. The analysis of the calendar-time portfolio in Table 5 suggests that the findings of abnormal returns reported in Table 4 are influenced by firms with lower market capitalization. It provides further evidence against cross-listing generating long-term benefits for the shareholder. At best, the calendar-time analysis suggests that cross-listing is neutral; at worst, it indicates that cross-listing reduces shareholder wealth in the long-run.

A further issue we consider is whether the long-run underperformance is linked with equity raising activities. Underperformance has been associated with initial public offerings of equity (Ritter, 1991; Ritter and Welch, 2002; Gompers and Lerner, 2003); however, none of the cross-listings we have studied coincides with an IPO in Australia. The US literature on long-run performance following SEOs has generally supported Myer and Majluf's (1984) pecking order, finding negative abnormal long-run returns after SEOs (Loughran and Ritter, 1995, 1997; Spiess and Affleck-Graves, 1995; Eberhart and Siddique, 2002). In Australia, research on SEO underperformance is still in its infancy. Brown et al. (2006) confirm that US findings on underperformance hold in Australia, although the under-performance is not as great as that experienced in the US. While many of the sample firms raise funds in the 36 months after cross-listing, an examination of the number of SEOs (Table 5) indicates that not all firms choose to raise equity following cross-listing.

We confirm that SEO activity cannot explain the abnormal returns in the regressions reported in Table 6. We use three measures to capture SEO activity. The SEO dummy variable (DSEO) takes a value of one if the sample firm conducted at least one SEO between the cross-listing date and the end of the 36th month following the cross-listing month. Number of SEOs (NSEO) is defined as the number of SEOs conducted by a sample firm between the cross-listing date and the end of the 36th month following the cross-listing month. The third measure we examine is the value of SEOs (VSEO), defined as the total proceeds of SEOs conducted by a sample firm between cross-listing date and the

¹⁶We have not considered any transaction costs which may be involved in the re-weighting of the dependent variable. As a consequence, the returns we analyze in Panel A may be overestimated.

¹⁷This expectation is based on literature cited in the previous paragraph documenting a substantial size premium in Australia (Gaunt et al., 2000; Durack et al., 2004; Durand et al., 2006).

end of the 36th month following the cross-listing month divided by the sample firm's market value of equity at the end of the cross-listing month. Only in the case of VWBHAR (value-weighted buy and hold returns) is the SEO variable significant and then only at the 10% level; only in the case of DSEO is the *F*-statistic associated with the regression significant and, again, it is only significant at the 10% level. Clearly, the underperformance we have found is not associated with raising equity finance.¹⁸

Table 6

Firms with Seasoned Equity Offerings (SEOs)

NSEO	Firms	VSEO	Firms
0	32	≤0	32
1	17	≤0.05	15
2	12	≤0.1	7
3	8	≤0.15	5
4	6	≤0.2	6
5	2	≤0.25	1
6	0	≤0.3	2
7	2	≤0.35	2
8	1	≤0.4	2
9	1	≤0.45	2
		≤0.5	1
		≤0.55	0
		≤0.6	1
		>0.65	2
		>0.65	3
At least 1 SEO	49	Total companies	81

This table shows the number of seasoned equity offerings (SEOs) conducted by sample firms in the 36-month period following the cross-listing month. *NSEO* shows the number of SEOs conducted by sample firms. The next firms column shows the number of companies conducting that particular number of SEO during the event windows. *VSEO* shows the total proceeds raised by the sample firms through the SEO divided by the firm's market value of equity at the listing month. The next firms column shows the number of companies with that particular *VSEO* value. This table also presents the number of sample firms with at least one SEO during the event window.

¹⁸ We conduct further analyses of other potential influences which may determine the level of abnormal returns. We do not report the results of these analyses because, like the analysis of the effect of SEOs reported herein, no significant results are found. Examples of variables we have considered included: change in total liabilities; change in issued and paid up capital; change in level of analyst coverage; change in analysts' forecast errors; change in share turnover; change in share price before cross-listing; and change in Tobin's Q. A limitation of our study is that our findings may be a function of the power of the tests as there may not be enough observations to detect any effects.

Table 7**SEOs and Abnormal Returns in the 36 Months Following Cross-Listing**

Performance	Intercept	DSEO	NSEO	VSEO	Adj R ²	F stat
VWBHAR	-0.187	-0.320*			0.029	3.408*
EWBHAR	-1.189	0.275			0.002	1.138
CTRBHAR	-1.977	1.108			-0.006	0.510
VWCAR	-0.119	-0.160			-0.006	0.548
EWCAR	-0.624***	0.071			-0.011	0.102
CTRCAR	-0.297	0.086			-0.012	0.047
VWBHAR	-0.278**		-0.064*		0.015	2.187
EWBHAR	-1.109***		0.054		-0.004	0.706
CTRBHAR	-1.694		0.241		-0.008	0.396
VWCAR	-0.312**		0.060		0.003	1.272
EWCAR	-0.750***		0.105		0.035	3.875*
CTRCAR	-0.394		0.093		-0.001	0.907
VWBHAR	-0.333***			-0.312*	0.003	1.210
EWBHAR	-1.060***			0.248	-0.008	0.351
CTRBHAR	-1.485			1.177	-0.010	0.220
VWCAR	-0.256**			0.270	-0.005	0.597
EWCAR	-0.654***			0.480	0.010	1.838
CTRCAR	-0.357			0.739	0.004	1.356

* Test statistic is significant at the 10% level

** Test statistic is significant at the 5% level

*** Test statistic is significant at the 1% level

See Tables 4 and 6 for definitions of the variables

As noted above, the literature suggests that firms cross-list for a number of reasons in addition to raising capital. We could assume that the benefits of cross-listing (such as increasing liquidity and expanding their shareholder base, acquiring shares to use in foreign acquisitions, and increasing a firm's profile in a foreign country with political and economic benefits) would be sought by a range of firms. It is therefore surprising that we observe cross-listed firms to be less profitable and to have higher debt levels at the time of cross-listing. We mentioned earlier the relatively small size of the Australian capital market, which may prompt firms to seek a foreign stock exchange listing when further capital raising is being considered. However, there are no particular factors in the Australian institutional environment which would explain why cross-listed firms exhibit different financial characteristics compared with firms that are not cross-listed, or why the cross-listed firms achieve negative returns following cross-listing.

In addition, possible costs of cross-listing do not appear to explain the negative returns for Australian firms. The main costs relate to the fees associated with the additional exchange listing and to accounting reconciliation and disclosure costs. The costs of cross-listing are greatest for firms listing on the more regulated US exchanges, namely NYSE,

NASDAQ and AMEX (Miller, 1999). Since only eight firms in our sample are listed on these exchanges, it is unlikely that the costs of cross-listing are the explanation of the negative returns we observed. In addition, Australia can be characterized as a developed economy with shareholder-oriented financial reporting. These attributes are more likely to mitigate against underperformance, than to contribute to it (Foerster and Karolyi, 2000).

4. Conclusion

It is generally assumed, based on the cross-listing literature, that cross-listing provides a positive signal about a firm. We consider whether cross-listing benefits shareholders by examining post-listing returns, an area where evidence is mixed. Our results suggest that cross-listing may be an ersatz signal of quality or a sign of “desperation” (if cross-listing is at the bottom of a firm’s pecking order of financing strategies). The negative long-run performance of 81 Australian firms in our sample suggests that cross-listing does not provide an unambiguous positive signal about a firm. On balance, it would appear that, at least for Australian firms, cross-listing is a negative signal of firm quality.

Our findings of long-run underperformance are robust to considerations of the “usual suspects”, IPOs and SEOs, that have been associated with the long-run underperformance around equity issuance strategies. The findings are contrary to many studies on the effects of cross-listing. It may be the case that the Australian firms under study in our paper are unusual, or that our findings are specific to the study period.¹⁹ We would welcome further country specific analyses that concentrate on the effects of cross-listing. Additionally, we believe that future research investigating explanatory factors for negative long-run abnormal returns after cross-listing is warranted. In particular, it would be useful to compare the performance of firms from markets with no *prima facie* need to bond to a “better” market with those of firms from countries with less stringent regulatory regimes.

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¹⁹ Although, as we note in footnote 12, our findings are not driven by a particular sub-period of the study period.

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