

Dual-Listing of Australian Shares on the New Zealand Stock Market

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Abstract

The present study investigates the impact of dual listing of Australian shares on the NZSE. The results suggest that the average excess return on the day of listing is negative but is statistically insignificant. The negative excess return starts to accumulate before the day of listing and becomes statistically significant several weeks after this date to the end of the period (day +150). These results are not significantly different between low liquidity and high liquidity sub-samples. The impact of dual listing on the volume of trade is negative and significant at the conventional statistical levels. The impact of dual listing on the volatility is positive and on the systematic risk and the cost of capital it is negative. However, the estimated changes of these coefficients are not statistically significant. In contrast to most of the previous findings, we can conclude that the New Zealand listings of Australian shares have no tangible financial benefits for the shareholders.

Key words: Dual listing, market segmentation, market integration, market anomaly, event study,

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I. INTRODUCTION

Over the past decade, the number of Australian companies that have listed their shares overseas has increased substantially. By mid 2000 over 136 companies, for which the Australian Stock Exchange (ASX) has home branch responsibilities, had directly listed their shares on at least one overseas exchange. The dual listing of Australian companies are spread across 20 stock exchanges in four continents. However, the New Zealand Stock Exchange (NZSE) accounts for the highest percentage of direct listings. By mid 2000 the total number of Australian companies that had dually listed their shares on the NZSE was 120. However, many of these shares have been delisted and the number currently stands at 61.

Companies can benefit from an overseas listing for a variety of reasons, including increased liquidity, access to a broader investor base and capital pool, ability to trade stocks in different time zones, and reduce potential risk with the foreign country in which the stocks are listed. These benefits are weighted against legal, fiscal and administrative costs in order to determine their net effect on the value of shares. Obviously, the importance of reasons for dual listing and the magnitude of their effect on the value of shares vary from one market to another. For example, an Australian company may receive more financial benefits from listing on NYSE by improving the liquidity of its shares than listing on NZSE. According to Saudagaran and Biddle's (1995) study for the United States, the most important reasons for the selection of the dual listing location are the requirements for financial disclosure and the magnitude of export to a foreign country. However, whatever these reasons might be, there must be a favorable impact on the assets of the firm to be acceptable to the shareholders. Unfortunately, companies may not be able to calculate the net effect of their decision in advance, before realizing considerable expenses. If the perceived benefits of dual listing are not realized, it becomes difficult for a company to explain the rationale of its decision to the shareholders, or even maintain its listing requirements in the long term. Evidence from listing of Australian shares on the NZSE show that close to 50% of shares were delisted after an average period of 3.1 years and one of the main reasons for delisting has been the failure of companies to pay their listing fees.

The theoretical justification for overseas listing is to overcome barriers to international investment in segmented capital markets. Segmented capital markets tend to alter the

required rate of return on otherwise identical shares. As a result, they are priced differently across different markets. If the required rate of return for the same stock is lower in a foreign market than in a domestic market, companies have an incentive to list their shares overseas to increase their investor's base. However, the deregulation of financial markets in recent years has removed impediments to international investing and has integrated capital markets around the world. If we assume that capital markets are fully integrated, temporary excess returns are arbitrated away and securities with identical expected risk and cash flows are priced the same. As a result, overseas listing is not necessary. Real world evidence, however, suggest that capital markets are partially integrated at best, therefore companies may benefit from dual listing of their shares equal to the degree of market segmentation. The partial or mild segmentation theories of the capital market that are developed or applied by Stapleton and Subrahman (1977), Errunza & Losq (1985), Eun & Janakiramanan (1986), Hieltala (1989), Foerster & Karolie (1999), and Douka & Switzer (2000) are based on this assumption.

The present study examines the impact of dual listing of Australian common stocks that were dually listed on New NZSE between 1986 and 2000 and attempts to answer some questions surrounding the potential benefits of these listings. The period under study is marked by the deregulation of financial markets in both Australia and New Zealand. The process of deregulation in Australia and New Zealand started simultaneously in 1983-1984, but were implemented at a different pace. The deregulatory reforms in New Zealand were the most comprehensive reforms in the OECD and were extremely rapid within the financial sector, especially in the first two and half years. These reforms converted the New Zealand capital market from being highly regulated to becoming one of the most deregulated markets in the world (Evans et al, 1996; Chay and Elswarapu, 2001). With regards to international listing of shares, NZSE has a liberal policy and recognizes the listing rules of other exchanges belonging to the FIBV (Federation Internationale des Bourse de Valeurs). It grants a listing to overseas issuers based on their compliance with the listing rules of their home exchange. The Australian Stock Exchange, however, has adopted a more conservative policy towards international listings, a company's eligibility is determined according to ASX rules. NZSE became exempt from these rules in 1997 by signing an agreement with ASX to mutually recognize each other's listing regulations.

Our study is important for several reasons. First, previous studies that have been conducted on the effect of dual listing have documented mixed results. Consequently, our study is expected to extend prior research and provides new insights about the implications of dual listing. Second, several dual listing studies have used Australian shares or Australian ADRs in conjunction with shares from other countries in their samples. However no research has been conducted on pure dual listing of Australian shares, therefore the findings of the present study are expected to add a fuller dimension to the literature in this area. Third, integration of financial markets in recent years and willingness of institutional investors to buy shares overseas are expected to reduce the potential benefits of dual listing. Yet, 80% of dual listing of Australian shares (96 out of 120 companies) in New Zealand took place during 1986-2000, when the market was more integrated than any period before. This seems to be in contrast with the theoretical

prediction that international dual listing are directly related to the degree of market segmentation. In addition, benefits such as, increase in liquidity of shares or access to a broader investor base, don't seem to be primary reasons for Australian companies to list their shares in New Zealand. The present study attempts to find possible reasons for dual listing of shares in New Zealand, some of which may have no tangible financial benefits in the short term.

Research Questions and Hypothesis Testing

1. Previous studies suggest that share prices react favorably to dual listing. However, post-listing performance of up to one year is negative. The present study examines whether the listing of Australian shares on the NZSE has been accompanied by an increase in their value around the day of listing and examines their reaction to dual listing after that date.
2. Cross listing can divert order flow from domestic to foreign markets, reduce domestic market liquidity and the share price. This negative effect can be even more severe for stocks with low liquidity and an already small order flow. The present study examines whether the impact of dual listing on the value of shares is significantly different between low and high liquidity shares.
3. Managers of firms may list their shares overseas to widen the foreign ownership base. We test whether New Zealand listings of Australian shares have enhanced the investor's base. We use an increase in the total volume of trade after dual listing as a proxy for expanding the investors' base.
4. Overseas listing of shares is expected to change the company's risk exposure. Previous findings indicate that "Typically, companies diversify their market exposures with a decline in their home market betas and an increase in the foreign market betas" (Karolyi, 1998). The present study examines whether there is any decline in the home market and an increase in the New Zealand market betas due to dual listing.
5. Previous studies indicate that one of the benefits of dual listing is a drop in the cost of capital. The present study examines whether the cost of capital was reduced after the dual listing of stocks in New Zealand.
6. When overseas exchanges are located in different time zones, dual listing of shares is accompanied with extended trading hours within a 24-hour period. New Zealand time is two hours ahead of Australian time. The Stock Exchange is open for trading between 9:30 and 15:30. The ASX trading hours are between 10:00–16:00. As a result, dual listing of Australian shares expands trading by 2.5 hours within a 24-hour period. The extension of trading hours is expected to increase the volume of trade. According to Jones, Kaul, and Lipson (1994), an increase in the volume of trade has a direct impact on volatility. Since previous studies document that the volume of trade increases after dual listing, this should be accompanied by an increase in volatility. However, an increase in volatility has a transient and a permanent component. An increase in noise trading is expected to

primarily affect the transient component, while an increase in informed trading would increase the permanent component of volatility. In this study, we examine changes in volume of trade and changes in volatility after dual listing to see whether the liquidity of Australian shares improves after dual listing.

The rest of this paper is organised as follows. Section II reviews previous empirical research. Research methodology and sample specification is discussed in section III. We present empirical results in section IV. A conclusion is drawn in section V.

II. PREVIOUS EMPIRICAL WORKS

Various authors have examined the impact of dual listing on the value of shares, volatility of returns, systematic risk and the cost of capital. Most of this literature has been surveyed by McConnell et al. (1996) and Karolie (1998). More recent literature on international listing includes Foerster and Karolie (1998, 1999), Miller (1999), Chan et al. (2000), Douka & Switzer (2000), Hargis (2000), and Patro (2000). The overall findings of these studies indicate that:

1. Excess return before and during the listing period is positive and after the listing date is negative.
2. Volatility of return increases after the listing day. If, according to noise trading hypothesis, this increase is accompanied by an increase in the correlation of returns, the liquidity of shares is not effected. If the correlation of returns is not statistically significant, findings are consistent with private information hypothesis and the liquidity of shares is increased due to an increase in informed trading activities.
3. The beta or systematic risk of the domestic market drops and the beta of the foreign market slightly increases.
4. Finally, dual listing is accompanied by a small but significant percentage point decrease in the cost of capital.

III. DATA AND METHODOLOGY

Data

The sample of Australian shares listed overseas was collected from the ASX. The price, volume and All Ordinaries Accumulation Index data were collected from the Security Industry Research Center of Asia-Pacific (SIRCA) database. The data on the listing date of Australian companies in New Zealand, the volume of trade after listing, and the NZSE Gross Index time series were collected from the NZSE. The monthly stock index data for Australia and New Zealand was collected from Morgan Stanley Capital International. 90-day Treasury note monthly data for Australia and New Zealand and Treasury bond monthly data for the United States was collected from the International Financial Statistics database. Monthly time series are denominated in US dollars.

As we discussed earlier, there are 120 companies that have had their shares dually listed by the NZSE. However, the date of listing for the period prior to 1986 is not available. This reduced our sample to 99 shares. Lack of regular daily data or an insufficient number of observations around the listing date for some shares (due to proximity of the listing date to present time or simultaneous listing of shares on the ASX and the NZSE) limited our sample to 50 companies.

A more comprehensive study could include data on announcement date as well as listing date. Kadlec and McConnell (1994) state that in an efficient market, the valuation effects of listing should be incorporated in the stock price at the initial announcement date. However, data for application dates and acceptance dates are not available in the case of Australian shares listed on the NZSE. As a result, we have limited our study to the listing date. Previous studies on the impact of dual listing on the value of shares around the announcement date have had mixed results. Some studies for the United States, for example, Ting et al. (1994), evaluated returns for the application date, the acceptance date, and the actual listing date of 346 US companies on ten different foreign exchanges. They found no abnormal return around the application and the acceptance dates. However, Kadlec & McConnell (1994) and Miller (1999) found significant excess return around the announcement date.

Methodology

The present study applies event study methodology, specifically the market model, as described by Brown & Warner (1985) and McKinley (1997) in order to examine the effect of dual listing on the stock return.

The parameters of the market model are estimated by using 200 trading days before the event period (days -250 to -51). The All Ordinaries Accumulation Index, which includes stocks with dividends re-invested, serves as the market index. We adjusted share prices with the dividend dilution factor to make them consistent with data on the All Ordinaries Accumulation Index.

Excess return for each company is calculated as the difference between actual return and estimated return from the market model for various intervals within an event period of 200 days (day -50 to +150). Then, estimated excess returns are averaged across each day in the event period for all companies in each sample. After estimating the average daily excess return the cumulative average excess return is calculated during the event period.

To test for statistical significance, each stock's excess return is standardized by the standard deviation of its forecast error. Two-tailed t-tests are used to decide if the average excess return and cumulative average excess return, respectively, differ significantly from zero during the event period. A Z-test is, also, used to decide whether the percent of companies with excess returns is significantly different from an average of 50 percent.

Liquidity is an important attribute of common stocks because of its potential effect on the value of shares. Finance theories and empirical findings suggest that the liquidity of

securities lower the cost of capital, which in turn has a favorable impact on share prices (Amihud and Mendelson, 1986). The present study examines how pre-listing liquidity of Australian shares affects the behavior of the market around dual listing time. We use two of the volume-based measures, which have been previously adopted by Khan & Baker (1995), average daily trading volume and the liquidity ratio, to assess the effect of dual listing on the liquidity of shares.

The liquidity ratio measures the average dollar volume of trading to the average price change during some time interval. The following equation gives the liquidity ratio as:

where:

P_{jt} = Price of the stock j on day t;

V_{jt} = Volume of the stock j on day t; and

$|AP_{jt}|$ = Absolute value of the percentage change in the price of stock j on day t.

The value of L_{jt} represents the sensitivity of the share's value with respect to a one percent change in the stock price.

Two liquidity measures are estimated for each stock over the period -200 to -51. The full sample is divided at the median into low and high liquidity sub-samples. Two tail t-tests are used to examine how the stock return for the low liquidity group differs significantly from the return of the high liquidity group.

IV. EMPIRICAL RESULTS

Excess Return

The first research question focuses on learning the impact of dual listing on stock returns. The null hypothesis is that the excess returns do not differ significantly from zero around the dual listing date. Rejecting the null hypothesis shows the existence of significant excess returns during that period.

Table 1 presents the results of the event analyses around the dual listing date for the full sample and the sub-samples partitioned by the liquidity ratio. Panel A shows a negative market reaction of -0.428 percent on the dual listing day. However, this figure is not statistically significant at the conventional levels. As a result, we accept the null hypothesis suggesting that dual listing has no significant effect on the value of shares in the event day. The average daily return is 0.654 percent for the week before and -0.130 percent after the listing date. These figures, however, are not statistically significant. The result of Z-tests show that only percentage of companies with positive or negative excess returns are not statistically different from the average of 50 percent. Overall, the signs of excess returns for the full sample are consistent with previous findings. However, a low level of t-statistics indicate that dual listing of Australian shares on the NZSE have no considerable impact on the value of shares on the day of listing, a week before and a week after.

Panel B presents the impact of dual listing for high liquidity stocks. The average return on the date of listing is 0.09 percent and is statistically insignificant. The average daily return for the week before the day of listing is -1.27 percent and is marginally significant at the 10 percent level. The average daily return for the week after the day of listing is 0.32 percent and is statistically insignificant. The result of Z-tests suggest that only percentage of companies with positive excess daily returns, during the week after the day of listing, is marginally significant at the 10 percent level. The result of the Z-test for the day of listing and for the week prior to the event day indicate that percentage of companies with positive or negative excess return are not significantly different from an average of 50 percent. The signs of excess return for this sub-sample are in contrast with previous findings.

The impact of dual listing on low liquidity stocks is presented in panel C of table 1. The average daily excess return in the week before the day of listing is 2.88 percent and is marginally significant at the 10 percent level. The average rate of return on the event day and the week after the event day is -0.79 percent and -1.82 percent, respectively. However, they are not statistically significant at the conventional statistical levels. The percentage of companies with positive daily excess return in the period before the event day is significantly different from the average (50 percent) at the 5 percent significance level. The Z-statistics indicate that the percent of companies with negative average excess return on the event day is not statistically different than the average. The percent of companies with negative average excess return on the week after the event day is statistically significant at the 10 percent level. The signs of excess return for this sub-sample are consistent with previous findings

Overall, the results in panel A for the full sample and in panel C for the low liquidity stocks are more consistent with previous findings that excess rate of return before event day is positive and after event date is negative. The results also suggest that the negative impact of dual listing on the NZSE is more pronounced for low liquidity stocks.

Table 2 presents the estimated cumulative excess return for 50 days before, to 150 days after the event day, for the full, high liquidity and low liquidity samples. In all three

cases, the negative excess return starts to accumulate with a varying degree before the event day. However, they only become statistically significant several weeks afterwards and remain highly significant until the day of +150. The maximum level of cumulative excess return for the full sample and the low liquidity samples are 20.99% and 27.65%, on the day of +140, respectively. The maximum level of cumulative excess return for a high liquidity sample is 21.28% on the day +150. As we discussed in part II, the announcement date for dual listing of Australian shares in New Zealand is not available. Previous findings indicate that the average gap between announcement and actual listing date is 10 weeks. If Australian shares have shown a negative excess return after the announcement date, this might be an explanation for the accumulation of negative excess return prior to the listing day in our study.

Previous studies indicate that the magnitude of negative excess returns that are due to dual listing for low liquidity stocks are higher than for high liquidity stocks. However, we didn't find any significant difference between excess returns in these two sub-samples. As a result, the following analysis in table 2, 3, and 4 has only been conducted on the full sample. Also, the estimated excess returns for sub-samples partitioned by the median of volume is very similar to the sub-samples partitioned according to liquidity ratios and they are not reported here.

Trade Volume

Table 3 presents the results of estimated changes in average daily trading volume and the volatility of returns. Panel A shows that the average volume of trade in Australia has dropped by 13.92 percent, from 601771 to 528247 shares during 125 (-150 to -25) days before, to 125 (+25 to +150) days after the event day. This figure is statistically significant at the 10 percent level. Z-test also indicates that 64 percent of companies in the full sample show a drop in the volume of trade, a deviation of 14 from 50 percent. This deviation is statistically significant at the 10% level. This may seem to indicate that New Zealanders and some international investors have shifted their trade to New Zealand after dual listing. However, the average daily volume of trade in New Zealand during 150 days after dual listing was only 3289. According to NZSE sources, many Australian stocks that are listed on the NZSE only provide a channel through which New Zealand investors can easily track company announcements, find out when dividends are paid on the shares, and so on. Technically, these stocks are tradable, but almost never do so. From the total sample in the present study, 52 percent of companies seem to be of this sort, showing no reported trade during 150 days after the dual listing.

Panel A of table 3 also presents a change in the overall average daily volume of trade in Australia and New Zealand of -70235 shares. This is equivalent to a drop of 13.13 percent and is statistically significant at the 10 percent level. Z-test also indicates that 64 percent of companies in the full sample show a drop in the volume of trade. This figure is identical to the figure for Australia because the average volume of daily trade for the stocks that are actively traded do not supersede the decrease in the average volume in Australia. This figure is statistically significant at the 10 percent level. Net decrease in the volume of trade after dual listing is a sign of downward shift in the investors' base.

Before making any conclusion with respect to changes in liquidity, we will examine the estimated changes in the volatility of return.

Volatility of Return

Results presented in panel B of table 3 indicate that the volatility of returns, shown by average variance, has increased by 9.73 percent during 125 (-150 to -25) days before, to 125 (+25 to +150) days after the event day. However, the magnitude of t-statistics indicates that this figure is not statistically significant. This result is consistent with the Z-test which reveals that the number of companies with an increase in their volatility above 50 percent is zero. Consequently, we conclude that volatility of return has not significantly changed due to dual listing.

The combined effects of volume and volatility indicate that the liquidity of Australian shares after dual listing has marginally decreased. This is in sharp contrast with previous findings that liquidity of shares after dual listing will increase.

Beta

Panel A in Table 4 presents the change in average beta or systematic risk for 125 (-150 to -25) days before, to 150 (+25 to +150) days after the event day. Consistently with the previous studies, the average beta in Australia dropped by 3.55 percent from 0.487 to 0.470. The percent of companies with drop in their beta is 56%. However, the magnitude of t-statistics and the Z-test show no significant change in the systematic risk.

Reported results in panel B of table 4 show that systematic risk for New Zealand dropped by 24.53 percent, from 0.264 to 0.212 during 125 (-150 to -25) days before, to 125 (+25 to +150) days after the event day. The magnitude of t statistics and the Z-test indicate that beta has not significantly changed. The lower reported beta after dual listing for New Zealand is not consistent with the result of previous studies.

Market Risk Premium and Cost of Capital

Panel C in table 4 presents the market risk premium for Australia and New Zealand and the estimated changes in the cost of capital. The procedures followed are based on Karolie's (1998) paper. Market risk premium is the mean market return in excess of the risk free rate based on monthly data from January 1982 to June 2000. We used Morgan Stanley Capital International (MSCI) indices as a proxy for the Australia and NZ market data. We also used Australian 90-day T-Note, NZ 90-day T-Note, and US 90-day T-Bond yields as proxies for risk free interest rates. These data and estimated changes in the cost of capital are denominated in US dollars.

Changes in the cost of capital are estimated as the product of changes in domestic market systematic risk and domestic market risk premium plus the product of changes in foreign market systematic risk and the foreign market risk premium. Since the change in betas for Australia and New Zealand are not statistically significant, changes in the cost of capital

must be zero. We estimated changes in this cost to show that even if beta was significantly changed after dual listing, it had a minimal impact on the cost of capital. As we can see in panel C, the estimated changes in this cost varies from 0.17 basis points to -2.02 basis points, depending on whether we use T-note or T-bond yield as a proxy for the risk free rate. As a result, we conclude that dual listing of Australian shares has no effect on the cost of capital.

V. SUMMARY AND CONCLUSION

The present study investigates the impact of dual listing of Australian shares on the NZSE. The results suggest that the average excess return on the day of listing is negative but is statistically insignificant. The negative excess return starts to accumulate before the day of listing and becomes statistically significant several weeks after this date to the end of the period (day +150). These results are not significantly different between low liquidity and high liquidity sub-samples. The impact of dual listing on the volume of trade is negative and significant at the conventional statistical levels. The impact of dual listing on the volatility is positive and on the systematic risk and the cost of capital it is negative. However, the estimated changes of these coefficients are not statistically significant. In contrast to most of the previous findings, we can conclude that the New Zealand listings of Australian shares have no tangible financial benefits for the shareholders. If the lack of these benefits is due to capital market integration in two countries, the reason for the market anomaly of 21 percent negative excess return during 150 days after dual listing remains to be answered.

Table 1- Excess returns for Australian Stock Exchange shares dually listed on New Zealand Stock Exchange around the dual listing day

Average excess return (in percent)	t-Statistics	Percent of firms with positive or negative excess return [†]	Z-test
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Panel A: Full sample

Average Days -5 to -1	0.65	0.61	60%	1.00
Day +0	-0.43	-0.89	50%	0.00
Average Days +1 to +5	-1.30	-1.21	48%	0.20

Panel B: High liquidity sample

Average Days -5 to -1	-1.27	-1.35 ^{***}	56%	0.60
Day +0	0.09	0.21	56%	0.60
Average Days +1 to +5	0.32	0.34	64% [*]	1.40 ^{***}

Panel C: Low liquidity sample

Average Days -5 to -1	2.88	1.43 ^{***}	68% [*]	1.80 ^{**}
Day +0	-0.79	-0.88	56%	0.60
Average Days +1 to +5	-1.82	-0.90	64% [*]	1.40 ^{***}

***Statistically significant at the 10% level

** Statistically significant at the 5% level

* Statistically significant at the 1% level

⊕ Depending on the sign of average excess return

Table 2- Accumulated excess returns for Australian Stock Exchange shares dually listed on the New Zealand Stock Exchange around the dual listing day

Period	Full sample		High liquidity sample		Low liquidity sample	
	Cumulative Average Return (in %)	t-Statistics	Cumulative Average Return (in %)	t-Statistics	Cumulative Average Return (in %)	t-Statistics
-50	-0.52	-0.76	-0.76	-1.28	-0.24	-0.19
-45	0.020	0.017	-0.26	-0.27	-0.64	-0.32
-40	-1.06	-0.67	-2.03	-1.53	-1.939	-0.68
-35	-1.17	-0.61	-2.43	-1.49	-1.661	-0.48
-30	-2.06	-0.94	-2.38	-1.27	-4.399	-1.11
-25	-1.83	-0.75	-1.34	-0.64	-4.694	-1.05
-20	-1.64	-0.61	-1.05	-0.46	-5.172	-1.05
-15	-1.47	-0.51	-1.50	-0.60	-4.935	-0.93
-10	-1.29	-0.421	-0.89	-0.34	-2.653	-0.47
-5	-1.77	-0.54	-1.37	-0.48	-4.838	-0.80
-1	-0.78	-0.23	-2.64	-0.89	-1.96	-0.31
+0	-1.20	-0.35	-2.55	-0.85	-2.75	-0.43
+1	-1.79	-0.52	-2.03	-0.67	-4.06	-0.63
+5	-2.08	-0.58	-2.18	-0.70	-4.56	-0.68
+10	-2.96	-0.79	-2.24	-0.69	-5.76	-0.83
+15	-3.76	-0.96	-2.87	-0.84	-7.09	-0.98
+20	-4.40	-1.09	-3.50	-0.99	-6.88	-0.92
+25	-5.29	-1.26	-4.14	-1.14	-8.02	-1.03
+30	-4.81	-1.11	-5.03	-1.34***	-8.91	-1.11
+35	-5.38	-1.21	-4.94	-1.27	-9.32	-1.13
+40	-6.67	-1.45***	-5.90	-1.48***	-9.43	-1.11
+45	-7.43	-1.58***	-6.32	-1.54***	-11.67	-1.33
+50	-6.66	-1.38***	-6.76	-1.61***	-8.86	-0.99
+60	-7.94	-1.57***	-9.00	-2.04**	-9.46	-1.00
+70	-7.71	-1.46***	-8.19	-1.77**	-8.42	-0.86
+80	-9.18	-1.67***	-9.64	-2.01**	-11.61	-1.13
+90	-9.22	-1.62***	-9.64	-1.94**	-11.16	-1.05
+100	-10.23	-1.73**	-10.14	-1.97**	-13.09	-1.19
+110	-11.78	-1.93**	-11.88	-2.23*	-15.28	-1.35***
+120	-15.06	-2.30*	-14.13	-2.58*	-17.95	-1.53***
+130	-18.44	-2.85*	-17.07	-3.02*	-24.01	-1.99**
+140	-20.99	-3.16*	-18.38	-3.17*	-27.65	-2.23*

+150 -17.29 -2.54* -21.27 -3.58* -21.93 -1.73**

***Statistically significant at the 10% level

*Statistically significant at the 5% level

* Statistically significant at the 1% level

Table 3. Pre- and post-dual listing changes in average daily trading volume and volatility of returns for ASX dually listing on the NZSE from 1986 to 2000

Panel A: Average daily volume

Domestic market:

Period prior to the day of listing 601771

Period following to the day of listing 528247

Change in volume -73524

t-statistics for the significance of change in average volume -1.53***

Percentage of companies with increase in their trading volume 36

Percentage of companies with decrease in their trading volume 64

Z-test for the significance of percentage of companies with

increase in their volume of trade (relative to average) 1.4***

New Zealand market:

Average daily volume after dual listing 3289

Total (Australia plus New Zealand)

Change in average daily volume after dual listing -70235

t-statistics for the significance of decrease in trading volume -1.52^{***}

Percentage of companies with increase in their trading volume 36

Percentage of companies with decrease in their trading volume 64

Z-test for the significance of percentage of companies with decrease in their volume of trade (relative to average) 1.4^{***}

Panel B: Volatility

Ratio of post-to pre-listing variances 1.10

t-statistics for the significance of change in variance 0.86

Percentage of companies with increase in their volatility 50

Percentage of companies with decrease in their volatility 50

Z-test for the significance of percentage of companies with decrease in their volatility (relative to average) 0.00

*** Statistically significant at the 10% level

** Statistically significant at the 5% level

*Statistically significant at the 1% level

Table 4. Pre-and post-dual listing changes in systematic risk and estimated cost of capital for ASX dually listing on the NZSE from 1986 to 2000

Panel A: Changes in systematic risk (beta) for Australia

Average beta for period prior to the day of listing 0.49

Average beta for period following to the day of listing 0.47

t-statistics for the significance of change in beta 0.43

Percentage of companies with an increase in their beta 44

Percentage of companies with a decrease in their beta 56

Z-test for the significance of percentage of companies with decrease in their beta (relative to average) 0.60

Panel B: Changes in systematic risk (beta) for New Zealand

Average beta for period prior to the day of listing 0.26

Average beta for period following to the day of listing 0.21

t-statistics for the significance of change in beta 0.79

Percentage of companies with an increase in their beta 50

Percentage of companies with a decrease in their beta 50

Z-test for the significance of percentage of companies with decrease in their beta 0.00

Panel C: Market risk premium and changes in the cost of capital

Market risk premium for Australia

In excess of Australian 90 day T-Note 0.047

In excess of US 90 day T-Bond 0.086

Market risk premium for NZ

In excess of Australian 90-day T-Note -0.014

In excess of NZ 90-day T-Note -0.018

In excess of US 90-day T-Bond 0.024

Changes in the cost of capital based on the combination

Of different market risk premiums:

$(0.470 - 0.487)(.047) + (0.212 - 0.264) (-0.0136) = -0.008\%$ or -0.08 basis points

$(0.470 - 0.487)(.047) + (0.212 - 0.264) (-0.0184) = 0.017\%$ or 0.17 basis points

$(0.470 - 0.487)(.086) + (0.212 - 0.264) (0.0236) = -0.202\%$ or 2.02 basis points

*** Statistically significant at the 10% level

** Statistically significant at the 5% level

*Statistically significant at the 1% level

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