

MARKET INSIGHTS

# The impact of ADR listing on liquidity

*By Professor Alex Frino, Elisa Di Marco and Dr Andrew Leone*

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## INTRODUCTION

In this edition of Market Insights, Professor Alex Frino, Dr. Andrew Lepone and Elisa DiMarco from the Finance Discipline at the University of Sydney examine the impact on liquidity of introducing an American Depository Receipt program. Their work highlights the benefits of international listing on domestic liquidity. Once again, I commend them for the rigour with which they pursue these questions and the relevance of their research findings.

Regards



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# The impact of ADR listing on liquidity

*Professor Alex Frino, Elisa Di Marco and Dr Andrew Leone*

## EXECUTIVE SUMMARY

This paper assesses the impact an American Depositary Receipt (ADR) programme has on the issuing company. Utilising daily trade data of the 122 active Australian issued ADRs, covering the period 1983–2008, this paper specifically examines the liquidity effects of ADRs on the issuing companies.

This study documents an improvement in liquidity following the first trade of an American Depositary Receipt (ADR). Specifically we find that:

- The reduction of proportional bid-ask spread for active ADR companies is more than double that of comparative control stocks.
- Similarly, the increase in turnover for active ADR companies is more than double that of comparative control stocks.
- OTC-traded ADRs have a more significant effect on the overall change in liquidity than exchange-traded stocks.
- The time interval between listing and trading may be delaying the potential benefits of issuing an ADR.

## 1. Introduction

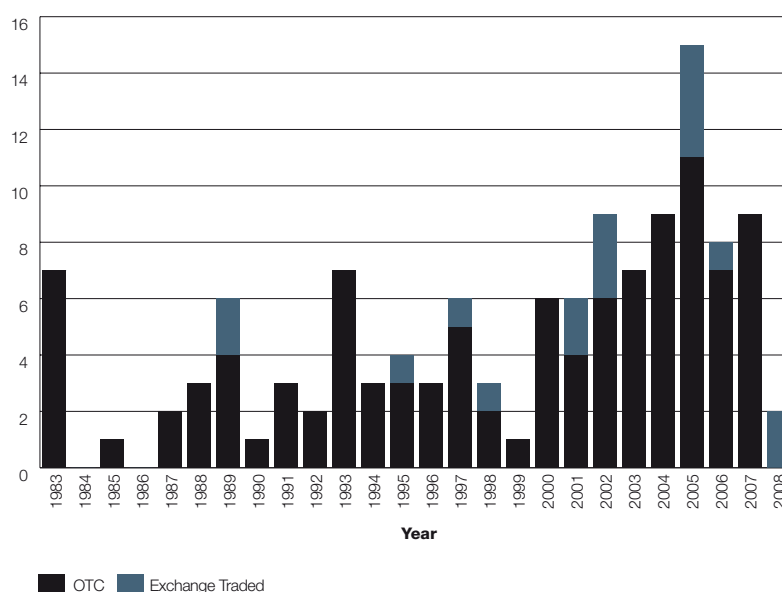
Cross-listing advocates argue that cross-listing is advantageous for both the listed company and its investors; an American Depositary Receipt (ADR) programme is one such method to cross-list. It is suggested that by cross-listing, the firm can diversify and broaden their investor base, potentially enhancing liquidity. Additionally, exposure to the global marketplace can strengthen the profile of the company, leading to heightened visibility, analyst following and media coverage. Benefits can also accrue to ADR investors. Trading in the investor’s home market reduces the cost of investing in an internationally diversified portfolio; costly currency conversions and high transaction costs are averted. Additionally investor access to information can be improved as local listing obligations must be adhered to<sup>1</sup>. For an in-depth analysis of cross-listing rationales and an evaluation of these motives, refer to Karolyi (1998) and Errunza et al. (1999).

This paper assesses whether or not these projected benefits are attainable through assessing the impact of ADR programmes on ASX listed companies. Utilising daily trade data of the 122 active Australian issued ADRs, covering the period 1983–2008, this paper specifically examines the change in liquidity in the home market after trading in the ADR commences.

## 2. What are American Depositary Receipts?

Depositary receipts (DR) were first issued by JP Morgan in 1927. Over the past decade DR programmes have gained momentum by Australian issuers; becoming a more popular means of attaining finance outside of the home market. Figure 1 demonstrates the growth in ADR issues. From 1983 to 2008, 141 ADRs<sup>2</sup> have been issued. The number of issued ADRs doubled during the period 2002–2008, demonstrating the acceleration in globalisation and investors desire to hold a diversified portfolio. A list detailing Australian ADR listing history was collated from the Bank of New York ([www.adrbny.com](http://www.adrbny.com)) and JP Morgan websites ([www.adr.com](http://www.adr.com)).

**Figure 1: Australian ADR Listing Trend 1983-2008. [Source BNY and JP Morgan].**



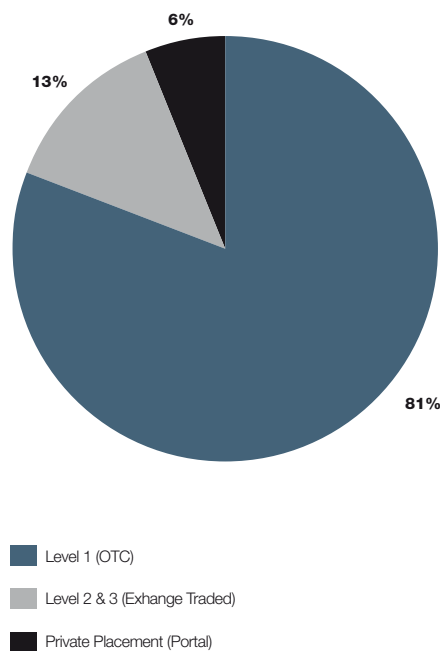
1 Refer to Section 2 detailing the adherence level to local listing requirements.  
 2 Between 1983 and 2008, 19 of these issues de-listed (from the de-listing of the company, acquisition of the company or de-listing the ADR).

A depositary receipt is a tradeable equity instrument which represents a stockholding in a security. They allow companies the potential opportunity to expand operations through exposure to international capital markets. DR programmes can be structured as an American Depositary Receipt (ADR) which allow companies outside of the United States access to American capital or as Global Depositary Receipts (GDR), which provide companies with an opportunity to access capital outside of their domestic market. DR programmes are attractive instruments for investors, allowing for international diversification without purchasing from international exchanges.

DRs can be sponsored or un-sponsored. Sponsored DR programmes are the predominant form of issuing. Companies that choose to issue a sponsored DR program utilise a depositary bank to manage investor relations. There are several categories of sponsored DR programmes that can be issued:

- *Sponsored Level 1 ADR:* Level 1 DR programmes are traded on the OTC Market (e.g. Pinksheets). These instruments are the simplest means of gaining access into the US capital market as full SEC registration and the provision of GAAP reports are not a requirement upon listing.
- *Sponsored Level 2 and 3 ADR Programmes:* Level 2 and 3 programmes are exchange listed instruments (e.g. NASDAQ, NYSE or AMEX). The issuance of either programme requires the adherence to US disclosure obligations and SEC registration. The primary difference between the two programs is the use of new and existing capital as the underlying stock in a Level 3 DR, while Level 2 DR programmes use existing capital.
- *SEC Rule 144A:* Capital is raised through the private placement of DR issues with qualified institutional buyers, retail investors are not permitted to enter into these transactions. Private placement DR programmes like Level 1 programmes do not require SEC registration. They trade on the Portal Quote system.

**Figure 2: Composition of Australian ADR Programmes [Source BNY and JP Morgan]**



### 3. Why Focus on Liquidity?

Liquidity is the ease at which securities can be bought and sold in the market without significantly affecting stock price. Liquidity is an essential characteristic to the success of any exchange. As the liquidity of a stock (or the market) increases, the greater the access available to investors; this increased visibility can be exhibited through a tightening/reduction in the bid-ask spread or an increase in turnover (or a combination of both). The question arises; by taking equity out of the home market (Australia) to form ADR's<sup>3</sup>, will liquidity in the stock be affected.

Prior research states that ADR programmes can improve the liquidity and growth opportunities of the home market and add value to the issuing firm, depending on geographical location. Results based on emerging markets reveal a central theme; the issuance of ADR's leads to a significant out-performance of their respective benchmarks, while developed markets have a more varied result.<sup>4</sup> It is widely accepted that emerging markets have a lower level of efficiency, integrity, regulation, supervision resources and investor rights. Listing in a more sophisticated market in the form of an ADR is a signal of the potential strength of the company, as companies that list Level 2 or 3 ADRs have to comply with more stringent reporting regulations. Research shows that this higher level of regulatory adherence is rewarded; that is, additional value is added to exchange traded ADRs from emerging countries. Australia being a sophisticated market is not bolstered by stricter reporting standards and the improvement of investor visibility as with emerging markets.

### 4. Data

To assess the impact of issuing an ADR on an ASX listed company, data from the 122 active Australian issued ADRs was gathered. The data collected from Bloomberg contained the first date the ADR was traded, closing prices, bid and ask quotes, daily high and low prices and daily volume. This information was used to calculate the following descriptive statistics:

- Proportional Bid-Ask Spread (PBAS): the bid-ask spread is the amount by which the asking price exceeds the offering (bid) price. The proportional bid-ask spread is used as a control for variations in stock price across stocks and over time. The proportional bid-ask spread is calculated by the following equation:

$$PBAS = \frac{\text{askprice}-\text{bidprice}}{(\text{askprice}+\text{bidprice})/2}$$

- Turnover: Turnover is calculated by summing the trade value of all trades executed on a day. Turnover is used in this study (instead of volume) to remove outliers that were present in excessively traded low-priced stocks.

$$\text{Turnover} = \text{Price} \times \text{Volume}$$

- Volatility: Volatility, a measure of risk, is calculated by taking the logarithm of the proportion of the high and the low price on each day for each stock.

$$\text{Volatility} = \ln \left[ \frac{\text{High}}{\text{Low}} \right]$$

For completeness, the results of the active ADR stocks are compared to control stocks. Control stocks were selected to best fit the industry and market capitalisation of the active ADR stock. In the cases where the industry didn't have a comparable stock, a firm with a comparative market capitalisation was selected.

The stocks with listed ADR's range from Australia's largest company, BHP Billiton, to small-cap stocks. Due to the large variation in sample companies, daily trading variables are adjusted for the mean and standard deviation; removing skewness and bias from the results, to allow for comparison. The abnormal activity

3 Equity is taken out of the home market to issue Sponsored Level 1 & 2 and Private Placement DR programmes. Sponsored Level 3 programmes use a combination of new and existing equity.

4 See Miller, 1999; Foerster & Karolyi, 2000; Doidge et al., 2004

of each variable is calculated by subtracting daily stock observations from a mean benchmark. The mean benchmark is based on the period, one year before the event window.<sup>6</sup> This benchmark period is chosen as it is not biased by the announcement and listing of the ADR.

For each of the descriptive statistics, the abnormal mean is calculated before and after the event date. The event date used in this study is the first day the ADR traded in the US market. The use of the first-trading day allows us to see the effect the trading in the stock’s foreign marketplace has on trading in the home market.

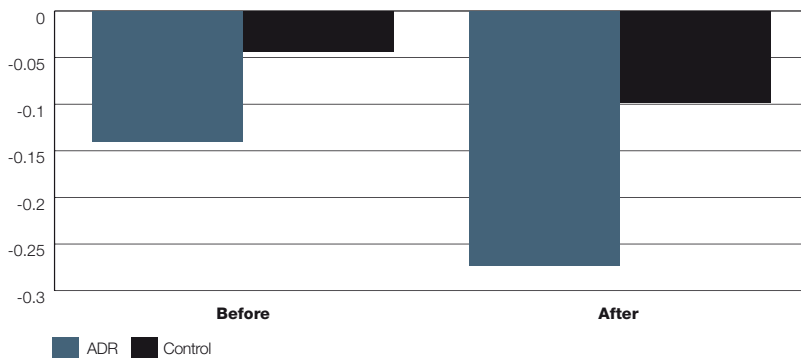
## 5. Results

Appendix 1 reports the summary results for the active ADR and their control stocks.

### 5.1 Active ADR Results

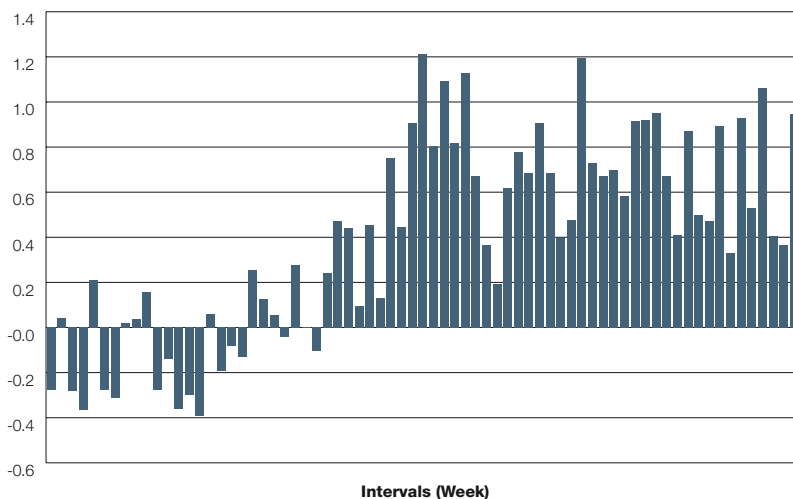
Figure 3 depicts the reduction in abnormal PBAS for ADR listed and control stocks. Over the event period, the PBAS tightened by 0.13361 standard deviations and 0.05498 standard deviations, respectively, in the 6 months after the first trading date.

**Figure 3: Standardised Proportional Bid-Ask Spread Comparison**



Turnover exhibits a similar development in liquidity. On average, turnover for ADR listed stocks increased by 0.129991 standard deviations compared to 0.05884 standard deviations for the control stocks in the 6 months following the first trading date of the DR programs. Figure 4 illustrates the sustained increase in the abnormal turnover after the first trades in the foreign market.

**Figure 4: Standardised Weekly Turnover**



<sup>6</sup> The event window is the six months before and after the first-trading date in the ADR.

The liquidity variables are all statistically significant at the 1% level. These results provide evidence that the issuance of an ADR can potentially improve the liquidity of the stock in the home market (Table 1 in the Appendix reports these summary statistics).

Previous studies by Faff (2002), Diodge (2004) and Ahmed (2006) report that for cross-listed Australian stocks, their risk profile increases marginally. Results of this study parallel these findings. Over the event period, volatility increased by 0.1425 standard deviations for active ADR stocks compared to a 0.02091 standard deviation decline in the control stocks. It is noted that for both the active ADR and control stocks, volatility is not statistically significant.

## 5.2 Decomposition of Listing Type

This section categorises the reaction to the first trading date by the type of listing. As described in Section 2, exchange traded ADRs consist of Level 2 and 3 DR programs, while Over-the-Counter ADRs consist of Level 1 and Private Placement DR programs. Results reveal that OTC stocks drive the overall results.<sup>7</sup> Although exchange traded ADR stocks account for a small percentage of the total, a breakdown of how the change is induced provides a useful insight for investors.

Table 2 (Appendix) summarises the liquidity change as OTC or Exchange induced. The tightening of PBAS as described in Section 5.1 is dictated by OTC stocks. The PBAS of OTC stocks tightens by 0.15822 standard deviations, while exchange traded increase by 0.0307 standard deviations. It is noted that the statistical significance of the results is very strong for OTC stocks. Exchange traded stocks are not statistically significant suggesting that the explanatory power of the variable is somewhat limited.

Over the event period the increase in turnover is shaped by OTC stocks. OTC stocks account for 60% of the increase in turnover, as highlighted in Table 1; the strength of OTC stocks is also emphasised through the high t-statistics. Importantly, the results for both categories have a strong statistical significance.

## 5.3 Event Date

Analysis was conducted using both the ADR listing date and the first-trading date as the event date. Results (not reported) indicate that stocks do not notably change around the listing date. Statistically, surrounding the listing date the significance of the results and the strength of the co-efficients was negligible. The use of the first-trading date (as discussed in the results Sections 5.1 and 5.2) demonstrates a stronger, more statistically significant outcome. Likewise, Oxford Metrica, a private research consortium utilise the first-trading date as the event date. Upon investigation it was also revealed that numerous stocks take more than a year to commence trading in their ADR. This is potentially delaying the positive outcome attainable from listing an ADR (as described in Section 5.1 and 5.2).

## 6. Conclusion

The overall results suggest that listing an ADR improves the liquidity and hence the visibility of the firm. The reduction in PBAS is also a representation of a reduction in transaction costs, reflecting improved efficiency of the market as a whole. Analysis pre- and post- the listing date and first-trading date reveals that liquidity improves in the period around the date the ADR first trades in the USA. Considering the delay in trading on numerous stocks, advocating and encouraging trading may potentially benefit stockholders and the market.

Finally an important conclusion is drawn from the separation of OTC and Exchange traded stocks. Prior studies directed by emerging countries reveal that exchange traded ADRs outperform OTC stocks. This research finds that for a sophisticated market, the adherence to US regulations and full SEC registration is not highly regarded. OTC stocks outperform exchange traded stocks, suggesting that the less complex the ADR the greater value added to the firm.

<sup>7</sup> It is noted that exchange traded stocks account for 13% of the analysed sample.

# APPENDIX

Table 1

*DESCRIPTIVE STATISTICS (ACTIVE ADR STOCK AND CONTROL STOCK RESULTS)*

This table reports descriptive statistics (standardised proportional bid-ask spread, standardised turnover and standardised volatility) for active Australian ADR stocks and Control stocks. For each of the variables, the standardised mean and median, median and change in mean is reported.

Panel A: 6month Results (3month before and after)	Active ADR Stocks		Control Stocks	
	Before	After	Before	After
<b>Standardised PBAS</b>				
Mean	-0.13962	-0.27323	-0.04361	-0.09859
Median	-0.37478	-0.49862	-0.26890	-0.32310
Mean Change	-0.13361		-0.05498	
Median Change	-0.12384		-0.05420	
T-Stat	-9.04		-3.79	
		(<.0001)***		(0.0002)***
<b>Standardised Turnover</b>				
Mean	0.01179	0.14170	-0.06078	-0.00194
Median	-0.18829	-0.10600	-0.24240	-0.22090
Mean Change	0.12991		0.05884	
Median Change	0.08229		0.02150	
T-Stat	11.01		5.55	
		(<.0001)***		(<.0001)***
<b>Standardised Volatility</b>				
Mean	-0.04724	-0.03299	-0.02971	-0.05062
Median	-0.20087	-0.20373	-0.22510	-0.25149
Mean Change	0.14250		-0.02091	
Median Change	-0.00296		-0.02639	
T-Stat	1.08		-1.49	
		(0.2807)		(0.1358)

\*\*\*, \*\*, \* denotes statistical significance at 1,5,10 percent respectively.

Table 2

*DESCRIPTIVE STATISTICS (LISTING DIFFERENCES)*

This table reports descriptive statistics (standardised proportional bid-ask spread, standardised turnover and standardised volatility) for active Australian ADR stocks. Table 2 distinguishes ADR stocks between OTC (OTC and Portal) and Exchange Traded (New York Stock Exchange, NASDAQ and American Stock Exchange). For each of the variables, the mean, median and change in mean is reported.

	OTC ADR Stocks		Exchange Traded ADR Stocks	
	Before	After	Before	After
<b>Standardised PBAS</b>				
Mean	-0.12832	-0.28654	-0.21397	-0.18327
Median	-0.34715	-0.49862	-0.49026	-0.49827
Mean Change		-0.15822	0.03070	
Median Change		-0.15147	-0.00801	
T-Stat		-10.00	0.74	
		(<.0001)***	(0.4582)	
<b>Standardised Turnover</b>				
Mean	0.01656	0.15307	-0.01814	0.07055
Median	-0.17921	-0.09359	-0.25033	-0.23287
Mean Change		0.13651	0.08869	
Median Change		0.08562	0.01746	
T-Stat		10.73	2.83	
		(<.0001)***	(0.0047)***	
<b>Standardised Volatility</b>				
Mean	-0.02853	-0.04033	-0.16308	0.01230
Median	-0.18385	-0.21003	-0.35181	-0.15436
Mean Change		-0.01180	0.17538	
Median Change		-0.02618	0.19745	
T-Stat		-0.83	4.83	
		(0.4048)	(<.0001)***	

\*\*\*, \*\*, \* denotes statistical significance at 1,5,10 percent respectively.

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