

THE EFFECTIVENESS OF A-REIT FUTURES AS A RISK MANAGEMENT STRATEGY IN THE GLOBAL FINANCIAL CRISIS

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ABSTRACT

A-REITs have been highly successful indirect property investment vehicles in Australia. However, the global financial crisis has had a significant impact on the performance of A-REITs in 2007-09. A-REIT futures were also established on the Australian Stock Exchange (ASX) in August 2002. This paper assesses the performance and trading of the A-REIT futures market over August 2002 – November 2009; particularly highlighting their significantly increased role by institutional investors during the global financial crisis. Using a number of scenarios, these A-REIT futures are also assessed for their effectiveness as a risk management strategy for institutional investors for hedging their A-REIT exposure during the volatility of the global financial crisis.

Keywords: A-REITs, A-REIT futures, risk management strategy, hedging, institutional investors, performance analysis, scenario analysis, global financial crisis

INTRODUCTION

A-REITs are the largest owners of institutional-grade property in Australia, with over \$200 billion in assets in diversified and sector-specific portfolios, and accounting for 54% of property assets under management (PIR, 2009a). This sees A-REITs as the second largest REIT market globally, accounting for 14% of the global REIT market capitalisation at September 2009 (Macquarie Securities, 2009). The significance of A-REITs is also a key factor in Australia being seen as the world's most transparent property market (JLL, 2008), with A-REITs enjoying a strong level of support by major institutional investors and superannuation funds (Newell, 2008). For example, major institutional investors with significant property securities funds include AMP, Centro, Deutsche, Colonial First State, BT and Vanguard (PIR, 2009a). Table 1 provides a general profile of A-REITs in 2009 to reflect their Australian and international stature.

Table 1: General profile of A-REITs: September 2009

Number of A-REITs: 65

Number of properties in A-REIT portfolios: 4,791

Total property assets: \$201 billion

Market capitalisation: \$83 billion

Percentage of Australian property assets under management: 54% (versus unlisted wholesale property funds (28%))

Global ranking: 2nd largest global REIT market (14%) (versus #1: US (47%))

Major A-REITs: Westfield (#1 globally), Stockland (#8), GPT (#18), CFS Retail (#28), with
seven A-REITs in top 50 global REITs

A-REIT sub-sectors: Diversified (37%), office (6%), retail (50%), industrial (7%)

Major diversified A-REITs: Stockland, GPT, Dexus

Major office A-REITs: Commonwealth Office Property, ING Office, Macquarie Office

Major retail A-REITs: Westfield, CFS Retail, Macquarie CountryWide

Major industrial A-REITs: Goodman Group, ING Industrial

Level of securitised property: 34% (versus US (6%), UK (4%), global (6%))

Level of A-REITs in Australian superannuation funds: 3% (versus unlisted property (7%))

Average level of debt: 36% (Westfield (40%), Stockland (17%), GPT (25%),
CFS Retail (28%))

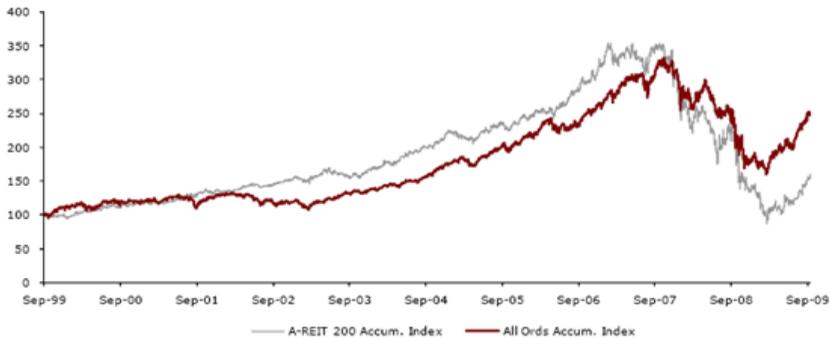
Overall potential for REITs and regulatory support: #2 REIT market in Asia-Pacific
(#1= Singapore)

Sources: Author's compilation from APRA (2009), Macquarie Securities (2009), PIR (2009a, b), Trust (2009), UBS (2009)

However, the global financial crisis has had a major impact on A-REITs in 2008-09; see Figure 1. This has resulted in significant volatility and loss of market

capitalisation, with the A-REIT market capitalisation reducing by 68% from \$150 billion to \$48 billion over September 2007 – March 2009 (PIR, 2009b). This GFC impact on A-REITs was more significant than that seen for the overall stockmarket. The global financial crisis has clearly highlighted the need for effective risk management strategies by A-REITs.

Figure 1: Performance of A-REITs versus shares: 1999 -2009



Source: PIR (2009b)

In August 2002, the Australian Stock Exchange (ASX) established an A-REIT futures market; this being a world first for this property finance sector. This enabled institutional investors to use A-REIT futures contracts to facilitate tactical asset allocation to protect the value of their A-REIT portfolios by hedging their A-REIT exposure. While a preliminary analysis of the development and performance of A-REIT futures was conducted over August 2002 – December 2003 (Newell and Tan, 2004), this only covered the early stages of the A-REIT futures market and did not cover the subsequent turbulent period for A-REITs during the global financial crisis over 2007 – 2009.

As such, this paper will assess the performance and trading of the A-REIT futures market over August 2002 – November 2009; particularly highlighting their increased role and significance during the global financial crisis of 2007 – 2009. Using a number of scenarios, these A-REIT futures will also be assessed for their effectiveness as a risk management strategy by institutional investors for hedging their A-REIT exposure during the global financial crisis.

Before undertaking this trading analysis, it is important to articulate the context of the impact of global financial crisis on A-REITs to highlight the need for A-REIT futures as an effective risk management strategy during a volatile market.

IMPACT OF GLOBAL FINANCIAL CRISIS ON A-REITs

Table 2 presents the performance of A-REITs compared to the other major global REIT markets. This clearly highlights the impact of the global financial crisis on A-REITs and the major mature REIT markets (eg: US, UK) in recent years. Table 3 also presents the performance analysis of A-REITs and the other major asset classes in Australia at September 2009. The lesser recent performance of A-REITs compared to the highly volatile stockmarket is clearly evident. This poor performance by A-REITs was also evident in each of the A-REIT sub-sectors; see Table 4. This under-performance by A-REITs has also clearly impacted on the performance and level of funds under management for the major property securities funds. While recent months have seen some degree of recovery by the A-REIT market (see Figure 1), this has not been to the same extent as that seen in most other global REIT markets; eg: annual return to November 2009 of -1% for A-REITs versus REITs in the US (40%), Singapore (85%), Hong Kong (65%), France (50%), UK (10%) and Japan (6%) (Macquarie Securities, 2009).

Table 2: Global REIT performance: September 2009

Country	Average annual total return (%)			
	1Y	3Y	5Y	10Y
Australia	-13.8%	-14.5%	-1.3%	7.4%
France	14.1%	1.6%	18.5%	NA
Hong Kong	15.0%	4.4%	5.6%	NA
Japan	11.3%	-3.4%	1.2%	NA
Singapore	14.7%	1.5%	13.8%	NA
UK	-36.9%	NA	NA	NA
US	-28.2%	-12.9%	1.3%	9.7%
Global	-18.2%	-11.2%	2.1%	10.2%

Source: Author's compilation from S&P (2009)

Table 3: A-REIT performance analysis: September 2009

Asset class	Average annual total return (%)			
	1Y	3Y	5Y	10Y
Direct property	-6.7%	5.5%	9.9%	10.6%
A-REITs	-23.0%	-18.7%	-4.6%	4.6%
Shares	7.4%	1.7%	9.7%	9.7%
Bonds	4.4%	6.2%	6.1%	6.1%

Source: Author's compilation from IPD/PCA (2009)

Table 4: A-REIT sub-sector performance analysis: September 2009

Asset class	Average annual total return (%)			
	1Y	3Y	5Y	10Y
A-REITs	-23.0%	-18.7%	-4.6%	4.5%
Office	-43.9%	-24.3%	-9.4%	0.1%
Retail	-8.9%	-10.3%	1.2%	7.9%
Industrial	-64.5%	-44.6%	-19.9%	-3.2%
Diversified	-29.0%	-23.3%	-9.3%	2.3%
International	-13.1%	-11.2%	-0.4%	6.8%
Stapled securities	-15.3%	-14.7%	-1.7%	6.2%

Source: Author's compilation from UBS (2009)

A major impact of the global financial crisis on A-REITs has been on the risk profile of A-REITs over 2007-2009 (DeFrancesco and Hartigan, 2009; Newell and Peng, 2009). While A-REITs changed their traditional rental income-focused strategy to a more aggressive growth strategy in recent years via increasing levels of debt, increased levels of international property and increased use of stapled securities, these A-REIT growth strategies were initially successful via effective risk management strategies adopted by A-REITs (eg: cheap debt, currency risk management) (Newell, 2006; Newell and McIntosh, 2007). However, the global financial crisis, including the major refinancing difficulties and stockmarket volatility, has seen A-REIT risk levels increase from 11% to 24% over the 15-month period of September 2007 – November 2008; in comparison, stockmarket risk only increased from 9% to 17% over this equivalent period (Newell and Peng, 2009). This has resulted in a significant loss of the traditional “low risk” defensive characteristics by A-REITs.

Similarly, the global financial crisis has seen A-REIT correlations with the stockmarket increase from $r= 0.37$ to $r= 0.75$ over September 2007 – November 2008 (Newell and Peng, 2009). This clearly reflects a significant loss of portfolio diversification benefits by A-REITs during the global financial crisis. This environment of reduced returns, increased risk and loss of portfolio diversification benefits by A-REITs during the global financial crisis has clearly highlighted the need to review the effectiveness of the risk management strategies used by A-REITs. As such, the following sections will provide specific details regarding the practical operational aspects of A-REIT futures and highlight the use of A-REIT futures as an effective risk management strategy by institutional investors for hedging their A-REIT exposure to protect the value of their A-REIT portfolios during the volatility of the global financial crisis.

SIGNIFICANCE OF A-REIT FUTURES

Development of property futures

With futures markets being well-established for commodities, financial/interest rates and stock index futures via significant major international futures markets (eg: Chicago Futures Exchange, London Futures Exchange, Sydney Futures Exchange), the benefits provided by futures contracts are significant. These include facilitating tactical asset allocation via synthetic portfolios, protecting the value of physical portfolios, allowing hedging of physical exposure, achieving leveraged returns, trading in a declining market, and reducing holding and transaction costs (Newell and Tan, 2004).

For US REITs, Giliberto (1993) developed a hedged REIT index, with Newell (1996) developing a hedged A-REIT index. Importantly, existing futures contracts for stocks, financial/interest rates, commodities and metals have been shown to not effectively hedge REIT returns (Liang et al, 1998; Oppenheimer, 1996). This has highlighted the need for specific REIT futures contracts for effective hedging of REIT returns. Jud and Winkler (2008, 2009) also showed the effectiveness of using US housing futures to transfer housing risk, but showed evidence of low trading volumes over 2006-2008.

Property futures for UK residential and commercial property were introduced in 1991 on the London Futures and Options Exchange. Trading in these property futures contracts were suspended in October 1991 due to non-viable trading volumes and artificially-supported trading volumes (Newell and Tan, 2004).

A-REIT futures were established on the Australian Stock Exchange (ASX) as part of the ASX Mini Index Futures market in August 2002. An equivalent A-REIT futures market was also established on the larger Sydney Futures Exchange (SFE) in June 2005; with the subsequent merger of the SFE and ASX in 2006 seeing only the A-REIT futures market on the ASX continuing to operate. This now sees over seven years of trading in the A-REIT futures market on the ASX. Operational aspects regarding A-REIT futures are discussed more fully in the next section.

Subsequent property futures markets have been established in various countries; these include:

- Dow Jones US Real Estate Index Futures; traded on the Chicago Board of Trade since January 2007
- US housing and direct commercial property futures; traded on the Chicago Mercantile Exchange since May 2006 and January 2007 respectively

- FTSE EPRA/NAREIT exchange listed futures for Europe and Euro Zone property stock indices involving 15 and 9 property companies respectively; traded on the Euronext Exchange since October 2007
- Eurex Property Index futures using the IPD UK All Property Index; traded on the Eurex since February 2009.

Whilst these futures markets cover both direct property and property companies, the A-REIT futures market on the ASX is the only REIT futures market available internationally, as well as having a longer timeframe than any of the above property futures markets.

A-REIT futures on the ASX

A futures market on the ASX was established in January 2002, with the introduction of the ASX Mini Index Futures market for futures trading. This ASX Mini Index Futures market is a much smaller volume futures market compared to the traditional high trading volume Sydney Futures Exchange market. A-REIT futures on this ASX futures market were subsequently introduced in August 2002, with the underlying index being the S&P ASX200 A-REIT index. These A-REIT futures form a part of the portfolio of futures contracts offered by the ASX futures market, which includes equities index futures, interest rate futures, energy futures (coal, electricity) and agriculture futures (grain, wool). An emissions trading futures market is approved for introduction in Q1:2010, with a water trading futures market currently being developed. Since August 2002, over 1 million A-REIT futures contracts have been traded at a total value of over \$16.6 billion¹; this reflects the overall significance and support of this A-REIT futures market as a risk management tool for institutional investors in protecting the value of their A-REIT portfolios.

Features of the A-REIT futures contracts on the ASX² include:

- futures contract value of \$10 per A-REIT index point
- futures contract maturity dates at 3rd Thursday in March, June, September and December
- full value of the A-REIT futures contract is not paid; instead, an initial margin is paid by both buyer and seller; this only represents a small percentage of the overall A-REIT futures contract
- initial margins vary depending on the volatility of the A-REIT index; they cover the maximum probable one-day move in the price of the A-REIT futures contract

¹ Author's calculation

² Full details of A-REIT futures contract specification is available at the ASX website (www.asx.com.au)

- initial margins can be cash or collateral (eg: shares)
- variation margins are also potentially payable; they are a cash amount paid to cover an unfavourable move in the trader's futures position; it is assessed daily
- costs can be offset against other futures contracts
- traded on the ASX options and futures trading platform
- futures contracts are registered, cleared and settled by the ASX's Australian Clearing House (ACH)
- cash settlement at maturity (net of margins) occurs on the next business day
- A-REIT futures contract costs include brokerage fees, with the ACH charging a registration fee of \$0.35 per A-REIT futures contract traded per side and a cash settlement fee of \$0.35 per futures contract per side
- market makers include individuals and firms; eg: Citigroup, JP Morgan.

Major A-REIT trading strategies include hedging strategies to protect the value of the A-REIT portfolio (via "selling" A-REIT futures) or speculative strategies to achieve leveraged returns for a small initial outlay (via "buying" A-REIT futures). For institutional investors seeking to reduce their risk and protect the value of their A-REIT portfolio in a volatile and declining market such as the global financial crisis, they would "sell" A-REIT futures and then agree to "buy" the underlying A-REIT index at a specified future date (eg: maturity). This would see any loss in value of the A-REIT portfolio offset by a profit on the A-REIT futures contract from subsequently "buying" the A-REIT index at maturity at a lower index value. The cost of this A-REIT risk management strategy (via initial margin) is significantly less than a put option, which requires the full initial contract premium to be paid.

From a practical perspective, the volatility of the market and the likelihood of a number of margin calls along the way to maturity of the A-REIT futures contract will see the futures trader needing to have sufficient collateral so as to stay in the trade. Similarly, given the buy/sell nature of A-REIT futures contracts, for every A-REIT futures trader that profits, another loses. This highlights the issue of both participants in this A-REIT futures contract having a clear outlook for the future direction of the A-REIT market.

The only research to date regarding A-REIT futures are Newell and Tan (2004) who assessed the development and preliminary performance analysis of A-REIT futures over 2002-2003, and Lee (2009) who assessed volatility transmission in A-REIT futures over 2004-2008. Lee (2009) found the volatility of A-REIT futures was more influenced by stockmarket volatility than by A-REIT volatility, as well as being more sensitive to negative news than positive news.

METHODOLOGY

Monthly trading volume information for A-REIT futures contracts was obtained from the ASX. This activity included the number of A-REIT futures contracts traded per month and the total value of A-REIT futures contracts traded per month. This was also collected for all other futures contracts traded on the ASX Mini Index Futures market. This trading activity data for A-REIT futures was available for August 2002 – November 2009; this being the full period for which A-REIT futures contracts have been traded. Full analysis of this A-REIT futures trading data was carried out to assess the significance of A-REIT futures trading over August 2002 – November 2009 and the increased usage and effectiveness of A-REIT futures trading during the global financial crisis. Details of the specific institutional investors participating in these specific A-REIT futures contracts to protect the value of their A-REIT portfolios are not available from the ASX; nor are details of the number of positions that are closed out before expiration or how many are settled at expiration. Similarly, the “size” of the various A-REIT futures trades (# of futures contracts) taken by specific institutional investors at specific times is not available from the ASX.

To assess the effectiveness of A-REIT futures as an A-REIT risk management strategy, a number of A-REIT futures contract scenarios were examined. These scenarios (6) are based on A-REIT futures market pricing at the relevant date and involved:

- #1: acting on initial A-REIT market uncertainty (September 2007)
- #2: acting on fuller evidence of A-REIT market uncertainty (December 2007)
- #3: acting on downturn and volatility following collapse of Lehman and other major financial players during GFC (September 2008)
- #4: delayed acting on scenario #2
- #5: partial hedging (50%) on scenario #2
- #6: missed reading initial market recovery (June 2009),

with A-REIT futures values for various A-REIT futures contracts obtained from Bloombergs. No margin calls along the way to contract maturity are included in this scenario analysis.

RESULTS AND DISCUSSION

A-REIT futures trading activity analysis

Table 5 presents a summary of A-REIT futures contract trading volumes over August 2002 – November 2009. Over this 7-year period, 1.1 million A-REIT futures contracts were traded at a total value of \$16.6 billion. This saw A-REIT futures as the most active futures contracts on the ASX, accounting for 57% of the number of all ASX futures contract trades and 75% of the value of all ASX futures contract trades over this period.

Table 5: Trading volume of A-REIT futures contracts: 2002-2009

Year	Number of A-REIT futures contracts traded	Value of A-REIT futures contracts traded	Average A-REIT futures contracts trading per month	
			#	\$
2002*	2,900	\$41.6M	580	\$8.3M
2003	45,204	\$675.6M	3,767	\$56.3M
2004	60,291	\$1,015.2M	5,024	\$84.6M
2005	76,948	\$1,456.5M	6,995	\$132.4M
2006	109,953	\$2,283.4M	9,163	\$190.3M
2007	233,505	\$5,416.7M	19,459	\$451.4M
2008	256,322	\$3,589.7M	21,360	\$299.1M
2009**	281,760	\$2,140.8M	25,615	\$194.6M
Total	1,066,883	\$16,619.5M	12,263	\$191.0M

Source: Author's compilation from ASX data

*: 5 months from August 2002 only

** : 11 months to November 2009 only

After an initial establishment period over 2002-2003, A-REIT futures have taken on increased significance. Since 2004, this has seen A-REIT futures contracts accounting for 48-80% of all ASX futures contract trades annually and 65-90% of the value of all ASX futures contract trades annually. By number of trades, A-REIT futures were the most active futures contract sector in 71% of months; similarly, it was the most active sector by value of trades in 82% of months. Only equities futures (ASX50, ASX200) and grain futures were the ASX futures sectors which exceeded A-REIT activity in the remaining 29% of months (by number) and 18% of months (by value).

Specific months where A-REIT futures trading were most active included:

- September 2007; # of futures contracts = 30,864 and value = \$750 million; reflecting the early stages of the GFC; reflects 14% of 2007 trading value; with the A-REIT index dropping 6% over the next three months
- December 2007; # of future contracts = 80,158 and value = \$1,715 million; reflecting clear evidence being available of the GFC impact; reflects 32% of 2007 trading value; with the A-REIT index dropping 8% in this month and 26% over the next three months
- September 2008; # of futures contracts = 40,404 and value = \$580 million; reflecting month of collapse of several major financial institutions (eg: Lehman, AIG, Merrill Lynch); reflects 16% of 2008 trading value; with the A-REIT index dropping 6% in this month and 30% over the next three months.

This summary analysis has clearly shown the increased usage of A-REIT futures by institutional investors to protect the value of their A-REIT portfolio in recent years; particularly since 2007. This is clearly reflected in the significantly increased average number of A-REIT futures trades per month in these latter years. The reduced average monthly value of A-REIT futures trades in 2008-2009 compared to 2007 is not a reflection of reduced trading activity, but more a reflection of the reduced value of each futures contract (\$10 per index point) with the significant reduction in the A-REIT index over this period (see Figure 1). The following section will specifically highlight the significance of A-REIT futures trading activity during the global financial crisis.

Significance of A-REIT futures trading during the GFC

To assess the significance of A-REIT futures trading during the global financial crisis, the A-REIT futures trading period of August 2002 – November 2009 was broken into the following four sub-periods for fuller analysis:

- GFC: September 2007 – November 2009 (27-months)
- Pre-GFC (#1): August 2002 – August 2007 (60-months); representing full period prior to GFC
- Pre-GFC (#2): May 2005 – August 2007 (27-months); representing 27 month period prior to GFC of equal timeframe to period of GFC
- Recovery: July 2009 - November 2009 (5-months).

Table 6 compares the A-REIT futures trading activity for these four sub-periods. The period of the global financial crisis has accounted for over 682,000 A-REIT futures contracts with a value of \$9 billion. This represents 64% of all A-REIT futures contracts and 54% of the value of all A-REIT futures contracts since 2002; clearly reflecting the increased use of A-REIT futures as a risk management strategy during the global financial crisis. This is further highlighted by the average monthly A-REIT futures trading activity shown in Table 6. This saw an average of over \$300 million per month in A-REIT futures contracts during the global financial crisis; representing a 74% increase over the average monthly value of futures contracts of \$191 million over 2002 – 2009.

Table 6: Use of A-REIT futures contracts during the global financial crisis

Event timeframe*	Number of A-REIT futures contracts traded	Value of A-REIT futures contracts traded	A-REIT futures contracts trading per month	
			#	\$
During GFC (27M)	682,835	\$8,999.3M	25,290	\$333.3M
Pre-GFC (#1) (60M)	384,048	\$7,620.2M	6,401	\$127.0M
Pre-GFC (#2) (27M)	242,454	\$5,293.4M	8,980	\$196.1M
Recovery (5M)	73,523	\$688.2M	14,705	\$137.6M
Total	1,066,883	\$16,619.5M	12,263	\$191.0M

*sub-period overlap does not see four sub-periods summing to the total A-REIT futures contracts trading activity

To more rigorously benchmark this increase in A-REIT futures trading activity during the global financial crisis, Table 7 (panel A) compares this A-REIT futures trading activity during the GFC with the corresponding levels of activity during the other three selected sub-periods. The significant increase in A-REIT futures contract activity during the GFC compared to the pre-GFC period is clearly evident, with an increase of over 150% in the average monthly value of A-REIT futures contracts (\$333M versus \$127M) and nearly a 300% increase in the average monthly number of A-REIT futures contracts (25,290 versus 6,401) compared to the pre-GFC (#1) period, with significant increases in activity also evident compared to the pre-GFC (#2) period. The recent tentative A-REIT recovery since June 2009 is also evident in a 58% decrease in the average monthly number of A-REIT futures contracts (25,290 versus 14,705) and a 41% decrease in the average monthly value of A-REIT futures contracts (\$333M versus \$138M) in this recovery sub-period in comparison to during the GFC. This reflects a degree of increased confidence in the recovery of the A-REIT sector since June 2009 and less concerns over the necessity to hedge their A-REIT portfolios by institutional investors.

Table 7: Increased usage of A-REIT futures contracts in GFC

Comparison	Increase in A-REIT futures contracts trading activity (average per month)	
	#	\$
Panel A: Sub-period analysis		
GFC Vs pre-GFC (#1)	+295%	+162%
GFC Vs pre-GFC (#2)	+182%	+70%
GFC Vs recovery	+72%	+142%
Panel B: Specific month analysis		
September 2007 Vs GFC	+22%	+125%
September 2007 Vs GFC (#1)	+382%	+491%
September 2007 Vs pre-GFC (#2)	+244%	+283%
September 2007 Vs recovery	+110%	+445%
December 2007 Vs GFC	+217%	+415%
December 2007 Vs pre-GFC (#1)	+532%	+1,250%
December 2007 Vs pre-GFC (#2)	+309%	+775%
December 2007 Vs recovery	+445%	+1,143%
September 2008 Vs GFC	+60%	+74%
September 2008 Vs pre-GFC (#1)	+531%	+357%
September 2008 Vs pre-GFC (#2)	+350%	+196%
September 2008 Vs recovery	+175%	+320%

Within the global financial crisis, the months of most A-REIT futures contract activity were September 2007 (\$750M), December 2007 (\$1,715M) and September 2008 (\$580M); with this activity corresponding to significant events in the GFC. Table 7 (panel B) compares these three specific months of most A-REIT futures contract activity with the previously selected sub-periods. The significance of these three specific months is clearly evident, with dramatic increases in the use of A-REIT futures contracts by institutional investors to protect the value of their A-REIT portfolios in these three particularly volatile months. These increases were highly significant compared to pre-GFC levels, but were also significant compared to the overall GFC period. Benchmarked against the GFC period, the increases in A-REIT futures contract values in these three months were 125% (September 2007), 415% (December 2007) and 74% (September 2008). This further reflects the response by institutional investors to use A-REIT futures contracts to protect the value of their A-REIT portfolios in these specific periods of extreme financial uncertainty during the global financial crisis.

Scenario analysis

To assess the effectiveness of A-REIT futures as an A-REIT risk management tool by institutional investors to hedge the value of their A-REIT portfolios during the global financial crisis, Table 8 presents six (6) scenarios that coincide with significant A-REIT “events” in the global financial crisis. These “events” relate to the financial uncertainty concerning A-REITs at September 2007, December 2007 and September 2008 (scenarios #1 - #5) and the potential recovery of A-REITs (scenario #6). These scenarios are assessed for the impact on a \$100 million A-REIT portfolio, with all scenarios considering A-REIT futures contracts to maturity, with no margin calls applied. Whilst these scenarios are simplistic, they highlight key scenarios for the use of A-REIT futures during the GFC, where the futures trader needed to have an outlook on the A-REIT market to implement the buying or selling of the A-REIT futures contract.

Scenario #1 coincides with the initial A-REIT market uncertainty in the GFC at September 2007. The futures trader’s outlook on the A-REIT market under this scenario is for a significant decline in the A-REIT market over this period of uncertainty and stockmarket volatility. This saw September 2007 as the second most active month for A-REIT futures contracts (by value), only exceeded by December 2007. Under scenario #1, the \$100 million A-REIT portfolio lost 12.3% of its value. However, by taking 4,054 A-REIT futures contracts to mature in December 2007, this would have covered the 12.3% loss on the \$100 million A-REIT portfolio. This highlights the effectiveness of A-REIT futures as a risk management strategy during this early phase of the GFC.

With December 2007 seeing fuller evidence of A-REIT market uncertainty in the GFC, it was the most active month for A-REIT futures contracts (by both value and number of contracts). Scenario #2 assesses the effectiveness of A-REIT futures contracts at December 2007. The futures trader’s outlook under scenario #2 was for further declines in the A-REIT market. Under scenario #2, the A-REIT portfolio lost 24.4% of its value. The use of 4,717 A-REIT futures contracts to mature in March 2008 saw this 24.4% loss in value covered; again, highlighting the effectiveness of A-REIT futures as a risk management strategy in the high volatility of the GFC.

Scenario #3 reflects the impact of the collapse of several major financial players (eg: Lehman) in September 2008. This increasing uncertainty in the GFC saw September 2008 being the third most active month for A-REIT futures by value of contracts. The futures trader’s outlook under scenario #3 was for another round of declines in the A-REIT market, following this renewed uncertainty. Under scenario #3, the \$100 million A-REIT portfolio lost 39.6% of its value. The use of 6,713 A-REIT futures contracts to mature in December 2008 saw this 39.6% loss in value covered.

Table 8: A-REIT futures scenario analysis

Scenario #1: Sept 2007 – Dec 2007		
Date	Stockmarket	A-REIT futures market
21 Sept	A-REIT index: 2439.6 A-REIT portfolio: \$100 million	A-REIT futures value: 2467 Action: sell 4054 A-REIT futures contracts valued at $4054 \times 2467 \times \10 = \$100,012,180
20 Dec	A-REIT index: 2138.8 A-REIT portfolio: \$87,670,110 Loss on A-REIT portfolio: \$12,329,890 (12.3% loss)	A-REIT futures value: 2145.3 Action: buy 4054 A-REIT futures contracts valued at $4054 \times 2145.3 \times \10 = \$86,970,462 Profit on futures contracts: \$13,041,718
Net profit*: \$711,828 (0.7%)		
Scenario #2: Dec 2007 – March 2008		
Date	Stockmarket	A-REIT futures market
21 Dec	A-REIT index: 2133.4 A-REIT portfolio: \$100 million	A-REIT futures value: 2120.1 Action: sell 4717 A-REIT futures contracts valued at $4717 \times 2120.1 \times \10 = \$100,005,117
20 March	A-REIT index: 1611.9 A-REIT portfolio: \$75,555,451 Loss on A-REIT portfolio: \$24,444,549 (24.4% loss)	A-REIT futures value: 1615.5 Action: buy 4717 A-REIT futures contracts valued at $4717 \times 1615.5 \times \10 = \$76,203,135 Profit on futures contracts: \$23,801,982
Net loss*: \$642,567 (0.6%)		
Scenario #3: Sept 2008 – Dec 2008		
Date	Stockmarket	A-REIT futures market
19 Sept	A-REIT index: 1481.7 A-REIT portfolio: \$100 million	A-REIT futures value: 1489.7 Action: sell 6713 A-REIT futures contracts valued at $6713 \times 1489.7 \times \10 = \$100,003,561
18 Dec	A-REIT index: 894.7 A-REIT portfolio: \$60,383,343 Loss on A-REIT portfolio: \$39,616,657 (39.6% loss)	A-REIT futures value: 887.7 Action: buy 6713 A-REIT futures contracts valued at $6713 \times 887.7 \times \10 = \$59,591,301 Profit on futures contracts: \$40,412,260
Net profit*: \$795,603 (0.8%)		

Scenario #4: Dec 2007 – March 2008 (delayed 2 weeks)

Date	Stockmarket	A-REIT futures market
4 Jan	A-REIT index: 2043.1 A-REIT portfolio: \$100 million	A-REIT futures value: 2050.5 Action: sell 4877 A-REIT futures contracts valued at $4877 \times 2050.5 \times \10 = \$100,002,885
20 March	A-REIT index: 1611.9 A-REIT portfolio: \$78,894,817 Loss on A-REIT portfolio: \$21,105,183 (21.1% loss)	A-REIT futures value: 1615.5 Action: buy 4877 A-REIT futures contracts valued at $4877 \times 1615.5 \times \10 = \$78,787,935 Profit on futures contracts: \$21,214,950
Net profit*: \$109,767 (0.1%)		

Scenario #5: Dec 2007 – March 2008 (50% hedge only)

Date	Stockmarket	A-REIT futures market
21 Dec	A-REIT index: 2133.4 A-REIT portfolio: \$100 million	A-REIT futures value: 2120.1 Action: sell 2359 A-REIT futures contracts valued at $2359 \times 2120.1 \times \10 = \$50,013,159
20 March	A-REIT index: 1611.9 A-REIT portfolio: \$75,555,451 Loss on A-REIT portfolio: \$24,444,549 (24.4% loss)	A-REIT futures value: 1615.5 Action: buy 2359 A-REIT futures contracts valued at $2359 \times 1615.5 \times \10 = \$38,109,645 Profit on futures contracts: \$11,903,514
Net loss*: \$12,541,035 (12.5%)		

Scenario #6: June 2009 – Sept 2009

Date	Stockmarket	A-REIT futures market
19 June	A-REIT index: 732.6 A-REIT portfolio: \$100 million	A-REIT futures value: 706.5 Action: sell 14,154 A-REIT futures contracts valued at $14,154 \times 706.5 \times \10 = \$99,998,010
17 Sept	A-REIT index: 938.3 A-REIT portfolio: \$128,078,078 Gain on A-REIT portfolio: \$28,078,078 (28.1% gain)	A-REIT futures value: 944.5 Action: buy 14,154 A-REIT futures contracts valued at $14,154 \times 944.5 \times \10 = \$133,684,530 Loss on futures contracts: \$33,686,520
Net loss*: \$5,608,442 (5.6%)		

*: net profit or net loss under each scenario reflects inability for whole number of A-REIT futures contracts to be able to exactly match \$100 million in A-REIT portfolio value.

As a variation on scenario #2, scenario #4 examines the issue of market timing, with the management decision to delay the use of A-REIT futures by two weeks in December 2007. The delayed decision saw the value of the portfolio drop 21.1% in value, with this loss being offset by using 4,877 A-REIT futures to mature in March 2008.

Similarly, as a variation on scenario #2, scenario #5 assesses the impact of only partially hedging the A-REIT portfolio value at December 2007; involving only hedging 50% of the \$100 million A-REIT portfolio. By using this 50% hedging strategy, the loss of 24.4% in the A-REIT portfolio value was only partially recovered by using 2,359 A-REIT futures contracts. This resulted in a loss of 12.5% in portfolio value; clearly highlighting the need for full hedging (rather than partial hedging) as the most effective risk management strategy for A-REIT futures.

With some evidence of an initial market recovery by A-REITs in June 2009, scenario #6 examines the impact of a missed reading of this A-REIT recovery by the institutional investors by continuing to use A-REIT futures. The futures trader's outlook under scenario #6 is for a further decline in the A-REIT market. In this case, this sees the futures trader significantly misreading the A-REIT market; resulting in a substantial loss on this futures contract. Under scenario #6, the \$100 million A-REIT portfolio increased in value by 28.1% to September 2009. Unlike the above scenarios, scenario #6 sees a \$34 million loss on the 14,154 A-REIT futures contracts used; resulting in a net loss of \$6 million. This loss offset clearly reflects the downside and loss potential from using A-REIT futures in an improving market.

PROPERTY IMPLICATIONS

This paper has clearly highlighted the impact of the GFC on A-REITs, and the use of A-REIT futures contracts as an effective risk management strategy by institutional investors for hedging their A-REIT exposure during the GFC. In particular, the timing of the use of A-REIT futures is important during critical times during the GFC; for example, September 2007, December 2007 and September 2008. This is clearly reflected in the significant levels of A-REIT futures contracts at these critical times. This high level of understanding and use of A-REIT futures contracts as an effective risk management strategy by Australian institutional investors is in strong contrast to the low levels of trading seen in the US housing futures market on the Chicago Mercantile Exchange (Jud and Winkler, 2009).

Whilst institutional investors have a range of risk management strategies available to protect the value of their A-REIT portfolios, this paper has clearly highlighted the effectiveness of A-REIT futures contracts to hedge their A-REIT exposure. A key ingredient in the success of implementing this A-REIT futures contract strategy by institutional investors is for the futures trader to have a clear outlook for the A-REIT

market; thus influencing the appropriate buying or selling strategy. This is further reinforced by the efficiency in pricing for these A-REIT futures. The maturity of the A-REIT futures market compared to property futures markets in the US, UK and Europe is a further measure of its acceptance as an effective risk management strategy for A-REIT institutional investors.

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