

MARKET INSIGHTS

Does the Sydney Futures Exchange
offer Trading Opportunities for
Global Institutions? June 2008 Update

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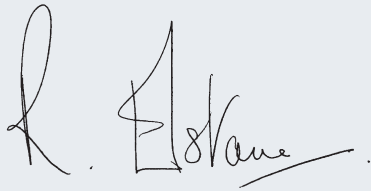
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FOREWORD

In this edition of Market Insights, Dr. Andrew Lepone and George Li from the Discipline of Finance at the University of Sydney update earlier work reported in the 2nd, 5th, 13th, and 21st editions of Market Insights. This work examines the extent of trading opportunities on the Sydney Futures Exchange for global institutions such as CTA's and hedge funds. I trust you will find this update valuable in examining the opportunities that SFE might present to your organisation.

Regards



Robert G. Elstone
Managing Director and Chief Executive Officer
ASX Limited



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Does the Sydney Futures Exchange offer Trading Opportunities for Global Institutions? June 2008 Update

Dr Andrew Lepone and George Li

EXECUTIVE SUMMARY

The aim of this paper is to assess whether there are new trading opportunities in SFE contracts relative to a suite of other contracts which are typically in the investment universe of global institutions such as hedge funds and global institutions. Using data from July 2005 to June 2008, the analysis focuses on (1) liquidity, (2) price volatility and correlations in returns, and (3) the likely effectiveness of trading rules based on historical returns (eg. momentum-type trading strategies). We examine the five most liquid contracts trading on the SFE, namely 90 Day Bank Accepted Bill futures, 30 Day Interbank Cash Rate, 3 Year Treasury Bond futures, 10 Year Treasury Bond futures and ASX SPI 200™ futures against the most liquid contracts in their respective asset classes. The key findings are as follows:

- SFE contracts are amongst the most liquid in the world in their respective asset classes, suggesting that the cost of trading these securities is likely to be quite low.
- The price volatility of SFE contracts is similar to other liquid futures contracts typically used by global institutions. Consequently, the magnitude of potential profits to be made from trading SFE contracts is similar to other contracts typically in the investment universe of global institutions.
- The correlation in price movements between SFE contracts and other contracts likely to be in the portfolios of global institutions are low. This implies that the addition of SFE contracts can provide new potential profit making opportunities, and can provide diversification benefits.
- The profitability of momentum-type trading strategies, or other trading rules based on predicting price movements on the basis of historical price movements, is likely to be as profitable (if not more so) for SFE contracts than those typically used by global institutions.

In summary, SFE contracts appear to provide new and potentially profitable opportunities for global institutions seeking to enhance their performance, which can be exploited at low cost.

1. Liquidity

One important consideration for global institutions is the liquidity of contracts. Liquidity determines the average size of the bid-ask spread, which represents the minimum cost of trading futures contracts, as well as slippage costs likely to be incurred in trading large blocks. In turn, bid-ask spreads and slippage reduce the profitability of trading a particular contract and hence the attractiveness of including them in an active portfolio. It is well established that the size of bid-ask spreads and slippage costs are related to the level of trading activity in a market.¹ Hence, to assess the liquidity of SFE contracts, we compare their trading volume to other actively traded contracts, which are likely to be in the portfolio of major global institutions.

We analyse every single futures contract in each asset class, as classified by Bloomberg. This allows us to provide a more accurate and complete ranking of futures contracts from around the world. Unfortunately examining volume gives a somewhat inflated view of the liquidity of contracts which are small in size. Contracts are therefore ranked based on their notional value, and converted to US Dollars for easier comparison.² Near contracts are the most liquid, with the exception of short term interest rate contracts, in which the first deferred is usually most active in trading. We take this into consideration by examining the most actively traded expiry series. Rankings for the top contracts in each underlying asset class are reported in Table 1.

The major futures contracts traded on SFE, namely (1) 90 Day Bank Accepted Bills, (2) 30 Day Interbank Cash Rate, (3) 3 Year and 10 Year Treasury Bonds and (4) ASX SPI 200™ are all amongst the 20 most actively traded contracts in the world, in their respective underlying asset classes. In particular, 90 Day Bank Accepted Bills are the 6th most actively traded short-term interest rate futures, the 30 Day Interbank Cash Rate is at 9th place, 3 Year and 10 Year Bonds are the 10th and 12th most actively traded long-term interest rate futures respectively, and SPI futures are the 16th most actively traded stock index futures. The SFE 90 Day NZ Bank Bill Futures, which has been increasing in popularity, is ranked 13th in short term interest rate contracts. Importantly, the top 20 futures contracts include those likely to be in the investment universe of global institutions such as futures on fixed income securities and stock indexes for US, Asian and major European markets.³ Consequently, the statistics provided in Table 1 suggest that the liquidity of SFE's contracts (in each underlying asset class) is high relative to those typically traded by global institutions.

1 See Aitken, Frino, Hill and Jarnecic (2004), "The impact of the introduction of electronic trading on bid-ask spreads: Evidence from futures markets in Hong Kong, London, and Sydney", *Journal of Futures Markets* 24(7), p 675-696.

2 Notional turnover is the product of the contract size and trading volume. The nominal contract size for interest rate contracts as well as the index multiplier for stock index futures was obtained from Bloomberg. All turnover values are converted to USD using daily exchange rate figures reported on Oanda.com.

3 Schneeweis, T., R. Spurgin and H. Kazemi (2004), 'Eurex Derivative Products in Alternative Investments: the Case for Managed Futures', *Economic and Financial Computing* 14(1), p 3-44.

Table 1

LIQUIDITY OF SFE FUTURES RELATIVE TO THE MOST ACTIVELY TRADED CONTRACTS IN THE WORLD – 1 JULY 2007 TO 30 JUNE 2008

	Contract	Exchange	Currency	Volume (No. Contracts)	Notional Turnover (USD Millions)
Panel A: Short-Term Interest Rate Futures					
1	90d Eurodollar	CME	USD	652,464,871	652,464,871
2	3m Euribor	Euronext	EUR	246,914,312	362,951,954
3	90d Sterling	Euronext	GBP	127,571,629	127,779,916
4	30d Federal Funds	CBoT	USD	20,926,532	104,632,660
5	3m Euroyen	TFX	JPY	30,730,038	27,714,822
6	90d Bank Accepted Bills	SFE	AUD	22,083,900	19,750,609
7	3m Can. Bankers' Acceptance	MX	CAD	11,870,637	11,730,426
8	3m Euroswiss	Euronext	CHF	10,649,318	9,551,647
9	30d Interbank Cash Rate	SFE	AUD	2,957,912	7,941,072
10	1m LIBOR	CME	USD	1,080,867	3,242,601
11	28d Mexican TIE	MexDer	MXN	162,749,322	1,502,376
12	3m Euribor	Eurex	EUR	734,025	1,080,607
13	3m NZ Bills	SFE	NZD	1,402,575	1,079,386
14	3m Euroyen	SGX	JPY	1,047,863	937,313
15	3m Euroyen	CME	JPY	276,923	247,715
16	3m Euroyen	Euronext	JPY	156,711	141,924
17	3m KLIBOR	BM	MYR	208,700	63,168
18	91d Mexican Cetes	MDX	MXN	3,393,513	31,766
19	90d Eurodollar	Euronext	USD	20,738	20,738
20	3m HIBOR	HKEEx	HKD	26,513	17,011

	Contract	Exchange	Currency	Volume (No. Contracts)	Notional Turnover (USD Millions)
Panel B: Long-Term Interest Rate Futures					
1	Euro-Bund	Eurex	EUR	309,795,827	45,342,369
2	US 10y T-Notes	CBoT	USD	331,352,555	33,135,256
3	Euro-Schatz	Eurex	EUR	191,229,448	28,104,262
4	Euro-Bobl	Eurex	EUR	168,039,553	24,668,163
5	US 5y T-Notes	CBoT	USD	189,504,803	18,950,480
6	US 2y T-Notes	CBoT	USD	84,432,498	16,886,500
7	Jap. 10y Bonds	TSE	JPY	11,739,394	10,661,268
8	US 30y T-Bonds	CBoT	USD	104,280,612	10,428,061
9	Long Gilt	Euronext	GBP	26,230,897	5,262,238
10	Aust. 3y T-Bonds	SFE	AUD	25,806,650	2,303,147
11	Korean 3y T-Bonds	KRX	KRW	13,471,079	1,414,991
12	Aust. 10y T-Bonds	SFE	AUD	15,525,568	1,383,360
13	Can. 10y Bonds	MX	CAD	7,926,211	784,412
14	Euro-Buxl	Eurex	EUR	1,377,242	201,890
15	Jap. 10y Bonds	Euronext	JPY	148,710	134,951
16	Jap. 10y Bonds Mini	SGX	JPY	1,015,194	91,429
17	Taiwan 10y Bonds	TAIFEX	TWD	459,514	73,087
18	Swiss Bonds	Eurex	CHF	379,639	34,453
19	Mexican 10y Bonds	MDX	MXN	1,586,939	14,939
20	Global 2040 Bond	BMF	USD	100,088	5,004

	Contract	Exchange	Currency	Volume (No. Contracts)	Nominal Turnover (USD Millions)
Panel C: Stock Index Futures					
1	S&P 500 E-Mini	CME	USD	521,568,020	37,027,581
2	DJ Euro Stoxx 50	Eurex	EUR	370,966,858	21,801,116
3	DAX	Eurex	EUR	48,380,492	12,949,122
4	KOSPI 200	KSE	KRW	47,034,265	5,750,783
5	S&P 500	CME	USD	15,611,911	5,529,398
6	FTSE 100	Euronext	GBP	34,880,040	4,282,996
7	NASDAQ 100 E-Mini	CME	USD	105,282,867	4,130,366
8	Nikkei 225	OSE	JPY	27,779,492	3,763,560
9	CAC 40	Euronext	EUR	47,247,765	3,628,093
10	Hang Seng	HKG	HKD	19,290,824	3,087,227
11	DJIA Mini	CBoT	USD	46,580,927	3,015,458
12	Amsterdam Exchange Index	Euronext	EUR	12361894	1,769,938
13	Topix	TSE	JPY	12,402,167	1,633,348
14	Nikkei 225	SGX	JPY	21,738,648	1,476,309
15	Swiss Market Index	Eurex	CHF	15,856,204	1,147,825
16	ASX SPI 200™	SFE	AUD	8,474,041	1,119,068
17	S&P CNX Nifty	NSE	INR	154,624,667	967,807
18	Nikkei 225 Mini	OSE	JPY	69,713,250	938,440
19	TAIEX	TAIFEX	TWD	14,759,323	799,529
20	BOVESPA	BMF	BRL	22,629,055	776,883

2. Volatility and Correlation

If a security has little price volatility over an investor's trading horizon, then the expected profitability from trading that security is low. Furthermore, if the returns on a security are strongly correlated with the returns on other securities (or combinations of securities) in an investor's portfolio, then it is unlikely to provide any new trading opportunities relative to the securities already in the investor's portfolio. Consequently, the following represent necessary (but not sufficient) conditions for a contract to provide a new trading opportunity:

- (i) it should provide considerable price volatility over an investor's trading horizon, and
- (ii) the correlation in returns on the contract and other securities in the investor's portfolio should be low.

To assess the extent to which SFE contracts are likely to provide new and profitable trading opportunities for global institutions, the price volatility of each contract is compared with other actively traded contracts in each asset class.⁴ Second, the correlation coefficient between the returns on SFE contracts and the returns on other actively traded contracts in the same asset class are calculated.

Table 2 reports the average price volatility of SFE and other contracts based on the 'true range'.⁵ We divide the true range in currency values by the current initial margin for each contract to provide a comparable measure of price volatility across contracts. This measures the average maximum potential profitability or return that can be generated from trading the contracts on a daily basis.

Panel A illustrates that there is considerable price volatility in both the 90 Day BAB Futures and 30 Day Interbank Cash Rate Futures. Panel B of Table 2 illustrates that the order of magnitude for price volatility of 3 Year and 10 Year Bond futures contracts are similar to (or higher than) those offered by Eurex contracts, which traditionally have the greatest liquidity. Finally, Panel C of Table 2 illustrates that the order of magnitude in volatility for ASX SPI 200™ futures is similar to other index contracts such as the S&P500, DAX, or DJ Euro STOXX 50. Overall, this analysis suggests that the profits which can be generated by trading SFE contracts is of similar magnitude to profits generated on contracts typically used by global institutions.

4 While we would like to analyse and present all available futures contracts, due to space limitations, we select a few from each asset class and geographic region. These selected contracts are analysed from Table 2 onwards.

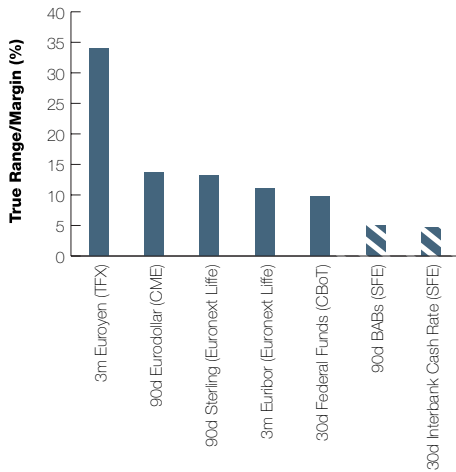
5 The true range is the maximum of the $(|close_{t-1} - low_t|, |high_t - close_{t-1}|, high_t - low_t)$. This has been converted to local currency values and divided by the margin for each contract.

Table 2

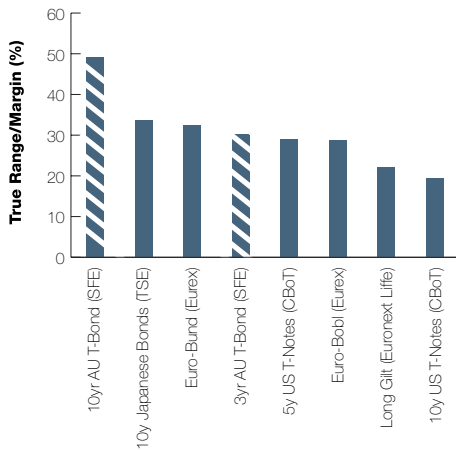
PRICE VOLATILITY EXHIBITED BY THE MOST ACTIVELY TRADED FUTURES CONTRACTS:

1 July 2005 to 30 June 2008

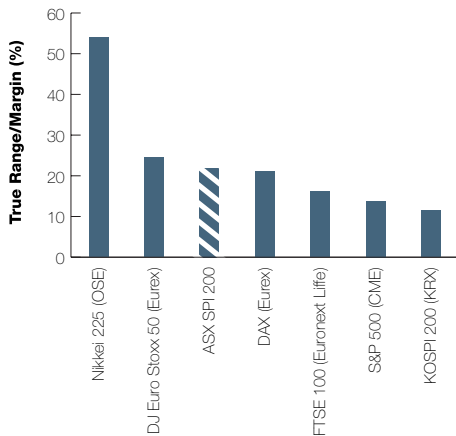
Panel A: Short-Term Interest Rate Futures



Panel B: Long-Term Interest Rate Futures



Panel C: Stock Index Futures



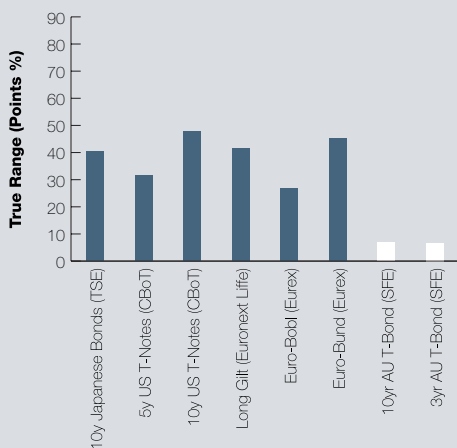
Technical Note 1:

A COMPARABLE MEASURE OF THE PRICE VOLATILITY OF SFE INTEREST RATE FUTURES

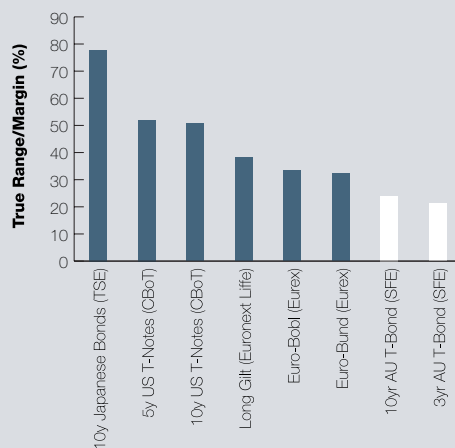
If you were to download the prices of Treasury Note futures trading on a US exchange and a Treasury Bond future trading on the SFE from an information vendor, and then calculate price volatility using the raw price series, you would incorrectly conclude that the price volatility of the SFE contracts is trivial relative to US contracts (see Panel A in the Exhibit 1 below). The reason this is an inappropriate comparison stems from differences in the way interest rate futures contracts are quoted in Australia relative to overseas markets. Unlike interest rate futures contracts traded in the US or Europe, the interest rate contracts traded on the SFE are quoted on a yield basis. For example, the quoted price of 10 year US Treasury Note futures trading on CBoT decreased by 0.28125 to 105.203125 on the 28th of June, 2007 relative to the previous close, while the quoted price of the 10 year Treasury Bond futures on SFE decreased by 0.035 to 93.765. While for the US contract, the quoted price represents the price of the underlying bond (per \$100 of face value) on SFE the quoted price represents 100 less the yield. In order to convert the SFE price to a value comparable to the US contract, you need to extract the yield from the quoted price and feed it into a discounted cashflow formula.* The value of the price change represented by the change in the price of the bond futures contract on SFE (0.035) looks trivial compared to the change in the price for US Note futures (0.28125), however they are in fact quite similar in dollar terms. For example, the value of the change in the SFE contract is 0.3263 per \$100 of face value (AUD) while the value of the change in the US contract is 0.28125 per \$100 of face value (USD). This implies that in order to produce a measure of volatility for SFE contracts which is comparable to overseas contracts, the value represented by the change in the quoted price of the SFE contracts needs to be calculated. Furthermore, because of the difference in currencies across contracts, in this paper, we also divide by the initial margin to get a comparable indication of the differences across contracts. Exhibit 1 below summarises the effect of making these adjustments on volatility comparisons. Quite clearly, when the comparisons are made on a comparable basis, the order of magnitude of the volatility of the SFE contracts is similar to the other contracts in the same asset class.

EXHIBIT 1 – PRICE VOLATILITY COMPARISONS BASED ON QUOTED PRICES AND CONTRACT VALUES

Panel A: Incorrect comparison – Volatility calculated using raw quoted prices



Panel B: Correct comparison – Volatility calculated after converting quoted prices to values and dividing by initial margin



* See www.sfe.com.au/content/sfe/products/pricing.pdf for a guide to pricing SFE interest rate contracts.

Table 3 documents the correlation between daily and weekly changes in the value of SFE contracts and the most actively traded contracts in the same asset class in Panel A. For comparison, the correlation coefficient with the most actively traded US futures contract in each asset class is also illustrated in Panel B. Calculations have been adjusted to account for time zone and currency differences.^{6,7}

Panel A in Table 3 illustrates that weekly correlation coefficients between SFE short term interest rate contracts (90 Day BAB and 30 Day Interbank Cash Rate futures) and other actively traded futures contracts are all less than 0.1. This suggests that there are ample new profit and portfolio diversification opportunities using SFE 90 Day BAB and 30 Day Interbank Cash Rate futures. Panel B provides the correlation of a comparable US contract (CME Eurodollar for short-term interest rate futures) to other actively traded contracts. The figures show that the correlation between CME Eurodollar futures and other contracts is greater in magnitude than correlations with SFE 90 Day BAB and 30 Day Interbank Cash Rate futures. Hence, SFE 90 Day BAB and 30 Day Interbank Cash Rate futures provide profit and portfolio diversification opportunities not provided by the other short term interest rate contracts.

Table 3 also reports the correlations among long-term interest rate futures. Panel A illustrates that the correlation between SFE 3/10 Year Treasury Bond futures and other contracts range between 0.20 and 0.36, and 0.21 and 0.41 respectively. Panel B reports correlations with the most liquid US contract of this class—the CBOT 10 Year T-Note futures contracts. It suggests that SFE contracts (specifically the 3 Year T-Bond futures) have lower weekly correlations with the CBOT 10 Year T-Note than all other contracts in this class. This implies that the SFE contracts may provide some of the best new profit making or diversification opportunities among the most actively traded contracts in this asset class.

Panel A of Table 3 also illustrates that ASX SPI 200™ futures contracts have correlations ranging between 0.28 and 0.51 against other futures contracts in this asset class. Panel B suggests that relative to the S&P500 futures contract traded on the CME, the ASX SPI 200™ contract generally has a lower correlation against European contracts, and a comparable correlation against Asian contracts. This again suggests that ASX SPI 200™ futures provide significant new profit-making opportunities and portfolio diversification potential.

6 Specifically, we estimated the correlation coefficient statistic for the following regression equation:

$$\Delta_i = a + b_1 \Delta_j + b_2 \Delta_{j(t-1)} + b_3 \Delta_{j(t+1)} + e_t$$

Where Δ_i is the change in contract i's value from t-1 to t. That is, we regress the change in value for one contract against the contemporaneous, leading and lagged values of the change in another contract.

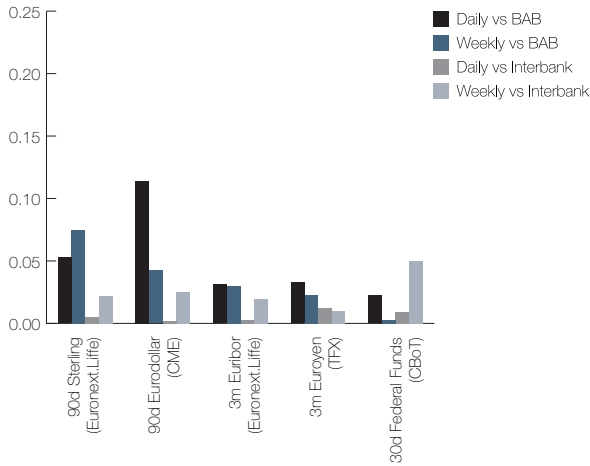
7 Values and price changes were converted to \$US in the analysis to adjust for currency differences.

Table 3
CORRELATION AGAINST SFE CONTRACTS AND MOST ACTIVE US CONTRACTS

1 July 2005 to 30 June 2008

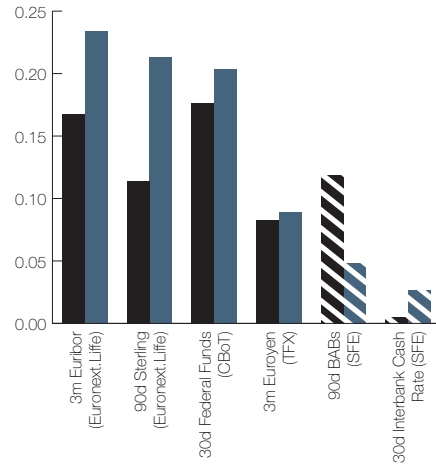
Panel A: SFE Contracts

v. 90 Day BAB and 30 Day Interbank Futures (SFE)

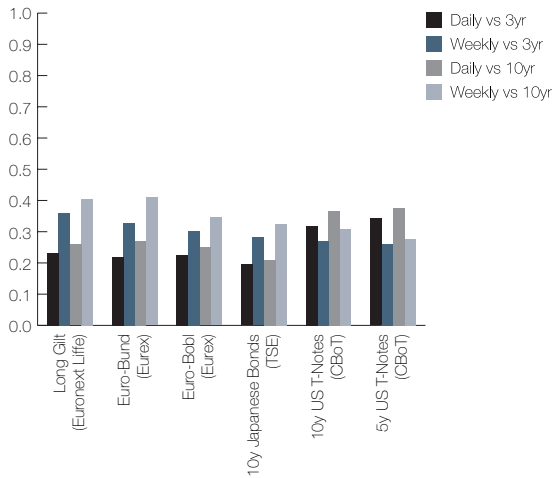


Panel B: A Comparable US Contract

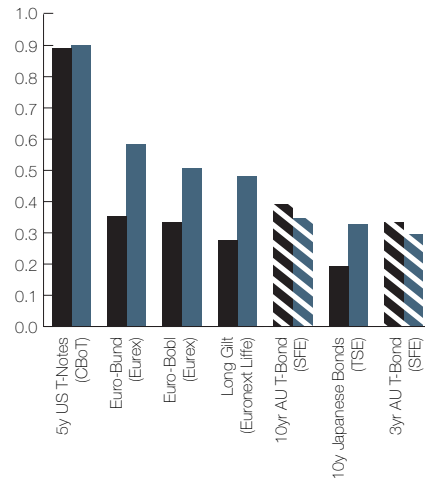
v. Eurodollar Futures (CME)



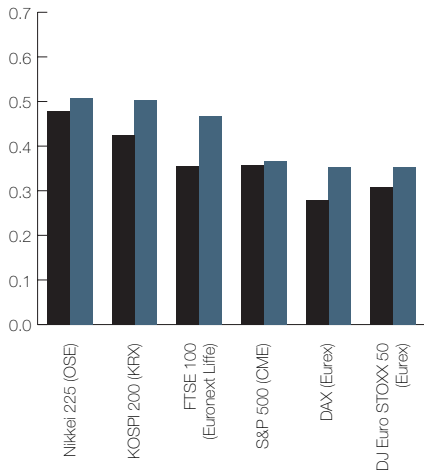
v. 3 and 10 Year AU T-Bond Futures (SFE)



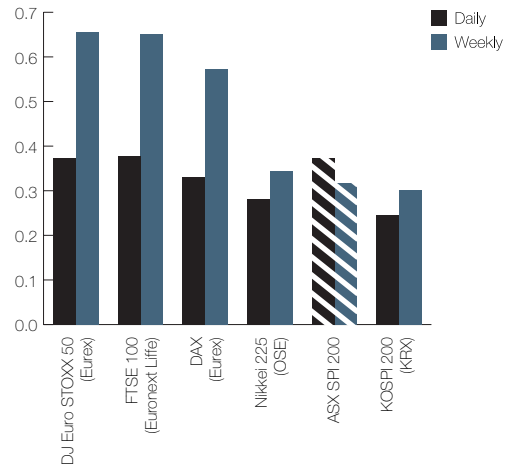
v. US 10 Year T-Note Futures (CBoT)



v. SPI 200 futures (SFE)



v. S&P 500 futures (CME)



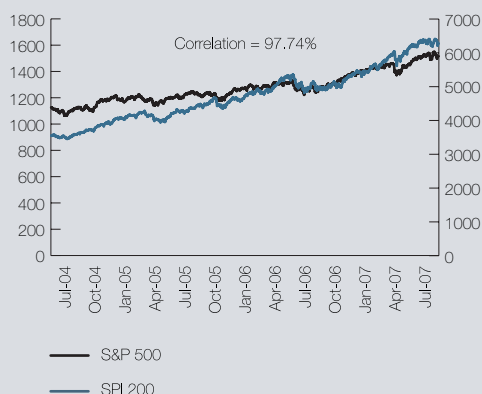
Technical Note 2:

MEASURING CORRELATION ACROSS FUTURES CONTRACTS – PRICE LEVELS OR CHANGES?

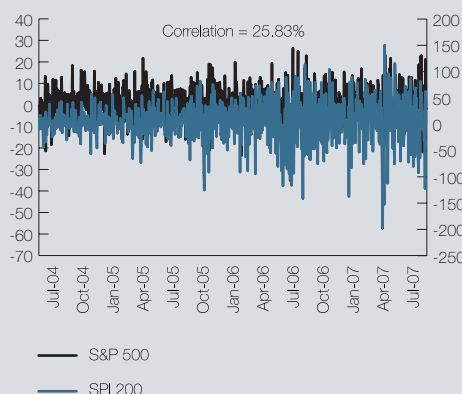
Most information vendors provide a facility for calculating the correlation in prices of different contracts. One of the choices faced by the analyst is whether they calculate the correlation coefficient on the basis of security price levels, changes or percentage changes. An understanding of this is important. For example, using data for the 3 year period ending 30 June 2007 produces a correlation coefficient between the price levels of ASX SPI 200™ futures trading on SFE and S&P500 futures trading on CME of 97.74% – extremely high. However, the correlation coefficient between the change in the price of ASX SPI 200™ futures and S&P500 futures over the same period is 25.83% – moderate (even after corrections for time zone and currency differences). While one estimate suggests that there is little to be gained from trading SFE futures, the other suggests that there may in fact be considerable opportunities for profiting from price movements unique to the Australian contract. So what is the truth?

EXHIBIT 2 – ‘STATIONARITY’ OF PRICE LEVELS AND PERCENTAGE CHANGES, AND THE CALCULATION OF CORRELATION COEFFICIENTS

Panel A: Incorrect calculation – Correlation based on price levels



Panel B: Correct calculation – Correlation based on price changes



The answer is quite clear, if not a little complicated. The change or percentage change in prices should be used to calculate correlation coefficients. Otherwise, correlation coefficients estimated between two price series will be spurious and over-inflated. The statistical reason for estimating the relationship between changes rather than levels underpins a body of work in econometrics known as co-integration, for which Clive Granger was awarded a Nobel Prize in 2003. Technically, stock price indices such as the S&P500 Index are a classic example of non-stationary time series variables* – that is they drift away from their mean values for extended periods of time (see exhibit 2). It has been proven in the statistical literature that regressing 2 nonstationary series produces spurious results. Essentially, regardless of what the variables are (eg. babies born in Sydney and stock price levels), if they are non-stationary a significant correlation coefficient will probably be calculated even if in reality there is no true relationship between the two variables. It is clear from Exhibit 2 that the change in prices does not suffer from this problem. Perhaps another, simpler, rationale for using price changes rather than levels is as follows. The percentage change in prices over a day essentially measures the relationship between the returns in two contracts over a day. Hence, for an investor with a trading horizon of 1 day the coefficient indicates the benefit from adding the security to their trading universe. The strength of the relationship between the two futures provides an indication of the potential profits of trading out of one and into the other, or vice versa. Hence if the correlation is perfect, there is little point in switching investment from one to the other. However, if the correlation is less than perfect, there is a potential benefit! The correlation in price levels, apart from being over-inflated, effectively captures the return from buying and holding each security over the entire period – for our purposes here, it is inappropriate.

* See Gujarati, D. (1995), Basic Econometrics, McGraw-Hill at page 714.

3. The Likely Effectiveness of Momentum-Type Trading Strategies

In a paper commissioned by Eurex, Schneeweis, Spurgin and Kazemi (2004) examine whether standard momentum-type trading rules typically used by global institutions are profitable when applied to Eurex futures relative to other futures typically traded by global institutions.⁸ According to the paper ‘An x-day momentum strategy takes a long position in a futures market on date t if the total return to the contract between dates t and t-x is positive. Otherwise the strategy takes on a short position.’ [p. 12]. In applying momentum rules to Eurex and other futures contracts, the paper uses 15, 27 and 55 day momentum trading rules. The problem with using this type of methodology for assessing the potential profitability from trading a contract is that it assumes the same type of strategy is optimum for different contracts. In their paper, Schneeweis et.al. (2004) compare the profitability of momentum-type trading rules applied to FTSE, NIKKEI, S&P500, DAX, US Treasury Bonds, LIBOR, Euro-Bobl and Euro-Bund futures. Implicitly, they are assuming that a momentum rule based on 15, 27 and 55 days is optimum for all these contracts.⁹

We use a more general approach in this paper to assess whether there are significant trading opportunities in SFE contracts for global institutions using trading rules based on historical price movements (such as momentum-type trading rules). We calculate the extent to which changes in the value of a contract on day t is explained by the changes in the value in each of the previous 30 days. In other words, we estimate the degree of correlation between changes in value on a contract and changes in the previous 30 days.^{10,11}

Table 4 reports the degree of correlation between changes in contract value on day t and changes in the previous 30 days for each contract. The higher the correlation, the more predictable are the returns of the contract and the more likely it is that a trading rule based on previous returns will be profitable. Panel A of Table 4 illustrates that the SFE 90 Day BAB futures contract has returns that are as predictable as other short-term interest rate contracts typically used by global institutions. Between July 1, 2005 and June 30, 2008, only the CBoT 30 Day Federal Funds contract had a higher correlation than the 30 Day Interbank Cash Rate, and 90 Day BABs. This suggests that a momentum-type trading rule or indeed any trading rule based on prior price movements will be as effective (or more effective) on the 30 Day Interbank Cash Rate and the 90 Day BABs when compared with other contracts. Panel B of Table 4 compares the correlations for the long-term interest rate futures. The degree of correlation in returns of the SFE 3 Year and 10 Year Bond Futures contracts is of higher magnitude compared to other contracts, ranking 2nd and 5th respectively. Finally, Panel C of Table 4 reports the effectiveness of momentum strategies for stock index futures, in which the SPI is of comparable magnitude. Overall, these results suggest that there are significant opportunities in SFE contracts for global institutions applying trading rules based on previous returns, such as standard momentum-based trading strategies.

8 Schneeweis, T., R. Spurgin and H. Kazemi (2004), ‘Eurex Derivative Products in Alternative Investments: the Case for Managed Futures’, *Economic and Financial Computing* 14(1), p 3-44.

9 Unfortunately, their results could simply be interpreted as demonstrating that a 15, 27 and 55 day momentum strategy is optimum for Eurex contracts. That is, there may be momentum-based trading rules that result in non-Eurex contracts to outperform Eurex contracts.

10 Specifically, we estimated the R-Square statistic for the following regression equation:

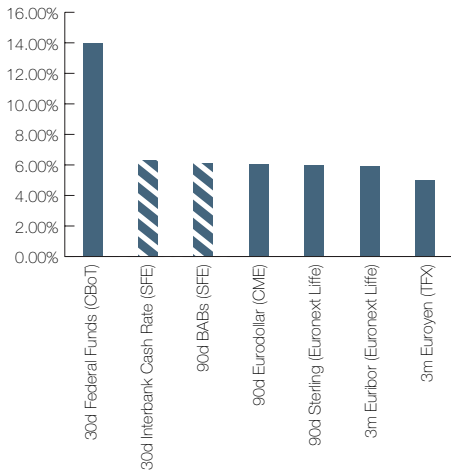
$$\Delta_{it} = a + \sum_{j=1}^{30} \Delta_{i(t-j)} + e_i, \text{ where } \Delta_{it} \text{ is the change in contract } i\text{'s value from } t-1 \text{ to } t.$$

11 Contract expiration dates were excluded from this analysis to achieve robust results. The broad conclusions reached are similar when these dates are included.

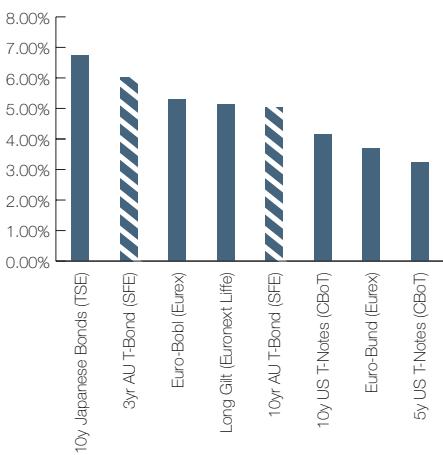
Table 4
CORRELATION BETWEEN RETURNS ON CONTRACT AND RETURNS IN EACH OF THE PREVIOUS 30 DAYS

1 July 2005 to 30 June 2008

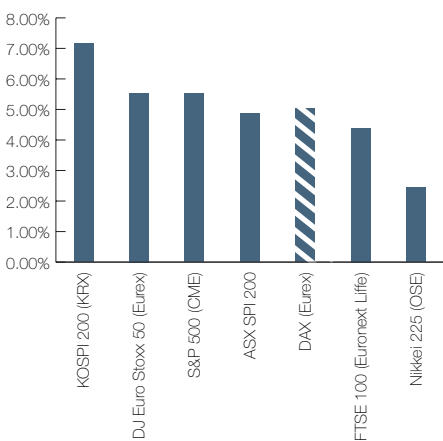
Panel A: Short-Term Interest Rate Futures



Panel B: Long-Term Interest Rate Futures



Panel C: Stock Index Futures



APPENDIX 1

Contracts examined, contract specification and margins as at 1 July 2008

Contract	Notional Size	Currency	Initial Margin	Min Tick	Min Tick Value
Panel A: Short-Term Interest Rate Futures					
30d Interbank Cash Rate (SFE)	3,000,000	AUD	660	0.005	12.33
90d Bank Accepted Bills (SFE)	1,000,000	AUD	2,600	0.01	variable
3m Can. Bankers' Acceptance (MX)	1,000,000	CAD	1,100	0.005	12.5
3m Euribor (Euronext)	1,000,000	EUR	1,175	0.005	12.5
90d Sterling (Euronext)	500,000	GBP	625	0.005	6.25
3m Euroyen (TFX)	100,000,000	JPY	17,500	0.005	1250
90d Eurodollar (CME)	1,000,000	USD	1,485	0.005	12.5
30d Federal Funds (CBoT)	5,000,000	USD	1,148	0.005	20.84

Panel B: Long-Term Interest Rate Futures

Aust. 3y T-Bonds (SFE)	100,000	AUD	760	0.005	variable
Aust. 10y T-Bonds (SFE)	100,000	AUD	1,530	0.005	variable
Euro-Bobl (Eurex)	100,000	EUR	1,110	0.005	5
Euro-Bund (Eurex)	100,000	EUR	1,610	0.01	10
Long Gilt (Euronext)	100,000	GBP	2,120	0.01	10
Jap. 10y Bonds (TSE)	100,000,000	JPY	1,430,000	0.01	10,000
US 10y T-Notes (CBoT)	100,000	USD	2,970	0.0156	15.63
US 5y T-Notes (CBoT)	100,000	USD	1,350	0.0078	7.81

Contract	Contract Unit (per point)	Currency	Initial Margin	Min Tick	Min Tick Value
Panel C: Stock Index Futures					
ASX SPI 200™	25	AUD	10,000	1	25
DAX (Eurex)	25	EUR	12,041	0.5	12.5
DJ Euro Stoxx 50 (Eurex)	10	EUR	2,506	1	10
FTSE 100 (Euronext)	10	GBP	5,000	0.5	5
Nikkei 225 (OSE)	1,000	JPY	480,000	10	10,000
KOSPI 200 (KSE)	500,000	KRW	16,121,250	0.05	25,000
S&P 500 (CME)	250	USD	30,938	0.1	25

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