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Testing a new Contrarian Strategy between Hong Kong and the Australian Resources Sector: A Research Note

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Abstract

During the financial crisis investment strategies following long only asset allocation methodologies floundered in the wake of a 57% peak-to-trough decline of the S&P 500. This paper demonstrates a new strategy that produces strong returns in both up and down markets. A new contrarian/pairs-trading approach using the Johansen (1988) cointegration method was developed and implemented from January 2003 to March 2013 using constituent stocks from the Hang Seng Index and Metals and Mining Index. The strategy produced a return of over 607% for the period (or an annual return of more than 21%). This supports previous research demonstrating the profitability of international arbitrage strategies (for example Abraham, 2013a; and Abraham, 2013b).

Keywords: Contrarian, Pairs-Trading, Cointegration

JEL: G14, G15.

Introduction

Figure 1 compares the Hang Seng Index with the Metals and Mining Index from 2007 - 2013. The two indices seem to track each other closely, implying that they may be economically linked with each other. Previous studies have demonstrated that the Chinese and Australian markets are linked through trade, with Australian exports of metals, coal and minerals benefitting both countries (for example Abraham, 2013a; and Abraham, 2013b).

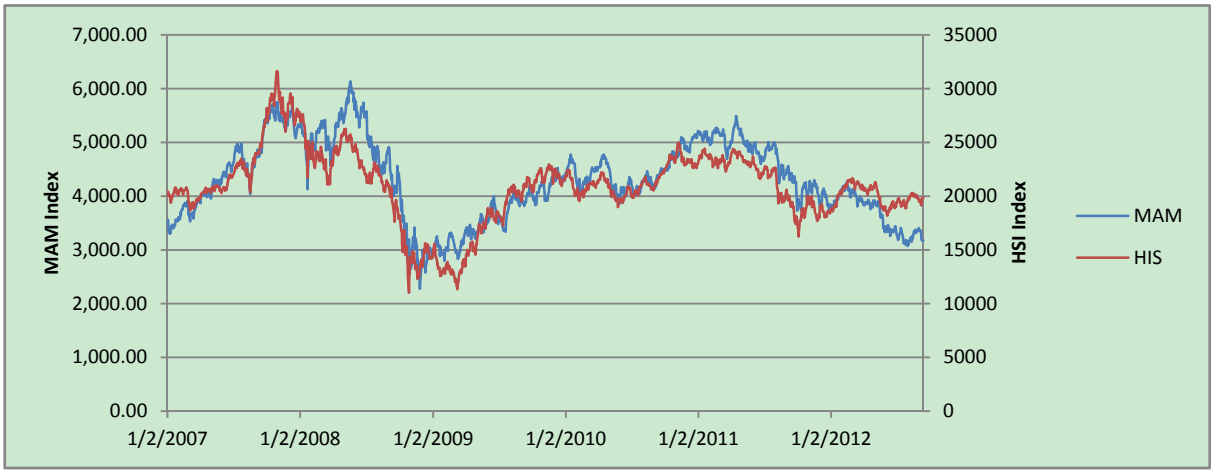

Figure 1. Comparison of the Hong Kong Hang Seng Index and the Australian S&P/ASX 300 Metals and Mining Index

NOTE: The Hang Seng Index is obtained from Yahoo Finance and the Metals and Mining Index is obtained from Standard and Poors.

The Efficient Market Hypothesis (EMH) is based on the following assumptions (Soares et al, 2005 and Burghardt, 2010);

- investors are rational;
- if they are not fully rational, they act in opposite directions, and cancel each other out;

and

- Otherwise, there are many arbitrageurs who will bring prices back to fundamentals.

Critics of the EMH state that people have loss avoidance (Odean, 1998) trade too much (Odean, 1999), which manifests as a failure to divest losing stocks and a preference to sell winning stocks (Shefrin & Statman, 1985; as cited in Soares et al, 2005 and Burghardt, 2010).

These deviations from rational behavior are due to the following (Soares, et al, 2005 and Burghardt, 2010);

- individuals are not rational, but rather develop preferences according to Prospect Theory and display loss aversion;
- they put greater weight on recent events;
- Framing effects cause them to form decisions depending on how a problem is presented.

Barberis and colleagues (1998) showed that security prices tend to under-react to new information. Also, over longer time periods, security prices over-react (Soares et al, 2005 and Burghardt, 2010). De Bondt and Thaler (1985) find investors over-reacted to good or bad news, and as a result, winners underperformed and losers outperformed in the following years. Eventually, prices revert to their fundamentals. Barberis and colleagues (1998) base their model on the heuristics of conservatism and representativeness. The typical investor is not fully informed about all securities, and yet the market may reach a state in which prices completely adjust to all information. This is due to the behaviours of marginal investors (Haugen, 2001). These people are well informed analysts, arbitrageurs and traders, who use computer models and databases which provide op to date information on firms. They act on information quickly so that stock prices fully reflect company, industry and economic information (Haugen, 2001). So it is conceivable that stocks are inefficient in the short-term but efficient in the long-term.

The disposition effect, results in under-reaction to economic information, leading to momentum effects (Frazzini, 2006). Securities do not reflect publicly available information in the short-term. Spyrou and colleagues (2007) find short-term investor reaction to extreme shocks in equities show that the market reaction to shocks for large capitalization stocks is efficient. However, for medium and small capitalization stocks the results indicate under-reaction to both positive and negative shocks. Daniel, Hirshleifer and Subrahmanyam (1998) find that investors are overconfident. The subsequent arrival of information that either confirms or disconfirms investor private information leads to further overreaction and return momentum; and reversals in the long run, as investors become aware of their mistakes (Spyrou et al, 2007).

Pairs trading exploit the stocks that are out of equilibrium for short-term time. It works by taking the arbitrage opportunity of temporary anomalies between related stocks which have long-run equilibrium, in which one stock will be overvalued relative to the other stock, by investing in a two-stock portfolio where the overvalued stock is sold and the undervalued stock is bought. The trade is closed out by taking the opposite position of these stocks after the stocks have reached their fundamental value; which is its long-run equilibrium relationship. The profit does not depend on market movements, making it a market-neutral investment strategy (Puspaningrum, 2009). Hong and Susmel (2003) formed a sample of 64 Asian shares that are listed in the U.S. as American depository receipts (ADR) over the period from 1991 to 2000 to examine the pairs underlying domestic shares with their ADRs. Nath (2003) examined 829 U.S. government debt securities over the period from 1994 to 2000. Perlin (2006) studied 100 most liquid stocks from the Brazilian market over 2000 and

2006. Gatev et al. (2006) analyze a sample of US stocks over 1962 and 2002. These pairs trading approaches demonstrates positive performance (Yuskel et al, 2010).

The cointegration relationship guarantees that the two stocks have a long-run stationary relationship. A linear combination of two I(1) non-stationary time series could form a stationary time series. If this happens, these two I(1) series are cointegrated. This paper utilises the Johansen (1988) methodology. The Johansen's approach uses a vector error-correction model (VECM) so that all variables can be endogenous (Puspaningrum, 2009). The theory of international investing is that international capital markets have independent price behaviours (Solnick et al, 2004). This paper introduces a strategy which profits from the connectedness of international capital markets and also provides a hedge against currency risk. During the financial crisis investment strategies following long only asset allocation methodologies floundered in the wake of a 57% peak-to-trough decline of the S&P 500 (Velissaris, 2010). In his recent papers, Abraham (2013a; 2013b) demonstrates that long-short/pairs-trading strategies are profitable, irrespective of market movements.

The Law of One Price strategy (LOP)

In its absolute form, the PPP condition states that the nominal exchange rate should be proportional to the ratio of the domestic to the foreign price level, i.e.

$$S_t = \alpha + \beta_0 P_t - \beta_1 P_t^* + \mu_t \quad (1)$$

S_t is the nominal exchange rate, P_t is the Australian resources stock and P_t^* is the CSC stock and μ_t stands for the regression errors. This is known as a trivariate relationship. The Johansen (1988) cointegration methodology is used to evaluate (1) by implementing a VECM and capturing the residuals of (1). A Signal Index to determine when to enter and exit a trade.

$$RESID \geq E[\mu] \pm \delta\sigma_{\mu t} \quad (2)$$

The SI is based on the 95% confidence interval, where $E[\mu_t]=0$ $\delta=1.96$. Enter the trade if the RESID (the residual) value is greater than $\delta\sigma_{\mu t}$ or less than - $\delta\sigma_{\mu t}$ standard deviations from the mean and exit the trade by reversing positions if the +/-$\delta\sigma_{\mu t}$ standard deviation is less than RESID.

If stocks in the Hang Seng Index and Australian resources stocks are good substitutes for each other they should be priced to the same fundamental value in efficient markets in the long-term. If one of the stocks in one index is mispriced in the short-run, rational investors will take advantage of this mis-pricing by selling the relatively overpriced one and purchasing the relatively under-priced one and earn a profit. Consequently their prices will revert to the fundamental value eventually. There should be a long-run equilibrium and the

spread between them should be stationary. If they are indeed cointegrated, trading strategies, which exploit the mean reverting property of the spreads between the pairs of stocks, should result in a profit (Abraham, 2013b).

The Abraham Partial Adjustment Model

The Abraham PAM (Abraham 2013b; 2013c) assumes the long-run equilibrium equation is given by the single-index model:

$$R_t = a + \beta R_m + e \tag{3}$$

Where R_t is the target return; a is the excess return; B is the sensitivity of the stock to the market, R_m is the market return; and e is the residual.

The following hypothesis known as the Abraham PAM is postulated:

$$R_t - R_{t-1} = \delta(R_t - R_{t-1}) \tag{4}$$

$$R_t - R_{t-1} = \delta\big((a + \beta R_m + e) - R_{t-1}\big) \tag{5}$$

$$R_t = \delta a + \delta\beta R_m + (1 - \delta)R_{t-1} + \delta e \tag{6}$$

$$R_t = \delta a + \delta\beta R_m + (1 - \delta)\beta R_{m_{t-1}} + \delta e \tag{7}$$

Where R_t is the return in time period t, R_{t-1} is the return in time period t-1, δ is the speed of adjustment coefficient and e is the error term E[e]=0 and E~ N(0, σ^2). When δ equals 0 there is no adjustment, when δ equals 1 there is full adjustment and the market is efficient, when δ is greater than 1 there is an over-reaction to economic information and when δ lies between 0 and 1 there is partial adjustment or under-reaction to economic information. For more information on the Abraham PAM see Abraham (2013b; 2013c).

Data and Methodology

The data is the top 33 (by market capitalisation) Australian resources stocks and Hang Seng index and its constituent stocks from 1 January 2003 to 1 March 2013. The weekly data was obtained from Yahoo Finance. Stocks were selected based on their market capitalisation. Missing values were substituted from prices occurring the previous day. There were 532 observations. The transaction cost for Australian and Chinese trades was assumed to be 1.4%. This was based on brokerage data from Australia and China (Hang Seng Investment October 2010; Commsec March 2013). Dividends were assumed to be reinvested. For the LOP strategy the Johansen approach was used. The Australian and Hong Kong stocks were ranked and paired with each other based on their similar speed of adjustment coefficients. The Hong Kong stocks were converted to Australian dollars and transformed into logarithms.

Results

Table 1 shows the profitability of the pairs-trading strategy using Hang Seng Index constituent stocks and Australian resource stocks.

Table 1. The Profitability of the LOP strategy implemented using Hong Kong and Australian Stocks

STOCK	SPEED	MCAP(mil)	STOCK	SPEED	MCAP(mil)	PROFIT (%)
WSA.AX	0.645269	574.78	0019.HK	179.8094	HK$134,615.00	120.7602
TRY.AX	0.639092	173.96	0101.HK	146.1484	HK$107,493.50	144.9203
AAI.AX	0.393709	8500	0386.HK	20.82513	HK$682,275.81	
SPH.AX	0.393499	676.63	0941.HK	11.48799	HK$1,628,286.00	
MDL.AX	0.390822	275.68	0293.HK	6.209212	HK$64,042.99	-461.528
SIR.AX	0.381389	788.42	0001.HK	5.257588	HK$282,572.09	
AGG.AX	0.37959	1831	0017.HK	5.231588	HK$61,604.92	
SGM.AX	0.379489	1936.85	1880.HK	3.584263	HK$75,317.70	
NCM.AX	0.379333	14399.05	0004.HK	3.499691	HK$179,989.59	1163.096
OGC.AX	0.377127	1362.91	1044.HK	3.459448	HK$112,302.30	10.6397
RIO.AX	0.376242	85933.67	1199.HK	3.100271	HK$30,987.14	217.6881
IRN.AX	0.374217	409.07	0012.HK	2.85234	HK$119,565.50	-29.59
GRR.AX	0.369982	219.73	0083.HK	2.521418	HK$63,285.39	
RRL.AX	0.362054	1878.68	0267.HK	2.501453	HK$43,355.40	
IGR.AX	0.357345	485.9	0494.HK	2.46905	HK$84,105.61	152.1506
KCN.AX	0.355858	531.4	0144.HK	2.203772	HK$71,880.08	1284.631
IMD.AX	0.355241	271.51	0762.HK	2.01776	HK$278,195.91	-144.983
SDL.AX	0.346122	645.14	0023.HK	-0.3139	HK$75,668.32	-3197.73
RSG.AX	0.343863	729.91	0027.HK	-0.51194	HK$288,185.31	
CDU.AX	0.334394	663.59	0005.HK	-0.83169	HK$1,578,887.00	-30.842
EVN.AX	0.328789	902.82	1109.HK	-0.94384	HK$112,064.70	
SBM.AX	0.310326	514.92	0388.HK	-1.52953	HK$151,691.00	
BSL.AX	0.309963	2651.66	0003.HK	-1.73144	HK$170,353.30	
ARI.AX	0.309798	1020.4	2388.HK	-2.08055	HK$263,262.19	6.8022
GDO.AX	0.307763	339.97	0011.HK	-2.23633	HK$240,127.50	
BHP.AX	0.296733	161632	0322.HK	-2.36752	HK$128,428.20	
IGO.AX	0.294202	859.34	0013.HK	-2.50434	HK$445,095.91	1596.856
PNA.AX	0.284723	1406.99	0006.HK	-3.94668	HK$131,470.50	8696.639
GBG.AX	0.266787	283.51	0688.HK	-5.88987	HK$178,163.00	292.8458
MGX.AX	0.266618	512.57	0002.HK	-6.07192	HK$178,163.00	-133.785
AQP.AX	0.254097	316	0016.HK	-8.8213	HK$264,233.41	
OZL.AX	0.252541	1440	0857.HK	-8.92129	HK$1,775,247.00	
LYC.AX	0.151946	1009.81	0291.HK	-13.0757	HK$62,488.48	

NOTE: 'STOCK' represents the Hang Seng Index constituent stock and the Australian resources stock; 'SPEED' represents the speed of adjustment coefficient; 'MCAP' represents market capitalization and 'PROFIT' represents the percentage profit from the pairs-trading strategy.

The results show that small cap pairs are more profitable than large cap pairs. Hong Kong stocks tend to over-react. This over-reaction occurs towards the target or away from the target. For reactions in the opposite direction of the target, the conclusion is that the stocks are adjusting very rapidly away from their fundamental values. These inefficiencies lead to profitable arbitrage opportunities, except in the instances of 0016HK, 0857HK, and 0291HK, where mispricing continues without converging to its fundamental value. The most profitable pair was PNA.AX/0006.HK, and the least profitable was SDL.AX/0023.HK.

Conclusion

Unlike previous international arbitrage studies between China and Australia (for example, Abraham, 2013a; Abraham 2013b), which were hypothetical, this strategy between Hong Kong and Australia may be fully implemented. This supports the research of De Bondt and Thaler (1985) who proposed that small cap stocks were more profitable than large caps and that small caps tended to over-react to new information.

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