MODIFIED MOVING-AVERAGE CROSSOVER TRADING STRATEGY:

EVIDENCE IN MALAYSIA EQUITY MARKET

By:

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DECLARATION

I declare that the substance of this project has never been submitted for any degree or postgraduate programs and qualifications.

I certify that all the supports and assistance received in preparing this research paper and all the sources abstracted have been acknowledge in this stated research paper.

SOH CHUEN YEAN

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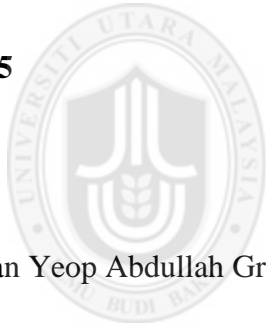
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Sincerely,

Soh Chuen Yean

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LIST OF ABBREVIATIONS

CTA   Commodity Trading Advisors

FBMKLCI FTSE Bursa Malaysia KLCI

MA   Moving-Average

MA_{short} Short period moving-average

MA_{long} Long period moving-average

ABSTRACT

This study examine the profitability of technical analysis using the most renowned trend-following tool, the original moving-average (MA) crossover strategy, to compare with the conventional simple buy-and-hold strategy, using the evidence from Malaysia equity market the FBMKLCI Index from 2000 to 2014. Specifically, this study investigates the performance of the original moving-average strategy and a modified moving-average crossover strategy with additional trading rules such as entry rule, exit rule, holding rule, and stop-loss rule. The results in this study are consistent to past studies that strongly support moving-average crossover trading strategies. The result here suggests that all combinations of short-MA and long-MA periods of the original MA crossover strategy and majority combinations of short-MA and long-MA of the modified MA crossover strategy outperform market benchmark with higher risk-adjusted return. In addition, the 1-period short-MA demonstrates the best return in both original and modified moving-average crossover strategy; better still the modified strategy outperforms the original strategy with lower frequency of trades which could largely reduce transaction costs and with lower return distribution variability.

Keywords: technical analysis, moving-average crossover, trading strategies, stop-loss

ABSTRAK

Kajian ini mengkaji keuntungan teknikal analisis menggunakan strategi 'moving-average crossover' (MA) asal berbanding dengan strategi beli-dan-memegang konvensional, dengan menggunakan bukti daripada pasaran ekuiti Malaysia FBMKLCI indeks dari tahun 2000 hingga 2014. Khususnya, kajian ini menkgaji prestasi strategi 'moving-average' asal dan strategi 'moving-average' diubahsuai dengan peraturan tambahan seperti peraturan kemasukan, peraturan keluar, peraturan memegang, dan peraturan had limit kerugian. Keputusan dalam kajian ini adalah selari dengan kajian lepas yang menyokong strategi 'moving-average'. Di sini hasilnya menunjukkan bahawa semua kombinasi tempoh MA-pendek dan MA-panjang untuk strategi MA crossover asal dan majoriti kombinasi tempoh MA-pendek dan MA-panjang untuk strategi "MA crossover" diubahsuai mempunyai prestasi yang melebihi penanda aras pasaran dengan pulangan terlaras risiko yang lebih tinggi. Di samping itu, 1-tempoh MA-pendek menunjukkan pulangan yang terbaik dalam kedua-dua strategi "MA crossover" asal dan yang diubahsuai. Strategi yang diubahsuai melebihi prestasi strategi asal dengan frekuensi perdagangan yang lebih kurang, ini mampu mengurangkan kos transkasi dan agihan pulangan kebolehubahan yang lebih rendah.

Keywords: teknikal analisis, "moving-average crossover", strategi berdagang, had-limit kerugian

CHAPTER ONE: INTRODUCTION

1.0 Introduction

Among many other technical trading strategies, the moving-average crossover trading strategy is commonly known as the most popular trend-following strategies and favorite tool among market practitioners, due to its simplicity in smoothing out market noise and able to identify changes in market trend. For many years, financial practitioners have been using moving-average crossover trading rules for market timing whether when to buy or to sell securities and attempt to profit from the financial market in earning above-average benchmark return and even outperform market benchmark.

Previous studies have found that investment and trading based on the strategies of moving-average crossover has been able to generate higher return than the conventional simple buy-and-hold strategy, when transaction cost is excluded. (Brock, Lakonishock, & LeBaron, 1992; Neely, 2002; Wilcox & Crittenden, 2009; Faber, 2007; Zhu & Zhou, 2009).

In this study, the performance of original moving-average crossover trading strategy for securities in Malaysia is examined. Furthermore, the modified moving-average crossover trading strategy, that has several extra trading rules (entry rule, exit rule, stop-loss rule, holding rule) are added into the original MA crossover trading strategy and is tested whether it produce better risk-adjusted return than the original MA crossover trading strategy and the conventional simple buy-and-hold strategy.

The contents of the thesis is for internal user only

REFERENCES

Admati, A. (1985). A Noisy Rational Expectations Equilibrium for Multi-Asset Securities Markets. *Econometrica, 53*(3), 629-657.

Alexander, S. (1961). Price Movements in Speculative Markets: Trends or Random Walks. *Industrial Management Review, 2*, 7-26.

Aronson, D. (2007). *Evidence-Based Technical Analysis: Applying the Scientific Method and Statistical Inference to Trading Signals.* Hoboken, New Jersey: Wiley.

Asness, C., Frazzini, A., & Pedersen, L. (2012). Leverage Aversion and Risk Parity. *Financial Analysts Journal, 68*(1).

Bachelier, L. (1900). Théorie de la Spéculation. Doctoral Dissertation in Mathematics, University of Paris. Translated into English by Cootner, P.H. (1964).

Barberis, N., Shleifer, A., & Vishny, R. (1998). A Model of Investor Sentiment. *Journal of Financial Economics, 49*, 307-343.

Bauer, R., & Dahlquist, J. (2012). Market Timing and Roulette Wheels Revisited. *Financial Anlayst Journal, 2012 (1)*.

Bessembinder, H., & Chan, K. (1995). The Profitability of Technical Trading Rules in the Asian Stock Markets. *Pacific-Basic Finance Journal, 3*, 257-284.

Bessembinder, H., & Chan, K. (1998). Market Efficiency and the Returns to Technical Analysis. *Financial Management, 27*, 5-17.

Black, F. (1986). Noise. *Journal of Finance, 41*, 529-543.

Blume, L., Easley, D., & O'Hara, M. (1994). Market Statistics and Technical Analysis: The Role of Volume. *Journal of Finance, 49*, 153-181.

Bollinger, J. (2002). *Bollinger on Bollinger Bands.* McGraw Hill.

Brock, W., Lakonishock, J., & LeBaron, B. (1992). Simple Technical Trading Rules and the Stochastic Properties of Stock Returns. *Journal of Finance, 47*, 1731-1764.

Brorsen, B., & Townsend, J. (1998). Performance Persistence for Managed Futures. *Conference on Applied Commodity Price Analysis, Forecasting, and Market Risk Management.*

Brown, D., & Jennings, R. (1989). On Technical Analysis. *Review of Financial Studies, 2*, 527-551.

Campbell, J. (1987). Stock Returns and The Term Structure. *Journal of Financial Economics, 18*(2), 373-399.

Campbell, J., & Kyle, A. (1993). Smart Money, Noise Trading and Stock Price Behavior. *Review of Economic Studies, 60*, 1-34.

Campbell, J., & Thompson, S. (2008). Predicting Excess Stock Returns Out-of-Sample: Can Anything Beat The Historical Average? *Review of Financial Studies, 21*(4), 1509-1531.

Chen, Q., Goldstein, I., & Jiang, W. (2007). Price Informativeness and Investment Sensitivity to Stock Price. *Review of Financial Studies, 20* (3), 619-650.

Cochrane, J. (2008). The Dog That Did Not Bark: A Defense of Return Predictability. *Review of Financial Studies, 21*(4), 1533-1575.

Coutts, J. A., & Cheng, K. C. (2000). Trading rules and stock returns: some preliminary short-run evidence from Hang Seng 1985-1997. *Applied Financial Economics 10*, 579-586.

Covel, M. (2011). *Trend Commandments: Trading for Exceptional Returns.* FT Press.

Cowles, A. (1933). Can Stock Market Forecasters Forecast? *Econometrica: Journal of the Econometric Society*, 309-324.

Daniel, K., Hirshleifer, D., & Subrahmanyam, A. (1998). Investor Psychology and Security Market Under- and Overreactions. *Journal of Finance, 53*(6), 1839–1885.

Day, T., & Wang, P. (2002). Dividends, Nonsynchronous Prices, and The Returns From Trading The Dow Jones Industrial Average. *Journal of Empirical Finance, 9*(4), 431-454.

Diamond, D., & Verrecchia, R. (1981). Information Aggregation in a Noisy Rational Expectations Economy. *Journal of Financial Economics, 9*, 221-235.

Dybvig, P. (1988). Inefficient Dynamic Portfolio Strategies, or How to Throw Away a Million Dollars in the Stock Market. *Review of Financial Studies, 1*, 67-88.

Edward, R., Magee, J., & Bassetti, W. (2007). *Technical Analysis of Stock Trends* (9 ed.). CRC Press.

Elder, A. (1993). *Trading for A Living.* John Wiley & Sons, Inc.

Faber, M. (2007). A Quantitative Approach to Tactical Asset Allocation. *Journal of Investing, 16*, 69-79.

Fabozzi, F., & Markowitz, H. (2002). *The Theory and Practice of Investment Management.* John Wiley & Sons, Inc.

Faith, C. (2007). *Way of the Turtle: The Secret Methods that Turned Ordinary People into Legendary Traders.* McGraw Hill.

Fama, E. (1965). Random Walks in Stock Market Prices. *Financial Analyst Journal, 21*(5), 55-59.

Fama, E. (1970). Efficient Capital Markets: A Review of Theory and Empirical Work. *Journal of Finance, 25*, 383-417.

Fama, E., & Blume, M. (1966). Filter Rules and Stock Market Trading. *Journal of Business, 39*, 226-241.

Fama, E., & Schwert, G. (1977). Asset Returns and Inflation. *Journal of Financial Economics, 5*(2), 115-146.

Friesen, G., Weller, P., & & Dunham, L. (2009). Price Trends and Patterns in Technical Analysis: A Theoretical and Empirical Examination. *Journal of Banking and Finance, 33*(6), 1089-1100.

Gandevani, H.M. (2001). Trading Systems As A Determining Factor In Increasing Financial Trading Performance (Doctoral dissertation). Retrieved from ProQuest Information and Learning. (UMI Number: 3015992).

Gartley, H. (1930). *Profits in the Stock Market.* New York: H.M. Gartley Inc.

Gehrig, T., & Menkhoff, L. (2006). Extended Evidence on The Use of Technical
Analysis on Foreign Exchange. *International Journal of Finance and Economics,
11*(4).

Gollier, C. (1997). On the Inefficiency of Bang-Bang and Stop-Loss Portfolio Strategies.
Journal of Risk and Uncertainty, 14, 143-154.

Grossman, S., & Stiglitz, J. (1980). On the Impossibility of Informationally Efficient
Markets. *American Economic Review, 70*, 393-408.

Gunasekarage, A., & Power, D. M. (2011). The profitability of moving average trading
rules in South Asian stock markets. *Emerging Markets Review 2(1), 17-33*.

Hirshleifer, D., & Luo, G. (2001). On the Survival of Overconfident Traders in a
Competitive Securities Market. *Journal of Financial Markets, 4*, 73-84.

Hong, H., & Stein, J. (1997). A Unified Theory of Underreaction, Momentum Trading,
and Overreaction in Asset Markets. Unpublished working paper. Sloan School of
Management, Massachusetts Institute of Technology.

Hurst, B., Ooi, Y., & Pedersen, L. (2010). Understanding Managed Futures. AQR
Working Paper.

Illmanen, A. (2011). *Expected Returns: An Investor's Guide to Harvesting Market
Rewards. Chap. 14: Commodity Momentum and Trend Following.* Wiley.

Jegadeesh, N. (2000). Foundations of Technical Analysis: Computational Algorithms, Statistical Inference, and Empirical Implementation - Discussion. *Journal of Finance, 55*, 1765-1770.

Jensen, M. (1978). Some Anomalous Evidence Regarding Market Efficiency. *Journal of Financial Economics, 6*, 95-101.

Kaminski, K., & Lo, A. (2008). When Do Stop-Loss Rules Stop Losses? *SIFR Research Report Series, 63*.

Kaufman, P. (2013). *Trading Systems and Methods* (4 ed.). John Wiley & Sons.

Kogan, L., Ross, S., Wang, J., & Westerfield, M. (2006). The Price Impact and Survival of Irrational Traders. *Journal of Finance, 61*, 195-229.

Kong, A., Rapach, D., Strauss, J., & Zhou, G. (2011). Predicting Market Components Out-of-Sample: Asset Allocation Implications. *The Journal of Portfolio Management, 37*(4), 29-41.

LeBaron, B. (1999). Technical Trading Rule Profitability and Foreign Exchange Intervention. *Journal of International Economics, 49*, 125-143.

Levich, R., & Thomas, L. (1993). The Significance of Technical Trading Rule Profits in the Foreign Exchange Market: A Bootstrap Approach. *Journal of International Money and Finance, 12*, 451-474.

Lo, A., & MacKinlay, A. (1990). Data Snooping Biases in Tests of Financial Asset Pricing Models. *Review of Financial Studies, 3*, 431-467.

Lo, A., Mamaysky, H., & Wang, J. (2000). Foundations of Technical Analysis: Computational Algorithms, Statistical Inference, and Empirical Implementation. *Journal of Finance, 55*, 1705-1765.

Lui, Y., & Mole, D. (1998). The Use of Fundamental and Technical Analyses by Foreign Exchange Dealers: Hong Kong Evidence. *Journal of International Money and Finance, 17*, 535-545.

Luo, G. (2003). Evolution, Efficiency and Noise Traders in a One-Sided Auction Market. *Journal of Financial Markets, 6*, 163-197.

Maillet, B., & Michel, T. (2000). Further insights on the puzzle of technical analysis profitability. *The European Journal of Finance 6 (2)*, 196-224.

Neely, C., Rapach, D., Tu, J., & Zhou, G. (2013). Forecasting the Equity Risk Premum: The Role of Technical Indicators. Working Paper: Federal Researve Bank of St. Louis.

Neely, C., Weller, P., & Dittmar, R. (1997). Is Technical Analysis Profitable in the Foreign Exchange Market? A Genetic Programming Approach. *Journal of Financial and Quantitative Analysis, 32*, 405-426.

Neely, C. (2002). The Temporal Pattern of Trading Rule Returns and Exchange Rate Intervention: Intervention Does Not Generate Technical Trading Profits. *Journal of International Economics, 58*, 211-232.

Neftci, S. (1991). Naive Trading Rules in Financial Markets and Wiener-Kolmogorov Prediction Theory: A Study of Technical Analysis. *Journal of Business, 64*, 549-571.

Olson, D. (2004). Have Trading Rule Profits in the Currency Markets Declined Over Time. *Journal of Banking & Finance 28 (1)*, 85-105.

Olszewski, E. (2001). A Strategy for Trading the S&P 500 Futures Market. *Journal of Economics and Finance, 25*(1), 62-79.

Ostgaard, S. (2008). On the Nature of Trend Following. Last Atlantis Capital Management.

Parisi, F., & Vasquez, A. (2000). Simple technical trading rules of stock returns: evidence from 1987 to 1998 in Chile. *Emerging Market Review 1 (2), 152-164.*

Qi, M., & Wu, Y. (2006). Technical trading-rule profitability, data snooping, and reality check: evidence from the foreign exchange market. *Journal of Money, Credit and Banking*, 2135-2158.

Ready, M. (1997). Profits from Technical Trading Rules. Working paper. University of Wisconsin-Madison.

Roberts, H. (1967). Statistical versus Clinical Prediction of the Stock Market. Unpublished manuscript.

Russel, P., & Torbey, V. (2002). The Efficient Market Hypothesis on Trial: A Survey. *Business Quest Journal*, 1-19.

Samuelson, P. (1965). Proof That Properly Anticipated Prices Fluctuate Randomly. *Industrial Management Review, 6*, 41-49.

Schwager, J. (1995). *Futures: Fundamental Analysis.* John Wiley & Sons, Inc.

Shynkevich, A. (2012). Performance of Technical Analysis in Growth and Small Cap Segments of the US Equity Market. *Journal of Banking and Finance, 36*(1), 193-208.

Sullivan, R., Timmermann, A., & White, H. (2003). Forecast Evaluation with Shared Data Sets. *International Journal of Forecasting, 19*, 217-227.

Sweeney, R. (1988). Some New Filter Rule Tests: Methods and Results. *Journal of Financial and Quantitative Analysis, 23*, 285-300.

Szakmary, A. C., & Mathur, I. (1997). Central bank intervention and trading rule profits in foreign exchange markets. *Journal of International Money and Finance, 16 (4)*, 513-535.

Szakmary, A., Shen, Q., & Sharma, S. (2010). Trend-Following Trading Strategies in Commodity Futures: A Re-Examination. *Journal of Banking and Finance, 34*, 409-426.

Taylor, J. (2000). A Quantile Regression Neural Network Approach to Estimating the Conditional Density of Multiperiod Returns. *Journal of Forecasting*, 299-311.

Taylor, M., & Allen, H. (1992). The Use of Technical Analysis in the Foreign Exchange Market. *Journal of International Money and Finance, 11*, 304-314.

Taylor, S. (1994). Trading Futures Using a Channel Rule: A Study of the Predictive Power of Technical Analysis with Currency Examples. *Journal of Futures Markets, 14*, 215-235.

Tharp, V. (2009). *Super Trader: Make Consistent Profits in Good and Bad Markets.* McGraw Hill.

Wilcox, C., & Crittenden, E. (2009). Does Trend Following Work on Stocks? Working Paper, Blackstar Funds, LLC.

Zakamulin, V. (2014). The Real-Life Performance of Market Timing with Moving Average and Time-Series Momentum Rules. Journal of Asset Management.

Zhang, X. (2003). Information Uncertainty and Stock Returns. *Journal of Finance, 61*, 105-137.

Zhu, Y., & Zhou, G. (2009). Technical Analysis: An Asset Allocation Perspective on the Use of Moving Averages. *Journal of Financial Economics, 92*(3), 519-544.