

# 臺美股市與期貨避險比例之分析

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## 摘要

股票與期貨市場的遽變及能夠吸引投資者在此市場中找尋投資組合績效。本研究著眼股票和期貨場的落後關係、相關性與避險比率，另外，本研究顯示期貨會比股票市場有較高的波動性且期貨市場會影響股票市場，本研究也與Kim (2003)的研究相符。王凱立，陳美玲 (2006)指出期貨市場可以比股票市場反應的來得快且也可以支撐期貨市場來穩定股票市場，因此，本研究可以提供投資者良好的管理風險建議。在本研究中，為了研究股票和期貨市場在不同階段改善避險比率在降低風險的重要角色，本研究採研究多期避險。本研究發現美國利用避險比率比台灣市場較有效率，此結果發現對於低度開發市場相當有幫助，也指出在短期內投資者會有較低的避險比率而投資者可以在長期達成高的避險率，因此檢驗多期避險率可以比單一期避險率提供較多仔細的資訊。

關鍵詞：避險效率;期貨市場;股票市場;基波理論

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參考文獻

Abhyankar, A. H. (1995). Return and volatility dynamics in the FTSE100 stock index and stock index futures markets. *The Journal of Futures Markets*, 15(4), 457- 488.

Anderson, R., & Danthine, J. (1980). Hedging and joint production. *Journal of Finance*, 35(2), 487-498.

Antonios, A., Gregory, F., & Andreas, P. (2003). Index futures and positive feedback trading: Evidence from major stock exchanges. *Journal of Empirical Finance*, 12(2), 219- 238.

Baek, I. M. (2006). Portfolio investment flows to Asia and Latin America: Pull, push or market sentiment? *Journal of Asian Economics*, 17(2), 363-373.

Baesel, F., & Grant, D. (1982). Optimal sequential futures trading. *Journal of Financial and Quantitative Analysis* December, 11(6), 689-695.

Baillie, R., & Myers, R. (1991). Bivariate GARCH estimation of the optimal commodity futures hedge. *Journal of Applied. Econometrics*, 6(3/4), 109-124.

Black, F. (1989). Universal hedging: Optimizing currency risk and reward in international equity portfolios. *Financial Analysts Journal*, 51(1), 161-167.

Booth, G. G., So, R. W., & Tse, Y. (1999). Price discovery in the German equity index derivatives markets. *The Journal of Futures Markets*, 19(6), 619-643.

Cantaluppi, L. (1994). Modeling currency hedges in a mean-variance framework. *Financial Analysts Journal*, 50(1), 57 – 61.

Chan, K. S. (1992). A further analysis of the lead-lag relationship between the cash market and stock index futures market. *The Review of Financial Studies*, 5(1), 123-152.

Choudhry, T. (2003). Short-run deviations and optimal hedge ratio: Evidence from stock futures. *Journal of Multinational Financial Management*, 13(2), 171-192.

Chris, B., Alistar, G. W., & Stuart, T. (2001). A trading strategy based on the lead- lag relationship between the spot index and futures contract for the FTSE 100. *International Journal of Forecasting*, 17(1), 31 - 44.

Daubechies, I. (1992). *Ten lectures on wavelets*. Society for industrial and Applied Mathematics, Montpelier. VT, USA: Capital City Press.

Dickey, D. A. & Fuller, W. A. (1979). Distribution of the estimators for autoregressive time series with a unit root. *Journal of the American Statistical Association*, 74(1), 427-431.

Donald, L., & Keshab, S. (2006). An empirical analysis of the relationship between hedge ratio and hedging horizon: Using Wavelet analysis. *The Journal of Futures Markets*, 27(2), 127-150.

Donald, L., & Soojong, K. (2005). Provisional liquidation of futures hedge programs. *Energy Economics*, 28(2), 266 – 273.

Donald, L., & Xiangdong, L. (1994). Estimating multiperiod hedge ratios in cointegrated markets. *The Journal of Futures Market (1986-1998)*, 13(8), 909.

Ederington, L. (1979). The hedging performance of the new futures markets. *Journal of Finance* March, 34(1), 157-170

Eric, C., Cheol, S. E., & Richard, K. (1994). International diversification through closed-end country funds. *Journal of Banking & Finance*, 19(7), 1237-1263.

Fernandez-Arias, E. (1996). The new wave of private capital inflows: Push or pull? *Journal of Development Economics*, 48(2), 389-418.

Figlewski, S. (1984). Hedging performance and basic risk in stock index futures. *Journal of Finance*, 39(1), 657-669.

Fleming, J., Ostdiek, B., & Whaley, R. E. (1996). Trading Costs and the Relative Rate if Price Discovery in Stock Index Futures Markets. *The Journal of Futures Markets*, 16(4), 353-387.

Filatov, S. V., & Rappoport, P. (1992). Is complete hedging optimal for international bond portfolios? *Financial Analysts Journal*, 48(4), 37-47.

Fortune, P. (1989). An assessment of financial market volatility: bills, bonds and stocks. *New England Economic Review*. Federal Reserve Bank of Boston, November/ December, 13-28.

Froot, K., Scharfstein, D., & Stein, J. (1993). Risk management: coordinating corporate investment and financing policies. *Journal of Finance*, 48(5), 1629-1658.

Gagnon, L., Mensah, S., & Blinder, E. (1989). Hedging Canadian corporate debt: A comparative study of the hedging effectiveness of Canadian and U.S. bond futures. *The Journal of Futures Markets*, 9(1), 29-38.

Gardner, W. G., & Wuilloud, T. (1995). Currency risk in international portfolios: how satisfying is optimal hedging? *Journal of Portfolio Management*, 21(3), 59 – 67.

Gencay, R., Whitcher, B., & Selcuk, F. (2002). *An introduction to wavelets and other filtering methods in finance and economics*. San Diego Academic Press.

Geppert, J. M. (1995). A statistical model for the relationship between futures contract hedging effectiveness and investment horizon length. *Journal of Futures Markets*, 15(5), 507-36.

Granger, C. J. (1996). Investigating Causal Relationships by econometrics models and cross spectral methods. *Econometrica*, 37(3), 425-435.

Grossmann, A. (1986). Wavelet transform and edge detection. *Stochastic Processes in Physics and Engineering*, 149-157.

Grunbichler, A., Longstaff, F., & Schwartz, E. (1994). Electronic screen trading and the transmission of information. *Journal of Financial Intermediation*, 3(2), 166-187

Harald, L. B., Michael, B., Udo, B., & Jorg, S. (1999). The preferred hedge instrument. *Economics Letters*, 66(1), 85-91.

Hill, J., & Schneeweis, T. (1982). The hedging effectiveness of foreign currency futures. *Journal of Financial Research*, 5(3), 95-104

Howard, C. T., & D'Antonio, L. J. (1986). Treasury Bill Futures as a hedging tool: A risk- return approach. *Journal of Financial Research* Spring, 11(6), 25 -39

Howard, C. T., & D'Antonio, L. J. (1991). Multi-period hedging using futures: A risk minimization approach in the presence of autocorrelation. *Journal of Futures Markets*, 11(4), 697-710.

Huang, B. N., Yang, C. W., & Hu, J. W. S (2000). Causality and cointegration of stock markets among the United States, Japan, and the South China Growth Triangle. *International Review of Financial Analysis*, 9(3), 281-297

In, F., & Kim, S. (2002). The influence of the foreign stock markets and macroeconomic news announcements on Australian financial markets. *Pacific-Basin Finance Journal*, 10(5), 571-582.

In, F., & Kim, S. (2005). Multiscale hedge ratio between the Australia stock and futures markets: Evidence from Wavelet analysis. *Journal of Multinational financial management*, 16(4), 411-423.

In, F., & Kim, S. (2006). The hedge ratio and the empirical relationship between the stock and futures markets: A new approach using wavelet analysis. *Journal of Business*, 79(2), 799-820.

Janikan, S., & Jack, S. (2006). The effects of management compensation on firm hedging: Does SFAS 133 matter? *Journal of Multinational Financial Management*, 18(3), 229-243.

Jorion, P. (1994). Mean variance analysis of currency overlays. *Financial Analysts Journal*, 50(3), 48-56.

Kritzman, M. (1993). The minimum-risk currency hedge ratio and foreign asset exposure. *Financial Analysts Journal*, 49(5), 77-78.

Kroner, K. F., & Sultan J. (1993). Time-varying distribution and dynamic hedging with foreign currency futures. *Journal of Financial and Quantitative Analysis*, 28(4), 535-51.

Lafuente, J. A, & Novales, A. (2002). Optimal hedging under departures from the cost-of-carry valuation: Evidence from the Spanish stock index futures market. *Journal of Banking & Finance*, 27(6), 1053-1078.

Laura, S. (1991). Taiwan: Growing Economy, More open markets create unprecedented export opportunity. *Business America*, 112(15/ 16), 6.

Leatharn, D. (1988). An empirical analysis of strip and rollover interest rate hedging. *Agricultural Finance Review*, 49(2), 112-119.

Lee, G. G. J. (1999). Contemporary and long-run correlations: A covariance component model and studies on the S&P 500 cash and futures

markets. *Journal of Futures Markets*, 19(8), 877-894. Lence, S. H., Sakong, Y., & Hayes, D. J. (1994). Multiperiod production with forward and option markets. *American Agricultural Economic Journal*, 76(2), 286-295. Lien, D., & Luo, X. (1993). Estimating multiperiod hedge ratios in cointegrated markets. *Journal of Futures Markets*, 13(8), 909-920. Lien, D., & Wilson, B. K. (2001). Multiperiod hedging in the presence of stochastic volatility. *International Review of Financial Analysis*, 10(4), 395-406. Lindsay, R. W., Percival, D. B., & Rothrock, D. A. (1996). The discrete wavelet transform and the scale analysis of the surface properties of sea ice. *IEEE Transactions on Geoscience and Remote Sensing*, 34(3), 771-87. Low, A., Muthuswamy, J., Sakar, S., & Terry, E. (2002). Multiperiod hedging with futures contracts. *Journal of Futures Markets*, 22(12), 1179 – 1203. Mallat, S. (1989). A theory of multiresolution signal decomposition: the Wavelet representation. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 11(7), 674-693. Miller, M. H., Muthuswamy, J., & Whaley, R. E. (1994). Mean reversion of Standard & Poor's 500 index basis changes: Arbitrage-induced or statistical illusion? *Journal of Finance*, 49(2), 479-513. Mitchell, R., & Ricardo, P. C. L. (1999). Tests of technical trading strategies in the emerging equity markets of Latin America and Asia. *Journal of Banking & Finance*, 23(12), 1887-1905. Morgan, G. E., Shome, D. K., & Smith, S. D. (1988). Optimal futures positions for large banking firms. *Journal of Finance*, 63(1), 175-195. Morlet, J. (1981) Sampling theory and wave propagation. Proceedings of the 51st Annual Meeting of the Society. Exploration Geophysics, Los Angeles, USA. Moschini, G., & Lapan, H. (1995). The hedging role of options and futures under joint price, basis, and production risk. *International Economic Review*, 36(4), 1025-1049. Percival, D. B., & Walden, A. T. (2000). Wavelet methods for time series analysis. Cambridge: Cambridge University Press. Raymond, C., & Wai-Ming, F. (2001). Relative informational efficiency of cash, futures, and options markets: The case of an emerging market. *Journal of Banking & Finance*, 25(2), 355-375. Riza, D., Donald, L., & David, R. S. (2003). Comparisons of short and long hedge performance: The case of Taiwan. *Journal of Multinational Financial Management*, 15(1), 51-66. Sener, T. (1998). Objectives of hedging and optimal hedge ratios: US vs. Japanese investors. *Journal of Multinational Financial Management*, 8(2), 137-153. Shyy, G., Vijayraghavan, V. & Quinn, B. S (1996). A further investigation of the lead-lag relationship between the cash market and stock index futures market with the use of bid/ask quotes: The case of France. *The Journal of Futures Markets*, 16(4), 405-420. Silber, W. (1985). The economic role of financial futures. American Enterprise Institute for Public Policy Research, Washington, DC. Sim, A. B & Ralf, Z. (2001). Dynamic hedging effectiveness in South Korean index futures and the impact of the Asian financial crisis. *Asia-Pacific Financial Markets*, 8(3), 237-258. Sims, C. (1972). Money, income and causality. *American Economic Review*, 62(4), 540-52. Steven, A. D, & Sim, A. B. (1999). Share price volatility with the introduction of individual share futures on the Sydney Futures Exchange. *International Review of Financial Analysis*, 8(2), 153-163. Stoll, H. R., & Whaley, R. E. (1990). The dynamics of stock index and stock index futures returns. *Journal of Financial and Quantitative Analysis*, 24(4), 441-68. Taylor, M. & Sarno, L. (1997). Capital flows to developing countries: Long- and short-term determinants. *The World Bank Economic Review*, 11(3), 451-470. Tsaia P.J., Swansonb P.E, & Sarkar S.K. (2006). Mean and volatility linkages for closed-end country funds. *The Quarterly Review of Economics and Finance*, 47(4), 550-575. Udo, B. & Bernhard, E. (1999). Market structure and multiperiod hedging. *International Review of Economics and Finance*, 9(4), 291-298. Wahab, M., & Lashgari, M. (1993). Price dynamics and error correction in stock index and stock index futures markets: A Cointegration Approach. *Journal of Futures Markets*, 13(7), 711-742. Wang, C., & Low, S. S. (2003). Hedging with foreign currency denominated stock index futures: evidence from the MSCI Taiwan index futures market. *Journal of Multinational Financial Management*, 13(1), 1-17. Wang, K. L., & Chen, M. L. (2006). The Dynamics in the Spot, Futures, and Call Options with Basis Asymmetries: An Intraday Analysis in a Generalized Multivariate GARCH-M MSKST Framework. *Academia Economic Papers* 29(4), 371-394.