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研究 生(中)	劉翔瑜
研究 生(英)	Hsiang-Yu Liu
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其他 題名	
指導 教授 (中)	李天行
指導 教授 (英)	Tian-ShyugLee
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摘要(中)	財務預測一直為各界研究的主題，本研究針對日經 225 指數為研究標的，透過倒傳遞類神經網路(Back-Propagation Neural Network)，及支援向量迴歸(Support Vector Regression)，建立日經 225 現貨指數開盤價之預測模型，並檢驗在非現貨交易時段之期貨價格、國際傳遞效果及其主要因素是否具有其內涵價值，並增加模型的預測效果；最後，透過不同的交易策略，計算其投資報酬率，以檢視其是否能獲得超額報酬。為驗證前述想法之正確性及有效性，本研究以日經 225 前一日現貨的收盤價、市值、芝加哥商業交易所(Chicago Mercantile Exchange)、新加坡衍生性商品交易所(Singapore Exchange Derivatives Trading)及大阪證券交易所(Osaka

	Securities Exchange)之日經 225 期貨指數為預測變數。實證結果發現，市值無法明顯提升模型的預測準確率，而非現貨交易時段及國際傳遞效果的確具有其內涵價值，能顯著提升模型的預測能力；而透過支援向量迴歸將非現貨交易時段及國際傳遞效果所得之預測值，並搭配當日沖銷的策略，其報酬率高達 60%以上，具有超額報酬，可提供給投資人做為參考依據。
摘要 (英)	This study investigates the information content and spill over effect of Nikkei 225 futures prices during the non-cash-trading (NCT) period. The same day's leading futures and previous day's cash and futures market closing indices are firstly used to predict the opening cash price in the cash market by the back propagation neural network (BPN) and support vector regression (SVR) models. Sensitivity analysis is employed to address and solve the issue of finding the appropriate setup of the networks topology for both BPN and SVR. To demonstrate the effectiveness of our proposed method, the five-minute and one-minute intraday data of spot and futures index from September, 1998 to October, 2004 was evaluated using BPN and SVR. Analytic results demonstrate that the NCT futures prices do provide useful information in predicting the opening cash price index, the one-minute intraday data provide more information than the five-minute intraday data, and SVR has better prediction capability than BPN. Finally a proposed trading strategy using the observed results can provide significantly better investment return than the commonly discussed buy and hold strategy.
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參考 文獻	中文部分 王鍾億(1998)，「類神經網路投資決策支援系統投資策略之研究」，成功大學企業管理研究碩士論文。黃玉如(1992)，「股價指數現貨與股價指數期貨兩者關聯性之探討以 S&P500 指數為例」，淡江大學管理科學研究所碩士論文。周慶華(2001)，「整合基因演算法及類神經網路於現貨開盤指數之預測-以新加坡交易所摩根台股指數期貨為例」，輔仁大學金融研究所碩士論文。林傳生(2004)，《Matlab 之使用與應用》，儒林圖書公司。林建成(2002)，「遺傳演化類神經網路於台灣股市預測與交易策略之研究」，東吳大學經濟研究所碩士論文。邱志洲(2002)，「STATISTICA 應用系列叢書(六)-類神經網路分析」。徐美珍(2004)，「企業財務危機之預測」，政治大學統計研究所碩士論文。莊桂香(1992)，「台灣與國際股市日內報酬的傳遞效果-ARCH 模型之應用」，中正大學財務金融研究所碩士論文。許馨尹(1999)，「國際產業關聯性對股票報酬訊息傳遞之影響-台灣與美國電子業之研究」，輔大金 融研究所碩士論文。陳雅雯(2003)，「支援向量機於預測台灣股市股價

漲跌之實證研究」，南華大學資訊管理研究所碩士論文。陳峙儒(2004)，「S&P500 股價指數期貨與現貨間價格預測效果的探討-根據時間序列與人工智慧模型」，成功大學財務金融研究所碩士論文。陳國玄(2004)，「人工神經網路與統計方法應用於台灣上市電子類股價指數預測與分類之研究」，國立成功大學統計研究所。楊政麟(1998)，「運用類神經網路於股價指數套利之研究」，台灣科技大學管理技術研究所碩士論文。蔡依玲(2001)，「台灣股票市場報酬率之研究」，國立成功大學統計研究所碩士論文。張振魁(2000)，「以類神經網路提高股票單日交易策略之獲利」，中央大學資訊管理碩士論文。張政一(2000)，「類神經網路顧有價證?預測股價及漲跌之研究」，中國文化大學國際企業管理研究所碩士論文。葉怡成(2002)，《類神經網路應用與實作》，台北：儒林。劉嘉鴻(2000)，「整合灰預測及類神經網路模型研究股市盤後期貨價格之資訊內涵以摩根台股指數及日經 225 指數為例」，輔仁大學金融研究所碩士論文。劉瑞鑫(2003)，「時間序列與人工智慧方法在台股指數報酬率預測之績效比較」，朝陽科技大學財務金融所碩士論文。蔡榮裕(1999)，「現貨盤後期貨交易資訊內涵之研究」，輔仁大學金融研究所碩士論文。曾淑青(1994)，「應用類神經網路於台灣股票市場量關係的預測與分析」，交通大學管科所碩士論文。羅華強(2001)，《類神經網路-Matlab 的應用》，新竹：清蔚科技。英文部分 Abhyankar, A. H. (1995), "Return and Volatility Dynamics in the FT-SE100 Stock Index and Stock Index Futures Markets," *Journal of Futures Markets*, Vol. 15, pp. 457-488. Admati, A. and Pfleiderer, P. (1988), "A Theory of Intraday Patterns: Volume and Price Variability," *International Review of Financial Studies*, Vol. 1, pp. 3-40. Anthony, A., Holmes, P. and Priestley, R. (1998), "The Effect of Stock Index Futures Trading on Stock Index Volatility: An Analysis of The Asymmetric Response of Volatility to News," *Journal of Futures Markets*, Vol. 18, pp. 151-166. Baba, N. and Kozaki, M. (1992), "Utilization of Soft Computing Techniques for Constructing Reliable Decision Support Systems for Dealing Stocks," *International Joint Conference on Neural Networks*, Vol. 3, pp. 2150-2155. Bergerson, K. and Wunsch, D. C. (1991), "A Commodity Trading Model Based on a Neural Network-expert System Hybrid," *International Joint Conference on Neural Networks*, Vol. 1, pp. 289-293. Bollerslev, T. (1986), "Quasi-Maximum Likelihood Estimation and Inference in Dynamic Models with Time-Varying Covariance," *Econometric Review*, Vol. 11, pp. 143-1172. Cawley, G. C. and Talbot, N. L. C. (2004), "Improved Sparse Least-squares Support Vector Machines," *Neurocomputing*, Vol. 48, pp. 1025-1031. Caudill, M. (1992), "Understanding Neural Networks: Computer Explorations," Vol. 1 and Vol. 2, Cambridge, MA: MIT Press. Chan, K. (1992), "A Further Analysis of the Lead-lag Relationship Between the Cash Market and Stock Index Futures Market," *International Review of Financial Studies*, Vol. 5, pp. 123-152. Chang, C. C. and Lin, C. J. (2001), LIBSVM: A Library for Support Vector Machines, Online Available at <http://www.csie.ntu.edu.tw/>. Cherkassky, V. and Ma, Y. (2003), "Comparison of Model Selection for Regression," *Neural Computation*, Vol. 15, pp. 1691-1714. Cherkassky, V. and Ma, Y. (2004), "Practical Selection

of SVM Parameters and Noise Estimation for SVM Regression,” *Neural Networks*, Vol. 17, pp. 113-126. Cherkassky, V. and Mulier, F. (1999), *Vapnik-Chervonenkis (VC) Learning Theory and Its Applications*,” *IEEE Transactions on Neural Networks*, Vol. 10, pp. 985-987. Chou, S. M., Lee, T. S. and Shao, Y. J. (2004), “Mining the Breast Cancer Pattern Using Neural Networks and Multivariate Adaptive Regression Splines,” *Expert Systems with Applications*, Vol. 27, pp. 133-142. Chung, H. M. and Gray, P. (1999), “Guest Editors Special Section: Data Mining,” *Journal of Management Information Systems*, Vol. 16, pp. 11-16. Craven, M. W. and Shavlik, J. W. (1997), “Using Neural Networks for Data Mining,” *Future Generation Computer Systems*, Vol. 13, pp. 211-229. Diamond, D. W. and Verrecchia, R. E. (1987), “Constraints on Short-Selling and Asset Price Adjustments to Private Information,” *Journal of Financial Economics*, Vol. 18, pp. 277-311. Engle, R. F. (1982), “Autoregressive Conditional Heteroskedasticity with Estimate of the Variance of U. K. Inflation,” *Econometrica*, Vol. 50, pp. 987-1008. Eun, C. S. and Shim, S. (1987), “International Transmission of Stock Market Movement,” *Journal of Financial and Quantitative Analysis*, Vol. 24, pp. 57-61. Fama, E. F. (1976), “A Note on the Market Model and the Two-Parameter Model,” *Journal of Finance*, Vol. 28, pp. 1181-1185. Glaria, B. A., Bengoechea, A., Mpodozis Marin, J. and Zuiiiga, R.J. (1996), “Stock Market Indices in Santiago Dechile: Forecasting Using Neural Networks,” *IEEE International Conference on Neural Networks*, Vol. 4, pp. 2172-2175. Grudnitski, G. and Osburn, L. (1993), “Forecasting S&P and Gold Futures Prices: An Application of Neural Networks,” *Journal of Finance*, Vol. 5, pp. 1155-1176. Hecht-Nielson, R. (1990), “*Neurocomputing*. Boston: Addison-Wesley,” *Proceedings of the IEEE International Joint Conference on Neural Networks*, Vol. 2, pp. 164-1990 Hornik, k., Gavert, H., Sarela, J. and Hyvarinen, A. (1989), “Multilayer Feedforward Networks are Universal Approximation,” *Neural Networks*, Vol. 2, pp. 336-359. Hsu, C. W., Lin, C. C. and Lin, C. J. (2003), “A Practical Guide to Support Classification,” retrieved Nov.21, 2004, from <http://www.csie.ntu.tw/~cjlin/papers/guide/.pdf>. Iihara, Y., Kiyoshi, K. and Toshifumi, T. (1996), “Intraday Return Dynamics between the Cash and the Futures Markets in Japan,” *Journal of Futures Markets*, Vol. 16, pp. 147-162. Jensen, M. (1978), “Some Anomalous Evidence Regarding Market Efficiency,” *Journal of Financial Economics*, Vol. 6, pp. 95-101. Jeon, B. N. and Von, G. M. (1990), “Growing International Co-movement in Stock Price Indexes,” *Quarterly Review of Economics and Business*, Vol. 30, pp. 15-30. Kim, K. (2003), “Financial Time Series Forecasting Using Support Vector Machines,” *Neurocomputing*, Vol. 20, pp. 307-319. Kimoto, T. and Asakawa, K. (1990), “Stock Market Prediction System with Modular Networks,” *International Joint Conference on Neural Networks*, Vol. 1, pp. 1-6. King, M. A. and Wadhvani, S. (1990), “Transmission of Volatility between Stock Markets,” *The Review of Financial Studies*, Vol. 3, pp. 5-33. Koike, A. and Takagi, T. (2004), “Prediction of Protein-protein Interaction Sites Using Support Vector Machines,” *Protein Engineering Design & Selection*, Vol. 17, pp. 165-

173. Lee, T. S. and Chen, N. J. (2002), "Investigating the Information Content of Non-Cash-Trading Index Futures Using Neural Networks," *Expert Systems with Applications*, Vol. 22, pp. 225-234. Lee, T. S., Chen, N. J. and Chiu, C.C. (2003), "Forecasting the Opening Cash Price Index Using Grey Forecasting and Neural Networks: Evidence from the SGX-DT MSCI Taiwan Index Futures Contracts," *Review of Securities and Future Markets*, Vol.12, pp. 151-170. Li, S., Kwok, J. T., Zhu, H. and Wang, Y. (2003), "Texture Classification Using the Support Vector Machines," *Pattern Recognition*, Vol. 36, pp. 2883-2893. Lin, W. L., Engle, R. F. and Ito, T. (1994), "Do Bulls and Bears Move Across Border? International Transmission of Stock Returns and Volatility," *The Review of Financial Studies*, Vol. 3, pp. 507-508. Lo, A. and Mackinlay, C. (1990), "When Are Contrarian Profits Due to Stock Market Overreaction?" Vol. 3, pp. 175-205. Martikaninen, T., Puttonen, V. (1994), "A Note on the Predictability of Finish Stock Market Returns: Evidence from Stock Index Future Markets," *European Journal of Operational Research*, Vol. 73, pp. 87-100. Minsky (1969) M. Papert, S. Perceptrons, MIT Press, MA, Cambridge. Parker, D. B. (1985), "Learning-logic: Casting the Cortex of the Human Brain in Silicon (Technical Report TR-47, Center for Computational Research in Economics and Management Science)," MIT press, Cambridge. Rumelhart, D. E., Hinton, G. E. and Williams, R. J. (1986), "Learning Internal Representations by Error Propagation," MIT Press, MA, Cambridge. Schmidt, M. (1996), "Identifying Speaker with Support Vector Networks," *Interface, 96 Proceedings*, Sydney. Steiner, M. and Wittkemper, H. G. (1998), "Portfolio Optimization with a Neural Network Implementation of the Coherent Market Hypothesis," *European Journal of Operational Research*, Vol. 100, pp. 27-40. Stephan, J. A. and Whaley, R. E. (1990), "Intraday Price Changes and Trading Volume Relations in the Stock and Stock Option Markets," *The Journal of Finance*, Vol. 45, pp. 1991-220. Stoll, H. R. and Whaley, R. E. (1990), "The Dynamics of Stock Market Prediction Using neural Networks: Does Trading Volume Help in Short-term Prediction?" *Proceedings of the International Joint Conference on Neural Networks*, Vol. 4, pp. 12438 - 2442. Tay, F. E. H. and Cao, L. J. (2001), "Application of Support Vector Machines in Financial Time Series Forecasting," *Omega*, Vol. 29, pp. 309-317. Trafalis, T. B. and Ince, H. (2000), "Support Vector Machine for Regression and Applications to Financial Forecasting," *Proceedings of the IEEE-INNS-ENNS International Joint Conference on Neural Networks, Italy*, Vol. 6, pp. 348-353. Tsaih, R., Hsu, Y. and Lai, C. C. (1998), "Forecasting S&P500 Stock Index Futures with a Hybrid AI System," *Decision Support Systems*, Vol. 23, pp. 161-174. Tse, Y. (1995), "International Linkages in Euromark Futures Markets : Information Transmission and Market Integration," *Journal of Futures Markets*, Vol. 18, pp. 129-149. Tse, Y. (1999), "Price Discovery and Volatility Spillovers in the DJIA Index and Futures Markets," *Journal of Futures Markets*, Vol. 19, pp. 911-930. Vapnik, V. N. (1997), "Support Vector Method for Function Approximation, Regression Estimation, and Signal Processing," *Advances in Neural Information Processing Systems*, Vol. 9, pp. 281-287. Vapnik, V. N. (2002), "The Nature of

	<p>Statistical Learning Theory (2 ed.),” New York: Springer Processing Systems 9, pp. 281-287. Wahab, M. and Lashgari, M. (1993), “Price Dynamics and Error Correction in Stock Index and Stock Index Futures Markets: A Co-integration Approach,” Journal of Futures Markets, Vol. 13, pp. 711- 742. Wang, X., Phua, P. K. H. and Lin, W. (2003), “Stock Market Prediction Using Neural Networks: Does Trading Volume Help in Short-term Prediction?” Proceedings of the International Joint Conference on Neural Networks, Vol. 4 pp. 2438-2442. Wei, K. C. J., Liu, Y. J., Yang, C. C. and Chaung, G. S. (1995), “Volatility and Price Change Spillover Effects across the Developed and Emerging Markets,” Pacific-Basin Finance Journal, Vol. 3, pp. 113-136. Werbos, P. J. (1974), “Beyond Regression: New Tools for Prediction and Analysis in the Behavioral Science,” Ph. D. Thesis. Harvard University, MA, Cambridge. Yang, Y. and Liu, X. (1999), “A Re-examination of Text Categorization Methods,” ACM International Conference on Research and Development in Information Retrieval, Vol. 22, pp. 42-49. Zhang, G., Patuwo, B. E. and Hu, M. Y. (1998), “Forecasting with Artificial Neural Networks the State of the Art,” International Journal of Forecasting, Vol. 14, pp. 35-62.</p>
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