

# Analyze the Relationship between REIT Capital Flows and Returns in United States and Taiwan

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## ABSTRACT

The purpose of this study is to examine the relationship between REIT capital flows and returns in United States and Taiwan and also examine the spillover effect between these two markets. Furthermore, we employ dividend yield and interest rate variable as control variables in our model to investigate whether the relationship between REIT capital flows and returns changes after controlling for interest rate and dividend yield variable. The result of Vector Autoregressive model indicates that in United States market, REIT capital flows are independent from the prior month's capital flows, but subject to REIT returns. REIT returns is not impacted by REIT capital flows and its historical value before and after controlling both dividend yield and interest rate. United States REIT investors may follow momentum strategy. In Taiwan market, we find that REIT capital flows is independent from REIT returns and its past value, nevertheless REIT returns positively significantly influences its own behavior. Taiwan REIT investors may follow momentum in REIT returns. Impulse response function shows response of United States REIT capital flows and REIT returns continues longer than those of the Taiwan REIT market. Through spillover effect test, we find out that United States REIT price has strong impact on the price of Taiwan REIT.

Keywords : REIT capital flows, REIT returns, VAR model, impulse response function.

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## REFERENCES

- Benson, K. L., Faff, R. W., & Smith, T. (2006). Endogeneity in fund flow and return: Evidence from individual funds. Working Paper. Bekaert, G., Harvey, C. R., & Lumsdaine, R. L. (2002). The dynamics of emerging market equity flows. *Journal of International Money and Finance*, 21 (3), 295-350. Berument, H., Dincer, N., & Olgun, H. (2006). The center and periphery relations in international stock markets. Working Paper. Cheng, H., & Glascock, J. L. (2005). Dynamic linkages between the greater China economic area stock markets - Mainland China, Hong Kong, and Taiwan. *Review of Quantitative Finance and Accounting*, 24 (4), 343-357. Clark, J., & Berko, E. (1997). Foreign investment fluctuations and emerging market stock returns: The case of Mexico. Staff Report 24, Federal Reserve Bank of New York. Clayton, J. (2003). Capital flow and asset values: A review of the literature and exploratory investigation in a real estate context. Working Paper 24, University of Cincinnati, Cincinnati, OH. Darras, A. F., & Zhong, M. (2002). Permanent and transitory driving forces in the Asian-Pacific stock markets. *The Financial Review*, 37 (1), 35-51. 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 (3), 427-431. Donald, W. K. A. (1993). Exactly median- unbiased estimation of first order autoregressive/ unit root models. *Econometrica*, 61 (1), 139-165. Dufour, J. M., & Renault, E. (1998). Short-run and long-run causality in time series: Theory. *Econometrica*, 66 (5), 1099-1125. Edelen, R. M., & Warner, J. B. (2001). Aggregate price effects of institutional trading: A study of mutual fund flow and market returns. *Journal of Financial Economics*, 59 (2), 195-220. Edwards, F. R., & Zhang, X. (1998). Mutual fund flows and stock and bond market stability. *Journal of Financial Services Research*, 13 (3), 257-282. Engle, R. F., & Granger, C. W. J. (1987). Co-integration and error correction: Representation, estimation, and testing. *Econometrica*, 55 (2), 251-76. Fisher, J., Ling, D. C., & Naranjo, A. (2006). Commercial real estate return cycles: Do capital flows matter? Working Paper. Froot, K. A., O'Connell, P. G. J., & Seasholes, M. S. (2001). The portfolio flows of international investors. *Journal of Financial Economics*, 59 (2), 151-193. Gompers, P. A., & Lerner, J. (2000). Money chasing deals? The impact of fund inflows on private equity valuations. *Journal of Financial Economics*, 55 (2), 281-325. Goetzman, W. N., & Massa, M. (2003). Index funds and stock market growth. *Journal of Business*, 76 (1), 1-28. Granger, C., & Newbold, P. (1974). Spurious regressions in econometrics. *Journal of Econometrics*, 2 (2), 111-120. Gujarati, D. (1992). *Essentials of Econometrics*. McGraw-Hill Inc. Hartzell, J. C., Kallberg, J. G., & Liu, C. H. (2005). The role of underlying real asset market in REIT IPOs. *Real Estate Economics*, 33 (1), 27-50. He, L. T., Webb, J. R., & Myer, N. (2003). Interest rate sensitivities of REIT returns. *International Real Estate Review*, 6 (1), 1-21. Hill, R.C., Griffiths, W. E., & Lim, G. C. (2007). *Principles of econometrics*. McGraw-Hill Inc. Hsiao, F. S. T., Hsiao, M. W., & Yamashita, A. (2003). The impact of the US economy on the Asia-Pacific region: Does it matter? *Journal of Asian Economics*, 14 (2), 219-241. Karceski, J. (2003). Returns-chasing behavior, mutual funds and beta 's death. *Journal of Financial and Quantitative Analysis*, 37 (4), 559-599. Kim, J. (2007). Stock returns and aggregate mutual fund flows: A system approach. Working Paper. Konya, L. (2004). Unit root, cointegration and granger causality test results for export and growth in OECD countries. *International Journal of Applied Econometrics and Quantitative Studies*, 1 (2), 67-94. Lieu, P. T., & Chi, C. W. (2006). How much does industry matter in Taiwan? *International Journal of Business*, 3 (2), 145-167. Lin, C. Y., & Yung, K. (2006). Equity capital flows and demand for REITs. *Journal of Real Estate Finance and Economics*, 33 (3), 275-291. Ling, D. C., & Naranjo, A. (1997). Economic risk factors and commercial real estate returns. *Journal of Real Estate Finance and Economics*, 14 (3), 283-307. Ling, D. C., & Naranjo, A. (2003). The dynamics of REIT capital flows and returns. *Journal of Real Estate Economics*, 31 (3), 405-434. Ling, D. C., & Naranjo, A. (2006). Dedicated REIT mutual fund flows and REIT performance. *Journal of Real Estate Finance and Economics*, 32 (4), 409-433. Masih, A. M., & Masih, R. (1997). A comparative analysis of the propagation of stock market fluctuations on alternative models of dynamic causal linkage. *Applied Financial Economics*, 7 (1), 59- 74. Phil, S. (1999). REITs: Outstanding value or same old story? *Journal of Financial Planning*, 12 (1), 38-39. Philippas, N. D. (2002). The interaction of mutual funds flows and security returns in emerging markets: The case of Greece. Working Paper. Remolona, P. C., & Gruenstein, D. (1997). Market returns and mutual fund flows. *Federal Reserve Bank of New York Policy Review*, 33-52. Ruey, S. T. (2001). *Analysis of financial time series*. John Wiley & Sons, INC, 309-350. Theodossiou, P., & Lee, U. (1993). Mean and volatility spillovers across major national stock markets: Future empirical evidence. *Journal of Financial Research*, 16 (4), 337-350. Titman, S., Wei, K. C. J., & Xie, F. X. (2004). Capital investments and stock returns. *Journal of Financial and Quantitative Analysis*, 39 (4), 677-700. Wather, V. A. (1995). Aggregate mutual fund flows and security returns. *Journal of Financial Economics*, 39 (2), 209-235. Wather, V. A. (1998). Has the rise of mutual funds increased market instability? *Brookings - Wharton Papers on Financial Services*, The Brookings Institution, 239-265. Wei, K. C. J., Liu, Y. J., Yang, C. C., & Chung, G. S. (1995). Volatility and price change spillover effects across the developed and emerging markets. *Pacific-Basin Finance Journal*, 3 (1), 113-136. Wilson, P., & Zurbrugg, R. (2003). International diversification of real estate assets: Is it worth it? Evidence from literature. *Journal of Real Estate Literature*, 11 (3), 259-278.