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Time-varying correlation between stock market returns and real estate returns

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ABSTRACT

Direct investment in commercial or residential real estate is found to provide valuable diversification benefits for Australian investors though this is not so evident for indirect real estate investment vehicles like listed Australian real estate investment trusts (A-REIT). Further, multivariate analysis of Australian real estate and share market quarterly returns, spanning the period from the 3rd quarter 1986 to the 3rd quarter 2009, suggest that the correlation between real estate returns and share market returns is time-varying. Finally, while all of the asset class correlation coefficients increased with the Global Financial Crisis period this broad movement in asset class correlation is not evident in during the Wall Street Crash of 1987.

1. Introduction

Real estate forms an important asset class for mutual funds both locally and globally (Higgins, 2007), accounting for around 10% of UK portfolio investment, around 5% of US portfolio investment (Blake et al., 1999) and close to 10% for Australian mutual funds.[2] Yet, it has been argued that the large institutions, particularly pension and superannuation funds, could benefit from even greater exposure to real estate investment (Blake et al., 1999; Brounen and Eichholtz, 2003; Hudson-Wilson et al., 2003; Lee and Stevenson, 2005). This is very much an empirical question determined by the correlation between available real estate investments and existing asset classes that make up pension and superannuation fund portfolios.

There are two key questions that we address in this paper. The first question is whether direct investment in commercial or residential real estate improves upon diversification benefits available in the share market. Unconditional correlation between returns on direct real estate investment and returns on shares suggests considerable diversification benefits as this is quite low but the critical factor for investors is whether this correlation will change over time: in particular, whether the correlation increases around crisis periods like the Wall Street Crash and the more recent global financial crisis. The destruction of diversification benefits achieved by share portfolios around financial crises is well known (Brooks and Del Negro, 2004; Campa and Fernandes, 2006; Caporale et al., 2005) but little is known about the impact of other asset classes on portfolio diversification during these turbulent periods, particularly real estate. The second

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question concerns whether listed real estate investment trusts provide the same level of diversification potential as direct property investment.

We use Australian share price returns and three classes of Australian real estate returns in analysis of time variation in correlation between these asset classes in an effort to better understand the quite low levels of institutional real estate investment noted in the literature. To date, Australian real estate research has focused on describing the market (Higgins, 2007), modelling the determinants of real house prices (Abelson et al., 2005; Bodman and Crosby, 2003), surveying Australian fund manager attitude to real estate investment funds (Keng, 2004) and assessing the performance of Australian listed A-REITs (Higgins and Ng, 2009). We extend this literature by analysing the time-varying correlation that exists between returns on different classes of real estate investment and share price returns.

Real estate, as an asset class, is perhaps more complex than might initially be thought, with at least two distinct sub-classes: commercial real estate and residential real estate. Further, investment can take place either through direct investment or indirect investment. Direct real estate investment is achieved through purchase of property while indirect investment is normally achieved through acquisition of shares or units in listed or unlisted entities that hold property (e.g. Australian real estate investment trusts or A-REITs).

Both liquidity costs and transaction costs are an important consideration in direct investment in either residential real estate or commercial real estate. Indeed, it is possible that these costs could negate the benefits of diversification in some markets. There are also problems with the valuation of direct real estate investment because real estate tends to be held for long periods of time and is rather heterogeneous in nature. Thus, because the market value of real estate is infrequently observed, appraisal based valuation is commonly relied upon for real estate portfolios. Nevertheless, there is a range of corrections available for these estimation issues (Byrne and Lee, 1995; Cho et al., 2003; Geltner and Goetzmann, 2000; Georgiev et al., 2003; MacGregor and Nanthakumaran, 1992; Newell and MacFarlane, 1996). Indirect investment offers a more liquid real estate investment but there is also some scepticism in the literature about the performance of this asset class (Brounen and Eichholtz, 2003; Byrne and Lee, 1995; Clayton and MacKinnon, 2001; Feldman, 2003; Georgiev et al., 2003). Estimation issues, arising from share market microstructure effects, could also affect returns calculated for this class of real estate investment (Brounen and Eichholtz, 2003; Georgiev et al., 2003). While we do not attempt to remove equity market microstructure effects, due to the arbitrary nature of these corrections, we do correct for serial correlation induced by appraisal based valuation and stale prices in our final model specification, using a simple time series adjustment.

A major contribution of this paper is in the analysis of time-varying correlation between returns generated by the three real estate investment sub-classes and Australian share market returns. It is well known that share returns tend to move together both over time and across markets and there is some evidence of increasing correlation during crisis periods. We extend the present literature through multivariate estimation of the correlations between Australian real estate returns and the Australian share market returns to assess whether a similar relation exists across these two asset classes. While the correlation between share returns and returns on direct real estate investment is quite low, the correlation is considerably higher for A-REITs. It appears that investment in indirect forms of real estate such as A-REITs offers more limited diversification benefit relative to direct real estate investment. Finally, our study provides further incentive for the use of multivariate GARCH (MGARCH) models in analysis changes in correlation over time. This approach can provide considerable insight into the variation that can take place in conditional correlation estimates over time (McClain et al., 1996; Moschini and Myers, 2002).

2. Data

The data used in this study consist of quarterly returns calculated for the Australian share market and for three real estate investment classifications including listed A-REIT and direct investment in commercial real estate and residential real estate over the period from September 1986 through to September 2009. The Australian Securities Exchange All Ordinaries Share Price Accumulation Index is used to capture share market returns (RALLORD). This share market index is adjusted for both capitalisation changes and dividends. Returns on direct investment in commercial real estate are calculated using the IPD/PCA Property Investors Digest Series (Composite) Index (RCOM). There is no total return index available for direct investment in residential real estate over the period of this study and so this return series is calculated using a separate house price index and a rental return index obtained from the Australian Bureau of Statistics (RRES). While we do not attempt to model the impact of property taxes in our direct investment series, we do adjust for the cost of managing these properties using a 12% reduction in rental returns. The Australian Securities Exchange S&P 300 A-REIT index is used in calculation of returns to listed Australian REITS (RAREIT).

Descriptive statistics are reported in Panel A of Table 1, with quarterly returns averaging 2% to 3% per quarter over the sample period. Listed property trust returns and share market returns are considerably more volatile than the returns reported for the direct real estate investments (RCOM and RRES), as might be expected given the impact of stale prices and appraisal based valuation techniques. The direct real estate investment returns also exhibit less skewness and kurtosis.

Q-statistics for serial correlation are reported in Panel B of Table 1 for each of the four series using both returns and squared returns. Serial correlation is evident in the direct real estate investment returns consistent with the valuation methods used in this data. There is no evidence of serial correlation in either of the two share market based index return series (RAREIT and RALLORD). Serial correlation is found in squared returns for all but the share market returns, suggesting the possibility of GARCH effects in these series. The ARCH LM test results also show strong support for ARCH effects in each of the three real estate return series though there is limited support for the existence of ARCH effects in the share market index return series (Table 1, Panel C). Finally, unit root tests (Panel D of Table 1) suggest that each of the four time series is stationary.