

Report on Master Thesis

Institute of Economic Studies, Faculty of Social Sciences, Charles University in Prague

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Title of the thesis:	European Real Estate Investment Trusts: Analyzing Correlation with a DCC-GARCH Model

OVERALL ASSESSMENT:

This master thesis can be characterized as an inspiring and mature academic work in a highly relevant field of European Real Estate Investment Trusts and their correlation with other major asset classes.

In section 1 Jiří provides basic justification for analyzing REITs and their correlation with other asset classes which is based on the diversification potential of REITs in portfolio management. Further, Jiří briefly outlines contents of the research paper and formulates the hypotheses: (1) European REITs and European stocks exhibit positive correlation, (2) their correlation grows in time and (3) same questions are asked for EU REITs as compared to fixed income investments and commodities. Also, introduction is partially used for literature overview relevant for the thesis.

Section 2 is a highly readable though slightly less relevant overview of REIT fundamentals, their history and legislation. Jiří proves broad understanding of REITs as an asset class. Literature review and references provided herein refer to various REIT issues and less so to the hypotheses specifically. Fundamentals discussed include inflation hedging characteristics, favorable tax regime and corporate governance implications of high leverage of REITs as well as the illiquidity problem of open-end funds in general. Also, country specific legislation is briefly covered for REITs in the U.S.A., Germany, France, U.K. and the Netherlands. An area for improvement would be to compare REITs as an alternative to other direct and indirect, public and private real estate investment strategies. This problem is visible in the description of the open-end vs. closed end fund structures where the reader wonders whether the structures described are still REITs and if so, where the border line between REITs and other non-REIT closed-end and open-ended funds lies. Brief description of other investment strategies would also help explain why REITs are underrepresented in some countries such as Germany or in the U.K, although Jiří makes good attempts in explaining these phenomena.

Section 3 provides a highly scientific theoretical background on the bivariate form of the DCC-GARCH model. Whilst the basics and derivation of the method are described in a sufficient detail, there is a limited discussion into other available research methods and why the particular method was selected. Jiří does mention that volatility clustering of REIT returns makes the DCC-GARCH model appropriate. Nevertheless, a more critical discussion of strengths, weaknesses and suitability of each method would be warranted. For instance, a more intuitive method such as rolling correlation was used by Niskanen and Falkenbach (2011) which is mentioned as one of the few method used for European REITs and would therefore deserve more detailed discussion. One weakness of the DCC-GARCH model mentioned by Jiří is that it is not suitable to differentiate between negative and positive shocks. The reader would appreciate how this weakness translates into interpretation of the conclusions given trending financial markets.

Section 4 is an essential description of the various data sets used for research. Jiří well specifies datasets for real estate, equities and commodities. discussion of the financial markets cycles. Minor criticism would be the German government bond yields used as benchmark for fixed income because these are used later in the report as the benchmark for risk-free rate in Sharpe ratio calculations. This creates slight methodological conflict. Nevertheless, Jiří well adjusts the data series for days of non-trading, considers frequency of data used, provides graphical inspection of data as well as elementary discussion and interpretation.

Section 5 provides own conclusions relevant to the hypotheses. Jiří provides quantitative and graphical support for his conclusion that (1) correlation between European REITS and European stocks is positive, high and is increasing in time, (2) correlation between European REITs and fixed income assets is negative, low and is decreasing in time and (3) correlation between European REITs

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and commodities is positive, low and is increasing in time. Similarly to Section 1, Jiří makes references to relevant literature herein to compare his results with research of other academics.

Moreover, section 5 also offers an interesting appendix to the thesis which underlines the implication of increasing correlation between REITs and stocks. Jiří presents four model portfolios and inspects their risk-adjusted returns using the Sharpe ratio. Whilst weights for individual asset classes in each portfolio are rather ad-hoc, it is not the aim of this thesis to perform a rounded optimization exercise in search of the efficient frontier along the Markowitz framework. The section well shows that REITs improve risk-adjusted returns to a pure stock portfolio but the section leaves unanswered questions how this diversification capacity of REITs compares with commodities, for instance.

Section 6 summarizes key findings. Recommendations for further research, nevertheless, are missing or not clearly stated.

On a general note, references to literature are being made throughout the thesis and there is not a distinct section on literature overview as such. The advantage of this approach is that relevant literature is mentioned wherever comparison to own conclusions or findings is appropriate. The disadvantage is that the reader must collect all comments throughout the thesis to consider what research had already been done in relation to the tested hypotheses. Language, writing style and structure of thesis is very good and a few minor improvements would make it excellent.

Overall, Jiří uses a highly scientific approach to test a relevant hypothesis, provides relevant literature review throughout the thesis and clearly states his own conclusions at the end. The minor defects and imperfections, in my view, do not hamper the reader to state that this is excellent academic work. As such I am pleased to recommend Jiří for the final state examination.

SUMMARY OF POINTS AWARDED:

CATEGORY		POINTS
<i>Literature</i>	<i>(max. 20 points)</i>	17
<i>Methods</i>	<i>(max. 30 points)</i>	27
<i>Contribution</i>	<i>(max. 30 points)</i>	28
<i>Manuscript Form</i>	<i>(max. 20 points)</i>	15
TOTAL POINTS	<i>(max. 100 points)</i>	87
GRADE	(1 – 2 – 3 – 4)	1

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Referee Signature