Reference No.:

S-HKU701/13

Research Grants Council of Hong Kong
Hong Kong – Scotland Partners in Post Doctoral Research
Completion Report

Part A (To be completed by the Awardee)

1. General Information

Name: Daniel Yet Fhang Lo

Home Institution: The University of Hong Kong

Project Period: June 2014   to   June 2015

Project Title: Spatial Autocorrelation of Real Estate Prices

Host Institution: Aberdeen University

Research Supervisor: Prof. Norman Hutchison

Chair Professor
Department of Real Estate

2. Summary of Fellowship

2.1 Objectives as per original application

1. Verify the existence of spatial autocorrelation in real estate prices;
2. Compare spatial autocorrelation levels of the Scottish real estate markets;
3. Identify a set of factors governing the formation of, and change in, spatial autocorrelation;
4. Examine how, and why, spatial autocorrelation has impact on accuracy of real estate prices in both Scottish housing market through the use of spatial-autoregressive hedonic price modeling;
5. Develop a theory on the relationship between spatial autocorrelation and a spectrum of real estate market characteristics, including liquidity, volatility, time-on-market, redevelopment potential, property atypicality and property age;
6. Test, using Scottish housing data, the hypothesis that spatial autocorrelation will increase with liquidity and decrease with time-on-market, volatility, redevelopment potential, property atypicality and property age;
7. Develop a method of assigning spatial weight matrix to enhance accuracy and cost-effectiveness for real estate valuation; devise a set of spatial autocorrelation robust hedonic models that improves existing real estate valuation methods in terms of unbiasedness.

3.   Research Outcome

3.1   Major findings and research outcome
(maximum one page; please make reference to Part 2.1 where necessary)

This paper has two important contributions. First and from a methodological stance, it demonstrates how housing policies can be empirically evaluated in the framework of spatial hedonic price modelling, which is one of the greatest departures from the mainstream literature. Existing approaches to examining institutional arrangements of housing market have been predominately normative or descriptive in nature, often producing elusive explanations, conclusions and implications that cannot be hypothesised or tested. Second, we complement the Scottish government' review of the Home Report scheme by providing some quantitative evidence. In particular, we explore how property sellers set asking prices in an information search context with the use of a large number of transactions in North East of Scotland. By subjecting the analysis in a hedonic setting that explicitly incorporates a spatial process of price discovery, we find *prima facie* evidence that property sellers are more prone to rely on prior sales to form asking prices, and hence a higher spatial autocorrelation of housing prices. Moreover, it is empirically revealed that the once-common practice of setting artificially low asking price with the aim to attract buyers in the Scottish housing market seems to have dwindled to a certain extent. We believe that the findings yield both theoretical and practical insights into real estate price formation, which are of great use and interest to policymakers, real estate developers, individual homebuyers, financial institutions and property professionals.

3.2   Potential for further development of the research and the proposed course of action
(maximum half a page)

The scope of the study could be extended in several directions: First, the underlying determinants of, as well as the effects of government policy on the spatial autocorrelation structure of commercial real estate/ resident rental market could be explored using the spatial hedonic models proposed in our paper, which can be flexibly modified to account for different variables, both spatial and aspatial. Second, with the use of some advanced GIS techniques, the spatial autocorrelation structure of real estate prices can be studied graphically so that its spatial interactions with other economic variables along a temporal dimension can be examined. Lastly, it has been established in the housing literature that spatial autocorrelation of real estate prices can have a geographical context. The findings of the study can therefore be further validated using data from other countries.

4. The Layman's Summary
(describe in layman's language the nature, significance and value of the research project, in no more than 200 words)

> In order to improve information transparency of the residential property market, the Scottish Government introduced a scheme named Home Report in 2008. According to the scheme, all property sellers are required by law to produce a valuation report for potential buyers' reference. Our research is designed to examine how the scheme affects the way in which property sellers set the asking prices of their properties after the introduction of scheme, and how the scheme changes the spatial structure of the real estate prices. It is believed that before 2008, sellers tended to set artificially low prices in order to attract more buyers, who had to conduct their own property appraisals. In other words, property sellers were in a better position when bargaining with buyers. By using a statistical method called spatial autoregressive modelling, we discovered that sellers tend to increase their asking prices considerably when listing their properties after the implementation of the scheme. This implies that the Scottish housing market has become more "transparent" in terms of the information shared by the market players. Furthermore, we also found that property prices are more "spatially connected" after the scheme came into effect. This could have profound policy implications especially in the areas of urban planning, social housing development and property taxation.

5. Peer-reviewed journal publication(s) arising directly from this research project
(Please attach a copy of each publication and/or the letter of acceptance. All listed publications must acknowledge RGC's funding support by quoting the specific grant reference.)

The Latest Status of Publications				Author(s)	Title and	Attached	Acknowledged
Year of publication	Year of Acceptance *(For paper accepted but not yet published)*	Under Review	Under Preparation *(optional)*	*(bold the authors belonging to the project teams and denote the corresponding author with an asterisk*)*	Journal/Book *(with the volume, pages and other necessary publishing details specified)*	to this report *(Yes or No)*	the support of this Joint Research Scheme *(Yes or No)*
2015	2015 (Accepted, subject to revisions)	√		**N. Hutchison,** G. Squires, A. Adair, J. Berry, **D. Lo,** S McGreal & S. Organ	Journal of Property Investment and Finance	YES	YES
	(Submitted to Urban Studies)	√		**D. Lo** and N. Liu	Urban Studies	YES	YES

6. **Recognized international conference(s) in which paper(s) related to this research project was/were delivered** *(Please attach a copy of each conference abstract/paper)*

Month/Year/ Place	Title	Conference Name	Attached to this report *(Yes or No)*	Acknowledged the support of this Joint Research Scheme *(Yes or No)*
June 2015	Information transparency and pricing strategy in the Scottish housing market: an evaluation of the Home Report Scheme	The European Real Estate Society Conference	YES	yes

7. **Other impact** *(e.g. award of patents or prizes, collaboration with other research institutions, technology transfer, etc.)*