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# Book of Abstracts

Kerem Yavuz Arslanlı | Editor

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ITU Faculty of Architecture  
ITU Urban and Environmental Planning and Research Center  
ITU Real Estate Development Masters Programme

22<sup>nd</sup> Annual European Real Estate Society Conference  
ERES 2015 Istanbul

# Book of Abstracts

Editor

Kerem Yavuz ARSLANLI

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## Preface

Dear Delegates at ERES 2015 Istanbul,

It's a pleasure for us to present you with this Book of Abstracts, consisting of contributions accepted for publication at the 22nd ERES Conference in Istanbul. The ERES 2015 Istanbul call for abstracts resulted to a 281 promising submissions of 424 authors from 41 countries. The theme distribution of papers are; Tax and Legal Issues in Real Estate %2, Marketing & Communication in Real Estate %2, PPF, PPP & Infrastructures %2, Asset, Property & Facility Management %3, Real Estate Education %3, Performance and Risk Management %3, Real Estate Portfolio Management %4, Corporate Real Estate %5, Real Estate Development %5, International Real Estate %6 Real Estate Finance & Investment %7, Real Estate Valuation %7, Market Research Analysis & Forecasting %11, Real Estate & Regional and Urban Economics %13, Green Buildings & Environmental Policies %13, Housing Markets & Economics %19.

The conference committed a broad range of topics pertaining to global real estate issues and a diverse audience comprising of academics and practitioners from Europe and around the World. Istanbul also provided a wonderful venue for the conference themes with its massive expansion and transformation processes throughout its history to explore different aspects of real estate not only for Istanbul but also across the World.

I would like to honor the support of A. Buket Önem, acting as the Conference Secretariat & preparing the book of abstracts for publication. I would like to thank to the Local Organizing Committee (Ferhan Gezici, Hayriye Eşbah Tuncay, Zeynep Erdoğan, Dilek Pekdemir) from Humanitas Tour; Hakkı Pehlivan, Dilek Dingeç and Duygu Oğuzman for helping on registrations and logistics. I would like to thank to Nur Esin for her magnificent "Istanbul" painting series, crafted only for ERES 2015 Conference. I would like to express my deep appreciation to Neşecan Çekici and Murat Berberoğlu for their supports and all our conference sponsors for their generous contributions.

Kerem Yavuz Arslanlı, PhD

Conference Chair





INTERNATIONAL REAL ESTATE SOCIETY

## Welcome from Ramón Sotelo, IRES President

Dear ERES 2015 Delegates,

As President of the International Real Estate Society, it is my pleasure to welcome you to the 22nd European Real Estate Society Annual Conference in Istanbul.

IRES is an umbrella association committed to encouraging real estate research and education on a global basis, providing means for enhancing the interconnectivity among all the sisters' societies: the American Real Estate Society, the European Real Estate Society, the Pacific Rim Real Estate Society, the Asian Real Estate Society, the African Real Estate Society, the Latin American Real Estate Society and the Middle East North Africa Real Estate Society.

This is our first annual conference from ERES in Turkey. Before, a very successful industry seminar took place in 2010 in Istanbul, too. We are proud so observe, Istanbul follows the European tradition to heavily include the industry into the academic conference – not only as sponsors, but also with participants on distinguished panels.

I would like to extend an invitation to attend the two IRES Panels during the conference. One, chaired by our incoming president, David Parker, included in the MENARES session and the other branded "Mind the gap – Academics and Practitioners in Real Estate" to discuss the relationship between the industry and the university. It is a honor for me to chair this panel.

As a member of a sister society you are a member of the IRES as well, and we appreciate your participation in our activities, sharing your ideas and helping IRES mission. IRES last year celebrated it's 20th anniversary. You find a 20th anniversary monograph edited by our past president Sandy Bond on our website.

Enjoy the conference and the fascination city of Istanbul.

Ramón Sotelo

President, International Real Estate Society

Bauhaus-University Weimar



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## Table of Contents

Preface \_\_\_\_\_ iii

Welcome from Ramón Sotelo, IRES President \_\_\_\_\_ v

### **A-5 Asset, Property&Facility Management**

Mohsen Shojaee Far, Ioanna Alasua Pastrana, Carlos Marmolejo Duarte \_\_\_\_\_ 1  
*Building Information Electronic Modeling (BIM) Process as an Instrumental Tool for Real Estate Integrated Economic Evaluations*

Kaia Kask \_\_\_\_\_ 2  
*Conceptual Framework for Measurement of Asset Depreciation on Buildings*

Hilde Remøy, Hans De Jonge \_\_\_\_\_ 3  
*Good Buildings Drive out Bad Buildings? Defining the Dogs and the Stars*

Carsten Lausberg, Franziska Piepke \_\_\_\_\_ 4  
*Improving the Purchase Decision in Real Estate Asset Management by Debiasing Decision-makers*

### **A-6 Asset, Property&Facility Management**

Leva Kvedaraviciene \_\_\_\_\_ 5  
*Major Drivers of Baltic Shopping Centres' Market*

Hilde Remøy, Sara Wilkinson \_\_\_\_\_ 6  
*Adaptive Reuse of Offices: Residential Conversions in Sydney*

Kaia Kask \_\_\_\_\_ 7  
*Implications from Fiscal Impact Analysis of Public Sector Real Estate Asset Management Models*

### **B-1 Corporate Real Estate**

Howard Cooke, Rianne Appel Meulenbroek \_\_\_\_\_ 8  
*Impact of Corporate Real Estate on UK Business*

Thijs Ploumen, Rianne Appel- Meulenbroek, Jos Smeets \_\_\_\_\_ 9  
*How to Align the Organization of the CREM-department to Strategy during a Recession*

Riikka Kyrö, Antti Peltokorpi, Karlos Arto \_\_\_\_\_ 10  
*Health and Wellbeing Sector Actors Embrace Collaboration and even Competition On-campus*

Theo Van der Voordt \_\_\_\_\_ 11  
*Adding Value by Corporate Real Estate: Parameters and Applications*

### **B-2 Corporate Real Estate**

Danielle Claire Sanderson \_\_\_\_\_ 12  
*Determinants of Satisfaction amongst Occupiers of Commercial Property*

Kevin Meyer, Andreas Pfnür, Maria Braunschweig \_\_\_\_\_ 13  
*PPP as an Alternative Procurement Method for Corporates*

Gheorghe Petru Multescu, Barry Symonds	14
<i>Alignment of Corporate Real Estate and Business Strategy in a disrupted market: hold and manage or sell?</i>	

### **B-3 Corporate Real Estate**

Ana Chadburn, Judy Smith	15
<i>The Productive Workplace for Knowledge Workers: A Focus on Workplace Design and Environment Across Various Age Groups</i>	
Karim Rochdi	16
<i>Ownership in Real Estate and Stock Market Performance: Evidence from German Equities</i>	
Markus Surmann, Wolfgang A. Brunauer, Sven Bienert	17
<i>The Energy Efficiency of Corporate Real Estate Assets: The Role of Professional Management for Corporate Environmental Performance</i>	
Pieter Le Roux	18
<i>What is the Real Added Value of Sustainable Office Buildings? - Initiating a Longitudinal Study</i>	

### **C-1 Green Building & Environmental Policies**

Erdal Aydin, Dirk Brounen, Nils Kok	19
<i>Capitalization of Residential Energy Efficiency</i>	
Lawrence Chin	20
<i>Sustainability in Retail Developments: Case of Singapore</i>	
Stephan Kippes	21
<i>The Attitudes of Buyers, Vendors, Tenants, and Landlords Concerning Environmental Questions - an Analysis based on Different National Empirical Surveys</i>	
Marcelo Cajias, Franz Fürst, Sven Bienert	22
<i>Is Energy Efficiency Priced in the Housing Market? - Large Sample Evidence from Germany</i>	

### **C-2 Green Building & Environmental Policies**

Fong-Yao Chen, Jen-Hsu Liang	23
<i>The Price Effect of EEWB Certification</i>	
Franz Fuerst, Pat McAllister, Anupam Nanda, Peter Wyatt	24
<i>Energy Performance Ratings and House Prices in Wales: An Empirical Study</i>	
Gunther Maier, Sabine Sedlacek, Philipp Kaufmann	25
<i>From Green Buildings to a Sustainable Real Estate Industry - Assessing Five Years of ÖGNI</i>	
Chiara D'Alpaos, Michele Moretto	26
<i>Do Smart Grids Increase Real Estate Market Values?</i>	

### **C-3 Green Building & Environmental Policies**

Pietro Bonifaci, Sergio Copiello	27
<i>A Multi Actor Multi Criteria Approach to Evaluate the Effectiveness of European Policies on Buildings Energy Retrofit. The Italian Context</i>	

Sotirios Thanos, Maria Karmagianni, Ian Hamilton \_\_\_\_\_ 28  
*Domestic Energy Prepayment and Fuel Poverty: Induced Self-selection of Housing Characteristics Influencing the Welfare of Fuel-poor Households*

Nikolas D. Müller, Andreas Pfnür \_\_\_\_\_ 29  
*Efficient measures for energetic retrofit—an interdisciplinary case study of representative housings in Germany*

Megat Mohd Ghazali Megat Abdul Rahman \_\_\_\_\_ 30  
*Measuring Instrument Constructs for Green Office Building Investments Variables Using Rasch Measurement Model*

#### **C-4 Green Building & Environmental Policies**

Saul Nurick, Alexandra Morris, Jody Schofield \_\_\_\_\_ 31  
*An Investigation into the Strategic Importance of GBFs within the Listed Property Market*

Michael McCord, John McCord, Peadar Davis, Martin Haran \_\_\_\_\_ 32  
*Is Energy Performance too Taxing?*

Megat Mohd Ghazali Megat Abdul Rahman, Maryanti Mohd Raid , Asmma' Che Kasim, Khadijah Hussin \_\_\_\_\_ 33  
*Impact of Indoor Environmental Quality and Innovation Features on Residential Property Price and Rent in Malaysia: a Review*

Costin Ciora, Gunther Maier, Ion Anghel \_\_\_\_\_ 34  
*Location, Location, Green. A spatial analysis of green buildings in Europe?*

#### **C-5 Green Building & Environmental Policies**

Sergio Copiello, Pietro Bonifaci \_\_\_\_\_ 35  
*Public-Private Partnership, Buildings Energy Efficiency and Social Housing: Renewed Tools to Satisfy Emerging Needs. Empirical Findings from a Comparative Analysis of Italian Experiences*

Rogério Santovito, Alex Abiko, Sven Bienert \_\_\_\_\_ 36  
*Discrepancies on Community-level GHG Emissions Inventories*

Nelufer Ansari, Marcelo Cajias, Sven Bienert \_\_\_\_\_ 37  
*The Value Contribution of Sustainability Reporting - an Empirical Evidence for Real Estate Companies*

Brian (Tony) Ciocchetti, Mehmet Emre Çamlıbel \_\_\_\_\_ 38  
*An Integrated Optimization Model for Capital Allocation of Energy Efficiency Measures of Existing Buildings: A Case Study of Bogazici University Kilyos Campus*

#### **C-6 Green Building & Environmental Policies**

Peter de Jong \_\_\_\_\_ 39  
*Longevity of Buildings as an Economic KPI*

Valentina Antonucci, Chiara D'Alpaos, Giuliano Marella \_\_\_\_\_ 40  
*How Regulation Affects Innovation: The Smart Grid Case at Urban Scale*

Sandra Vieira Gomes, Teresa Florentino \_\_\_\_\_ 41  
*The Role of Urban Parks in Cities' Quality of Life*

Philippe Bélanger \_\_\_\_\_ 42  
*Fundamental Value of Distributed Photovoltaic Energy Production around the World*

## D-1 Housing Markets & Economics

Philipp Deschermeier _____	43
<i>The Consequences of the Demographic Change on the Demand for Personal Living Space in Germany</i>	
Stephanie Moulton, Donald Haurin, Wei Shi, Mike Ericksen _____	44
<i>Who Gets a Reverse Mortgage? Identifying Household Level Determinants of U.S. Reverse Mortgage Choices</i>	
Lyndall Bryant _____	45
<i>Developer Charges and Housing Affordability in Brisbane, Australia</i>	
Clare Branigan, Paul Ryan _____	46
<i>Behavioural Biases in the Acquisition of Multiple Properties by Owner Occupier Investors during the Irish Residential Real Estate Bubble</i>	

## D-3 Housing Markets & Economics

Annelies Hoebeeck, Carine Smolders _____	47
<i>The Impact of the Mortgage Interest and Capital Deduction on Belgian Borrowing Behavior</i>	
Costin Ciora, Ion Anghel, Gunther Maier _____	48
<i>Housing Price Indexes in Central and Eastern Europe. A Comparative Study on the Models</i>	
Tanja Tyvimaa, Karen Gibler, Velma Zahirovic-Herbert _____	49
<i>The Effect of Age-Restricted Housing on Surrounding House Prices</i>	
Deborah Levy, Richard Dunning, Craig Watkins _____	50
<i>New Behavioural Business Practices: Agent Interactions in the Housing Market</i>	

## D-4 Housing Markets & Economics

Sinem Guler, Kangalli Uyar, Nihal Yayla, Bülent Güloğlu _____	51
<i>Estimation of Hedonic House Pricing Model through Non-Parametric Methods: Istanbul Real Estate Market</i>	
Stephanie Heitel, Andreas Pfnür _____	52
<i>Multiple Interests as Management Challenge for German Housing Companies: How Diverse and Conflicting are their Stakeholders' Expectations?</i>	
Peter Parlasca, Bogdan Marola _____	53
<i>House Prices in Europe – Indicator Development and Figures</i>	
Yasmine Essafi, Arnaud Simon _____	54
<i>Housing Market and Demography, Evidence from French Panel Data</i>	

## D-5 Housing Markets & Economics

Simon Stevenson, James Young _____	55
<i>How do Optimal Reserves Compare to Actual Undisclosed Reserve Prices? Empirical Evidence from English Open Outcry Auctions of Residential Property</i>	

Brano Glumac, Thomas, P. Wissink \_\_\_\_\_ 56  
*Homebuyers' Preference for Installed PV Systems – Discrete Choice Experiment*

Daniel Y. F. Lo, Nan Liu \_\_\_\_\_ 57  
*Information Transparency and Pricing Strategy in the Scottish Housing Market – an Evaluation of the Home Report Scheme*

Paloma Taltavull de La Paz, Francisco Juárez \_\_\_\_\_ 58  
*Long Term House Price Series for Spain: Construction and International Comparison*

## **D-6 Housing Markets & Economics**

Ing. Jan Veuger \_\_\_\_\_ 59  
*Housing Association Objectives need to be under the Same Roof: Report*

Erwin Van der Krabben, Joep Arts \_\_\_\_\_ 60  
*Synergy Effects of Collaboration by Housing Corporations and Institutional Investors on the Dutch Housing Market*

Frans Schilder, Edwin Buitelaar \_\_\_\_\_ 61  
*The Economics of Style*

Angelika Kallakmaa \_\_\_\_\_ 62  
*What to Expect from the Housing Market in 2015*

## **D-7 Housing Markets & Economics**

Danielle Barentsen, Philip Koppels, Hilde Remøy \_\_\_\_\_ 63  
*Heritage Designation and House Prices*

Darius Kulikauskas \_\_\_\_\_ 64  
*Measuring Fundamental Housing Prices in the Baltic States: Empirical Approach*

Dimitra Kavarnou, Anupam Nanda \_\_\_\_\_ 65  
*Is the Housing Market of the most Tourism Penetrated Places Affected by Tourism Penetration? – The Case Study of Crete Island*

Mehmet Emre Çamlıbel, Gülcemal Alhanlıoğlu, Deniz Uğurlu \_\_\_\_\_ 66  
*Structural Models of Urban Regeneration in Emerging Markets-Turkey Case*

## **D-8 Housing Markets & Economics**

Christopher Hannum, Kerem Yavuz Arslanlı \_\_\_\_\_ 67  
*A Measure of Spatial Competition in Residential Brokerage*

Ingrid Janssen, Roger Bougie, Koen Pillen \_\_\_\_\_ 68  
*The Effect of Different Pricing Strategies in the Dutch Housing Market*

Diego Salzman \_\_\_\_\_ 69  
*London Town a Behavioural Approach to Property Prices in the Capital City*

Mohd Azhar Ab Wahid \_\_\_\_\_ 70  
*Generation Y Homeownership in Malaysia*

## **E-1 International Real Estate**

Puying Li, Simon Huston	71
<i>International Competitiveness of China's Construction Firms</i>	
Francois Viruly	72
<i>An Assessment of the Viability of Large Mixed-Use Real Estate Developments in Sub-Saharan Africa</i>	
Kristian Kahre, Ene Kolbre	73
<i>Housing Affordability Changes in Baltic Capitals: On the Effect of Housing Boom and Negative Housing Equity on Housing Affordability</i>	

## **E-2 International Real Estate**

Eamonn D'Arcy, Stephen Roulac	74
<i>Global Brands the New Global Badge of Real Estate Service Quality?</i>	
Colin Lizieri, Daniel Mekic	75
<i>Real Estate and Global Capital Networks: Drilling into the City of London</i>	
Rene-Ojas Woltering	76
<i>The Effect of Interest Rates Changes on Listed Real Estate Companies</i>	

## **E-3 International Real Estate**

William Dimovski	77
<i>The Direct Costs of A-REIT IPOs</i>	
Vivek Sah, Alan Tidwell	78
<i>Are REITs more Transparent than Stock: Evidence Using a Propensity Score Model</i>	
Ayosha Orth	79
<i>Strategic Relevance of Due Diligence Real Estate – An Integrated Transaction Cost Theory Approach</i>	

## **E-4 International Real Estate**

Guowei Gu	80
<i>Examining the Time of Housing Supply</i>	
Sofia Dermisi	81
<i>Global Comparative Effects of Civil Unrests on Hotel Performance</i>	
Nicola Livingstone, Sara Wilkinson	82
<i>Reconsidering the 'Internet Effect': Real Estate Retail Outcomes in Australia &amp; the UK</i>	
Stephen Roulac	83
<i>Thinking - In and Outside - The Box: Asynchronous and Substitutable, Hyper-complexity and Predictability, Risk and Value, Sustainability and Permanence, Disruption and Destruction</i>	

## **G-1 Market Research, Analysis & Forecasting**

Ke Qiulin, Karen Sieracki, Michael White	84
<i>Transactions Based Commercial Real Estate Indices: A Comparative Performance Analysis</i>	
Sotiris Tsolacos, Kyung-Min Kim	85
<i>The Role of Liquidity in Forecasting Office Yields in Europe</i>	

Tony McGough, Jim Berry \_\_\_\_\_ 86  
*Bond Rate Trends and their Impact on the Relationship with Real Estate Yields*

Fotis Mouzakis, Dimitrios Papastamos, Simon Stevenson \_\_\_\_\_ 87  
*Rationality and Momentum in Real Estate Investment Forecasts*

## **G-2 Market Research, Analysis & Forecasting**

Keith Lown, Michael White \_\_\_\_\_ 88  
*Cyclical and Structural Components to Yield Movements: The Case of Central London Offices*

Ramiro J. Rodriguez \_\_\_\_\_ 89  
*Hedonical Office Rents Index with Spatial Econometrics*

Peter Sittler, Alexander Bosak \_\_\_\_\_ 90  
*The Office Market in Vienna: An Analysis of Trends and Cycles*

## **G-3 Market Research, Analysis & Forecasting**

Marian Alexander Dietzel \_\_\_\_\_ 91  
*Sentiment-Based Predictions of Housing Market Turning Points with Google Trends*

Charalambos Pitros, Yusuf Arayıcı \_\_\_\_\_ 92  
*How to Identify Housing Bubbles? A Decision Support Model*

Michael Schier, Michael Voigtländer \_\_\_\_\_ 93  
*User Costs of Housing, House Price Developments and Real Estate Bubbles: Evidence from Germany*

Yuriy Kochetkov, Elena Grebenuk \_\_\_\_\_ 94  
*Short-term Cycles in the Residential Market of Moscow and St.Petersburg*

## **G-4 Market Research, Analysis & Forecasting**

Daniël Vos, Monique Arkesteijn, Clarine Van Oel, Hilde Remøy \_\_\_\_\_ 95  
*Current Vacancy among Primary Schools in The Netherlands*

Yener Coşkun, Ali Coşkun, H. Murat Ertuğrul, Ünal Seven \_\_\_\_\_ 96  
*Testing for Bubbles in Turkish Housing Markets: A Comparison of Alternative Methods*

Jonas Hahn, Paul Bartsch, Sven Bienert, Doğan Kesdoğan \_\_\_\_\_ 97  
*Universal Web Based Data Processing Model for Rental Housing Profitability Calculation of Energetic Retrofitting*

Arydas Jadevicius, Simon Huston, Andrew Baum \_\_\_\_\_ 98  
*Two Centuries of Farmland Prices in England*

## **G-5 Market Research, Analysis & Forecasting**

Minou Weijs- Perrée, Rianne Appel- Meulenbroek, Bauke De Vries, Sjoerd Romme \_\_\_\_\_ 99  
*Market Research on Business Centre Concepts in The Netherlands*

Neil Crosby, Steven Devaney, Peter Wyatt \_\_\_\_\_ 100  
*Development Viability Indicators for UK Regions – Construction and Evaluation of New Time-series Estimates*



Vassiliki Vlachostergiou, Theodore Mitrakos, Calliope Akantziliotou \_\_\_\_\_ 101  
*Monitoring Commercial Property Prices during the Crisis: Evidence from Greece*

Alastair Adair, Jim Berry, David McIlhatton, Bob Martens, Stanley McGreal, \_ 102  
*European Real Estate Society Research Agenda: Looking Back and Projecting Forward*

## **G-6 Market Research, Analysis & Forecasting**

Áron Horváth, Gábor Révész \_\_\_\_\_ 103  
*Identifying Lag Relationships in the Office Market with a Turning Point Method during the Global Financial Crisis*

Charles Ostroumoff, Malcolm Frodsham \_\_\_\_\_ 104  
*A Simulation Model to Minimise the Tracking Error between the IPD Annual Index Estimate and the IPD Annual Index*

Dieter Rebitzer, Mark Renz, Paolo Colucci \_\_\_\_\_ 105  
*Economic Convergence in the EU and its Impact on Property Markets*

Ke Qiulin, Karen Sieracki \_\_\_\_\_ 106  
*Transaction Frequency and Property Price*

## **H-8 Marketing & Communication in Real Estate**

Markus Mändle, David Hummel \_\_\_\_\_ 107  
*Housing Co-operatives and Digital Democracy – Basic Aspects and Empirical Evidence*

Yuen Leng Chow, Seow Eng Ong \_\_\_\_\_ 108  
*Personality and Sales Performance*

Prashant Das \_\_\_\_\_ 109  
*Internet Search and Hotel Revenues*

Peter Sittler \_\_\_\_\_ 110  
*The User Satisfaction and Usability of the Austrian Land Register Real Estate App "LexioMobil"*

## **HD-4 Housing Markets & Economics II**

Ahmet Büyükduman \_\_\_\_\_ 111  
*House Price and Rent Developments in Istanbul: 1988-2012*

Marc Francke \_\_\_\_\_ 112  
*The Price-Turnover Relationship in European Housing Markets*

Wolfgang A. Brunauer, Wolfgang Feilmayr, Ronald S. Weberndorfer \_\_\_\_\_ 113  
*Residential Property Price Indices for Austria*

Xin Janet Ge, Brendan Williams \_\_\_\_\_ 114  
*House Price Determinants in Sydney*

## **HH-7 Housing & History**

Mustafa Çağhan Keskin \_\_\_\_\_ 115  
*Foundations and Real Estates of Yorguc Pasha Family through The Ottoman Endowment System*

Bilge Ar _____	116
<i>Byzantine Building Stock after the Conquest of Constantinople in 1453</i>	
Nisa Semiz _____	117
<i>Property Issues of Istanbul Seawalls</i>	
Ayşe Tuğba Şengil _____	118
<i>Seventeenth Century Residential Real Estate Prices in Istanbul</i>	

## **I-7 Performance and Risk Management**

Olga Filippova _____	119
<i>Office Market Response to Earthquake-Prone Building Policy in New Zealand</i>	
Alexandra Bay _____	120
<i>Efficiency Measurement of Swiss Shopping Centers Using Data Envelopment Analysis (DEA)</i>	
Charles-Olivier Amédée-Manesme, Fabrice Barthélémy _____	121
<i>Ex-ante Real Estate Value at Risk Calculation Method</i>	
Andréas Heinen, Mi Lim Kim, Alfonso Valdesogo _____	122
<i>Regime Switching House Price Dependence: Evidence from MSAs in the US</i>	

## **I-8 Performance and Risk Management**

Chiara D'Alpaos, Rubina Canesi _____	123
<i>Risks Assessment in Real Estate Investments: An AHP Approach</i>	
Enareta Kurtbegu, Juliana Caicedo-Llano _____	124
<i>Bootstrap Analysis for Asian REIT's Portfolios</i>	
Mutale Katyoka, Simon Stevenson _____	125
<i>Real Estate Market Risk Modelling</i>	

## **J-8 PPF, PPP & Infrastructures**

Daniel Wurstbauer, Christoph Rothballer _____	126
<i>Systematic Risk Factors in European Infrastructure Stock Markets</i>	
Joanna Wegrzyn, Adam Nalepka, Agnieszka Telega _____	127
<i>Reasons for PPP in Poland - Taxonomic Analysis</i>	
Eero Valtonen, Heidi Falkenbach, Kauko Viitanen, Erwin Van der Krabben _____	128
<i>Risk Allocation in Implementation of Urban Development Projects –Comparison of Finland, The Netherlands, and The UK</i>	

## **K-1 Real Estate & Regional and Urban Economics**

Elif Alkay, Berna Keskin, Craig Watkins _____	129
<i>Explaining Spatial Variation in Real Estate Development Activity in Turkey</i>	
Ilir Nase _____	130
<i>A Study of English House Price Data with Spatial Dependence</i>	
Melike Karaca, Aliye Ahu Akgün _____	131
<i>Socio-Spatial Transformation by Gated Communities on the Peri-urban Areas</i>	

## **K-2 Real Estate & Regional and Urban Economics**

Lynne Michael _____	132
<i>Agglomeration Economics and Global Cities: The case of London, New York and Relativity</i>	
A. (Annette) Tjeerdsma, Ing. Jan Veuger _____	133
<i>How Dutch Municipalities Manage their Community Real Estate</i>	
Dirk Kootstra, Ing. Jan Veuger _____	134
<i>Measuring the Added Value of Housing for Primary Education</i>	
Johannes Stiller, Dirk Assmann _____	135
<i>Knowledge Spillovers in Cities: The Creation and Transmission of Knowledge</i>	

## **K-3 Real Estate & Regional and Urban Economics**

Anil Kashyap, Jim Berry _____	136
<i>The Impact of Mass Transit System on Property Values in India</i>	
Simon Huston _____	137
<i>Regional Emerging Hubs - Catalysts, Drivers and Constraints</i>	
Merve Kaya, Ferhan Gezici Korten _____	138
<i>The Impacts of Real Estate Projects on Transformation of Centres in Izmir</i>	
Buğra Kağan Esen _____	139
<i>How Shall the Governance of the Urban Renewal Projects at Historical Sites be Performed? – Example of the Izmir Kemeralti District</i>	

## **K-4 Real Estate & Regional and Urban Economics**

Nicole Braun, Philipp Schäfer _____	140
<i>Short-term Rentals and Housing Rents. The Case of Airbnb in Berlin</i>	
Kristin Wellner, Friederike Landau, Claus Müller _____	141
<i>Housing Economics and Changing Residential Quality in Berlin</i>	
Dieter Rebitzer, Paolo Colucci, Mark Renz _____	142
<i>Impact of the Rent Brake on German Housing Markets</i>	

## **K-5 Real Estate & Regional and Urban Economics**

Ding Hsiu-yin _____	143
<i>Does Land Fragmentation Delay the Implementation for Urban Renewal?</i>	
Ayşe Nur Albayrak _____	144
<i>Industrial Decentralization as a Real Estate Development Project: Gebze Case</i>	
Jessie Bakens, Gwilym B Pryce _____	145
<i>Ethnic Mover Flows and Neighborhood Change in Scotland</i>	

## **K-6 Real Estate & Regional and Urban Economics**

Colin Jones, Nicola Livingstone _____	146
<i>The Restructuring of the UK Urban Retail Hierarchy and the Consequences for Real Estate Investment</i>	

Costin Ciora \_\_\_\_\_ 147  
*Behavioral Real Estate. A Literature Review*

Gheorghe Petru Multescu, Ala Daugeliene \_\_\_\_\_ 148  
*Developing Resilient Property Markets in the Wake of the 2008 Economic Crisis*

Tony Shun -Te Yuo Yuo \_\_\_\_\_ 149  
*Retail Rents and Spatial Patterns of Product Variety in Urban Shopping Areas*

## **K-7 Real Estate & Regional and Urban Economics**

Mehmet Akif Levent, Semih Adil, Ayşe Gökbayrak \_\_\_\_\_ 150  
*Real Estate Valuation use in Urban Transformation Projects*

Mohsen Shojaee Far, Carlos Marmolejo Duarte \_\_\_\_\_ 151  
*Does 3D Information Modeling Give Better Vision to Deal with Future Real Estate Capacities of Inaccessible Areas within Conflict Zones?*

Mehmet Topçu \_\_\_\_\_ 152  
*Relationship between Urban Development and Housing Values: The Example of Konya*

Juan Camilo Echavarría Ochoa, Carlos Marmolejo Duarte \_\_\_\_\_ 153  
*Diversity Analysis: The Case of Barcelona Metropolitan Region*

## **L-5 Real Estate Development**

Magdalena Zaleczna, Rafał Wolski \_\_\_\_\_ 154  
*The Polish Real Estate Market as an Area for Developers*

Graham Squires, Norman Hutchison, Alastair Adair, Stanley McGreal, Samantha Organ \_\_\_\_\_ 155  
*Innovative Finance for real Estate Development in Pan-European Regeneration*

Kevin Meyer, Andreas Pfnür \_\_\_\_\_ 156  
*Cognition Biases in Real Estate Investment Decisions. Empirical Evidence from the German Development Market*

Cath Jackson, Allison Orr \_\_\_\_\_ 157  
*Integrating Interests: Consumers-Retailers-Investors*

## **L-6 Real Estate Development**

Nurbanu Türgen \_\_\_\_\_ 158  
*Project Management in Real Estate Development Projects*

Joanna Wegrzyn, Michal Gluszk \_\_\_\_\_ 159  
*The Success of PPPs in Poland*

Jovita Nnametu, Iheanyi Alaka, Derek Fidelis Chikezie Okoronkwo \_\_\_\_\_ 160  
*Staff Housing: Panacea to Academic Productivity (Nigerian Institutions)*

Andrej Adamušcin \_\_\_\_\_ 161  
*Analysis of the Retail Market Development in Bratislava with a Focus on Retail Function and its Wider Relations within the City*

## **L-8 Real Estate Development**

- Berndt Lundgren, Fan Yang Wallentin \_\_\_\_\_ 162  
*Measuring the Effect of Unobservable Factors in Residential Choice Behaviour*
- Martina Bendová, Saija Toivonen \_\_\_\_\_ 163  
*Residential Infill Development – The Connection between Inhabitants' Attitude and Areal Characteristics*
- Huub Ploegmakers, Pascal Beckers \_\_\_\_\_ 164  
*The Impact of Planning on Business Development*

## **MNR-5 MENARES**

- Reyhaneh Rahimzad, Ali Parsa, Simon Huston \_\_\_\_\_ 165  
*Evaluating Mega Urban Regeneration Projects: Developing a New Model*
- Yasser Zanjiri, Ali Parsa \_\_\_\_\_ 166  
*Financing Real Estate and Urban Regeneration in Iran*
- Leila Shojaei, Ali Parsa \_\_\_\_\_ 167  
*Sustainability, Tall Buildings, High Density and Compact City Development: Dubai Marina, Dubai, United Arab Emirates*
- Ali Hepşen, Olgun Aydın, Orhan Vatandaş \_\_\_\_\_ 168  
*Housing Market Annual Gross Yield Modelling: A Comparison between two Dynamic Markets (Istanbul and Dubai)*

## **N-6 Real Estate Education**

- Margaret McFarland, Hossein Lavasani \_\_\_\_\_ 169  
*Multi-disciplinary Real Estate Education: A Comparison of a US and European Approach*
- Kathryn Robson, Guillermo Aranda- Mena, James Baxter \_\_\_\_\_ 170  
*Industry Expectation of Australian Property Higher Education Programs*
- Pieter Le Roux \_\_\_\_\_ 171  
*Creating Future-Proof Learning Environments - A Study on Educational Objectives and Conceptual Decision-Making*
- Anil Kashyap, Saumya Shirina \_\_\_\_\_ 172  
*Ethics in Real Estate Firms in India*

## **N-8 Real Estate Education**

- Mohd Haris Yop \_\_\_\_\_ 173  
*Future Direction of Real Estate Education for the Certificate Programs at National Institute of Valuation (INSPEN)*
- Bob Thomson, Bob Martens \_\_\_\_\_ 174  
*Blended Learning in Real Estate Education: A Survey*
- Stephen Roulac \_\_\_\_\_ 175  
*What Do Students Need To Know About Property? What Do Textbooks Actually Teach About Property?*

Gisela Vogt, Dieter Rebitzer	176
<i>Integration of Internationally Orientated Content into Real Estate Education Programmes - Exemplified by the Degree Programmes at Nuertingen-Geislingen University</i>	

## O-1 Real Estate Finance & Investment

Graeme Newell	177
<i>The Performance and Diversification Benefits of European Non-listed Real Estate Funds</i>	
Chetna Batra	178
<i>Evaluating Financial Health of Real Estate &amp; Construction Industry in India</i>	
Rachael Daisy Mirembe, Isaac Nabeta Nkote, Augustine Matovu	179
<i>Mortgage Financing and the Performance of Real Estate Business in Uganda; Lessons a from a Developing Country Context</i>	
Kaia Kask, Priit Sander, Kantšukov Mark	180
<i>CAPM versus Expert Opinion: Do Practitioners' Perceptions Meet Theory? Evidence from the Survey of Estonian Commercial Real Estate Market</i>	

## O-2 Real Estate Finance & Investment

Arvydas Jadevicius, Stephen Lee	181
<i>UK REITs Don't Like Mondays</i>	
Stephen Lee	182
<i>Herding in the UK Real Estate Market</i>	
David Parker	183
<i>Idiosyncratic Risk in Direct Property - A Review of the Literature</i>	
Giacomo Morri, Alessandro Baccarin	184
<i>European REITs NAV Discount: Market Sentiment and Fundamental Factors</i>	

## O-3 Real Estate Finance & Investment

Brent Ambrose, Michael Shafer, Yildirim Yildirim	185
<i>The Impact of Tenant Diversification on Spreads and Default Rates for Mortgages on Retail Properties</i>	
Stephen Ryan, Matthew Richardson	186
<i>Behavioural Biases among Real Estate Investment Decision Makers. Has Anyone Seen My Neocortex? I'm Sure I Left It Here Somewhere.</i>	
Patrick Krieger, Carsten Lausberg	187
<i>Decisions, Decision-making, and Decision Support Systems in Real Estate Investment Management</i>	
Sebastian Schnejdjar, Michael Heinrich	188
<i>Explaining the Discount in Closed Open-Ended Real Estate Funds in Germany</i>	

## O-4 Real Estate Finance & Investment

Graeme Newell	189
<i>The Changing Real Estate Market Transparency in the European Real Estate Markets</i>	

Simon Stevenson _____	190
<i>Volatility Transmission: A Global Tri-Variate Analysis of Public Real Estate and Foreign Exchange Markets</i>	
Paul Ryan, Clare Branigan _____	191
<i>The Irish Real Estate Bubble: A Behavioral Finance Perspective</i>	
Omokolade Akinsomi, Seow Eng Ong, Muhammad Faishal, Graeme Newell _____	192
<i>Does Being Islamic or Shariah-compliant Affect Capital Structure? Evidence from Real-estate Firms in the Gulf Cooperation Council States.</i>	

## **O-6 Real Estate Finance & Investment**

Alex Moss, Hans Vrensen, Nigel Almond _____	193
<i>Establishing a Blended Global Real Estate Investment Strategy Using Transaction Based Indices</i>	
Annisa Dian Prima, Simon Stevenson _____	194
<i>Investor Protection, Corporate Governance and Firm Performance: Evidence from Asian Real Estate Investment Trusts</i>	
Steven Devaney, David Scofield _____	195
<i>Measurement and Drivers of Time to Transact UK Commercial Real Estate Investments</i>	

## **P-1 Real Estate Portfolio Management**

Sevtap Kestel, Yener Coşkun, Bilgi Yılmaz, _____	196
<i>A Comparative Study on REIT Returns in Istanbul Stock Exchange by Using Single Index and Fama-French Methods</i>	
Omokolade Akinsomi, Lloyd Kemp, Boitumelo Masilela, Nishaan Ansary _____	197
<i>The Effects of REIT Sub-Categories on Mixed-Asset Portfolios in South Africa</i>	
Rafał Wolski _____	198
<i>Investment Risk in the Context of Price Changes in the Real Estate and Capital Markets</i>	

## **P-2 Real Estate Portfolio Management**

Işıl Erol, Doğan Tırtröğlü _____	199
<i>Pricing of IPOs: The Unique Case of Turkish REITs</i>	
Charles-Olivier Amédée-Manesme, François des Rosiers, Philippe Grégoire _____	200
<i>The Pricing of Embedded Lease Contracts Options</i>	
Alex Moss, Kieran Farrelly _____	201
<i>Alternative Index (Smart Beta) Strategies for REIT Mutual Funds</i>	

## **Q-1 Real Estate Valuation**

Nick French, Laura Gabrielli _____	202
<i>Pricing to Market - Property Valuation Methods Revisited</i>	
John MacFarlane _____	203
<i>Statutory Valuation and the Use of Automated Valuation Models</i>	
Ytzen Van der Werf, Fred Huibers _____	204
<i>Effect of Changing Valuer on Real Estate Portfolio Valuations</i>	

## **Q-2 Real Estate Valuation**

- Carlos Marmolejo Duarte, Juan Camilo Echavarría Ochoa \_\_\_\_\_ 205  
*Does Urban Subcentres Influence Housing Prices? An Analysis of the Metropolitan Region of Barcelona*
- Peter Palm, Helena Bohman, Magnus Andersson \_\_\_\_\_ 206  
*Anchoring Effects in Appraisals – A Study of Swedish Real Estate Students*
- Anja Dust, Kathleen Evans, Carsten Lausberg, Marcel Schmid, Francois Viruly \_\_\_\_\_ 207  
*Reducing the Property Appraisal Bias with Decision Support Systems*
- Paulo Castanheira \_\_\_\_\_ 208  
*Evolution of the Explanatory Variables of the Price of Real Estate in Lisbon during the Last Economic Crisis*

## **Q-3 Real Estate Valuation**

- Ari Laitala, Juhana Hiironen, Mikael Postila, Kauko Viitanen \_\_\_\_\_ 209  
*Value of the Energy Performance Certificates in the Housing Market – What is the Weight as Evidence of Open Data?*
- Marko Kryvobokov \_\_\_\_\_ 210  
*Housing Rents in Wallonia, Belgium: The Observation System and Market Segmentation*
- Sr. Faziyah Abd Rasid \_\_\_\_\_ 211  
*Assessing the Most Suitable Valuation Approaches and Methodologies for Stratum Title in Malaysia*
- Wolfgang Feilmayr \_\_\_\_\_ 212  
*Levels and Development of Real Estate Prices in Different Austrian Regions*

## **Q-4 Real Estate Valuation**

- Peter Elliott, Clive Warren, Jason Staines \_\_\_\_\_ 213  
*The Effects of Demolition Control Precincts on Property Values*
- Douw Boshoff \_\_\_\_\_ 214  
*The Use of Options Pricing Methods for the Valuation of the Bare Dominium Value of Property with a Long Term Land Lease*
- Nan-Yu Chu \_\_\_\_\_ 215  
*The Effect of Strategy Alliance on Property Values: A Case Study of Hotels in Taiwan*
- Lina Bellman, Peter Öhman \_\_\_\_\_ 216  
*How Authorized Property Appraisers Construe Information for Valuation of Commercial Properties: A Repertory Grid Study*

## **R-8 Tax and Legal Issues in Real Estate**

- Ramón Sotelo \_\_\_\_\_ 217  
*Actual Topics within Germanys Housing Policy*



Sebastian Johann	218
<i>Development of Refurbishment Concepts – The case of Multi-family Houses from the 1970s in Western Germany</i>	

Mike Hefferan	219
<i>Contemporary Challenges to Statutory Valuation Systems-The Australian Experience</i>	

## **PAN-1 PANEL - EPRA Public Real Estate Investments; An International Perspective**

Alex Moss	220
<i>The Performance Implications of Adding Global Listed Real Estate to an Unlisted Real Estate Portfolio</i>	

Marielle Chuangdumrongsomguk, Colin Lizieri	221
<i>Diversification Gains, Sector Exposure and Systematic Risk in International Public Real Estate Markets</i>	

Martin Hoesli, Elias Oikarinen	222
<i>Are Public and Private Real Estate Returns and Risks the Same?</i>	

Martin Hoesli, Stanimira Milcheva, Alex Moss	223
<i>The Impact of Financial Regulations on The European Listed Real Estate Sector</i>	

## **PAN-4 PANEL – MSCI Globalisation of Real Estate Investment**

Alex Moss, Nicole Lux	224
<i>The Impact of Liquidity on Valuation and Capital Raising for Global Listed Real Estate Companies</i>	

Mark Clacy-Jones	225
<i>Managing Performance &amp; Risk through Blended Global Investment Strategies</i>	

Bert Teuben, Peter Hobbs, Mark Clacy-Jones	226
<i>The Listed Funds' Real Estate Investment Process: Linkage between Asset Strategy &amp; Reporting and Investor Objectives</i>	

## **PHA-1 Doctoral Presentation**

Ignas Gostautas	227
<i>Electricity Consumption and House Values</i>	

Ebraheim Labash, Simon Huston	228
<i>Residential Valuation Systems in the United Arab Emirates</i>	

Liming Yao, Michael White, Alla Koblyakova	229
<i>House Price Appreciation and Housing Affordability: A Study of Younger Households Tenure Choice in China</i>	

Magdalena Teska	230
<i>Income Distribution and Housing in Poland between 2004 and 2012</i>	

## PHA-2 Doctoral Presentation

Randy I. Anderson, Nico B. Rottke, Sebastian Krautz _____	231
<i>Is Real Estate Private Equity Real Estate?</i>	
Thomas Müller _____	232
<i>The Trade-off between Housing and Pensions in the Household Portfolio of the Elderly</i>	
Frank Kwakutse Ametefe, Simon Stevenson, Steven Devaney _____	233
<i>Toward a Liability Driven Investment Paradigm for DC Pensions: Implication for Real Estate Allocations</i>	
Pau Blasi, Alain Cohen, Arnaud Simon _____	234
<i>The Determinants of Historical Property Market Risk Premium in the London Office Market</i>	

## PHB-1 Doctoral Presentation

Nurul Hana Adi Maimun, Jim Berry, Stanley McGreal, Michael McCord _____	235
<i>The Impact of Energy Performance Certificates on the Prices of Dwellings</i>	
Deborah Miriam Leshinsky _____	236
<i>Resolving Value through the Court System</i>	
Claudia Ascherl, Wolfgang Schaefers _____	237
<i>IPO Underpricing of European Property Companies</i>	
Ari Laitala _____	238
<i>Summarizing Doctoral Thesis: Hunt for the Green Value</i>	

## PHB-2 Doctoral Presentation

Mohsen Shojaee Far, Carlos Marmolejo Duarte _____	239
<i>Impacts of Abandoned Properties in Conflict Zones (Geopolitical Brownfields) on Real Estate Development &amp; Regeneration Possibilities: Case of Cyprus Conflict</i>	
Henri Lüdeke _____	240
<i>Real Estate Contribution Margin System with Hierarchical Structure Effects a Concept for Real Estate Residential Companies and Cooperatives</i>	
Patrick Krieger _____	241
<i>Investigations into the Reasons for Non-normal Real Estate Returns – Time Matters!</i>	
Kateryna Kurylchyk _____	242
<i>Real Estate Investment Risks: The Case of Central and Eastern Europe</i>	
Keyword Register _____	243
Author Index _____	247



## **Building Information Electronic Modeling (BIM) Process as an Instrumental Tool for Real Estate Integrated Economic Evaluations**

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The initial costs of a building are quite small in comparison to the life-cycle costs, as it is estimated that they represent less than 30% of the total life-cycle cost of a building. Accordingly if we consider integration of the life-cycle cost of a building into the estimation of investment values, then we would have a better and clearer idea of how much our total operation costs is during and after construction process. This integration possibility would positively affect the decisions of private investors about their investment and also assist the public sector to decide on better proposals for civic buildings, where integration of running cost into total investment may provide more efficient decisions. However, traditional forecasting methods are not accurate, and it may not demonstrate the reality. Therefore the main focus of this study is an investigation on a practical and instrumental methodology based on technological possibilities in the AEC industry, where integration of building information electronic modelling (BIM) processes into real estate economic evaluations suggested. Findings of this study demonstrate the opportunities to manage and estimate a reliable and accurate information on a building's life cycle in real time by considering each element and its components into the calculation, which may change the metrics for a real estate economic evaluation in order to achieve sustainable and efficient property investment towards smart city agendas.

Keywords: BIM, facility management, life cycle, real estate, smart city

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# A-5

## Conceptual Framework for Measurement of Asset Depreciation on Buildings

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Asset depreciation is an important issue in many economic decisions made either by private or public sector institutions in all times. For example, the methodology and measurement issues of asset depreciation are influencing capital budgeting decisions in corporate finance and also major capital expenditure decisions that concern public sector long-term investments.

As the depreciable assets come in many forms, there is still large gaps in literature that need to be filled in order to develop comprehensive estimates of depreciation for tax and accounting purposes (Hulten 2008: 1). Also, as it is asserted by Diewert (2005), the accounting for the contribution of capital to production is more difficult than accounting for the contributions of labor or materials, because – when a reproducible capital input is purchased for use by a production unit at the beginning of an accounting period, it is not possible to simply charge the entire purchase cost to the period of purchase. Since the benefits of using the capital asset extend over more than one period, the initial purchase cost must be distributed somehow over the useful life of the asset. This is the fundamental problem of accounting (Diewert 2005: 480), which has been solved by the calculation of asset depreciation.

The current literature about depreciation in general is very broad and well-researched and it may seem that everything in that field has been done already. Nevertheless, looking more thoroughly the overwhelming literature written about asset depreciation, the author of the current paper has found that there is a lack of systematic approach to the background of the topic with thorough theorization about the connections and links with other relevant problems, like capital expenditure, user cost of capital, asset price and asset rental price. Therefore, the aim of the current paper is to develop a systematic theoretical framework for a building asset depreciation concept that would integrally account all the mentioned co-factors, stemming from the fact that building asset does have some special features over other (durable) assets like vehicles and machinery. The paper also sets up a research question, whether at the long-run equilibrium level, the cost of capital used to discount the cash flows from the building asset, should equal at least the depreciation rate of the same asset?

Keywords: Asset depreciation, asset rental price, building maintenance, capital expenditure, user cost of capital

## Good Buildings Drive out Bad Buildings? Defining the Dogs and the Stars

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Financial and real estate crises and “new ways of working” reduce the need for office space. For example in Amsterdam, currently 17% of the office space is vacant, of which 60% is structurally vacant. As a consequence, office markets have become replacement markets without a quantitative need for new office buildings: Good buildings drive out bad buildings.

When relocating, office organisations consider buildings and locations within geographically defined markets that optimally facilitate their main processes, reduce costs, optimise flexibility, and support image and financial yield. Sustainability is important for organisations to define their image and comply with customer expectations. Hitherto, new office developments were the response to this demand. Meanwhile, vacancy, financial scarcity, public opinion and governmental policy oppose new office construction in locations with high vacancy. New strategies are needed to respond to the demand for sustainable office space and limit new developments. Adaptive reuse of the existing building stock and new adaptive buildings could be the key.

The revealed preferences of office users and organisations are important to understand office building obsolescence and lifespan. In former research the relationship between property characteristics and office user preferences was revealed. This paper aims at answering the question: which physical characteristics are found to reduce the risk of office building obsolescence?

To answer this questions, an extensive literature review is done on revealed preferences, location and building quality, and obsolescence studies. Henceforth, empirical studies are conducted in the Dutch office market to outline the relationship between physical characteristics and reduced risk of office building obsolescence.

Keywords: Commercial office real estate, lifespan, obsolescence, revealed preferences, vacancy

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**A-5****Improving the Purchase Decision in Real Estate Asset Management by Debiasing Decision-makers****Carsten Lausberg**, *Nurtingen-Geislingen University, Germany***Franziska Piepke**, *University of Hamburg, Germany*

The question how real estate investment decisions should be made and are actually made has been extensively discussed in the literature. However, some behavioral aspects such as the effect of the anchoring bias on the quality of purchase decisions or the effectiveness of debiasing strategies have been neglected so far. It can be assumed that these aspects greatly influence decision-making in real estate—as has been convincingly shown for other areas.

This paper examines whether the anchoring effect occurs in real estate asset management and if this bias can be minimized using debiasing-strategies. To answer our research question we set up an experiment in which we asked 152 real estate experts to form an opinion about the ceiling price for a property described in an investment memorandum. We found that the probands anchored their opinion to the given offering price. That was in line with our expectations and the previous literature. But we also found that a simple debiasing strategy, considering a worst-case scenario, significantly reduced the unwanted anchoring effect. The results show that there are promising ways to improve decision-making. More research is needed until our findings can be incorporated in decision processes and decision support systems.

Keywords: Anchoring, debiasing, decision-making, real estate asset management

## Major Drivers of Baltic Shopping Centres' Market

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The paper takes into consideration the complexity of shopping centres' segment in the context of changing economy as well as in comparison with other real estate segments. It has often been said that the dynamics of retail real estate are three-dimensional (Shopping centre management, ICSC, 1999) while those of most other real estate formats are two-dimensional. The reasoning behind the comparison is that most nonretail real estate – office, apartment and warehouse formats, for example – are based upon a simple landlord-tenant relationship. Shopping centres and other retail real estate formats are based upon a more complex dynamic which includes the same two parties plus customers, who must patronize tenants' stores in order to the process to work – thus creating a three-party process. The complexity results from the additional challenges related to finding the appropriate assortment of tenants who can effectively attract enough consumers to support the business plan, including paying the landlord's rents. Moreover, in most cases, the fourth party – lender – plays important role when providing capital needed by shopping centre owners to build, purchase of finance a centre.

The aim of the paper is to analyze the major Baltic shopping centre market drivers in the context of three dimensional dynamics as well as changing economy and discuss the key drivers' impact for the segment development and change, as retail segment adapts to various challenges and opportunities more rapidly than the most of other real estate formats

Keywords: Baltic shopping centers, customer as a change agent, market drivers, shopping centers market



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# A-6

## Adaptive Reuse of Offices: Residential Conversions in Sydney

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**Sara Wilkinson**, *University of Technology, Australia*

The built environment contributes 40% to total global greenhouse gas emissions and 87% of the buildings we will have in 2050 are already built. If predicted climate changes are correct we need to adapt existing stock sustainably. Reuse is an inherently sustainable option, which reduces the amount of waste going to landfill. Inevitably settlements and areas undergo change, whereby land uses become obsolete and buildings vacant. At this stage, the options are either to demolish or to convert to another use. In central business districts (CBDs) outside of Australia there is a long history of office to residential conversion. Although these types of conversions are few in number in the Sydney CBD, a trend is emerging in conversion. Some 102,000m<sup>2</sup> of office space is earmarked for residential conversion in Sydney as demand for central residential property grows and low interest rates create good conditions. Coupled with this, is a stock of ageing offices and a population projected to increase by 4% to 2031 requiring 45000 new homes. With the Sydney market about to be flooded with the Barangaroo office supply in 2017, the conditions for residential conversion are better than ever. Based on the foregoing, this paper aims at answering the questions: which drivers drive residential conversions in Sydney? And what are the barriers for successful conversions? This paper investigates the nature and extent of residential conversion in Sydney, as well as the drivers and barriers to successful conversion. Through an extensive literature study, the paper identifies the key lessons from international residential conversion projects. Subsequently, expert interviews are held with developers in the Sydney market. This paper explores the potential of delivering sustainability to the Sydney CBD through residential conversion.

Keywords: Building adaptation, land use, residential conversion, sustainability, vacancy

## Implications from Fiscal Impact Analysis of Public Sector Real Estate Asset Management Models

**Kaia Kask**, *University of Tartu, Estonia*

Countries are different in terms of territory, population, income, their traditions and habits vary, and also the ways, how they handle their public sector real estate management is not the same. Still, there are a lot of common features, which are universal to bear in mind while making decisions over the use of taxpayers' money. On one hand, in every country the government has to administrate in terms of budgetary constraint, but on the other hand, in every democratic country the public sector has been evoked to serve the interest of the citizens of that country. On the public sector level, there is a general agreement that government authorities need to make state-concerning financial decisions prudently, weighing carefully the consequences in executing different scenarios of action. Smaller countries like Estonia have fewer opportunities and scantier resources (both human and financial) to deal with the complex problems concerning large amounts of capital assets, and therefore decisions over public sector real estate issues need to be made even more diligently.

The paper fills the gap in the literature, where no quantitative level analysis of public sector real estate management has been elaborated. In this paper, an Estonian example has been taken in order to analyse the results from four different state real estate asset management scenarios, called as models. Therefore, the aim of the paper is to draw the implications of public sector real estate asset management models, based on the quantitative fiscal impact analysis on state budget and government sector account. The state real estate assets are viewed in two separated classes – as general-purpose properties and special-purpose properties.

On the one hand, the research shows an extreme complexity of the implementation of public sector real estate asset management (PREAM), but on the other hand, the paper shows that the model-based asset management decision-making and quantitative evaluation of fiscal impact on the level of public sector real estate is applicable also in practice. Implications made out of the research should give some broader enlightenment about the problems arising from the similar kind of model-based analysis of the performance of PREAM in other countries.

Keywords: PREAM models, asset management, benefit-cost analysis, fiscal impact analysis, public sector real estate

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**B-1**

## Impact of Corporate Real Estate on UK Business

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**Purpose:** Corporate Real Estate (CRE) directly impacts upon the performance of business, as a cost and in providing the environment for it to operate in. Lease length and the total financial commitment is rarely understood and is not a prominent part of the decision-making process. However, the financial burden of property can hamper business and indeed lead to its failure. The purpose of the research is to establish the scale of the commitment to CRE; examine how it varied over the period 2007 to 2013 (namely into and out of the financial crisis and the recession), in absolute terms and against profitability; determine portfolio flexibility (or anticipated inflexibility) and establish whether business can resize the property portfolio in reaction to changes in the business environment.

**Design/methodology/approach:** The research approach was to examine the published financial accounts of the top 350 quoted companies listed on the London Stock Exchange. The first stage was to extract the data for the individual companies for the years 2007 to 2013 inclusive. The data included turnover; profitability; net asset of the company; property book value; Full Time Employees; property provisions and the profile of property lease commitments. Companies were grouped in business sectors, such as retailing, industrial, etc., for analysis.

The analysis examines the lease length profile; the cost of property against turnover and profitability and relative to the headcount within the organisation; and how the provision for surplus property compares to profitability. It considers the sectors on an individual year basis and how the ratios have changed from 2007 to 2013. The underlying focus was to assess how business reacted to the financial crisis and the recession. That was measured by reference to changes in turnover, profitability and headcount through and out of the recession. Allied to that the question was how did business seek to change its property cost base and what correlation is there between the various metrics. The process of abstracting data and analysis is on going, and with that how business is recovering from the recession. Sectorial differences as well as the overall patterns are examined.

**Findings:** The analyses indicated that the impact of the recession was relatively transitory. The retail sector, as an example, showed for 2007 to 2012 that the total lease commitment expanded by circa £1,500m rising to £9,387 in 2012. Through

**Keywords:** Benchmarking of CRE, financial commitment to CRE, metrics, surplus property

## How to Align the Organization of the CREM-department to Strategy during a Recession

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Purpose-In times of recession a lot of companies need to reduce costs. This also affects the budgets that are available for corporate real estate (CRE). Therefore it is important that the organization of the CRE management (CREM)-department is optimally aligned with CRE-strategy. This study provides a tool for evaluating the organization of the CREM-department when applying the CRE-strategy of cost reduction. Design/methodology/approach-The evaluation tool for alignment of the organization of the CREM-department is a result of an explorative study. First a literature study was conducted which led to a theoretical model of factors that influence the organization of the CREM-department, with regard to five components: Organizational structure, Sourcing, Centralization, Process management and Company culture. Then empirical data was collected through interviews with two groups of respondents, namely CREM-departments who served as cases and CRE-consultants to hear their expert opinions. Cross-case analysis and a comparison of these results with the expert opinion of the consultants were used to look for links between the CREM department components and each CRE strategy. Findings-It was not possible to formulate links between every possible CRE strategy and the CREM-organization as most of the cases had implemented the same strategy, namely cost reduction. This did provide the opportunity to construct a clear evaluation model for this particular strategy. Not all the themes were aligned with the chosen CRE-strategy identically by all the CREM-departments with a cost reduction strategy, but many similarities came forward and were backed by the CREM experts. This was worked into an evaluation model on the alignment of the organization of the CREM-department with a cost reduction strategy. Research limitations/implications-The model developed is especially relevant for CREM-departments who have similar characteristics as the CREM-departments who served as cases: large companies with a division macro-organizational structure that apply the CRE-strategy of cost reduction. The evaluation model does not spell out exactly how the CREM organization should be managed and formed, but does provide insight in a number of main choices that can influence the organization of CREM. The purpose of the evaluation model is that the CREM department becomes aware of the consequences for the organization of CREM when implementing a cost reduction aimed CRE-strategy.

Keywords: CREM organization, cost reduction, model, strategy

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**B-1**

## Health and Wellbeing Sector Actors Embrace Collaboration and even Competition On-campus

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The purpose of this study is to understand how multiple actors from the same business sector perceive operating on a campus setting. The main focus is on the relationships between tenants on-campus, as well as on identifying potential derived from the location on-campus. The study is a qualitative case study of two health and wellbeing campuses in Finland. The cases share some key characteristics, but are in different phases of their life-cycles. The similarities and differences between the two campuses provide fertile ground for comparison. Altogether 19 semi-structured interviews of organisations operating on the two campuses comprise the main source of data.

The interviewed actors appreciated the joint resources and facilities provided by the campus. Joint resources were thought to comprise human capability and technology, but also reputation and brand. Specialised health care equipment and facilities are particularly beneficial to share due to their expense and lower utilisation rate. However, also joint restaurant, parking, reception and other facility services were appreciated. Additionally, informal joint areas allowing spontaneous interaction, such as coffee rooms and open hallways were mentioned as a preference. The campus enables providing supplementing services and products for a shared customer segment in a "Health and Wellbeing Shopping Centre" type of setting. Interestingly, even competition was tolerated and welcomed by the actors. The reasoning was that, access to a wider offering would be beneficial for potential customers, and therefore the whole campus. The informants considered essential that all actors on-campus share a common vision and goals. A potential threat was identified in the lack of an impartial integrator onsite.

The study indicates that tenants benefit from the possibility to operate on a campus designated for a specific business sector from both practical (joint facility services) and strategic (joint vision) perspective. The findings provide interesting insight for both real estate owners and corporate real estate professionals. For the former, the findings may be useful when planning a tenant-mix, or retrofitting facilities. The latter might consider the findings when re-locating and selecting new facilities. It should be noted that, the study is explorative in nature and the findings cannot necessarily be generalised beyond their context. Further studies with cases from outside Finland would be of interest.

Keywords: Campus, corporate real estate, facilities, health and wellbeing, multi-tenant

## Adding Value by Corporate Real Estate: Parameters and Applications

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The concept of adding value by real estate from the perspective of the end user is "hot". The search for added value is included in current research within both the fields of Corporate Real Estate Management (CREM) and Facility Management (FM) and is also a popular subject in curricula at universities and other institutions of higher education. However, a review of literature shows a lack of consistency in definitions and value parameters. Besides, still much work has to be done to operationalise different value parameters and to be able to measure the benefits and costs of CREM and FM interventions in a reliable and valid way. This paper first explores the meaning of added value in connection to other concepts such as the match between demand and supply and alignment of real estate to organisational aims and objectives. Then an overview will be presented of different value dimensions based on an extensive review of the literature. Furthermore the paper presents the findings of empirical research within the health care sector regarding the values that are incorporated in value adding management, which values are prioritized and why, and how health care organisations link their choices regarding real estate and building related facilities to their organisational objectives. The methods range from interviews with CEOs, project managers and facility managers in hospitals and facilities for assisted living of the elderly, to a web-based survey among real estate managers and facility managers working in the mental health care sector. The data from different research projects are compared on prioritized aspects and measures to support cost reduction, labour productivity, user satisfaction, and other values. The paper also includes an exploration of how to explain similarities and dissimilarities in prioritized aspects between different organisations and different sectors, and reflections on the gaps between theory and practice. The paper ends with some practical recommendations and recommendations for further research.

Keywords: Added value, corporate real estate, health care, performance measurement, value parameters

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**B-2**

## Determinants of Satisfaction amongst Occupiers of Commercial Property

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In order to maximise occupancy and rental income, landlords must attract and retain occupiers. Therefore landlords and property managers need to understand what aspects of property management matter most to occupiers. This paper uses structural equation modelling and regression to analyse 4400 interviews with retailers, office tenants and occupiers of industrial property, conducted over a 12-year period. Interval-scale ratings of satisfaction with many aspects of occupancy are used as explanatory variables. The dependent variables are satisfaction with property management, value for money, overall occupier satisfaction and landlord reputation.

**Key Findings:** For all three asset classes, the aspects with most impact on occupiers' satisfaction with property management are found to be communication, understanding business needs and responsiveness to requests. For occupiers' overall satisfaction, the key determinants vary between asset classes, with 'Tangibles', including the form and function of the building, its location and amenities, being of particular importance to occupiers of industrial units and offices. Satisfaction with property management, and the professionalism of the landlord and manager, have an impact on occupiers' willingness to recommend their landlord, as does occupiers' perception of the Corporate Social Responsibility of the landlord. The accuracy and timeliness of billing and documentation, and the cleanliness and maintenance of the property, strongly influence occupiers' perception of receiving value for money for rent and service charge. The paper discusses the magnitude and significance of these effects, and the differences in importance of the explanatory variables for the three commercial asset classes.

**Keywords:** Corporate real estate management, landlord - tenant relationship, occupier satisfaction, property management, reputation

## PPP as an Alternative Procurement Method for Corporates

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Real estate, mainly being workspace, is an important resource for non-property companies and their core business processes, and ultimately influences productivity. Procurement of such real estate as well as servicing and maintaining it, incurs extensive capital and operating costs, which in turn have a significant impact on the company's performance. Meanwhile, real estate developments very often show massive overruns in time and budget as well as quality deficiencies. These inefficiencies pose an enormous risk for the success of a non-property company. In a pilot project for the first time was investigated to what extent the PPP-model can meet the complex requirements of a private property user. For this purpose, the development and the first operating phase of a new headquarter was scientifically monitored through a mix of qualitative and quantitative research methods. The results show that a significant reduction of costs and risks is possible through this innovative procurement method. But the economic optimization of the building can also lead to a reduction of user-specific qualities, which may negatively affect productivity and satisfaction of the property user.

Keywords: Corporate real estate, PPP, workplace, real estate development



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**B-2****Alignment of Corporate Real Estate and Business Strategy in a Disrupted Market: Hold and Manage or Sell?**

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**Barry Symonds**, *London South Bank University (LSBU), Symonds Konsult International Ltd, Chelmsford, UK*

Further to the 2008 financial crisis, many financial institutions throughout Europe have experienced turbulence. Post 2008 economic developments varied widely across European countries. Some markets returned to growth while distressed economies continued to affect property markets especially across Central Eastern Europe. One of the main outcomes of the crisis consisted of banking institutions holding property assets as a result of defaults. Such property is expensive to hold and brings increased liabilities, particularly in a distressed property market, however shifting economic trends offer difficult decision making options.

Business strategies adopted prior to the credit crunch did not necessarily include a specific Corporate Real Estate dimension, however this situation had to be adjusted in accordance with political and financial regulations set by the European Union and the European Central Bank. This has led to financial institutions having to develop Corporate Real Estate strategies of either having to dispose of build assets at unacceptable discounts or holding and managing those assets in the interests of their investors.

The research aims to investigate the issues surrounding the decision-making process on disposing of or holding onto their "unwanted" property assets with specific reference to particular case studies from Central Eastern European property and financial markets. Specific findings highlight the importance of adopting a specific strategy to align Corporate Real Estate decisions with the current business strategy and the most important factors affecting the decision-making process.

Keywords: Business strategy, central eastern Europe, corporate real estate strategy, distressed property markets, property asset decision-making.

## The Productive Workplace for Knowledge Workers: A Focus on Workplace Design and Environment across Various Age Groups

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**Judy Smith**, *Institute of Real Estate, Kingston University, UK*

The nature of work has changed and office designers are striving to find the ideal workplace design that meets the needs of knowledge workers. According to Thompson and Kay (2008) the issue of productivity is becoming of key interest in all sectors. In recent years, firms have begun to realise that a workplace environment that has been well designed is more likely to attract the highest calibre of worker and reduce staff attrition. (Gensler, 2005). A poorly-designed workplace can increase stress levels and negatively affect performance. As many as one- fifth of workplaces in the UK do not provide sufficient work place environments, and that at least one quarter of staff in the UK logged 'serious' complaints about factors such as poor layout, furniture, temperature and noise, among others (Myerson et al, 2011). Overall, British businesses are still considerably behind in creating workplaces that optimise employee satisfaction. (Arup, 2011). Improved workplace design can lead to a productivity increase Gensler (2005) and Bootle and Kalyan (2002) agree that billions of pounds are wasted each year due to the unproductive layout and design of some offices. There is a clear connection between the work environments and office users' productivity within the workplace. Most studies include the components of furniture, noise, lighting, temperature and spatial arrangements when considering that which affects productivity (Hameed and Amjad, 2009). However, there is no clear consensus as to which factors predominate. Employees of different generations respond differently to how their workplace environment is designed (Myerson et al, 2010). Almost 50% of today's economy is knowledge-based and more workers are expected to be flexible, creative and communicative, (Greene and Myerson, 2011). The creation of work environments that result in satisfied and productive knowledge workers and end users requires information about user preferences concerning their work environments, and as the nature of work is changing, there is a need for updated research within this subject. Method: This paper will be based on research carried out on knowledge workers in 7 substantial companies within London. Results: Some results are already known and these include: employees are most productive when under pressure and in a buzzy environment; colleagues, design of office and quality of IT are the greatest factors that make employees unproductive.

Keywords: Age groups, employee productivity drivers, knowledge workers, productive workplace, workplace design and environment

**B-3****Ownership in Real Estate and Stock Market Performance:  
Evidence from German Equities**

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While the ownership of real estate constitutes a considerable proportion of most listed firms' balance sheet, in the existing literature, whether or not the benefits outweigh the risks associated with corporate real estate, is the subject of controversy. In this context, the present paper investigates the repercussions and impact of corporate real estate on the stock performance of non-real estate equities in a time-series setting. In particular, the role of corporate real estate ownership in the pricing of returns is examined, after taking well-documented systematic risk factors into account. Employing a data sample from 1999 to 2013, we identify and analyze the conditions and characteristics faced by firms with a high level of corporate real estate. Since effects might be driven by industry-related differences, we explore whether the impact of ownership in real estate varies according to distinct business segments. In view of the significant difference in the proportion of real estate ownership among listed companies and the illiquid characteristics of real estate per se, investors demand a real estate or illiquidity return premium for such ownership. The present paper provides further insights into the pricing of stock returns, by considering corporate real estate as a priced determinant. The findings enhance the interpretation of expected general equity returns and may thus be of particular interest for investors as well as the management boards of listed companies.

Keywords: Asset pricing, ownership in real estate, portfolio management, property-intensive, real estate

## The Energy Efficiency of Corporate Real Estate Assets: The Role of Professional Management for Corporate Environmental Performance

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Despite the rising information about the ecological footprint and greenhouse gas externalities of corporates' activities only little is known about the energy efficiency of corporate real estate assets. When considering achievements from the past, such as significant reduction of carbon emissions and towards carbon accounting, the energy consumption of corporate real estate assets is of emerging interest within the sustainability strategy of corporations. On the contrary to residential and commercial buildings within the real estate industry accessibility to profound datasets for corporate assets in terms of energy performance is rather difficult. When employing a unique multi-national dataset of big-box wholesale buildings obtained from METRO Cash & Carry (MCC) the authors investigate the relationship between energy consumption, physical building characteristics and the potential impact of corporate management. The study analyzes the dataset with electricity and heat consumption in a panel regression to investigate expected higher levels of energy savings over time. All above insights about energy efficiency measures of corporate real estate assets within a special asset class we analyze the contribution of professional management towards a more efficient corporate environmental performance.

Keywords: Carbon emissions, corporate real estate management, energy efficiency, hedonic effects, sustainable real estate

**B-3**

## What is the Real Added Value of Sustainable Office Buildings? - Initiating a Longitudinal Study

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This paper presents initial research outcomes of a longitudinal study which was initiated in 2013/2014 to determine the real added value of sustainable buildings for end-users. The focus of this research is on the added value of sustainable buildings to organisations – specifically the added value thereof to user-experience, comfort, well-being and perceived performance. The sustainability of a newly constructed or refurbished office building is often used extensively in marketing the sustainable goals and ambitions / achievements of organisations. Being the start of a longitudinal study, the objectives of this research is firstly, to establish a proper theoretical framework according to which the added value of sustainable office buildings to both end-users and organisations can be studied, and secondly, using case studies to validate the theoretical knowledge. The development and initial research discussed in this paper was executed as a bachelor graduation project in the IREFM (International Real Estate and Facility Management) programme at the Academy of Hotel and Facility Management at the NHTV Breda University of Applied Sciences in the Netherlands. The methodology employed was based on the development of a theoretical framework according to literature sources in the field of sustainability and the impact thereof on end-users and organisations. Subsequent to the development of the theoretical framework, interviews and questionnaires were used to further develop the framework for application as a conceptual framework for the longitudinal study. Preliminary results of the case study indicate that users of sustainable office buildings are more satisfied and perceive themselves to be more productive. However, employees still suffer from physical complaints whilst being in the office building, which indicates that sustainable buildings do not directly increase physical well-being of employees. For many employees, the indoor climate is affecting daily tasks, which might result in stressful situations and therefore in decreased psychological well-being. Although employees feel safe in the office building and experience enhanced social interaction because of the available workspace, it can be concluded that overall well-being of employees is not increased due to sustainable office buildings. The study provides a first-draft approach to developing a comprehensive framework for longitudinal research into the real added value of sustainable office buildings.

Keywords: Decision-making, office buildings, performance, satisfaction, sustainability

## Capitalization of Residential Energy Efficiency

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The uncertainty regarding the financial return of energy efficiency (EE) investments may be a reason for households not to undertake profitable investments in energy efficiency. Therefore, it is important to identify the market value of energy efficiency in the housing sector. Previous literature provides some empirical evidence on the impact of energy efficiency on sale prices in the building sector. However, the most common methodological drawback of the evidence provided by the available literature is the potential bias that may arise due to the omission of unobserved dwelling characteristics that are correlated with the EE.

In this study, using a large representative dataset from the Netherlands, we propose an instrumental variable approach in order to correctly identify the capitalization of energy efficiency in the housing market. We benefit from a continuous energy efficiency measure provided by Energy Performance Certificates (EPC), which enables us to estimate the elasticity of house price with respect to its energy efficiency. As well as including detailed dwelling characteristics in the hedonic model, we use an instrumental variable (IV) approach to deal with the potential omitted variable bias. The 1973-74 oil crisis, which created an exogenous discontinuity in the EE levels of the dwellings constructed before and after this date, and the evolution of building codes are used as instruments for energy efficiency. Our results indicate that the standard OLS estimates are downward biased. By using an IV approach, we find that as the energy efficiency level increases by 50 percent for an average dwelling, the value of the dwelling increases by around ten percent. In order to examine whether the value of EE increases by the disclosure of EPC, we create a common energy efficiency measure for certified and non-certified dwellings, which is based on actual energy consumption. Our findings do not suggest a larger capitalization rate for the dwellings that are transacted with EPCs. Finally, in order to examine the over-time variation in the capitalization of EE, we estimate the hedonic model for each year separately from 2003 to 2011. We document that the value of EE has doubled from 2003 to 2011, which might be partly explained by the increase of energy prices, the relative decrease in house prices.

Keywords: Building code, energy efficiency, energy label, house price, regression discontinuity

# C-1

## **Sustainability in Retail Developments: Case of Singapore**

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In Singapore, the retail sector is one of the highest consumers of energy per floor area, with tenants within a retail mall accounting for approximately 50 per cent of the building's total energy consumption (BCA, 2013). This reflects the need to reduce the energy consumption of retail tenants to enhance the mall's sustainability, and to lower the carbon footprint of the retail sector in Singapore.

Going green has been adopted in many developed countries such as Australia, Europe, Canada, and USA. The aim is to encourage both landlords and tenants to minimize adverse environmental impact, and is widely known as a powerful mechanism to drive carbon dioxide savings in commercial properties. However, sustainable developments are a relatively new phenomenon in Singapore.

This study examines how the implementation of sustainability practices and approaches can contribute to an increase in overall patronage to a mall, and if shopper characteristics such as their education levels and ethnicities will influence their perceptions on the need and benefits of sustainability in retail malls.

The results obtained a sample of two malls found that most shoppers are more incentivized to increase patronage to malls with sustainability practices including the introduction of green leases.

Keywords: Energy conservation, green leases, retail malls, Singapore, sustainable developments

## **The Attitudes of Buyers, Vendors, Tenants, and Landlords Concerning Environmental Questions - an Analysis based on Different National Empirical Surveys**

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The climate change and an increased awareness of environmental questions have led to much tougher environmental laws globally. In accordance with the Kyoto treaty is striving hard to fulfil its environmental obligations.

Increasingly stringent environmental laws and soaring energy prices are therefore forcing the Real Estate sector to respond. While new buildings must comply with the new regulations, older buildings need to be upgraded as well; that means "greening" existing properties becomes a political and commercial priority. When improvements are necessitated in existing properties, the new regulations force the owners to upgrade the building to the higher standards.

This paper researches and analyses these environmental issues relevant to the house buyers, vendors, tenants, and landlords to determine the importance of sustainable housing to the general public.

The paper is based on a national empirical survey from spring 2005; the paper also compares and analyses data from six different surveys (from 2009 to 2015) carried out by the author.

Keywords: Awareness of environmental questions, ecology and real estate, energy performance of buildings, green building, sustainability



# C-1

## Is Energy Efficiency Priced in the Housing Market? - Large Sample Evidence from Germany

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The European Union introduced Energy Performance Certificates (EPC) in 2002 to all member states in order to enhance the environmental awareness in the real estate industry. EPCs act nowadays as a mandatory instrument in investment decisions when letting or selling new and particularly existing buildings. Empirical research across the member states has shown over the last years that energy conservation pays off as the financial benefits might exceed potential investment costs. Although Germany adopted a strict sustainability agenda to reach a carbon neutral stock by 2050, evidence about the potential energy premium in the housing market is scarce. In this paper we investigate the effect of energy performance measured by EPCs on asking rents in the German housing market based on a database involving more than 1,000,000 observations. We explore the relationship extensively between 2013 and 2014 using advanced semiparametric regression models and provide evidence of a substantial impact of energy savings on asking rents and thus on the buildings' performance.

Keywords: EPC, generalized additive models, german housing, sustainability, energy performance

## The Price Effect of EEWB Certification

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Energy depletion and Ecological sustainability are two global-wide issues that most countries seriously concern about, and construction industry takes a big share of energy consumption and ecological damage. Therefore, the promotion of the green building gradually becomes the trend and leads the direction of national policy. The EEWB (Ecology, Energy Saving, Waste Reduction, Health), the Taiwanese green building labeling system, was established in 1999.

This article exams the price effect of the green label with hedonic regression model in New Taipei City, and the result shows that the building certificated with EEWB gets 8% premium on average. Price premium varies at different levels of labels, and they are 14.3%, 2.7%, 4.8% and 8% for qualified, bronze, silver and gold levels. Low-priced areas have significantly higher premium of 16.8% comparing to the High-priced areas of 4.5%. In terms of space and location, the buildings in CBD obtain lower green premium than those in outskirts. We believe higher premium is seen in low-price outskirt area due to the extra marketing green labels have for these buildings.

Keywords: EEWB green building labeling system, green building, hedonic pricing model, Taiwan

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**C-2****Energy Performance Ratings and House Prices in Wales:  
An Empirical Study****Franz Fuerst**, *Cambridge University Land Society , UK***Pat McAllister**, *University College London, UK***Anupam Nanda**, *University of Reading, UK***Peter Wyatt**, *University of Reading, UK*

The aim of this research was to investigate the price effect of EPC ratings on the residential dwelling prices in Wales. It examined the capitalisation of energy efficiency ratings into house prices using two approaches. The first adopted a cross-sectional framework to investigate the effect of EPC band (and EPC rating) on a large sample of dwelling transactions. The second approach was based on a repeat-sales methodology to examine the impact of EPC band and rating on house price appreciation. A concern with hedonic price models is potential omitted variable bias. In the context of this study, dwellings in higher EPC bands may have been subject to unobserved improvements that enhance their quality as well as their energy performance. With this in mind, a series of robustness checks were undertaken, the main purpose of which was to restrict the sample to dwellings built relatively recently, and to exclude dwellings that are more likely to have been improved or that may be unusual in some way – dwellings that have been re-sold within a short period of time for example.

## **From Green Buildings to a Sustainable Real Estate Industry - Assessing Five Years of ÖGNI**

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**Sabine Sedlacek**, *MODUL University, Austria*

**Philipp Kaufmann**, *ÖGNI, Austria*

In this paper we assess five years of activity of ÖGNI, the Austrian Green Building Council. About five years ago the organization started off as an activity of two individuals. In the meantime it has developed into an important actor of the Austrian real estate industry. The organization has certified over 100 buildings according to the DGNB system not only in Austria but also in some other European countries. In addition to that it has developed instruments for supporting a transition toward sustainability for the real estate sector and related sectors by taking a more holistic perspective that looks at products, processes and people. After five years of development, ÖGNI can be considered a success story that justifies a closer investigation. The analysis of our paper is based upon information from documents and stakeholders about the historical development of ÖGNI and of sustainable real estate in Austria and upon a survey of members of the organization. The paper will investigate, to what extent and in what respects the five year development of ÖGNI can be considered successful and will identify the main lessons that can be drawn from this example.

Keywords: Certification, green buildings, organization, sustainability

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**C-2****Do Smart Grids Increase Real Estate Market Values?**

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Purpose –Buildings energy efficiency is generally considered in terms of energy consumption, costs and GHG emissions reduction in line with the 2020 goals. It is commonly agreed that the greater the building energy efficiency, the greater the property market value. To increase energy efficiency, deep retrofitting was set in place and simultaneously photovoltaic power plants (PV) were installed, boosted through feed-in-tariffs that made them extremely attractive for both institutional and small private investors. Nonetheless Government incentives and regulations were not able to foster consumers to substantially change their energy consumption patterns. In this scenario overall cost-savings by PV-generation systems would only have a marginal impact on real estate market values, if the energy consumption pattern of the household does not match the most beneficial generation pattern and energy management is not properly performed. Aim of the paper is to investigate whether Smart Grids can increase market values due to higher production and consumption flexibility. Smart grids give de facto producers and consumers, the opportunity to be active in the market and strategically decide their optimal production/consumption pattern. We provide a model based on the real option theory to determine the value of this flexibility and the related market value increase. Design/Methodology/Approach – We model the homeowner decision to invest in a PV plant and connect to a Smart Grid. We determine the property potential market value increase due to the opportunity to perform active energy management given by smart grids and we compare this value increase to the PV plant value per se. To capture the value of managerial flexibility we implement a real option approach. Findings – The paper provides a theoretical framework to model the owner's decision to invest in a PV plant, to be integrated in a smart grid, and determines the real estate market value increase. The greater the flexibility the greater the market value Research limitations/implications – Interesting policy implications might be driven from the model implementation. It might be derived the optimal mix between building energy retrofitting and energy market participation that increases property values in a smart grid scenario. Originality/values – The novelty of the paper lies in the attempt to define energy efficiency also in terms of flexible energy management and its implications in the energy market.

Keywords: Investment under Uncertainty, real estate market values, real options, smart grids

## **A Multi Actor Multi Criteria Approach to Evaluate the Effectiveness of European Policies on Buildings Energy Retrofit. The Italian Context**

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**Sergio Copiello**, *Department of Design and Planning, University IUAV of Venice, Italy*

In recent years the traditional models and tools used by the public sector to attract private capital into urban regeneration are in crisis, partly due to the economic situation. At the same time, new paradigms able to capture the interest of private subjects in regeneration are emerging. One of these, and perhaps the most interesting for its potential and the growing interest from the European Union, is the energy retrofit of existing buildings.

According to some studies carried out at European and international level, the savings on energy bill and the increase of buildings market value not always seem to be able to justify a redevelopment intervention. A purely financial approach to existing buildings energy retrofit is thus not sufficient to define the convenience of such interventions, since stakeholders, social actors and their interests are multiple and often conflicting. Furthermore policies developed by the European Union are complex and have to deal with different issues such as environmental protection, fossil fuel dependence reduction and the incentive of the building sector.

Therefore, present research aims to analyse the compliance between European energy policies and stakeholders' goals, using a multi-actor-multi-criteria approach in order to assess all the aspects that investors and public bodies take in account in an energy leads redevelopment project. The underlying assumption can be summarized as follow: in the framework of sustainability and social policies, the lower the conflict among actors, the greater the effectiveness of the measures.

European policy measures are classified depending on their nature of economic incentives or command and control policies. Focusing on the Italian context, representatives of main stakeholders involved in energy retrofit projects are identified, asked to weight a common set of criteria (based on their specific objective) and then to evaluate the compliance between policy measures and their goals. The weighting of criteria and judgement among policy measures are based on the fuzzy set theory to model the stakeholders' subjectivity in the assessment.

A cluster analysis allows identifying policy measures, and subsets of them, creating fewer conflicts among stakeholders. Results are then compared with the single judgements expressed by each stakeholder so as to analyse the relationship between goals optimization and conflict reduction, and to define a policies ranking based on their effectiveness.

Keywords: Buildings energy retrofit, European energy policies, multi actor multi criteria analysis

**C-3****Domestic Energy Prepayment and Fuel Poverty: Induced Self-selection of Housing Characteristics Influencing the Welfare of Fuel-poor Households**

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**Ian Hamilton**, *UCL Energy Institute, UK*

Prepayment meters are normally installed in the UK to address the risk of non-payment from overindebted households and the literature shows a discrepancy of higher energy prices in prepayment meters. This research seeks to understand the spatial aspect of this sorting process, where prepayment meters and higher energy prices are concentrated in the areas of higher fuel poverty. A corollary research question is whether this sorting affects aspects of the consumption of housing services with respect to structural and neighbourhood characteristic. State-of-the-art latent class discrete choice models (LCM) are employed on the choice of prepayment to standard payment meter. LCM approach identifies unobservable subgroups within the population and the housing stock, allowing better understanding the impact of exposure to patterns of multiple risks, as well as the antecedents and consequences of complex behaviours. Therefore, interventions can be tailored to target the subgroups that are affected most; in this case, households vulnerable to fuel poverty affected by market failures that lead to adverse self-selection.

Keywords: Discrete choice models, energy prices, fuel poverty, housing services, sorting

## Efficient Measures for Energetic Retrofit—an Interdisciplinary Case Study of Representative Housings in Germany

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The discussion about energy refurbishments is defined by high complexity. If house owners or policy makers have to identify appropriate energy standards for their buildings or the existing stock, various aspects of different disciplines (e.g. economics, ecology, building physics, architecture, ...) have their place and must taken into account. The amount of disciplinary studies on the effects of energetic retrofits grows steadily, and every discipline proofs their numbers continuously. Nevertheless, in disciplinary research, interdependencies between the various relevant aspects of the involved disciplines remain open. This paper aims to reduce the complexity by creating transparency as well as to identify particularly efficient measures for the residential refurbishments. In a case study on exemplary residential buildings, different measures of energetic retrofitting are analyzed in terms of their impact on various aspects, which are relevant to diverse disciplines (i.e. temperature effects, GWP, incremental costs for energy savings,). The identified effects show in detail the efficiency of different measures as well as their reciprocal interactions. Hence, the results provide both a guideline of beneficial measures of energetic refurbishments and a useful sequence order for house owners. Further, a transparent basis for policy implications about future levels of legal requirements for energy usage of buildings and funding instruments for energy reduction to each other.

Keywords: Green and sustainable building, energetic retrofit, energy efficiency of real estate, energy policy for real estate, incremental costs for energy savings



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**C-3**

## Measuring Instrument Constructs for Green Office Building Investments Variables Using Rasch Measurement Model

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University Technology Malaysia, Malaysia*

The aim of this paper is attempt to introduce the application of Rasch measurement model analysis to determine the validity and reliability of each construct in the questionnaire. In achieving this objective, a questionnaire survey was developed consists of 6 sections and a total of 106 responses were received from various investors who owned and rent office buildings in Kuala Lumpur. The Rasch Measurement analysis is used to measure the quality control of item constructs in the instrument by measuring the specific objectivity within the same dimension, to reduce ambiguous measures, and a realistic estimation of precision and implicit quality. The Rasch analysis consists of the summary statistics, item unidimensionality and item measures. A result shows the items and respondent (person) reliability is at 0.91 and 0.95 respectively.

Keywords: Green office building investment, rasch measurement model, instrument constructs, validity and reliability

## **An Investigation into the Strategic Importance of GBFIs within the Listed Property Market**

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**Alexandra Morris**, *University of Cape Town, South Africa*

**Jody Schofield**, *University of Cape Town, South Africa*

**Purpose** - The purpose of this paper is to investigate the level of importance that green building features and initiatives (GBFIs) have with regards to decision strategies in the South African listed property market.

**Design/methodology/approach** - The paper extrapolates qualitative data in the form of a multiple case study analysis as the overarching research methodology. Three South African real estate investment trusts (REITs) participated in the research. Pattern matching in conjunction with semi-structured interviews was implemented to determine whether patterns in the literature could be matched to the empirical data.

**Findings** - It was found that each REIT is at different stages with regards to the implementation of GBFIs, thus relating to the decision strategy adopted by each REIT. The strategies applied had different drivers; either to reduce costs or to gain a competitive advantage in local and international markets. REITs that had been implementing GBFIs for a longer period of time were found to have more advanced strategies and a higher degree of GBFI consideration in their decision strategies. The main conclusion revealed that there is a range with regards to the level of how reactive/proactive of each of the three participating REITs in terms of their decision strategies with specific reference to GBFIs. This is mainly due to the fact that green building is still in its infancy in the South African property market, thus resulting in delays regarding the full implementation of GBFIs in the South African listed property market.

**Research limitations/implications** - This paper is indicative and highlights a number of issues surrounding the decision strategies in the listed property market with regards to the level of implementation of GBFIs. There is scope for a more comprehensive investigation by increasing the number of cases, so as to reduce interpretation of the results as generalizable.

**Practical implications** - The findings indicate a broad spectrum in the level of integration of GBFIs in the decision strategies with the South African listed property market. The level of integration is dependant on when a particular REIT started implementing GBFIs. Those REITs that were proactive in implementing GBFIs into their portfolio are starting to accrue benefits that are resulting in a competitive advantage.

**Originality/value** - This is the first paper to investigate the role GBFIs play in the decision strategies in the South African REITs.

**Keywords:** Decision strategies, Green building features and initiatives s (GBFIs), Real estate investment trusts (REITs)

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**C-4****Is Energy Performance too Taxing?****Michael McCord**, *University of Ulster, UK***John McCord**, *University of Ulster, UK***Peadar Davis**, *University of Ulster, UK***Martin Haran**, *University of Ulster, UK*

Over the past decade, there has been an increasing policy focus on improving the environmental performance of the housing stock. Following the Kyoto Protocol, the reduction of energy consumption attributable to buildings is a key Government policy objective. The housing sector has therefore observed a paradigm shift with increasing emphasis on energy efficient housing becoming a new orthodoxy. A side effect of this has been the mandate for 'compulsory' Energy performance certificates (EPCs) as new laws are promulgated relating to the need to conform with energy performance levels. As from 2018, all properties with EPC levels F and G will not be 'lettable' and this is likely to be extended to properties for sale. With increasing utility costs to customers, purchasers and authorities are becoming increasingly concerned with the running cost of properties and whether property energy improvements will be capitalized into sale value. Indeed, how energy efficiency is valued in the residential property market in terms of resale or appraisal value is a growing concern (McNamara, 2008; Sayce et al., 2010). Notwithstanding this, the relationship between energy performance and property value remains nebulous, complex and under-researched. In Europe, few studies investigate the effect of energy performance rating on residential property value with limited information and research in the UK and Northern Ireland context. This research uses hedonic analysis to investigate the relationship between EPCs and property sale price within the Belfast housing market. The findings show that there is a positive statistically significant relationship – however, this is complex and subject to omitted variable bias and endogeneity problems. In addition, there appears to be a rural urban divide with regards to where policy should target. We further develop a multiplicative model (CAMA) to assess the energy performance of properties across NI using CO<sub>2</sub> kg m<sup>2</sup>. The results show that introduction of a 'green' tax may indeed help foster behavioural change, but is in no way a panacea.

Keywords: Energy performance, green tax, mass appraisal

## Impact of Indoor Environmental Quality and Innovation Features on Residential Property Price and Rent in Malaysia: a Review

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Green building concept, a trend in developed nations, has spread to Malaysia. The green features improve the functions of buildings and promises higher returns. Indoor environmental quality (IEQ) and Innovation (IN) are among six criteria of Green Building Index (GBI) that building owner needs to attain for its building to be certified as 'green' in Malaysia. The benefit of IEQ is to create conducive indoor environment for building occupants for living and working. While IN is to meet the objectives of GBI through green building design initiatives and sustainable construction practices. The research question is does IEQ and IN features give direct impact to residential property price? Therefore, this paper will review the broad literature regarding the impacts of indoor environmental quality (IEQ) and innovation (IN) for residential property and its implication to market price and rent. The early hypothesis of this paper anticipate that innovation (IN) and indoor environmental quality (IEQ) features will indirectly increase residential property market price and rent in spite of the lack of comparative financial data. From this paper, it is hope that the positive impacts of these features will encourage building owners, developers and other main development actors to put these criteria into the same consideration as other criteria in GBI as one of the way to compensate the impact of the building towards economic, environment and social features.

Keywords: Green building Index (GBI), green building features, indoor environmental quality, innovation, property price and rental

## C-4

### Location, Location, Green. A Spatial Analysis of Green Buildings in Europe?

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The high spread of green building certification across Europe has become more visible with the new projects that have been built in the last five years. Our main research focus is on the location of green buildings within European cities. We argue that green buildings should cluster in a specific distance from the Central Business District (CBD). Taking into consideration the urban development of cities and specific characteristics of the CBD, our aim is to analyze empirically whether or not this hypothesis is supported by data from European cities.

We will use publicly available data for various green building certificates (LEED, BREEAM, DGNB) which give addresses or coordinates for certified buildings and will combine this information with GIS-based information for the respective cities. We will use point pattern analysis in order to find spatial clusters of project in the various cities and relate these results to distance from CBD as well as some basic city characteristics.

Keywords: Green buildings, location

## **Public-Private Partnership, Buildings Energy Efficiency and Social Housing: Renewed Tools to Satisfy Emerging Needs. Empirical Findings from a Comparative Analysis of Italian Experiences**

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To deal with the recession of the global economy since 2008, the financing of programs relating to strategic infrastructure and facility could provide a significant boost to a renewed growth. Despite this perspective, the conditions of public finances, especially in the EU countries, allow recourse to government intervention only in exceptional and temporary basis. Owing to the limited availability of public funds, the further diffusion of Public-Private Partnership (PPP) appears to be a viable strategy to implement investment projects. Nevertheless, in the Italian context as in other parts of Europe, the PPP initiatives have been progressively slowed down, over the past few years, by unfavorable conditions emerged in capital markets.

The framework outlined so far is further complicated by the changing needs expressed by community. During the recent past, concessions and project finance have been extensively used to build and manage transport infrastructure and hospitals. Since the past few years new priorities are emerging, such as the refurbishment of social housing stock, the supply of new homes at prices or rents affordable for low income households, as well as the rehabilitation of public buildings intended for administrative offices or schools. Aim of present research is to examine whether buildings energy efficiency measures positively affect the feasibility of social housing projects. This implies the need to investigate the extent of the savings on operating costs, achievable with interventions targeting the buildings energy efficiency, and the contribution they are able to provide to the viability of Public-Private cooperation projects, especially in the field of social housing. Therefore, a case study analysis is performed by comparing a number of ongoing experiences in major cities of northern Italy.

Empirical findings highlight structural changes concerning the partnership model. First of all, a new group of players emerges. Interventions are no longer promoted by construction companies or by facility management ones. The new stakeholders are bank foundations and real estate investment funds. Furthermore, public contribution's forms are reinventing themselves, with a reduced incidence on the investments. Within this framework, the achievement of high energy efficiency standards appears to be a relevant feasibility driver for interventions designed to satisfy social housing needs, particularly those to be implemented by means of PPP.

Keywords: Buildings energy efficiency, public-private partnership, social housing

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**C-5****Discrepancies on Community-level GHG Emissions Inventories****Rogério Santovito**, *Universidade de São Paulo, Brazil***Alex Abiko**, *Universidade de São Paulo, Brazil***Sven Bienert**, *IREBS International Real Estate Business School, Germany*

Over the last decades, greenhouse gas (GHG) emissions have grown at an increasing rate, which is likely to continue on the long-term trend. These emissions must be significantly reduced to avoid the worst impacts of climate change. As the world becomes more urbanized, cities stand at the forefront of efforts to achieve this goal. GHG emissions flow in and out of the administrative and geographical limits of a city, and interdisciplinary information is needed to pursue low-emission urban development strategies. Existing GHG inventory tools and procedures favor scaled-down estimations and direct emission sources. Policy makers cannot rely on scaled-down data from national GHG inventories to take action on a neighborhood level. As the geographic coverage of a GHG inventory gets smaller, emission activities that occur within the defined boundaries are intrinsically interconnected with 'out-of-bound' areas. In this case, accounting for emissions occurring outside a neighborhood is not an option, but a requirement. This paper presents a comparison among existing GHG emissions tools and methodologies, focusing on the problems that arise when using top-down Emissions factors to calculate indirect emissions.

Keywords: Greenhouse gases, inventory, neighbourhood, urban sustainability

## The Value Contribution of Sustainability Reporting - an Empirical Evidence for Real Estate Companies

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Sustainability has evolved to one of the major challenges for society and business world. This changing perception over the past two decades resulted in increased requirements for corporate sustainability. In order to meet stakeholders' informational desires the documentation of the corporate contribution to sustainability becomes an important aspect of companies' stakeholder communication. Especially the real estate industry bears high responsibility since this branch is assumed to be one of the major triggers of the anthropogenic climate change and resource exploitation making sustainable corporate management and the communication thereof inevitable. The Global Reporting Initiative (GRI) as the leading authority in sustainability reporting published a globally recognized common framework in order to ensure the comparability and standardization of corporate sustainability reporting. This paper analyses for the first time whether sustainability reporting has an influence on the stock prices of real estate companies. Using the methodology of event study, the research for a global sample (Europe, USA and Australia) shows a clear positive impact. Thus, sustainability and the communication thereof have an impact on corporate valuation, making efforts to promote corporate sustainability not stamped as altruism. In fact, sustainability is of decision relevance for shareholder and investors and therefore a success factor for companies. The results of this study provide the empirical evidence for listed real estate companies.

Keywords: Corporate performance, GRI CSRevent study, sustainability reporting



**C-5**

## An Integrated Optimization Model for Capital Allocation of Energy Efficiency Measures of Existing Buildings: A Case Study of Bogazici University Kilyos Campus

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**Mehmet Emre Çamlıbel**, *Soyak Holding, Turkey*

Buildings are responsible for more than a third of global energy consumption, and emit nearly 40% of all CO<sub>2</sub> emissions. A small, but growing body of literature seeks to identify and isolate methods which may be employed in order to reduce the energy consumed in the operation of these structures.

In this study, we develop a decision-making algorithm to mitigate the uncertainty of financial and environmental factors related to energy improvements of existing buildings, and how to efficiently allocate available funds in order to undertake such improvements. We develop a case study, in which forty two energy efficiency measures (EEM) are identified within the existing buildings of a University campus in Turkey. The operations of the buildings are analyzed, and energy consumption, energy costs and carbon emissions are measured. Costs and savings of these specific EEMs are calculated as are a number of their possible combinations. Of the more than four trillion possible combinations of energy improvement packages, the ones providing the greatest savings per unit of investment are computed for a range of limited investment budgets. This optimization problem is solved through the uses of both a Mixed Integer Programming (MIP), and a custom developed heuristics model.

Our findings suggest that over the optimized investment curve, the most efficient use of EEM capital occurs withing a very tight range of allocation, providing the greatest returns in terms of energy savings, energy costs and carbon emission. Retrofitting of existing buildings with an optimized investment budget appears to be a viable investment strategy, providing yearly savings of 33% in energy use, 22% in energy cost and 23% in carbon emission. Our results show that a decision-maker can comfortably use a less sophisticated heuristics approach, which only minimally deviates from an exact MIP solution. Finally, we compare optimized solutions for retrofitting existing buildings against alternative investments of building new energy production plants and demolishing and re-constructing new buildings. In both cases retrofitting proved to be significantly more efficient in terms of investment cost, energy savings and CO<sub>2</sub> reduction.

Keywords: Carbon emissions, energy efficiency measures, mixed integer programming, sustainability

## Longevity of Buildings as an Economic KPI

**Peter de Jong**, *Delft University of Technology, The Netherlands*

In the medical field a vast literature has investigated on correlation between longevity and economic welfare. The debate is going on researching for attributes contributing to these KPI's. On international level longevity-convergence is evident. Countries with modest longevity levels experience life expectancy gains in the last 50 years than countries with a higher starting level. The purpose of this paper is to set up an international data and methodological context for the building industry to investigate if and to what extent longevity of buildings is also a KPI for real estate, adding to economic performance on different levels.

The research approach starts with the definition (regression) of the changing relation between income and longevity for given moments in time (actual and a base year in the past). Followed by monetising the value of longevity gains by converting them into income value. This will enable the possibility to express different causes of demolition (technical underperformance, replacement, functional obsolescence) into reduction of income value. With buildings the question of longevity will always against which cost. Total life cycle cost spanning sequential economic (or technical) lifetimes, including cost of refurbishment and renovation, next to initial cost and maintenance, are added to the analysis.

The first finding which is aimed for is the confirmation that life expectancy of buildings is a similar important dimension of welfare as life expectancy of people. Secondly to put a value to longevity, and finally valuing demolition as an opposite of adaptive reuse.

There is rich data on the macroeconomic part of the equation through several international institutions. The research limitation, and challenge for cooperation, lies in the data collection of life expectancy for buildings on a comparable level. Dutch data reveals an approach for actual life expectancy of buildings. A base life expectancy must be constructed. Within this dataset it is possible to test the methodology for different Dutch cities, but the reflection on macroeconomic KPI's requires international comparison, for which ERES is the ideal platform.

Mirroring a debate and a methodology of another field of science is not original in itself, but the effect is. In the minds of real estate people and politicians a new build CBD is a sign of desirable prosperity. However a sound mix of old and new can be found in many mature capital cities. The social and practical

Keywords: International comparison, LCC, life expectancy, longevity, valuing causes of demolition

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**C-6****How Regulation Affects Innovation: The Smart Grid Case at Urban Scale**

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**Purpose:** The paper discusses energy saving policies implemented in Italy in the last ten years and shows their ineffectiveness in promoting innovation in new energy systems, such as Smart Grids. The economic fundamentals involved in energy consumption are investigated with specific reference to high rise – high density settlements and their prevalent building typology, i.e. tall buildings. The paper discusses how the energy demand and consumption of a single building can affect the energy trade-off of entire cities.

**Approach:** We examine current local and national policies- for energy consumption reduction, then we discuss how Italian urban planning should adopt ad hoc regulation in order to pursue innovative systems of energy saving. We also - debate on the present absence of procedures to evaluate these policies' effects on market demand in both new building construction and deep energy retrofit. Finally we argue the inadequacy of Italian national and local legislation in promoting Smart Grids as innovative systems of electric energy production, distribution and consumption.

**Findings:** We represent the stat of art in the Italian legislation for energy saving and we offer a theoretical framework to verify the effectiveness of these measures. Furthermore we propose a new way to promote innovative systems of energy production for high density settlements. In this respect, due to technological and facility management characteristics tall buildings are an opportunity to experiment smart grids at neighborhood level. Beyond the construction engineering advances, we present how regulation should help to improve innovation.

**Research limitations/implications:** The paper is mainly exploratory and identifies some issues for further research. Data on housing market demand related to public incentives must be collected to measure the effectiveness of local norms. Furthermore, selected case studies must be investigated to verify the energy demand at diverse urban density: this survey is preliminary to the definition of protocols for both technological and regulatory interventions.

**Originality/values:** The paper is the first attempt in Italy to present the role of town planning norms in the promotion of Smart Grids and, in general, to match innovative distributed energy systems to legislation in planning. Furthermore the present contribution highlights the potential of specific building typologies, e.g. tall buildings, in the promotion of Smart Grids.

**Keywords:** Energy saving, skyscrapers, smart grids, sustainability, urban planning

## The Role of Urban Parks in Cities' Quality of Life

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The concerns on the preservation of the natural environment have focus mainly on large ecosystems protection. These areas are usually distant from the urban environment, where only relatively smaller natural spaces can survive. These small-scale green areas are often disregarded, when compared with the large ones, and many of their benefits are diminished. However, the urban nature provides important social and psychological benefits to human societies, which enrich human life. They provide spaces for social interaction, enhancing the community cohesion, while contributing for a healthier lifestyle. Another advantage is related to the air quality improvement and climate protection due to their ability to store carbon.

Although public preferences for environmental attributes may vary among individual citizens according to their socio-economics characteristics and daily activities, these benefits are well recognized by most citizens, having clear consequences on housing choices. Furthermore, green spaces may be used as factors to increase the attractiveness of a city, by making the city green and pleasant.

The main concern of this paper is to address the importance of green areas for the urban citizens, and to analyze their distribution in consolidated cities. A case study for the city of Lisbon, Portugal is presented, where spatial distribution, distance from residential areas and population satisfaction is analyzed, amongst other indicators.

Keywords: Air quality, quality of life, urban parks

**C-6**

## Fundamental Value of Distributed Photovoltaic Energy Production around the World

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**Background** – Photovoltaic (PV) panels are an important component of passive and positive energy buildings. The value of the PV depends on the price of the electricity and on the quantity of energy produced. PV investors does not want to maximize the quantity of energy produced but the cash flow generated by the electricity produced. Electricity prices are cyclical, so is they depends on the time of the days and on the day of the year. Electricity prices are different around the globe, so are solar radiation. The optimum combination of high price and high radiation is not easy to find. The best locations to install PV panel are locations where radiation and prices combination merge together to create the maximum value.

**Purpose** – This paper intend to present a method that integrate weather data and market price dynamic in order to find the fundamental value of distributed PV production. In a second time, we use this approach to find the fundamental value of distributed PV production around the globe for 30 locations and 60 different climate readings.

**Design** – We use standard weather data from two sources. These data source give information about the radiation available for each hour of the year. We use historical electricity price data and official authority forecast to forecast the future electricity price path. We then optimize the position of the PV panel in order to achieve the higher present value of the energy sold over the life cycle of the PV panel, including standard technology decay. This optimum positioning maximize the cash flow generated by PV panels and therefore should be considered as PV fundamental value.

**Results** – As of now, results are preliminary but at the time of the conference, we will have the fundamental value for each location. We already know that some location among the best location are surprising.

**Limitations / implications** – Electricity price data source quality are not the same for each jurisdiction. Future energy price is a combination of historical price, for the hourly price pattern, and official forecast, for growth rate path. Obviously the results are dependent on their reliability.

**Practical implications** – Investors choice of investment and policy maker decision can be impacted by the results.

**Originality / Value** – We analyze the fundamental value for a number of locations. Second, we analyze the robustness of the result obtain with different data sources.

**Keywords:** Distributed photovoltaic, electricity prices, real estate, weather

## The Consequences of the Demographic Change on the Demand for Personal Living Space in Germany

**Philipp Deschermeier**, *Research Unit for Real Estate Economics Cologne Center for Economic Research, Germany*

Demographic change is dramatically transforming the German society: the ratio of young to old and of the gainfully employed to pensioners is shifting in favor of older persons. In the coming decades this development causes a substantial macroeconomic structural transformation affecting all of the important markets in Germany. For example the labor market will lack young workers, the product markets will have to adjust to structurally changed consumer demands and on the capital market, savings behavior and the demand for productive investments will be changing. With respect to the real estate market the change in the age structure and the regional distribution of the population will affect the demand for personal living space.

Besides the macroeconomic dimension, the demand for personal living space is determined by social factors (e.g. more "living apart together" relationships increase the demand for smaller flats in the metropolitan areas), demographic factors (old people demand other housing as young) and individual preferences (buying vs. renting properties). The research proposal aims at providing forecasts of the age specific demand of personal living space for Germany until 2030. The analysis will use data of the German Socio-Economic Panel, a longitudinal panel dataset of the population in Germany. The analysis will feature a functional data model with time series coefficients, which are used to model the age-specific demand for living space. This model will be forecasted up to the year 2030. The results provide an insight on the challenges of the demographic transition in Germany with respect to the real estate market. The presentation will focus especially on the economic consequences of the aging society in Germany on the demand for personal living space.

Keywords: Germany, demography, forecasting, personal living space

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**D-1**

## Who Gets a Reverse Mortgage? Identifying Household Level Determinants of U.S. Reverse Mortgage Choices

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**Donald Haurin**, *Department of Economics Ohio State University, USA*

**Wei Shi**, *Department of Economics Ohio State University, USA*

**Mike Ericksen**, *Department of Finance Texas Tech University, USA*

Internationally, there is increasing interest in the potential of elderly households to withdraw their home equity, but remain in their home, through some form of reverse mortgage. However, reverse mortgage markets are limited to the U.S. and South Korea. One question is whether seniors will originate reverse mortgages if the contract and process are well documented, the mortgage is insured and relatively riskless. If seniors are willing to tap home equity through this mechanism, then the potential for growth in the reverse mortgage market is very large in both the U.S. and world.

However, very little is known about the characteristics of those who obtain reverse mortgages in the U.S. compared with the general population of seniors. The penetration rate is only about two percent. Our study helps address this deficiency through the analysis of a unique data set of senior households who sought counseling in 2010 and 2011 for the predominant form of reverse mortgages, the government insured Home Equity Conversion Mortgage (HECM). We combine data on counseled households with weighted nationally representative data from the 2010 wave of the Health and Retirement Study. Our estimation model focuses on two decisions: seeking counseling (which is a prerequisite for applying for a reverse mortgage) and obtaining the mortgage. We use a truncated bivariate probit model for the estimation. We find that household income, home equity, race and prior credit performance are associated with the probability of obtaining a reverse mortgage. Specifically, the largest demand for reverse mortgages is among seniors who have high home equity but a low income flow. Seniors who were past due on their previous mortgage also have a relatively high probability of seeking a reverse mortgage; however, counseling tends to moderate this demand. In general, the required counseling session tends to increase the probability that credit worthy households apply for reverse mortgages, reducing the probability for seniors with a poor credit history. We exploit an exogenous change in counseling requirements and find that enhanced counseling is associated with a reduced likelihood of obtaining a HECM, and that this effect is largely explained by information provided about eligibility for alternative public benefits.

Keywords: Counseling, mortgage choice, reverse mortgage, senior housing

## **Developer Charges and Housing Affordability in Brisbane, Australia**

**Lyndall Bryant**, *Queensland University of Technology, Australia*

**Purpose** - This paper empirically examines the effect of developer charges on housing affordability in Brisbane, Australia. Developer paid fees or charges are a commonly used mechanism for local governments to pay for new urban infrastructure. Despite numerous government reports and many years of industry advocacy, there remains no empirical evidence in Australia to confirm or quantify passing on of these charges to home buyers. **Design/methodology/approach** - This research applies a hedonic house price model to 4,699 new and 25,053 existing house sales in Brisbane from 2005 to 2011.

**Findings** – The findings of is research are consistent with international studies that support the proposition that developer charges are over passed. This study has provided evidence that suggest developer charges are over passed to both new and existing homes in the order of around 400%.

**Research limitations/implications** - These findings suggest that developer charges are thus a significant contributor to increasing house prices and reduced housing affordability.

**Practical/Social Implications:** By testing this effect on both new and existing homes, this research provides evidence in support of the proposition that not only are developer charges over passed to new home buyers but also to buyers of existing homes. Thus the price inflationary effect of these developer charges are being felt by all home buyers across the community, resulting in increased mortgage repayments of close to \$1000 per month.

**Originality/value** - This is the first study to empirically examine the impact of developer charges on house prices in Australia. These results are important as they will inform governments on the outcomes of growth management strategies on housing affordability, providing the first evidence of its kind in Australia.

**Keywords:** Developer charges, growth management, house prices, housing affordability, impact fees



**D-1****Behavioural Biases in the Acquisition of Multiple Properties by Owner Occupier Investors during the Irish Residential Real Estate Bubble****Clare Branigan**, *University College Dublin, Ireland***Paul Ryan**, *University College Dublin, Ireland*

Ireland's economic crisis has its roots in a housing bubble that collapsed in 2007. This paper examines the behaviour of Irish people who purchased one or more residential properties for investment purposes prior to the global financial crisis in 2007. During the period that constituted Ireland's residential property bubble, many people were not satisfied with acquiring a house solely as a dwelling and doubled their bets by acquiring other properties for investment purposes. In many cases the prices paid for these properties were uneconomical vis-a-vis the rental income stream associated with them. In the case of overseas properties many investors made purchase decisions without even gathering the most basic information on the suitability of these properties as potential investments. We consider the behavioural and psychological factors that drove Irish residents in the acquisition of one or more residential property for investment both in Ireland and within the continent of Europe, North America and South Africa.

The biases we examined were, Representativeness, Overconfidence and Availability. We find evidence that due to the representativeness heuristic, investors may have been over-extrapolating the past growth into the future. In addition, lenders also over-extrapolated the increase in house prices and made credit easily available, largely financed by deposits from financial institutions in other euro area countries. People over estimated the precision of their forecasts, when for example, in an effort to estimate an asset's value, they become overconfident about the usefulness of this information gathered for this purpose. For example, groupthink and media cheerleading whereby only favourable information and positive news in relation to real estate values was reported in the media despite a series of international reports, including those from the OECD and the IMF, warning that property values were too high based on economic fundamentals. Such asymmetric media reporting may have exacerbated investors overconfidence leading them to see property as a one way bet which in turn leads them to push the price of the asset higher with upward price movements becoming a self-fulfilling prophecy. (Daniel, Hirshleifer, Subrahmanyam, 1998). In terms of Availability, the Irish media were almost without exception cheerleaders for the booming property market, only dampening their enthusiasm months after prices had started to decline in late 2007.

Keywords: Behavioural drivers, Ireland, financial crisis, housing bubble, residential property

## The Impact of the Mortgage Interest and Capital Deduction on Belgian Borrowing Behavior

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In 2005, a system of mortgage interest, insurance premiums and capital deduction (MICPD) was introduced in Belgium to replace and simplify the previous system of fiscal housing benefits. Mortgage interest, capital amortizations and insurance premiums were assembled into one single deduction package. Although previous research has shown that the MICPD did not promote home ownership, we show in this paper that the MICPD did affect the mortgage market. The Household Finance and Consumption Survey is used to investigate the impact of the MICPD on the borrowing behavior of the Belgian households. A probit analysis is used to model the probability of holding mortgage debt. Mortgage demand, mortgage terms and housing consumption are estimated simultaneously in a 3-SLS approach. The results indicate that the fiscal benefit of the MICPD has induced households to modify their mortgage amounts and terms to maximize the fiscal advantage of the MICPD, rather than inducing them to take out a mortgage. Furthermore, we find that couples and financially unconstrained households are most likely to adapt their borrowing preferences.

Keywords: Housing consumption, interest deduction, mortgage demand, mortgage term

## **D-3**

### **Housing Price Indexes in Central and Eastern Europe. A Comparative Study on the Models**

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In recent years, housing indicators have become significant in understanding the evolution of the real estate market. As there is a significant impact of the housing price indexes on the public awareness of the current state of a real estate reliability of such indices is important. This paper examines the housing price index from a methodological point of view, with a focus on Central and Eastern Europe. Results suggests that the majority of the real estate markets in this region is relatively new in adopting a real estate index, compared with Western Europe or US markets. Thus, the anchoring upon similar models developed in these markets needs to be done with a focus on regional characteristics.

Keywords: Comparative study, house price index, housing price methodology, real estate market

## The Effect of Age-Restricted Housing on Surrounding House Prices

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The value of property in residential neighborhoods depends, in part, on the surrounding housing stock due to the effect of housing externalities. We investigate the impact of age-restricted housing on the price of neighboring condominiums in Tampere, Finland. A spatial pattern emerges in all our specifications: age-restricted housing implies an increase in surrounding housing values within a radius of 200 meters of up to 2.65% and up to another 2.47% increase for an additional age-restricted property within 400 meters. The positive spillover effect of owner-occupied age-restricted housing is larger than that of rental housing. The positive effect of senior houses on surrounding properties is diminished if the age-restricted property has an onsite nursing care unit. In addition, the positive effects of age-restricted houses are not extended to assisted living facilities.

Keywords: Finland, age-restricted housing, condominium, house prices, housing markets

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**D-3****New Behavioural Business Practices: Agent Interactions in the Housing Market**

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**Craig Watkins** *Department of Urban Studies and Planning, The University of Sheffield, UK*

Agents have been crucial in shaping owner-occupier housing search and bidding strategies (Levy et al, 2008). But, this is changing. Recent research for RICS shows that UK house purchasers have only very limited exposure to agents. Their decisions are now influenced by Internet listing services and a range of formal and informal contacts (Dunning and Watkins, 2012), altering the institutional framework of housing decisions.

The study incorporates interviews with estate agents and website providers businesses in order to provide insights into agents' understanding of contemporary institutional arrangements and their role in shaping housing search behaviour. It compares information provision, housing search and decision-making processes in the UK and New Zealand in an 'online' era. These countries have similar levels of consumer demand for owner occupancy, proclivity towards Internet listing services and estate agency roles, but dissimilar selling mechanisms. This juxtaposition enables a cross national reflexive approach to analysing the relationship between agent and housing searcher.

The study highlights the opportunities and threats that exist to the estate agency industry within the evolving institutional environment.

Keywords: Estate agents, housing decisions, institutional framework, internet listing services

## Estimation of Hedonic House Pricing Model through Non-Parametric Methods: Istanbul Real Estate Market

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The housing market is consisted of sub-markets that give it segmented structure and it exhibits heterogeneous characteristic due to both immovable and durability of houses and their different structural, location and neighborhood characteristics from each other. Accordingly, each sub-market has different pricing structure owing to different supply and demand conditions of each individual market. Therefore, price estimation process for houses are rather difficult. However, Hedonic Pricing Approach especially used in pricing of products in heterogeneous markets that enables calculation of marginal impacts of individual characteristics on price of products and facilitates house pricing process. During investigation of the relationship between real estate prices and their characteristics, spatial effects are required to be taken into consideration which are significant determinant in house prices. Spatial effects can be presented as spatial autocorrelation and spatial heterogeneity. Whereas spatial dependency among house prices, which arise as a result of adjacency effect are described as spatial autocorrelation, variation in relationship between house prices and their characteristics based on the segmented structure of the housing market are described as spatial heterogeneity. Therefore during investigation of the relationship between house prices and their characteristics, there is need for models which allow relationships to vary according to locations and which consider spatial dependency in house prices. While Non-Parametric Spatial Models are appropriate for the standing need, the OLS Regression Model or Parametric Spatial Models do not take spatial effects into consideration because of their limiting assumptions. The present paper aims to have better understanding on demand side of the Istanbul Real Estate Market by investigating marginal effects of various characteristics of 2838 houses from 39 counties, which are assumed to represent Istanbul Real Estate Market through Non-Parametric Spatial Models based on Hedonic Pricing Approach in the period of October-December 2013. The results obtained from estimation through Non-parametric Spatial Models revealed that the relationship between house prices and their characteristics is differentiated for each sub-market and that there is non-linear relationship between house prices and spatial characteristics.

Keywords: Hedonic pricing approach, Istanbul real estate market, non-parametric spatial models, spatial effects

**D-4**

## Multiple Interests as Management Challenge for German Housing Companies: How Diverse and Conflicting are their Stakeholders' Expectations?

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The German housing market is strongly regulated including e.g. limitations of rent increases and energy-efficiency standards for new buildings. However, it is not sufficient for housing companies to comply with these formulated rules. Due to a pluralistic corporate governance system and the high social importance of housing in Germany, the management must also consider interests by their numerous stakeholders such as owners, employees, tenants, business partners, politics, authorities, and other interest groups. Some foreign investors only became aware of this required stakeholder-orientation when they were faced with negative press and protests for not fulfilling the expectations (e.g. concerning adequate maintenance levels).

In addition to providing affordable housing for a broad spectrum of households, companies are expected to fulfill further interests like for example energy-efficient buildings, adequate social management, better customer service, and increased profit generation. Strategies to balance these different and partly conflicting interests are required. Before interests can be balanced systematically, transparency on the stakeholder expectations is required. The purpose of this study is to show what kind of expectations are addressed towards housing companies, how they differ between stakeholder groups and what kind of conflicts may arise.

Expectations are analyzed exemplarily in a case study with a German municipal housing company. More than 1,400 stakeholders were invited to take part in a survey on their expectations towards the company. The survey was analyzed by qualitative, descriptive and multivariate analyses.

The results of the survey confirm the variety of interests. Expectations not only vary between stakeholder groups but are also heterogeneous within some of the typical stakeholder groups.

Managers should be aware of this heterogeneity of expectations, as they often tend to focus only on stakeholders with whom they interact regularly or who engage proactively. Even participation approaches bear the risk of participants representing only a small minority. Thus, companies should try to integrate multiple stakeholder perspectives for decision-making to fulfill the diverse needs as best as possible.

Keywords: Balancing of interests, heterogeneity of demands, housing company, stakeholder analysis, target conflicts

## House Prices in Europe – Indicator Development and Figures

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When the crisis occurred the existing sets of national house price indices (HPIs) were often based on private sources outside official statistics. These indicators could differ widely, in particular with respect to the type of price data, coverage and quality adjustment. Due to sustained efforts from Eurostat and the National Statistical Institutes (NSIs), the situation has dramatically improved since then.

Building on a pilot project launched in early 2000's to develop price indices for Owner Occupied Housing, Eurostat and the NSIs released the first experimental HPIs at the end of 2010. After a period of consolidation in 2011-2012, the official harmonised HPIs were released in the beginning of 2013. The quarterly data started in 2005.

Official European statistics need to abide to the highest standards of quality and harmonisation across countries. To arrive at this level, the most important issue has been the availability of data on the price of the transactions. A second key challenge has been associating the price to the dwelling characteristics. A third key challenge has been the quality adjustment from one time period to the next.

The European project produced an international Handbook on Residential Property Price Indices complemented by practical guidelines for the compilation of harmonised HPIs. A reference legal framework has been set up targeting the years to come without any obligation to provide back data. Today HPIs published by Eurostat are used for several policy purposes: for monetary policy, for financial stability and also to monitor macroeconomic imbalances in EU Member States: The development of real house prices (nominal HPI deflated by the final consumption deflator) is one of the eleven MIP Scoreboard indicators used in the European Semester Monitoring.

While the policy uses rely mainly on a swift dissemination of current data, the analysis of the housing market requires also longer data series. Eurostat has been working on this issue and today it is possible to disseminate longer data for most EU countries going back to 2000.

This longer series have the advantage that, in addition to the post-crisis period, they capture the pre-crisis period. Moreover, they are available in one place for all EU countries on the Eurostat website. The publication of HPIs for EU countries going back to 2000 offers thus a reliable and easy-to-use source of data for those interested in better understanding the evolution of housing markets.

Keywords: Official statistics, house price indices, housing as investment asset



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**D-4**

## Housing Market and Demography, Evidence from French Panel Data

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Worldwide variations in the population structure are taking place over the next century, and this is expected to have impacts on the whole economic systems, and particularly on the housing market (i.e. price of homes, ownership structure, and supply and demand of residential properties). In this paper, we empirically investigate how the French real estate is affected by both economic and demographic factors. Starting from the theoretical benchmark model of Takàts (2012), we first investigate the relationship between collective and individual housing prices dynamics and GDP, total population and old age dependency ratio. Results from fixed effect regressions on 94 French departments on the period 2000-2013 show that real estate prices are significantly and positively affected by the total population number and the total GDP, while they are significantly and negatively affected by the old age dependency ratio (ratio of population aged 60+ to the working population). This study, to our knowledge, is conducted for the first time across departments in France. Furthermore, obtained results and the particular case of France have motivated further research by enriching the baseline model with various financial, real estate, economic and demographic explanatory variables and analyzing our panel in a more segmented way. In all cases, economic impact on real estate market is significant and around the unit\_ i.e. 1% increase in GDP leads a 1% increase in housing prices\_ while demographic factors seem to have a greater impact on housing market prices.

Keywords: Demographic factors, economic factors, fixed effect, housing market prices, panel data

## How do Optimal Reserves Compare to Actual Undisclosed Reserve Prices? Empirical Evidence from English Open Outcry Auctions of Residential Property

**Simon Stevenson**, *University of Reading, UK*

**James Young**, *University of Auckland, New Zealand*

The empirical analysis of auctions has frequently been constrained by data limitations. This is especially so with respect to undisclosed reserve prices. As a result, it has often been difficult to empirically consider some of the key theoretical arguments regarding the impact and role of reserve prices. Using a dataset that includes information on the undisclosed reserve prices, this paper examines residential property auctions in Dublin, Ireland. The Irish market provides an interesting case to consider the dynamics of the auction process and specifically the optimal reserve price.

The analysis is based on a range of primarily theoretical pieces that have considered the optimal value of the reserve, especially when undisclosed (e.g. Riley & Samuelson, 1981; McAfee & Vincent, 1992; Vincent, 1995; Li, Perrigne & Young, 2003; Caillaud & Mezzetti, 2004; Hu et al., 2010). The primary piece of the literature that has considered real estate in this context is McAfee, Quan & Vincent (2002). The data set utilized in this study consists of 389 properties that were offered for sale through auction between 1998 and 2002. Importantly, this data includes information on variables often missing from existing empirical work, including the undisclosed reserve, the attendance at the auction, the number of bids and bidders and the individual auctioneer presiding. A key advantage in this dataset is that unlike many papers (e.g. Ong et al., 2005) we do not have to rely on proxies to capture the impact of different factors. In addition, due to the nature of the auction procedure followed in Ireland, we are largely considering willing sellers. Therefore, unlike papers such as DeBoer et al. (1992) and McAfee et al. (2002), our reserve estimate is based on perceived market value and not related to issues such as outstanding mortgage debt or unpaid tax. This allows us to directly compare the theoretical optimal reserve with the actual undisclosed reserve in the market place.

Keywords: Auctions, Ireland, optimal reserve price

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**D-5****Homebuyers' Preference for Installed PV Systems –  
Discrete Choice Experiment**

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**Thomas P. Wissink**, *Real Estate Management & Development, Department of Built Environment, Eindhoven University of Technology, The Netherlands*

**Purpose** - This paper contains the findings of dwelling buyers' preferences towards installed photovoltaic (PV) system on their potential homes and thus provides an insight on the overall impact of PV systems to home purchasing. **Design/methodology/approach** - These preferences are determined by a discrete choice model that is based on stated preference data of dwelling buyers in the Eindhoven region.

**Findings** - The most important findings are that a PV system is on average highly appreciated by dwelling buyers and that this appreciation is relatively larger by dwelling buyers that live in more urban/central neighborhoods.

**Research limitations/implications** - This paper is essentially exploratory and raises a number of questions for further investigation such as determining the real estate value of installed PV systems.

**Practical implications** - The findings would suggest that the diversity of homebuyers' preferences would vary. It is dependent on the homebuyers' personal characteristics but also on institutional settings of an energy system. Therefore, the provided insight must be regarded as local and further research is necessary for understanding the impact on the European residential real estate markets. **Originality/value** - This paper estimates the impact of the installed PV system on the housing choice by stated choice data on the local housing market.

**Keywords:** Eindhoven, multi nominal logit (MNL), pv system, preferences, willingness to pay (WTP)

## Information Transparency and Pricing Strategy in the Scottish Housing Market – an Evaluation of the Home Report Scheme

**Daniel Y. F. Lo**, *Department of Real Estate and Construction, Faculty of Architecture, The University of Hong Kong, China*

**Nan Liu**, *Centre for Real Estate Research, University of Aberdeen Business School UK*

The Scottish housing market has some unique characteristics. The dominating selling mechanism is the “offers over” system, where the property on the market is listed as “price over” a certain amount. When there is more than one potential buyer, the seller tends to set a “closing date” at which, offers from all the potential buyers are submitted in a form of first price sealed bid auction, normally the highest offer will be accepted. This selling mechanism has been very popular among sellers, and is believed to keep the market buoyant to a certain extent. However, this unique system has also been criticised as a “corruptible system”, mainly because it has left estate agents open to accusations of setting artificially low asking prices to create competition, leading people who cannot afford the property paying for surveys. Since In December 2008, the Scottish government introduced a new regulation – the Home Report. Sellers are required to provide information on the condition, valuation, energy efficiency and utility services when list properties in the market, and Home Report can be accessed by potential buyers free of charge. One of the aims of the scheme is to address the problems created by the practice of setting artificially low asking price. Five years since the introduction of Home Report, the Scottish government carried out consultation on the Home Report and findings were published in 2014. While the government’s consultation results are based on qualitative data, this paper aims to provide some quantitative evidence on the effect of Home Report on seller’s pricing strategy. After allowing control for market conditions, dwelling qualities and locations, the paper tests whether there is a significant difference in price setting in Northeast Scotland. This paper uses data from Aberdeen Solicitors’ Property Centre from 1998 to 2013. Results from the hedonic models suggest that sellers set price using evidence of recently transacted properties in nearby locations, and since the introduction of the Home Report, this spatial autocorrelation is more pronounced. The results also show that the introduction of home Report statistically reduces the deviation between actual asking price and estimated asking price, which is used as a proxy to the valuation. These results suggest that sellers’ pricing strategy has fundamentally changed since the introduction of the Home Report. The scheme appears to be effective in addressing the problems created by the practice of setting artificially low asking price.

Keywords: The Scottish housing market, government policy, information transparency, pricing strategy, spatial autocorrelation

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**D-5****Long Term House Price Series for Spain: Construction and International Comparison**

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**Francisco Juárez**, *University of Alicante, Spain*

This paper reconstruct the long term serie of housing prices in Spain (aggregate) using statistical methods based on ARIMA models. It build the data for sixties until eighties period in quarterly basis, of weighted house prices for the Spanish aggregate and some selected regions. The method uses 2 proxies for house prices reconstruction, the GDP and Mortgage units, and base the built series on the housing market fundamentals. After that, the paper compare the Spanish housing prices with other long term series available like the UK, France, US, Germany, Netherlands, Italy and Japan. The reconstruction shows the different effect that the inflation process occurs during seventies had on housing prices and the similarities of global cycles among European countries.

Keywords: ARIMA models, Spain, housing prices

## Housing Association Objectives need to be under the Same Roof: Report

**Ing. Jan Veuger**, *Hanze University of Applied Sciences, The Netherlands*

**Purpose** - Housing associations make too small a contribution to society, the government has to step in too frequently because of maladministration, and the associations' executives are often unaware of the far-reaching impact of their decisions. These are the conclusions of new academic research conducted by Jan Veuger of Rotterdam School of Management, Erasmus University (RSM). In his dissertation, he asserts that in numerous cases there is no correlation between social and financial objectives. The Dutch House of Representatives debated the results of the report *Ver van huis* from the Parliamentary Committee of Inquiry on Housing Associations in early December 2014.

**Design/methodology/approach** - After extensive exploration of the literature and PhD studies on the period from 2005-2009, the research design inspired based on the grounded theory, which has a certain bias as a result of the extensive literature study. In the line of thinking of the grounded theory, interviews with directors more or less contracted uninhibited according to a narrative method. Afterwards these interviews, independent of the researcher, thematic and labeled by a single Delphi method be submitted to an expert group which created a storyline. The results of this Delphi method have been submitted to a peer group of directors. Then these conclusions in a survey presented to 60 selected directors and the subsequent conclusions. There has thus been more than a triangulation of research than just interviews, Delphi method and survey. Hypotheses are thereby omitted because of the difficulty of fitting in within the chosen research design inspired by grounded theory.

**Findings** - Why this qualitative thesis 'Control of housing associations in consistency with social values'? To understand and to discover patterns about the how and why of the functioning of corporations in society as they do now. This qualitative study is about the search for ideas, backgrounds, motives, resistors and motives and is therefore suitable for the following question: with contradictions are there in the social values that underlie housing associations that affect the way they are governed? The overall summary conclusions to answer the central question is: Directors, at the highest level thinking about how to deal with values ensure they drive on their own, monitor, know the consequences and take responsibility.

**Keywords:** Board, consistency, housing associations, responsibility, social values

**D-6**

## Synergy Effects of Collaboration by Housing Corporations and Institutional Investors on the Dutch Housing Market

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**Joep Arts**, *Stec Groep, The Netherlands*

The Dutch rental housing market is strongly dominated by housing corporations. They own around one third of the total housing stock in the Netherlands and about 95% of the total rental housing stock. Consequently, the private rental market represents only a very small segment. A substantial part of what is called 'social housing' actually only belongs to that segment because of rent control: on the private rental market these houses would be let for higher rents. For several reasons, the national government considers this now as an 'unhealthy' situation. The private sector is reluctant to invest in new, more expensive rental housing (as distinguished from 'social housing'), despite an increasing demand for this segment by medium and high-income groups, due to the dominant position of the housing corporations. At the same time, most of the housing corporations have difficulties with investing in new social housing, because they lack the investment capacity to do so. A potential solution to this catch 22 situation is to create a fund with both one or more housing corporations and one or more institutional investors as shareholders. The housing corporations' input consists of a part of their housing stock, while the institutional investors bring in funding. This fund then consists of high-end former social housing, but now 'transformed' into private sector housing. The anticipated result would be that housing associations will have money to invest in the renewal of their remaining housing stock, that institutional investors would have an additional real estate segment to invest in, and that medium and high-income groups will find more opportunities to rent medium and high-quality housing. With help of game simulation, with the participation of both representatives from housing corporations and institutional investors, we have tested under what conditions these actors would be willing to create such a fund. The game simulation shows that, in principal, both groups believe in synergy effects, but that both cultural differences between housing associations and investors (e.g. with respect to risk assessment; required returns on investment; acceptable operational costs), discussions about the present value of the housing stock brought in by the housing corporations (including taxation issues) and present regulation still act as a barrier to such a mixed fund. To improve the chances of creating a fund, it is crucial to agree on terms and conditions.

Keywords: Creating a mixed rental housing fund, housing corporations, institutional investors

## The Economics of Style

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In the last decades, many advanced economies have experienced the proliferation of design styles that refer to the past. Some have raised the hypothesis that the willingness to pay for these neo-traditional dwellings is larger than for dwellings with other, more 'modern' design styles. Theoretically this is possible in restricted housing markets with imperfect market competition. To our knowledge the existence of price effects for building styles has not been researched yet. This paper reports on a cross-sectional hedonic price analysis of building styles in the Netherlands. We find a significant price premium for neo-traditional architecture.

Keywords: Architecture, housing market, spatial planning



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**D-6****What to Expect from the Housing Market in 2015**

**Angelika Kallakmaa**, *Tallinn University of Technology, Estonia*

The Estonian housing market has a short, but already remarkable history with skyrocketing housing prices, a housing bust period and a slowdown in recent years. The rise in the Estonian housing market was mostly driven by consumers' expectations and easy access to credit. Political decisions might have been made with the purpose of ensuring better access for households to the loan market, but at the same time not taking into account its impact on the real estate market. The article seeks to analyse the development of the housing market in Estonia, evaluate the current situation and predict potential development trends. The development of the housing market has been investigated from three main aspects. Firstly, the development and changes of economic environments are evaluated and links to the general development of the whole real estate market, especially of the housing market, are provided. Secondly, the demand within and factors influencing the housing market are analysed in greater detail. Thirdly, changes in regulatory framework are investigated.

Keywords: Estonia, demand, housing, regulatory framework

## Heritage Designation and House Prices

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Built cultural heritage is generally believed to be an important urban amenity that influences the attractiveness of cities as place of residence and business location. However, while the provision and maintenance of cultural heritage is costly and relatively easily estimated, the benefits arising from cultural heritage are much harder to quantify. Consequently, historic buildings have been demolished because the costs of adopting them for new use were estimated to outweigh the possible price premium related to the historic nature of the building. Quantification of the benefits of cultural heritage might provide an additional incentive and justification for public and private parties to preserve and maintain the stock of built cultural heritage. In this paper, the value effect of cultural heritage is analysed in two ways: the price effect of listed status on the market value of dwellings is investigated; and possible externalities – spillover effects – of listed buildings on nearby property values are explored. For this purpose several specifications of hedonic price equations are estimated to determine whether a listed building status yields a price premium and if proximity to listed buildings is capitalised in property values.

Keywords: Adaptive reuse, hedonic pricing, heritage, housing

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**D-7****Measuring Fundamental Housing Prices in the Baltic States: Empirical Approach**

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This paper develops a comprehensive framework for assessing housing price misalignments from the fundamental prices in the Baltic States. For this purpose several statistical indicators (price-to-rent ratio, price-to-income ratio, price deviations from Hodrick-Prescott filtered trend) are used together with econometric models. Such models include reduced form equilibrium price regressions estimated for individual countries and for the panel as well as supply-demand system for each of the Baltic countries. Statistical indicators are employed in combination with the model estimates to arrive to clearer conclusions about residential real estate price misalignments. This paper contributes to the literature by filling the gap of monitoring housing market developments consistently in the Baltics and developing a framework that can potentially be used to monitor price misalignments in the residential real estate markets of other countries.

Keywords: Baltics, fundamentals, housing, prices, real estate

## Is the Housing Market of the most Tourism Penetrated Places Affected by Tourism Penetration? – The Case Study of Crete Island

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**Anupam Nanda**, *University of Reading, UK*

This study tries to identify whether the most tourism penetrated places are the ones which have the greatest influence in terms of house prices because of tourism. In Chapter 1 we briefly presented the economic, political and real estate framework of the country and particularly this of the islands. In chapter 2, we tested standard hedonic model for the housing markets of the islands which revealed some unique drivers. One of the basic driver, is this of tourism appearing constantly significant across particular islands; so natural question out of that is to look deeper into tourism penetration. By taking Crete Island as a case study, from 2006 to 2012, we firstly structure tourism indicators for each prefecture. Then, by using the principal component analysis, we create the Tourism Penetration Index (TPI) of each prefecture and we rank the four prefectures of Crete from the most tourism penetrated to the least one. The second stage of the analysis we regress the data of the four individual prefectures in three steps: firstly, we regress properties without the TPI effect; secondly, we use the Tourism Penetration Index (TPI) of the first stage corresponding the prefecture and the year to each observation, so as to observe its significance to the house prices of each prefecture. To the last step of the second stage of the analysis, we add to the hedonic models the TPI of the neighbour prefecture(s), so as to identify whether there is any the spill-over effect cause by tourism penetration. The focus here is to identify whether a) the TPI<sub>j</sub> of a prefecture j is significant on House Prices of the prefecture, b) its significance on House Prices of each prefecture follows the same ranking as in first stage and therefore, whether the most Tourism Penetrated places are the ones whose houses prices have been mostly affected by tourism penetration, c) House Prices are affected by the TPI of the neighbour prefecture (tourism spill-over effect). Models are tested for robustness across several specifications.

Keywords: Crete island, PCA, hedonic regression analysis, tourism penetration, housing prices, tourism performance

**D-7****Structural Models of Urban Regeneration in Emerging Markets-Turkey Case**

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**Gülcemal Alhanlıoğlu**, *Soyak Holding, Turkey*

**Deniz Uğurlu**, *Soyak Holding, Turkey*

**Purpose** - As a national movement, urban regeneration is the future of Turkish residential real estate market. In this paper, the models that let housing sector to make sustainable investments to urban regeneration are examined. In this regard, the purpose of this paper is to investigate the structural models of urban regeneration projects take place in emerging markets from the perspective of Turkish examples. It estimates various business and financial models according to varying dynamics of Turkey's recent urban regeneration projects. The paper demonstrates decision making approaches to utilize models that will fit better under changing circumstances.

**Design/methodology/approach** - The paper reviews the differences of urban regeneration projects in developed and emerging markets. It explores the driving forces behind urban regeneration, legal infrastructure, and practices in Turkey specifically. It draws upon recent urban regeneration examples in Turkey. The paper analyses the existing models and proposes methods to choose the proper models that match with the varying dynamics.

**Findings** - Urban regeneration needs are different for developed and emerging markets and even for each emerging markets. There is no one-fits-all model in urban regeneration projects. Various dynamics play roles in adoption of proper business and financing model in regeneration projects. Decision making process for the model that fits the project usually lacks systematic analysis. However, urban regeneration needs in emerging markets display similar characteristic as they stem from the same dynamics. Hence urban regeneration practices and models can be adapted to the projects of other emerging markets. In planning stage of urban regeneration projects while methods, resources and financing tools are being planned and allocated, a checklist and/or a flowchart consist of some critical questions addressing the proper business models can be used as decision making tools/approaches.

**Research limitations/implications** - This paper is essentially exploratory and raises a number of questions for further investigation. There is scope to extend the research to examine other business development models and propose advanced decision making approaches addressing complicated factors.

**Originality/value** - This is the first paper to examine business models in urban regeneration projects and accordingly propose decision making approaches for adopting the suitable model to follow.

**Keywords:** Business model, decision making, emerging markets, financial model, urban regeneration

## A Measure of Spatial Competition in Residential Brokerage

**Christopher Hannum**, *Istanbul Technical University, Turkey*

**Kerem Yavuz Arslanlı**, *Istanbul Technical University, Turkey*

This project will build a theoretical model of real estate brokerage using assumptions based upon findings from the extensive brokerage literature. In this model differentiation in services and quality between brokerage firms combined with differentiation in preferences between sellers lead to measurable ranges of operation for brokerage firms. These ranges overlap, leading to the competitive nature of the industry. This theoretical model can be simulated in order to predict when ranges will grow or shrink and when competition within them will increase or decrease.

Using MLS data for Northern Colorado we will measure the range of operation in ArcGIS for each brokerage firm and each agent in the sample by using actual geocoded data for listings and transactions. These ranges of operation will be used to calculate a market share of listings or transactions for the agent or brokerage firm within their own range of operation. For example, while a county might have 1200 listings a certain brokerage firm within that county may compete only within a smaller area of that county in which there are 120 listings. If the brokerage firm has 40 total listings our methodology would give them a market share of 33% within their operating range rather than 3% within the county.

Market share measures for individual agents and brokerage firms will be combined to generate a market concentration measure for larger predefined areas such as cities or census blocks akin to the Herfindahl-Hirschman Index. This will be done using a weighted average, using conventional market share measures (the aforementioned 3%) for weights. Using panel data techniques we will test whether higher values for our market concentration measure are correlated with higher or lower sales prices. We will examine whether market shares and the size of operating ranges for individual agents and brokerage firms vary predictably with local market conditions. These tests will help to determine what value better measures of brokerage firm market share and market concentration will have to policy makers and real estate practitioners, potentially in identifying desirable locations for new entrants and in predicting future trends.

Keywords: Brokerage, spatial analysis

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**D-8**

## The Effect of Different Pricing Strategies in the Dutch Housing Market

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**Roger Bougie**, *TIAS School for Business & Society, The Netherlands*

**Koen Pillen**, *TIAS School for Business & Society, The Netherlands*

The use of reserved price strategies gained popularity in the Dutch housing market. The more common asking price strategy is still widely applied and gives potential buyers the opportunity to negotiate below a listed asking price. Since the market can be characterized as cold and the average time that it takes to sell the property (Time on Market) has increased from 86 days in 2007 to 176 days in 2013, sellers and brokers are looking for new pricing strategies. In 2014 one of every fifty houses was sold on a reserved price basis, where a fixed minimum was the starting point for negotiation. The aim of this research was to measure the effect of using different pricing strategies on the actual sales price and the TOM. For this purpose data was collected on 5.316 reserved price transactions and 24.582 sales prices transactions covering the period 2009-2014. Hedonic regression modelling was used to estimate the effect of pricing strategy on the sales price and Time on Market. In our analyses we controlled for variables that might potentially bias our results. Results show that using the reserve price method the Time on Market decreases with more than 50% compared to using the asking price method. The average reduction of the sales price, using reserved pricing, is 4,4%. These results give clarity for sellers of houses in their tradeoff between price concessions that they are willing to take and the expected reduction of the time that is required to sell the house.

Keywords: Hedonic modelling, housing market, pricing, time to market

## London Town a Behavioural Approach to Property Prices in the Capital City

**Diego Salzman**, *London South Bank University, UK*

Few cities in the world cause so much attention as London. Arguably the financial centre of Europe and the beating heart of global business, London is a living proof that some of the most important real estate economics postulates do not apply. With average prices for a one bedroom flat oscillating around half a million pounds and an average gross income salary of merely £30k, this powerful city seems to be more of a myth for those who aspire success rather than a pleasant city to live in. This paper aims by using behavioural variables along with elements of multimodal critical discourse analysis into a hedonic pricing model, to extend our understanding of the 'irrational' housing prices in London and why Londoners seem to accept de-facto this inconvenient reality they are living in.

Keywords: Behavioural real estate, London UK, property appraisal, real estate markets



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**D-8****Generation Y Homeownership in Malaysia**

**Mohd Azhar Ab Wahid**, *University Malaya, Malaysia*

Owning a home is a fundamental importance for most of Malaysians. Homeownership has always been one of the concerns amongst the young generation entering adulthood. The increasing trend of home prices may be beyond reach for many Malaysians, especially the young people who are just entering the work force with their existing commitments and expenses. The aim of this study is to identify the earliest possible age of homeownership amongst Generation Y in Malaysia. In order to achieve the research aim, findings for this research to be established are as follows; to examine the housing preference of Generation Y homeownership; to identify the location of property of Generation Y homeownership; and to determine the housing price affordable to Generation Y. The secondary data of residential property transactions in Selangor, Malaysia are used in order to achieve the aim and objectives. The findings of this research are the housing preference for the Generation Y in Selangor and the most preferred location of Generation Y homeownership. The research indicates that the housing price affordable to the Generation Y in Selangor is RM250,000 and for landed property is RM400,000.

Keywords: Generation Y, homeownership, housing

## International Competitiveness of China's Construction Firms

**Puying Li**, *Real Estate and Land Management School of Royal Agricultural University, UK*  
**Simon Huston**, *Royal Agricultural University, UK*

The purpose of this Ph.D. research is to systematically investigate the factors which influence the international competitiveness of Chinese Construction Firms (CCFs). The research is conducted in conceptual, empirical, corroboratory and reflexive phases using a combination of secondary and primary sources. Secondary data and questionnaire responses are analysed statistically but case study observations and corroboratory interviews are handled qualitatively.

To address the research aim, specific research objectives are set: 1. Identify the Chinese construction firms' problem and outline a pathway for a complete answer to it. 2. Undertake a systematic literature review of notions of competitiveness in various fields to develop a conceptual framework of CCFs. 3. Conduct a preliminary desktop review of global construction firm best practices, comparing successful with unsuccessful firms. 4. Describe the methodology for a complete answer to the Chinese construction firm question. 5. Analyse CCFs' Key Performance of Indicators (KPIs). 6. Apply the exploratory knowledge to fine-tune the preliminary model of international competitiveness of CCFs. 7. Operationally test the refined CCFs' international competitiveness model against a combination of quantitative and qualitative research evidence. 8. Conduct focus group meeting to consider institutional, cultural, geographical, political and religious issues which could moderate CCFs' international competitiveness. 9. Distil research findings and make key policy recommendations.

The combination of desktop secondary research, analysis of KPIs, case studies, surveys and interviews will provide a complete answer to the research question of what factors influence the international competitiveness of Chinese construction firms.

Keywords: KPIs, construction firm, construction market, international competitiveness, performance

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**E-1**

## **An Assessment of the Viability of Large Mixed-Use Real Estate Developments in Sub-Saharan Africa**

**Francois Viruly**, *University of Cape Town, South Africa*

This study provides an understanding of the viability and investment decision making processes associated with mega, mixed-use developments across Sub-Saharan Africa (SSA). In doing so the study questions the economic and non-economic parameters that drive these projects and the market reality of the feasibility studies that they are based on. Due to their size, the success or failure of these projects can have considerable private and public implications.

In addressing these questions, the research considers the academic literature that has developed around the characteristics of large mixed use developments. Research conclusions draw on the existing literature and four case studies located in Kenya (Tatu City), Nigeria (Eko Atlantic), South Africa (Century City) and the DRC (Cite Du Fleuve). These projects are approximately of a similar size and value, incorporate a number of residential and non-residential uses, and have the potential to significantly impact on local markets.

The study draws the conclusion that decisions to undertake mega real estate projects across SSA tend to be based on parameters that extend beyond private financial objectives and often fail to take cognizance of the market context.

Keywords: Mixed use developments, feasibility parameters, spatial impact of mixed use developments, sub-Saharan Africa

## Housing Affordability Changes in Baltic Capitals: On the Effect of Housing Boom and Negative Housing Equity on Housing Affordability

**Kristian Kahre**, *Tallinn University of Technology, Estonia*

**Ene Kolbre**, *Tallinn University of Technology, Estonia*

After the early 2000s housing boom Baltic countries' capitals witnessed strong downturns in residential housing market in 2007/2008, with apartment prices contracting between 2007 and 2009: 45.5% in Tallinn, 59.6% in Riga, and 39.9% in Vilnius. We analyze the changes in income, repayment and purchase affordability. The income affordability in terms of price-to-income ratio decreased based on three city average more than 55% just in short timeframe of 2004-2007; it improved significantly after the contraction in prices in 2009. The housing affordability index (HAI) shows that by the end of 2013 the repayment and purchase affordability was in comparison to the peak of the boom in 2007 approximately two times higher in Tallinn, three times higher in Vilnius, and four times higher in Riga. We also show the extent of the problem of negative housing equity and how it can affect housing market.

Keywords: Baltic States, housing affordability, housing boom, price-to-income ratio

## E-2

### Global Brands the New Global Badge of Real Estate Service Quality?

**Eamonn D'Arcy**, *University of Reading, UK*

**Stephen Roulac**, *Roulac Global, USA*

This paper examines the strategic implications for the future of real estate services (RES) of the creation of global real estate service brands as a result of a long-standing process of internationalisation in this sector. This process has had two distinct phases; an initial period of consolidation from 1997 which resulted in the evolution of embryonic global service delivery platforms and a second phase of consolidation post the global financial crises where the creation of truly global brands was a key driving force. The analysis examines how a strong brand image has created new intangible assets for the sectors principal global delivery platforms and thus has altered the competitive landscape in the sector on a number of levels. It also considers brand image as a proxy for service quality and reputation and how branding in the sector has displaced the role of professional bodies and affiliations as badges of service quality. It concludes with an assessment of the prospects for further consolidation in the sector creating fewer but potentially stronger global brands.

Keywords: Global brands, internationalisation, real estate services

## Real Estate and Global Capital Networks: Drilling into the City of London

**Colin Lizieri**, *Cambridge Real Estate Research Centre, University of Cambridge, UK*

**Daniel Mekic**, *Cambridge Real Estate Research Centre, University of Cambridge, UK*

There is a growing awareness in urban social science of the importance of commercial real estate as a medium by which large cities are embedded within global capital networks. City centre transformations emphasising office development focussed on financial and business services firms tie cities into international employment cycles while the capital sunk into the real estate locks those cities into global capital markets through ownership and finance. This trend is most pronounced in developed world cities whose focus is on financial services. The process has become more marked with the globalisation of commercial real estate markets. RCA data for major office deals 2007-2014 show 35% of those transactions were cross-border. Investment is strongly concentrated: 20 cities account for over 67% of deals by value. Major global investors and international chains of brokers and agents play a key role in this process.

While urban research has become more aware of these tendencies, the nuances of market processes are often lost in over-simplistic categorisations such as “international financial capital” or “property developers”. There is considerable diversity in the nature of office investors with substantial differences in motivations for building international portfolios and in the impacts of investment for the cities concerned. Further, there is a substantial separation between the process of development and the process of longer term investment that often seems downplayed in academic research.

This paper aims to address that gap with a detailed examination of the City of London office market. The study draws on a unique database identifying ownership of offices for over 40 years, allowing analysis of the shift over time from predominantly local domestic ownership to 2014 when over 60% of space is non-UK owned. We analyse changing tides of ownership linked to transformation of the City economy, the data revealing waves of ownership which differ nationally, regionally and by entity type. We trace the new developments in the City revealing the processes that link development and investment activity. These analyses will be placed in the context of employment trends and the investment performance of the City office market in national and global context and draw on evidence of the motivations and objectives of global real estate investors. The paper concludes by examining the implications for the planning, governance and economy of cities.

Keywords: Global capital flows, office markets, real estate ownership

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# E-2

## The Effect of Interest Rates Changes on Listed Real Estate Companies

**Rene-Ojas Woltering**, *University of Regensburg, Germany*

This paper examines the effect of interest rate changes on the performance of listed real estate companies. The motivation for the analysis is based on the idea that interest rate changes are negatively related to a) the relative attractiveness of equities compared to other asset classes such as fixed income or the money market, b) the prices of the underlying properties of the listed real estate companies, and c) the operating performance of listed real estate companies as the costs of debt rise. The analysis is based on monthly data over the 2000 to 2014 period for a global panel of 9 regions. This rich setting offers substantial heterogeneity in interest rates across time and countries. In additional analysis I investigate the effect of interest rates on relative price measures such as the discount or premium to NAV. Furthermore, I account for foreign currency effects by considering both, the perspective of an unhedged US-investor and the perspective of an investor that only makes hedged investments.

Keywords: Interest rates, international real estate, REITS, real estate stocks

## The Direct Costs of A-REIT IPOs

William Dimovski, *Deakin University, Australia*

Direct costs of Australian REIT IPOs were last reported in the literature using data to 2004. Much has occurred since then. This study introduces and includes the A-REIT IPOs over the last 10 years and examines the cost and the factors influencing the percentage underwriting and percentage total direct costs by A-REITs IPOs. The study also investigates specifically whether the utilization of an underwriter (who guarantees the success of the capital raising) rather than a stockbroker (who doesn't guarantee such success) costs significantly more. The study finds that larger capital raisings and those with large investor or institutional involvement identified in the prospectus are significant in reducing underwriting costs. The study does not find that underwritten IPOs are significantly more expensive (or cheaper) than those not underwritten. Additionally, the size of the issue, whether the firm offers stapled securities (is internally managed) and has higher net asset to issue price characteristics reduces the total cost of underwritten IPOs.

Keywords: Australia, IPOs, REITS, total direct costs, underwriting costs



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**E-3**

## Are REITs more Transparent than Stock: Evidence Using a Propensity Score Model

Vivek Sah, *University of San Diego, USA*

Alan Tidwell, *Columbus State University, USA*

Research on the broader US equity market shows that corporate credit rating downgrades and negative Credit Watch announcements affect stock prices negatively. Holthausen and Leftwich (1986) examine the common stock price reaction to bond rating changes and Credit Watch announcements and find evidence of a stock price response to all events except an actual rating upgrade. Dichev and Piotroski (2001) examine the long-run stock returns following bond ratings changes, using Moody's bond rating changes from the 1970 to 1997 time period. They find limited abnormal performance for upgrades, but statistically significant negative abnormal returns of 10 to 14% in the year subsequent to a downgrade. Thus, they conclude the market does not fully anticipate the negative implications of downgrades for future profitability. REITs on the other hand may or may not react similarly to credit rating announcements due to their special regulatory environment. The literature points to credit ratings as a factor that broadly impacts external financing decisions and capital structure. REITs target debt levels to obtain credit ratings just above the investment grade cutoff point where clear differences in financing cost and length to maturity can be observed (Brown and Riddiough (2003) and Highfield, Roskelley and Zhao (2007)), and REITs with banking relationships are more likely to have credit ratings (Hardin and Wu (2010)). Additionally, Campbell, Dodd, Hill and Kelly (2012 working paper) offer evidence that credit ratings are inversely related to dividend volatility and measures of financial constraints. This study compares and contrasts the effect of rating changes on REITs and non-REIT stocks. This is done by using the non-REIT group as a control group. The control group is created by a unique propensity score model based on multiple REIT characteristics. By creating a control group comprising of non-REIT stocks that are similar to the treatment group REITs, it gives us a chance to compare two set of entities that are similar on a set of characteristics. The data for this study is from 2003 to 2013. We use ratings from Moody's, S&P and Dun and Bradstreet. The hypothesis that REITs are more transparent than non-REITs is tested by measuring market reaction to credit change announcements for both the groups that have been created.

Keywords: Credit ratings, REITs, transparency

## Strategic Relevance of Due Diligence Real Estate – An Integrated Transaction Cost Theory Approach

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The subprime mortgage crisis caused significant damage to the international real estate market. Did the crisis teach us anything? In practice, yes. For one, examinations in the form of due diligence of real estate assets have become more frequent and more thorough. Activities on the real estate market in Germany are recovering robustly and have almost reached pre-crisis levels. Thus, the practice of due diligence is increasing correspondingly.

However, the literature on due diligence real estate is still exiguous and lacks outright theoretic approaches. This thesis investigates the relevance of due diligence within real estate transactions by contextualizing it within integrated Transaction Cost Theory approaches and its behavioral assumptions. Transaction-cost and agency-theory parameters such as bounded rationality, opportunism and uncertainty offer approaches for describing how due diligence reduces information asymmetries, uncover hidden characteristics, and therefore prevent adverse selection. The conducted multi-method qualitative study affirms the strategic relevance of due diligence within real estate transactions. It indicates that due diligence is fundamental and serves to minimize risks by reducing information asymmetries.

The main finding is that shorter portfolio life-cycles and the growing trend towards outsourcing indicate clearly that the asset real estate is becoming a commodity. The relevance of due diligence real estate is therefore also gaining. In times of high volatility and uncertainty, a reduction of information asymmetry is highly desirable.

Keywords: Asymmetric information, due diligence real estate, hidden characteristics, transaction cost theory, uncertainty investment decision making, real estate risk and return factors

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**E-4****Examining the Time of Housing Supply**

**Guowei Gu**, *London Institute of Real Estate, School of the Built Environment, London South Bank University, UK*

Housing is one of the essential contributing factors to the growth of the economy. "Despite its importance, however, the housing sector has not received adequate attention from macroeconomists." (Zhu, 2014) Housing studies in general cover two areas – housing demand and housing supply. Compare with housing demand, researchers have noted that housing supply is understudied (Green, et al, 2005) probably due to the deficiency of micro-data of housing supply which embraces supply quantity and supply time. By gathering 885 housing projects from the official property registration platform in Shanghai, China, this paper focuses on examining how the time of housing supply is determined, more specifically the determinants of the first period of time\* from land supply to housing supply. After analysing the generalized property development model and undertaking multiple linear regressions, we find that government is a major party in influencing the times of housing supply. Firstly, the permits and certificates required by various government or government related agents in the process largely determine the length of construction and marketing. Secondly, the three independent variables, i.e. plot area, plot ratio and housing price, are all significant at 1% level. Relatively speaking, plot ratio exerts bigger impacts than the other two on the dependent variable of the first period of time with a coefficient of 4.63. The results prove that government could play a vital role in housing supply.

Keywords: Housing supply time, land supply, plot ratio, property development process

## Global Comparative Effects of Civil Unrests on Hotel Performance

**Sofia Dermisi**, *Urban Design and Planning College of Built Environments University of Washington, USA*

Civil unrest is an old phenomenon with causes spanning from economic conditions to political, ideological, religious and other perceived oppressions or limitations by a portion of an area's population. The level of unrest can span the full spectrum of crowd dynamics, from peaceful demonstrations to riots, with their fall-out effects causing minimal to significant damage in both the urban environment as well as the urban fabric. The extent, intensity and time-frame of the civil unrests affect an area's commerce, with hotels being in the forefront of such risk due to the perceived fear resulting in reservation cancellations and therefore lost income for owners of this real estate asset type. The paper focuses on hotel performance in select countries across continents which experienced civil unrest due to the financial crisis, occupy and political movements (e.g. Arab Spring) as well as radical or racial tensions. Utilizing hotel data from 2000 through the beginning of 2015 the paper explores the links between performance indicators, such as Average-Daily-Rate (ADR) and Revenue-Per-Available-Room (RevPAR) with civil unrest variables while differentiating among luxury, mid-price and economy hotels. Two distinct methodologies are applied: a) identification of densities and clustering of civil unrest events and hotel performance trends with the use of GIS and b) econometric analysis with the use of fixed effect regression modeling. The initial results suggest that economic and radical unrests affect more deeply hotel performance compared to others.

Keywords: Average daily rate and revenue-per-available-room, civil unrest, clustering and density, GIS, hotel performance

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**E-4****Reconsidering the 'Internet Effect': Real Estate Retail Outcomes in Australia & the UK 83****Nicola Livingstone**, *Bartlett School of Planning, UCL, UK***Sara Wilkinson**, *University of Technology, Australia*

Online retailing has evolved in recent decades and now represents a significant and integral element of the retail market. The 'internet effect' has been manifested in diverse ways across different markets, with international responses to the growth of online shopping and the real estate consequences for the UK and US markets examined by Worzala et al (2002). With the benefit of hindsight, this paper seeks to revisit the conclusions drawn by Worzala and other researchers (Dixon & Marston, 2002; Ellis-Chadwick et al, 2002) at the beginning of the Twenty-First Century, assessing their relevance and application to the online retail markets which have emerged in the last decade in Australia & the UK. The research addresses the lacuna of research regarding the real estate outcomes for the retail market as a consequence of developments in online shopping (2004-2014).

The retail industry in Australia (2010-11) accounted for 4.5% of GDP, employing 10.9% of the working population (ABS, 2012). Retailing is similarly highly significant in the UK and employs approximately 3 million people, more than 10% of the workforce (BRC, 2012). In 2012 the retail sector contributed £151bn (16%) to the UK's economic output (ONS, 2014). Although retailing plays a key role in the developed economies of Australia and the UK, when it comes to the evolution of online retailing they are structurally very different industries. In terms of internet retailing, the UK has the greatest proportion of sales globally, with 11.5% of retail sales in November 2014 made online (ONS, 2014). By November 2014 in Australia, online sales for the preceding year were equivalent to 6.8% of the total spent in traditional retailers (NAB, 2014). Cushman & Wakefield rank the UK as the most developed online market globally, followed by the USA, Germany and France. Australia is ranked 14th (Cushman & Wakefield, 2013). This paper considers the evolution of internet retailing in the UK & Australia markets, considering the characteristics of the retail markets themselves, the central differences in the evolution of online shopping within them, strategic shifts in retailing patterns towards multi-channel interfaces, and the resulting consequences for the retail real estate market so far. It is a qualitative assessment of the 'internet effect' in prime Australian and UK markets, combining secondary data with interview responses from leading retailers.

Keywords: Australia, UK, international experience, online retailing, qualitative analysis

## Thinking - In and Outside - The Box: Asynchronous and Substitutable, Hyper-complexity and Predictability, Risk and Value, Sustainability and Permanence, Disruption and Destruction

**Stephen Roulac**, *Roulac Global, USA*

Most property practitioners are innocent of the prospects for and consequences of innovation, presuming that real estate involvements somehow are exempt from the forces of Creative Destruction and Disruptive Innovation. Notably, two of the most successful IPOs in recent times, AirBnb and Uber have profound real estate implications. The former now accounts for an inventory of lodging facilities larger than any hotel brand. The latter's assault on car ownership could realign spatial patterns, property values, and regional economic status.

How innovation threatens established interests and creates new opportunities, and thereby impacts the property markets, is the subject of this paper. The elements of the property process in the context of the supply chain and value chain are examined through the prism of change patterns over time, present vulnerabilities, future consequences and implications.

The many facets of the property box—its creation, function, placement, productivity, financing, experience, operations, management, profitability, value—are considered in the context of the six primary technologies: transportation, information, communications, knowledge/meaning, energy/power, money, that determine the demand for property goods and services and shape our places. This research builds on numerous prior studies by the author of these phenomena, extending over four decades, and integrates the implications of such powerful themes as the Internet of Things, Predictive Analytics, Big Data, Personalization and Customization, SaaS Business Models, Place Competition, Gamification, Amplification, and more.

Keywords: Innovation, development, technology, real estate economics

# **G-1**

## **Transactions Based Commercial Real Estate Indices: A Comparative Performance Analysis**

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**Karen Sieracki**, *KASPAR Associates Ltd, UK*

**Michael White**, *Nottingham Trent University, UK*

Property performance indices have become well established in the UK and other countries. This is important from an investment perspective as it enables comparisons to be made against other asset classes. In this paper we compare the performance of existing valuation based and transactions based indices with a new transactions based index. Specifically we evaluate whether the new transactions index can fulfil the role of a performance benchmark for commercial real estate investments. The paper analyses index construction methods identifying the most appropriate method for construction of the new transactions based index for UK commercial property. The new index is then constructed for a period of over 40 years from 1970 to 2013. We consider how well the new index reflects the underlying market and market movements and compare its performance with both valuation and transactions indices.

Keywords: Index, UK commercial property, transaction

## The Role of Liquidity in Forecasting Office Yields in Europe

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**Kyung-Min Kim**, *Seoul National University Graduate School of Environmental Studies*

*Dept of Urban & Regional Planning, Korea*

The impact of the global financial turmoil and the sovereign debt crisis on the volume of investment transactions has been well publicized. A prominent trend has been the volatility and shifting pattern in investment flows in European investment markets post 2008. This volatility in investment activity levels, which is hardly surprising given the Eurozone woes, has been reflected in pricing which also exhibited significant variation. Capital flows or investment turnover reflect investor sentiment and impact on risk premia. A key research question is to assess the incremental impact of fluctuating turnover volumes on office yields.

Existing global research to study yields builds on theoretical frameworks that incorporate economic factors, financial series and fundamentals in the real estate market. Further, this body of research explains yield movements utilising a host of other factors. These include market transparency, currency risks if not hedged, financial risks, lease structures and property rights – with the list of such factors being more extensive. However, the high volatility in real estate prices and yields in the last five years directs our research attention to investor confidence and sentiment as causes of rapid yield/price adjustments. This guides the setup of our empirical investigation which takes part into two stages.

In the first stage a model is built aiming to capture yield movements. This model needs however to be strongly responsive to allow for quick adjustments in yields, which was the case in the period 2007 to 2010. In the second stage the model is augmented to accommodate cross border capital flows. These models are estimated with data from major European office centres.

The contribution of the study is threefold. First, the study sheds further light into the determination of European office yields. Second, it identifies the factors which have more immediate effects on yields and are more appropriate to explain their short-term fluctuations. The third implication of the study is deemed the most important one. It quantifies risks for the current office yields in Europe that can arise from the economy and reversals in investment turnover.

Keywords: Office yields, capital flows, risk factors



# G-1

## **Bond Rate Trends and their Impact on the Relationship with Real Estate Yields**

**Tony McGough**, *BCA Research, UK*

**Jim Berry**, *University of Ulster, UK*

In the last year many financial markets have continued to show a downward trend in government bond rates. In some markets like Switzerland 10 year rates have been posting negative yields. The relationship between bond yields and commercial real estate pricing is a well-known one. The impact of changes in the so called 'risk free rate' on property yields, given their large income component, is understandable. So what is the implication for real estate yields if bond rates move negative on a wider scale? More importantly what is the implication of continued downward pressures generally within financial markets on the value of real estate? This paper examines the signals being sent from the bond markets concerning long term pricing of prime and secondary assets and considers what relationship remains with real estate as bonds move to ultra-low levels. Having broken down the signals it examines the statistical relationship, and considers whether there is evidence of statistical breaks as extreme points occur within the financial markets.

Keywords: Bond Yield analysis, commercial markets, real estate indicators, statistical breaks

## Rationality and Momentum in Real Estate Investment Forecasts

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**Dimitrios Papastamos**, *Eurobank Property Services S.A., Greece*

**Simon Stevenson**, *University of Reading, UK*

This study examines the rationality and momentum in rental and capital value forecasts of commercial real estate investment market in the United Kingdom. The adopted approach employs three dimensional panel data methods, by attributing the time series dimension to the sequential re-issues by a forecaster of a certain target forecast. The empirical method allows a multiplicity of assumptions regarding the covered by the data target time periods, forecast horizons, forecasters or groups of those to be examined with simultaneous use of the overall panel of data, without the need of segmenting the data set. The investigation includes macro-economic attribution factors to the temporary levels of forecast accuracy, such as Gross Domestic Product and the Default Spread. The empirical findings demonstrate that forecasters tend to maintain their biases over subsequent issues of the same target forecast, regardless of the lowering forecasting horizon. The results also indicate that forecasting accuracy is positively correlated with macro-economic conditions at the time of prediction.

Keywords: Bias, forecast errors, momentum, property forecasts

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**G-2****Cyclical and Structural Components to Yield Movements:  
The Case of Central London Offices****Keith Lown**, *Nottingham Trent University, UK***Michael White**, *Nottingham Trent University, UK*

The central London office markets have entered a period where, in every sub-sector, historically low prime yields have been registered. In more normally recorded market circumstances the phenomenon of mean reversion tendency would be expected to have a moderating impact on yield compression at this stage in the property cycle. However, in London other powerful influences could be neutering the expected reversion to mean principle. Essentially these are: The sheer weight of capital arriving in London from predominantly middle eastern and far eastern sources; the emergence of London as one of, if not the, pre-eminent global safe haven for international real estate investors, and a desire for wealth protection over investment return from large sections of the global investment community.

In these circumstances, could London be argued to have developed a large degree of immunity to a number of the traditionally accepted key influences on yield profile? (for example UK GDP growth or relatively modest movements in rental levels). In addition, have some influences risen in their importance and others waned? This research seeks to identify the key impacts on yield profile that have traditionally been recognised; determining if there are any new key impacts; and quantifying the likely degree of influence on net initial yield composition that these component forces have.

Keywords: Cycles, mean reversion, offices, yields

## Hedonical Office Rents Index with Spatial Econometrics

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We explore the evolution of the office market rents in Madrid by means of a spatial hedonical modelling. We estimate rental levels in a semi-annual basis by fitting a model with a set of hedonical exogenous variables as well as with the impacts of "neighbour" transactions. Our dataset comprises a new-letting contract list since 2003 to 2014 with a semi-annual structure including both a wide range of characteristics intrinsic to each leased property and the geocoding (UTM coordinates) of each transaction. This allows us to both uncover impacts on real rents of several hedonical property characteristics and outline a controlled dynamic path for real rents. The focal elements determining rents in the Madrid office market are localization with respect to the Central Business District (the farther from the CBD the lesser the rent), the age of the construction, the technical quality of the building and the international openness of the tenant, which is a proxy for its commitment with the landlord via a strong lease contract. We also prove the existence of relationships of influence of neighbour office rents on new-contract rent levels. In terms of the dynamics of the rents themselves, when estimating the rent of an archetypical office, our methodology effectively captures the downward span between 2003 and 2004 as a result of the "dot-com" bubble bust, the pick-up period of the recent Spanish economy boom (2005-2008) and the bust period of 2008-2014. Compared to the simple average and the deal-size weighted average, our methodology uncovers a lower average rent in the bust period. This may be explained by the limitation of average methodology to capture spatial feedback in prices as well as sample composition skewness that our methodology actually does not have.

Keywords: Commercial property, hedonic modelling, office market, rent Index, spatial econometrics

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# G-2

## The Office Market in Vienna: An Analysis of Trends and Cycles

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**Alexander Bosak**, *Bosak Real Estate Consulting GmbH, Austria*

In the economic situation the existence of real estate cycles is evident. Especially the office market is influenced by several micro- and macroeconomic factors. In contrast to the housing market rents the office market rents do not rise significantly in Vienna. They remain constant or even declined over the years.

In the first part of the paper a brief overview to the theory of real estate cycles and the theoretical approach of analysing real estate cycles is given.

In the second part of this paper a structural time-series methodology is used to predict the prime rent and real estate cycles in the Viennese office market. As a result two types of predicting long-time movement models are given. A correlation of delayed vacancy rates time series shows a cycle length of the Vienna office market of nine years. The model is based on data from CBRE Austria supplemented by own research. The investigation on real estate cycles in the Viennese office market has shown that a simplified model based on the vacancy rate and the growth rate of real gross domestic product (GDP) will also create valid results. From these calculations it can be determined that the change in the vacancy rate progresses the change in real prime rent by three years.

In the third part recommendations for the management of real estate companies are given, which are based on the theoretical backgrounds and the empirical analysis. How investors or asset managers operate in office markets is highly depending on the occurring office market cycles for example in order to determine the optimal time of lease renewal.

Keywords: Market analysis, office market, real estate cycles, time series analysis, Vienna

## Sentiment-Based Predictions of Housing Market Turning Points with Google Trends

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**Purpose** – Recent research has found significant relationships between internet search volume and real estate markets. This article examines whether Google search volume data can serve as a leading sentiment indicator and is able to predict turning points in the US housing market. One of the main objectives is to find a model which can be used to produce real-time forecasts in practice. **Methodology** – Starting from eight individual real-estate-related Google search volume indices, a multivariate probit model is derived by following a selection algorithm. The best model is then tested for its in- and out-of-sample forecasting ability. **Findings** – The results show that the model predicts the direction of monthly price changes correctly with over 89 per cent in-sample and just above 88 per cent in 1 to 4-month out-of-sample forecasts. The out-of-sample tests show that although the Google model is not always accurate in terms of timing, the signals are always correct when it comes to foreseeing an upcoming turning point. Thus, as signals are generated up to six months early, it functions as a satisfactory and timely indicator of future house price changes. **Practical Implications** – The results suggest that Google data can serve as an early market indicator and that the application of this data set in binary forecasting models can produce useful predictions of upward and downward movements of US house prices, as measured by the Case-Shiller 20-City House Price Index. This implies that real estate forecasters, economists and policy makers should consider incorporating this free and very current data set into their market forecasts or when performing plausibility checks for future investment decisions. Moreover, the results could potentially be of value for traders investing in Case-Shiller House Price futures and options. **Originality** – This is the first paper to apply Google search query data as a sentiment indicator in binary forecasting models to predict turning points in the housing market.

**Keywords:** Forecasting, google data, housing market, sentiment, turning points

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**G-3**

## How to Identify Housing Bubbles? A Decision Support Model

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**Purpose** – The purpose of this paper is to provide a decision support model for the early diagnosis of housing bubbles in the UK during the maturity process of the phenomenon. **Design/methodology/approach** – The study adopts a positivist approach utilising several parametric statistical tools to support the usefulness of normal distribution theorem to bubble detection. The strategy of this study involves case study analysis by relying on the UK housing bubble periods of 1986-1989 and 2001/2-2007. The research process for the model development is divided into four stages. The first stage includes the identification and verification of the selected variables. The second focuses on the key constructs of the model. The third stage identifies the model's diagnostic rule and proposes the model. The fourth stage includes the tests of the model through the implementation of the case studies.

**Findings** – The findings of the model reveal that the period of 1986-1989 and the period of 2001-2006 were bubble periods for the UK housing market at a 95% confidence interval. At 90% confidence the model reveal that the UK housing market was in a bubble for the periods between 1986-1989 and 2001-2007. The study further finds that for uncovering housing bubbles in the UK house price changes have the same weight with the debt-burden ratio when their velocity is positive. The application of this model has led us to conclude that the model's outputs are fluctuated in line with the phases of the UK real estate cycle.

**Originality/value** – This paper is amongst the few studies that propose a model for identifying housing bubbles in the UK and the first to be based purely on the acceleration rate of the model input. This is also the first study that attempts to hierarchize each variable on the basis of which variables accounts better the presence of housing bubbles. This paper will help researchers and professionals (i.e. appraisers) to better understand the 'risk' associated with the presence of bubbles in the UK housing market.

**Keywords:** Housing affordability, housing bubbles, normal distribution, UK case study

## User Costs of Housing, House Price Developments and Real Estate Bubbles: Evidence from Germany

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Real estate prices increased markedly in Germany, in particular in metropolitan areas. These increases lead to the conjecture/presumption that speculative bubbles are developing, similar to those in Spain or Ireland in 2007 and 2008. Based on a user cost of housing approach it is shown, that for most German districts the recent price changes can be ascribed to fundamental factors and are not driven by speculative behavior. The increasing prices can rather be interpreted as a catch-up process, especially because real estate prices did not rise the decade before. Modelling different price and interest rate scenarios support this explanation. Even a sudden and pronounced surge in interest rates would give scope for a sharp price correction, which is typical for a bursting bubble. Thus, the probability of an imminent real estate bubble is rather low. The low interest rate could rather change housing consumption in general and lead to fundamental structural changes in the German real estate market as homeownership becomes more attractive in comparison to renting.

Keywords: Germany, real estate bubbles, user costs of housing



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**G-3**

## Short-term Cycles in the Residential Market of Moscow and St.Petersburg

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To date, the theory of housing market cycles is not well developed. Clearly, even in general case the development of the models for cycle analysis involves numerous interrelated and unresolved theoretical problems. As for Russia, we face a lot of additional problems – lack of reliable data, existence of calculus in two types of currency for real estate market, high influence of government decisions and regulations on supply and demand. Anyway, residential property cycles exist in Russia cities and could be detected and investigated by various methods.

For large cities of Russia (Moscow and St.Petersburg) extensive data for housing market have been accumulated and processed. In this paper, we explore the following data: asking prices for apartments since 2000 year, sales volumes, number of apartments on display at the market, share of mortgage in sales, information about starts of new construction, etc. Using a panel of 15 year, we examine the formation of housing market cycles, behavior in inflection point, their amplitude and period.

The paper contributes to our understanding of housing market cycles in Moscow and St.Petersburg in two ways. First, we found high influence of real macroeconomic variables on market. The analysis suggests that results from the housing market should be evaluated in the context of the overall economy's performance. Second, we discover the existence of short-term cycles in price dynamic, inherent to own real estate market. The period of cycles is about 27 months in 2000-2009 and up to 40 months in 2009-2014. Presumably, unusual turnaround took place in the residential market during 2008-2009 years crisis. It would be noted the nature of the impact of fundamentals on residential market changed in 2008/2009 too.

Will be considered separately hypothesis about the formation of the 18-year cycle, where shot-term cycles are the part of general 18-year process.

Keywords: Market modelling, real estate cycles, time series

## Current Vacancy among Primary Schools in The Netherlands

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The number of children in the Netherlands is declining and will continue doing so for the coming decade. Consequently, primary schools face vacant floor space. Media reports state an alarming situation, without mentioning exact numbers on the current scale of the problem. Nevertheless, it is very relevant since vacancy costs public funds. This research concentrates on hidden vacancy, which is defined as the situation in which a school uses the entire school building, while not needing all available floor space based on government regulations.

The DAS-framework is used as a conceptual model to approach the problem. Vacancy is a result of a mismatch between demand and supply. To calculate vacancy, demand and supply must be known. Demand can be calculated, based on amounts of students per school. However, the total supply is unknown, since this information is decentralized. Until now only estimates of the current supply are available, which vary between 10 M and 15,8 M m<sup>2</sup>. This makes it impossible to estimate the current vacancy. To solve this knowledge gap, an extract from a Cadastral database (BAG), holding information on Gross Floor Area and building year, was matched with the addresses of schools as registered in a database of the Office of Education. However, the raw version of this database held serious limitations. Often information was clearly incorrect and a substantial number of schools was missing. Therefore 100 municipalities were requested for additional data. As a result the database is enriched with detailed object information of 18% of the Dutch municipalities.

It was found that the current supply of primary schools is 9,6 M m<sup>2</sup>. This leads to a national vacancy level of 7,9%. However, taking into account a friction vacancy of circa 4% and the rent of floor space to third parties nuances this percentage. Thus it is concluded that vacancy among primary schools is not as alarming on a national scale as reported. However, it is also concluded that the demand will decline in the coming years. The cost of this vacancy, corrected for a friction vacancy of 4%, is between 6,7 and 17,5 M euro annually. If the supply is not adapted to this changing demand, increase of vacancy is expected. For academics, the findings of this paper nuance existing literature, give insight in the current supply of primary schools and the scale of the current vacancy. Last it provides valuable insights for future scientific use of Cadastral data and its limitations.

Keywords: BAG, cadastre, current supply primary school buildings, public real estate management, vacancy

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# G-4

## Testing for Bubbles in Turkish Housing Markets: A Comparison of Alternative Methods

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Real estate economy has showed unusual performance in last decade in Turkey. Growing house supply/sales, credit volume, and rising house prices have mostly marked as boom. The perception of housing boom has also raised concerns among local/international investors, consumers, and policy-makers. The objective of the paper is to present the findings of the first comprehensive bubble analysis of Turkish housing markets utilizing/comparing several alternative methods. In order to address research questions, the study established two research objectives, 1) To identify characteristic variables of a housing bubble analysis in the context of Turkish housing market, and 2) To empirically measure whether rising house prices have been justified by fundamental factors. The outcomes of the study provides critical knowledges to domestic/international stakeholders of Turkish housing (and real estate) market.

Keywords: Housing bubble, Turkey, house price, mortgage, residential market

## **Universal Web Based Data Processing Model for Rental Housing Profitability Calculation of Energetic Retrofitting**

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The current level of energy efficiency investments in the rental housing sector is in danger of missing EU policy targets to be reached by the year 2020. It's possible that the goals are not being met due to a wide variety of reasons. Of great importance are especially different economic and political conditions for energy saving investments among the European member states. Furthermore the respective legal regulation in many states might still lead to "split incentives' barriers" e.g. the landlord-tenant disincentive in the rental housing sector. Also a general lack of transparency and easy to process data is a core challenge for market participants. Therefore it is important to create a unique framework in order to assess the commercial viability of energy efficiency retrofitting in the rental housing stock. Besides calculation tools and models the assessment also has to take into account the inherent characteristics of the specific national rental markets, rental regulations, tax regimes etc. In order to ensure that such an approach is user friendly and widely used, a Web based solution will be needed. In our paper we will present a Web based concept to collect, normalize and process relevant data in order to ensure individualized results for the various investors types, legal environments etc. For that reason we will present a general network architecture using Web based technology. Here we put special emphasis on user friendly data processing as well as privacy & security. Due to the fact that the investment conditions for energetic retrofitting's are varying considerably in Europe and furthermore input data is not static we need a flexible automatic processing tool that compute the data accordingly. For that reason we will present efficient algorithms and a universal data model.

Keywords: Web-tool, energy efficiency, framework, privacy, security, usability

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**G-4****Two Centuries of Farmland Prices in England**

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**Simon Huston**, *Royal Agricultural University, UK*

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The dissemination of robust real estate data helps to improve market efficiency. Sound investment analysis requires long series to form a long-term view but, whilst this has been available for the commercial sector, the same has not been true for agricultural land. Comparable series on the long-term market position of the farmland in England are fragmented. The current paper navigates the methodological complexities involved in rectifying the land price information deficiency. The study employs chain-linking approach to construct a long-term farmland series for England. It then adjusts series for inflation to examine real land market returns. The constructed 200 year series of English farm land prices performance tightens analysis and enhances decision making.

Keywords: Chain-linking, England, farmland, prices, returns

## Market Research on Business Centre Concepts in The Netherlands

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New ideas about working and the work environment have caused the business centre market to become more differentiated. Several new business centre concepts focus on other aspects than merely offering office space, such as a variety of services and facilities, support for enterprises to survive or grow, and help in creating working communities. However, the business centre market is still difficult to define, because it consists of several distinct types of properties and is formed by many different players. Some of the existing literature has attempted to classify the business centre market into several categories, but this has not yet resulted in a clear taxonomy of different business centre concepts and their characteristics. This study aims at developing such a taxonomy, based on data collected among business centres in the Netherlands. The data are collected by means of semi-structured interviews with real estate professionals. The findings of this study give a clear overview of existing business centre concepts, their characteristics and their (dis)similarities. These findings will help real estate owners and developers to make well-informed decisions about the type of business centres that they want to develop or invest in. In addition, the taxonomy arising from this study can also guide organizations in selecting the business centre that best fits their needs. The key contribution of this study is that it provides a taxonomy of the business centre landscape.

Keywords: Business centres, concept development, market research, taxonomy

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**G-5****Development Viability Indicators for UK Regions –  
Construction and Evaluation of New Time-series Estimates****Neil Crosby**, *University of Reading, UK***Steven Devaney**, *University of Reading, UK***Peter Wyatt**, *University of Reading UK*

Understanding development viability is an important issue for property market participants and urban policy makers. In the UK, an extensive debate has arisen surrounding how much developers should contribute towards local infrastructure and the role that viability should play in setting such amounts. This debate is hampered by a lack of good quality empirical data on either land values or development viability in different areas. We attempt to address this problem by applying a residual method for calculating site value in different areas using data on values and construction costs stretching from the mid-1980s through to 2010. Each estimate represents the price that would be paid to commence development of a particular commercial property type at that time. Sometimes, the figures are negative, indicating that development is not viable at that point. Hence, they do not necessarily equal land value, as land values can reflect the option to develop a site more profitably in the future. Nonetheless, they capture the viability of development at different times and so are capable of informing policy makers in regard to stimulating or taxing private sector development activity. The estimates are undertaken for major towns and cities and then averaged across the locations within each region. The resulting regional measure is then compared to data on economic activity and construction output in order to evaluate the robustness of the figures and understand the relationship between potential viability and subsequent development activity in different areas.

Keywords: Construction activity, development viability, land values, residual method

## **Monitoring Commercial Property Prices during the Crisis: Evidence from Greece**

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The recent economic swing caused by the financial crisis has had a severe impact on commercial property prices in Greece. The already hard to monitor commercial property market has become extremely illiquid and its investment indicators have been distorted by low business activity, limited demand, very few transactions and immediate need for liquidation by distressed owners. The objective of this paper is to establish the most important determinants of commercial property rental and open market values in Greece, within the crisis. Furthermore the particularities and distortions of the market are highlighted along with the difficulty in monitoring its trends. The paper concludes with a brief presentation of the recent effort of Bank of Greece to produce commercial property price indices and its first results.

Keywords: Commercial property price indices, distressed market, investment indicators, price determinants within a crisis



# G-5

## European Real Estate Society Research Agenda: Looking Back and Projecting Forward

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Now in its 20th anniversary year the European Real Estate Society (ERES) has actively promoted quality-led research by creating a structured and permanent network involving real estate academics and professionals across Europe. The organisational structure within ERES supports the Society's mission which is dedicated to facilitating and advancing the discipline of real estate by raising the quality, status and reach of real estate research and education. The Society aims to fulfil its mission by providing different forums for constructive engagement by academics, private sector stakeholders and public sector organisations within the real estate discipline.

Adopting a truly European perspective to the rapid internationalisation of real estate markets has increased in importance over the past two decades of the Society's history. Engagement in and co-operation with other national research communities as well as our international sister societies links ERES to an extensive network within the wider international real estate research community. In accordance with the vision of the founding members of the Society, ERES remains committed to creating added value for our membership, stakeholders and sponsors. With a current membership of 700 members (2014), ERES is dedicated to engaging with and continuing to support the development, application and out-reach of high quality research across Europe.

This paper will consider the 20 year historical perspective in the development of the research profile of the European Real Estate Society including change and progression over time in the themes, topics and quality of real estate research. Specifically the paper will consider the new emerging research focus and how the objectives of the Society have helped facilitate its members in the production of quality research. The paper will also project forward to determine the potential in promoting a forum for the discussion and dissemination of real estate research.

Keywords: ERES, historical, perspective, themes, topics

## Identifying Lag Relationships in the Office Market with a Turning Point Method during the Global Financial Crisis

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Lead-lag relationships among office market indicators are essential to discover for both theoretical and practical reasons. This paper identifies an approximately one year lag between office market yield and new supply; a somewhat shorter distance of rents and yields is revealed. According to the concluded calculations, vacancy and take-up respond swifter to external shocks. We use the crisis as an identifier, and detect reactions of turning points of the time series in a worldwide database provided by DTZ.

Keywords: Forecasting, global database, global financial crisis, lead-lag relationship, office market

## **G-6**

### **A Simulation Model to Minimise the Tracking Error between the IPD Annual Index Estimate and the IPD Annual Index**

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**Malcolm Frodsham**, *Real Estate Strategies Global Limited, UK*

IPD Futures Contracts are traded on the IPD UK Annual Total Return Index. Contracts traded during the year are priced using the standard Capital Asset Pricing Model (CAPM) and incorporate pricing on the basis of the capital and income performance for the year-to-date, plus the uncertainty as to the performance of property for the remainder of the year. The IPD Monthly Index provides an estimate of the current year-to-date performance. This paper outlines a simulation technique for Property Portfolio Fund Managers, Risk Managers and Multi Asset Managers to progressively (on a month by month basis) factor into their estimate the tracking error between the IPD Monthly and IPD Annual Index.

Keywords: Derivatives, forecasting

## Economic Convergence in the EU and its Impact on Property Markets

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Since the Euro-crisis the cohesion and economic convergence within the EU are questioned from what we derived our exploratory question: "Is there a convergence between the members-states (EU-15) or not?" This will be evaluated within the framework of an empirical analysis. In the first part of our paper we are examining convergence terms and definitions (absolute-,  $\beta$ - and  $\sigma$ - convergence) and their demarcations. Households, companies and nation-states are considered. In the following Gossen's Law, the Solow model and the principle of subsidiarity are outlined and explained. On this foundation a comparison of the convergence and divergence theories in reality will be drawn.

Keywords: Crisis, economic convergence

# **G-6**

## **Transaction Frequency and Property Price**

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The frequency distribution of commercial real estate transactions by length of holding period is not uniform. The distribution in transaction activity implies that frequently and infrequently traded properties are associated with possible clientele effects often associated with difficult to observe property and ownership characteristics. However, repeat sales index as a metrics assume that frequently and infrequently sold properties are similar in capital expenditures, maintenance and other characteristics. Therefore, returns using repeat sales likely overstate appreciation by misattributing this investment. In this paper, we investigate whether the frequency and sales sequence matter in determining price appreciation. We investigate whether the first sale of a repeat sale pair occurs at discount to properties classified as single sale properties and the second sale transactions of repeat sale pairs to sell for a premium to single sale properties. The study will focus on London office market from 1991 to 2014.

Keywords: London office market, property price, transaction frequency

## Housing Co-operatives and Digital Democracy – Basic Aspects and Empirical Evidence

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Web 2.0 and social media revolutionized our communication and caused extensive social change. In wake of this digital revolution the inherent notion of democracy has changed. Increased demand for transparency, the readiness to engage in dialogue and the opportunity to participate have shown that social media increasingly impacts our democratic structures and decisions. Also housing co-operatives were affected by these developments due to their democratic structures and traditionally strong member relations. In this context social media offers a multitude of opportunities for digital participation. This paper shows the basic aspects of participation in digital democracy. It describes how housing co-operatives can use these tools and mechanisms. However, this paper also illustrates the risks that are connected to the use of digital participation. Besides the theoretical aspects, also the results of an empirical survey is presented. The survey determines the status quo of digital democracy within the housing co-operative sector in Baden-Württemberg, Germany. In addition the attitude of co-op managers regarding the risk and benefits of digital participation was surveyed. The results show clearly that, so far only a few housing co-operatives offer their members opportunities for digital participation. Furthermore, the majority of the co-op managers express a skeptical view towards this new form of media. However, at the same time co-op managers emphasize, that in future the significance of social media and digital participation will probably rise considerably.

Keywords: Housing co-operatives, social media

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# H-8

## Personality and Sales Performance

**Yuen Leng Chow**, *National University of Singapore, Singapore*

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Research in psychology and behavioral studies have shown that integrity validation by way of meta-analysis is important in predicting job performance and counterproductive job behaviors (Deniz, Chockalingam and Schmidt, 1993). Dependability testing for personnel selection is also routinely carried out by financial institutions and government agencies (Sackett, Burris and Callahan, 1989). The application of personality profiling for real estate salespeople is largely absent in the literature save for isolated work (see Brinkmann, 2009). Thus, the objective of this study is to carry out a personality profiling exercise for real estate salespeople in Singapore and coupled with their corresponding observable characteristics such as age, gender, qualifications, etc., to identify both an empirical and personality profile of successful real estate salespeople in Singapore. Using these results, we can further compare this profile with their Western counterparts to check if there are cross-cultural differences.

The first phase of our study was carried out in December 2013. 185 respondents from one brokerage agency firm took our 16 PF test. Out of these respondents, 25% (47 pax) were identified to be in the Top 300 ranking in terms of sales performance. We are currently preparing to implement the second phase of our study for respondents from two other agency firms.

In terms of methodology, we adopted the Sixteen Personality Factor Questionnaire (16PF) developed by Raymond Cattell. The idea is that we could better understand and predict human behavior using 16 narrow personality descriptors (such as warmth, reasoning, emotional stability, etc.) and 5 broader primary personality descriptors (such as extraversion, anxiety, independence, etc.). We were able to match the subject's personality indicators with observable characteristics (age, gender, education level, number of years with company and whether the salesperson joined from a different agency). We ran a probit model using a dummy indicator of one to identify the top salespeople (Top 300 ranking) as the dependent variable and the list of 16 narrow personality descriptors and observable characteristics as the explanatory variables.

Our initial results indicate that in terms of observable characteristics, top salespeople tend to be younger, more educated, and have stayed with the company for a longer period of time. The last finding hints at a possible survivorship bias; that is, only performing sales

Keywords: Cross cultural, personality indicators, successful salespeople

## Internet Search and Hotel Revenues

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We examine if online information search trends reflect public interest in purchasing hotel rooms. We introduce the trends into univariate forecasting models and conventional structural models of room night stays and occupancy rates. We find that on a monthly frequency, search trends are significantly reflective of future room night stays and occupancy rates after controlling for known determinants of these variables. Inclusion the trends significantly improve the weekly forecasts of the performance fundamentals.

Keywords: Google searches, forecasting, hotel, rents



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# H-8

## The User Satisfaction and Usability of the Austrian Land Register Real Estate App “LexioMobil”

**Peter Sittler**, *Real Estate Institute for Real Estate Management FHWien University of Applied Sciences of WKW, Austria*

This research paper focuses on the practical use of real estate applications (RE-Apps) concerning the Austrian land register. Apps are small programmes on smartphones or tablets which are classified by their usage. One category is land register. After the app “iEigentum/xEigentum” by the company Beinhofer other regional clearing companies failed getting into the mobile market. With the app “LexioMobil” by the company Medix a new land register application was released in June 2014. The paper gives methodical comparison of land register applications available in Austria based on the results of a quantitative survey to determine user satisfaction and usability of real and effective users of this application. The aim of the paper is to identify the relevant factors influencing the user needs and to realize ways of using mobile land register apps to improve the customer information and usability. The field of applications for real estate is not well explored, especially quantitative explorations are not existing for the Austrian market. This paper covers a structural and technological overview and a market potential analysis of apps for the use of land register databases with a conclusion of expected future developments in this field.

Keywords: Land register, new technology, real estate app, real estate marketing

## House Price and Rent Developments in Istanbul: 1988-2012

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The analysis regarding the housing prices could be made in the light of long-term data. However, because the indexes that have been produced recently in Turkey are limited to a short term, such long-term analysis could not be made. Building backward housing price indexes by analyzing the factors that affect the development of housing prices will bring about the analysis of not only the dynamics of the domestic housing market within the country but also a comparison of housing markets between our country and other countries of the world.

The main purpose of this study is to close the gap of the index needed to evaluate the movement of housing prices in the city of Istanbul. For this purpose, the data about the sale and rent prices of houses within a selection of districts of Istanbul between 1988 and 2012, a time span of 25 years was gathered to construct the sale and rent index of houses. Proceeding from this index, the development of sale and rent prices has been examined; the long-term trends and the short-term fluctuations of housing prices have been determined and the interaction between the change in housing prices and other economic variables has been researched. In this study, it has been found out that the sale and rent prices are compatible with the city model in the sense that it is closed in the short term and open in the long term; that the housing supply in Istanbul has been elastic; that transportation solutions which do not lead to space friction could be produced; that housing prices move parallel to stock exchange and bond prices; and that there has been no house price bubble.

Keywords: Asset price, house price indices, housing bubble, housing supply, price to rent ratio

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**HD4****The Price-Turnover Relationship in European Housing Markets**

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This paper examines what determines the relation between prices and turnover in European housing markets. We estimate this relationship using a panel vector error correction model. We focus on the role of path dependency, direct feedback, mortgage market indicators, and several other macro-economic indicators. We find that there is particularly strong direct feedback between prices and turnover. Also the mortgage market indicators, such as the outstanding mortgage loans to GDP, play an important role. Prices, turnover, the outstanding mortgage balance to GDP, and the level of GDP are cointegrated. Those markets with the strongest feedback mechanism between prices and turnover are also those markets which are the most volatile.

Keywords: Cointegration, credit constraints, nominal loss aversion, price-turnover relationship

## Residential Property Price Indices for Austria

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In this paper a new residential property price index (RPPI) for Austria a so called "spatial imputation index" is presented. The basic principle of this index is to evaluate hedonic price models over all census tracts in Austria for representative bundles of characteristics and to compare the results over time. By this it is possible to aggregate on arbitrary spatial scales above census tract levels, taking into account various perspectives on the housing market by applying different weighting schemes for aggregation. Methodologically, we use Generalized Additive Models (GAM), which account for possibly nonlinear functional relationships using regression splines and for unexplained spatial heterogeneity (beyond what can be explained by location covariates) using random effects. The paper gives an overview over the methods and variables used for the hedonic models and provides examples for the regional index on census tract levels all over Austria. The results of the aggregated index are further used by the Austrian central bank.

Keywords: Generalized additive model, hedonic index, nonlinear regression, random effects, spatial imputation

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# HD4

## House Price Determinants in Sydney

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House prices in Sydney have increased substantially over the last ten years. The median price of established houses was \$473,630 in 2003 and reached up to \$811,837 in June 2014, an increase by around 70 per cent. Many families are forced into the rental market as they cannot afford to own a home at such high prices. According to Demographia (2014), the Median Multiple (median house price divided by gross annual median household income) for Sydney is nine times, compared to 6.2 times in New York and 7.3 times in London. This research studies the main determinants of house price increased in Sydney using the quarterly data collected from Australian Bureau of Statistics and Reserve Bank of Australia. By applying the multiple regression analysis, it is found that the fundamental elements such as population growth, interest rate and the number of house supply were the main factors that contributed to price increased for the last ten years in Sydney.

Keywords: House prices, Interest rate, population, Sydney, house supply

## Foundations and Real Estates of Yorguc Pasha Family through The Ottoman Endowment System

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Amasya, an important Ottoman city in the 15th century, was governed by the tutor of Sultan Murad II, Yörgüç Pasha (d. 1442) and later successively by Hızır Pasha (d. 1466) brother of Yörgüç Pasha and Mehmed Pasha (d. 1494) son of Hızır Pasha. Yörgüç Pasha's family, who governed the city, contributed to the reconstruction of Amasya region with their architectural patronage. Yörgüç Pasha commissioned a complex consisting of a zawiya (a multi functional building for worship and accommodation), a madrasa and an imaret (soup-kitchen) in Amasya, several mosques in the towns near Amasya such as Havza, Vezirköprü, Kavak and Gümüş, mektebs (elementary schools) in Tokat and Vezirköprü and a tekke (dervish lodge) in the village of İshakalanı; Şahbula Hatun, Yörgüç Pasha's wife, commissioned a masjid, a fountain and a mekteb in Amasya; Mustafa Bey (d. 1444), son of Yörgüç Pasha, commissioned a zawiya-imaret in Havza; Hızır Pasha commissioned a complex consisting of a zawiya, madrasa and imaret in Amasya, a mosque and a tekke in Samsun, a madrasa in Sonisa; Mehmed Pasha commissioned a complex consisting of a mosque, a tabhana (rooms for accommodation), a madrasa and an imaret.

The organizations, incomes and expenditures of these charity foundations, that had been served free of charge, were clearly specified by the waqfiyas (endowments) formed by the Yörgüç Pasha family members who had commissioned them. The sources of income of these foundations were the tax percents of several villages which the family had privilege on and the revenue-generating structures commissioned by the family and endowed to them. According to the waqfiyas, they commissioned four hans (caravanserais) one bedesten (covered bazaar), several shops, six mills and eleven hammams around Amasya to fund the foundations. Yörgüç Pasha commissioned a han, seventeen shops and a hammam in Amasya, a han and hammam in Tokat and hamams in Gümüş and İskilip; Mustafa Bey commissioned a hammam in Amasya, a hammam and a han in Havza; Hızır Pasha commissioned a hammam in Amasya, a mill in Ladik; Mehmed Pasha commissioned a hammam and a han in Samsun, a hammam and a mill in Tokat, two hammams in Niksar, four mills in Amasya and a bedesten in Tosya. This study aims to reveal the relations between the charity foundations and endowed properties of Yörgüç Pasha family based on the waqfiyas.

# HH7

## Byzantine Building Stock after the Conquest of Constantinople in 1453

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After the conquest of Constantinople by the Ottomans the population of the city was found grossly lowered. Many buildings were already deserted before the time of conquest. Mehmed II immediately started construction activities to build a new Turko-Islamic capital. During his reign there was no ideological systematic conversion of churches into mosques, the Byzantine building stock was used for the new functions necessary to be fulfilled urgently. A new group of elites was formed among soldiers who got richer by spoils of war and some buildings were assigned to them to form the new neighborhoods. Needing people for constructions Mehmed II took some extra ordinary measures to raise the population including allowing the escaped locals of Constantinople to reoccupy the buildings they left without paying taxes. He also called for Ottoman elites from former capitals; Bursa and Edirne offering them privileges such as occupying any empty palace in Constantinople without payments. This paper deals with the function change and ownership of Byzantine building stock after the Ottoman conquest.

Keywords, Byzantine building stock, Ottoman usage, adaptive reuse

## Property Issues of Istanbul Seawalls

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Istanbul Seawalls, prolonged along the northern and the southern shores of historic peninsula, have been witnesses to all periods of historic Istanbul since its establishment as a Greek colony at the tip of the peninsula. They were influenced by the historical developments of the city as the other parts of Istanbul City-Walls. During the Middle Ages, the defense system had repairs and renovations. Their maintenance was not carried on regularly in the Ottoman era; yet the walls survived the vicissitudes of time with their firm structures. Starting from the sixteenth century, the martial importance of the city-walls decreased gradually with the result of proliferation of firearms, and from the nineteenth century, they lost their significance militarily. Then settlements developed in the immediate vicinity of the walls, and some parts went into private ownership. Moreover modernization of the city accelerated damages and losses on the walls. Today only parts of Istanbul Seawalls are intact. Within this study, the history and the current state of Istanbul Seawalls have been searched in terms of their ownership status, and their property issues have been analyzed.

Keywords: Istanbul Seawalls, history, ownership change



## Seventeenth Century Residential Real Estate Prices in Istanbul

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This study is based on research about residential real estate prices of Istanbul in seventeenth century. City of Istanbul which located both Asia and Europe has history of approximately 9000 years. The earliest known settlement of Istanbul dates from 6700 BC at the historic peninsula on European Side. City centre of Istanbul in seventeenth century is also located in this area which is today known as Fatih and Eminonu districts and they are part of World's Cultural Heritage. In seventeenth century, Istanbul had been part of Ottoman Empire since 1453. For centuries it was the capitol of economics, social life and administration of the Empire and then Republic of Turkey, although the last moved to Ankara after republic is established, yet importance of the city did remain.

This study aims to determine how residential real estate market evolved in the long-run with historical perspective. It has discovered that not many studies are existed in the literature about real estates of Istanbul with historical perspective. Additionally this study is also expected to contribute to create a background/basic for further studies in similar subjects such as commercial real estates and different timelines. In order to achieve that a database of sales prices of residential real estates in Istanbul spanning the years from 1600-1699 are going to be put together. Sale registrations of Ottoman Central Istanbul Islamic Courts of seventeenth century provides a large scale of data about relevant subject. Using this database, decade-interval chances in real estate prices are planned to estimate. Moreover, reviewing effects of historical milestones to the house prices during specified period is a goal.

As conclusion; in addition to appraising the residential real estate values of seventeenth century in Istanbul, city of average 700.000 population, through central districts, the city's financial history is going to be explored, especially in terms of city's residential facilities.

Keywords: 17<sup>th</sup> century, grand bazaar, Istanbul, residential real estate, valuation

## Office Market Response to Earthquake-Prone Building Policy in New Zealand

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The Canterbury earthquakes caused significant disruption and destruction of commercial premises. The effects of the earthquakes have spread across New Zealand and seismic risk has become a significant issue for property owners and tenants. The seismic strength of a building is now a major consideration for tenants when making commitments to a long term lease. There are also examples where building owners are investing in strengthening their buildings despite the relevant legislation not yet having been passed by central government. The framework for this research is that tenants and landlords preferences towards existing buildings may change with regard to growing awareness of seismic strength and this change in behaviour will be evident in the increased rental prices in buildings with higher building standards. This research provides an empirical investigation of the rental price differentials between seismically safe and earthquake-prone buildings before and after the Canterbury earthquakes.

Keywords: New Zealand, earthquake, office market, price premium, rent

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**I-7**

## Efficiency Measurement of Swiss Shopping Centers Using Data Envelopment Analysis (DEA)

**Alexandra Bay**, *Center for Urban & Real Estate Management (CUREM), University of Zürich, Switzerland*

DEA as an Operations Research based linear programming approach for evaluating the relative performance of homogenous Decision Making Units (DMUs) is applied to Swiss shopping centers. Output-to-input efficiency ratios – as for example the sales productivity – incorporate one output (sales) and one input (sales area). Peer group comparisons (efficiency rankings) are difficult if multiple inputs and / or multiple outputs of different kind of data (quantitative, qualitative, categorical etc.) or measuring units (CHF, m<sup>2</sup>, %) are to be considered.

That is where DEA shows its advantages: DEA simultaneously handles multiple input factors (e.g. sales area, parking lots, OCR) and multiple output factors (e.g. sales, sales productivity, customer satisfaction) in a single efficiency measure – without prior fixing the factor weights. Furthermore, DEA helps in evaluating the DMUs (reference DMUs or benchmarks) that inefficient DMUs could refer to in order to improve efficiency (input reduction and / or output increase).

The literature review focuses on real estate DEA applications and emphasises property types whose efficient operation is crucial for valuation – as for retail properties or for properties run by operating companies (hospitals, hotels, shopping centers etc.).

The empirical analysis implements the Charnes-Cooper-Rhodes-Model (CCR model), the Banker-Charnes-Cooper-Model (BCC model) and the Additive model, and combines different shopping center performance drivers. Sales area and sales are strong performance drivers. Ratios as factors show new insights, and a DEA model including ratios could be an alternative to the widely used sales productivity. By differentiating the factors between food and retail sales and food and retail sales area, respectively, the efficiency of the shopping center sector mix is assessed.

Practical implications using DEA as a benchmarking or rating tool – for example in a Management Information System (MIS) – are given.

Keywords: Data envelopment analysis, efficiency, performance evaluation, operations research, shopping centers, Switzerland

## Ex-ante Real Estate Value at Risk Calculation Method

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The computation of Value at Risk (\$VaR\$) has long been a problematic issue in commercial real estate. Difficulties mainly arise from the lack of appropriate data, lack of transactions, the non-normality of returns, and the inapplicability of many of the traditional methodologies. In addition, real estate investment is difficult to diversify and specific risk remains latent in investors' portfolio. It follows that risk of the entire market does not correspond to risk an investor bears. Therefore the risk measurements based on index do not represent the specific portfolio risk. As a result, calculation of this risk measure has rarely been done in the Real Estate field. However, following a spate of new regulations such as Basel II, Basel III, NAIC and Solvency II, financial institutions have increasingly been required to estimate and control their exposure to market risk. Hence, financial institutions now commonly use "internal" \$VaR\$ (or Expected Shortfall) models in order to assess their market risk exposure. The purpose of this paper is to propose a model that incorporates real estate portfolio specificities in a real estate VaR model.

Keywords: Real estate finance, regulation, risk measurement, value at risk

## Regime Switching House Price Dependence: Evidence from MSAs in the US

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In this paper, we analyze and model the dependence of house prices of Metropolitan Statistical Areas (MSAs) in the US, taking into account the dynamics of dependence. We model the dynamics in the dependence, using a regime switching model with a two-state hidden Markov chain. We use a multivariate Gaussian copula and a Canonical Vine copula to model the dependence of house price changes of MSAs, and identify a high and low dependence regime, or a symmetric and asymmetric dependence regime in the housing market. Furthermore, we use interest rates and LTV as factors affecting the transition probabilities of the Markov chain to see if those variables affect the change of dependence between house prices. The main contribution of this paper is to model dependence of house price returns of MSAs which can vary across time in a flexible way using multivariate copulas and a regime switching model. Using various multivariate copulas, we implement the variation of dependence across time in terms of magnitude and shape into the model. First, we use a multivariate Gaussian model with an equicorrelation for all pairs of MSAs, and estimate two different equicorrelations which are for different two regimes with a regime switching model. Through this estimation, we find a high and a low dependence regime in the housing market among MSAs. Besides the magnitude of dependence, we model different shapes of dependence for different regimes across time using a Canonical vine copula and a multivariate Gaussian copula with a regime switching model. The former is employed for an asymmetric dependence or tail dependence regime, and the latter is used for a symmetric dependence regime. In this paper, we verify a symmetric and an asymmetric dependence regime for different time period. Besides, using macroeconomic variables such as the change rate of interest rate ( $\Delta r$ ) and the change rate of Loan to Value ( $\Delta LTV$ ), we see if these variables can explain different dependence regimes across time in a better way. We find, especially,  $\Delta LTV$  is consistently shown to be closely related to a high dependence regime. This partly shows the vicious cycle between credit supply and house prices.

Keywords: Credit risk, contagion, copula, dependence, regime switching

## Risks Assessment in Real Estate Investments: An AHP Approach

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**Purpose:** Aim of the paper is to provide an ex-ante valuation model to address risk and uncertainty in real estate investment decisions. We propose a model for risks assessment that helps to evaluate risks and opportunities of real estate assets taking into consideration different aspects of the project and related risks (market risk, valuation risk, market growth risk, operating risk, etc.). Our main objective is rather to provide research tools that reveal the riskiness of a property investment than to provide an interpretative model.

**Design/Methodology/Approach:** Rigorous risk assessment measures, based on mathematical algorithms, are here presented. Specifically, we propose an overall risk scoring model to classify real estate investments' riskiness and we propose a procedure for a synthetic risks assessment that, based on the AHP model, will help investors to manage risk exposure and opportunities in property investments.

**Findings:** We define the risk components and relative measures according to the literature and experts in real estate investments. We determine each risk component by implementing the mathematical algorithms provided. Then, according to a pool of experts and financial managers' judgments, we define the thresholds to classify each risk component as conservative, moderate, aggressive and finally we aggregate them into a synthetic overall risk index. Numerical examples on urban development projects are presented in order to test the effectiveness of the AHP model in supporting decisions and adapting strategies to a permanently changing environment.

**Research limitations/implications:** We provide mathematical algorithms, adaptable and interpretable, that can be generally applied in real estate investments. The proposed model can be easily understood by third parties and applied to different property types. Risk measures and relative thresholds may be dependent on the investment (e.g. new development, renewal, etc.) and the property type (e.g. office vs residential building, etc). As far as the scoring model is concerned, the weighting has been identified with reference to the Italian scenario, and similarly the classification of risks.

**Originality/values:** The risk assessment model here proposed may have interesting effects in terms of risk management strategies. Results are transparent and easy to be understood.

**Keywords:** AHP, real estate investments, risk assessment, uncertainty

# I-8

## Bootstrap Analysis for Asian REIT's Portfolios

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A new bootstrap technique is applied to analyze the performance of a set of Asian REITs and make selections based on the best performers. The cross-section of Asian REITs being non-normal, these techniques are quite useful. The risk-adjusted performance issued from traditional asset pricing models will be analyzed with bootstrapping tools that will also allow controlling for multiple testing problems usually encountered when analyzing the cross-section of returns. "published in the "Handbook of Asian Finance," edited by David Lee and Gregoriou, 2014."

Keywords: Asian REITs, false discovery rate, bootstrap selection, control in multiple testing, portfolio performance

## Real Estate Market Risk Modelling

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**Simon Stevenson**, *University of Reading, UK*

The global financial crisis towards the end of the last decade saw an increased interest in the role of risk management in the main stream financial investment market. Among other things, the measurement and management of market risk, credit risk and operational risk have become more pronounced than ever before. Value-at-risk (VaR), a tool which assesses the maximum possible loss of an investment, assuming a given confidence level, is widely used in the investment world to measure market and credit risk. This measure has however come under constant criticism as it only considers the maximum loss for a specific confidence level and ignores any losses beyond that threshold, which could arise from extreme events. Secondly, VaR assumes normal distribution of returns and yet this is not the case with most financial returns, which have the added complexity of being susceptible to the phenomenon of 'fat tails'. (It should be noted however, that it is only the basic version of VaR that has the normality issue and this can be addressed through the use of Monte Carlo.) Thus, the credibility of VaR seems to be losing ground. Though derived from the principles of VaR, the expected shortfall (ES) is being forwarded as an alternative proposition due to its ability to overcome some of the shortcoming of VaR, particularly when it comes to dealing with tail risk. To this effect, the ES is being mooted as a tool for market risk regulation, replacing VaR in the banking sector as proposed by the Basel Committee on Banking Supervision. This said, the ES has its own challenges especially because it cannot be subjected to back-testing due to its non-listable attribute. Furthermore ES is also said to be quite sensitive to extreme values. In the real estate market, very limited research has been conducted on modelling market risk. This study therefore aims to investigate market risk modelling for real estate and assess whether, and / or the extent to which, the expected shortfall model offers a better alternative to VaR in terms of measuring market risk. Public real estate has been chosen as the focus of the study as it is more amenable to the application of VaR compared to private real estate.

Keywords: Expected shortfall, market risk, real estate risk, risk measurement, value-at-risk



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**J-8****Systematic Risk Factors in European Infrastructure Stock Markets****Daniel Wurstbauer**, *IRE|BS, University of Regensburg, Germany***Stephan Lang**, *IRE|BS, University of Regensburg, Germany***Wolfgang Schaefer**, *IRE|BS, University of Regensburg, Germany***Christoph Rothballer**, *Boston Consulting Group, USA*

This paper is the first to investigate the systematic risk factors driving European infrastructure equity returns using traditional asset pricing models. As infrastructure companies are exposed to specific risks such as regulatory changes, a lack of product diversification and construction risks, the pricing should differ substantially from that of general equities. Further differences are expected, due to the monopolistic environment in which many infrastructure companies operate. The major issue researchers face when analyzing infrastructure stocks is the lack of infrastructure indices with a sufficiently high number of constituents and data history. Therefore, the data sample will be constructed by retrieving all dead and active European stocks and subsequently filtering them, based on the Standard Industrial Classification (SIC). Accordingly, only stocks in the sectors of telecommunication, transport and utilities are chosen. As the industry definitions include a large variety of economic activities in the infrastructure sectors, such as service or product suppliers, the sample needs to be screened in a second step for companies that focus mainly on "pure" infrastructure business. This screening will be conducted on the basis of the business descriptions retrieved from various data sources, such as Datastream and Google Finance and annual reports (asset test and revenue test). As indicated, the body of literature on asset pricing studies of infrastructure equities is very limited. This is surprising, since investor appetite for infrastructure investments has grown significantly over the past few years. Consequently, this paper contributes to our understanding of infrastructure equities. Portfolio managers and investors can draw on the findings, in order to manage their risk exposure more efficiently.

Keywords: Asset pricing, fama french, infrastructure investments, systematic risk

## Reasons for PPP in Poland - Taxonomic Analysis

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**Agnieszka Telega**, *Cracow University of Economics, Poland*

The aim of this paper is to determine the motives of PPP implementation in municipalities. It was assumed that implementation of this kind of projects is determined by the characteristics that can be aggregated into three areas: availability of infrastructure, the size of the financial resources at the disposal of municipalities, ability to finance investment project without exceeding the limits of liability. A quantitative study of this relations was conducted with the use of taxonomic analysis. The study failed to clearly resolve the problem of the impact of infrastructure gap onto PPP decisions. The results confirmed that municipalities have been experiencing negative phenomena of rising public debt. This threatens the investment process. Research shows that PPP is perceived by the communities as a remedy to the problems associated with obtaining finance for investment.

Keywords: Infrastructure gap, investments, public debt, public-private partnership (PPP)

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**J-8****Risk Allocation in Implementation of Urban Development Projects –Comparison of Finland, The Netherlands and The UK****Eero Valtonen**, *Aalto University, Finland***Heidi Falkenbach**, *Aalto University, Finland***Kauko Viitanen**, *Aalto University, Finland***Erwin Van der Krabben**, *Radboud University Nijmegen, The Netherlands*

Developing new neighbourhoods, both through greenfield and brownfield projects, is risky business. These kinds of large scale urban development projects can take several decades and contain high amount of both private and public investments. Uncertainty concerning the time table as well as the overall profitability of the projects is obvious. Development industry is usually also highly regulated, at least in the developed economies. Albeit the property rights allowing using, transacting and benefiting from a private property are usually secured by law, the change of a property's use is somehow regulated at the same time. The main argument supporting this regulation is handling the externalities caused by a particular use of a real estate, such as a polluting factory in the middle of a residential neighbourhood. The regulation concerning planning and development differs among countries, although the underlying argument is the same.

Our study aims to investigate the planning and development practices with the perspective of risk allocation in urban development projects in Finland, in the Netherlands and in the UK. These countries form an interesting group for comparison because of their differences concerning planning and development, i.e. the countries represent different planning systems according to urban planning literature.

The main emphasis in the study is put on the risk positions of the municipalities and private developers in the studied countries. To study the risk position the legislation governing planning and development together with illustrative case examples in each country are analysed. Special attention is paid to the roles of the municipalities and private developers in planning the to-be-developed areas and to the responsibilities of the municipality in the implementation of the plans concerning the infrastructure provision. Together with the infrastructure provision responsibilities it is discussed how the delivery of the infrastructure can be financed.

Keywords: Development, infrastructure, planning, risk, urban

## Explaining Spatial Variation in Real Estate Development Activity in Turkey

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**Craig Watkins**, *University of Sheffield, UK*

There is a strong policy discourse at local and national level in Turkey that ascribes considerable economic benefits to new construction activity. Critics, however, argue that this policy discourse has led to a mismatch between public policy and market fundamentals in many cities. It has been suggested that policy intentions might be driving construction levels above demand levels and could be contributing to uneven spatial development between regions. This paper seeks to shed light on this argument by systematically exploring the relationship between planning policy and development activity in 81 Turkish cities. The analytical framework draws on research undertaken by Bramley and Leishman (2005) and Henneberry et al (2005) on the relationship between public policy and market outcomes and has been adapted to take account of the institutional arrangements and policy instruments operating in Turkey. Drawing on data on economic activity, local social indicators, planning permissions and applications, and demographic change, the paper develops a cross-sectional econometric model that helps isolate the effects of planning policy from other drivers of construction activity. The second stage analysis uses GIS methods and spatial statistics to develop an understanding of spatial variations in the drivers of development activity. The paper offers some tentative conclusions about the relationship between policy imperatives, market fundamentals and development activity.

Keywords: Planning policy, real estate development, spatial variation

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**K-1****A Study of English House Price Data with Spatial Dependence**

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This paper exploits recent developments in spatial econometrics to investigate local authority level house prices in England. It extends upon previous related studies in three ways. First, the research overcomes the hurdles related to boundary changes by focusing on a ten year dataset for the period 2004 -2013. This is enabled through rigorous and systematic data mining to enable analysis at the current level of 326 English local authorities (unitary and districts). Second, based on urban economic theory, the model is expanded (with regard to previous studies) to include economic and social variables. Finally, various specifications of the weight matrix are tested for different levels of spatial dependence and theoretical insights from the fields of regional and urban economy.

Keywords: Average house prices, English local authorities, spatial dependence

## Socio-Spatial Transformation by Gated Communities on the Peri-urban Areas

**Melike Karaca**, *ITU Regional Planning Master Programme, Turkey*

**Aliye Ahu Akgün**, *Istanbul Technical University, Turkey*

“Some walls are meant to keep people in, some to keep people out” (Blakey & Snyder, 1997) After 1980s, especially in 2000s the establishment of new settlements in Istanbul, named as gated communities and the increasing numbers is the result of not only globalization but also taking into account housing production and marketing as one of the main development strategy. Another reason is that the developers and producers in the housing sector consider Istanbul as an open market. Due to the demand for luxury housing and prestigious life, which means also demand for both vertical and horizontal gated communities, the increasing number of such settlements is inevitable. Depending on this high demand, gated communities do not only appear as a housing production type but also as a new lifestyle. Some people prefer to fulfil their aim to have a prestigious life in the urban centre, while some prefer to live in the peri-urban zones away from urban centre in contact with nature and the lifestyles offered by gated communities. On this basis, in order to supply this demand, developers prefer more peri-urban areas, in other words rural areas. This type of housing production in rural areas has created socio-spatial transformations in the uniqueness of the rural areas. The research will focus on Göktürk where gated communities in Istanbul first appeared. The socio-spatial transformation of Göktürk will be analysed by first social transformation via population, education level and employment via data obtained from TURKSTAT. In addition, the spatial transformation will be estimated by aerial photos of 1987, 1996, 2005 and 2010 in order to understand the changes in transportation, streets, green areas, gated communities and housing.

Keywords: Istanbul, gated communities, peri-urban areas, socio-spatial transformation

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**K-2**

## Agglomeration Economies and Global Cities: The case of London, New York and Relativity

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This paper evaluates the manner in which agglomeration influenced formation of cities and how this has changed with the evolution of 'global cities'. Furthermore, a study of global cities concentrating on London and New York, investigating the sales turnover of commercial real estate, is undertaken to investigate any changes in relativity.

Changes in capital flows recorded in commercial real estate transactions over time will be analysed using market data supplied by RCA for each city sector studied. As a consequence of electronic communications and reduced costs of travel, earlier predictions were made of the 'end of geography' with reference to ending the importance of strategic fixed locations. Despite this, studies of agglomeration reveal that once a path dependency is established, a self-augmenting process with existing structure and infrastructure, direct contacts between firms, local information flows, joint use of facilities and provision of venture capital provided by existing firms in the location, maintains a local momentum. Firms create their own 'externalities' in a location resulting in positive effects on that industry. Whether this can continue to maintain or extend the life of an international financial centre has not been studied in great depth. In recent years the global network of world cities has undergone some alteration in balance of activity. A number of cities from developing nations are playing an increasingly significant part in global economic activity.

The research confirms the significance of cities as a global base for business has not declined. However, agglomeration economies in the new wealth producing firms in global cities have altered from those important to former wealth producers in manufacturing. Furthermore, technological development has manifested vast changes in global competitive and economic advantages altering balances accordingly.

Keywords: International financial centre, agglomeration economies, global cities, sustainability, technology

## How Dutch Municipalities Manage their Community Real Estate

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In the Netherlands, the amount of square meters of community real estate is estimated between 83 and 85 million square feet. Although these are only estimates, the numbers give an indication of the extent of Dutch community real estate. Due to its size it can be stated to be a segment that covers an important part of the real estate market. However, it seems that community real estate is not yet always managed in a professional way since owning real estate is in most cases not the core business of the owner (mostly municipalities and other non-profit organizations). Because community real estate is financed with public funds and the real estate is physically located in the middle of the society, it is a subject of discussion in the Netherlands and therefore subject of our research in the past seven years.

The problem addressed in this paper is which trends can be recognized in the way Dutch municipalities deal with their community real estate.

In order to describe these trends, municipalities were asked to complete a questionnaire about the way they manage this type of real estate. From 2008 until 2014 (except for 2013) the municipalities completed the questionnaire with an average response rate of 23% (14%-37%). The questionnaire developed over time and contained approximately 30 to 45 questions. Most of the questions were repeated and some were added, deleted or adjusted due to current developments and feedback of respondents.

From the answers given on the questionnaire, many results can be showed and conclusions can be drawn. 49% of municipalities are currently experiencing problems in conducting community real estate tasks and a majority (63%) is not yet ready to outsource their core functions. If municipalities are considering this, they only do this on operational tasks. 92% indicates that the separation of housing costs and operating expenses are a current theme. Many municipalities (56%) do not take measures for financial risks. 40% has both a bureaucratic vision as a municipal property policy, whereas 33% has neither of these. In the short term, municipalities consider another way of organizing their community real estate tasks. The number of municipalities that measures technical quality, user satisfaction and the contribution of community real estate to policy objectives has increased.

Keywords: Community real estate, municipalities, real estate management, The Netherlands, trends



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**K-2**

## Measuring the Added Value of Housing for Primary Education

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**Ing. Jan Veuger**, *Hanze University of Applied Sciences, The Netherlands*

**Purpose:** The purpose of this paper is to develop an instrument that provides insight in the added value of a school for primary education, from the perspective of different stakeholders. The following groups are considered stakeholders: municipality, school board, environment, parents and children. An instrument like this is needed in order to be able to measure the effect of an intervention within an experiment. The intervention is about decentralizing the available financial resources from the municipality to the school boards.

**Design/Methodology/approach:** In order to find a measuring instrument, a literature study has been done to the aspects on which added value can be rated for the different stakeholders. Since "value" has a different meaning for the various stakeholders, these aspects have been searched for in literature related to various fields, namely Business Administration, Finance, CREM and FM. The instrument will be calibrated in a follow-up study using interviews. In addition, the Delphi method will be applied.

**Findings:** The research has given information that can help build up a useful and well founded instrument to measure the added value of school buildings for the different stakeholders. Apart from the financial issues (such as costs per square meter), which are interesting only to part of the stakeholders, other aspects were found that can help measure the perceived value for the other stakeholders (such as: employee satisfaction, innovations, flexibility, market share, etc). Furthermore, it seems desirable to apply real estate strategies with regard to (portfolios of) school buildings.

**Originality/value:** There are no publications yet on instruments that measure the added value experienced by different stakeholders with regard to school buildings. In practice, financial exploitation of school buildings when it comes to value is only about book value and depreciations. By measuring the added value (for the other stakeholders) through other aspects as well, one gets a better overall picture of the actual output of the building. With the insights gained through this measurement, a more extensive initial investment in a school building might be justified. The instrument can also be of value during negotiations on spending/dividing financial means for housing between school boards and municipalities. Thus, the value of this instrument is more comprehensive than just the use of it in the experiment that will be carried out in the framework

**Keywords:** Primary education, Real estate, added value, measurement, stakeholders

## Knowledge Spillovers in Cities: The Creation and Transmission of Knowledge

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We analyze knowledge spillovers in a search-theoretic spatial equilibrium framework with workers who are heterogeneous in knowledge type. Knowledge spillovers result from random face-to-face interactions between workers in the city. The outcome of those interactions crucially depends on the combination of the interacting individuals' knowledge types. In contrast to previous work, we explicitly model knowledge spillovers as the interplay of two channels: knowledge transmission (imitation) and knowledge creation (innovation).

Our results show that if the role of innovation is sufficiently important, individuals choose an excessively narrow range of partners to interact with, leading to lower than socially optimal creation of new ideas, which results in socially inefficient city sizes.

Keywords: Agglomeration, innovation, knowledge, learning, matching

# **K-3**

## **The Impact of Mass Transit System on Property Values in India**

**Anil Kashyap**, *RICS School of Built Environment, India*

**Jim Berry**, *University of Ulster, UK*

The capitalisation of transit access in property values has long been investigated by property researchers and policy analyst. A premium in property price induced by transit services measures the rate of capitalisation and indicates positive impact of transit investments, which can be used to develop transit-based policies such as value-capture and transit-oriented development strategies. Land development impacts of mass transit have long been studied in the developed economies. Yet relatively little is known by the outside world about the Indian experience due to India's rather short history in the development of mass transit and real estate market. This paper attempts to fill the gap by presenting evidence from India, with a detailed case study of Jaipur Metro Rail Corporation by selecting two transit lines in Jaipur, the study examined land development context and estimated hedonic housing price models to measure the proximity premiums associated with these metro lines. The empirical evidence shows that investments in mass transit can have significant and positive impacts on land development. Properties with transit proximity enjoy sizable price or value premiums. The research findings underscore the importance of introducing zoning and other land regulatory changes prior to the initiation of transit projects as well as applying value-capture tools to help finance investments and redress inequities.

Keywords: Capitalisation, transit, land development, property values, value capture

## Regional Emerging Hubs - Catalysts, Drivers and Constraints

**Simon Huston**, *Royal Agricultural University, UK*

Most economic development over the next fifty years is likely to be centred on regional towns. Many of regional conurbations are ill prepared to cope with growth pressures. Others are more geared up for 'smart growth'. Some regional settlements have aspirations to become 'knowledge hubs' to attract investment and generate prestigious local jobs. University status or expansion is one promising regional development catalyst. Urban beautification projects can also help to attract foreign talent or retain local skills and avoid the stigma associated with 'dormitory suburbs' or cultural deserts. However, the metamorphosis of conservative regional market towns into vibrant knowledge Arcadias confronts philosophical, forecasting, institutional, housing and funding constraints. The research outlines the contested urban renewal backdrop and applies an environmental scanning and systems framework to it. In its empirical phase, the research investigates how catalysts, drivers and development constraints manifest at the local level in the case of two expanding regional English conurbations - Hereford and Cirencester.

Keywords: Environmental scanning, knowledge hubs, partnerships, regional development, smart growth

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**K-3**

## The Impacts of Real Estate Projects on Transformation of Centres in Izmir

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**Ferhan Gezici Korten**, *Department of City and Regional Planning, Istanbul Technical University, Turkey*

The term real estate has exerted direct impacts on the urban finance and macro-form in changing economies of the world cities. This paper examines the urban dynamics of Izmir as candidate for brand city which explain how the city has developed by major projects.

Izmir has been famous as a trade center ever since it's past history. In recent years, most of the efforts have been made to make the port city famous in service facilities again. The aim of the paper is to analyze the development process of central districts within the city of Izmir and to examine the role of real estate projects. During the time of ever-increasing uncertainty, a question gets more pertinently than ever: Will the main three districts maintain the reliability of the city economy in equilibrium through new planned service-based functions. Therefore a survey was conducted including interviews with the project developers who operated major investments in Konak, Bayraklı and Karşıyaka districts.

The decision-making and implementation process, and challenges to become the central districts are related flexible, adaptable and fast-changing economy. The findings of the research put forward that the interest of the capital and the basic strategies of the plans and investments do not overlap. After strategic regional land use plan and other upper scaled plans have been realized, developers are expecting that the study area will attract significant real estate projects which have mixed use functions with various forms. Originality/value - This is the first paper to examine urban dynamics of the centers in Izmir from the perspective of real estate development for better understanding to relationships between brand city vision, urban macro-form and major projects.

Keywords: Brand city, major projects, real estate, transformation, urban centres

## How Shall the Governance of the Urban Renewal Projects at Historical Sites be Performed? – Example of the Izmir Kemeralti District

**Buğra Kağan Esen**, *Ankara University, Turkey*

In the last decade, experiences in urban renewal projects have enabled a systematics, which help overcome physically worn out urban areas. Every urban renewal project shall have a different origin and resolution model just like every city has different natures and requisites. Any given urban renewal project shall have a tailored governance model for its spatial problem solving and desired project intention.

Most of the time, such move in historical districts is to put forward the old original profile of the district. Apart from all other factors, these projects aim aesthetical concerns. It is intended to obtain a better appearance and respect for the former urban lifestyle.

The historical Izmir Kemeralti Project, endeavored for a while, is a good example for such situation. Pioneered by the local authorities and some civil organizations, this project is remarkable by many aspects. The subject district, which is still very active, has been the merchandising center and downtown location of Izmir since forever. Not only for Izmir, but also for the whole Western Anatolia region, it is a junction of the complete informal retail center. Meanwhile, for this region where very valuable historical buildings exist, it is disfavored by many Izmirians that the region has become home for the unpermitted sellers and unorganized vendors. The intended renewal project aims to elevate the class of the still-strong trade activities in the region as well as to reveal the historical buildings.

In this paper, a management and governance model is probed for the Project mentioned above. A quick view shows, the area is privately owned, property values have skyrocketed and the merchandising activity is pretty intense. In that case, the chance of performing eminent domain is out of question, also in the sense that it might undermine the intensity of the day-to-day businesses. And so, a relation between the public authority, entrepreneurs and the landowners shall be well organized to properly renew the area. This research is focused on the governance dimension and the business planning of this Project.

The contribution of this research to urban sciences may be twofold. First, it contains advice for renewing historical downtown areas when governance techniques are considered. Second, it provides notion for applying negotiation methods for the tremendously valuable urban renewal areas, whether they are historical or not.

Keywords: Mathematical modeling, commercial property, historical district, property values, urban renewal

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**K-4**

## Short-term Rentals and Housing Rents. The Case of Airbnb in Berlin

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**Philipp Schäfer**, *University of Regensburg (IREBS), Germany*

Airbnb (ABB) offers short-term rentals for tourists via an online-market platform. In contrast to traditional holiday lodgings the flats are usually residential apartments or rooms, offer fewer services and are therefore mostly cheaper. The phenomenon of ABB can nevertheless also trigger spillovers to non-participants and is currently being debated extensively in several German cities. The prevailing view: The urban housing markets are concerned with a diminution of housing supply and increasing rents. The central point thereby is, that due to ABB a large part of residential flats is removed from the housing market. Several providers divert their flats illegally into permanent holiday flats and do not just offer the flats occasionally as is intended by the share economy. Berlin is the largest ABB-market in Germany and especially here individual buyers have discovered the conversion from rental flats into holiday flats as a specific investment scheme. This paper aims to analyse the coherence between the ABB-density and housing rents in the different neighbourhoods of Berlin with a simple 1-W ANOVA. Furthermore, the web data of ABB is analysed with respect to illegal usage.

Keywords: Airbnb, housing rent, short-term-rental, urban tourism

## Housing Economics and Changing Residential Quality in Berlin

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Berlin is a growing city. Almost 48,000 people permanently moved to Berlin in 2013, and the number of national and international tourists is constantly rising: 30 million tourist overnight stays are expected in over 700 tourist accommodations in 2016. This massive influx of people challenges the existing built capacities, leading to a tense housing market with increasing rents, selling prices and standard land value, especially in attractive inner-city neighborhoods. The politicization of real estate development and rent prices has produced several regulatory housing policy measures such as the increase of the land purchase tax (2014), Subpoena on the Prohibition of the Misuse of Living Space (2014), and Rent Control (2015). The development of Berlin's real estate market into one of the most attractive capital investment markets took place at unprecedented speed: inter alia, the transformation of rental property into condominiums or the transformation of residential into commercial usages, vacancy rates have decreased to around 2 percent today. These developments have resulted in a strongly articulated demand for new (residential) constructions requesting about 20,000 additional dwelling units in Berlin. In a four-field-matrix developed elsewhere (Landau/Wellner, 2014), the variable of 'tourist accommodations' (TA) is being examined as influential factor on the changing residential quality in inner-city residential neighborhoods in Berlin, where tourism has an increasing impact on both economic development as well as on social cohesion. Tourism has evoked resentment and protest amongst some residents of areas that are heavily frequented by tourists. The variable TA is divided into an official or formalized accommodation segment, i.e. hotels and hostels, as well as an informal sector, i.e. privately-rented sublets or vacation rentals whose number is estimated at 12,000 in all over Berlin. The dimensions of residential quality will be differentiated into built features (location, quality of building etc.), economic (rent level, tenant mix etc.), social (neighborhood atmosphere, security, fluctuation etc.), ecological and health-related (noise, pollution etc.) aspects, thus contributing to the conceptualization of 'residential quality'.

Keywords: Housing economics, housing policy, rent prices, residential quality, tourism



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**K-4**

## Impact of the Rent Brake on German Housing Markets

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**Paolo Colucci**, *Nürtingen-Geislingen University, Germany*

**Mark Renz**, *Nürtingen-Geislingen University, Germany*

In recent years, the demand for housing and hence rents in most growing German areas has steadily increased. In order to limit the rise in rents a new instrument, called rent brake, was introduced. The process was accompanied by controversial discussions among market participants, economists, and political parties. Finally, the new law was passed in 2014.

According to the new rent act special rights will be granted to the federal states of Germany. They will be able to restrict the rents charged for re-letting in certain designated areas where housing demand and rents are high. In these areas, landlords will not be allowed to increase the rent beyond a maximum of 10% above the customary comparative rent.

This discussion paper attempts to examine the legal, economic, social, and political aspects of the German rent brake. Firstly, the impacts based on an economic standard model are analyzed. The result of this analysis speaks clearly against the rent brake. Secondly, legal problems at execution level are identified. On the basis of market data it is shown that only a small part of Germany is really affected. Also this fact speaks against the rent brake, mainly due to unsolved implementation details. Thirdly, social policy aspects are taken into consideration. The findings show that the rent brake is perceived positive by most voters. It suggests the impression that the government does something for the tenants. Fourthly, from a strategic standpoint Merkel (CDU/CSU) wins at the expense of the coalition partner (SPD) and the opposition (Alliance 90/The Greens, THE LEFT), who originally developed the idea.

Keywords: Comparative rent, housing policy, rent act, rent brake, social policy

## Does Land Fragmentation Delay the Implementation for Urban Renewal?

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Land fragmentation is deemed to be a significant factor in delaying land development especially for integrating an urban renewal project. One strategy to identify urban renewal area is that the landowners designate the renewal units by themselves in accordance with the criteria as determined by the local authority. They may apply for implementation of the urban renewal business of that area in keeping with the regulations. However, land assembling always takes a long time in processing an urban renewal business so as to not all renewal units are successful led to successful urban renewal businesses. How long will a renewal unit take to implement an urban renewal business is crucial for successfully implementing urban renewal projects. In this study the time that renewal units take to implement urban renewal businesses and why they do were analyzed.

Keywords: Land assembly, land fragmentation, renewal unit

**K-5****Industrial Decentralization as a Real Estate Development Project: Gebze Case**

**Ayşe Nur Albayrak**, *Gebze Technical University, Turkey*

Gebze has gained its industrial identity by the decentralization of industrial firms from Istanbul throughout the years and become one of the most important industrial centers in Turkey. But recently, transformation of industrial areas has come to the urban agenda in Gebze. In this context, the aim is to decentralize the industrial areas and to transform into qualified residential - urban facility areas. There are numerous examples of transformation of industrial areas in Istanbul and in other major cities in the literature. The area in Gebze (D-100 Road and its immediate surroundings), however, is a special case for including active manufacturing units and for the size of its scale. Such transformation will modify not only the industrial facility areas but also the social structure, production relations in the industry and employment structure in the region. Thus, the regional industry is expected to transform into high technology sectors. "The Information Valley" is about to established in addition to existing research institutions such as Gebze Technical University, GTU-TEKMER, TUBITAK-MAM and also GOSB Technopark.

This area has been declared as a "special project zone" in various urban and regional planning documents but the priority of such transformation on the other hand has not been clarified yet. The purpose of this study is to discuss the effects of urban transformation offered as a real estate development project on the city of Gebze. Following the introduction chapter presenting a theoretical framework for urban transformation, the second chapter reviews planning documents and compares foresights about Gebze. Interviews with the Chamber of Commerce and other local actors are presented in the third chapter. This chapter is organized in three headings. These are effects on production relations, modification of the labor structure and social vulnerabilities. The final chapter presents evaluations and recommendations for policy makers. It is important to demonstrate positive and negative aspects of possible effects of urban transformation on Gebze and to create an environment of discussion which ensures participation of local players. It is not possible to succeed in such a large scale transformation without the contributions of local actors.

Keywords: Gebze, industrial transformation, urban transformation

## Ethnic Mover Flows and Neighborhood Change in Scotland

**Jessie Bakens**, *University of Sheffield, UK*

**Gwilym B Pryce**, *University of Sheffield, UK*

In this paper we describe the role of ethnicity in spatial patterns of mover flows in Scotland by focusing on the ethnicity of movers in relation to the ethnic composition of neighbourhoods. Many cities are becoming more and more ethnically diverse. Within cities however, neighbourhood population composition might not always reflect this diversity as clustering, segregation, but also mixing of ethnic groups predominantly takes place on lower spatial levels. For individual residents, the ethnic population composition of a neighbourhood might therefore become an increasingly distinctive and important feature for the comparative evaluation of residential locations. If the ethnic population composition of a neighborhood plays a role in individual location decisions, compositional preferences are most likely related to one's own ethnicity. Understanding this mechanism in the process of residential location decisions will ultimately help us to better understand ethnic neighbourhood dynamics.

For the analysis in this paper, we use a unique combination of datasets on a very fine-grained spatial level. We link the Registers of Scotland house transactions data between 1990 and 2010 with the Scottish Neighbourhood Statistics. The ethnicity of house buyers is identified by (sur) name analysis. There is a rich literature on using onomastics to identify ethnicity, and this approach can overcome some of the drawbacks inherent in using other ways of identifying ethnicity like, for example, country of birth.

Adapting a gravity model of spatial interaction, we model spatial patterns of mover flows of different ethnic groups in Scotland and neighbourhood compositional change. Spatial interaction models offer a systematic approach to describe the role of neighbourhood population composition in determining location patterns of different ethnic groups.

Keywords: Ethnic mover flows, neighborhood dynamics

## **K-6**

### **The Restructuring of the UK Urban Retail Hierarchy and the Consequences for Real Estate Investment**

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Over the last thirty years or so a new dispersed sub-regional urban system has emerged in many developed countries. Key accessibility relationships have been transformed leading to a 'rationalisation' of the retail hierarchy that has seen large centres grow and out of town centres developed at the expense of small town centres that have gone into decline. There is little hard evidence on this trend but there has been a large increase in clothing and footwear stores in UK regional centres with a parallel decline in sub-regional and town centres over the period 1998-2010. These phenomena have given rise to the term polycentric urban region and urban networks with an implied shift away from a central places hierarchy. Some of the long term culminations of these trends have been stressed in a series of well publicised reports, notably The Portas Review. This paper will examine the consequences for real estate rents and investment by analysing the long term changes in rent levels of local centres within a (evolving) central place framework. The primary data are 'standard' high street rents on a quarterly basis from 1984 of more than 400 towns provided by CBRE.

Keywords: A new central place, Rent shifts, retail hierarchy, urban change

## Behavioral Real Estate. A Literature Review

**Costin Ciora**, *The Bucharest University of Economic Studies, Romania*

Evidence of the impact of behavioral analysis in real estate has become clearer during the real estate market bubble, and prior to that, when irrational exuberance affected the movements in this market. The purpose of this paper is to comprise a literature review of behavioral real estate, looking closely on the concepts and potential for analysis.

Keywords: Behavioral analysis, behavioral real estate, irrational exuberance, real estate economics

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**K-6**

## Developing Resilient Property Markets in the Wake of the 2008 Economic Crisis

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**Ala Daugeliene**, *Faculty of Civil Engineering and Architecture Kaunas University of Technology, Lithuania*

Building cities capable to withstand adverse conditions generated by climate, environmental, resource- or community-driven vulnerabilities is part of a global response aiming to strengthen our cities through enhancing their adaptive capacity of reaction. However, world city rankings identified above do not address specifically enough a modern-day threat to our cities: economic disasters. Sustainable urban development and resilient urban economies depend on the strength of property markets and subsequent construction sectors.

The 2008 credit crunch and subsequent economic recession have had a devastating impact on some of the European property markets. Some of the Central Eastern European (CEE) emergent markets have been mostly affected by a chronic lack of finance, poor government and governance and high perception of risks and vulnerability to investors in real estate. Property markets instability has affected local economies, local communities and urban and regional development.

Institutional investors and market analysts are aware of the prospect of another potential property market crisis within the next decade. In the current weakened EU economic context growth has been limited and austerity measures have come into strong conflict with economic investment requirements. Developing a set of factors that contribute to property market resilience to economic cycles and future recession should therefore become a priority for the local governments and investors in Europe.

How can emergent property markets become more resilient and what are the lessons that emergent property markets can learn from developed property markets in order to enhance their adaptive capacity of reaction to economic disasters?

The research aims to develop a model for appraising property market resilience in European capital and regional cities. Developed property markets were analysed in order to establish specific factors that helped them become more resilient to economic disasters. Lessons to be learnt and mistakes to be avoided are considered for the development of more resilience as part of CEE emergent property markets. Establishing a successful model for appraising resilience in emergent and developed property markets will ultimately help with establishing a long-term European capital and regional city index of property market resilience as a tool for managing urban resilience to future economic disasters.

Keywords: Central Eastern Europe, city resilience, emergent property markets, property cycles, crisis, property markets resilience

## Retail Rents and Spatial Patterns of Product Variety in Urban Shopping Areas

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This research aims to examine the spatial patterns of product variety and its relationship with the rental values for urban shopping areas. In order to reveal the complexity of various spatial structures of shopping areas, this research establishes a spatial hierarchy product variety database. The basic model applies the concepts from the Central Place theory, Bid-rent model to connect related indexes of spatial complexity, product variety and rents. The database includes three major components: 1) using GIS to generate basic spatial characteristics information variables and the spatial indexes will be generated from space syntax software, such as Depthmap or Axwoman; 2) product variety data from a detailed survey of sampled shopping areas and shopping districts; and 3) a detailed rental data so as to generate retail rental gradient of shopping areas. The preliminary results show that certain spatial patterns of product variety dominants the rental market, and it is not the greater the general variety the higher the rent.

Keywords: GIS, high-street stores, retail agglomeration economies, retail property, spatial analysis



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**K-7**

## Real Estate Valuation use in Urban Transformation Projects

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**Semih Adil**, *IMM Urban Transformation Directorate, Turkey*

**Ayşe Gökbayrak**, *IMM Urban Transformation Directorate, Turkey*

In Istanbul, existing built up areas are threat against many natural and urban risks. Concurrently, these urban spaces have often economic, social and physical scarcities. There is a necessity for urban transformation projects in these slum areas to meet today's urban space needs also to provide a livable city. Built & Transfer & Evacuate model was developed to realize these urban transformation projects. Built & Transfer & Evacuate is a model that can be used on empty, state-owned urban development areas. Any essential public areas such as green areas, regional parks, public health facilities, educational facilities etc. can be planned in these urban spaces within the master plans for these areas. Due to the model, the buildings those built on the state-owned areas will be bartered for the existing risky buildings which are in the nearest areas. After demolition of the buildings in these areas new master plan studies will be done on the risk-free ones to provide a sustainable urban transformation. Therefore, planned, livable urban spaces will be created. To define the contribution values of the property owners in urban transformation areas, real estate valuation studies should be done. In general, the value of the existing and new built buildings had defined to state the distribution value of the project. Before the master plan and design studies, land-real estate valuation studies should be completed to have the most suitable functions for the areas and to have the best localization of them within the defined criteria.

Keywords: Built, transfer, evacuate model, Istanbul, real estate valuation, urban transformation

## **Does 3D Information Modeling Give Better Vision to Deal with Future Real Estate Capacities of Inaccessible Areas within Conflict Zones?**

**Mohsen Shojaee Far**, *Center of Land Policy and Valuations (CPSV), Polytechnic University of Catalonia, Spain*

**Carlos Marmolejo Duarte**, *Valuation and Land Management Research Centre (CPSV), UPC University, Spain*

Changes in technological paradigm regarding the information modeling of geospatial data (geomatics) brought significant possibilities of virtual simulation of urban environments via aggregation of information from different sources into a geometric model. These capacities have been used in many different disciplines from military and governmental uses to commercial systems, such as satellite 3D models of different areas (i.e. Google Maps) or GIS data and BIM models. Considering this technological possibility as a tool of visualization of urban components, for urban planning purposes and real estate evaluations, provides an integrated system of management, integration and distribution of complex urban geo-information. As an alternative use of such systems, this study explores the capacities and advantage of using information modeling approaches for simulating the inaccessible areas within geopolitically conflict zones (either by legal or physical restrictions-geopolitical brownfields) to provide a visual presentation of current physical conditions of given areas. This approach may also open possible visions on potential future real estate capacities of those affected areas and its peripheries, where more accurate and reliable development and regeneration proposals may produce accordingly. Correspondingly a methodological framework of data collection (aggregation of information) and also simulations suggested, which consequently may deliver more efficient decisions on future real estate market capacities to decision makers (authorities), real estate experts, and urban planners.

Keywords: Geopolitics and conflict zones, inaccessible areas, information modeling, real estate capacity, virtual reality

**K-7****Relationship between Urban Development and Housing Values: The Example of Konya**

**Mehmet Topçu**, *Selcuk University, Turkey*

This study aims to examine the effects of public or private sector based urban investment on housing values which are in the environs of these kinds of investments. For this purpose, the study uses totally 13 parameters including 5 parameters related the properties of housing structure, 7 parameters related environmental properties and accessibility parameter. At the last 15 years, two regions are in the forefront where urban investments have important impact in Konya which can be seen as a catalyst for the rapid development of the city. For this reason, these areas were chosen as sample. The first sample area is at the north new-developing side of the city. This area has many new investments like shopping mall, gated housing projects, stadium, fairground etc. And, the second sample is at the east side of the city which has also many transformation areas and investments (law court, private university, hospital, urban park, shopping mall, etc). In this context, for measuring the structural and environmental properties of housing units, a total of 200 questionnaire was applied to the housing units by using random sampling technique. Information regarding economical values of housing units was obtained from real estate companies. These derived data were evaluated by statistically. In conclusion, the results from the evaluations showed that building age, housing unit size, density, safety-security, accessibility, having parking lots and having elevator parameters are significantly effective on housing values.

Keywords: Konya, urban development, housing values

## Diversity Analysis: The Case of Barcelona Metropolitan Region

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There are many aspects that adds economic value in a metropolitan region. Among them and as a methodological approach of this paper it has been included the diversity measurement and its quantitative analysis. Given the positive and regulating capabilities of diversity in the urban systems, an analytical model has been developed in order to assess the distribution of housing prices using variables that allows calculating diversity in an economical and territorial basis. The parameters involved are variables such as land use, the distribution of employment, the income level of the population, transport accessibility, among others. The methodology adopted focuses on assess different variables and its internal diversity as a measure of both the balance and abundance of pre-constructed indicators. From the above it is possible to draw conclusions of the importance of its inclusion in metropolitan systems planning.

In the case of the metropolitan region of Barcelona (RMB) and its 164 municipalities the study show that diversity of located employment, diversity of economic activity including income levels and diversity of land uses are highly positive factors which have a direct influence in the metropolitan setting, making a difference on residential market values.

Keywords: Shannon index, diversity, entropy, job commuting, real estate value

# L-5

## The Polish Real Estate Market as an Area for Developers

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The Polish real estate market have coped with an economic slowdown quite well. However, some sectors and localisations developed in different pace. The authors would like to describe some factors influencing the conditions of the real estate market and its current level of development. Having this background the authors would like to analyse financial results of developers dividing them into different categories. The authors would like to find what kind of developers have found the best solutions and strategies in changing economic environment.

Keywords: Developer company, financial condition, real estate

## Innovative Finance for Real Estate Development in Pan-European Regeneration

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**Norman Hutchison**, *University of Aberdeen, UK*

**Alastair Adair**, *University of Ulster, UK*

**Stanley McGreal**, *University of Ulster, UK*

**Samantha Organ**, *The University of the West of England, UK*

Following the Global Financial Crisis (GFC), the role of finance in real estate development for regeneration requires re-examination. The research presented in the conference paper draws on research funded by the Royal Institution of Chartered Surveyors (RICS), which focused on how and whether real estate development has become more innovative following the GFC - with particular reference to regeneration from a pan-European perspective. The findings show key financial factors and emergent funding mechanisms, whilst a comparative analysis of three case studies based across Europe (London, UK; Leiden, The Netherlands; and Berlin, Germany) provide greater insight on the similarities and differences between projects that can be considered new and possibly innovative.

Findings demonstrate that there has been growth in the blend of financial products used in real estate development for regeneration across Europe. This blend is set with greater equity financing, often sourced from institutional funds from domestic and foreign consortiums. Additionally, partnership structures adopting a collaborative-competitive ethos have been adopted - particularly by those beginning to use large-scale multi-bank finance. The emergence of project bonds also set the tone for a more infrastructure-specific nature of funding when uncovering innovative finance for real estate development in pan-European regeneration.

Keywords: Equity, finance, innovative finance, real estate, regeneration

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**L-5****Cognition Biases in Real Estate Investment Decisions.  
Empirical Evidence from the German Development Market**

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**Andreas Pfnür**, *TU Darmstadt Department of Law and Economics, Germany*

Cognitive biases have been intensely studied in security markets so far (Simon 1987). Flyvberg (2005) also found, that project management decisions in the construction of infrastructure suffer from cognitive biases. In the field of real estate development investment decisions no empirical analysis of these social-psychological effects like miscalibration (e.g. Zacharakis/Sheperd, 2001), over optimism (e.g. Heating, 2002) or escalating commitment (Staw/Ross 1987) are known so far. A lot of actual large scale projects like the new Berlin Brandenburg Airport or the new Hamburg Opera House Elbphilharmonie, which is one of the 10 most expensive single building project developments of the last years gives a lot of impressionistically evidence, that the cognition bias of project investment decision makers is one of the most important reasons for running out of time and costs.

Therefore we develop a model of cognition biases in real estate development decision situations containing the most relevant biases and the key types of decision makers and situations. Real estate development decisions differ from security investments, because there are several parties who work together in one relatively long lasting project, while they can physically see the project and it's success grow.

In a large-scale empirical survey among all types of real estate project decision makers (e.g. sector, hierarchy, personal experience) we analyze and compare the individual degrees of cognition biases with methods coming from the empirical social research. We measure cognition biases and their specific reasons. The results of several univariate and multivariate analyses show heavily cognition biases in real estate investment decisions, which vary intensely between different types of decision makers. Especially in real estate development decisions the degree of bias depends on the individual objective and subjective knowledge and the incentives of the decision maker. We also found evidence that the degree of the bias in decision situations, which results in inefficiency, is not given, but can reduced by far. So we are able to derive some methodological implications for theory and practice in the field of efficient institutionalizing the project.

Keywords: Cognition bias, decision making, real estate development, real estate investment, risk management

## Integrating Interests: Consumers-Retailers-Investors

**Cath Jackson**, *University of Sheffield, UK*

**Allison Orr**, *University of Glasgow, UK*

The retail sector underpins many local and national economies, yet is experiencing a prolonged period of change and uncertainty. Securing successful large-scale retail-led developments within town and city centres can be key to economic success and stability, yet is a challenging and complex process. This is exacerbated during times of change, with the decision-making environment faced by investors undergoing dynamic transformation driven by changing consumer behaviour, retailer rationalisation and concerns over the accessibility of these traditional public places. The role of the city centre is being challenged and the aspirations of multiple user groups and stakeholders need to be revisited to seek to ensure the future-proofing of the next generation of retail developments.

The role of the city centre faces challenges from the evolving behaviour and objectives of consumers and retailers and, in turn, each group comprises diversity. Consumers, for example, include user groups such as leisure users, workers, drinkers, diners, tourists, arts and culture users, the third sector, socialisers, service users, residents and, of course, shoppers (within both comparison and convenience sectors). Within each of these categories, behaviour has changed due to shifts in working hours, commuting patterns, utility of central public spaces, disposable income and, importantly, multi-channel internet shopping. Similarly, the characteristics and objectives of retailers have changed, with expansion in store numbers, store sizes and, more recently, retraction in representation with consequent changing requirements for space. It is within this diverse and complex context that the role of the city centre is explored.

A model is developed to provide a comprehensive yet accessible representation of the diversity of user groups and stakeholders, their relationships, aspirations and the environment within which they operate. At its core it shows investors and depicts the challenges they face in terms of situating risk within the opportunities represented by the catchment of users (occupiers and consumers) and satisfying the diverse aspirations of the catchment. It is argued that such a model can progress our understanding of the role of the city centre and, thus, may be an important input into investor decision-making by contextualising user group and stakeholder relationships, aspirations and pressures, enabling alignment of retail developments and urban regeneration goals.

Keywords: City centre, decision-making, future-proofing, investment, retail



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# L-6

## Project Management in Real Estate Development Projects

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Real estate development projects are hierarchical and sequential processes which are needed to be considered and analyzed by focusing on several disciplines. Getting through the real estate development projects in right time, with planned objective quality and budget is the general purpose; however, it is not so common to perform it perfectly. In real estate development projects, it is very important contribution to planned objectives that keeping the project management approach remain on agenda and using it as a tool. In today's conditions, implementing an idea of real estate development is possible with efficiency in leading, management and organization. Concordantly in this study all parts of the real estate development projects that are the idea inception and refinement; feasibility; preconstruction; construction; stabilization have been handled as the processes of initiating; planning; executing; monitoring and control; closing. Real estate development processes in such a unity have been analyzed through the field of project management knowledge areas. In this way, finding out which knowledge areas have priority in each real estate development process has become possible.

Keywords: PMI methodology, project management, project management knowledge areas, real estate development, real estate development processes

## The Success of PPPs in Poland

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**Michał Głuszak**, *Cracow University of Economics, Poland*

The construction and provision of infrastructure services is often based on a partnership between public and private sector under a framework of Public Private Partnerships (PPPs). This type of partnership has been employed in Poland since 2009. Though public-private partnerships in Poland are a relatively young and promising investment model, they are still poorly developed. As a result, only a small number of projects (20%) managed to get funding. Given this observation, the objective of this paper is to examine how economic and political characteristics contribute to the success of PPPs. We examine a database with PPP projects using a generalized linear model in the form of a logit model in order to find out what factors exerts impact on PPPs success in Poland.

Keywords: PPPs, logit model, project success

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**L-6****Staff Housing: Panacea to Academic Productivity  
(Nigerian Institutions)**

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**Iheanyi Alaka**, *Nigerian Institution of Estate Surveyors and Valuers (NIESV) Nigeria*

**Derek Fidelis Chikezie Okoronkwo**, *Nigerian Institution of Estate Surveyors and Valuers (NIESV), Nigeria*

**Purpose:** Housing issues bother every living human especially workers who cover long distances to their work places. This paper attempts to examine the effect of housing proximity on the workers productivity as it relates to tertiary institutions in Nigeria. This is with the view to proposing effective and workable staff housing that will enhance institutional productivity especially for the academics, as the tertiary institutions are meant to be citadels of higher learning per excellence.

**Design/Methodology/approach:** The cross-sectional survey design was adopted to elicit relevant data that will guide the researchers' proposal for improving productivity among academics of the selected tertiary institutions in Imo State, via staff housing scheme. A multi-stage sampling procedure consisting of quasi-probability sampling approaches for the survey. Appropriate tables and data analysis techniques were also employed in explaining the field results.

**Findings:** Findings focused on the difficulties faced by these staff as a result of distance from home to workplace; academics' attitude to work in relation to productivity and its impact on student-staff relationship vis-a-vis learning outcomes and identification of suitable staff housing strategies for the selected institutions.

**Originality/Value:** The outcome provides a framework for improving workers productivity in Nigerian Tertiary Educational Institutions through staff housing. It serves as a warning guide to the Nigerian government and other private investors while prioritizing institutional structures towards enhancing workers' productivity and creation of strong synergy among the stakeholders of tertiary academics.

**Keywords:** Tertiary institution, academics, productivity, staff housing, synergy stakeholders

## **Analysis of the Retail Market Development in Bratislava with a Focus on Retail Function and its Wider Relations within the City**

**Andrej Adamušcin**, *Slovak University of Technology, Institute of Management, Slovakia*

The aim of the contribution was to analyse the development of shopping centres in Slovakia with the main focus on Bratislava in relation to the localization, structure, supply of premises, capabilities of shopping centres. The study analyses the system of shopping centres, its influence, importance and impact on their surroundings. This contribution is also dealing with retail function as such and with its wide relation with another functions and its position within the city as such.

The contribution in its analytical part is predominantly focused on bigger retail schemes within the city and their influence on the city life in various aspects in spatial planning frame. Conceptual part solves two various concepts of retail development in the city as well as special one which is dedicated to the development of new High Street scheme on lower scale. The contribution is not dealing only with physical structure as such but on the contrary reflects market standards as well as market situation.

Main outcomes from the contribution are related with analysis of development of shopping centres in Bratislava and also with new approach how to solve the spatial planning in terms of retail as the function as such is closely linked with the market and absolutely depends from participants on the market as well as participants on the market are depended on the spatial planning.

Keywords: Development, retail function, retail market, shopping centers, spatial planning

# L-8

## Measuring the Effect of Unobservable Factors in Residential Choice Behaviour

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**Fan Yang Wallentin**, *Uppsala University, Department of Statistics, Sweden*

Previous research has shown that it is likely that residential choice behavior is mostly affected by unobservable factors. The purpose of this research paper is to investigate the effect of heterogeneous unobservable factors in residential developments on residential choice behavior using exploratory and confirmatory factor analysis.

Our results show that there are significant effects of unobservable factors on residential choice behavior. The methodology presented can be used to advise developers, architects or planners in evaluating those attributes that create value to improve, for example, the overall design solutions in real estate development projects.

Keywords: Residential choice behavior, real estate development, structural equation modeling

## Residential Infill Development – The Connection between Inhabitants' Attitude and Areal Characteristics

**Martina Bendová**, *Aalto University, Finland*

**Saija Toivonen**, *Aalto University, Finland*

Helsinki Metropolitan Area is a growing region with rising demand for housing. The low density of housing, which is very often visible in Finland and in other Nordic countries, bears great potential for infill development to conquer or at least ease the growing need for housing. Densification is often argued to be one answer to the environmental pressures the built environment is coping with. The main argument is that, densification of residential areas will make better use of existing infrastructure and decrease travelling. In addition to the positive environmental impacts, the infill developments are argued to have societal benefits such as diversification of population and land use, and increased vitality of the area. Infill development can also bring economic benefits to various parties. At the same time that the city is seeking savings in infrastructure construction and maintenance costs, housing companies may also receive financial means from the construction of a new building on their property. This income can potentially cover costs needed for example for energy and pipe renovations, and lift construction.

In Finland where the level of owner-occupancy in housing is high, home owners can be seen as key players when discussing new infill developments. While the public sector sets the frames, eventually much is in hands of the real estate owner and inhabitant. Even though the impact of infill developments has been studied thoroughly, little is still known about the willingness or unwillingness of inhabitants to support infill development in their neighborhood. The topic deserves more attention, as infill development projects often face opposition from the inhabitants, despite the many known benefits.

The aim of this study is to find connections between characteristics of areas and their inhabitants' attitude towards infill development. The results can give a better understanding of inhabitants' appreciations. This knowledge could be applied in urban planning processes to support infill developments in the future. The inhabitants' attitudes are examined using a questionnaire survey. The survey was carried out in the Helsinki Metropolitan Area, and the extensive questionnaire received opinions from 1088 respondents. The inhabitants' attitudes towards infill development are compared to different areal characteristics to reveal their interconnections and significance.

Keywords: Areal characteristics, densification, housing, infill development, inhabitants attitude

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**L-8****The Impact of Planning on Business Development**

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This paper explores the relationship between planning policies and the performance of the industrial property market. There has been a growing research interest in measuring the impact of planning and land-use regulations on property market outcomes. Nevertheless, at least three main limitations have been highlighted in the literature that constrain the development of a stronger evidence base. These are insufficient attention for the impact of planning at the micro-level of supply, a relative lack of studies that assess the impact of planning on other than housing markets (i.e. office, retail, and industrial property markets) and inadequate consideration of the potentially varied impacts of different types of planning intervention. This research attempts to improve on these limitations by adding results from two novel datasets. The first contains information on individual building permits for a sample of Dutch municipalities who have given us access to their data. The data cover the period from 2004 to 2008. This permits an analysis of investment activity at the micro-level, looking at building investment at the level of individual sites allocated for industrial uses. The second dataset consists of a range of indicators that capture different dimensions of planning intervention. These indicators reflect the main policy actions and initiatives deployed by (local) governments in the Netherlands in order to influence business development. A model has been developed to estimate the effect of these planning indicators on investment activity in industrial buildings. The results provide some evidence of the negative effects on new construction often associated with planning induced restrictions on the amount of available land. However, it appears that more proactive (regeneration) policies, designed to improve the physical environment of particular sites, have a more profound and positive impact on investment in both refurbishment and new construction.

Keywords: Building investment, industrial property, planning, regeneration

## Evaluating Mega Urban Regeneration Projects: Developing a New Model

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**Ali Parsa**, *Royal Agricultural University, UK*

**Simon Huston**, *Royal Agricultural University, UK*

In 21st century, with the rapid global urbanization, cities are undergoing dramatic expansion and regeneration. Urban migration, driven by jobs and other opportunities for wealth generation and economic development, has created the phenomenon of 'megacities'. Mega Urban Regeneration Projects (MURP) and emblematic projects were once urban policy solution. However in practice, MURPs, due to their complexity, scale and risk, were often over-budget or late (Flyvbjerg et al, 2003; Altshule and Luberoff 2003).

Issue: Besides the risk of waste and high opportunity costs, the other criticism levelled against MURP is their proclivity to concentrate spatially on privileged enclaves or capital cities. Arguably, London has had too many construction projects whilst regional UK is neglected but is this a sustainable development model?

This paper draws upon case studies in the UK. It first develops a MURP screening framework and then uses it to critically evaluate London's large urban regeneration developments. This study will contribute to academic discourse and produce practical implications for the policy makers, planners, investors, developers and other key stake holders who are involved with Mega Urban Regeneration developments, to reinforce positive trends and enable policies to avoid mistakes. The methodology involves an extensive literature review, secondary data analysis and profiling a series of case studies and interviews with key players involved with mega urban regeneration projects.

Keywords: Foresight, resilience, urban planning, institutions, sustainability



## Financing Real Estate and Urban Regeneration in Iran

**Yasser Zanjiri**, *Urban Paradigm, Iran*

**Ali Parsa**, *Royal Agricultural University, UK*

The advancement in institutional financing in Iran has affected both the funding and investment environment in almost all businesses including urban development and real estate in recent years. This has provided private sector owned businesses with new vehicles for capital raising while offering innovative investable products to institutional and retail investors compared with other forms of investment notably the saving accounts and share trading. In a broader context, however, this has enabled businesses to utilise private sector capital in a larger scale. Reviewing recent activities in the capital market particularly the funds, provides a better understanding of both the market size and its contribution to real estate and urban development sector. This paper will outline the latest development of the real estate market in Iran. Furthermore, through providing an analytical investigation of the capital market in Iran, this paper examines a variety of mechanisms utilised for delivery of urban regeneration projects in Iran employing different forms of public private partnerships and private sector finance via establishment of Special Purpose Vehicles (SPVs). This is done through utilising live case study projects in which sources of finance, fund structure and operation models are investigated. This paper undertakes an in-depth analysis of the financing mechanisms based upon the evidence drawn from case study projects, identifies three different types of SPVs focusing on main sources of finance and assesses the characteristics and effectiveness of these schemes.

Keywords: Middle east, real estate finance, real estate investment, urban development, urban regeneration

## **Sustainability, Tall Buildings, High Density and Compact City Development: Dubai Marina, Dubai, United Arab Emirates**

**Leila Shojaei**, *IAU University Department of Architecture and Urban Planning, UAE*

**Ali Parsa**, *Royal Agricultural University UK*

Contemporary urban development in the United Arab Emirates has been based on the creation of spectacular skyscrapers. Dubai has a large concentration of tall buildings amongst them the world's tallest tower, Burj Khalifa. The development of high-rise buildings in Dubai (residential, commercial or mixed-use) is defining the city with structures competing with each other in design and height. These towers provide a high ratio of space where more people can live, especially when the land is in limited supply with rapid population growth. Tall buildings may be sustainable in terms of saving land, but constant ground level interaction can impact environmental and social components. They also provide great views, gulf water front, man-made lakes augmenting real estate values and neighboring areas to capitalise on their prospects too.

The development of Dubai Marina district has been based on formation of the man-made Marina from rerouting the water from the Persian Gulf to create a new compact waterfront with high-rise buildings. This paper will address two key questions concerning social and environmental sustainability criteria. Firstly, what are the characteristics of high-rise, high-density compact urban form? And secondly, how high rise, high-density compact cities could address the social and environmental sustainability in Dubai Marina?

The methodology is based on a mixed method approach involving both qualitative and quantitative (Statistical Analysis and SPSS software) of case study of Dubai Marina.

Keywords: Compact city, real estate values, tall buildings, urban development, waterfront development

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**MNR5**

## Housing Market Annual Gross Yield Modelling: A Comparison between two Dynamic Markets (Istanbul and Dubai)

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**Olgun Aydın**, *Mimar Sinan University, Institute of Science, Department of Statistics, Turkey*

**Orhan Vatandaş**, *REIDIN Lead Data Analyst, Turkey*

The main purpose of this study is to investigate whether there is a long-run relationship between macroeconomic indicators and residential returns for two dynamic markets (Istanbul and Dubai). This paper uses the monthly residential return data for the twelve year period from January 2003 to December 2014 provided by REIDIN. In order to identify long term equilibrium between residential returns and macroeconomic indicators, correlation analysis, impulse response analysis and kriging metamodelling are utilized for the study. The findings of this paper would help government and property investors for creating more effective property management strategies in these markets.

Keywords: Correlation analysis, impulse response analysis, kriging metamodelling, macroeconomic indicators, residential returns

## Multi-disciplinary Real Estate Education: A Comparison of a US and European Approach

**Margaret McFarland**, *University of Maryland, USA*

**Hossein Lavasani**, *University of Maryland, USA*

Real Estate education in the US at the graduate level has had a "bumpy" time in US academic institutions. Up until the year 2000 or so, most real estate was taught, if at all, in business schools as a finance/valuation proposition. There was little or no bow to the Graaskamp model of multi- and inter-disciplinary curriculum in recognition of the diverse disciplines that impact real estate and hence the need for a curriculum to match. In 2006 when the University of Maryland established its Master of Real Estate Development [MRED] program it embraced the multi-disciplinary approach, and was the 7th program in the US based outside of a Business School, offering a more extensive (and broader based) education for real estate professionals. There are now more than 20 such programs in the US as well as multiple programs across Europe. Each program is quite unique and can be compared for differences in curriculum, pedagogy, delivery method (executive, on line, face to face), student background preparation, emphasis on professional skills development, as well as type of faculty (research, clinical, professional) and desired outcomes/positions for students. This paper compares two programs with similar objectives but very different delivery methods -- one in the US (Maryland) the other in Bucharest, Romania. The Maryland program is now 9 years old and has evolved with a parallel emphasis on financial competency as well as professional skills development. The Advanced Studies in Urbanism and Real Estate Development (ASURED) established in 2014 is affiliated with the "Ion Mincu" University of Architecture and Urban Planning and is accredited by RICS. This paper will address what are the common, as well as dissimilar, elements of each program and provide a further basis for consideration of educational standard setting in real estate education, both in US and Europe.

Keywords: Curriculum, diversity, pedagogy, professional skills, multi-disciplinary

## N-6

### Industry Expectation of Australian Property Higher Education Programs

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**Purpose:** Property education is predominantly taught at undergraduate level, supported by post-graduate programs at many Australian universities. This paper examines undergraduate property programs from the perspective of one of the major stakeholders; the property industry. The current offerings have evolved from highly applied practical valuation-centric programs in the 1970s to broader, more academic programs in the current era. This change has created different expectations for both students and industry. **Methodology:** Initially a focus group of six property industry employers was held and their discussion is included in the paper and informed the development of a questionnaire using the online delivery vehicle Qualtrics. This questionnaire was emailed to 460 industry leaders, as listed on company websites and university Employer of Choice databases. 95 people responded to the questionnaire.

**Findings:** After surveying students, recent graduates and industry leaders, it appears as if there is a gap between what the universities claim about their graduates and what many employers of property graduates find. Despite the best efforts of the universities and their staff, despite robust and rich curricula, it would appear that evidence from industry and the Australian Property Institute who register practitioners, is that most graduates require specialist training and additional study before they can be considered work ready.

**Value:** This paper offers valuable insights with regard to how higher education property programs are regarded by the property industry in Australia.

**Keywords:** Industry expectations, accreditation, real estate education, work experience, work ready graduates

## Creating Future-Proof Learning Environments - A Study on Educational Objectives and Conceptual Decision-Making

Pieter Le Roux, *NHTV Breda University of Applied Sciences, The Netherlands*

Changes in the demographical composition of student numbers, their educational expectations and advances in didactic formats require that educational institutions review the link between their physical learning environments and their educational visions. In general, educational visions respond to “changing social demands and technological developments, innovations in the industry, new insights within knowledge domains, and last but not least, results from educational research” (NHTV, 2014). The purpose of the current on-going study is to research changes and developments in educational goals and objectives (in response to the educational vision), and rank conceptual decision-making on creating responsive and future-proof learning environments in order of relevance and applicability to the specific educational vision in question.

The current research design applies multiple methodological approaches. Part of this approach consists of a similar methodology as was discussed in earlier research on the application value of a process model for supporting decision-making in property and real estate management education (Le Roux, 2014) as was presented at the 2014 ERES conference in Bucharest, Romania. As such, this process model for supporting decision-making on organisational accommodation is applied as a central structuring element in determining educational objectives for / with new learning environments. In addition to the application of this process-model for supporting decision-making, literature on quality function development is applied to assist in the ranking of conceptual choices for elaborating and implementing solutions for future-proofing learning environments.

The originality and value of the current research lies in the combination of multiple research methodologies in facilitating evidence-based decision-making on future-proof strategies and approaches to creating more responsive learning environments. This is particularly true in terms of the application of the theoretical knowledge associated with quality function deployment (QFD) in learning environments.

Keywords: Decision-making, educational vision, learning environment, quality function deployment, responsive

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# N-6

## Ethics in Real Estate Firms in India

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The real estate sector has been the backbone of the Indian economy and has been a major contributor in the economic growth. The real estate developers have been instrumental in changing the face of India from being an under-developed country towards accelerating its way to a developed country. Real estate transactions are not only getting larger in numbers in India but also involve increasingly large sums of money. The real estate market has been known for its lack of transparency in the past, but the trend is changing rapidly. The larger property consultancies are handling a number of international clients now – clients who are eager to enter or expand operations on the Indian subcontinent. Such clients have high standards in terms of service quality and clarity, and are often justifiably worried about being taken for a ride by unscrupulous operators. They initially have to depend on is the tangible, verifiable ethical approach of their real estate partners on this end. The facets of ethical business conduct in India pertain to clients, others to employee conduct and yet others to government authorities. Sets out to examine the expectations of ethics in real estate firms in India. It surveys real estate agents and their clients on their expectations of ethics in property transactions. Draws conclusions pertaining to ethical expectations from the results of this field work. This paper aims to focus on the importance of rules of conduct and professional ethics from the perspective of RICS (Royal Institute of Chartered Surveyors) code of ethics.

Keywords: Real estate, business conduct, business conduct, ethical practices, real estate firms

## **Future Direction of Real Estate Education for the Certificate Programs at National Institute of Valuation (INSPEN)**

**Mohd Haris Yop**, *National Institute of Valuation (INSPEN), University of Malaya, Malaysia*

Real estate education is a unique program specifically develops to educate and equip students with strong knowledge and principle of Real Estate that lead to and sustain a productive Real Estate based career in future. The direction of real estate education necessitates an important emphasis on the managerial, empirical and decision-making aspects of the respective industry. INSPEN is established with a function to execute educational programs with a particular emphasis on the needs and wants of the aforesaid industry. The vision of INSPEN is to realize a high quality form of education and diversification of skills in career in real estate through basic real estate education at the aforementioned establishment. Therefore, the study to aim the relevancy of existing subjects in meeting the current and future direction of real estate education provided by INSPEN certificate programs and to fill a lack or gap on generic skills and knowledge outcome from industrial perspective and students' experiences. The results indicate that Real Estate Valuation was the most important subject from the participating graduates and industry professionals respectively and the following the subject was Industrial Training. Technical knowledge recorded a somewhat higher score with an advantage. On the other hand, a small difference of score was recorded for skills such as Mathematical competence, English fluency and writing eloquence. Four generic skills were in line with the future educational direction proposed by INSPEN for its certificate programs. There was also a suggestion that INSPEN should offer courses beyond the certificate level in partnership with universities and conduct part-time courses for working and non- working executives who are already in the real estate industry.

Keywords: Generic skills, industrial perspective, knowledge, real estate education, students experiences



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**N-8****Blended Learning in Real Estate Education: A Survey****Bob Thomson**, *Remit Consulting LLP, UK***Bob Martens**, *Vienna University of Technology, Austria*

Blended learning is to be regarded as a didactical meaningful combination of traditional face-to-face instruction and state-of-the-art e-learning formats. The efficiency and flexibility of computer-mediated forms of learning are combined with the social aspects of face-to-face communication. In other words a useful learning arrangement which combines modern-day means of networking through the internet and 'classical' learning methods and media.

At the time of writing, blended learning has been operational for some fifteen years. Normally this would be long enough for optimal models to have evolved and regimes to be established to measure the effectiveness of the techniques employed. However, blended learning involves the use of technology – at least in part – and fifteen years is a long time in technology terms.

Early online learning developed as an asynchronous process – especially outside the traditional University environment. As a student-centred teaching method it uses different resources to facilitate information sharing among a network of people. It is not constrained by time or place but was constrained by technology, particularly low bandwidth that restricted the complexity of course material and effectively prevented the construction of synchronous interaction. More recently, with the effective removal of bandwidth constraints, synchronous online learning has been developed as a way of addressing the issues of transactional distance experienced with asynchronous learning.

It must be noted that real estate education is not at all unified. Major differences may exist concerning (blended) learning. In order to verify this assumption, a survey about the use of blended learning in real estate education has been conducted. Survey results have been triangulated with a number of in-depth interviews with course directors and leaders. In addition case studies of blended learning practice are presented to add context to the study.

Keywords: Computer mediation, content management system (CMS), learning models, teaching METHODS, virtual learning environment (VLE)

## What Do Students Need To Know About Property? What Do Textbooks Actually Teach About Property?

**Stephen Roulac**, *Roulac Global, USA*

To function effectively in multiple roles and priorities concerning property students need to know property knowledge that they would not know prior and sadly, all too prevalently, after to an introductory real estate principles course. These roles subsume responsible citizen, consumer of property goods and services, choosing place in which to live, selecting and arranging the terms of a particular property interest, property in business, development and the place making process, property financing and investing, and the various functions of property and the careers associated with those property functions. This big scope, big scale, big tent knowledge prescription implies an audience for property education extending well beyond those who might work in the property discipline per se. Introductory property textbooks, however, are predominantly oriented to those who would pursue property careers.

The design of a property curriculum necessarily follows from consideration of the scope and particulars of the property discipline as widely recognized and practiced. If the property discipline is considered narrowly, as it most often is, then the needed knowledge may be very different than if the property discipline is considered more broadly, as it too seldom is. Consider the differences in how need to know property knowledge might be defined from such contrasting perspectives as:

- Sell side or buy side
- Business level or individual consumer level
- Private property or public good
- Property owner or tenant
- Property provider or property user

The property discipline is most be effectively considered from dualistic perspectives, a portfolio of yin and yang contrasts. Just as property practitioner and professionals education must reconcile the challenge of balancing established institutions and new models, tradition and innovation, continuity and discontinuity, so, too, must the articulation and instruction of property knowledge reconcile these competing objectives. This task is made even more fraught by the extraordinary change in so very many elements of the property discipline.

This paper builds on an empirical content analysis of real estate textbooks in relationship to their relative emphasis on major categories of knowledge, to consider the degree to which these textbooks cover the major perspectives that may be favored for property knowledge. A structure to organize property discipline knowledge into 15 property knowledge domains is provided

Keywords: Education, academics, real estate

# **N-8**

## **Integration of Internationally Orientated Content into Real Estate Education Programmes - Exemplified by the Degree Programmes at Nürtingen-Geislingen University**

**Gisela Vogt**, *Nürtingen-Geislingen University, Germany*

**Dieter Rebitzer**, *Nürtingen-Geislingen University, Germany*

The integration of internationally orientated content modules in English language into the curriculum of real estate education programmes is frequently required by accreditation agencies and university management, also however by the job market and employers. One of the challenges in the process is to provide the language skills required and to tailor the internationally orientated content modules in such a way that they represent an integrated part of undergraduate and graduate programmes. The first part of the following paper presents an example of how students with largely varying levels of English language skills at entry level enhance their language proficiency skills and are introduced to the most relevant technical real estate terms in order to meet the needs of the job market and to complete internationally orientated content modules in English language successfully. In the second part of the paper examples will be given of successful integrations of internationally orientated content modules in English language within the Bachelor and Master programmes of Nuertingen-Geislingen University.

Keywords: Internationalisation, real estate education

## The Performance and Diversification Benefits of European Non-listed Real Estate Funds

**Graeme Newell**, *Property Investment School of Business University of Western Sydney, Australia*

Non-listed real estate funds are an important real estate investment product in the European real estate landscape. These non-listed real estate funds provide investors (eg: pension funds, sovereign wealth funds) with exposure to high quality real estate portfolios in the European region.

Using the INREV non-listed real estate fund index, the risk-adjusted performance and diversification benefits of European non-listed real estate over 2010-2014 is assessed. This is further assessed for European non-listed real estate fund performance by style (core, value-add), country, region, sector (single sector, multi-sector) and structure (closed end, open end). This paper provides important insights into the benefits of European non-listed real estate in a portfolio.

Keywords: Diversification benefits, Europe, non-listed real estate funds, risk-adjusted performance, sub-sectors

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# 0-1

## Evaluating Financial Health of Real Estate & Construction Industry in India

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Real Estate & Construction sector plays an important role in the development of a country's base. Understanding its performance would be crucial as, in India, it is one of the largest contributors to the Gross Domestic Product (GDP) and one of the largest generators of economic activity. Real estate & construction sector in general, is perceived to be financially more risky compared to other sectors of the economy. The current research extends and adds to the extant literature by investigating the financial health of Real Estate & construction firms in India. Financial ratio analysis which is one of the most widely used tools for financial performance evaluation is used for this study. The following major categories of ratios have been used for the analysis-Efficiency, Profitability, Solvency and Liquidity. The time period for the study is 2009-2014. Publicly listed Indian real estate & construction companies which are engaged in the development of retail, commercial, residential and civil services are examined. A sample of 20 real estate & construction companies listed on Bombay Stock Exchange (BSE) and National Stock Exchange (NSE) was selected for this empirical research. All of the selected sample Indian real estate & construction firms have a market capitalization of more than Rs. 100 crores. The research study relies on secondary data based on firms' annual reports and financial statements. The research provides important insights into the financial performance of real estate & construction firms in India and the findings are encouraging for the growing real estate & construction sector. The findings will be useful for investors and government policy makers.

Keywords: Construction, financial analysis, India, ratios, real estate

## **Mortgage Financing and the Performance of Real Estate Business in Uganda; Lessons a From a Developing Country Context**

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The study was prompted by increased development of real estate in Uganda particularly Kampala. The purpose of this study was therefore to establish the relationship mortgage financing and performance of real estate in Uganda. To achieve the above purpose, a cross-sectional research design together with the quantitative research design was used in the survey. The survey population included Mortgage Beneficiaries and Real Estate Firms in Kampala District. Snow ball sampling method was used to select samples used in the study. Self administered questionnaires were used to collect data from Mortgage Beneficiaries and Real Estate Firms. Data was collected from 297 respondents with a response rate of 84%. Data was analyzed using (Statistical Package for Social Scientist) SPSS. Pearson's rank correlation coefficient was used to measure the strength of the relationship between variables and a regression analysis was used to determine the extent to which the dependant variable could predict a change in the independent variable. The findings indicated that Mortgage Financing and Performance of Real Estates are significantly correlated. From this study, it is recommendable that in a quest to improve real estate performance, other factors like; Political stability, training for employees in mortgage banks and promptness in the authorization and appraisal process of mortgage loans should be given attention.

Keywords: Mortgage finance, real estate, agency-brokerage, rental income, return, risk

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**0-1**

## **CAPM versus Expert Opinion: Do Practitioners' Perceptions Meet Theory? Evidence from the Survey of Estonian Commercial Real Estate Market**

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According to finance theory, several methods (either direct or indirect) can be used to calculate investor's required rate of return. In case of direct method, the value of required rate of return will be given by investors themselves, which depend heavily on investors' levels of risk aversion. In case of indirect methods, the required rate of return is calculated using current or historic data. The major difficulty here is that actual required rate of return cannot be observed from market data and that is why scholars have to estimate different rates of return, using various techniques. One of the most well-known and widely used methods in theory and also in practice for estimating required rate of return of an investment is capital asset pricing model (CAPM).

Although widely used, CAPM has still got a quite heavy criticism by several. Therefore, the authors of the paper have an intention to test the correctness of the estimation of long-term rates of return, calculated by CAPM on real estate market experts in Estonia. Real estate market has chosen as the test-market sector because of its explicit framework. Estonia as a test-country has been chosen because of the secondary intention to prove the applicability of CAPM also on smaller markets. The aim of the authors of the paper is to compare coherence between the expert opinion and the theoretical calculation of the most appropriate long-term rates of return for commercial real estate projects on the example of Estonian real estate market. Knowingly to the authors, there has been not done similar kind of survey so far, implying to the possible gap in the literature.

The survey findings show that the results acquired through the questionnaire conducted among real estate appraisers, investors and consultants in Estonia verify the correctness of the result of required rate of return obtained by CAPM, based on long-term historic data. Based on both results, the average long-term required rate of return of a typical market participant, considering typical commercial real estate in Estonia, is rounded to 9%.

Keywords: Capital asset pricing model, commercial real estate market, market expert opinion, real estate investment, required rate of return

## UK REITs Don't Like Mondays

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The research examines whether REITs returns on the different days of the week differ from each other. It uses EPRA/NAREIT UK Index daily closing values (GBP) and its two sub-indices FTSE EPRA/NAREIT UK REITs and Non-REITs as dependent variables. It employs Kruskal-Wallis (KW) tests and dummy-variable regression to test the hypothesis. In addition to that, the study introduces dummies for outliers to control for observations that are distant from other data-points. The overall findings provide evidence that return anomalies exist in the UK REITs. Investors can therefore gain superior returns in UK REITs by recognising the day-of-the-week effect.

Keywords: Anomaly, calendar, REITs, returns, UK



# 0-2

## Herding in the UK Real Estate Market

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Previous studies of “herding” are largely concentrated in the stock market and have shown contradictory results depending to a great extent on the adopted estimation model. It is important therefore to examine herding behaviour in different asset markets using a number of models. This study therefore contributes to the literature on “herding” by studying the propensity for investors in the UK private real estate market to exhibit herding behaviour using monthly data over the period 1987-2014 using a number of model specifications.

Keywords: Herd behaviour models, UK private real estate data

## **Idiosyncratic Risk in Direct Property - A Review of the Literature**

**David Parker**, *University of South Australia, Australia*

Idiosyncratic risk in listed property securities has been widely investigated and reported in the literature. Less attention has been paid to idiosyncratic risk in direct property. This paper seeks to review the current state of the literature concerning idiosyncratic risk in direct property and identify opportunities for further research.

Keywords: Direct, idiosyncratic, property, risk, specific

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**0-2**

## European REITs NAV Discount: Market Sentiment and Fundamental Factors

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**Alessandro Baccarin**, *Bocconi University, Italy*

This paper analyzes the NAV discount of European REITs listed in France, in the Netherlands and in the United Kingdom between 2003 and 2014 considering both the “rational” and the “noise trader” approaches. The analysis examines the hypothesis that discounts (premiums) are the result of leverage, size, liquidity, risk, performance, investment activity and sentiment. The results on traditional NAV discount are compared with those obtained using an unlevered NAV discount formula introduced by Morri, et al. (2005) that cleans for the bias generated by the level of gearing. Among the main conclusions emerge that REITs in different markets have different behavior. Moreover, the relationship that leverage has with the traditional NAV discount is positive for England and France based REITs, while it is negative for the Netherlands based REITs. When the discount is adjusted to remove the bias due to the level of debt, the relationship between leverage and unlevered discount became less pronounced in all cases. Higher liquidity commands lower discounts for French REITs, while Dutch and British REITs, which trade in markets that are characterized by a higher number of average daily transactions, do not seem to suffer discounts (premiums) derived from liquidity. Operational risk and performance are for all the three samples significant to explain the NAV discount, the first having a positive relationship with the discount, and the second having a negative relationship with it. Later a new formula that adjusts the NAV discount for the investor sentiment is introduced with the aim of identifying better firm specific factors that contribute to the discount in order to clean possible distortions induced by sentiment. Sentiment, when measured using the average sector discount, deeply affects the discount, accounting alone for 10% to 15% of the explicative power of the model considered. The results confirm the findings obtained using non-sentiment adjusted regressions, even if reaching a lower level of R-squared. Changes of behavior between growth periods and during crises are also investigated. A further analysis of the NAV discount in phases of upswing and downturn allows to say that, while fundamental factors are more relevant and stable when the market is growing, price fluctuations during periods of recession are heavily influenced by market sentiment, and fundamentals do not describe the dynamics of the NAV discount in a satisfactory way.

Keywords: NAV discount, REITs, closed-end fund puzzle, leverage, noise traders

## The Impact of Tenant Diversification on Spreads and Default Rates for Mortgages on Retail Properties

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**Michael Shafer**, *Providence College, USA*

**Yildiray Yildirim**, *Syracuse University, USA*

We use an empirical model of commercial mortgage spreads to examine how tenant diversification impacts credit spreads for mortgages on retail properties. We find that mortgages on properties with a highly diversified tenant base have spreads that are up to 8.5 basis points higher than spreads on mortgages for single-tenant properties, but that mortgages on properties with moderate levels of tenant diversification have spreads that are up to 5.5 basis points lower than mortgages on single-tenant properties. The spread discount for mortgages on properties with moderate levels of tenant diversification disappears when the lease of the property's largest tenant expires before the loan matures. Despite the spread discount that is given to properties with moderate levels of tenant diversification, we find that the likelihood with which a mortgage goes into default increases as tenant diversification increases.

Keywords: CMBS, mortgage spreads, tenant diversification

## 0-3

### **Behavioural Biases among Real Estate Investment Decision Makers. Has Anyone Seen My Neo-cortex? I'm Sure I Left It Here Somewhere.**

**Stephen Ryan**, *Mercer, Ireland*

**Matthew Richardson**, *Fidelity Worldwide Investment, UK*

Purpose – To examine whether investors in commercial real estate exhibit some important behavioural biases, namely: anchoring, herding, framing/nudging, loss aversion and over-confidence. If so, are there steps that investors and their agents (fund managers and advisors) could take (a) to temper the effects of their own biases and (b) to exploit the presence of such biases in other market participants?

Design/methodology/approach – Analysis of historic data sources at asset and market levels and over different time periods, with focus on identifying the specific biases listed above, singly and in combination

Findings – Understanding of behavioural bias merits greater attention.

Research limitations/implications – Reliance on inferences from historic data

Practical implications – May help develop clearer understanding of market drivers and improved decision-making for market participants.

Originality/value – New research within the real estate industry that could help investors understand the highly cyclical nature of commercial real estate investment markets

Keywords: Behavioural biases, anchoring, herding, framing, loss aversion, over-confidence

## Decisions, Decision-making, and Decision Support Systems in Real Estate Investment Management

**Patrick Krieger**, *ImmIT – Nürtingen-Geislingen University, Germany*

**Carsten Lausberg**, *Campus of Real Estate Nürtingen-Geislingen University, Germany*

**Purpose** – To date there is no such thing as a real estate decision theory. If we want to understand real estate-related decisions we have to resort to general decision theories and adapt them to this asset class. In our paper we do so for real estate investments. More specifically we examine the characteristics of letting and other investment decisions, their integration in the decision-making process, and the technical means available to support the decision-makers. As a theoretical basis we use dynamic decision theory which is not as restrictive as other decision theories and better corresponds to the time-dependent and interdependent nature of many investment decisions. Based on our analysis and a case study we develop a set of forward-looking indicators for real estate investment decisions and a concept for a scoring-type decision support system.

**Design / methodology / approach** – At first we present an overview of the literature, covering sources from psychology, informatics, and real estate. Afterwards we employ a case study to demonstrate that dynamic decision theory better corresponds to reality than classical decision theory. Based on these findings we describe our view of real estate decision-making and set up criteria for decision support systems in real estate investment.

**Findings** – The literature review revealed that there are a lot of findings in the distinct research disciplines that have never been applied to real estate. Furthermore we found that interdependencies and feedback processes are typical for real estate investment decisions. Hence, dynamic decision theory seems much more applicable to develop suitable indicators and factors for a decision support system.

**Research limitations / implications** – More research is needed to validate the dynamics in cash flow pattern and to form a complete decision support system.

**Originality** – The paper provides a new viewpoint on decision-making in real estate investment and qualitative factors of decision support systems in this area.

**Keywords:** Behavioural finance, complexity, decision support systems, dynamic decision-making, key indicator

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**0-3**

## Explaining the Discount in Closed Open-Ended Real Estate Funds in Germany

**Sebastian Schnejder**, *University of Regensburg, Germany*

**Michael Heinrich**, *University of Regensburg, Germany*

In succession of the financial crisis various German open-ended real estate funds were closed and are now forced to fully liquidate their assets. Since Germany has an underdeveloped REIT market compared to most Anglo-Saxon countries, this has severe consequences for the efficiency of the capital allocation towards real estate. The paper therefore investigates to what extent the closing of these open-ended real estate funds were caused by their own economic situation (captured by e.g. liquidity ratio, asset structure). In detail, the paper analyses the upcoming discount in closed German open-ended funds. The discount is defined as the difference between the Net Asset Value and the aftermarket share price of the fund. The panel dataset contains unique monthly data for 9 finally closed open-ended real estate funds in Germany from 2008 to 2014. One first result indicates that fundamental economic operating numbers of the specific open-ended real estate funds can't fully explain their discount. Therefore the Closed-End Fund Puzzle theory may be up to an adjustment in the context of open-ended real estate funds in order to identify suitable variables for irrational and herd behavior in explaining the discount on the macro-level.

Keywords: Germany, NAV discount, closed fund, herd behavior, open-ended fund

## The Changing Real Estate Market Transparency in the European Real Estate Markets

**Graeme Newell**, *Property Investment School of Business University of Western Sydney, Australia*

A key ingredient for increased investor confidence in the European real estate markets has been the improved real estate market transparency in the European markets in recent years. Using the JLL global real estate transparency index, countries are classified as high transparency, transparent, semi-transparent, low transparency and opaque.

This paper assesses changes in the real estate transparency for 33 European real estate markets over 2001-2014. This is also assessed in a regional and global real estate market context. Differences in real estate transparency between the developed and emerging European markets are also highlighted.

Keywords: Developed markets, emerging markets, Europe, JLL, real estate market transparency



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**0-4**

## Volatility Transmission: A Global Tri-Variate Analysis of Public Real Estate and Foreign Exchange Markets

Simon Stevenson, *University of Reading, UK*

A large number of papers have examined various aspects concerning the volatility of the public real estate sector. Whilst this literature initially tended to concentrate on the volatility dynamics of single-domestic markets (e.g. Stevenson, 2002; Cotter & Stevenson, 2006, 2008; Liow, 2009; Liow & Ibrahim, 2010) it has increasingly examined the international issues. This strand of research is also tied in with those papers to have considered spillovers and contagion affects in returns (Michayluk et al., 2006; Liow et al., 2011; Hoesli & Reka 2011; Yang et al., 2012; Zhou 2011). Two recent papers (Liow, 2012, Stevenson, 2013), in turn extend this literature to consider the drivers of integration across international securitised real estate markets. This study further extends the above cited pieces of research to more fully account for the impact of exchange rates. It analyses the volatility transmission between the public real estate and foreign exchange markets. This is undertaken using a trivariate specification of the Baba, Engle, Kraft and Kroner-generalised autoregressive conditional heteroscedasticity (BEKK-GARCH) model. The analysis extends from 1990 through 2014 and the results highlight the importance of factoring in fully the currency markets into any analysis of international investment.

Keywords: Contagion, international investment, public real estate, volatility, volatility transmission

## The Irish Real Estate Bubble: A Behavioral Finance Perspective

**Paul Ryan**, *University College Dublin, Ireland*

**Clare Branigan**, *University College Dublin, Ireland*

Between the mid- 1990's and the mid- 2000's, in a period characterized as the Celtic Tiger, the Irish residential real estate market experienced a boom. During the 13 years from 1994 to 2007 house prices rose in excess of 400% and then in September 2007 they started to collapse with a sustained decline continuing for almost six years eventually stabilising in March 2013. From peak to trough this fall was in excess of 50% and in modern times is second only to Japan in terms of magnitude. This series of years of steady price rises accompanied by sustained price declines constitutes a classic speculative bubble which, when it finally burst, had disastrous consequences not only for the housing market, but also for the banking system and the entire Irish economy triggering eventually triggering a bailout from the IMF, European Commission and European Central Bank. This paper explores the role that individual's emotions potentially played in firstly escalating and eventually pricking this bubble. To do this we conduct a textual analysis on official reports (including IMF and OECD reports) as well as commentary on the real estate market as reported in the media as prices firstly escalated and eventually declined. We also perform a textual analysis of the official reports that were commissioned after the collapse to investigate their analysis of the causes of the bubble. Our findings are consistent with Kindleberger and Aliber (2011) who couch their model of market bubbles in terms of human emotions, though the official reports into the causes of the crisis were largely silent on emotions as a primary driver. Our results have implications for the effectiveness of official policy responses to prevent a similar bubble emerging in the future

Keywords: Dublin, behavioural finance, bubbles, rationality

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**0-4****Does Being Islamic or Shariah-compliant Affect Capital Structure? Evidence from Real-estate Firms in the Gulf Cooperation Council States.****Omokolade Akinsomi**, *The University of Witwatersrand, South Africa***Seow Eng Ong**, *National University of Singapore, Singapore***Muhammad Faishal**, *National University of Singapore, Singapore***Graeme Newell**, *Property Investment School of Business University of Western Sydney, Australia*

This paper examines how compliance to Shariah principles may be associated with a firm's capital structure choice. Shariah compliant real estate firms measured by those listed on the Dow Jones Islamic Index and Islamic real estate firms measured by firms with an internal Shariah board have significantly lower leverage than general real estate firms in the Gulf Cooperation Council. Furthermore Islamic and Shariah compliant real estate firms are different from general real estate firms however these differences do not explain previous findings. Firm characteristics are controlled for and a fixed effect regression is employed, results explaining differences in leverage is significant at the 1% level for Islamic real estate firms and inconclusive for Shariah compliant firms.

Empirical findings in this paper show that it may be over-simplistic to assert that Shariah-compliant and Islamic real estate firms have less leverage than their general counterparts. After controlling for firm characteristics and fixed effect on each firm, results of lower leverage remain persistent in Islamic real estate firms. Differences in lower leverage by Islamic real estate firms is explained by poor access to the debt market and the unwillingness of Islamic real estate growth firms to explore leverage as a source of capital.

Keywords: Shariah compliance, capital structure, leverage, real estate firms, gulf cooperation council

## Establishing a Blended Global Real Estate Investment Strategy Using Transaction Based Indices

**Alex Moss**, *Consilia Capital, UK*

**Hans Vrensen**, *DTZ, UK*

**Nigel Almond**, *DTZ, UK*

There has been significant interest over the last three years in combining listed real estate securities with direct or unlisted real estate to provide a “blended” investment solution, which both improves liquidity and optimises risk adjusted returns over the cycle. Following recent work on combining a UK direct portfolio with a global listed portfolio, we have expanded our geographic sample to Asia, Europe, and the US.

Data we use the new series of transaction based real estate indices provided by DTZ in Europe and Asia, but for the US we use the Moodys CPPI Index. We will use the IPD and NCREIF valuation based indices for the UK, Europe and Asia, respectively for listed securities we use the EPRA Global developed Index. Our data covers the period 2002-2014

Purpose The aim of the study is to answer four questions: 1) Is the benefit to risk-adjusted returns shown for incorporating global listed real estate securities with a UK direct property fund also apparent if the direct property element comprises European, Asian, and/or US assets? 2) How does the performance impact change over the cycle? 3) Is there a benefit to using transaction rather than appraisal based indices for the US and Europe? 4) Do the results alter materially if global real estate securities funds data is used rather than the EPRA Index?

Keywords: Blended portfolios, global real estate, Indices, Investment strategies, transaction based indices

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**0-6**

## Investor Protection, Corporate Governance and Firm Performance: Evidence from Asian Real Estate Investment Trusts

**Annisa Dian Prima**, *INREV, The Netherlands*

**Simon Stevenson**, *University of Reading, UK*

This study aims to investigate the impact of investor protection on Asian REITs valuation and performance. The relationship between investor protection and corporate governance mechanisms, namely board independence, concentrated ownership by outside blockholders and sponsors are also examined in this study. The sample consists of 317 firm year observations from 57 REITs across Japan, Singapore, Hong Kong and Malaysia with 10 years period between 2002 and 2012. The findings show that REIT with stronger investor protection is associated with higher firm valuation. Investor protection, however, is found to have only a weak positive effect on REIT performance. The results further reveal that investor protection can be a substitute to a weak level of board independence, but not vice versa. The results also suggest that investor protection serves as a complement to the monitoring of outside blockholder. More importantly, there is no evidence that REIT sponsors expropriate unitholders' wealth when there is a weak investor protection in place. Overall, the findings show that Asian REIT unitholders are generally protected, with an average score of 14 out of 18. However, there is still room for improvement to foster an investor confidence to facilitate the development of the Asian REIT market in the future.

Keywords: Corporate governance, REITs, Asian markets

## Measurement and Drivers of Time to Transact UK Commercial Real Estate Investments

**Steven Devaney**, *University of Reading, UK*

**David Scofield**, *University of Aberdeen, UK*

Trading commercial real estate involves a process of exchange that is costly and which occurs over an extended and uncertain period of time. This has consequences for the performance and risk of real estate investments as well as the strategies that investors can adopt. Despite this, the vast majority of research on transaction times has occurred for residential rather than commercial real estate. We conduct a study into the time taken to transact commercial real estate investments in the UK, using a sample of 578 transactions over the period 2004 to 2013. We measure average times to transact from both a buyer and seller perspective and we conduct econometric analysis to explain variation in transaction times between assets. The median time for purchase of real estate from introduction through to completion was 104 days and the median time for sale from marketing to completion was 135 days. However, there is considerable variability around these medians and the results from Cox Proportional Hazard models suggest that this is related to market state, type and quality of asset and the type of participants involved in the transaction. Our findings shed light on the drivers of liquidity at an individual asset level and can be used in models that try and quantify the impact of uncertain time on market on real estate investment risk.

Keywords: Hazard models, liquidity, real estate risk, time on market, transaction process

# **P-1**

## **A Comparative Study on REIT Returns in Istanbul Stock Exchange by Using Single Index and Fama-French Methods**

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**Yener Coşkun**, *Capital Markets Board of Turkey, Turkey*

**Bilgi Yılmaz**, *Middle East Technical University (METU), Institute of Applied Mathematics, Turkey*

However its popularity has been rising recently, the root of Turkish REITs industry backs to mid-1990s. Representing the critical linkage between finance and real estate, the industry has special importance in Turkish financial and real estate sectors. In this study, the performance of REITs return, in Istanbul Stock Exchange for the period 2008-2013, is analyzed by defining its determinants and comparing the efficiency of single index and Fama-French three factor models. There are three main contributions in this study. As the first in Turkish REITs literature, a major contribution of the study is to show differences of the return variability on individual stock returns based on single index and Fama- French models. From a practical contribution perspective, this study may have wider application and provide a tool for critical decision-making in the REITs portfolio management. The study also provides information to the investors who are willing to get benefit from diversification by investing in REITs. Initial outcomes suggest that REIT return may show difference according to proposed model and macroeconomic and real estate market related variables may have specific effects on return variability.

Keywords: Fama-French three factor model, portfolio management, REIT, risk diversification, single index model

## The Effects of REIT Sub-Categories on Mixed-Asset Portfolios in South Africa

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**Boitumelo Masilela**, *The University of Witwatersrand, South Africa*

**Nishaan Ansary**, *The University of Witwatersrand, South Africa*

This research aims to determine the effect of various REIT sectors on mixed asset portfolios in South Africa. By using quarterly data and the Markowitz Mean Variance framework the effect of each REIT sector on a mixed asset portfolio is determined. The REIT sectors in South Africa are limited to Diversified, Industrial & Office, Retail and Specialty REITs. Data for this research was gathered from the McGregor database which is linked with the Johannesburg Stock Exchange. All of the data including the REITs stock prices, the All Share and the All Bond was sourced from McGregor Database from January 2004 to December 2013. Results show that there seems to be more substantial evidence that specific REIT sub-categories can achieve lower portfolio risk than All REITs portfolio. Our findings indicate that Diversified REITs, Industrial & Office REITs as well as Specialty REITs are all able to achieve lower portfolio volatility than All REITs. Retail REITs seem to be the riskiest REIT sub-category. This study is relevant for investors such as pension funds, government sovereign funds and mutual funds who are interested in diversifying their portfolios to include specific sector of REITs and most importantly reducing volatility.

Keywords: REITs, real estate portfolio management, returns, risk, South Africa



# **P-1**

## **Investment Risk in the Context of Price Changes in the Real Estate and Capital Markets**

**Rafal Wolski**, *University of Lodz, Poland*

It is believed that the residential real estate market tends to be subject to strong price fluctuations. This is an element of risk, which directly affects investors and not just those who are interested in speculation, but also those who cater to that market their housing needs. Strong fluctuations in real estate values are reflected in the many dimensions of the financial condition of the investors. Affect the possibilities of meeting the housing needs, limits, and sometimes raises the credit rating, raises investment risk measured with measures of volatility. Apart from the obvious social aspect and focus on the financial aspect, the author examines how the occurrence of price bubbles is a characteristic for the housing market. In this context, it was decided to compare the volatility of the capital market and the housing market in Poland. Checked the correlation between these markets and the power of change of price indices, as well as individual assets. Applications can help rationalize decisions regarding the allocation of capital, and not just about the motives of speculative investors, but also to those who satisfy their housing needs. Being able to compare, they may decide of particular direction of investments, as well as they may choose between buying or renting an apartment.

Keywords: Capital market, housing, real estate, risk

## Pricing of IPOs: The Unique Case of Turkish REITs 21

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The legal foundation of the Turkish Real Estate Investment Trust (REIT) structure, put in place in 1995, is considerably different and more complex than those observed elsewhere and predates those in Singapore, Japan, France, and the UK. Our paper builds on the unique legal and institutional details about Turkish REITs, as elaborated in Erol and Tirtiroğlu (2011), and studies the pricing of their initial public offerings (IPO) between 1996 and September 2014. Turkish REITs enjoy complete flexibility in their dividend policy while being exempted from corporate taxes and also exhibit a legally mandated concentrated ownership structure. Further, they have some legally allowed flexibility in the asset allocation of their portfolios. While Turkey exhibits substantial macroeconomic uncertainty early on, it abates quite visibly, even during the Global Financial Crisis, since mid-2000s. We document empirically underpricing in the late 1990s and early 2000s and then fair or overpricing in late 2000s and early 2010s. This finding differs from those of no underpricing for REIT IPOs from the US market beyond the late 1990s. As a control sample, we also focus on all non-REIT Turkish IPOs issued during the same sample period and offer comparative evidence on the pricing of REIT and non-REIT IPOs.

Keywords: IPO pricing, Turkish REITs, concentrated ownership, dividend payout

# P-2

## The Pricing of Embedded Lease Contracts Options

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In all the major asset class, implied volatility is obtained from the quotations of the derivatives market. However, in real estate, derivatives market is almost inexistent and volatility pricing face many difficulties. This paper proposes a methodology to determine implied volatility of real estate market based on options embedded in lease contracts. Leases are generally agreed for long term with possible options to leave in favour of the tenant during the course of the lease. Tenants that have no break-options during the life of their lease expect either to pay a lower rent or to receive more gratuities (rent free, financial incentives...) than those with options to leave. We built up a model that allows estimating implied volatility based on the leasing transactions by analogy between lease options and financial options.

Keywords: Implied volatility, lease structure, risk

## Alternative Index (Smart Beta) Strategies for REIT Mutual Funds

**Alex Moss**, *Consilia Capital, UK*

**Kieran Farrelly**, *The Townsend Group, UK*

This paper looks at the effectiveness of Alternative Index (Smart Beta) strategies for funds concentrated in listed real estate equities. In particular, we examine not just the impact on raw returns relative to a standard (free float market capitalisation weighted) benchmark throughout the cycle, but in particular we look at the subsequent level of tracking error and compromise in liquidity to determine appropriate risk adjusted returns.

The paper use the EPRA Global Developed Index as the benchmark, and looks at monthly data over a 20 year period (June 1994-2014) for three regions; North America, Europe, and Asia Pacific. The periods are divided into distinct phases of the cycle to determine the effectiveness of each strategy, in each region, at each stage of the cycle.

The weighting strategies we use are: Equal Weighting, Fundamental (Gross assets and NOI), Valuation (Relative Dividend Yield, and Price to Book Value), Volatility, and Leverage

The usefulness of Alternative Indices in asset allocation has been examined in detail for generalist equity funds, but there is little literature on the impact on sector specific funds in general, and real estate securities funds in particular.

The results provide valuable insights into how superior risk adjusted returns can be generated at different stages of the cycle by tilting the portfolio concentration away from free float market capitalisation towards alternative medium term buy-and-hold strategies, whilst minimising risk as defined by tracking error and liquidity reduction.

Keywords: Alternative index, investment strategies, mutual funds, REITs, smart beta

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# Q-1

## Pricing to Market - Property Valuation Methods Revisited

**Nick French**, *Department of Real Estate & Construction Oxford Brookes University, UK*

**Laura Gabrielli**, *Dipartimento di Architettura, Italy*

Since the global Financial Economic Crisis (FEC) hit the world markets in 2007/2008, the role of property valuation has been under greater and greater scrutiny. The process of valuation and its quality assurance has been addressed by the higher prominence of the International Valuation Standards Council (IVSC). This is a significant initiative worldwide. However, there has been little written on the appropriate use of valuation approaches and methods in market valuations.

Since the publication of the IVSC Valuation Standards, there is now a hierarchy of valuation definitions. These are determined by the International Valuation Standards of the International Valuation Standards Council (IVSC, 2013). In order, there are Valuation Approaches, Valuation Methods and, as a subset of the methods, techniques or models. The IVSC recognises three approaches (Income, Cost and Market) that are all based on the underlying economic principles of price formation. The appropriate basis will vary depending on the purpose and nature of the valuation. Each of these principal valuation approaches includes different detailed methods of application and within these methods, there are different models. It may seem to be unnecessarily precise and a simply a question of semantics but it is important to have an understanding of where valuation models, as discussed in this paper, fit within the process of valuation. The hierarchy within the IVSC standards follows the convention noted below:

**APPROACHES** (IVSC Para 56) 1. Income The income approach provides an indication of value by converting future cash flows to a single current capital value. 2. Cost The cost approach provides an indication of value using the economic principle that a buyer will pay no more for an asset than the cost to obtain an asset of equal utility, whether by purchase or by construction. 3. Market The market approach provides an indication of value by comparing the subject asset with identical or similar assets for which price information is available.

**METHODS** 1. Comparable Method (Market) 2. DRC/Construction Method (Cost) 3. Investment Method (Income) 4. Residual Method (Income) 5. Profits Method (Income)

**TECHNIQUES** (IVSC Para 61) For example, with the Investment Method, the valuer can choose an implicit or explicit model. e.g. Implicit Capitalisation vs. Explicit DCF Income capitalisation (implicit), where an all-risks or overall capitalisation rate is applied to a representative single period  $i$

**Keywords:** Aluation models, market value, property valuation, valuation approaches, valuation methods

## Statutory Valuation and the Use of Automated Valuation Models

**John MacFarlane**, *School of Computing, Engineering and Mathematics University of Western Sydney, Australia*

The requirements for statutory valuations are that they are fair and equitable so that these characteristics also pertain to the taxes based on the valuations. It is also preferable that statutory valuations are close to market values so that there is a reasonable level of transparency in the valuation process and the general public can have confidence in the statutory valuation outcomes.

It is also important that the statutory valuation process is relatively inexpensive so that the associated taxes are reasonably efficient.

In New South Wales, annual Land Valuations are produced for approximately 2.5 million properties. A very natural question is: "What is the place for Automated Valuation Models (AVMs) and Computer Aided Mass Appraisal (CAMA) in the statutory valuation process?".

The paper will examine this basic question and others which follow from it, including:

- What is the balance between reduced cost and the consistency and accuracy of valuations?
- What should be the complexity of the underlying model(s)?
- What are the associated data requirements for different categories of properties (zonings)?
- To what properties can an AVM be applied and where should other valuation methods be used?

Examples from the NSW land valuation process will be considered.

Keywords: Mass appraisal, modelling, outliers, quality assurance

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# Q-1

## Effect of Changing Valuer on Real Estate Portfolio Valuations

**Ytzen Van der Werf**, *University of The West of England, UK*

**Fred Huibers**, *Amsterdam School of Real Estate, The Netherlands*

Institutional investors in The Netherlands experience a large shift in market value after changing valuer on their portfolio valuations. Examples of differences up to -30% were reported during the period of decreasing values after the GFC.

We studied a set of over 22,000 individual valuations on a 6 year period (2008-2013) and found a significant effect of changing valuer for the office property market of nearly -9%. Partially this effect was caused by the nature of the valuation process (desk top versus full valuation) but most of the difference was due to the absence of knowledge of the previous valuation. Retail and residential properties did not exhibit a significant effect of the absence of knowledge. Furthermore when trying to explain the reason for this difference we found that surveyors performing a first time valuation used more recent comparable evidence to underpin their valuations than valuers performing a repeat valuation. Average age of the used comparable transactions in a first time valuation is 8.5 months where the average age of comparable evidence for repeat valuations appears to be nearly 10 months.

Anchoring to existing market evidence by repeat valuers seems to be at the heart of the problem. Changing valuer could lead to large differences in the market value of the properties under valuation but appears to be more in line with contemporary market evidence. Institutional investors should investigate the comparables used by valuers performing repeat valuations more thoroughly.

Keywords: Anchoring, change valuer, property valuation

## Does Urban Subcentres Influence Housing Prices? An Analysis of the Metropolitan Region of Barcelona

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**Juan Camilo Echavarría Ochoa**, *Valuation and Land Management Research Centre (CPSV), UPC University, Spain*

In the monocentric classic model the bid rent theory suggest a trade-off between land value and transport costs between residential location and the CBD where all employment is likely to be concentrated. Nevertheless, contemporary metropolises significantly apart from that stylized model for a number of reasons. Firstly, monocentricity coexist with polynucleation and employment diffusion and, secondly the place of work does not exerts the only, and probably, nor the main influence on quotidian travel behaviour, since transport surveys reveals an emergence of non-labour mobility. In this paper we test in Barcelona Metropolitan Area, a very well recognised polycentric Mediterranean city, whether proximity to subcentres is a key determinant of housing prices. Using listing prices a hedonic model is built, and the asking price is regressed over the distance to different subcenters, identified by analysing the travel and spatial behaviour of people, among other control variables. The results suggest that subcentres does exert little influence on housing prices and other amenities have a significant influence on the spatial distribution of values.

Keywords: Housing prices, land value, polycentrism, urban economics



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## Q-2

### **Anchoring Effects in Appraisals – A Study of Swedish Real Estate Students**

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**Helena Bohman**, *Malmö University, Sweden*

**Magnus Andersson**, *Malmö University, Sweden*

**Purpose** – The objective of the research is to investigate the anchor effect in appraisal of residential property based on a quantitative survey among Swedish students at a program for real estate brokerage. Prior research has identified various factors that influence price perceptions, including factors that affect assessments of the perceived value of products to consumers and, relatedly, the reference prices consumers use to evaluate the attractiveness of given prices (e.g., Winer 1986). Although the determinants of reservation prices have been extensively studied, there has been much less research regarding the manner in which consumers decide on the lowest price they are willing to accept for a product (for exceptions, see, e.g., Carmon and Ariely 2000; Kahneman, Knetsch, and Thaler 1990). The value appraised is individual and may depend on different parameters such as tacit knowledge and personal taste. Tversky and Kahneman's (1974) seminal work on anchor effects reveal that an external number, referred to as anchors, influence the value people will estimate a given object. Within real estate valuation Northcraft and Neale (1987) applied the same idea on real estate, conducting a study in which both students and real estate agents were to value the same house while changing the conditions regarding asking price for the house. Although the asking price should not affect the valuation of the market value, the study concluded that both real estate agents and students were positively affected by the asking price.

**Design/methodology /approach** - An experiment with students was conducted where they were to value two different properties. The experiment tasks were designed to be both representative of real valuation situation and to be relevant for the students in their course as a kind of rehearsal. They were not informed of the experiment's manipulative design nor the research objectives. A total of 53 students, all in their last semester in the real estate broker education within the course of Real estate valuation, participated in the experiment and were divided into group A and B. In addition one more group was included. This group C consists of 17 participants who all are employed as assistant at broker firms and undertaking in service-training in order to become licensed real estate brokers. This group was included to be used as a control group since they can be considered as semi-professionals or at least to have practical pre-knowledge.

**Keywords:** Appraisal, anchor effect, real estate broker, residential property

## Reducing the Property Appraisal Bias with Decision Support Systems

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**Marcel Schmid**,

**Francois Viruly**, *University of Cape Town, South Africa*

Any appraiser is subject to many potentially biasing influences which compromise the accuracy of the appraisal. One of the most prominent biases is the anchoring heuristic: appraisers involuntarily anchor to reference points such as their previous valuation, the value opinion of the seller, or the last transaction price. While many studies have proven the existence and importance of the anchoring effect in real estate appraisals, very few studies have suggested practical means to counter it ("debiasing"). In this paper we demonstrate that the anchoring effect can be reduced with a computer software supporting the valuers in their decision-making.

In our experiments we asked experienced valuers and novices to perform a valuation of a commercial property, based on a set of documents and with the help of a self-written valuation software. Each proband received one of three versions of the software with different features for debiasing to test its influence on the appraised values. The experiments were carried out in Germany and South Africa using two variants of the income approach as the valuation method. Two of the properties were fictitious, one was real and for sale when the experiment was carried out. The comparison of the sub-samples adds to our understanding of how decision support systems can reduce valuation variance.

Keywords: Anchoring heuristic, appraisal bias, debiasing, decision support system, valuation variation

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## Q-2

### Evolution of the Explanatory Variables of the Price of Real Estate in Lisbon during the Last Economic Crisis

**Paulo Castanheira**, *ESAI- escola Superior de Actividades Imobiliárias, Portugal*

The main purpose of this study is to understand how the price of housing is formed in the new (expo) and old town in Lisbon (traditional neighborhoods). The study focuses on the prices of the apartments that were sold with the assistance of Estate Agents operating in Lisbon in last 3 years, and how the economic crisis can explain the market price. For the development of the study, we used two different methodologies: Hedonic Pricing Methods (MPH) and Artificial Neural Networks (ANN). ANN are a less traditional econometric technique from the field of Artificial Intelligence, but they are strong competitors with the MPH. In the last two decades, the MPH has been applied to the real estate market in Portugal but, till the present, no single study is known with the ANN. To obtain the best hedonic model, numerous tests were developed, aiming the validation of MPH and also the adequate selection of variables that contribute most to the prices. The tests were performed with the statistical software SPSS, The explanatory variables included in the final model for the price of an apartment were: the floor area (m<sup>2</sup>), the garage and basement index, the comfort index, the location index and two other variables resulting of interactions, one between the year of sale and the condition of the apartment (whether it is new or used) and the other between the preservation index and the condition of the apartment. With these six explanatory variables, the MPH has achieved an accuracy quite significant when compared with some previous studies.

Keywords: Artificial neural networks, hedonic prices

## Value of the Energy Performance Certificates in the Housing Market – What is the Weight as Evidence of Open Data?

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**Juhana Hiironen**, *Aalto University, Finland*

**Mikael Postila**, *Orava Funds, Finland*

**Kauko Viitanen**, *Aalto University, School of Engineering, Department of Real Estate, Planning and Geoinformatics, Finland*

More and more computable data related to real estate has been opened in Finland in recent years. One of the most interesting services is <http://asuntojen.hintatiedot.fi/> which is operated by The Housing Finance and Development Centre of Finland (ARA). Data in the service is about single transactions in the Finnish housing market. Approximately one third of the data contains the information of the energy efficiency class nowadays as well.

In the survey the housing market of Helsinki was studied using data covering the year 2014 transactions. As a research method linear regression analysis and OLS estimation were applied to study how the information of the energy performance certificates EPCs was capitalized into transaction values. Results show that there are difficulties to estimate shadow prices for each separate EPC class. But grouping the certificates into bigger entities gave somewhat expected and rational results.

Research discuss slightly also the data needed in this kind of estimations. In practical level the transaction based data was enriched by demographic and socio-economic open data to get reliable shadow prices and unbiased results.

What is interesting to see is that even though energy efficiency is a factor having a price influence, it is not a search criterion in the biggest Finnish internet housing brokerage services. As a conclusion it can be said that even though EPCs have been part of compulsory information in the real estate market several years, the situation could be almost in its infancy like in the Finnish real estate market which is anyway quite developed market in many ways.

Keywords: Energy efficiency, energy performance certificate, linear regression, open data

**Q-3****Housing Rents in Wallonia, Belgium: The Observation System and Market Segmentation**

**Marko Kryvobokov**, *Center for Sustainable Housing Studies (CEHD), Belgium*

In the French-speaking Belgian region of Wallonia, one third of households rent their accommodations. Three thirds of them represent private rental sector. Taking into account the important size of this sector and recognizing the weakness of the existing state of data collection, the administration of the Walloon Region has recently decided to create a system of residential rent observation. The detailed and updated information about housing attributes and rents should be used in housing policy revision, including more transparent rent estimation in private rental sector. The Center for Sustainable Housing Studies is responsible for the statistical and methodological management of this system.

The first wave of the observation system includes 2,500 face-to-face interviews among the private renters in the arrondissements of Nivelles and Charleroi. While the former represents to large degree the rich suburbs of Brussels, the latter is a mainly urbanized area well-known by its chronic problems of poverty, high crime rate and low quality of housing. In both arrondissements, it was asked 3.6% of households renting their accommodation in private sector. Though in hedonic regression literature the analysis of housing rents is rather rare, it is applied more and more often in recent years. In our study, a hedonic model of housing rents is constructed with internal and geographical attributes as explanatory variables. Neighborhoods are included in the equation as dummies. The aim of the study is to find which mode of data treatment provides better model performance and out-of-sample prediction: an overall model with all observations or market segments at the spatial level of the contrasting arrondissements (or at a lower spatial level). Spatial and geographically weighted regression methodologies are applied.

Keywords: Wallonia, hedonic model, housing rent, market segmentation, rent observation

## **Assessing the Most Suitable Valuation Approaches and Methodologies for Stratum Title in Malaysia**

**Sr. Faziah Abd Rasid**, *National Institute of Valuation (INSPEN), Malaysia*

The National Land Code (NLC) was amended in 1990 to enable the state authority to issue stratum title for underground space. Stratum Title can be separated from land titles issued for surface land. This is stipulated in Part 5(A) under Section 92A to 92G. According to Section 92G (1), underground land can be used for any purpose provided approval is obtained from the authority, which is the federal government. In relation to underground development with many utilities, the appraisal of real estate related to underground land use involved some unusual circumstances. Ordinary appraisal concerned with a total bundle of rights referred to as fee simple interests and it is generally assumed that the use and enjoyment of real property rights relates to the surface of the land. However, there are several below-surface uses of land that require a real estate appraisal. In this research study, it is the intention to look on the legislation issues related with Stratum Title, to examine the differences exist between Stratum Title and underground development in other countries. Also to determine the factors that affecting the stratum interest and to assess and analyses the valuation issues that impact on Stratum Title and renew possible valuation approaches and methodologies that could be applied in the Malaysian context.

Keywords: Stratum title, subterranean space, underground development, valuation methodologies and techniques

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**Q-3****Levels and Development of Real Estate Prices in Different Austrian Regions**

**Wolfgang Feilmayr**, *Department of Planning Vienna University of Technology, Austria*

After a period of more or less stable real estate prices at the beginning of the 21st century, the prices have shown a sharp rise since around 2007 especially in Vienna, the other federal capitals and its surroundings, whereas in the rural areas in the periphery prices even declined. In this paper special attention is paid to alpine and touristic regions. The main differences of these compared to the other regions will be elaborated. Moreover the variables explaining the prices and developments will be identified. Results will be presented for single family houses and for owner occupied apartments. The underlying models use nonlinear hedonic regression methods. The price observations and the attributes of the single real estates stem from different data bases including purchase and offer prices. The neighborhood covariates come mainly from the spatial information system IRIS, which has been developed for all Austrian communities at the institute of regional science of Vienna University of Technology.

Keywords: Alpine regions, Austria, hedonic models, regional real estate prices

## The Effects of Demolition Control Precincts on Property Values

**Peter Elliott**, *University of Queensland, Australia*

**Clive Warren**, *University of Queensland, Australia*

**Jason Staines**, *University of Queensland, Australia*

As municipal governments continue to implement historic preservation regulations, it is vitally important to understand the effects on the designated properties and the housing market. Determining and understanding the impact is important for property owners, buyers, planning authorities and valuers.

Whilst it is known that historic preservation designation has an effect on property value, the effects are mixed and unclear. The direction and magnitude of the effect is dependent on locational factors, regulatory, structural, and housing market variables. Literature has extensively examined the effects that historic preservation designation has on the value of residential property in Europe and the United States. This is the first study conducted in Australia that investigates the economic effects of Demolition Control Precincts (DCPs). This research examines the housing market.

The theoretical model draws upon urban planning theory and housing economics in the context of an Australian housing market, the City of Brisbane. It was hypothesised that, DCPs reduce the supply of residential vacant land, causing a degree of scarcity. The demand for residential vacant land in DCPs is inelastic, creating market segmentation. It was hypothesised that this segmentation results in residential vacant land in DCPs selling for a premium over comparable vacant land not located in DCPs.

Results from hedonic price regression models validate the research model and provide several insights. Key findings are that Brisbane's residential vacant land market is segmented, due to a scarcity of vacant land in DCPs. Vacant land within DCPs exhibits inelasticity of demand. Vacant land located in DCPs sell for a price premium of 11 percent, over comparable vacant land located outside of a DCP. Consistent results are found across all locations of Brisbane, including inner and outer suburbs.

The thesis has procedural and substantive policy implications. Planning authorities must find an appropriate balance between historical preservation and urban development. Property valuation of residential vacant land and houses requires recognition of housing market segmentation and price premia.

Keywords: Demolition control precincts, impacts, property value



## **Q-4**

### **The Use of Options Pricing Methods for the Valuation of the Bare Dominium Value of Property with a Long Term Land Lease**

**Douw Boshoff**, *University of Pretoria, South Africa*

The Bare Dominium of a property is the interests that remain after leasehold rights are removed. These properties are typically characterised by a long term land lease, which are improved by the land tenant or lease holder from which a sub-lease income could be received. The right to this sub-lease income will revert to the land-owner at expiry of the leasehold. Valuers are, however, sceptical to assign a value to such improvements in the hands of the land-owner, due to uncertainty of future market changes and the time-frame associated with the forecast. This study investigates the use of a put-option to create a risk-free investment, calculated by using an iterative Black-Scholes Model, as an alternative to traditional discounted cash flow techniques. The advantage of using options pricing theory is that it includes volatility of the market in the value calculation. The research is based on a case study involving a number of actual valuations. The outcome is a proposed model that can value the bare dominium and assign a risk-adjusted value to the property, thereby calculating the risk involved for changes in the market volatility, different types of property, risk structures and lease terms.

Keywords: Bare dominium, black-scholes model, options pricing theory, property valuation

## The Effect of Strategy Alliance on Property Values: A Case Study of Hotels in Taiwan

**Nan-Yu Chu**, *Department of Land Management, Feng Chia University, Taiwan, R.O.C.*

It has been improved that brand could make the price premium and have multiple benefits. Thus, development of brand is one of most important strategies for real estate developers or owners. However, it takes time and cost to create. Alternatively, the strategy alliance seems to be the other approach to build brand. This paper argues that "Does strategy alliance make the price premium for real estate?" "What is the effect of cooperation on property values?" Therefore, based on the theory of brand premium and strategy alliance, this paper is centered on hotel properties in Taiwan, and uses the case study method to analyze how the value of hotel is changing after alliance. The empirical result showed that trust and manager support could maintain the long relationship of cooperation in the beginning of strategy alliance. Besides, the degree of price premium was determined by types of alliance. We suggest that the property owners or developers could use the concept of strategy alliance to create real estate benefits.

Keywords: Brand premium, property value, strategy alliance

## Q-4

### How Authorized Property Appraisers Construe Information for Valuation of Commercial Properties: A Repertory Grid Study

**Lina Bellman**, *Mid Sweden University, Sweden*

**Peter Öhman**, *Mid Sweden University, Sweden*

**Purpose** – This study describe and analyze authorized property appraisers' (APAs) thought patterns when commercial properties are valued, and compare and draw conclusions about their thinking in terms of content, complexity and homogeneity.

**Design/methodology/approach** – First, a standard set of elements and constructs was included in the grid form (used for data collection). Second, the repertory grid technique and principal component analysis were used to map and analyze the thought patterns of nearly half (67) of the authorized APAs in Sweden.

**Findings** - Analysis of the individual grids and the mean grid of all respondents demonstrated similarities in the APAs construing and revealed relatively homogeneous thought patterns. Accordingly, the APAs seem encouraged by general guidelines (such as Swedish Annual property Index valuation guidance), and by guidelines and ethical rules prepared by the APAs own organization. At the same time the APAs thought patterns were found to be relatively complex. They focus on several kinds of information and their assessments are perceived to effect property valuation on micro and macro levels differently.

**Practical implications** – Based on the homogeneity in the APA's thought patterns, this study discusses if authorized APAs have begun a “legitimacy journey” towards an upcoming establishment of a profession.

**Originality/value** – To the auditors knowledge this is the first study using the repertory grid to map and analyse APA's thought patterns at an aggregated level.

**Keywords:** Authorized property appraisers, valuation judgments, commercial properties, profession, thought patterns, aggregated level, repertory grid technique, Sweden

## Actual Topics within Germanys Housing Policy

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During the electoral campaign for the general elections held on 22nd September 2013 the lobby group representing the tenants proposed a rent regulation in the housing sector concerning also new contracts for existing housing beyond social housing. This proposal was immediately included into their political agenda by the social democrats (SPD) and very shortly afterwards also taken as a position by chancellor Merkel as leader of the Cristian Democratic Party (SPD), although many doubts were expressed within her own party. Only the liberal party opposed to any type of rent control, but did in the end not enter parliament. After elections a coalition between the Social Democrats and the Cristian Democratic Parties was established and the implementation of the rent control fixed. This paper analyses the political reasons for the behavior of Angela Merkel, looks at the expected results from this rent control concerning the allocation of flats, the proportion of home-ownership, the ongoing segregation within cities, and the future construction of new housing.

Keywords: Germany, housing policy, rent regulation

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**R-8**

## Development of Refurbishment Concepts – The Case of Multi-family Houses from the 1970s in Western Germany

**Sebastian Johann**, *University of Kaiserslautern, Germany*

The European housing stock is dominated by properties built before the 1980s. These buildings are to a great extent far behind current technical and social requirements. This paper develops a supply- and demand-oriented refurbishment concept for residential buildings, specifically the case of multi-family houses from the 1970s in Western Germany. About 2.4 million dwellings and more than 13% of the entire multi-family housing stock in West Germany are located in multi-family houses from the 1970s, in many cases still without any major refurbishment measures until now. A large portion of this stock was or will be subject of portfolio deals often involving foreign investors. Using data from housing corporations, more than 13,700 energy certificates and expert interviews as well as a secondary analysis of a representative survey of housing demand in Germany the key building characteristics and needs for action for this type of the building stock are identified. Further, the specific requirements of the main target groups are found. The results show prioritized refurbishment measures including improvements of thermal insulation (e.g. roof, exterior walls), energy supply, bathrooms, balconies, house entrance areas as well as the structuring of outdoor facilities. The empirical results are useful for property owners like housing corporations, municipalities, owner communities or foreign investors in Western Germany and other European countries to find fundamental and demand-oriented refurbishment measures for their buildings.

Keywords: Multi-family houses, obsolescence, refurbishment measures, residential property building, user requirements

## Contemporary Challenges to Statutory Valuation Systems- The Australian Experience

**Mike Hefferan**, *University of the Sunshine Coast, Australia*

Ad valorem assessment of real property represents one of the longest surviving mechanisms for securing government revenue and still represents an important component of taxation collections across both developed and developing countries. Its acceptance and longevity reflects its relative simplicity, rationality and perceived equity. While these fundamentals remain, the nature and complexity of many contemporary property assets and the density of development, particularly in urban areas, present challenges to the statutory valuation processes. It has been necessary in some jurisdictions to significantly amend and adapted legislation and practice to accommodate a demonstrably different economic, community, environmental and political context. This paper describes the nature of this new environment and how it impacts on the way in which statutory valuations are performed and are applied. It draws on case study examples from Australia where in some jurisdictions, quite radical changes have been necessary to ensure the sustainability of and confidence in these systems. The paper suggests that there are a number of key characteristics and initiatives that assists in this evolutionary process though also alerts that there are some fundamental challenges to this form of assessment and taxation that now need to be addressed in a comprehensive and strategic way. The work is based on a literature/legislative study and specific investigations and structured interviews, drawn principally from examples in Queensland, other Australian States and New Zealand. A number of findings will be relevant to other jurisdictions that rely, at least in part, on taxation basis on the assessment of property value.

**Keywords:** Ad valorem taxation, statutory valuation processes, changes in property assets, legislative change, Australian property examples

# PAN1

## The Performance Implications of Adding Global Listed Real Estate to an Unlisted Real Estate Portfolio

**Alex Moss**, *Consilia Capital, UK*

It has been established in a previous paper (Moss & Farrelly 2014) that adding a global listed real estate element (25%-30%) to an unlisted (UK) real estate portfolio could enhance returns. This paper takes the analysis and understanding of blended real estate portfolios further, by increasing the geographic range of the unlisted element, and examining refinements to a straight buy and hold strategy for the listed element. In particular it seeks to answer the following questions: 1) Does the strategy work for regions other than the UK? We examine the impact of combining a global listed element with a direct property allocation from Europe, Asia and the US, using Transaction Based Indices. 2) Would performance be improved if different Smart Beta (Alternative Index Weighting) strategies were employed? If so which strategies (Equal weighting, High/ Low Leverage, etc.) work best? 3) Is it possible to adopt a rules-based trading strategy that would enhance performance of the listed element? We look at Momentum based strategies, Trend Following, and a combination of the two, concluding that these strategies can have a significant role to play in risk reduction of the listed element of a blended portfolio.

## Diversification Gains, Sector Exposure and Systematic Risk in International Public Real Estate Markets

**Marielle Chuangdumrongsomsuk**, *Cambridge Real Estate Research Centre, Department of Land Economy, University of Cambridge, UK*

**Colin Lizieri**, *Cambridge Real Estate Research Centre, Department of Land Economy, University of Cambridge, UK*

Investors increasingly use listed real estate securities to provide international diversification in their property portfolios. The success of such strategies depends on differing exposure to risk factors across the range of securities acquired and on the long run integration (or lack of it) of the returns of real estate firms. However, real estate investors (particularly those focussed on active management strategies) often select individual stocks (for example by size) that may not track published national indices (the basis of much research) and may have sector and geographical biases (for example, with excess exposure to major cities). As a result, commonly-held stocks may have a high exposure to global risk factors, altering risk-adjusted return and diversification relationships. In this paper, we re-analyse the benefits of holding a portfolio of international real estate securities, by incorporating evidence of real estate factors, cointegrating relationships and structural breaks and, specifically, test whether the diversification benefits depend on how integrated or independent the firms and countries are at global or regional level and whether more risk reduction can be achieved through holding internationally diversified investments in markets that are less dominated by global real estate factors. We examine the portfolio performance and factor sensitivities of “cointegrated and “independent” groups first at national level and then at individual sector level and for firms with high exposure to global financial centres. We assess whether the portfolios differ in terms of risk-adjusted return based on Sharpe ratios and sensitivity to systematic risk, using a range of multi-factor models, and decompose portfolio risk using Fama-Macbeth approach testing for differences in risk sensitivity and volatility. The extent of this global effect helps inform international investors, particularly in light of a growing integration within global securities markets. This task is given further significance by the events of the global financial crisis, where correlation between markets (and asset classes) appeared to increase rapidly precisely when diversification would have been most valuable.



# PAN1

## Are Public and Private Real Estate Returns and Risks the Same?

**Martin Hoesli**, *University of Geneva, Switzerland*

**Elias Oikarinen**, *University of Turku, Finland*

This article investigates the similarity of public and private real estate returns and risks over the long horizon using data for the U.S and the U.K. The results show evidence of a one-to-one relationship between publicly traded REIT performance and privately traded direct real estate investment performance in three out of four U.S. real estate sectors and one out of two U.K. sectors. The return volatilities generally do not differ significantly between the REIT and direct real estate markets regardless of investment horizon. The findings have important practical implications. First, they indicate that public and private real estate investments can be considered to work as good substitutes in an investment portfolio with several years investment horizon. Second, they suggest that REIT related ETFs and derivatives could be used to hedge risks caused by investors' direct real estate holdings or by lending institutions' mortgage lending inventory.

Keywords: Hedging, portfolio, REIT, return, risk

## The Impact of Financial Regulations on the European Listed Real Estate Sector

**Martin Hoesli**, *University of Geneva, Switzerland*

**Stanimira Milcheva**, *University of Reading, UK*

**Alex Moss**, *Consilia Capital, UK*

There are several ongoing changes to the regulations on the financial markets such as the Alternative Investment Fund Management Directive (AIFMD), Solvency II and Basel III which will directly or indirectly affect the European real estate sector. Although the implementation of some of them is still in progress, the aim of this study is to assess potential outcomes associated with the regulatory reforms for the listed real estate industry in selected European countries. Our main focus will be on analysing the impact of regulation on the size and structure of the listed real estate sector in Europe. There has been almost no empirical research in this area thus far due to the lack of data and the uncertainty surrounding the regulatory changes. While the overall impacts are hard to be determined without awaiting the full implementation of the regulations in the national legislations, we aim to provide a first assessment of the effects of major financial market regulations on systematic risk in country real estate returns as well as on debt and equity issuance in Europe.

Keywords: Financial market regulation, listed real estate, interviews debt and equity issuance

## PAN4

### The Impact of Liquidity on Valuation and Capital Raising for Global Listed Real Estate Companies

**Alex Moss**, *Consilia Capital, UK*

**Nicole Lux**, *Deutsche Bank, UK*

In a previous paper we examined the impact of liquidity on the valuation of European property shares, and determined that not only was there a strong relationship between liquidity and valuation post GFC but that it also had significant implications for fund raising and therefore a company's ability to grow. In this paper we extend the study to include North American and Asian companies, thereby allowing for regional differences in the liquidity effect, and also accounting for local valuation preferences. In addition we also look at the relationship between the liquidity of a company and the level of equity and debt issuance pre and post GFC to determine whether there is a relationship.

Keywords: Global REITs, liquidity, valuation

## Managing Performance & Risk through Blended Global Investment Strategies

**Mark Clacy-Jones**, *MSCI / IPD, UK*

As real estate investment becomes increasingly global the number of investment funds with exposure across countries and regions is growing. An emerging trend is the use of different routes to access real estate returns with portfolios comprising mixtures of direct real estate, unlisted funds and REITs as well as derivatives and real estate debt with the added dimension of geographical dispersion of assets. The benefits and constraints of each type of real estate exposure will be discussed in the context of a variety of investment strategies, considering a spectrum of investors and mandates to highlight appropriate blends of direct real estate, unlisted funds and listed exposure. Using IPD datasets across more than 30 countries for direct real estate and unlisted real estate funds, combined with MSCI listed real estate indexes, and IPD size estimates of national market universes, it is possible to analyse and compare performance and risk for a number of different investment strategies. Conclusions can then be drawn on the benefits of blended global strategies over more conventional approaches to portfolio construction, which are dominated by domestic, single route strategies.

Keywords: Blended, global, investment, performance, strategy

## PAN4

### The Listed Funds' Real Estate Investment Process: Linkage between Asset Strategy & Reporting and Investor Objectives

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**Mark Clacy-Jones**, *MSCI / IPD, UK*

During the first quarter of 2015, IPD conducted a survey into the investment process of listed real estate funds, with a particularly close examination of their strategy and reporting. This paper provides a detailed analysis of the relationship between the investor relationship, strategy and asset management, with a particular focus on investment strategy, transparency & reporting and asset management.

The results are based on a desk-based analysis of over 100 listed funds, in-person interviews with over 25 listed funds and a literature review. The focus is on listed funds in Europe and Asia-Pacific, providing in-depth coverage of these funds across approximately 10 countries. The research provides a comprehensive review of the large listed real estate industry of approximately USD 2.5 trillion (GAV) across the globe, including their different investment styles and their geographic exposures. The more innovative aspects of the research relate to the approach of listed funds' investment process, explaining the potential for misalignment at various stages of the investment process. This includes alignment between investor objectives and actual real estate exposures, the investment styles, and the link between portfolio and asset-specific monitoring and the investment strategy. The final section of the paper draws out some of the implications of the research including a categorization of different types of listed funds and the steps taken by a series of 'global leaders' seeking to strengthen the investment process.

Keywords: Investment styles, listed funds, real estate investment process,  
transparency&reporting

## Electricity Consumption and House Values

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The study investigates whether electricity consumption could be a valuable data supplement in analysing house value variations within the city. Electricity consumption is a proxy for economic and citizen activity, wealth, population size, density, and to a certain extent habits of the residents. In general, electricity could substitute many factors that are essential in real estate markets. The study investigates real estate market in London by employing a panel of electricity consumption and house price data of 32 boroughs from 2003 to 2014. The data enables to examine cross-sectional and temporal links using several panel models. Additionally, robustness of outcomes are tested. The findings indicate that there is a negative correlation between domestic electricity consumption and average house values, suggesting that owners of more expensive houses consumes less electricity. On the other hand, boroughs that consume more non domestic electricity are positively related with the average house values in the area, suggesting that homes are more expensive in more active areas. Electricity consumption could supplement data used in real estate market analysis. The electricity consumption data is precise, rapidly obtained, and could be gathered frequently without high cost, contrary to population and economic activity statistics. At the same time electricity consumption may help analyse the characteristics of an area that are difficult to quantify and expensive to collect. To the authors' knowledge, there is no other study that investigates interconnection between electricity consumption and real estate market. By using the electricity consumption, house price trends could be quantified more precisely, thus producing a city profile that paints a more realistic picture for the market participants.

Keywords: London, electricity consumption, house prices, panel

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# PHA1

## Residential Valuation Systems in the United Arab Emirates

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Since 1996, real estate development has transformed the United Arab Emirates (UAE) into a regional trade and logistics hub. Between January 2003 and December 2010 Dubai Residential Property Price Index (DRPPI) rose from 100 to a heady 240 in 2008 and then dropped back to 156.19 by 2010. The value of two bedroom apartments in the iconic 'Burj Khalif, the world's tallest building, rose to \$3,811 and fell back down to \$762 per per square foot. During the 2008 property collapse, residential prices in Dubai fell around 50% and by 2010, exhibitors at Cityscape dropped from 1,000 to 200. Property values in the UAE are exposed to strategic risks, sentiment, oil price fluctuations and the movement of global capital into and out of the trading hub. Internally, each emirate has distinct spatial and evolving sub-markets. Recognising the volatile backdrop and high information costs, the research seeks to develop a robust residential property valuation system for the UAE.

Keywords: Capital flows, information asymmetry, residential property, sub-markets, valuation standards

## House Price Appreciation and Housing Affordability: A Study of Younger Households Tenure Choice in China

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**Michael White**, *Nottingham Trent University, UK*

**Alla Koblyakova**, *Nottingham Trent University, UK*

Housing affordability distinguishes 'need' and 'access' as the key criteria to examine the ability of the households to enter the housing market or transit into homeownership. Housing affordability was broadly considered as the relationship between housing and non-housing expenditures, which examines the ability of households paying for a house without breaking current living standards or falling into poverty. In the context of economic transition and housing reform in China a fully market-oriented housing market has developed. The expansion of the residential housing market has been accompanied with house price appreciation and inflation, accelerating urbanization, and a rising demand for housing. These changes have led to affordability problems, particularly for low and middle-income groups. Recent research on housing affordability has shifted from estimating affordability indices to policy debates of granting housing and social welfare subsidies.

This paper examines the magnitude of Chinese households' housing affordability issues since the early 1990s, on the basis of the most common measures of housing affordability. It combines ratio approach with demographic factors, household formation and financial constraints in estimation. Tenure choice refers to households' housing decision under the constraints of financial ability to choose owner-occupied or live in renting houses. The paper then employs affordability estimation results and analyses how these impact tenure choice decisions. The model not only employs aggregate level data from Statistical Yearbook, but also uses Household Survey data to reflect households' affordability situations in China. With respect to the results, this paper tries to propose further policy measures regarding housing affordability and insufficient housing subsidies.

Keywords: Households, housing affordability, tenure choice



# PHA1

## Income Distribution and Housing in Poland between 2004 and 2012

**Magdalena Teska**, *San Vicente del Raspeig, Spain*

As performing the major transition reform and joining the European Community fifteen years later Poland's economy should be rather observed from the broader historical perspective, nevertheless as provided by Eurostat data the income inequality in Poland between 2004 and 2012 decreased by roughly 15%. Thus, this decrease was a result of redistributive effect of social benefits and taxes. And, which was the impact of this redistributive effect on housing allocation if the median equivalised disposal income was higher by roughly 9% for the owners of dwellings and the ownership rate reached 82% in 2012?

Between 2004 and 2008 the housing market boomed and then slowed down for the next six years leading to reducing sales volumes and falling prices. On the other hand, the dwellings' prices have been rising over the last twenty years driven by the strong economic growth. The boom indeed was forced by the increased inflow of investments, mainly due to accession to the European Union, low interest rates, mortgage financing development and new government programmes. And although the housing sector was a considerable priority for the communist government, since then it has been still facing the major problems like: housing shortage and deficiency of dwellings, decay of building stock, the ownership structure, demographic and social changes in the context of the building stock and availability of dwellings, changes in the labour market, the government housing policy, barriers to the development of the construction industry.

Keywords: Housing market, income distribution, income distribution and housing

## Is Real Estate Private Equity Real Estate?

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**Sebastian Krautz**, *EBS Universität für Wirtschaft und Recht, Germany*

In our paper we look at the risk/return characteristics of global real estate private equity investments and compare them to those of direct real estate and general private equity investments (i.e. Venture Capital and Buy-out funds).

We investigate if the REPE investments behave more like PE investments than direct real estate investments. The results obtained in this study allow us to address a long-lasting debate regarding the way in which these investments should be called, i.e. REPE or PERE (depending on the individual preference of which aspect should be more pronounced). We will further whether capital allocations towards opportunistic REPE investments are in the wrong 'bucket' when included in the real estate share of the portfolio allocation.

Keywords: Asset allocation, portfolio strategy, real estate investment, real estate private equity

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# PHA2

## The Trade-off between Housing and Pensions in the Household Portfolio of the Eldery

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Both household investments in own housing and payments into the pension system are forms of a life-cycle redistribution process of income from working age to retirement. They can be seen as a store of wealth that can be released in the old-age. There is a already well-established theory about a possible trade-off between both income forms or more generally speaking between home ownership and the development of the welfare state. This paper adds to the existing literature by estimating the offset between pension and housing wealth using cross-sectional data of households in 12 European countries within the Survey of Health, Ageing and Retirement in Europe (SHARE), a multidisciplinary panel database that includes data on health, socio-economic status and social and family networks of more than 85,000 individuals aged 50 or over. We calculate all measures of wealth including pension wealth at the peak of the households asset wealth curve to analyze their portfolio composition with a focus on pension and housing wealth. By applying a simple life-cycle model we find empirical evidence in favor of the trade-off theory. However we are able to show that the offset effect varies between countries which is in line with expectations due to differences in their pension system.

Keywords: Home ownership, household wealth, housing, pension

## Toward a Liability Driven Investment Paradigm for DC Pensions: Implication for Real Estate Allocations

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**Steven Devaney**, *University of Reading, UK*

The role of real estate in investment portfolios was analysed within an Asset Liability Management Framework since 2000 (see Chun et al (2000), Craft (2001, 2005), Booth (2002)). It was found that, when liabilities are taken account of, the diversification role of real estate turns out to be more limited and accounts for the reduced exposure to this asset as witnessed in the portfolio of most institutional investors. Brounen et al (2010) highlighted another important issue: the choice of liability stream. They demonstrated that different definitions of liability result in different allocations to real estate. They compared results obtained when the actuarial projected benefit obligations of DB Schemes as used in Chun et al (2000) to those obtained by using the market value of the projected benefit obligations. The market values were obtained by accounting for interest rate and inflation risk.

With the shift from Defined Benefit to Defined Contribution pension structures across the globe, many feel that there is no need to adopt an ALM approach in optimisation. However, the global financial crisis which occurred between 2007 and 2008 has brought to the fore the uncertainty of income that pension contributors, especially those based on defined contribution (DC) formulas. Pension legislations in some OECD countries require that DC Pension funds provide a certain minimum on pension contributions. These minimum guarantees could be absolute or relative. Relative return guarantees are set in relation to a certain benchmark synthetic investment portfolio or the average performance of pension funds in the industry. When minimum return guarantees are offered by companies that sponsor DC Plans, the plan inherently takes on DB features (OECD, 2012).

In the first part of this study, we examine the long-run relationship between the various asset classes and our chosen liability benchmarks using correlation analysis and cointegration techniques. We make use of various minimum return guarantees and other potential benchmarks as our definition of liabilities: 0% nominal return; 0% real return (inflation proxies: CPI and RPI), government bond rate, risk-free rates such as t-bill and repo rates (Sharpe, 1994). In the second part of our study, we use the dynamic Asset Liability Model of Dempster et al (2002). As in Brounen et al (2010), results of our study would demonstrate how a change in definition of liability impacts on the asset allocation decision.

Keywords: Asset allocation, cointegration, liability, pensions, portfolio

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# PHA2

## The Determinants of Historical Property Market Risk Premium in the London Office Market

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**Arnaud Simon**, *Paris Dauphine University, France*

The goal of this paper is to get a better understanding of what are the determinants of historical property market risk premium in the London office market, and how these historical risk factors vary through the cycle, therefore affecting market performances. For this purpose we assembled different data series covering the Q2 2001 to Q2 2014 period. Using the main drivers of the economy and both the financial and property market we demonstrate empirically that the risk premium (defined as the difference between the Office Total Return and the 10-year Gilt Yield) reacts positively with increases in the net absorption or prime rents. On the other hand, it reacts negatively with increases in net additions or average net initial yields.

Keywords: London office market, risk factors, risk premium

## The Impact of Energy Performance Certificates on the Prices of Dwellings

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**Jim Berry**, *University of Ulster, UK*

**Stanley McGreal**, *University of Ulster, UK*

**Michael McCord**, *University of Ulster, UK*

Following the Kyoto Protocol, energy efficiency in the property sector has become a growing concern and there has been an increasing policy focus on improving the environmental performance of dwellings. Whilst an emerging body of empirical research has identified price premiums associated with improved building energy efficiency, the relationship between energy performance and residential property remains under-researched, geographically diverse, and inhibited by a paucity of data. By developing a database and applying a hedonic pricing model, this research aims to establish whether there is a green premium associated with dwellings within the Belfast Metropolitan Area. The findings will contribute new knowledge for policy makers and practitioners in the property sector.

Keywords: Belfast metropolitan area, energy efficiency, hedonic model, housing market, sustainability

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# PHB1

## Resolving Value through the Court System

**Deborah Miriam Leshinsky**, *Bond University Australia*

The courts are currently ill equipped to assess property valuations. At present arbiter and unpredictable valuations are being accepted. Current outcomes can be harmful to litigants and wasteful to society. Judges face the same valuation uncertainty as the parties themselves. Expert witnesses are always going to be called by the courts - so the system is in need of a good set of protocols.

Currently judges face conflicts in the system, there is a lack of clarity. In order to resolve less error, maintain credibility and refrain from bias, property valuers are required to not deviate from the true value. When statistics are involved it would involve an accurate estimate of value.

However property valuers are not taught how to resolve value through statistics - so where is the accuracy in property values in the current judicial system?

Keywords: Resolving value through the courts

## IPO Underpricing of European Property Companies

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The widely known phenomenon of “underpricing” is frequently observable during the IPO process and has been researched extensively. Underpricing refers to the systematically negative difference between the offer price and the first trading price in the secondary market, implying that the issuing company collects less money than would have been possible in a fully efficient market. Whereas underpricing in the real estate sector is has been investigated in considerable depth in the USA, Australia and Asia, European studies in this field are scarce. Yet, the motivation to conduct a pan-European analysis on the underpricing of property IPOs is twofold. First, as stated above there is, to the best of our knowledge, no European study about underpricing differences in the real estate sector. Second, due to a growing number of listed real estate companies in most European countries, a pan-European study should provide clear evidence of IPO pricing in Europe. To investigate the underpricing phenomenon in the European real estate sector, this study uses a pan-European sample of listed property companies and Real Estate Investment Trusts (REITs). Specifically, our sample comprises ten REITs and 92 listed property companies over the period 1999-2014. The study is based on the methodology of Beatty and Ritter (1986) concerning ex-ante uncertainty, for which we use such proxies as gross proceeds, offer price, market capitalization at the IPO date and the age of the company at the issuing date. In addition, we include a dummy variable for the two years before the financial crisis, in order to take into account the high number of IPOs during this period. Finally, the study considers whether there is a significant difference between the initial returns of listed property company and REIT IPOs.

Keywords: IPO, ex-ante uncertainty, listed real estate, pan-European study, underpricing



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**PHB1**

## Summarizing Doctoral Thesis: Hunt for the Green Value

**Ari Laitala**, *Aalto University, Finland*

Nowadays relatively wide body of literature in the field of real estate handles the value of sustainability – and as a part of it, the value of energy efficiency. Most of this literature seems to be focusing on the issues of what kind of green value there possibly exists in the different real estate submarkets. Drivers of the green value have also been discussed and many factors have been argued like energy savings, rent premiums, enhanced brand images and decreased risk level.

However, conceptualization of the green value has been discussed less and connection to value theory has been almost slurred. Hereby, questions like how subjective and objective nature of green value can be characterized, how they are interweaved and how subjective value perceptions drive the objective value in the market are paid less attention.

Empirical part of the research is focusing on the value perceptions of energy efficiency benefits by different property market actors, like real estate owners and energy efficiency service providers. Opinions of the real estate valuers related to market functioning and regularities in this relation are mapped as well. Also the role of energy efficiency and energy performance certificates in the valuation practice is studied.

Focus on the study is on commercial property market but also some notifications related to housing market are done. Research clarifies the elements of green value and decision making criteria for energy efficiency investments. Finally there is an attempt to model how green value in conceptual level have an impact on prices.

As a summary paper clarifies the questions of what the green value is, why it is there and what is the impact mechanism on price. Practical implications of the results are related to value engineering highlighting investment analysis and possibly some contributions to enhanced valuation considerations can be provided as well.

Keywords: Energy efficiency, green value, real estate valuation

## Impacts of Abandoned Properties in Conflict Zones (Geopolitical Brownfields) on Real Estate Development & Regeneration Possibilities: Case of Cyprus Conflict

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Abandoned areas are one of the most fundamental consequences within conflict zones, where they may appear as buffer zone, militarized areas, and closed or restricted zones. In this regard there are two complimentary discussions: one advocates the impacts of conflicts among regional policies and related actions arisen according to the facts that can produce geopolitically conflict zones, and the other one advocates the nature and origins of geopolitical conflict zones that can negatively impact the regional policies. Taking both discussions together as two dimensions among land management issues in conflict areas, and also considering conflicts in regional policies and existence of geopolitically conflict zones, would express a negative impact on any planning proposals for real estate developments and regeneration possibilities. Therefore this study attempt an investigation on these two dimensions to demonstrate the complicated realities associated with geopolitically conflict zones. Case of Cyprus conflict taken as an evidence to this study, where the rare situation of four decade of ongoing conflict became part of norm of decision making processes regarding all possible real estate development and regenerations scenarios. The study takes documentary and empirical research methods as the main methodological approach for data collection and analysis, where it particularly uses qualitative analysis in order to gain insights into the unspoken issues of real estate development difficulties within an internationally ignored conflict zones such as North Cyprus.

Keywords: Conflict Zones, Cyprus policy, geopolitical brownfields, real estate proposals, regeneration

# **PHB2**

## **Real Estate Contribution Margin System with Hierarchical Structure Effects a Concept for Real Estate Residential Companies and Cooperatives**

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Current rents are determined by the market. They are the result of both supply and demand. In order to estimate if the own cost situation fits to the market rents and market sales quota, the real estate companies have to create a reverse rent calculation with their planned prospective cost situation. Calculations on a Cash Flow-base don't have the warranty of fitness for the special purpose of reverse rent calculation because of the volatile Cash Flow-trends and the inclusion of cash outflows with investment characteristics. Therefore the aim is to adapt the multi-stage contribution margin systems, which are state of the art in the industry, for the use in the residential real estate industry. The contribution margin system has to be expanded to a statement of changes in contribution margins. There are variances in ascending powers, which have to be checked in a variance analysis. These variances are caused in different dimensions of the data models of the residential real estate companies. The use of an OLAP-System will be helpful for the classification and interpretation of the variances.

Keywords: Contribution margin system, OLAP-systems, residential real estate companies, variance analysis, reverse rent calculation

## Investigations into the Reasons for Non-normal Real Estate Returns – Time Matters!

**Patrick Krieger**, *ImmlT – Nürtingen-Geislingen University, Germany*

**Purpose** – Many studies have shown that real estate returns are not normally distributed. Instead, the returns were found to be leptokurtic and slightly skewed with fat tails on both ends of the distribution. This specific shape of real estate distributions complicates tasks such as measuring property risk, forecasting real estate markets, and optimizing real estate portfolios. Some of the reasons for the non-normality have been documented, but they cannot fully explain the distribution curve. In this paper we focus on time-related aspects such as the maturities of lease contracts and vacancy periods and their effect on real estate returns. The aim of our research is twofold: (1) providing some new reasons for non-normal distributions of real estate returns and (2) giving some guidance for modelling real estate risk.

**Design / methodology / approach** – A unique data set of lease contracts from a German residential real estate portfolio is employed. Distributions of contract maturities and vacancy periods are analysed with distribution fitting routines.

**Findings** – Contract maturities and vacancy periods are not normally distributed. These results shed some light on the return distributions in favour of compound distributions. Additionally a subset of lévy processes is provided for modelling real estate risk.

**Research limitations / implications** – Only residential real estate in Germany is examined. Other sectors and countries are interesting topics for future research.

**Originality** – This paper may provide evidence in favour of compound distributions for direct real estate investments. Furthermore, some guidance is provided for modelling real estate risk. This is valuable for both research and management practice.

**Keywords:** Compound distributions, fat-tails, leptokurtosis, non-normality, residential real estate

## Real Estate Investment Risks: The Case of Central and Eastern Europe

**Kateryna Kurylchyk**, *WU Vienna University of Economics and Business, Austria*

International real estate diversification provides significant benefits which are inevitably associated with considerable risks and costs. This requires a thorough analysis of options in order to take account of substantial uncertainty and foreignness implied by international investment per se, as well as the real estate market risks inherent in foreign countries. These factors are intensified by economic and political distresses and make real estate investors use more discretion in their operations abroad.

Similarly, in the face of downturn, market players have become cautious about investing in Central and Eastern Europe (CEE) and shifted their investments away from many once booming markets. In other words, the crisis resulted in an increased perception of risk and a change towards more selective investment strategies in CEE, with international investors unprepared to take high country risks even though property risks may be low. Thus relatively more importance is attached to country risks vs. property specifics and gains when making investment decisions. This study has been motivated by the perceived shortage of research on real estate markets and investment decision making factors in CEE, as well as the need for understanding these aspects in order to ensure sound investments in the region. It seeks to identify major risks of investing in real estate, with a particular focus on selected CEE countries. The paper addresses in the first instance the complexity of country risk as a composite risk and its components. Further, real estate investment trends and issues in the CEE markets are discussed, with specific investment risks for the CEE region identified. Finally, the importance of the factors influencing investment decision making is discussed, as perceived by international investors in the region.

This research contributes to a better understanding of barriers and risks of international real estate investment while assisting investors in improving their perception of opportunities and implications associated with real estate investments in the CEE region.

Keywords: CEE countries and region, country risk, international investment,

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## Keyword Register

- accreditation, 170, 176  
Ad valorem taxation, 219  
adaptive reuse, 40, 116  
Adaptive reuse, 3, 64  
added value, 11, 18, 103, 134  
age-restricted housing, 50  
agglomeration economies, 132, 149  
Aluation models, 202  
anchor effect, 206  
anchoring, 4, 49, 186, 207  
Anchoring, 4, 204, 206, 207  
Anchoring heuristic, 207  
ARIMA models, 59  
Artificial neural networks, 208  
Asset allocation, 229, 231  
Asset depreciation, 2  
asset management, 4, 7, 224  
Asset pricing, 16, 126
- behavioral real estate, 147  
behavioural finance, 191  
Behavioural finance, 187  
Behavioural real estate, 70  
Benchmarking, 8  
bootstrap selection, 124  
Brand city, 138  
building maintenance, 2  
Buildings energy retrofit, 27
- Campus, 10, 39, 187, 207  
Capital asset pricing model, 180  
Carbon emissions, 17, 39  
Certification, green buildings, 25  
Chain-linking, 99  
CMBS, 185  
Cognition bias, 156  
Commercial office, 3  
commercial property, 85, 101, 102, 139, 207, 236  
Community real estate, 133  
Comparative rent, 142  
Compound distributions, 239
- concept development, 100  
conflict zones, 151, 237  
Contagion, 190  
conversion, 6, 116, 140  
Corporate governance, 194  
Credit ratings, 79  
Credit risk, 122  
CREM organization, 9
- Decision strategies, 31  
Demolition control precincts, 213  
development viability, 101  
Discrete choice models, 28  
distressed market, 102  
distressed property, 14  
Diversification benefits, 177  
diversity, 57, 76, 145, 153, 157, 169
- ecology and real estate, 21  
economic convergence, 106  
educational vision, 171  
EEWH green building labeling system, 23  
electricity consumption, 225  
electricity prices, 43  
emerging markets, 67, 189  
employee productivity, 15  
Energy conservation, 20  
energy efficiency, 17, 19, 24, 26, 29, 32, 36, 39, 58, 98, 209, 233, 236  
Energy efficiency, 209, 236  
entropy, 153  
ERES, 40, 103, 171  
ethical practices, 172  
Ethnic mover flows, 145  
ex-ante uncertainty, 235
- facility management, 1, 36, 41  
Facility Management, 1, 11  
Fama-French three factor model, 196  
farmland, 99  
financial analysis, 178

---

Financial commitment, 8  
financial condition, 154, 198  
forecasting, 1, 44, 88, 92, 105, 110, 137, 239  
future-proofing, 157, 171

gated communities, 131  
Generation Y, 71  
geopolitical brownfields, 151, 237  
Global capital flows, 76  
google data, 92  
Google searches, 110  
green building, 21, 23, 31, 33, 35  
Green building Index, 33  
Green buildings, 35  
green value, 236  
growth management, 46

Hazard models, 195  
health and wellbeing, 10  
health care, 10, 11  
Hedging, 220  
hedonic model, 19, 66, 205, 208, 210, 233  
hedonic modelling, 90  
Hedonic modelling, 69  
hedonic models, 58, 66, 114, 212  
hedonic pricing, 23, 64, 70, 233  
hedonic regression analysis, 66  
herd behavior, 188  
Herd behaviour models, 182  
heritage, 64  
house price index, 49  
house price indices, 54, 112  
House prices, 115  
household wealth, 230  
housing, 19, 21, 22, 28, 32, 36, 41, 42, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 69, 70, 71, 74, 81, 91, 92, 93, 94, 95, 97, 98, 108, 112, 113, 114, 122, 131, 133, 134, 136, 137, 140, 141, 142, 152, 153, 160, 163, 164, 191, 198, 205, 208, 209, 210, 213, 217, 218, 227, 228, 230, 233, 236  
housing affordability, 46, 74, 227  
Housing affordability, 46, 93, 227  
housing associations, 60, 61  
housing bubble, 47, 93, 97, 112  
Housing bubble, 97  
housing bubbles, 93  
Housing consumption, 48  
housing corporations, 61, 218  
housing market prices, 55  
housing policy, 141, 142, 210, 217, 228  
housing values, 50, 152

Implied volatility, 200  
Innovative finance, 155  
IPO pricing, 199, 235

income distribution, 228  
infill development, 163  
information asymmetry, 80, 226  
innovation, 33, 41, 135  
international competitiveness, 72  
internet listing services, 51

knowledge workers, 15  
kriging metamodelling, 168

Land assembly, 143  
land development, 136, 143  
land fragmentation, 143  
land supply, 81  
land values, 101  
LCC, 40  
lead-lag relationship, 104  
learning environment, 171, 174  
leptokurtosis, 239  
leverage, 184, 192  
listed funds, 224  
logit model, 159  
loss aversion, 186

Mass appraisal, 203  
mean reversion, 89  
mixed integer programming, 39  
Mixed use developments, 73  
mortgage demand, 48  
Mortgage finance, 179  
multi nominal logit, 57  
mutual funds, 197, 201

---

NAV discount, 184, 188  
noise traders, 184  
nominal loss aversion, 113  
nonlinear regression, 114  
non-parametric spatial models, 52

obsolescence, 3, 40, 218  
occupier satisfaction, 12  
office buildings, 3, 18, 30  
OLAP-systems, 238  
online retailing, 83  
operations research, 120  
optimal reserve price, 56  
options pricing theory, 214  
ownership change, 117

panel data, 55, 68, 88  
pedagogy, 169  
pensions, 231  
performance, 7, 8, 11, 13, 15, 16, 17, 18, 21, 22, 24, 32, 38, 40, 45, 66, 72, 76, 77, 79, 82, 85, 95, 97, 99, 105, 109, 110, 120, 124, 164, 177, 178, 179, 184, 193, 194, 195, 196, 209, 210, 220, 223, 231, 233, 236  
performance, strategy, 223  
personality indicators, 109  
PMI methodology, 158  
polycentrism, 205  
portfolio management, 16, 196  
PPP, 13, 36, 127, 159  
PREAM models, 7  
price premium, 62, 64, 119, 213, 215  
price-to-income ratio, 65, 74  
pricing strategy, 58, 69  
productivity, 11, 13, 15, 120, 160  
professional skills, 169  
property forecasts, 88  
property markets resilience, 148  
public debt, 127  
public real estate management, 96

rasch measurement model, 30  
rationality, 80, 88, 191, 219  
real estate bubbles, 94  
real estate cycles, 91, 95  
real estate education, 169, 170, 173, 174, 176  
real estate indicators, 87  
real estate marketing, 111  
real estate services, 75  
real estate stocks, 77  
real options, 26  
regeneration, 27, 67, 151, 155, 164, 165, 237  
regression discontinuity, 19  
REIT, 31, 77, 78, 79, 124, 181, 184, 188, 194, 196, 197, 199, 201, 220, 222, 223, 235  
rent act, 142  
rent regulation, 217  
repertory grid technique, 216  
reputation, 10, 12, 75  
resilience, 148, 165  
Resolving value, 234  
retail hierarchy, 146  
retail malls, 20  
retail market, 83, 161  
reverse mortgage, 45  
risk, 3, 13, 28, 53, 61, 80, 82, 86, 87, 93, 108, 119, 121, 123, 124, 125, 126, 128, 150, 156, 157, 165, 177, 179, 180, 183, 184, 193, 195, 196, 197, 198, 200, 201, 214, 220, 223, 229, 231, 232, 236, 239, 240  
risk assessment, 61, 123  
risk factors, 16, 86, 126, 232  
risk measurement, 121, 125  
risk premium, 232

senior housing, 45  
shopping centers, 5, 120, 161  
short-term-rental, 140  
single index model, 196  
smart beta, 201  
smart city, 1  
smart grids, 26, 41  
smart growth, 137  
social housing, 36, 61, 217  
social media, 108  
social values, 60  
spatial analysis, 35, 68, 149  
spatial autocorrelation, 52, 58



---

spatial dependence, 130  
spatial econometrics, 90, 130  
spatial imputation, 114  
spatial planning, 62, 161  
spatial variation, 129  
stakeholder analysis, 53  
strategy alliance, 215  
Stratum title, 211  
structural equation modeling, 162  
sustainability, 6, 17, 18, 20, 22, 23,  
25, 27, 37, 38, 39, 41, 132, 165,  
167, 219, 233, 236  
sustainable real estate, 17, 25  
systematic risk, 16, 126  
tenant diversification, 185  
time series analysis, 91  
transaction based indices, 193  
transaction cost theory, 80  
transaction frequency, 107  
turning points, 92, 104  
underground development, 211  
underwriting costs, 78  
urban parks, 42  
urban regeneration, 27, 67, 157,  
165, 166  
urban renewal, 137, 139, 143  
urban transformation, 144, 150  
vacancy, 3, 6, 91, 96, 104, 141, 239  
variance analysis, 238  
virtual reality, 151  
volatility transmission, 190  
waterfront development, 167

---

## Author Index

Ab Wahid, Mohd Azhar.....	70	Bay, Alexandra .....	120
Abd Rasid, Sr. Faziah .....	211	Beckers, Pascal.....	164
Abiko, Alex.....	36	Bélanger, Philippe.....	42
Adair, Alastair.....	102, 155	Bellman, Lina.....	216
Adamušcin, Andrej .....	161	Bendová, Martina .....	163
Adi Maimun, Nurul Hana .....	235	Berry, Jim.....	86, 102, 136, 235
Adil, Semih .....	150	Bienert, Sven .....	17, 22, 36, 37, 97
Akantziliotou, Calliope.....	101	Blasi, Pau .....	234
Akgün, Aliye Ahu .....	131	Bohman, Helena.....	206
Akinsomi, Omokolade .....	192, 197	Bonifaci, Pietro .....	27,35
Alaka, Iheanyi .....	160	Bosak, Alexander.....	90
Albayrak, Ayse Nur.....	144	Boshoff, Douw.....	214
Alhanlioglu, Gulcema.....	66	Bougie, Roger.....	68
Alkay, Elif.....	129	Brackenie, Pim.....	18
Alp, Ali.....	95	Branigan, Clare .....	46, 191
Alsasua Pastrana, Ioanna.....	1	Braun, Nicole.....	140
Ambrose, Brent.....	185	Braunschweig, Maria.....	13
AmédéeManesme, Charles Olivier.....	121 200	Brounen, Dirk.....	19
Ametefe, Frank Kwakutse.....	233	Brunauer, Wolfgang A.....	17, 113
Anderson, Randy I.....	231	Bryant, Lyndall .....	45
Andersson, Magnus .....	206	Buitelaar, Edwin .....	61
Anghel, Ion.....	34, 48	Buyukduman, Ahmet .....	111
Ansari, Nelufer.....	37	Caicedo-Llano, Juliana.....	124
Ansary, Nishaan.....	197	Cajias, Marcelo .....	22, 37
Appel- Meulenbroek, Rianne .....	8, 9, 99	Camlibel, Mehmet Emre .....	38, 66
Antoniucci, Valentina .....	40	Canesi, Rubina.....	123
Ar, Bilge.....	116	Castanheira, Paulo .....	208
Aranda- Mena, Guillermo .....	170	Chadburn, Ana .....	15
Arayici , Yusuf .....	92	Che Kasim, Asmma.....	33
Arkesteijn, Monique.....	95	Chen, Fong-Yao .....	23
Arslanli, Kerem Yavuz.....	67	Chin, Lawrence .....	20
Arts, Joep.....	60	Chow, Yuen Leng .....	108
Arto, Karlos .....	10	Chu, Nan-Yu .....	215
Ascherl, Claudia .....	237	Chuangdumronsomsuk, Marielle .....	221
Assmann, Dirk.....	135	Ciochetti, Brian (Tony).....	38
Aydin, Erdal.....	19	Ciora, Costin.....	34, 48, 147
Aydin, Olgun .....	168	Clacy-Jones, Mark .....	225, 226
Baccarin, Alessandro .....	184	Cohen, Alain .....	234
Bakens, Jessie.....	145	Colucci, Paolo .....	105, 142
Barentsen, Danielle .....	63	Cooke, Howard.....	8
Barthélémy, Fabrice .....	121	Copiello, Sergio.....	27,35
Bartsch, Paul .....	97	Coskun, Yener.....	96, 196
Batra, Chetna.....	178	Crosby, Neil.....	100
Baum, Andrew .....	98	D'Alpaos, Chiara.....	26, 40, 123
Baxter, James.....	170	D'Arcy, Eamonn.....	74

Das, Prashant .....	109	Haurin, Donald .....	44
Daugeliene, Ala .....	148	Hefferan, Mike .....	219
Davis, Peadar .....	32	Heinen, Andréas .....	122
De Jong, Peter .....	39	Heinrich, Michael .....	188
De jonge, Hans .....	3	Heitel, Stephanie .....	52
De Vries, Bauke .....	99	Hepsen, Ali .....	168
Dermisi, Sofia .....	81	Hiironen, Juhana .....	209
Des Rosiers, François .....	200	Hobbs, Peter .....	226
Deschermeier, Philipp .....	43	Hoebecck, Annelies .....	47
Devaney, Steven .....	100, 195, 233	Hoesli, Martin .....	222, 223
Dian Prima, Annisa .....	194	Horváth, Áron .....	103
Dietzel, Marian Alexander .....	91	Hsiu-yin, Ding .....	143
Dimovski, William .....	77	Huibers, Fred .....	204
Dunning, Richard .....	50	Hummel, David .....	107
Dust, Anja .....	207	Hussin, Khadijah .....	33
Echavarría Ochoa, Juan Camilo .....	153, 205	Huston, Simon .....	71, 98, 137, 165, 228
Elliott, Peter .....	213	Hutchison, Norman .....	155
Ericksen, Mike .....	44	Jackson, Cath .....	157
Erol, Isil .....	199	Jadevicius, Arvydas .....	98, 181
Ertugrul, H. Murat .....	96	Janssen, Ingrid .....	68
Esen, Bugra Kagan .....	139	Johann, Sebastian .....	218
Essafi, Yasmine .....	54	Jones, Colin .....	146
Evans, Kathleen .....	207	Juárez, Francisco .....	58
Faishal, Muhammad .....	192	Kahre, Kristian .....	73
Falkenbach, Heidi .....	128	Kallakmaa, Angelika .....	62
Farrelly, Kieran .....	201	Kangalli Uyar, Guler, Sinem .....	51
Feilmayr, Wolfgang .....	113, 212	Karaca, Melike .....	131
Filippova, Olga .....	119	Karmagianni, Maria .....	28
Florentino, Teresa .....	41	Kashyap, Anil .....	136, 172
Francke, Marc .....	112	Kask, Kaia .....	2, 7, 180
French, Nick .....	202	Katyoka, Mutale .....	125
Frodsham, Malcolm .....	104	Kaufmann, Philipp .....	25
Fuerst, Franz .....	24	Kavarnou, Dimitra .....	65
Fürst, Franz .....	22	Kaya, Merve .....	138
Gabrielli, Laura .....	202	Kemp, Lloyd .....	197
Ge, Xin Janet .....	114	Kesdogan, Dogan .....	97
Gezici Korten, Ferhan .....	138	Keskin, Mustafa Çağhan .....	115
Gibler, Karen .....	49	Keskin, Berna .....	129
Glumac, Brano .....	56	Kestel, Sevtap .....	196
Gluzsak, Michal .....	159	Kim, Mi Lim .....	122
Gokbayrak, Ayse .....	150	Kim, Kyung-Min .....	85
Gostautas, Ignas .....	227	Kippes, Stephan .....	21
Grebenuk, Elena .....	94	Koblyakova, Alla .....	229
Grégoire, Philippe .....	200	Kochetkov, Yuriy .....	94
Gu, Guowei .....	80	Kok, Nils .....	19
Guloglu, Bulent .....	51	Kolbre, Ene .....	73
Hahn, Jonas .....	97	Kootstra, Dirk .....	134
Hamilton, Ian .....	28	Koppels, Philip .....	63
Hannum, Christopher .....	67	Krautz, Sebastian .....	231
Haran, Martin .....	32	Krieger, Patrick .....	187, 241

Kryvobokov, Marko .....	210	Mitrakos, Theodore .....	101
Kulikauskas, Darius .....	64	Mohd Raid, Maryanti .....	33
Kurtbegu, Enareta .....	124	Moretto, Michele .....	26
Kurylchyk, Kateryna .....	242	Morri, Giacomo .....	184
Kvedaraviciene, Leva .....	5	Morris, Alexandra .....	31
Kyrö, Riikka .....	10	Moss, Alex .....	193, 201, 220, 223, 224
Lahbash, Ebraheim .....	228	Moulton, Stephanie .....	44
Laitala, Ari .....	209, 238	Mouzakis, Fotis .....	87
Landau, Friederike .....	141	Müller, Nikolas D. ....	29
Lang, Stephan .....	126	Müller, Claus .....	141
Lausberg, Carsten .....	4, 187, 207	Müller, Thomas .....	232
Lavasani, Hossein .....	169	Multescu, Gheorghe Petru .....	14, 148
Le Roux, Pieter .....	18, 171	Nalepka, Adam .....	127
Lee, Stephen .....	181, 182	Nanda, Anupam .....	24, 65
Leshinsky, Deborah Miriam .....	236	Nase, Ilir .....	130
Levent, Mehmet Akif .....	150	Newell, Graeme .....	177, 189, 192
Levy, Deborah .....	50	Nkote, Isaac Nabeta .....	179
Li, Puying .....	71	Nnametu, Jovita .....	160
Liang, Jen-Hsu .....	23	Nurick, Saul .....	31
Liu, Nan .....	57	Öhman, Peter .....	216
Livingstone, Nicola .....	82, 146	Oikarinen, Elias .....	222
Lizieri, Colin .....	75, 221	Okoronkwo, Derek Fidelis Chikezie .....	160
Lo, Daniel Y.F. ....	57	Ong, Seow Eng .....	108, 192
Lown, Keith .....	88	Organ, Samantha .....	155
Lüdeke, Henri .....	240	Orr, Allison .....	157
Lundgren, Berndt .....	162	Orth, Ayosha .....	79
Lux, Nicole .....	224	Ostroumoff, Charles .....	104
MacFarlane, John .....	203	Palm, Peter .....	206
Maier, Gunther .....	25, 34, 48	Papastamos, Dimitrios .....	87
Mändle, Markus .....	107	Parker, David .....	183
Marella, Giuliano .....	40	Parlasca, Peter .....	53
Mark, Kantšukov .....	180	Parsa, Ali .....	165, 166, 167
Marmolejo D., Carlos 1,151,153,205, 239		Peltokorpi, Antti .....	10
Marola, Bogdan .....	53	Pfñür, Andreas .....	13, 29, 52, 156
Martens, Bob .....	102, 174	Piepke, Franziska .....	4
Masilela, Boitumelo .....	197	Pillen, Koen .....	68
Matovu, Augustine .....	179	Pitros, Charalambos .....	92
McAllister, Pat .....	24	Ploegmakers, Huub .....	164
McCord, Michael .....	32, 235	Ploumen, Thijs .....	9
McCord, John .....	32	Postila, Mikael .....	209
McFarland, Margaret .....	169	Pryce, Gwilym B. ....	145
McGough, Tony .....	86	Qiulin, Ke .....	84, 106
McGreal, Stanley .....	102, 155, 235	Rahimzad, Reyhaneh .....	165
McIlhatton, David .....	102	Rebitzer, Dieter .....	105, 142, 176
Megat Abdul Rahman, M. Ghazali ...	30, 33	Remøy, Hilde .....	3, 6, 63, 95
Mekic, Daniel .....	75	Renz, Mark .....	105, 142
Meyer, Kevin .....	13, 156	Révész, Gábor .....	103
Michael, Lynne .....	132	Richardson, Matthew .....	186
Milcheva, Stanimira .....	223	Robson, Kathryn .....	170
Mirembe, Rachael Daisy .....	179	Rochdi, Karim .....	16

Rodriguez, Ramiro J.....	89	Tirtiroglu, Dogan.....	199
Romme, Sjoerd.....	99	Tjeerdsma, A (Annette).....	133
Rothballer, Christoph.....	126	Toivonen, Saija.....	163
Rottke, Nico B.....	231	Topcu, Mehmet.....	152
Roulac, Stephen.....	74, 83, 175	Tsolacos, Sotiris.....	85
Ryan, Paul.....	46, 191	Türgen, Nurbanu.....	158
Ryan, Stephen.....	186	Tyvimaa, Tanja.....	49
Sah, Vivek.....	78	Ugurlu, Deniz.....	66
Salzman, Diego.....	69	Valdesogo, Alfonso.....	122
Sander, Priit.....	180	Valtonen, Eero.....	128
Sanderson, Danielle Claire.....	12	Van der Krabben, Erwin.....	60, 128
Santovito, Rogerio.....	36	Van der Voordt, Theo.....	11
Schaefers, Wolfgang.....	126, 237	Van der Werf, Ytzen.....	204
Schäfer, Philipp.....	140	Van Oel, Clarine.....	95
Schier, Michael.....	93	Vatandas, Orhan.....	168
Schilder, Frans.....	61	Veuger, Ing. Jan.....	59, 133, 134
Schmid, Marcel.....	207	Vieira Gomes, Sandra.....	41
Schnejdar, Sebastian.....	188	Viitanen, Kauko.....	128, 209
Schofield, Jody.....	31	Viruly, Francois.....	72, 207
Scofield, David.....	195	Vlachostergiou, Vassiliki.....	101
Sedlacek, Sabine.....	25	Vogt, Gisela.....	176
Semiz, Nisa.....	117	Voigtländer, Michael.....	93
Sengil, Ayse Tugba.....	118	Vos, Daniël.....	95
Seven, Unal.....	96	Warren, Clive.....	213
Shafer, Michael.....	185	Watkins, Craig.....	50, 129
Shi, Wei.....	44	Weberndorfer, Ronald S.....	113
Shirina, Saumya.....	172	Wegrzyn, Joanna.....	127, 159
Shojaee Far, Mohsen.....	1, 151, 239	Weijjs- Perrée, Minou.....	99
Shojaei, Leila.....	167	Wellner, Kristin.....	141
Sieracki, Karen.....	84, 106	White, Michael.....	84, 88, 229
Simon, Arnaud.....	54, 234	Wilkinson, Sara.....	6, 82
Sittler, Peter.....	90, 110	Williams, Brendan.....	114
Smeets, Jos.....	9	Wissink, Thomas, P.....	56
Smith, Judy.....	15	Wolski, Rafal.....	154, 198
Smolders, Carine.....	47	Woltering, Rene-Ojas.....	76
Sotelo, Ramón.....	217	Wurstbauer, Daniel.....	126
Squires, Graham.....	155	Wyatt, Peter.....	24, 100
Staines, Jason.....	213	Yang Wallentin, Fan.....	162
Stevenson, Simon.....	55, 87, 125, 190, 194, 233	Yao, Liming.....	229
Stiller, Johannes.....	135	Yayla, Nihal.....	51
Surmann, Markus.....	17	Yildirim, Yildiray.....	185
Symonds, Barry.....	14	Yilmaz, Bilgi.....	196
Taltavull de La Paz, Paloma.....	58	Yop, Mohd Haris.....	173
Telega, Agnieszka.....	127	Young, James.....	55
Teska, Magdalena.....	230	Yuo, Tony Shun-Te You.....	149
Teuben, Bert.....	226	Zahirovic-Herbert, Velma.....	49
Thanos, Sotirios.....	28	Zaleczna, Magdalena.....	154
Thomson, Bob.....	174	Zanjiri, Yasser.....	166
Tidwell, Alan.....	78		



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