



Riga Technical University
Faculty of Engineering Economics and Management
Institute of Civil Engineering and Real Estate Economics

**“SCIENTIFIC PROBLEMS OF ENGINEERING
ECONOMICS OF CONSTRUCTION AND REAL
ESTATE MANAGEMENT, REGIONS AND
TERRITORIES DEVELOPMENT ICEREE’2019”**

Organized within 60TH International Scientific
Conference of Riga Technical University
27 – 28 September 2019
Riga, Latvia

BOOK OF ABSTRACTS

RTU Press

Riga – 2019

Organized within 60TH International Scientific Conference of Riga Technical University “Scientific Problems of Engineering Economics of Construction and Real Estate Management, Regions and Territories Development ICEREE`2019”. Book of Abstracts. Riga: RTU Press, 2019

Editor-in-Chief

Prof. Ineta Geipele, Riga Technical University, Latvia

Managing Editor

Prof. Tatjana Tambovceva, Riga Technical University, Latvia

International Editorial Board

Prof. Maija Šenfelde, Riga Technical University, Latvia

Prof. Jānis Vanags, Riga Technical University, Latvia

Prof. Frank Riemenschneider-Greif, Münster University of Applied Sciences, Germany

Prof. Reiner Jäger, Karlsruhe University of Applied Sciences, Germany

Prof. Roode Lias, Tallinn University of Technology, Estonia

Assoc. Prof. Armands Auziņš, Riga Technical University, Latvia

Dr. Jurga Naimavičiene, Vilnius Gediminas Technical University, Lithuania

Dr. Loreta Kanapeckiene, Vilnius Gediminas Technical University, Lithuania

Dr. Kamil Kowalczyk, University of Warmia and Mazury in Olsztyn, Poland

Technical Editor

Iveta Stāmure, Riga Technical University, Latvia

Jānis Zvirgzdiņš, Riga Technical University, Latvia

Contacts:

Faculty of Engineering Economics and Management

Riga Technical University

Kalnciema Str. 6-210

LV-1048, Riga, Latvia

Phone: +371 67089845

E-mail: ICEREE2019@rtu.lv

ISBN: 978-9934-22-369-3 (pdf)

Authors are responsible for the correctness of the publications.

All rights are reserved. No part of this publication may be reproduced, stored, transmitted or disseminated in any form or by any means without prior written permission from Riga Technical University represented by RTU Faculty of Engineering Economics and Management to whom all requests to reproduce copyright material should be directed in writing.

© Riga Technical University, 2019

Published by RTU Press, Riga Technical University, 1 Kalku Street, Riga LV-1658, Latvia

CONTENTS

HISTORICAL TRENDS IN LATVIA’S HOUSING POLICY AND PLANNING TO IDENTIFY FACTORS AFFECTING SUSTAINABLE DEVELOPMENT <i>Actiņa G., Pļaviņa B., Geipele I.</i>	6
PLANING OF ENERGY EFFICIENT SOLUTIONS AND IMPLEMENTATION PROBLEMS IN MULTI-RESIDENTIAL BUILDINGS IN LATVIA <i>Actiņa G., Pļaviņa B., Geipele I.</i>	7
WASTE MANAGEMENT ROLE OF RESIDENTIAL BUILDINGS UNDER MANAGEMENT AND ITS IMPACT ON THE ENVIRONMENT <i>Amoliņa I., Geipele I.</i>	8
METHODOLOGICAL GUIDELINES AND RECOMMENDATIONS TO SUPPORT IMPLEMENTATION OF VALUES-LED PLANNING APPROACH INTO PRACTICE <i>Auziņš A., Geipele I., Kočanova R.</i>	9
CRITICAL CREATIVE THINKING IN THE STUDY PROCESS of THE REAL ESTATE MANAGEMENT <i>Buliņš J., Stāmure I., Geipele I.</i>	11
INVESTMENT OF ACCUMULATED STATE-FUNDED PENSION FUNDS IN LATVIA’S ROAD INFRASTRUCTURE OBJECTS <i>Čudars L., Geipele I.</i>	12
NEW APARTMENT PROJECTS VALUATION, SITUATION ANALYSIS AND SOLUTIONS <i>Džigune D., Stāmure I., Geipele I.</i>	13
CONTROL SOLUTIONS IN CONSTRUCTION BUSINESS <i>Fedotova K.</i>	14
FEATURES of THE BALANCED STATE REGULATORY FRAMEWORK IN THE FINANCIAL MARKET <i>Freimanis K., Šenfelde M.</i>	17
NECESSITY FOR RESEARCH SKILLS IN RTU STUDY COURSE “INTRODUCTION TO REAL ESTATE RESEARCH” <i>Geipele I., Zvirgzdiņš J., Plotka K.</i>	18
OFFICE SPACE EVALUATION ECONOMIC JUSTIFICATION <i>Jurjāne I., Muskate R.</i>	20
SOCIO-ECONOMIC ASPECTS OF LATVIAN ARCHAEOLOGICAL HERITAGE: THREATS AND OPPORTUNITIES <i>Kairiņš A.</i>	21
THE ANALYSIS OF CONTEMPORARY ECONOMIC PROBLEMS OF RESIDENTIAL REAL ESTATE MARKET IN LATVIA <i>Kauškale L.</i>	22
FINANCIAL IMPROVEMENTS OF THE ENTERPRISE AND RESTORATION OF ITS SOLVENCY IN THE CONDITIONS OF THE RISK MANAGEMENT <i>Kirjanen A., Labudin A., Samodurov A.</i>	23
ANALYTICAL EVALUATION OF THE INDICATORS OF THE COMPETITIVENESS OF THE CONSTRUCTION INDUSTRY IN THE BALTIC STATE <i>Klešs Ā., Stāmure I.</i>	24

QUALITATIVE CHARACTERISTICS OF RESIDENTIAL REAL ESTATE <i>Kočanovs N., Geipele I., Kočanova R., Bogodistaja O.</i>	25
SELF-SUFFICIENT USE OF TERRITORIES IN THE CONTEMPORARY CONTEXT <i>Lazdins A.</i>	26
IMPROVING TRANSNATIONAL EDUCATION IN TIMBER CONSTRUCTION BY THE USE OF PROJECT-BASED LEARNING APPROACH <i>Mortensen A., Amado M., Hamburg P., Tupenaite L., Naimaviciene J., Kanapeckiene L., Taylor R.</i>	27
APPRAISAL OF COMMERCIAL PROPERTY, PROBLEMS AND SOLUTIONS IN LATVIA'S REAL ESTATE MARKET <i>Muskate R.</i>	28
COMPARATIVE ANALYSIS OF MASS VALUATION METHODS FOR MULTI-DWELLING BUILDINGS IN LATVIA AND SWEDEN <i>Muskate R., Tambovceva T.</i>	29
OPTIONS FOR STRATEGIC MANAGEMENT OF REAL ESTATE PORTFOLIO IN ORGANISATION <i>Pāvuls H., Geipele I.</i>	30
TWO APPROACHES TO EXAMINE THE IMPACT OF DIFFERENT CREDIT DEFAULT INDICATORS OF REAL ESTATE LOANS <i>Pfalz R.</i>	31
FINANCIAL ASSESSMENT OF THE SUSTAINABILITY OF MANAGEMENT AND ADMINISTRATION COMPANIES FOR RESIDENTIAL HOUSES <i>Pļaviņa B., Actiņa G., Geipele I., Geipele S.</i>	32
PRICING POLICY OF THE MANAGEMENT AND ADMINISTRATION OF RESIDENTIAL HOUSES IN LATVIA <i>Pļaviņa B., Actiņa G., Geipele I., Geipele S.</i>	33
CIRCULAR BUILDING MATERIALS AND WASTE MANAGEMENT STRATEGIES AS CONTRIBUTORS TO ACHIEVEMENT OF SUSTAINABLE DEVELOPMENT GOALS <i>Plotka K., Zvirgzdiņš J.</i>	34
METHODOLOGY FOR TEACHING ENVIRONMENTAL MANAGEMENT AND ECO-ECONOMICS AT RIGA TECHNICAL UNIVERSITY <i>Plotka K., Zvirgzdiņš J., Geipele I.</i>	35
BLUE GROWTH ACTIONS IN COASTAL MUNICIPALITIES IN LATVIA <i>Pudzis E.</i>	36
APARTMENT PROPERTY VALUATION PROBLEMS AND SOLUTIONS FOR MORTGAGE CREDIT <i>Rosicka V., Stāmure I., Geipele S.</i>	37
RESEARCH ON THE TECHNICAL DETERIORATION OF STANDARD MULTI-STOREY RESIDENTIAL BUILDINGS <i>Šnīdere L., Menniks M., Konrāds V., Rudzītis A., Vulāns A.</i>	38
FINANCIAL SOURCES AND CONDITIONS FOR THE RENOVATION OF STANDARD MULTI- STOREY RESIDENTIAL BUILDINGS <i>Šnīdere L., Menniks M., Rudzītis A., Vulāns A.</i>	40
RECOMMENDATIONS FOR A RENOVATION POLICY OF STANDARD MULTI-STOREY RESIDENTIAL BUILDINGS <i>Šnīdere L., Menniks M., Princis G.</i>	42
QUALITY MANAGEMENT SYSTEM DEVELOPMENT IN REAL ESTATE MANAGEMENT <i>Šreibere S., Geipele I.</i>	43

WHAT IS DESIGN HIDING? HOW? WHY? Could en 16310 “engineering services - terminology to describe engineering services for buildings, infrastructure and industrial facilities” change and improve interactivity between designer and builder? <i>Uzulens J., Geipele I.</i>	44
LOWERING THE EMPLOYMENT BURDEN: THE WAY TOWARDS SUSTAINABLE DEVELOPMENT <i>Vanags J., Geipele I.</i>	45
A NOVEL AND SUSTAINABLE APPROACH TO WASTE FLOW MANAGEMENT <i>Vanags J., Geipele I.</i>	47
INFORMATION ASYMMETRY IN REAL ESTATE TRANSACTIONS AND ITS IMPACT ON THE TRANSACTION OBJECT <i>Vanags J., Geipele I., Kauškale L.</i>	49
POPULATION CHANGE FORECAST BY THE EU AND OECD: A CRITICAL ASSESSMENT <i>Vanags J., Geipele I., Linde N.</i>	51
CRITICALLY CREATIVE METHOD IN RESEARCH AND HIGHER EDUCATION <i>Vanags J., Geipele I., Linde N.</i>	54
CORRUPTION IN THE CONSTRUCTION INDUSTRY: SIGNIFICANT CASES AND CONSEQUENCES <i>Vanags J., Geipele I., Stāmure I.</i>	56
QUALITY OR CONFORMITY OF CONSTRUCTION PRODUCTS: WHAT IS WHAT? <i>Vanags J., Geipele I., Stāmure I.</i>	57
REAL ESTATE TRANSACTION COSTS IN LATVIA <i>Viesturs J., Auzins A.</i>	59
THE IMPACT OF CULTURE AND CREATIVITY CLUSTER TO THE ECONOMY OF THE CITY <i>Zariņš G., Plotka K., Viržbickis J., Zvirgzdiņš J., Geipele S.</i>	61
RIGA TECHNICAL UNIVERSITY STUDY COURSE “MANAGEMENT OF INNOVATIONS IN BUILDING CONSTRUCTION” TEACHING METHODOLOGY <i>Zariņš G., Plotka K., Zvirgzdiņš J., Geipele I.</i>	62
SUITABLE RESEARCH METHODS IN STUDY PROCESS OF RIGA TECHNICAL UNIVERSITY <i>Zvirgzdins J., Geipele I.</i>	63
REAL ESTATE APPRAISAL OF INVESTMENT OBJECT <i>Zvirgzdins G., Muskate R.</i>	64
CHANGING THE PARADIGM: CIRCULAR ECONOMY AND RELATED CONCEPTS <i>Zvirgzdins J., Plotka K.</i>	65

HISTORICAL TRENDS IN LATVIA'S HOUSING POLICY AND PLANNING TO IDENTIFY FACTORS AFFECTING SUSTAINABLE DEVELOPMENT

Gita ACTIŅA¹, Baiba PĻAVIŅA², Ineta GEIPELE³

¹⁻³ Riga Technical University, Latvia

Corresponding author's e-mail: Gita.Actina@rtu.lv

Abstract. Housing policy is the overall set of actions and measures planned and defined at the highest level of government which directly influences the demographic dynamics of the country, i. e. changes in the number of the population. Unlike other sectors of economy, the demand for residential space exists in any situation, regardless of whether there is a growth or decline in the development at the national level. Providing an appropriate environment, regulating the management and administration of the housing stock is part of housing policy, which is justified by historical trends in the sphere of real estate.

The aim of the study is to identify the factors that affect the implementation of housing policy and the management and administration of residential houses. The identification of these factors will allow to identify their positive or negative impact on planning processes and the further development of interrelated components of the sector.

Within the framework of the study, by using the quantitative research methods, the regulatory framework was analysed, publicly available data on the demographic situation and its composition, housing stock, as well as related financial data were collected, analysed and compared.

Evaluating historical trends in housing policy and management and administration of residential buildings, it is concluded that changes in ownership patterns and their historical chronology are directly related to the intensity of cooperation between the state and local governments in defining and developing of housing policy, which, hence, justifies the need for further studies.

Keywords: *Housing policy, Planning processes, Strategic planning, Real estate management and administration.*

JEL Classification: G18, H21, H54, N14, N64, O18, O21, R28, R38 K11, K25

PLANING OF ENERGY EFFICIENT SOLUTIONS AND IMPLEMENTATION PROBLEMS IN MULTI-RESIDENTIAL BUILDINGS IN LATVIA

Gita ACTIŅA¹, Baiba PĻAVIŅA², Ineta GEIPELE³

¹⁻³ Riga Technical University, Latvia

Corresponding author's e-mail: Gita.Actina@rtu.lv

Abstract. Directive (EU) 2018/2002 of the European Parliament and of the Council of 11 December 2018 amending Directive 2012/27/EU on energy efficiency regulates the targets to be achieved at the European level and provides instructions for the Member States to draw up their national plans and to set national energy efficiency targets for 2030. In this country, subsequent strategic and tactical plans will be based on national targets, in accordance with the planning hierarchy.

The aim of this study is to identify problems related to the achievement of national energy efficiency targets and introduction of energy efficient solutions in multi-residential buildings in Latvia, as well as to find appropriate solutions that meet the interests of the flat owner community of multi-residential buildings and facilitate the implementation of national regional and administrative plans.

The study showed that energy efficient solutions in multi-storey residential buildings are more common in the capital of Latvia than in regions which might be explained by difficulties in finding access to financing. Access to financing is affected by population density and economic development in the region. To improve the current situation in the sphere of energy efficiency in multi-storey residential buildings in Latvia, it is necessary to establish a link between decision-making and planning organizations and energy end-users such as the flat owners communities of multi-storey residential buildings.

The study includes the use of the statistical and logical methods of data processing and analysis.

Keywords: *Energy efficiency, Sustainable development, Efficiency management, Planning, Solvency ratios*

JEL Classification: O18, P11, P18, Q43, Q48, Q58, R39, R58

WASTE MANAGEMENT ROLE OF RESIDENTIAL BUILDINGS UNDER MANAGEMENT AND ITS IMPACT ON THE ENVIRONMENT

Iveta AMOLIŅA¹, Ineta GEIPELE²

^{1,2} Riga Technical University, Latvia

Corresponding author`s e-mail: iveta.pukite@rtu.lv

Abstract. Waste management plays an important role in the housing management process. In order to ensure efficient and environmental friendly waste management in Latvia, the National Waste Management Plan 2013-2020 aims to prevent waste generation, ensure a significant reduction of the total amount of waste generated, promote the development of a more sustainable consumer behaviour model, ensure rational use of waste as a resource, and ensure that the generated waste is not hazardous or presents a low risk to the environment and human health. Household waste is generated during the daily activities, the construction process, and also in other ways. In recent years, when the European Union funds for the renovation of buildings become available, construction process waste management has become topical. Certain products / substances (e.g. fire retardants, heavy metals) are used in the construction industry which, during operation, may result in emissions that are harmful to human health and / or the environment. In addition, construction or renovation also results in material residues, which disposal needs to be considered by the parties involved in the process. Effective waste management ensures removal, recycling or utilization of municipal, construction, industrial, bulky, biological, hazardous waste. Interruption or irregularity in the waste management process can have adverse health, environmental, aesthetic and financial consequences. This means that it is important for housing managers, in cooperation with waste disposal operators, to cooperate in organizing the waste management process, environmentally sound waste treatment, waste sorting and public education on waste sorting and environmental compliance.

Keywords: *Environmental impact, Residential housing management, Waste management, Waste sorting*

JEL Classification: K25, K29, K32, L85, L97

METHODOLOGICAL GUIDELINES AND RECOMMENDATIONS TO SUPPORT IMPLEMENTATION OF VALUES-LED PLANNING APPROACH INTO PRACTICE

Armands AUZIŅŠ¹, Ineta GEIPELE², Raja KOČANOVA³

^{1,2} Riga Technical University, Latvia

Corresponding author`s e-mail: armands.auzins@rtu.lv

Abstract. The opportunity to promote sustainable land use and development as well as to add value to dynamic changes in the quality and quantity of land-related resources at least in Europe's scope is recognised. It has been argued that established scientifically sound framework should promote the internalisation of negative externalities and enable to determine the synergy for enhanced territorial governance and balanced socio-economic development and environmental sustainability. The study focuses on a values-led planning (VLP) approach to be introduced into land management practice. It is concerned with the development of methodological solutions. Finally, based on the outcomes of analytical work and consolidated evidence gathering (CEG) through empirical research, the objectives for VLP approach are set and the structure for methodology is designed.

Keywords: *Values-led planning approach, Methodology, Recommendations, Spatial planning.*

JEL Classification: O21

Introduction

It has been argued that the implementation of new planning approach within proposed framework would lead towards improved land use policies and better territorial governance, developing more inclusive and resilient territories for the benefit of a society. The conceptual background and feasibility of VLP approach to be introduced into land management practice by capitalising first of all on comparative analysis of dynamic spatial planning systems and planning cultures in European scope have been explored during previous research. Conceptual considerations towards VLP approach showed the reasonability to improve the relevant practice and assess its effects in specific territories based on identified values and attitudes, thus avoiding, e.g. unplanned urban sprawl, environmental/landscape fragmentation and damage, unequally populated areas, remarkable differences in income, insolvent territories etc. Consolidated new knowledge from stakeholders' experience and empirical evidence provides better understanding and guiding the relevant processes, e.g. organisation of and involvement in spatial planning, deliberative making of spatial plans, application of planning tools, sharing values and preferences among stakeholders.

A research towards spatial planning practices in Europe is addressed to different planning cultures. Some scientific contributions clearly distinguish between planning systems and planning cultures. It has been demonstrated that planning practices inherent to the system cannot be drawn from a comparison of legal-administrative framework conditions alone. Therefore, the outcome from comparative analysis of planning practices (changes in cultures) is essential rather than of planning systems, which are only represented by hierarchies, artefacts and institutional settings. European comparative studies reveal the trends and directions in the evolution of spatial planning systems and territorial governance as well as design new typologies in Europe and indicate on synergies and/or antagonisms between EU policies and national spatial planning and territorial governance. Cross-fertilisation between EU cohesion policy and spatial planning practice also has recently been in agenda of European planning communities.

In the light of (1) overviewed European comparative studies and analysed its outcome through analytical research examining a range of scientific literature and documentary sources as well as (2) an outcome of CEG within developed framework, it is proposed to set the objectives and to structure the methodology for VLP approach. The aim of the study is to explore and discuss the development of methodological solutions to support implementation of VLP approach into land management practice.

Methodology of Research

The synergy from applying various planning policies and approaches has been observed by review of scientific literature and using comparative analysis and synthesis techniques. Summarising on the overview and analytical research towards better understanding of spatial planning and territorial governance in Europe and CEG from selected case studies, the setting of objectives and the development of methodological solutions for introduction of VLP approach is substantiated.

Findings and Results

The key results of comparative European studies show dynamic changes with regard to evolution of spatial planning and territorial governance. Evidence-based knowledge at European level on planning systems and practices as well as on territorial governance reflects a highly differential landscape in terms of terminology, concepts, tools and practices. CEG is mainly based on identification of barriers, bottlenecks, good planning-implementation practices, values and preferences, governance and collaboration forms. The knowledge of competent experts from seven selected countries through partner institutions represented dominating opinions of stakeholders in some extent and gave some discursive influence on research as complementary to analytical one. VLP approach contributes with so to say “evaluation and planning-implementation concept” and consequent principles towards balancing foremost both interests nature/landscape protection and new development. Analysed practices and its continuity emphasise quite challenging issues towards more integrated, participatory and strategic planning approach and contribute to this topical research regarding developing VLP approach to be implemented for improving land use and spatial development.

Conclusions

The main conclusions of the research show that within established frameworks the analytical work and CEG through case studies at selected differently experienced spatial planning practices promoted methodology development. The outcomes contributed significantly to develop scientifically sound and empirically proven methodological guidelines for implementation of VLP approach into land management practice. The methodology includes key policy-making principles, evaluation techniques, models, criteria, typology and indicators as well as recommendations for innovative assessment tools to be applied when introduce proposed planning approach for sustaining land use management. The provision of knowledge-building platform for dissemination of the information and communication on possibilities to implement a VLP approach by applying the developed methodological guidelines and proposed recommendations, including web-based solutions and geo-compatible databases, is further necessary.

Acknowledgement

This work has been supported by the European Regional Development Fund within the Activity 1.1.1.2 “Post-doctoral Research Aid” of the Specific Aid Objective 1.1.1 “To increase the research and innovative capacity of scientific institutions of Latvia and the ability to attract external financing, investing in human resources and infrastructure” of the Operational Programme “Growth and Employment” No. 1.1.1.2/VIAA/1/16/161.

References

1. Auziņš, A. & Viesturs, J. (2017). A Values-led Planning Approach for Sustainable Land Use and Development. *Baltic Journal of Real Estate Economics and Construction Management*, 5, 275–286. <https://doi.org/10.1515/bjreecm-2017-0021>.
2. CEC – Commission of the European Communities. (1997). *The EU Compendium of Spatial Planning Systems and Policies*. Luxembourg: Office for Official Publications of the European Communities. Retrieved from <https://publications.europa.eu/lv/publication-detail/-/publication/059fcedf-d453-4d0d-af36-6f7126698556>
3. Getimis, P. (2012). Comparing Spatial Planning Systems and Planning Cultures in Europe. *Planning Practice and Research*, 27(1), 25–40.
4. Reimer, M., Getimis, P., Blotvogel, H. (Eds.). (2014). *Spatial Planning Systems and Practices in Europe: A Comparative Perspective on Continuity and Changes*. Routledge.
5. ESPON EGTC. *Comparative Analysis of Territorial Governance and Spatial Planning Systems in Europe*. Available at <https://www.espon.eu/programme/projects/espon-2020/applied-research/comparative-analysis-territorial-governance-and>
6. Cotella, G. (2018). Editorial: EU Cohesion Policy and domestic territorial governance. What chances for cross-fertilization? *Europa XXI*, 35, 5–20.
7. Auziņš, A. (2018). Key Trends and Aspects Influencing Changes into Spatial planning Systems and Practices in Europe. *Proceedings of the 2018 International Conference “Economic Science for Rural Development” No 48, Jelgava, LLU ESAF, 9-11 May 2018*. 26–35.

CRITICAL CREATIVE THINKING IN THE STUDY PROCESS OF THE REAL ESTATE MANAGEMENT

Jurgis BULIŅŠ¹, Iveta STĀMURE², Ineta GEIPELE³

^{1,2,3} Riga Technical University, Latvia

Corresponding author`s e-mail: bulinsjurgis@gmail.com

Abstract. Abuse of freedom of expression and a decline in the self-regulation of economic operators are increasingly seen in society, including in the academic world. The results of many scientific studies and practical observations show that critical thinking deficits are more prevalent in-school adolescents and young people, as well as among students. Often, data obtained in official journals, as well as in magazines, newspapers and state-funded mass media, are considered true. To prevent this, it is important to use the subject's ability to think critically. It should be noted that in many cases nowadays scientists' works and publications show signs of pseudoscience and incorrect attitude towards the basic values of scientific activity. Critically creative thinking helps the student and anyone else develop the ability to realize the thinking process better, more clearly. To understand precisely the definition of critical creative thinking, it is first necessary to define concepts such as 'thinking', 'critical thinking' and 'creative thinking'. Critical thinking is a way of thinking in which the subject expresses an opinion as to whether the thing or phenomenon corresponds to his or her perception of it. Creative thinking, on the other hand, is the process of creating new materials and/or intangibles, which gives rise to unique insights into the content of a thinking object and/or the process of its creation. A by-product of the development of critical thinking is creativity. In many cases, creativity is a function or consequence of critical thinking. It was more pronounced in the construction and industry as well as in the individual service sectors. Combining critical thinking with creativity produces critical creativity that uses the critical creative method. The Critical Creative Method interpreted as a set of purposefully selected and mutually compatible measures applied in the search for a better and/or more effective solution on a case-by-case basis, at a specific place and time. The results show that the RTU FEEM study environment dominated by creative thinking, but there is a lack of critical and critical creative thinking.

Keywords: *Critical creative thinking, Critical thinking, Creative thinking*

JEL Classification: I24; J24; Y9

INVESTMENT OF ACCUMULATED STATE-FUNDED PENSION FUNDS IN LATVIA'S ROAD INFRASTRUCTURE OBJECTS

Linards ČUDARS¹, Ineta GEIPELE²

^{1,2} Riga Technical University, Latvia

Corresponding author's e-mail: lc@inbox.lv

Abstract. Outflowing of State Funded Pension Scheme (hereinafter - SFPS) assets abroad is due to the lack of the attractive financial instruments in the capital market of Latvia. The author of thesis concludes in the analytical part that one of the solutions to decrease the outflow of SFPS investments abroad could be the development of large national infrastructure of road projects based on a Public-Private Partnership (PPP) and attracting private investments. Research contains a survey of PPP model for road infrastructure projects and provides SWOT (strengths, weaknesses, opportunities, and threats) analysis in order to assess internal and external factors, as well as current and future potential of PPP model. Authors research finds out the urgent activities and implementations in order to develop PPP road infrastructure projects and attract SFPS assets. The main conclusion is that the deficit of the Latvian road budget can be significantly decreased by attracting of SFPS funds. In order to provide attracting of SFPS funds several PPP road infrastructure projects should be launched in Latvia, special Road fund should be re-established to segregate financing of road infrastructure from total state budget, as well as securitization must be developed in order to promote liquidity and attract private investments. Finally there is necessity to implement several amendments in the Law on State Funded Pension Scheme in order to eliminate obstacles for attracting of SFPS funds for road infrastructure of Latvia.

Keywords: *Investment, Pension funds, Infrastructure objects*

JEL Classification: O16, G11, P33, H75, R42

NEW APARTMENT PROJECTS VALUATION, SITUATION ANALYSIS AND SOLUTIONS

Daiga DŽIGUNE¹, Iveta STĀMURE², Ineta GEIPELE³

^{1,2,3} Riga Technical University, Latvia

Corresponding author`s e-mail: iveta.stamure@rtu.lv

Abstract. In Latvia, after the restoration of independence, the demand for valuation services appears. Initially, this is in the form of securing after the privatization of property provided by foreign companies, with the development later of sole traders and local firms doing this work.

Questions about evaluation methodology and their application in practice gained topicality. Industry professionals formed the Professional Association - Latvian Appraisers Association, and in 1995 became a member of the International Committee on Property Valuation Standards. In 2000 changed its name to the Latvian Association of Property Appraisers.

There are three approaches to real estate valuation: market comparative transactions, income and costs.

With each of these approaches, it is possible to make a rating, each with its specific view of the subject being evaluated and its criteria. When evaluating real estate, more precisely apartments, information about the technical condition, characteristics, planning, utilities and equipment of the object, residential building and apartment is obtained, researched and summarized, market situation, value factors, market value and / or the value of sales based on the approach chosen ultimately results in aggregation of data.

As demand for new homes grows, so does the demand for their market value. Compared to other Latvian cities, construction of new project apartments is rapidly developing in Riga. Demand for apartments in new projects increases, as some of the factors may include increases in income and family reunification and growth.

Keywords: *New apartment projects valuation, Real estate valuation*

JEL Classification: O18; E22; R2; R3

CONTROL SOLUTIONS IN CONSTRUCTION BUSINESS

Kristīne FEDOTOVA

Riga Technical University, Latvia

Corresponding author`s e-mail: kristine.fedotova@rtu.lv

Abstract. In today's changing business environment, a variety of deliberately managed processes that can monitor, control and analyze the various activities of companies, public authorities and individuals are playing an increasingly important role. These processes serve as tools for evaluating various kind of activities.

In the result of all these processes, it is possible to get acquainted with and evaluate true financial and economic position of companies, their operational efficiency, evaluate and control the construction and production processes by identifying, controlling and improving their quality.

Keywords: *Control, Construction business, Audit*

JEL Classification: L74, N60

Introduction

Today's changing business environment is increasingly marked by the deliberate management of a variety of processes, through which it is possible to control the various activities of companies. It should be noted that these processes serve as tools for evaluating various financial instruments in construction, management, government, science-intensive education, etc. kind of activity areas.

As a result of all these processes, it is possible to get acquainted with and evaluate the true financial and economic position of companies, their operational efficiency, to evaluate and control the construction and production processes by identifying, controlling and improving their quality.

They help to control the process of various innovations, implementation of norms and provide opportunities to improve these processes. The above processes serve as a support for various decision-making processes involving high risk and individual assessment in the preparation of qualified and competent professionals.

The role of control in the construction business

One of the essential processes of corporate governance is auditing, which, based on explanations in the literature, is defined as the examination of documents reflecting economic activity. There are many explanations of audit concepts, but each of them expresses the essence, tasks and objectives of auditing.

An audit is defined as independent control and the expression of an auditor's opinion on the financial statements of the entity in accordance with applicable regulations. (Ekonomikas skaidrojošā vārdnīca, 2000) It is the systematic, independent and documented process of obtaining audit evidence, objectively evaluating it, determining the level of performance of audit criteria and preparing the auditor's report.

In the field of construction business and real estate management, the key audit objective can be complemented with the task of discovering reserves for better use of financial resources, analyzing tax compliance, developing measures to optimize the financial position, costs, results, revenues and expenses of an entity.

Practical analysis of these questions, together with the consolidation of theoretical knowledge, is an essential part of understanding the issue under study.

When assessing the significance of control in the field of construction business, it is important to take into account that the construction industry in Latvia is one of the sectors regulated by a number of regulatory enactments, as well as different requirements have to be followed in the construction process. Therefore, it is necessary to acquire skills of preparation of reports reflecting economic activity, as well as requirements of their accuracy, because in practice, on-site inspections are carried out on a regular basis in order to make the work process completely safe and "transparent".

Alignment must be not only documentary and regulatory, but also the construction itself and its process. The structure must be in good working order, the employees must have an employment relationship with the company (Darba likums, 2001) and all labor protection and general preventive measures prescribed by laws

and regulations must be followed in order to ensure maximum safety at work. (Darba aizsardzības likums, 2001)

All of the above is interconnected and, as a whole, constitutes a complete audit of construction, in the common interest of society as a whole and of the state, to promote sustainable and predictable economic development.

The construction industry in Latvia is one of the largest industries not only in terms of manufactured product, but also with a large number of employees and significant investments.

Based on industry data, it should be noted that in 2017 the industry resumed growth after a few years break (construction output in 2017 was already 21.7% higher than in 2016). This was largely due to the launch and implementation of EU Structural Fund projects, which had a positive overall impact on the sector. (2017.gadā būvniecības apjomi nozīmīgi pieauga, 2018)

According to the forecasts of the Ministry of Economics of the Republic of Latvia, the sector was expected to grow in 2018 as well, (Šogad ekonomikas izaugsme varētu sasniegt 4,2 %, lēš EM, 2018) which actually came true - in 2018, construction volumes increased by 21.9% (reference prices). The implementation of the European Union Structural Funds projects and private investments are widely regarded as the drivers of the development of the sector. (Būvniecības nozarē 2018.gadā saglabājās strauja izaugsme, 2019)

Although growth rates have remained slower than in previous years, the construction industry will continue to develop steadily in 2019 as well. In the first quarter of 2019, construction output exceeded the corresponding period of the previous year by 7.4% (unadjusted data). At the same time, it should be noted that the impact of the development factors of the sector so far is weakening due to the completion of large private construction projects and the maximum investments of the European Union Structural Funds. (Būvniecības nozarē stabila izaugsme, 2019)

The number of employees in the construction sector returned to the level of 2009 already in 2015 - 72 thousand. of employees. (Būvniecība, 2016) Despite a slight decrease in the number of employees in 2016 and 2017 (on average 64.5 thousand employed persons), in 2018 the number of employed persons continued to increase (74 thousand employed persons). (Nodarbinātie pēc saimnieciskās darbības veida un dzimuma 2019)

At the same time, it should be noted that the construction industry is complex as it encompasses many different sub-sectors, working closely together. Accurate and documented construction of the construction site is only possible with the help of quality control (Būvniecības kvalitātes kontrole, 2017) and construction supervision. The construction process in Latvia is controlled by the state in accordance with the laws and regulations governing the construction sector. (Būvniecības likums, 2013) According to them, the conformity of the construction process with the regulatory enactments, the coordinated project, as well as with materials of appropriate quality used in the construction, shall be checked, observing the regulatory enactments regulating the construction industry.

Conclusions and Proposals

Given the close relationship between construction with significant investments and the high level of responsibility towards the users of the project being implemented, the operation of the construction complex and the close cooperation between the sub-sectors are essential.

When it comes to attracting investments, it is important to take into account that construction projects often attract direct foreign capital, which must be released in a timely manner, otherwise different deviations may occur during construction.

In Latvia, the volume of investments in construction and construction of infrastructure objects is growing and the significance of technical auditing of construction objects is becoming more and more evident. Customers of construction sites should be aware that any malfunctioning in the construction process may prove to be a problem affecting the sustainability of the construction, which can significantly endanger the planned return on investment, operating costs and, most importantly, the safety of construction users.

All of these problems are complex in nature and require a construction audit to ascertain compliance with all quality and safety requirements during construction, as well as construction in accordance with the design and regulations governing the construction industry and the conformity of the materials used in the construction.

When accepting an object from a contractor, it is becoming increasingly popular to attract qualified construction professionals at the time of delivery, who are able to identify non-conformities with the design, regulatory requirements, and low-quality work through a full construction audit.

It facilitates further communication with the builder regarding warranty work and also serves as a security guarantor in disputes when they come to court.

References

1. 2017.gadā būvniecības apjomi nozīmīgi pieauga (2018) [online]. Ministry of Economics of the Republic of Latvia [accessed on 4 April 2019]. Available at: https://www.em.gov.lv/lv/nozares_politika/buvnieciba/statistika__petijumi/.

2. *Būvniecības likums* (2013) [online]. Law of the Republic of Latvia, Riga, 9 July, 2013, Latvijas Vēstnesis, website Likumi.LV [accessed on 15 March 2019]. Available at: <https://likumi.lv/doc.php?id=258572>.
3. *Būvniecība* (2016) [online]. CSB.LV [accessed on 14 April 2019]. Available at: http://www.csb.gov.lv/sites/default/files/skoleniem/sekundarais_sektors/buvnieciba.pdf
4. *Būvniecības kvalitātes kontrole* (2017) [online]. Inspecta.com [accessed on 15 March 2019]. Available at: <https://www.inspecta.com/lv/Pakalpojumi/Inspicesana/Buvju-inspekcija-ekspertizes/buvniecibas-kvalitates-kontrole/>
5. *Būvniecības nozarē 2018. gadā saglabājās strauja izaugsme* (2019) [online]. Ministry of Economics of the Republic of Latvia [accessed on 4 April 2019]. Available at: <https://www.em.gov.lv/lv/jaunumi/23454-buvniecibas-nozare-2018-gada-saglabajas-strauja-izaugsme>
6. *Būvniecības nozarē stabila izaugsme* (2019) [online]. LVportals.lv [accessed on 20 May 2019]. Available at: <https://lvportals.lv/dienaskartiba/304221-buvniecibas-nozare-stabila-izaugsme-2019>
7. *Darba likums* (2001) [online]. Law of the Republic of Latvia, Riga, 20 June, 2001, Latvijas Vēstnesis, website Likumi.lv [accessed on 27 March 2019]. Available at: <https://likumi.lv/doc.php?id=26019>
8. *Darba aizsardzības likums* (2001) [online]. Law of the Republic of Latvia, Riga, 20 June, 2001, Latvijas Vēstnesis, website Likumi.lv [accessed on 20 March 2019]. Available at: <https://likumi.lv/doc.php?id=26020>
9. *Ekonomikas skaidrojošā vārdnīca*. (2000). Riga, Zinātne. 436 p.
10. *Nodarbinātie pēc saimnieciskās darbības veida un dzimuma* (2019) [online]. CSB.lv [accessed on 11 June 2019]. Available at: (http://data1.csb.gov.lv/pxweb/lv/sociala/sociala_nodarb_nodarb_ikgad/NBG081.px/table/tableViewLayout1/?rxid=a39c3f49-e95e-43e7-b4f0-dce111b48ba1)
11. *Šogad ekonomikas izaugsme varētu sasniegt 4,2 %, lēš EM* (2018) [online]. Portal Delfi.lv [accessed on 17 February 2019]. Available at: http://www.delfi.lv/business/biznesa_vidē/sogad-ekonomikas-izaugsme-varetu-sasniegt-4-2-les-em.d?id=49603507

FEATURES OF THE BALANCED STATE REGULATORY FRAMEWORK IN THE FINANCIAL MARKET

Kristaps FREIMANIS¹, Maija ŠENFELDE²

^{1,2} Riga Technical University, Riga, Latvia

Corresponding author's e-mail: Kristaps.Freimanis_5@edu.rtu.lv

Abstract. Market participants, regulators and researchers often use the combination of words “balanced” and “regulatory framework” in their particular researches or publicly expressed views when explaining how certain area of interest should be improved, e.g. what should be the balanced regulatory framework of new financial products launched in the market or how bank regulation could be more balanced. In these cases detailed suggestions are proposed to certain problems. However, research and generally public discussion lacks more high level discussion of the concept of “balanced regulatory framework”. In the financial market in 2013 Basel Committee on Banking Supervision launched the discussion paper proposing some basic structural elements of this concept for banking regulation. However, no public discussion has followed. The paper addresses this research gap providing most often mentioned features of the balanced state regulatory framework in the literature. Authors have focused their research on the financial market as it is one of the most regulated areas in economics.

Currently authors are researching what could be the features of the balanced state regulatory framework in the financial market. During the coding process eight categories have revealed: “unified+”, “unified-“, “flexible”, “effective”, “proper degree of freedom”, “limiting risk-taking incentives”, “simple” and “theoretically backed”.

Results clearly show three dominating categories/ features of the balanced state regulatory framework in the financial market: “unified+”, “limiting risk-taking incentives” and “flexible”. Those features show both sides of the market: regulator’s interest in “limiting risk-taking incentives” and market player’s interest in “unified+” and “flexible”.

Research methods used: literature analysis, descriptive statistics.

Keywords: *Financial markets, State regulatory framework*

JEL Classification: G18

NECESSITY FOR RESEARCH SKILLS IN RTU STUDY COURSE “INTRODUCTION TO REAL ESTATE RESEARCH”

Ineta GEIPELE¹, Jānis ZVIRGZDIŅŠ², Kaspars PLOTKA³

¹⁻³ Riga Technical University, Latvia

Corresponding author's e-mail: Ineta.Geipele@rtu.lv

Abstract. The future specialist should be familiar with the theory and practice of scientific research relevant to the one's chosen specialisation; be able to identify problematic situations, their nature, formulate the subject, aim and tasks of the research, which should be logical.

The study course provides knowledge and understanding of the variety of research methods, their use, academic writing and develops student's skills for conducting creative and innovative research. The course covers questions related to research nature, basic concepts, research methodology, as well as academic integrity and research ethics. Students develop skills necessary for literature analysis, empirical research, analysis and interpretation of research data, academic writing and research presentation.

Keywords: *Concept, Methodology, Philosophy of science, Scientific method, Scientific subject.*

JEL Classification: I21, R30

Introduction

Student's engagement into research can be seen as an important intellectual and scientific potential of the future, which can positively influence and guide the student into becoming a specialist. Student's scientific research is a compulsory and integral part of the student's growth and education process at the university, supported by a single component of the study and the formation of qualified, creative young professionals and scientific continuity. Student's participation in scientific work during studies is a necessary part of qualified and competitive specialist training because the progress of science and technology is determined by a comprehensive flow of scientific information.

The aim of the student's research work is to develop the student's creative abilities and to improve the professional training based on an individual approach.

Elements of scientific research should be included at all stages of the study process in order to promote the acquisition of in-depth knowledge and develop the student's skills and competences in research and academic writing.

Methodology of Research

The study aims at analysing the concept “research skill”, developing and describing the system of organisation of scientific research activities in the field of real estate in the related study courses of Riga Technical University, which include the identification of the concept “research” approach.

Findings

Independent studies are organised in the form of both independent (individual) and group work. They develop an understanding of research methods, their choice and application. Independent studies include work with literature and e-resources.

Students individually perform the literature analysis, write and submit a report. Students write and submit an argumentative essay on real estate and related issues. The group of students conducts empirical research on a current real estate issue, processes the data using a computer program and presents the research results.

Conclusions

Research is considered to be an important factor that contributes to the development of student's and study skills, helps improve the professional and theoretical knowledge system of the future specialist, and develops attitude towards science as an important tool in the development of technologies and innovations.

References

1. Cotton, M. (2015). Stakeholder perspectives on shale gas fracking: a Q-method study of environmental discourses. *Environment and Planning A*, 47(9), 1944–1962.
2. Denzin, N. K., & Lincoln, Y. S. (Eds.). (2011). *The Sage handbook of qualitative research*. Sage.
3. Fisch, M., & Whewell, W. (1991). *Philosopher of Science* (Vol. 27). Oxford.
4. Herschel, J. F. W. (1845). *A preliminary discourse on the study of natural philosophy*. Longman, Brown, Green & Longmans.
5. Legget, R. F., & Karrow, P. F. (1983). Geology in Civil Engineering. *GEOLOGY*, 960, 219.
6. Mc Kevitt, P., Partridge, D., & Wilks, Y. (1992). Approaches to natural language discourse processing. *Artificial Intelligence Review*, 6(4), 333–364.
7. Pelling, M. (2012). *The vulnerability of cities: natural disasters and social resilience*. Routledge.
8. Ryan, M., & Li, Y. (2008). *Marxism and deconstruction: A critical articulation*.
9. Van Dijk, T. A. (2019). *Macrostructures: An interdisciplinary study of global structures in discourse, interaction, and cognition*. Routledge.

OFFICE SPACE EVALUATION ECONOMIC JUSTIFICATION

Ieva JURJĀNE¹, Renāte MUSKATE²

^{1,2} Riga Technical University, Latvia

Corresponding author's e-mail: renate.muskate@gmail.com

Abstract. This theme is topical because the office space will increase the demand growth in office space evaluation, economic aspects and the market value on the role. The research goal is to find commercial real estate valuation problems and to develop solutions and proposals for action. Work out a concrete assessment of the subject to the analysis using the market value method of calculation. Research objectives are: to explore the real estate statistical information in Latvia, describe the valuation of real estate and development, look at commercial real estate valuation issues, evaluate specific objects and perform its analysis, using the market value method of calculation, maintenance and conservation efforts in the premises and forward conclusions and recommendations.

Keywords: *Valuation, Real iestate, Real estate valuation, Office space, Commercial real estate, Market value.*

JEL Classification: O18; E22; R2; R3

SOCIO-ECONOMIC ASPECTS OF LATVIAN ARCHAEOLOGICAL HERITAGE: THREATS AND OPPORTUNITIES

Andris KAIRIŠS

Riga Technical University, Latvia

Corresponding author's e-mail: kairiss.andris@gmail.com

Abstract: Threats to archaeological heritage, incl. looting and destruction of hillforts, castles, religious objects, burial grounds and other sites, illegal obtaining and trade of antiquities lead to impoverishment of archaeological heritage and irreversible loss of both immovable and movable archaeological objects. These threats are most often observed from the point of view of criminal justice and heritage deprivation, not always paying sufficient attention to socio-economic consequences. On the other hand, the study of socio-economic opportunities provided by management of archaeological sites has been paid relatively moderate attention.

The research literature on the socio-economic problematics of threats to archeological heritage as well as the aforementioned opportunities most often addresses situations in countries located outside the Baltic region of Europe and with some rare exceptions does not relate to Latvia. However, the available statistical data as well as information provided by law enforcement and heritage protection institutions on the damage of Latvian archaeological sites and the illegal trade of archaeological artifacts originating from Latvia indicates existing danger for national archaeological heritage, although the situation has improved in recent years.

In economic terms effective management of cultural heritage provides large opportunities for development in related fields. This is the reason why threats to archaeological heritage cause not only cultural and aesthetic losses as well as elimination of possibilities to know one's own history but produce also local, regional and even national economic development barriers concerning investment, public revenue, tourism, scientific and research potential et al.

The presentation, using available statistics, drawing upon expert interviews, study of scientific literature and legal regulation will provide insight into Latvian archaeological heritage potential, socio-economic characteristics of archaeological heritage, consequences of the corresponding threats, some countermeasures applied and issues of estimating monetary value of national antiquities.

Keywords: *Threats to archaeological heritage, Socio-economic consequences, Antiquities, Latvian archaeological potential*

JEL Classification: A12, A14, Z10, Z13

THE ANALYSIS OF CONTEMPORARY ECONOMIC PROBLEMS OF RESIDENTIAL REAL ESTATE MARKET IN LATVIA

Linda KAUSKALE

Riga Technical University, Latvia.

Corresponding author e-mail: Linda.Kauskale@rtu.lv

Abstract. Changes in several economic indicators affect the population's purchasing power, the price level in the real estate market, financial opportunities of market participants, as well as profitability parameters that affect the entrepreneurial activities within industry and between countries, in case of international investments. The aim of the research is to analyse the economic problems of the development of residential real estate market, by analysing the economic issues, which can appear in operational phase of the life cycle of object. In the research, the attention also to the rent market development is being paid as well. The object of the research is residential real estate market. The subject of the research is the economic problems related to the development of real estate market and to real estate management (case of rent). The literature analysis, comparative analysis, observations, communication with industry participants, and logical access methods have been used in the research. During the research it was found that economic problems can arise at all stages of building life cycle, also at operating phase of the building life-cycle. The high role of the exogenous factors has been highlighted for the sustainable development of rent market as well. The research highlights the high role of sustainable planning of the finances and investigates the related financial risks that exist. The results of the research and recommendations can be applied to the industry regulation and planning of the improvement of the economic situation and economic processes of the market participants.

Keywords: *Economic balance, Economic problems, Economic risk, Financial planning, Real estate market, Rent of real estate, Residential real estate, Resources, Sustainability.*

JEL Classification: E20, Q01, R31

FINANCIAL IMPROVEMENTS OF THE ENTERPRISE AND RESTORATION OF ITS SOLVENCY IN THE CONDITIONS OF THE RISK MANAGEMENT

Aleksandr KIRJANEN¹, Alexandr LABUDIN², Alexandr SAMODUROV³

¹ *Saint Petersburg State University and North-West Institute of Management — branch of the RANEPA, Russia*

^{2,3} *North-West Institute of Management — branch of the RANEPA, Russia*

Corresponding author e-mail: kirjanen@mail.ru

Abstract. The paper presents a generalized balance equation of financial and economic activity of the enterprise. Dynamic characteristics of risk management, including zones of permissible, critical and catastrophic risks are described. On the basis of business speed and investment profitability, a table of SWOT analysis of the financial recovery of the enterprise is built. Four strategies of economic security and possible risks are considered. An example of a possible financial recovery of the enterprise using intermediate risky activities is given.

Keywords: *Bankruptcy, Economic security, Financial stability, Restoring solvency, Risk management, Speed of business process.*

JEL Classification: M21

ANALYTICAL EVALUATION OF THE INDICATORS OF THE COMPETITIVENESS OF THE CONSTRUCTION INDUSTRY IN THE BALTIC STATES

Āris KLEŠS¹, Iveta STĀMURE²

^{1,2} Riga Technical University, Latvia

Corresponding author`s e-mail: ariskl@inbox.lv

Abstract. Construction companies in the Baltic States are increasingly forced to compete with companies from other sectors of the economy to provide the necessary resources and construction companies from abroad who are willing and able to engage in the construction product market. The evaluation of the competitiveness of the construction industry provides an opportunity to identify the advantages and disadvantages of the industry, as well as to develop an appropriate strategy for maintaining or improving the competitiveness of the construction industry. The objective of the research is to analyse and compare the indicators of the competitiveness of the construction industry in the Baltic States, as well as to predict future changes.

The growth of the basic indicators of the construction industry in the Baltic States is analysed and the competitive advantages, as well as their importance in the construction product market, is described. In addition to that, the factors affecting the competitiveness of the internal and external environment of the construction industry are described and the development strategy of the construction industry of Latvia for the year 2014 to 2017 is assessed.

The theoretical explains the most significant concepts of the study and reveals its economic content. Market competition models in economic theory, as well as market competition rules and supervision in Latvia, are also analysed. In the theoretical part, the system of evaluation of the competitiveness indicators of the construction industry is compiled.

In the practical part of the research, the changes in the indicators of the competitiveness of the construction industry in the Baltic States from the year 2010 to 2018 are analysed and prediction of the changes in the indicators by the following years are made. To compare the competitiveness of the construction industry between Latvia, Lithuania and Estonia during the reporting period, a model for the evaluation is created. Based on the results of the research, conclusions are drawn and suggestions made to increase the competitiveness of the construction industry in the Baltic States.

Keywords: *Construction industry, Competitiveness, Competition, Effectiveness, Resources*

JEL Classification: K42, M21

QUALITATIVE CHARACTERISTICS OF RESIDENTIAL REAL ESTATE

Nikita KOČANOVŠ¹, Ineta GEIPELE², Raja KOČANOVA³, Olesja BOGODISTAJA⁴

^{1,2,3} Riga Technical University, Latvia

⁴ Real Estate company BG Group, Riga, Latvia

Corresponding author e-mail: Nikita.Kocanovs@rtu.lv

Abstract. Today people often meet with the difficulties about buying the property. Usually it seems that there is a huge choice of qualitative residential real estate on the market segment. Additionally, to the existing real estate property built during soviet period and pre-war houses during the last 10 years the huge number of new project residential real estate have been built. The authors of the research made a review of the decision-making process of people who are looking for the property and found out the important aspects of real estate characteristics to which the great attention is paid for. For today there is no general approach of real estate category allocation by qualitative property types and characteristics. Approaches of residential real estate typification are based on the research of consumer peculiarities of this specific product. Statistical studies and expert assessments have made it possible to identify separate groups of residential real estate properties that differ in their qualitative characteristics. It will allow to use it for the research of consumer preferences on the real estate market and making the decisions about improving its structure.

Keywords: *Real estate market, Real estate quality, Quality of built environment.*

JEL Classification: R3

SELF-SUFFICIENT USE OF TERRITORIES IN THE CONTEMPORARY CONTEXT

Andrejs LAZDINS

Latvia University of Life Sciences and Technologies, Latvia

Corresponding author`s e-mail: lazdins.andrejs@gmail.com

Abstract. The self-sustaining model of territory maintenance and development is not a new idea (permaculture) but is relevant today in the context of sustainable territorial development. The maintenance and development of a site is becoming more and more expensive, but the maintenance and development of a self-sufficient area results from the existing capacity of the site (the sum of all resources) and the degree of transformation. Key indicators are the ability of nature to sustain biodiversity and the ability of society to live within the resources available on the site. The absolute measure of self-sufficiency is "one", which indicates absolute equilibrium in the territory. The tracking and observation method shall be used to calculate the resulting values by combining in the Isikava fish-bone model. Main tracking and monitoring groups indicators: agricultural land; forests; water; territories and infrastructure; culture and education; availability of other services. The obtained result shows the degree of self-sufficiency of the territory, which allows to understand the interaction of inhabitants (society) and environment (territory). The novelty of the study is to prove that there is no need to develop areas, there are areas with high self-sufficiency and no need for resources. There are territories where the level of "degradation" is high, and resources need to be invested in these areas.

Keywords: *Self-sufficient, Territories, Model, Criteria*

JEL Classification: C13, R10, R38

IMPROVING TRANSNATIONAL EDUCATION IN TIMBER CONSTRUCTION BY THE USE OF PROJECT-BASED LEARNING APPROACH

Andrea MORTENSEN¹, Miguel AMADO², Pille HAMBURG³, Laura TUPENAITE⁴,
Jurga NAIMAVICIENE⁵, Loreta KANAPECKIENE⁶, Roger TAYLOR⁷

^{1,7} VIA University College, Denmark

² Universidade de Lisboa, Portugal

³ Tallinn University of Applied Sciences, Estonia

⁴⁻⁶ Vilnius Gediminas Technical University, Lithuania

Corresponding author`s e-mail: amot@via.dk

Abstract. According to National Oceanic and Atmospheric Administration, atmospheric CO₂ has not been seen on the earth at this high level (400 ppm) for millions of years. The construction sector is responsible for 36% of all greenhouse gases in the planet. One of the ways to deal with this negative impact is to increase the use of sustainable and environmentally friendly materials in the construction sector. Timber sequesters carbon and can convert CO₂ to O₂, therefore it is seen as the best material to use. To direct the construction sector towards greater use of sustainable timber the Erasmus+ project HiTimber (*Sustainable High-Rise Buildings Designed and Constructed in Timber*) has been initiated in 2017. With the objective of developing a trans-disciplinary and international course in design, construction and management of sustainable high-rise timber buildings, the project aims at enhancing the quality and relevance of students' knowledge and skills for the future labour market needs. In frames of the projects two workshops for bachelor degree students were delivered where the project-based learning approach (PBL) has been applied. This paper examines the effects of the PBL approach in transnational and interdisciplinary education in timber construction by examples and results from the HiTimber workshops. The presented results were derived from two surveys within the HiTimber project conducted in 2018 and 2019 where 29 lecturers and 45 students completed feedback questionnaires about PBL-based courses. In general all teachers and 85% of students were satisfied with the PBL approach. Further the results are based on two summer schools regarding wood organized by VIA University College, other summer schools and 14 workshops held around Europe with more than 400 students participating. The paper presents results concerning the teachers and students evaluation of planning, content and outcomes of the courses, discusses future perspectives and provides recommendations for the implementation of PBL in the different courses with similar structure and objectives.

Keywords: *Project-based learning, Education in timber construction, Evaluation, improvement of learning.*

JEL Classification: L74, N60, I23

APPRAISAL OF COMMERCIAL PROPERTY, PROBLEMS AND SOLUTIONS IN LATVIA'S REAL ESTATE MARKET

Renāte MUSKATE

Riga Technical University, Latvia

Corresponding author's e-mail: renate.muskate@gmail.com

Abstract. The main objective of research is to identify those commercial property's characteristics and problems which are common in valuating practise and appraisal methods which are used in valuating commercial property. Research tasks are: to identify teoretical basis, legislation in Latvia, valuation standarts and practise to determine object's value, to determine object's characteristics, determine appraisal's objective, to determine appraisal methods which are used in valuating this particular object, to determine Latvia's economic situation as a whole and real estate market situation, to determine office building and office premises market situasion in Riga, to make suggestions to improve Latvian real estate market appraisal practise. Author described the meaning of a term „real estate” in Latvia, the development of real estate evaluating field in Latvia, as well as analyzed real estate market situation and lease agreements and their effects on the object being evaluated, and also given an analysis of the best way of exploitation of a real estate. In the conclusions are described evaluating of commercial facilities and evaluating problems. Research provides basic information about valuation standarts and methods, information about locasion and clasification of commercial property and office premises in Riga, market information about Latvia's economy and office premises.

Keywords: *Valuation, Real iestate, Real estate valuation, Development, Commercial property.*

JEL Classification: O18; E22; R2; R3

COMPARATIVE ANALYSIS OF MASS VALUATION METHODS FOR MULTI-DWELLING BUILDINGS IN LATVIA AND SWEDEN

Renāte MUSKATE¹, Tatjana TAMBOVCEVA²

^{1,2} Riga Technical University, Latvia

Corresponding author e-mail: renate.muskate@gmail.com

Abstract. The aim of the paper is to analyse and compare the different approaches to cadastral valuation of the multi-dwelling buildings in Sweden and Latvia. The results yield several differences between both systems such as frequency of cadastral valuation, methods for gathering precise data and adjustment coefficient of 75% that Sweden has introduced. Swedish authorities frequently update their valuation models in order to develop their accuracy while Latvia has chosen to freeze cadastral values for period of time till 2020 until it resolves the deficiencies with its cadastral valuation models. However, the existing deficiencies have not been made public information.

Keywords: *Cadastral valuation, Real estate, Valuation models, Cadastral values.*

JEL Classification: R31, R32

OPTIONS FOR STRATEGIC MANAGEMENT OF REAL ESTATE PORTFOLIO IN ORGANISATION

Hugo PĀVULS¹, Ineta GEIPELE²

^{1,2} Riga Technical University, Latvia

Corresponding author e-mail: ineta.geipele@rtu.lv

Abstract. Real estate management activity is related to the legal issues of property maintenance, work planing (technical and economic) and it`s organization and planaing monitoring. Real estate is managed by either the property owner/s or legal prossessor. This means that they have the right to entrust the management of work, under contract, to a company engaged in property management and administration or to a physical person who provides property management services. Real estate management, it`s maintenance and restoration are closely connected with real estate ownership opportunities for effective and sustained implementing his rights, obligations and opportunities for development. Administration and management of real estate life cycle is on of the most important components after the construction of real estate. Research subject is real estate management, but the research object – property management portfolio. Aim of research is to investigate the real estate portfolio management strategy development, identifying prospects for building a portfolio of real estate management. The research has specific value and novelty, because of the deeper investigation on the real estate portfolio managements most important aspects affecting the efficient operation of the process and examined risk management role in portfolyo management, which significantly affects the whole process of future prospects and quality. To get information, monographic methods, questionnaires, quantitative and analitical methods where used.

Keywords: *Real estate portfolio, Strategy management, Development*

JEL Classification: R30, G11, C41, R11

TWO APPROACHES TO EXAMINE THE IMPACT OF DIFFERENT CREDIT DEFAULT INDICATORS OF REAL ESTATE LOANS

Reimar PFALZ

University of Latvia, Riga, Latvia

Corresponding author's e-mail: plc_rem_fm@yahoo.com

Abstract: Financing of real estates was a trigger of the biggest financial crisis after the “Great Depression” from the early thirties in the last century. One of the main causes of this 2007 started crisis was poor risk management in real estate financing. This paper examines the impact of different classes of indicators on credit default rates of real estate loans. Two research approaches should confirm a model that proves: how strong is the relationship between different predictor variables such as interest rates, macroeconomic and individual indicators on the response variable of credit defaults. The first approach is doing descriptive and inferential experimental research by collecting secondary data in different markets and by analyzing these data for correlations and for linear regressions. The second approach is a survey of different banks to compare and complement the results of the first research approach. The research gives the evidence that individual indicators and macroeconomic indicators have a higher impact on credit defaults than interest rates. The scientific research on this theme led to nearly the same result in different markets: the unemployment rate and thus personal conditions are the most responsible predictors for the credit defaults, also in different markets. The novelty of this work is the proof that a banking survey with primary data on the causes of credit defaults confirms and complements the results of the secondary data analysis.

Keywords: *Credit Risk Management, Financing Private Residential Real Estates, Interest Rates, Mortgages, Credit Defaults, Securitization, Financial Crisis and Subprime Mortgage Crisis.*

JEL Classification: D12, E43, G21, H12, H63

FINANCIAL ASSESSMENT OF THE SUSTAINABILITY OF MANAGEMENT AND ADMINISTRATION COMPANIES FOR RESIDENTIAL HOUSES

Baiba PĻAVIŅA¹, Gita ACTIŅA², Ineta GEIPELE³, Sanda GEIPELE⁴

¹⁻⁴ Riga Technical University, Latvia

Corresponding author's e-mail: Baiba.Plavina@rtu.lv

Abstract. The management and administration of residential houses in Latvia can be performed by legal and natural persons who have the appropriate qualifications, which are determined by the Law on Administration of Residential Houses. There are 767 active legal and natural persons registered in the Register of administrators of residential houses kept by the Ministry of Economics of the Republic of Latvia, they, according to the regulatory framework, are entitled to fulfil the functions and duties of the real estate manager. In order to employ the most sustainable and efficient administrator for a residential house, the community of flat owners has the right to choose and contractually agree upon the management and administration of the house with any person of their choice. Most often the choice is based on the lowest price and the reputation of the management and administration company.

The purpose of the study is to evaluate the administrator's experience and sustainability in provision of the service to identify existing trends and facilitate the selection process. The study contains the financial analysis of the management and administration companies for residential houses using the DuPont model and bankruptcy prediction models. The results of modelling provide an estimate of the financial position of the company and predict its solvency in the near future. The research approach is a descriptive and inferential experimental study by collecting, analysing and comparing secondary publicly available financial data using model calculation formulas.

The result of the study proves that by using the bankruptcy and solvency prediction models, the community of the flat owners may avoid fraudulent low-priced bids.

Keywords: *Financial Analysis, Residential Stock, Management, Real Estate, Financial Accounting and Auditing.*

JEL Classification: F36, G33, M34, M48, O18, R21, R30, R33

PRICING POLICY OF THE MANAGEMENT AND ADMINISTRATION OF RESIDENTIAL HOUSES IN LATVIA

Baiba PĻAVIŅA¹, Gita ACTIŅA², Ineta GEIPELE³, Sanda GEIPELE⁴

Riga Technical University, Latvia

Corresponding author's e-mail: Baiba.Plavina@rtu.lv

Abstract. Based on previous studies on pricing principles for management and administration of residential houses, the study aims to track pricing trends in Latvia over the period from 2014 to 2018, assessing the influencing factors and prospects for the sustainable development of residential houses.

According to the data from the Central Statistical Bureau (CSB), in Latvia, from 2014 to 2018 the average price for management per 1m² has increased by 8%, in Riga – by 14%, but in the region of Vidzeme – decreased by 14%.

The study examines the pricing processes of management and administration: direct regulatory legislation, such as mandatory services, and indirect regulatory legislation, such as security aspects, that are regulated by normative documents with regard to fire safety of homes; tax system effects and other economy related aspects.

In the course of the study, the analysis of the regulatory basis was carried out, the questionnaire method was used, the management companies were surveyed in order to find out the pricing policy of each particular company and the dynamics of changes during the last five years.

The results of the study show that the price and quality of management and administration depend on the ability of the owners of flats to resolve their differences and to find a common solution.

The scientific result of the study provides an opportunity to determine the significance of the trend of factors influencing pricing policy in Latvia on average and in the regions.

Keywords: *Pricing Policy, Economic Analysis, Financial Planning and Accounting, Housing Stock, Management, Real Estate.*

JEL Classification: F36, M21, R21, R29, R33, R51

CIRCULAR BUILDING MATERIALS AND WASTE MANAGEMENT STRATEGIES AS CONTRIBUTORS TO ACHIEVEMENT OF SUSTAINABLE DEVELOPMENT GOALS

Kaspars PLOTKA¹, Janis ZVIRGZDINS²

^{1,2} Riga Technical University, Latvia

Corresponding author`s e-mail: Janis.Zvirgzdins_1@rtu.lv

Abstract. The construction industry is responsible for a significant amount of global greenhouse gas emissions. Additionally, large proportion of landfill waste is contributed by construction industry which is based on the exploitation of unsustainable materials which increases the pollution and amount of CO₂ emissions. The increase in construction volumes and the amount of reconstruction and demolition of outdated buildings demand the development of promising research areas aimed at improving the efficiency of building waste management, which provides both economic and ecological benefits. Therefore, building materials and appropriate waste management strategies are important aspects to promote the achievement of sustainable development goals. Different level resource efficiency and circular economy policies stimulate the need to use environmentally friendly, reusable building materials. Authors used literature review and state-of-the-art review to discover the links among circular building materials, waste management strategies, greenhouse gas emissions, economics, logistics, stakeholders and sustainable development. Results show that transition to circular economy requires changes from product design to new business, waste management and market models, and new modes of consumer behaviour. Significant role in promoting sustainable development is given to sustainable, circular and green building materials. However, reusable material strategies depend on businesses developing effective and economic applications that can overcome many barriers to close material loops. Construction waste management is highly dependent on the coordination and efficiency of interaction among the authorities, waste processing and construction companies, investors and other stakeholders.

Keywords: *Building materials, circular economy, construction, waste management.*

JEL Classification: R11, Q01, Q53

METHODOLOGY FOR TEACHING ENVIRONMENTAL MANAGEMENT AND ECO-ECONOMICS AT RIGA TECHNICAL UNIVERSITY

Kaspars PLOTKA¹, Jānis ZVIRGZDIŅŠ², Ineta GEIPELE³

¹⁻³ Riga Technical University, Latvia

Corresponding author`s e-mail: Kaspars.Plotka@rtu.lv

Abstract. The article investigates teaching methods in various interdisciplinary study courses at Riga Technical University. The effectiveness of teaching and the level of training in the disciplines of economics and management are directly dependent on the flow of students and the interaction between the instructor and the student. Linear sequence of forms of the study process has been established: lectures, seminars, colloquiums, independent work, tests, exams and various out-of-class activities. None of these forms can be recognised as universal, being able to replace other forms. The study forms used in the teaching process are interrelated with clear conditions and logical sequence. Each form has a significant impact on the other. A form of verbal communication with the audience is topical in order to deliver academic and practical knowledge in the form of lectures. Four types of study forms in economics and management study courses can be distinguished: overview lectures, problem-based lectures, installation lectures and lectures of the study course. Overview lectures focus on updating the existing knowledge or introducing new and up-to-date material.

Problem-based lectures provide cognitive material as a single problem or a set of problems, based on theoretical or practical topicality.

The main task of installation lectures is to systematise the student's existing knowledge, to pay attention to complex problem situations, to carry out an independent analysis of the work and analysis of information on current literature and sources.

The lecture of the study course is part of the theoretical and practical course, which may include seminars, colloquia and tests. The recommended final assessment form is the examination.

When planning and organising practical classes, it is important to integrate two or three blocks of knowledge from different previously acquired study courses into the study course; therefore, it is important to define the objectives of the integrated classes. If the overall goal is defined, then only the information necessary to achieve the goal is taken from the content of the study courses. The integration process of the study course can lead to tension and overload of students caused by switching between fragments of different study courses. It should be noted that the quantitative ratio and role of different study forms may vary.

Keywords: *Economy; Management; Methodology; Instructor; Student; Study course; Study forms.*

JEL Classification: A20, A39

BLUE GROWTH ACTIONS IN COASTAL MUNICIPALITIES IN LATVIA

Edgars PUDZIS

Riga Technical University, Latvia

Corresponding author`s e-mail: edgars.pudzis@rtu.lv

Abstract. The goal of the research is to investigate and to identify effective Blue RIS3 implementation measures and best practices around Baltic Sea and to synthesize the findings in one document. The analysis aims at finding important aspects and conditions for future Blue Growth and RIS3 implementation in Latvia coastal municipalities. Research covered the following Blue Growth sectors - Machinery & Technology, Life Science & Blue Medicine, including SPA and coastal tourism, and Energy. Different Blue Growth measures from Latvia, Estonia, Germany, Sweden and Finland where analysed by using such methods as - logical analyse, expert interviews, SWOT analyses. After analyses of measures in different countries, most suitable perspective) for implementation in Latvia coastal municipalities where identified - Lounaistieto - regional information service operating in Southwest Finland, Centre of excellence in health promotion and rehabilitation as example from Estonia, Pomorskie Smart Specialisation's (PSSs) Boards and Competence Academy Tourism as example from Sweden. Main conclusions of this research where - success of the Blue Growth concept in every region is highly dependent on the efforts made by local, regional and national authorities, the effectiveness of supporting agencies and the awareness raising for existing and new entrepreneurs. It can be concluded that there is wide range of economic sectors that are affected by Blue Growth and smart specialisation. On the one hand, this can be considered as a positive effect, since, among other benefits, this allows for the industries to develop based on the market demand. On the other hand, lack of focus could lead to too excessive spreading of resources, reducing support for the activities with the greatest socioeconomic return.

Keywords: *Coastal areas, Economic development, Blue growth, Coastal municipalities, Strategic development*

JEL Classification: O18 , 032

APARTMENT PROPERTY VALUATION PROBLEMS AND SOLUTIONS FOR MORTGAGE CREDIT

Viktorija ROSICKA¹, Iveta STĀMURE², Sanda GEIPELE³

^{1,2,3} Riga Technical University, Latvia

Corresponding author`s e-mail: iveta.stamure@rtu.lv

Abstract. Although the demand for housing has recovered after the economic crisis, it is not as high as before. Households continue to have high levels of financial debt. Household incomes are slowly increasing, but they are still relatively low to generate the significant savings needed to buy new homes. Credit policies, on the other hand, are significantly more cautious as credit institutions still have high levels of overdue loans to households and are thus reluctant to take new risks. Credit institutions also have a relatively large portfolio of real estate that they need to manage or sell, so credit institutions may be primarily interested in realizing existing assets but are reluctant to lend new loans to acquire or develop other properties. In Jekabpils it is most difficult to sell apartments in the price range from 7,000 to 10,000 euros. Mostly they are partially renovated apartments in average technical condition. This means that households cannot buy this type of housing through mortgage lending.

Real estate valuation is an important part of the mortgage lending process.

The main objective is to evaluate the possibilities of purchasing a home through mortgage lending in Jekabpils.

The main tasks of the research are to determine the values of real estate. The researchers to identify and analyse the factors affecting the real estate market, to analyse estimate the housing market in the Jekabpils.

The research evaluated similar apartment properties, determining their market values, explored potential mortgages for real estate registration, evaluated the choices made by the state support system when purchasing a home, and drew conclusions. Proposals have been developed based on the findings of the study.

Keywords: *Mortgage lending, Real estate valuation*

JEL Classification: O18; E22; R2; R3

RESEARCH ON THE TECHNICAL DETERIORATION OF STANDARD MULTI-STOREY RESIDENTIAL BUILDINGS

Laimdota ŠNĪDERE¹, Mārtiņš MENNIKS², Vitauts KONRĀDS³, Andris RUDZĪTIS⁴, Andris VULĀNS⁵

^{1,5} Riga Technical University, Latvia

² Riga Stradins University, Latvia

³ Latvian Association of Civil Engineers, Latvia

⁴ "SIA" "Jūrmalas siltums", Latvia

Corresponding author`s e-mail: laimdota.snidere@rtu.lv

Abstract. In 2015 and 2016, the Riga City Architect's Office conducted the study "An Evaluation of the Socio-economic Values of Climate Impacts, Adaptation to Climate Change and Adaptation Possibilities in Standard Multi-Storey Residential Building Blocks in Riga and Latvia" („Sustainable Development of Riga Multi-Storey Residential Building Areas") in collaboration with the Riga Stradins University and the Riga Technical University. During the study, 132 standard multi-storey residential buildings were inspected, in 9 different Riga residential areas, in accordance with the construction time and type of the buildings.

Various opinions on the quality and service life of standard multi-storey residential buildings are periodically published in mass media, however, no systemic research has been conducted on the technical state and structural integrity of the buildings. National laws of the Republic of Latvia define the service life of residential buildings in the 28 September 2010 Cabinet Regulations No. 907 "Regulations Regarding the Survey, Technical Servicing, Current Repairs and Minimal Requirements for Energy Efficiency of the Residential House". Depending on the materials and structures used in the construction of the buildings, the average service life of standard type buildings is 70 years (316th, 318th and 119th series) and 60 years (103rd, 104th, 464th, 467th and 602nd series). As of 2018, the average service life of several standard multi-storey buildings constructed in 1958 is ending. The average service life of the structural elements and engineering appliances of these buildings has passed.

The goal of the research study was to draw public attention to the deterioration defects characteristic to standard buildings, to their types and volume. Renovation of standard multi-storey buildings is unilaterally related only to energy efficiency improvement measures. It is much more important to prevent deterioration defects in the utility systems of the structural units of the buildings and their utilities systems, to retain the use-value of the buildings and renew their service life to a certain extent.

In order to achieve the goal of the research, six major standard groups of standard buildings were selected in various neighborhoods of Riga, according to post-war construction stages:

- 1) Standard buildings of the first post-war construction stage, 316th/318th and 464th series buildings in Jugla;
- 2) Standard buildings of the second post-war construction stage, 467th series five-storey and 602nd series buildings in Purvciems;
- 3) Standard buildings of the second post-war construction stage, "Lithuanian project" and 467th series nine-storey buildings in Purvciems;
- 4) Standard buildings of the third post-war construction stage, 602nd series buildings in Imanta and Ziepniekkalns.

For each building type, a technical inspection report was drawn up, data on heat consumption for the period from 2010 to 2015 was summarized, calculations of the average and specific heat consumption were conducted, in accordance with laws and regulations. For each

building type in a certain residential area, cost estimates for the renovation of external structural elements and energy efficiency increase measures were drawn up. In apartments of three renovated and non-renovated standard buildings of the 316th, 464th and 602nd series, air permeability measurements were conducted in accordance with the requirements of the standard LVS EN 13829:2013 L.

Keywords: *Real estate, Multi-storey residential buildings, Development*

JEL Classification: O3, O14, O18

FINANCIAL SOURCES AND CONDITIONS FOR THE RENOVATION OF STANDARD MULTI-STOREY RESIDENTIAL BUILDINGS

Laimdota ŠNĪDERE¹, Mārtiņš MENNIKS², Andris RUDZĪTIS³, Aldis GREĶIS⁴

^{1,4} Riga Technical University, Latvia

² Riga Stradins University, Latvia

³ SIA "Jūrmalas siltums", Latvia

Corresponding author`s e-mail: laimdota.snidere@rtu.lv

Abstract. In 2015 and 2016, the Riga City Architect's Office conducted the study "An Evaluation of the Socio-economic Values of Climate Impacts, Adaptation to Climate Change and Adaptation Possibilities in Standard Multi-Storey Residential Building Blocks in Riga and Latvia" („Sustainable Development of Riga Multi-Storey Residential Building Areas") in collaboration with the Riga Stradins University and the Riga Technical University. During the study, 132 standard multi-storey residential buildings were inspected, in 9 different Riga residential areas, in accordance with the construction time and type of the buildings.

The overall floor area of the inspected buildings is 392,138 square meters. For each building type, a technical inspection report was drawn up, data on each building's heat consumption for the period from 2010 to 2015 were summarized, calculations of the average and specific heat consumption were conducted in accordance with energy audit requirements for the buildings. For each type of inspected buildings in a certain residential area, cost estimates for the renovation of external structural elements and energy efficiency increase measures were drawn up.

During the study, it was concluded that the renovation of standard residential buildings is urgently necessary to bring the residential areas and buildings into order as environmental objects, to prevent damages due to deterioration of the residential buildings, and to decrease heat consumption for heating. The paying capacity of the apartment owners does not allow for additional payments to renovate the buildings, therefore, after the renovation of the residential building, the overall payments should not exceed the payments of a non-renovated residential building.

The main financial source for the renovation of a residential building is the redundant payment for the heat energy savings acquired for heating in result of the energy efficiency improvement measures. In the course of the study, a calculation methodology was created, as well as a software tool enabling the determination of financial conditions for each building, which depends on the current heat consumption and the technical deterioration level of the building.

The main financial condition for the renovation of the building is the decrease of the current heating heat consumption by 50%. For this condition, the permissible construction costs are calculated for the particular building, depending on the price of the supplied heat energy, the annual interest rate of the available external financing and the loan term. A renovation measures program is offered for the permissible construction costs, to fulfill the condition of 50% heat energy savings.

To justify and verify the conclusions for the developed methodology and calculations, the results of renovation and energy efficiency improvement projects for standard buildings implemented in the period from 2001 to 2016 were summarized and analyzed in the study. It was concluded that project management quality is of crucial significance in building renovation and energy efficiency improvement projects. 50% heat energy savings from

heating have been achieved in those cases where a high-quality construction plan has been developed and the construction operations have been carried out in line with the plan.

Given Latvia's circumstances, the construction costs can be reduced if the renovation of standard buildings is managed simultaneously in building complexes and residential areas. It is necessary to implement innovative construction methods to increase productivity specifically in the renovation of standard buildings.

Keywords: *Real estate, Multi-storey residential buildings, Financial source*

JEL Classification: O14, O16, O18, G23

RECOMMENDATIONS FOR A RENOVATION POLICY OF STANDARD MULTI-STOREY RESIDENTIAL BUILDINGS

Laimdota ŠNĪDERE¹, Mārtiņš MENNIKS², Gvido PRINCIS³

¹Riga Technical University, Latvia

²Riga Stradins University, Latvia

³The Riga City Architect's Office, Latvia

Corresponding author's e-mail: laimdota.snidere@rtu.lv

Abstract. In 2015 and 2016, the Riga City Architect's Office conducted the study “An Evaluation of the Socio-economic Values of Climate Impacts, Adaptation to Climate Change and Adaptation Possibilities in Standard Multi-Storey Residential Building Blocks in Riga and Latvia” („Sustainable Development of Riga Multi-Storey Residential Building Areas”) in collaboration with the Riga Stradins University and the Riga Technical University. During the study, 132 standard multi-storey residential buildings were inspected, in 9 different Riga residential areas, in accordance with the construction time and type of the buildings.

A sociological survey was conducted to perceive the attitude and knowledge of the apartment owners and users of residential apartments in Riga's standard type buildings in matters of maintenance and renovation of buildings.^{1,2} Permanent residents of Riga residing in the 132 buildings selected for the project, aged from 18 to 74 years, were chosen as the target group of the survey poll. 3007 direct (*face-to-face*) interviews were conducted at the respondents' homes. The understanding of the owners and users of the apartments of the legal and technical infrastructure of their multi-storey buildings is compliant with the traditions existing in society and their own education level. The decision on the maintenance and renovation of the multi-storey building is made by its apartment owners' association. In the sociological survey², it was found that the apartment owners do not want to initiate renovation projects of their residential homes on their own account. A national level distinct housing policy is necessary for the systemic renovation of standard type residential buildings and the environment in city residential areas.

Components of the renovation policy of standard type buildings:

1. It is necessary to ensure quality management of the renovation of standard type buildings on a national and municipal level, to achieve the necessary heating heat energy consumption savings of 50% and air quality in residential premises.
2. On the level of national and municipal laws and regulations and guarantees, availability of financial resources needs to be ensured for the renovation of standard type residential buildings, with an annual interest rate up to 2% and a loan term of up to 30 years.
3. An education and certification system for standard type building renovation project managers needs to be created.
4. Simultaneous renovation of a large number of standard residential buildings needs to be started in building complexes and residential areas.

Keywords: *Real estate, Renovation policy, Socio-economic values, Standard multi-storey residential buildings*

JEL Classification: I18, L85, R31, R38, R53

¹Šnīdere, L., Geipele, I., & Stāmure, I. (2016). Perception of Standard Multi-Storey Residential Building Owners on the Technical Condition of Buildings, Energy Efficiency of Buildings and Building Value Increase in the Period of Development from 2005 to 2016; Perception Case Study in the Sociological Surveys. *57th International Riga Technical University Scientific Conference on Economics and Entrepreneurship (SCEE'2016): Proceedings*

²Šnīdere, L., Geipele, I., & Stāmure, I. (2017). Case Study of Standard Multi-Storey Residential Building Owners and Tenants' Perception of Building Technical Conditions and Renovation Issues. *Baltic Journal of Real Estate Economics and Construction Management*, 5, 6–22 <http://doi.org/10.1515/bjreecm-2017-0002>

QUALITY MANAGEMENT SYSTEM DEVELOPMENT IN REAL ESTATE MANAGEMENT

Sanita ŠREIBERE¹, Ineta GEIPELE²

^{1,2} Riga Technical University, Latvia

Corresponding author e-mail: ineta.geipele@rtu.lv

Abstract. As in any other industry the role of a competition in house management is increasing. The owners of apartments wants the best service possible for the money they have spent. Failure to provide qualitative service threatens with the loss of a customer. There is a tendency of changing house-manager in so-called house manager's office houses, which till now lived along with the system, in which they entered along with housing fund division by districts and giving for administration. As in any other industry there are companies that destroy the common impression of the industry. Part of residents accepts quality of service provided by house-manager.. Besides residents are not informed about services that are to be provided by house-manager. A part of apartment owners who wants adequate service for the money they have spent are trying to change house-manager company by involving other owners of flats. The aim of the research - to evaluate opportunities of Quality management system developement in real estate management, to put forward proposals for their implementation. Quality management system enables the company to arrange the internal environment thus arranging also visible part of the service provided. The practical value of the research - quality management system introduction for real estate management company, described in masters thesis is a considered model to face with and advantage of its introduction for company's operation.

Keywords: *House management industry, Real estate management, Quality management system, Development*

JEL Classification: L85, R31, L15

WHAT IS DESIGN HIDING? HOW? WHY?

Could EN 16310 “Engineering services - Terminology to describe engineering services for buildings, infrastructure and industrial facilities” change and improve interactivity between designer and builder?

Janis UZULENS¹, Ineta GEIPELE²

^{1,2} Riga Technical University, Latvia

Corresponding author`s e-mail: janis@jurisconsultus.lv

Abstract. The understanding of the term “design” in English and Latvian languages are different. But we all understand that design means culture, art, a creative process, which are often realized by the builder and/or the manufacturer. The design is at the beginning and at the end of the process. If we discuss buildings, we understand the whole life of them. The design is realized by three subjects: owner, designer, and builder. But design hides from society, what exactly happened when the project starts to realize. We can't be blamed on designers and architects. The goal of the research is to bring together designers, architects and builders, and owners, calling on them to be more responsible to each other. One of the most useful tools is the EN 16310 standard.

Keywords: *Construction, Design, Architecture, Standard, FIDIC, Owner, Builder, Legal, Honesty.*

JEL Classification: L7

LOWERING THE EMPLOYMENT BURDEN: THE WAY TOWARDS SUSTAINABLE DEVELOPMENT

Jānis VANAGS¹, Ineta GEIPELE²

Riga Technical University, Latvia

Corresponding author`s e-mail: [Janis.Vanags.@rtu.lv](mailto:Janis.Vanags@rtu.lv)

Abstract. Employment burden is a relatively new concept in modern economic theory and employment theory. The employment burden consists of the hours that the employed individuals are required to spend at their place of work within a specified period of time, in accordance with the contract concluded and in compliance with the national rules and regulations. The socio-economic content of the employment burden becomes particularly relevant in the context of sustainable development and in the face of depleting earth's biological resources. According to the Ecological Footprint and Global Biocapacity, richer countries in the world consume several times more natural resources compared to developing countries due to long working hours. So far, the OECD countries have not felt the scarcity of biological and other resources for economic development and wealth creation, despite the fact that their territory does not have sufficient resources to meet the demand.

Thanks to high productivity and long working hours, the income of the economically active population in rich countries is high enough to meet the needs beyond the first 3 steps of the Maslow's pyramid, while remaining able to make savings. High income level leads to overconsumption and obesity, followed by the need for long working hours and even higher incomes to improve health, which is greatly damaged by a high income level and unreasonable food consumption. In practice, there is strong evidence that long working hours and increased incomes have negative side effects on many economically active citizens. In the context of over-exploitation of biological resources, the logical question is raised: how long can it continue and what will be the consequences? In fact, this is the most important issue for sustainable development. To date, many EU countries have developed various plans for sustainable development. Given the continuing over-exploitation of biological resources and the intensification of the greenhouse effect, it is hypothesized that policymakers believe that a national sustainable development plan is in itself a sufficient condition for economic activity in a country to follow the principles of sustainable development.

Reducing the employment burden, especially in high-income countries, can be the first significant step towards sustainable development, which can have the following positive effects:

- a) the number of working hours per week will be reduced for the economically active population;
- b) countries may move to a 4-day working week and employees will have their third day off;
- c) in these countries, employment opportunities will be increased and the natural rate of unemployment will be reduced;
- d) employees will be able to spend more time with their family, children and friends and to cultivate spiritual values;
- e) the health condition of the economically active population will be improved, with a greater emphasis on a healthier lifestyle;
- f) the pressure on biological resources will be drastically reduced, the amount of greenhouse gases in the atmosphere reduced and the risk of temperature increase reduced.

It is important for policymakers to be aware that sustainable development will not succeed on its own, in spite of the thick documents of the Action Plan. The time has come for us to

act in a profound and unusual way, but in line with the threat posed by the decline in the reproductive capacity of biological resources and the increase in the average annual temperature.

Keywords: *Employment burden; Sustainable development; Hours of work; Overconsumption; Obesity.*

JEL Classification: D12, D31, D62, F62, F63, J08, J31, O44, Q28

A NOVEL AND SUSTAINABLE APPROACH TO WASTE FLOW MANAGEMENT

Jānis VANAGS¹, Ineta GEIPELE²

Riga Technical University, Latvia

Corresponding author`s e-mail: [Janis.Vanags.@rtu.lv](mailto:Janis.Vanags@rtu.lv)

Abstract. The amount of waste generated in different parts of the world is one of the quintessential problems and major challenges for the sustainable development of civilization in the 21st century. The significant non-compliance in the overall waste management system is the non-collected waste. It poses an additional threat to species diversity, reduces the capacity for rejuvenescence biological resources, and has a negative impact on the quality of the environment and human health. The main problem in the overall waste management system is the non-collected waste. To a large extent, this is due to the inadequacy of the current waste management system, which does not comply with the principles of rational behaviour and sustainable development.

Keywords: *Waste; Waste management system; Sustainable development; Principles of rational behaviour.*

JEL Classification: D62, E21, E71, H23, H31, Q53, Q58

Introduction

Waste generated by economic actors is one of the major challenges for sustainable development of civilization in the 21st century. Many scientific studies have shown that waste, its enormous volume and the structure are directly linked to the global climate change.

The main problem in the overall waste management system is the non-collected waste. Low-income countries collect only 48 percent of waste in cities, but this proportion drops drastically to 26 percent outside of urban areas. The rapid increase in the total amount of waste and non-collected waste in the environment is largely due to significant weaknesses in the waste management system. It does not comply with the principle of rational behaviour of waste producers; therefore, many subjects seek and find ways to deal with self-generated waste in a more profitable way. It is time for the significant reforms on the current waste management system, taking into account the Law of Rational Behaviour and the threats to sustainable development posed by the waste.

Methodology of Research

The working methodology consists of a set of purposefully selected, interconnected and complementary methods. The method of analysis is used in order to study the quantitative and qualitative aspects of the waste stream in different countries and regions of the world. The critically creative approach together with the analysis and comparison methods is used in the evaluation of various publications. Synthesis and induction methods as well as systemic approaches are used to make proposals for reformation of the existing waste management system and to develop a new and more sustainable approach.

Findings

At present, the annual volume of the global waste generation is over 2.12 billion tonnes a year, or nearly 230 kilograms per capita. The distribution of waste flow across countries varies since the standard of living in these countries ranged from 0.11 kg per capita in the least developed countries to 4.54 kg per capita in more prosperous countries. Thereby economically developed countries generate about 34 percent, or 683 million tonnes, of the world's waste. The World Bank predicts that volume of the global waste may increase to 3.40 billion tonnes by 2050 or 1.6 times, more than twice the population growth over the same period. People from different countries generate 2.01 billion tonnes of municipal solid waste annually, with at least 33 percent of that not managed in an environmentally safe manner. Worldwide, every person's generated amount of waste has reached 0.74 kg but ranges widely, from 0.11 to 4.54 kg. Economically developed countries generate about 34 percent, or 683 million tonnes, of the world's waste, although they only account for 16 percent of the world's

population. Different levels of waste production and the amount of not collected waste in different countries of the world are largely due to differences in incomes, problems of over-consumption in richer countries, as well as traditions and differences in national waste management systems.

Conclusions

The new waste management system provides special, additional payment for waste management at the same time as goods are purchased. This additional payment is required because the purchaser not only sells the product, but also potential waste, which is transformed into real waste after the product has been used to meet needs. Most importantly, the purchaser of the product, or any other subject, will be able to recover this additional payment at the moment when the waste generated by the consumed good is handed over to a waste manager. The new approach thus offers a real opportunity to turn waste into a potential value. Therefore, under the new waste management system, it is no longer important whether the waste is collected by the polluter itself or by someone else when waste is discarded into the environment. Thus, the collection of waste from the environment is transformed into an additional source of income for the entities that collect this uncollected waste.

References

1. Brizga, J., Teibe, I., Pusvilka, A., Ozola, L., Jansons M. (2014). Bez atkritumiem: Vadlīnijas nevalstisko organizāciju kapacitātes stiprināšanai. Rīga, Homo ecos, 55 lpp. ISBN 978-9934-14-183-6.
2. Cudečka-Puriņa, N. (2018). Sadzīves atkritumu apsaimniekošanas vadīšana atkritumu poligonu ilgtspējas nodrošināšanai. Rīga, RESEBA. Promocijas darbs.
3. Teibe, I. (2017). Sadzīves atkritumu apsaimniekošanas pārvaldības attīstība Latvijā. Rīga, LU. Promocijas darbs.
4. Achtar, A. & Sarmah A.K. (2018). Construction and demolition waste generation and properties of recycled aggregate concrete: A global perspective. *Journal of Cleaner Production*, 186, 262–281.
5. Amasuomo, E. & Baird, J. (2016). The Concept of Waste and Waste Management. *Journal of Management and Sustainability*, 88–96. <https://doi.org/10.5539/jms.v6n4p88>
6. Basu, R. (2009). Solid Waste Management-A Model Study. *Sies Journal of Management*, 6, 20–24.
7. Bea, J. (2013). Zero Waste Home: The Ultimate Guide to Simplifying Your Life by Reducing Your Waste. New York, Scribner, p. 304.
8. Beranek, W. (1992). Solid Waste Management and Economic Development. *Economic Development Review*, 10, 49.
9. Chandra, R. (2015). Environmental Waste Management. New York, Taylor & Francis Group. p. 586
10. Dorey, M., 2017. No. More. Plastic. : What you can do to make a difference. London. *Ebury Publishing*, p. 160.
11. Ghiani, G., Laganà, D., Manni, E., Musmanno, R., & Vigo, D. (2014). Operations research in solid waste management: A survey of strategic and tactical issues. *Computers & Operations Research*, 44(4), 22–32. <https://doi.org/10.1016/j.cor.2013.10.006>
12. Hatem, A. A., Husnain, H., Saleem, S. A., Majed, A., Md. Shafiquzaman, Rehan, S. (2019). Performance Assessment Model for Municipal Solid Waste Management Systems: Development and Implementation. *Environments*, 6, 19, 2–26. <https://doi.org/10.3390>
13. Kaza, Silpa; Yao, Lisa C.; Bhada-Tata, Perinaz; Van Woerden, Frank. (2018). What a Waste 2.0 : A Global Snapshot of Solid Waste Management to 2050. Urban Development;. Washington, DC: World Bank.
14. Rogers, H. (2019). Gone Tomorrow: The Hidden Life of Garbage. New York, The New Press, p. 306
15. Salemdeeb, R., Al-Tabbaa, A., Reynolds, C. (2016) The UK waste input–output table: Linking waste generation to the UK economy. *Waste Manag Res* 34, Oct., 1089–1094.
16. Siegle, L. (2017). Turning the Tide on Plastic : How Humanity (And You) Can Make Our Globe Clean Again. London. *Orion Publishing Co.* p. 272.
17. Singh, J., Saxena, I., Bharti, A. (2018). The Importance of Waste Management to Environmental Sanitation: A Review. *Advances in Bioresearch*. <https://doi.org/10.15515/abr.0976-4585.9.2.202207>
18. Soltani, A., Hewage, K., Reza, B. (2015). Multiple stakeholders in multicriteria decisionmaking in the context of municipal solid waste management: A review. *Waste Management*, 35, 318– 328.
19. Sushil, (1990). Waste Management: A Systems Perspective. *Industrial Management & Data Systems*, 90(5), 1–67. <https://doi.org/10.1108/02635579010140584>
20. UN. (2015). Global Waste Management Outlook.
21. World Bank. (2019). Global Economic Prospects, June 2019. Washington, DC: World Bank. p. 137.
22. Zaman, A.U. (2017). A comprehensive study of the environmental and economic benefits of resource recovery from global waste management systems. *Journal of Cleaner Production*, 124, 41–50.
23. Wang, T. (2019). Global Waste Generation – Statistics & Facts. <https://www.statista.com/topics/4983/waste-generation-worldwide/>

INFORMATION ASYMMETRY IN REAL ESTATE TRANSACTIONS AND ITS IMPACT ON THE TRANSACTION OBJECT

Jānis VANAGS¹, Ineta GEIPELE², Linda KAUSKALE³

Riga Technical University, Latvia

Corresponding author`s e-mail: Janis.Vanags@rtu.lv

Abstract. The concept of information asymmetry is inherently multidimensional. Its content is closely related to social sciences such as psychology, economics, politics, etc. Different intelligence, cognitive abilities, perception of the environment, and purposefulness of individuals form the social basis of information asymmetry. It means that information asymmetry as a social phenomenon has emerged and developed along with the development of civilization. It is quite possible that information asymmetry exists in the animal world both within and among species. This is largely evidenced by indirect scientific research on animal sowing and its manifestation in a particular environment. Despite its rich history of development, the concept of information asymmetry only emerged in the academic world in the second half of the last century. In the subsequent years, the volume and depth of research in this area were increasing rapidly and reached the peak of scientific research already at the beginning of the 21st century, more precisely in 2001, when George Akerlof, Mikhail Spence and Joseph Stiglitz were awarded the Nobel Prize for market research under information asymmetry conditions. Information asymmetry plays an important role in the development of market economy. According to the classical economic theory, in a free market, full competition is only possible if the amount of information available to the buyer and seller about the transaction subject is similar. The difference in awareness is insignificant and cannot be used by the seller to increase the price of the item. Such a state of affairs tends to be termed in theory by the concept “perfect information”, which is the most important assumption in scientific research and for the development of regularities in the neoclassical economy. As the production of goods has diversified and their complexity increased, there has been an increase in information asymmetry between the buyer and seller used to manipulate price in favour of the seller. Information asymmetry has thus become one of the most important aspects for the regulation of the market economy by the relevant public authorities. Reducing information asymmetry has also been taken care of by market participants themselves. Already in the first half of the 14th century, the word “broker” was used in medieval England to identify a profession whose representatives were involved in buying the required premises for public authorities and selling the unnecessary ones. Over the decades, the term “broker” had been used in other Western European countries, phonetically adapting it to the language of the country concerned, but retaining the root of the word. Given the importance of brokerage activities in reducing information asymmetry, in many countries brokerage activity is governed by national laws and regulations. Brokerage services are a relatively new profession in Latvia. To a large extent, this is due to the brokers’ poor reputation among market participants, their low level of professionalism, and detected fraud cases. The effect of information asymmetry in the real estate market was very convincing after Latvia’s accession to the EU, when real estate speculators from Western Europe and North America appeared on the local real estate market. This situation was used by the companies operating in the real estate market in order to raise transaction prices. As a result, between 2003 and 2007 dwelling prices increased 2.5 times in the country, but in Riga – 4.4 times, in Jelgava – 5.2 times, in Liepāja – 4.7 times and in Rēzekne – 3.7 times. The most interesting thing is that such a rapid price increase has not been found in any national statistics for the past 100 years. Despite a considerable price increase, public authorities did not intervene in this process and banks continued to extend credit until 2008,

when the recession hit. It is quite possibly one of the most vivid demonstrations of irresponsibility of public authorities in the European Union since its inception. Due to information asymmetry in the housing market, thousands of households got into a debt trap and were left without any work and livelihood. As a result, more than 100,000 people of working age left the country after the recession in the housing market.

Keywords: *Information asymmetry; Real estate market; Housing prices; Broker.*

JEL Classification: B12, D52, D82, E31, H31, H32

POPULATION CHANGE FORECAST BY THE EU AND OECD: A CRITICAL ASSESSMENT

Jānis VANAGS¹, Ineta GEIPELE², Nīna LINDE³

Riga Technical University, Latvia

Corresponding author`s e-mail: Janis.Vanags@rtu.lv

Abstract. The population is the socio-political and economic basis of each country. Evidence for this idea can be found in the history of civilization development. At the beginning of the 21st century, Latvia, other Baltic States and the EU have been facing the threats posed by civilization itself for several centuries. The most important threats are air, water and land pollution and its increase, the annual average temperature rise, the sharp difference in income between rich and the least developed countries, and the over-concentration of the world wealth in the hands of a small section of the population. In the social economy, population stratification and climate change are the major causes of migration in the world. In these circumstances, it is important to “look” into the future in order to better identify current threats and potential changes, as well as their performance over time. Probably being driven by their best intentions, the EU statisticians have produced population projections for the current EU countries up to 2080. From a scientific point of view, it should be seen as an important and bold step to look over several decades to understand what changes in the population will take place today as a result of the identified and unknown threats. The study focuses on Latvia and the other Baltic States, as well as on Northern European countries. Table below provides the EU forecast data.

The EU Population Projections up to 2080

Countries	Estimated figures by time interval (<i>million</i>)							2030/ 2020 %	2080/ 2020 %
	2020	2030	2040	2050	2060	2070	2080		
Estonia	1.32	1.31	1.28	1.26	1.22	1.18	1.14	-0.89	-13.48
Latvia	1.91	1.74	1.60	1.51	1.43	1.34	1.28	-8.77	-32.82
Lithuania	2.75	2.41	2.13	1.96	1.84	1.72	1.66	-12.32	-39.69
Denmark	5.89	6.30	6.56	6.69	6.76	6.83	6.86	6.98	16.49
Norway	5.17	5.40	5.88	6.27	6.57	6.81	7.01	8.79	32.62
Finland	5.56	5.70	5.72	5.69	5.65	5.63	5.58	2.44	0.29
Sweden	10.29	11.24	11.99	12.68	13.28	13.84	14.39	9.17	39.78

Data source: Table compiled by the authors using EUROSTAT data and calculation results

As can be seen from the data in the table, the EU predicts that the population of Latvia may decrease to 1.66 million or 32 % by 2080. The largest part of population decline is forecast in Lithuania – less than 1.1 million or 39.7 %, but the smallest in Estonia – 0.18 million or 13.5 %. All Scandinavian countries are expected to increase their population. This is mainly the case for Sweden, with an increase of around 1.4 times and in Norway – 32.6 % increase. In the EU, the total population is expected to rise to about 520 million or 2.1 % during this time. The largest population growth is forecast in Luxembourg – just under 1.9 times, in Norway – 1.38 times and in Ireland – 1.34 times. With a lower birth rate, the EU forecasts that Latvia’s population will decrease by just under 1 million, or nearly 2 times, approaching Estonia with 0.9 million and a 30 % decline, while Lithuania’s population decline will be 1.56 times, the highest in the EU. It should be noted that the population in the old EU Member States is projected to increase by 8.2 %, while in the new Member States it will

decline by 22 %. It means that the richest EU countries are projected to continue to increase their wealth at the expense of the new Member States by attracting the labour and talents they need. It would be naive and utopian to imagine that the new Member States would accept such a policy. Scientific studies and observations show in practice that the very existence of a system in the EU is threatened by drastic socio-economic disparities. Therefore, the population projection cannot be considered as contributing to the stability of the EU. Instead, the EU should pursue a sufficiently effective convergence policy so that Latvia, the other Baltic States, as well as the other new Member States reach the EU average level of development no later than the middle of this century.

Population projections have also been developed by the OECD countries, but for a shorter period, up to 2030. The data by the Baltic and Scandinavian countries are presented in the table below. The general trend of the data presented in the table is similar to the forecast made by the EU – the population growth in Latvia and the other Baltic States is negative, while in the Scandinavian countries it is positive. The largest population decline in the Baltic States by 2030 is expected in Lithuania – 12.4 %, followed by Latvia with 8.9 %, and Estonia will experience the lowest decrease – 0.99 %. It means that there are no significant differences in population projections made by the EU and OECD. Therefore, these indicators could be considered scientifically relevant if the forecast were accompanied by the assumptions and constraints used in the forecast. The topicality of the assumptions and constraints is determined by the fact that in all cases the projected indicators from 2020 to 2030 do not correspond to a linear function.

The OECD Population Projections up to 2030

Countries	Estimated figures by time interval (<i>million</i>)								2080/ 2020 %
	2020	2021	2022	2023	2024	2026	2028	2030	
Estonia	1.32	1.32	1.32	1.32	1.32	1.31	1.31	1.31	-0.99
Latvia	1.90	1.89	1.87	1.86	1.84	1.81	1.77	1.74	-8.87
Lithuania	2.73	2.70	2.67	2.63	2.60	2.53	2.46	2.39	-12.40
Denmark	5.86	5.89	5.91	5.94	5.97	6.02	6.07	6.12	4.46
Norway	5.39	5.42	5.46	5.50	5.53	5.61	5.68	5.75	6.83
Finland	5.54	5.55	5.56	5.57	5.57	5.59	5.60	5.61	1.30
Sweden	10.37	10.47	10.57	10.66	10.74	10.89	11.03	11.15	7.46

Data source: Table compiled by the authors using EUROSTAT data and calculation results

Examining the results of the EU and OECD forecasts by the Scandinavian countries, significantly larger deviations have been revealed. The largest discrepancy is observed in Finland's population projections up to 1.9 % for 2030, followed by Denmark – 1.56 times and Norway with 28.7 %. Taking into account the conservative nature of population changes, especially in economically developed countries and their location in Northern Europe, where the threat of global climate change is significantly lower than in Central Europe and Southern Europe, such deviations between forecasts would not be acceptable. It means that one of the forecasts or both cannot be considered scientifically satisfactory and, without appropriate adjustments, they cannot be used in other scientific studies and/or development planning of the organisation of the countries concerned without the corresponding adjustments. In addition, adjustments need to be accompanied with assumptions and constraints related to the threats and opportunities affecting population change. In addition, the projections for population change in the Baltic States made by the EU up to 2080 threaten the preservation of their existing national identity due to the small size of their population, creating a threat of socio-national conflict in the European Union.

To a greater extent, this applies to Latvia and Lithuania; therefore, politicians in these countries and the EU should focus on these issues in order to develop and implement concrete and sufficiently effective measures to preserve basic population in the Baltic States and reduce social conflicts, thus strengthening the EU socio-economic foundations.

Keywords: *Population projections; Population forecast; Baltic States; Scandinavian states.*

JEL Classification: C 32; E17; J11; J61

CRITICALLY CREATIVE METHOD IN RESEARCH AND HIGHER EDUCATION

Jānis VANAGS¹, Ineta GEIPELE², Nīna LINDE³

¹⁻³ Riga Technical University, Latvia

Corresponding author`s e-mail: Janis.Vanags@rtu.lv

Abstract. The cognitive basis of the critically creative method is critically creative thinking. In human activities, it has been, is and will be a constant guide to the development of civilization. A small proportion of individuals have always been critically minded, and even smaller proportion has been critically creative, intuitively using the critically creative method. It gives us the opportunity today to use the discoveries of scientists and inventions of designers, from simple everyday things to new knowledge about space. Advances in science and technology have been made thanks to those who, at the beginning of the last century, were critical of the opportunities available to humans to meet their needs, of the knowledge about the world around them, and of scientific regularities. Not only were they critical of the environment and the knowledge available to the public, they analysed, evaluated and synthesised new knowledge and regularities, as well as invented new materials and technical devices without which we could not imagine the possibility of meeting our needs. In spite of this march of critically creative thinking, it became the focus of attention in the academic world only in the middle of the last century. One of the pioneers of critical thinking research is Edward M. Glaser, who defined critical thinking as follows: Critical thinking is an objective analysis of facts to form a judgment. The ability to think critically, as conceived in this volume, involves three things: (1) an attitude of being disposed to consider in a thoughtful way problems and subjects that come within the range of one's experiences, (2) knowledge of methods of logical inquiry and reasoning, and (3) some skill in applying those methods. Unfortunately, this definition cannot be considered scientifically significant because it expresses a utopian ideal attitude towards the subject, considering that a person is capable of analysing the facts objectively. In practice, there is much evidence that a person is incapable of thinking objectively and of making objective decisions. Moreover, formation of the judgement is the positive effect of creative thinking rather than critical thinking. Thus, the definition does not reveal what critical thinking is, but explains what it consists of and what is needed to develop the ability to think critically.

In the academic environment, there are many definitions of critical thinking where similar mistakes are made. It should be noted that the critical thinking method has not yet found its place in globally recognised glossaries of scientific terms. Therefore, within the framework of the research, critical thinking is interpreted as follows: Critical thinking – a type of cognitive activity that results in the discovery of imperfections in the research object and in obtaining a more objective view of it at a particular place and time. However, the explanation of the critical method is similar: Critical method – a set of purposefully selected, mutually compatible and complementary elements used to discover the flaws of the research object under study in order to gain a more objective picture of it at a particular place and time. From this follows the explanation of the critically creative method: a set of purposefully selected, mutually compatible and complementary elements that are used to discover the flaws of the research object under study in order to gain a more objective idea of developing improvements or other products at a specific place and time.

The results of the research demonstrate that the characteristics of pseudoscience are increasing in the academic environment. This, to a large extent, relates to social sciences, where researchers rate the form of expression higher than the accuracy of the content of the research. This tendency also spreads in higher education. It can be seen as a product of

synthesis of liberal politics implemented in the developed countries and misunderstood freedom of expression, but it does not mean that it has to be accepted. In a rapidly changing external environment, higher education institutions face new challenges in order to maximally adjust the content of the study process to the changes in the labour market; to make the knowledge, understanding and awareness of the internal and external environment of the company and/or other systems obtained at higher education institutions commensurate with the threats and opportunities they will face, at least in the short to medium term. The critically creative method, its purposeful and fair use can be a useful aid in increasing the relevance of scientific research and higher education, which are the most important aspects of increasing demand for higher education and research.

Keywords: *Critical thinking; Critical thinking method; Critically creative method.*

JEL Classification: I24; J24; Y9

CORRUPTION IN THE CONSTRUCTION INDUSTRY: SIGNIFICANT CASES AND CONSEQUENCES

Jānis VANAGS¹, Ineta GEIPELE², Iveta STĀMURE³

¹⁻³ Riga Technical University, Latvia

Corresponding author`s e-mail: Janis.Vanags@rtu.lv

Abstract. Within the research, several definitions of corruption are identified, in which the concept of corruption is formulated quite differently. Corruption is often associated with state institutions and their entities, on the one hand, and entrepreneurs, on the other. However in practice, it has been observed that in most cases corruption is related to violations of written and/or unwritten laws for the purpose of gaining benefits that cannot be legally obtained. Therefore, within the theme of the research, corruption is interpreted as follows: Corruption is a set of purposefully selected, mutually compatible and complementary, often non-regulatory measures that are implemented with the aim of creating an exceptional situation for achieving one's goals. Corruption subjects are individuals in society who engage in corrupt transactions in their own personal interest or that of an organisation for the purpose of achieving benefits from the corrupt transaction. By its very nature, corruption has always been related to competition among different competitors. Nowadays, corruption and its measures have become much more sophisticated and diversified, ranging from petty corruption to large-scale, even global corruption, known as grand corruption. The results of the research demonstrate that corruption is a relatively topical issue in Latvia. According to the Transparency International study, the Corruption Perceptions Index for 2018 is 58 points, which places Latvia in 41st place among 180 countries included in the study. Thus, corruption in Latvia is on a par with countries such as Georgia and Spain. However, Latvia's neighbour Estonia ranks 18th with 73 points, while Lithuania ranks 38th. Construction is one of those sectors of the national economy where corrupt transactions are relatively widespread and remain at a relatively high level for several years. Corruption is most widespread in public procurement related to the procurement of various state-relevant construction products.

Companies operating in the construction industry engage in corrupt transactions, mainly to find themselves in an exceptional position among competitors who compete with each other for the production of a construction product. Causes of the spread of corruption and its persistence in the construction sector can be divided into several groups: social, technical, economic and governance causes. The results of the research have demonstrated that corruption in Latvia is an integral part of external entrepreneurship. Among the causes of corruption mentioned above, the social causes of governance are the most important ones. Using logical approaches and induction methods, it has been found that construction companies benefit from engaging in corruption – the potential benefit in many cases is greater compared to the potential loss in case of corruption detection. It means that the Latvian rules and regulations are sufficiently liberal in relation to the threat of corruption. As a result, construction companies interested in corruption are able to negotiate mutually beneficial agreements with relevant officials in public institutions, which allow them to acquire the right to execute public contracts in the construction industry without competition. Moreover, public contracts involved in corrupt transactions are often generously repaid. The second major group of causes of corruption is the greed and low level of legal awareness of construction companies, as well as the legislators' low level of competence in regard to the causes of corruption.

Keywords: *Corruption; Construction industry; Corruption cases; Competitiveness.*

JEL Classification: A14, K42, L74, M21

QUALITY OR CONFORMITY OF CONSTRUCTION PRODUCTS: WHAT IS WHAT?

Jānis VANAGS¹, Ineta GEIPELE², Iveta STĀMURE³

¹⁻³ Riga Technical University, Latvia

Corresponding author`s e-mail: Ineta.Geipele@rtu.lv

Abstract. The concept of quality has become increasingly popular in the past decade. The results of the study demonstrate that only a few quality users are aware of its content. The construction industry is not an exception. No one should have any objection if the concept “quality” is used by the customer or user of the construction product, who has brief contact with construction and does not have the necessary knowledge in the manufacture of construction products. However, the use of the concept of quality by manufacturers of construction products is not correct and does not correspond to the content of the concept. Being aware of the quality content and knowing that the construction industry agrees with the regulated sphere one can come to the conclusion that construction companies do not produce quality products and do not produce poor quality products. Conforming and/or nonconforming products are produced in construction. In practice, cases of analysis and evaluation of construction products and the results of scientific research prove that the precision of the concepts used in communication drastically reduces the potential risk of inappropriate decision making and contributes to the increase in resource efficiency. This applies in full to companies operating in the construction industry, associations involved in the development of the construction industry, as well as to civil servants involved in the development of regulatory enactments in construction.

Taking into account the observations and research results outlined above, the study focuses on the content of the concepts of quality and conformity, their relationship and transformation. Quality is a set of attributes defined by an individual in the society, a particular subject, which is used to evaluate a particular object. An important element is included in this definition – the attributes defined by the subject. It means that the subject has an idea of quality and each has its own quality, there are no two identical ideas of quality. Therefore, the discussion about the existence or non-existence of quality is fruitless. The concept of conformity is needed in order to reach a compromise between the buyer and the seller and between the manufacturer and the consumer. What is conformity? Conformity is a set of attributes of parties involved in the transaction or a set of attributes defined by law, which is known to the parties involved in the transaction. It means that in every situation when the buyer or the customer of the construction product is not satisfied with the quality of the manufactured product, the manufacturer first checks the conformity of the product characteristics with the laws and regulations before deciding on further action.

In the construction sector, the production of new products mainly begins only after the project in question is completed. It is the project that contains the customer’s quality requirements. After the project is designed, the quality requirements are transformed into conformity requirements. When a construction project arrives at a construction company and the construction process begins, the conformity requirements included in the project are supplemented with the requirements defined in the building regulations, standards and other regulatory enactments. As a result, in the construction product manufactured one can identify the customer-defined quality requirements, as well as the conformity requirements that are stipulated in the relevant regulatory enactments. Thus, the situation becomes sufficiently clear and unambiguous – if construction companies and their stakeholders are willing to achieve a higher level of conformity of construction products, they first need to know and understand the content of the concepts of quality and conformity and their role in managing

the production of a conforming construction product, as well as use these concepts according to the content.

Keywords: *Quality; Conformity; Construction; Construction product.*

JEL Classification: M11, O22, R31

REAL ESTATE TRANSACTION COSTS IN LATVIA

Janis VIESTURS¹, Armands Auzins²

^{1,2} Riga Technical University, Latvia

Corresponding author's e-mail: Janis.Viesturs@rtu.lv

Abstract. Real estate transactions are associated with several complicated and mutually connected activities to satisfy the needs and demands of different economic and social interests, which in turn are related to the transfer of real estate ownership, registration of property rights, financing, and other requirements related to each transaction. One of the key concepts of new institutional economics theory is transaction costs. The purpose of this study is to determine how competitive Latvia is in terms of real estate transaction costs in the Baltic region with particular emphasis on comparing the real estate transfer tax.

Keywords: *New institutional economics, Real estate transaction costs, Transaction cost classification*

JEL Classification: D23

Introduction

In economic theory costs can be divided into production costs and transaction costs. Transaction costs are to be separated from production costs, which is the cost category analysed by neoclassical economics. The main proponents of new institutional economics, emphasize transaction costs as one of the most important objects of research, defining them as the costs of running the economic system. There are several approaches to transaction cost classification, therefore, in each particular case, when transaction costs are calculated or individual countries are compared, it is necessary to determine what is included in the term “transaction costs” and to take into account that countries have diverse law systems and hence different procedures for the transfer of title.

Methodology of Research

When studying the openness of Latvia to international real estate transactions between 31 October 2018 and 31 December 2018, a survey was conducted, which includes interviews with 50 real estate transaction experts in Latvia representing 11 professions: real estate agents, real estate company managers, real estate developers, entrepreneurs, academic personnel/researchers, real estate managers, sworn notaries, real estate appraisers, lawyers/attorneys, representatives of credit institutions and other real estate specialists.

Findings and Results

In scientific research and other sources of information there are several categories of transaction costs — 1) *ex ante* and *ex post* transaction costs; 2) search costs, legal costs and administrative costs of transaction, adjustment costs, financial costs, uncertainty costs; 3) direct and indirect costs; 4) obligatory or those costs determined by law which can be calculated accurately, for example, real estate transfer taxes and registration fees. The main component of obligatory transaction costs — the transfer tax — in Latvia, in comparison to the other two Baltic countries, is considerably higher, therefore, in terms of transaction costs, Latvia is less competitive. When evaluating the possibilities of attracting investments to the Baltic region by the criterion “transaction costs”, it is advisable to consider various options for reducing the real estate transfer tax in Latvia.

Conclusions

The results of this research shows that it is necessary to compare real estate transaction costs at the regional level because the transfer tax and transactions costs in a large majority of world's countries in general are higher than in all three Baltic states. A high real estate transfer tax in the Baltic region is one of the factors impeding real estate investments in Latvia. In addition to other factors it is a cause for potential investments in real estate to be channelled to neighbouring countries.

References

1. European Property Rights and Wrongs. (2011). Ed. by Diana Wallis and Sara Allanson. Editorial Office: Conexio Public Relations, 2011. Resurss skatīts 2017. gada 19. maijā: <https://www.scribd.com/document/90551431/European-Property-Rights-and-Wrongs>
2. Case XI ZR 405/12. (2014). Germany's Federal Court of Justice (Bundesgerichtshof). Retrieved from <http://juris.bundesgerichtshof.de/cgi-bin/rechtsprechung/document.py?Gericht=bgh&Art=en&sid=96665a8c2fdb796abb993eaf0a0b1c9f&nr=68051&pos=0&anz=2>
3. Cross Border Acquisitions of Residential Property in the EU: Problems Encountered by Citizens. Directorate General for Internal Policies. (2016). Policy Department C: Citizens' Rights and Constitutional Affairs. European Union. Retrieved from <http://www.europarl.europa.eu/supporting-analyses>
4. Kälin, Ch. H. and Taylor, A. (2013). International Real Estate Handbook. Acquisition, Ownership, Sale, Tax, Estate Planning. 4th edition. Zurich: Ideos Publication Ltd.
5. Lindqvist, S. (2016). Transaction Costs for Single-family Houses: An International Comparison. *Nordic Journal of Surveying and Real Estate Research*, 5 (1), 24–41. Retrieved from <http://ojs.tsv.fi/index.php/njs/article/view/2701/2475>
6. Murray, P. L. (2007). Real Estate Conveyancing in 5 European Union Member States: A Comparative Study. Visiting Professor of Law from Practice, Harvard Law School, Cambridge, MA, USA. Retrieved from <http://www.dnotv.de/files/Aktuelles/murrayreportfinal310807en.pdf>
7. Purchasing Real Estate in Europe (2012). European Law Firm. Retrieved from <https://www.european-law-firm.com/guide/purchasing-real-estate-in-europe201011.pdf>
8. Registering Property Methodology (2019). Doing Business. The World Bank. Retrieved from <https://www.doingbusiness.org/en/methodology/registering-property>
9. Transaction Costs (2018). Global Property Guide. Retrieved from <https://www.globalpropertyguide.com/faq/transaction-costs>
10. Transaction Costs in the Real Estate Market (2019). Management Study Guide. Retrieved from <https://www.managementstudyguide.com/transaction-costs-in-real-estate-market.htm>
11. Quigley, J. M. (2004). Transacting Costs and Housing Markets. *Housing Economics and Public Policy*. Retrieved from <https://escholarship.org/uc/item/6pz8p6zt>
12. Van Ommeren, J. (2008). Transaction Costs in Housing Markets. Tinbergen Institute Discussion Paper No. 08-099/3. <http://dx.doi.org/10.2139/ssrn.1285971>
13. Vitikainen, A. (2007). Transaction costs concerning real property. In: Stubkjær E., Frank A., Zevenbergen J. Real property transactions: procedures, transaction costs and models. European Cooperation in the Field of Scientific and Technical Research. COST Action G9 Project, IOS Press. p.p. 101.-118.
14. Williamson, O. E. (1981). The Economics of Organization: The Transaction Cost Approach. *The American Journal of Sociology*, 87(3), 548–577. Retrieved from http://unige.ch/sciences-societe/socio/files/1114/0533/6204/Williamson_1981.pdf
15. Williamson, O. E. (1985). The Economic Institutions of Capitalism. Firms, Markets, Relational Contracting. New York: Free press.

THE IMPACT OF CULTURE AND CREATIVITY CLUSTER TO THE ECONOMY OF THE CITY

Girts ZARIŅŠ¹, Kaspars PLOTKA², Jānis VIRŽBICKIS³, Janis ZVIRGZDIŅŠ⁴,
Sanda GEIPELE⁵

^{1,2,4,5} Riga Technical University, Latvia

³ University of Latvia, Latvia

Corresponding author e-mail: girts.zarins.1@rtu.lv

Abstract. Creativity and intellectual capital development contribution to city is an important economical component of the modern cities. Due the flexible nature and soft cluster borders, an exact contribution evaluation is burdened, indicating a need for modelling, and still for planning and city development planning a necessary condition is at least qualitative understanding of the economic contribution of particular cluster and consider some models for development analysis as alternative comparison. The competitiveness of the territories depends on their attractiveness to economically active individuals and the opportunities city to provide for resulting economic growth with satisfying needs for qualitative intellectual services. Viewing as intellectual and creativity service portfolio in particular city or a city district (area) can to be analysed for understanding resulting economic activity in city. Authors used literature review and rapid review to assess the challenges of assessing and analysing situation in cities for estimating and modelling culture and creativity cluster contribution for a city economy development. The research results indicate that culture and creativity cluster is providing increasingly growing contribution for modern city economy. The authors suggest to assess culture and creativity cluster contribution with a model and to use the classification according the general economic activity (NACE) (Statistical Classification of Economic Activities in the European Community, Rev. 2, 2017). To verify initial theoretical model analysis in 4 cities was performed and results presented. Even if with generalized model analysis depth is limited, still it can be used to provide necessary basis for decision making, and possible for a particular city identifying as potential areas of focus. More advanced analysis models may improve long term development initiative target achievement rates and to support the planning and later integration of cultural and creative sector activity sources into urban economy. It also would help to assess funding alternatives of investments needed and unified methodology when used for different cities would provide comparable Key Performance Indicators (KPIs) to compare cultural and creative sector contribution to city economies and together with historical data also would provide basis for further model improvements.

Keywords: *City development, Culture impact, Economy, Economy modelling, Integration, Investment*

JEL Classification: R11, R51, Z10.

RIGA TECHNICAL UNIVERSITY STUDY COURSE “MANAGEMENT OF INNOVATIONS IN BUILDING CONSTRUCTION” TEACHING METHODOLOGY

Girts ZARIŅŠ¹ Kaspars PLOTKA², Janis ZVIRGZDIŅŠ³, Ineta GEIPELE⁴

¹⁻⁴ Riga Technical University, Latvia

Corresponding author e-mail: Kaspars.Plotka@rtu.lv

Abstract. The construction industry is one of the sectors of the economy with stable economic growth and sustainable development. Competition in the industry is high, which forces the industry to evolve. One of the critical factors for development is the obtaining or acquisition of innovative construction technologies. Innovations help reduce construction costs, increase construction speed for building and renovation of structure, and simplify certain the construction processes. Technology innovation is required in the construction process and it also drives the development of new building materials. To support development of innovations, attention and effort should be devoted for training of young professionals and corresponding teaching methods.

Riga Technical University study course “Management of Innovations in Building Construction” is closely related to economic processes in society. While studying this course, a requirement for finishing a demonstration of students' independent work. Independent work requires the merging in study process, metacognitive, and intellectual skills in the study process and might involve research in several disciplines, providing concepts of integration between different knowledge disciplines and areas. Cross disciplinary research with integration makes function need to find new cross section points and integration with the construction industry. The interdisciplinary knowledge and skills used in the study process can be used in the students' practice activities and work outside the university. Students not only test the correctness of their profession choice in the internship process, they also begin to develop management and innovation experiences.

It is important to avoid superficial knowledge in the study and practice process with students to choose one of standard solution. Rigid teaching methods prevents innovative thinking. The key to the innovation process is not to cross the boundary between what is needed and what is desired, between what is desired and what is required. It is important to consider systematicity and sequence in the course. Comprehensive research on innovative construction processes, phenomena and systems sets is closely linked with the set of study objectives.

Keywords: *Construction, Innovation, Integration, Knowledge study process.*

JEL Classification: A20, A39, O31, L74

SUITABLE RESEARCH METHODS IN STUDY PROCESS OF RIGA TECHNICAL UNIVERSITY

Janis ZVIRGZDINS¹, Ineta GEIPELE²

^{1,2} Riga Technical University, Latvia

Corresponding author`s e-mail: Janis.Zvirgzdins_1@rtu.lv

Abstract. Qualitative solutions for solving current issues related to all dimensions of sustainable development – environment, society and economy – are based on science and research. Therefore, it is crucial to ensure the sustainability of qualitative science and research in the long run. Students should be introduced to research and research methods from the very beginning of their study process. The aim of the research is to find out the optimal solutions for the order of the choice of research methods in the study process adapting to different perception and preparedness levels of students. Authors use the literature review to explore the most suitable research methods for different level – Bachelor`s, Master`s and Doctoral – students. Results show that the most appropriate research methods in the early phases of study process are analysis and synthesis, induction and deduction and monographic method. Student`s continuous improvement in research methodology can be achieved using such mathematical methods as grouping, correlation and indexation and such empirical research methods as observation, survey, interview and Delphi method. At the late stages of individual study process commonly used research methods include literature review, literature overview and qualitative content analysis and students have clear understanding where to find scientific articles and valid data for their research.

Keywords: *Research methods, Study process.*

JEL Classification: A20, I21

REAL ESTATE APPRAISAL OF INVESTMENT OBJECT

Gatis ZVIRGZDIŅŠ¹, Renāte MUSKATE²

^{1,2} Riga Technical University, Latvia

Corresponding author e-mail: renate.muskate@gmail.com

Abstract. Real estate valuation is comparatively new field of professional activity and all related questions in Latvia have been under-examined. The research was developed to define appraisal for concrete investment object. Within part survey of people opinion regarding the most important factors of their apartment choice was done. Also typical apartment building projects from Soviet times were looked into. Appraisal of concrete investment object was carried out. Part of research consists of insight for assessors job organization and appraisal creation process. Author came to conclusion about optimal apartment choice for people and project investment results. Author made suggestions regarding real estate assessor training improvements, as well as data information optimization.

Keywords: valuation, real iestate, real estate valuation, investment object, apartment.

JEL Classification: O18; E22; R2; R3

CHANGING THE PARADIGM: CIRCULAR ECONOMY AND RELATED CONCEPTS

Janis ZVIRGZDINS¹, Kaspars PLOTKA²

^{1,2} Riga Technical University, Latvia

Corresponding author`s e-mail: Janis.Zvirgzdins_1@rtu.lv

Abstract. In a modern world where the society`s desires are unlimited but planet`s resources are limited it is crucial to be aware of the ongoing processes and to understand that each action taken by societal members has an impact on environment. At the moment world is witnessing environmental crisis related to climate change, loss of biodiversity, deforestation, air, water and soil pollution, ozone depletion, etc. Therefore, ‘business as usual’ development trajectories are not tolerable and drastic changes have to be introduced. A promising concept in scientific environment is circular economy, which is aimed to replace the existing ‘take-make-dispose’ approach of linear economy and to conserve the resources for future generations. Authors used literature review to explore the fundamentals of circular economy and related concepts which can contribute to creation of more sustainable world. Results show that reducing, reusing and recycling practices and efficient waste management strategies are the driving forces of circular economy. Additionally, it should be stated that systemic changes supported by circular design and business models are required to bring the concept to real life. Such related concepts as Cradle to Cradle, Sharing Economy, Performance Economy, Biomimicry, Natural Capitalism, Industrial Ecology and Blue economy also have a great potential to ensure planet`s sustainability. However, the greatest barriers are societal ones which are linked to high resistance towards change.

Keywords: *Biomimicry, Blue Economy, Circular economy, Cradle to Cradle, Industrial Ecology, Natural Capitalism, Performance Economy Sharing Economy*

JEL Classification: R11, Q01, Q53