SUSTAINABLE DEVELOPMENT OF REAL ESTATE: DECISION SUPPORT MODEL AND RECOMMENDATIONS FOR THE PERIOD OF CRISIS

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Abstract. The aim of this paper is to propose a decision support model for real estate development and recommendations that could help Lithuania during economic crises. Research, theoretical and practical tasks of sustainable real estate development process were revised, particular examples presented. Different models and methods for analysis of real estate development discussed. Decision support model, encompassing extensive analysis of the global trends, best crisis management practices, assessment of the factual situation and provision of recommendations for different stakeholders under conditions of market instability presented. According to proposed model, the research was performed by studying the expertise of advanced industrial economies and by adapting such to Lithuania while taking into consideration its specific history, development level, needs and traditions. Basing on these findings, accumulated know-how, the results of previous scientific studies and practical insights of the other authors, specific recommendations to avoid crisis and minimize its consequences in macro-, meso- and micro- levels were provided. Recommendations illustrate holistic point of view and assumption that real estate development consists of creativity, research and art.

Keywords: sustainable development, real estate, development process, decision support model, crisis, recommendations.

Introduction

Sustainable development is inconceivable without healthy real estate market that provides facilities for all human activities while improving the public spaces in cities and towns. Unfortunately, buildings have a significant impact on the environment since they are one of the largest sources of CO_2 emissions. It causes the greenhouse effect and contributes to global warming. In the EU states, buildings consume more than 40% of all energy, of which residential buildings – about 63% (Balaras et al., 2007). Problems of chaotic urban development, energy consumption, pollution, climate change, etc. encourage to search for adequate real estate development solutions.

Sustainable development in the context of sustainable urban environment is understood as the construction which creates built environment, including efficient use of resources and taking into account the environmental aspects (Kibert, 2005). Sustainable development basically means that priorities are given to mixed use of buildings, social diversity of people, high quality projects and sus-

tainable buildings. According to Choguill (2008), no city will be sustainable if the component parts thereof are not sustainable. Therefore it is important to start with buildings. Recently, a lot of research have been carried out, buildings were assessed by various assessment methods, especially aimed at solution of energy and other resources' consumption issues. Building sustainability assessment becomes one of the main problems of sustainable construction. However, building sustainability is defined by mutually conflicting criteria. The challenge is to make a rational decision on the basis of these criteria. Multi-criteria methods of assessment are generally used in solving the abovementioned problems (Zavadskas, Turskis, & Kildienė, 2014).

A building project can be regarded as sustainable only when all the various dimensions of sustainability (environmental, economic, social, and cultural) are dealt with. Developing countries give priority to their social and economic problems (Gibberd, 2005; Libovich, 2005).

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Developed countries are concerned about the reduction of impact to environment, therefore they give priority to environmental issues and have achieved good results in the development of a sustainable environmental management practices.

Currently sustainability principles become more popular in design, assessment, construction, exploitation and demolishment of the buildings (Raslanas, Stasiukynas, & Krutinis, 2012). There are a lot of SAS (sustainability assessment systems) created in the world which are used for assessment of one or another aspect of sustainable building development – environmental, economic or social. International association for Facility Management Professionals (IFMA) presented guide (Portalatin, Roskoski, Koepke, & Shouse, 2010) and analyzed about more than 30 different rating systems. Sustainability evaluation in different countries realized by different methodologies and different systems. Many systems are based on the other systems. However, there are not many systems that cover all components as equally significant. Among most popular systems are BREEM, CASBEE, GBTool, Green Globes, LEED. Most of those were developed as national systems and later were adopted to international markets. Those systems have different limitations, have new releases and are updated periodically. The systems are limited mainly focus on the specific building, as if it is isolated from other buildings, infrastructure and many other factors that characterize a particular built environment (Conte & Monno, 2012). Sharifi and Murayama (2013) analyzed seven SAS, and highlighted their advantages and disadvantages and recommended how to improve them. Most systems do not cover sufficiently the social, economic and institutional aspects of sustainability; there are ambiguities and shortcomings in the weighting, scoring and rating. Raslanas, Kliukas, and Stasiukynas (2016) suggested the buildings sustainability assessment model allowing assessment of the aspects of sustainable construction – environmental, economic and social in the same way – by 33–34% weightings. This model was developed using the expert, breakdown, compensation and the Analytic Hierarchy Process (AHP) methods.

Currently real estate developers require interdisciplinary information and a level of qualification that can assure the stability of developed products, economic effectiveness and quality. The authors of this paper aim to prompt developers' creativity and form public responsibility by sharing their accumulated know-how, the results of previous scientific studies and their practical insights. A great deal has been written on the different elements involved in the process of real estate development in a variety of literature sources. This paper provides integrated information along with practical examples that assist in assuring sustainable real estate development, particularly during period of crisis. Although economic crises are unavoidable, the opinion here is that rational decision making in real estate development makes it possible to diminish the losses.

1. Models and methods for the analysis of real estate development

Many models and methods for the analysis of real estate development and their components have been developed worldwide:
- Linear models of the real estate development process (Medalen, 2004; Miles, 2007; Røsnes & Kristoffersen, 2009);
- Iterative real estate project models (Olsson, Sørensen, & Leikvam, 2015);
- Seven stages real estate development process model (Kohlhepp, 2012);
- New Keynesian dynamic stochastic general equilibrium model on China's housing market fluctuations (Wen & He, 2015);
- A sub-regional model of housing markets in England (Bramley & Watkins, 2016);
- The recreational complex real estate sustainability assessment model allowing assessment of the aspects of sustainable construction (environmental, economic and social) (Raslanas et al., 2016);
- Typology-based approach model for estimation of the energy performance certificate of a housing stock characterized via qualitative variables (Florio & Teissier, 2015);
- Mixed-methods evaluation of a short-term housing support program for homeless families (Meschede & Chaganti, 2015);
- Method and model for early-warning and forecasting of real estate development (Huang et al., 2015);
- Model for optimization of construction contracting in housing development project (Ngowtanasuwan, 2013);
- Model of conflict resolution (Wang, Kilgour, & Hipel, 2015);
- Risk evaluation model for real estate projects (Sun, Huang, Chen, & Li, 2008);
- Analogical regression method (a real estate appraisal system) (Kettani & Oral, 2015);
- Mixed-method approach (downtown redevelopment) (Charney, 2015);
- Normative process model (managing iterations in the modular real estate development process) (Eppinger, Bonelli, & Gonzalez, 2013);
- Model of park development (BenDor, Westervelt, Song, & Sexton, 2013);
- Hedonic model for high-speed rail station on spatial variations in housing price (Geng, Bao, & Liang, 2015);
- Public–private partnership models (Cruz & Marques, 2011; Wang, 2015);
- Micro-simulation model of housing market processes (Ettema, 2011);
- Megaproject model and a new funding model for travelling concepts and local adaptations around the Delhi metro (Bon, 2015);
- Expanded business operations model to evaluate eco-smart corporate communities (Dean, Fath, & Chen, 2014);

– New generation of integrated land-use models (Voigt & Troy, 2008);
– Planning models (Carmona, 2009);
– Quantitative model for office development (Tang & Choy, 2000);
– Conflict solving model to resolve different stakeholder demands in the port redevelopment (Park & Lim, 2013);
– Corridor trace analysis method (Thekdi & Lambert, 2015);
– Community-based research model (Heacock & Hollander, 2011);
– Hybrid model (land development strategies for regional economic corridors) (Mittal & Kashyap, 2015);
– Small hydropower development model (Chen, Wang, He, & Li, 2013);
– Model of real estate prices and business cycles in emerging economies (Minetti & Peng, 2013);
– Comparative, historical, statistical methods and the method of enumeration (Geipele & Kauškale, 2013);
– Dynamic stochastic general equilibrium (DSGE) model to study housing market fluctuations in China (Ng, 2015);
– Grey box model for evaluating the energy renovation effects on the thermal performance of social housing buildings (Terés-Zubiaga, Escudero, García-Gafaro, & Sala, 2015).

Short description of some of the models and methods for the analysis of real estate development is provided below.

Linear models that describe real estate development stages, proposed by Røsnes and Kristoffersen (2009), Miles (2007), Medalen (2004) in general include: ideas for development (concept, aims, visions, search for funds, etc.); acquisition/search for building site and negotiations; contacts with an authority and risk planning; acquisition of site; feasibility studies; company structure and financial constraints; strategic planning; contact with authorities; scope clarification; negotiations/signing of contracts; status of regulation and planning; design; contract formation and marketing; construction process; finalization and management (or sale) of the real estate.

Many of the proposed models present the real estate development process as relatively linear. However, research on project management reveals that many of the projects are developed in an iterative manner. Project managers consistently fail to recognize different types of uncertainty, each of which requires a different management approach (De Meyer, Loch, & Pich, 2002). Perspective that acknowledges the existence of environmental uncertainty and complexity is highly required in today's strategic management thinking in organizational contexts (Nerur & Balijepally, 2007). For this purpose agile methods are developed to manage an iterative project process.

Conboy and Fitzgerald conducted (2004) a review of the literature on agility across many disciplines, and developed a comprehensive framework of software development agility, through a thorough review of agility across many disciplines. Agile methods help to respond quickly to changing circumstances without excessive rework. Case studies by Olsson et al. (2015) indicate that there is a need to describe the real estate development process in an iterative manner. Authors have developed an agile model for real estate development projects. The repeating analyzes, as it was demonstrated by the authors, is a good illustration of the dynamical character of real estate development.

Review of the models reveals that real estate development should be analyzed in an integrated manner, taking into account the most important development phases from the initial project idea till the exploitation of the buildings, their maintenance and demolition. Moreover, in the context of sustainability, market uncertainties must be assessed and creative decisions implemented.

From the discussed holistic point of view, real estate development covers creativity, research and art (Figure 1). Creativity helps invent, imagine, problem-solve, create, and communicate in fresh, new ways. Real estate market as others requires creative thinkers in the form of scientists, engineers, researchers, technology innovators, business entrepreneurs, performers, designers, inventors and educators. Those with the ability to "think outside of the box" will lead the future and are one of most important elements in finding way from crisis.

Creativity is generally judged, as creating the greatest added economic value and benefit to society. Over 90 creative means are known at this time: analogy, empathy, synecology, brain storming, bionics, lateral thinking, mind map, concept map, TRIZ, problem solving, HBGA, Basadur SIMPLEX, biomimetics, six hats, De Bono methods, project renaissance, and others. These, along with other creative means, are applicable for real estate development in all of the stages.

Research is the receipt of information (dissemination of knowledge by refuting previous theoretical models or by expanding, fulfilling existing information) while examining reality. Research is the "creation" of information. The research process encompasses scientific research and all areas of life. Summarizing publically recognized information and transmitting and conveying (such as by lecturing at schools of higher research) information are also ascribed to research. The endeavor of research as a constant process is to receive (as much as possible) information, get to know and understand reality better, be able to forecast the future and use the acquired achievements in practice. Research as a social phenomenon is an important part of society and its culture. Findings of research are vitally
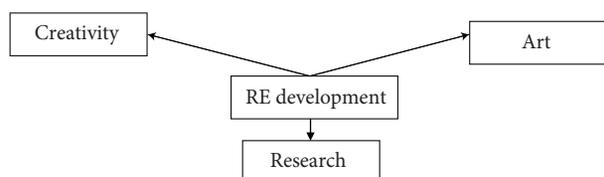

Figure 1. Real estate development consists of creativity, research and art

important for innovations in the real estate development context.

Art can be understood in various ways. Several definitions of art relevant to the process of real estate development are presented below:

– Art is considered a uniquely spiritual technique, and each branch of art is a somewhat differing spiritual technique.

– Art is the ability to make something finely, irreproachably and well and mastery (art of acting, art of managing, art of interacting).

– Art is the use of mastery and imagination for creating aesthetic objects, an environment or experience that can be shared with others.

– The most common and most popular meaning of art is an aesthetic-sensual expression of a human creative endeavor.

Therefore it can be asserted that real estate development consists of creativity, research and art; it is creative, frequently extraordinarily complicated, partly logical and partly intuitive. This holistic approach should be applied in comprehensive real estate development solutions, especially during period of crisis.

Basing these assumptions and considering that sustainable real estate development must not only encompass economic, political, legal and institutional types of decisions but also other, qualitative aspects, including social, cultural, ethical, demographic and other, the decision support model for real estate development during period of crisis is proposed.

2. Decision support model for real estate development

Experience from the recent crisis in Lithuania indicates that it is necessary to comprehensively analyze and make rational decisions at micro-, meso- and macro-levels in the effort to ensure sustainable real estate development, especially under conditions of market instability. To solve this integrated problem, the decision support model, developed by authors, is proposed (see Figure 2). Description of the model is provided as follows.

In this model, the real estate development process is described by eight interrelated stages (see Table 1).
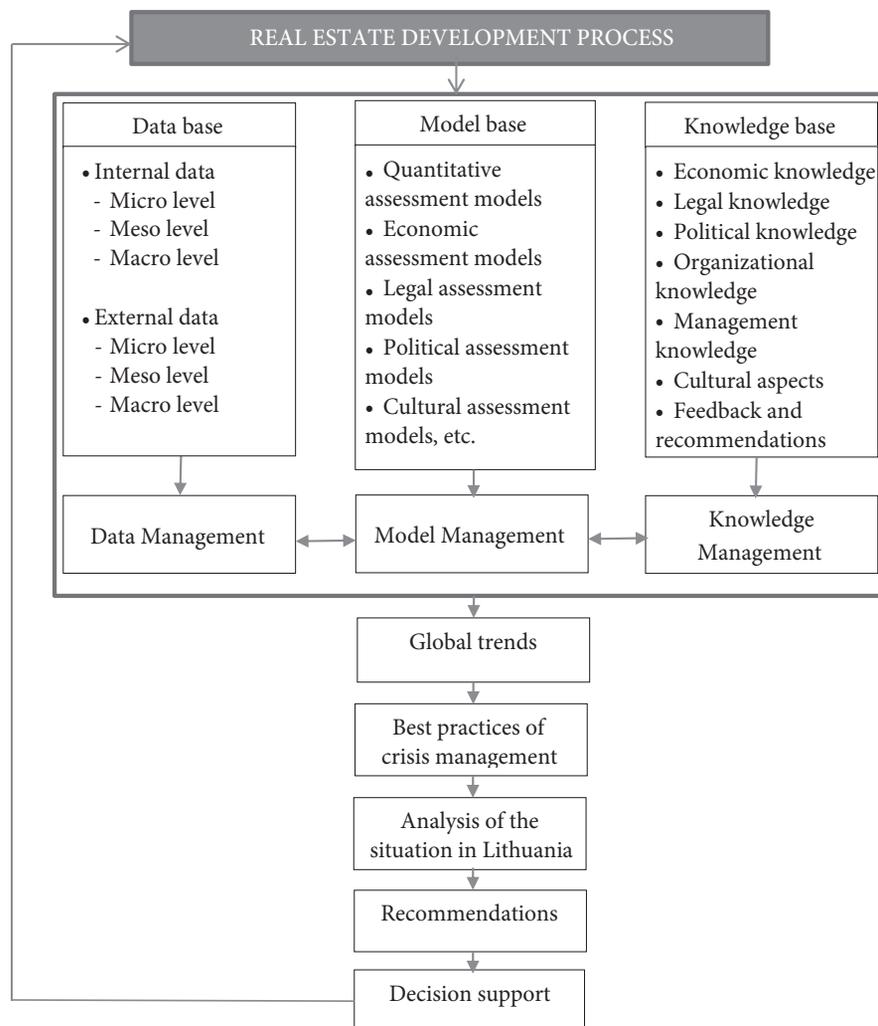

Figure 2. Decision support model for real estate development

Table 1. Real estate development process

Goal setting stage	The Developer analyzes the existing RE market and construction prices, forecasts future perspectives, determines a client's objectives and needs that must be met, analyzes various RE development alternatives and establishes the possibility of accomplishment.
Planning stage	The detail planning for real estate development project performed. The developer performs a search for alternative land lots, analyzes them and selects the most rational one. The developer negotiates with potential credit providers, partners, experts and buyers (lessees) and makes a decision regarding a preliminary project for the structure.
Market research, opportunities analyses and developer decision-making stage	The developer continues improvements and examines the possibilities of the ideas raised during the goal setting and planning stages. The developer either performs market research him/herself or obtains it from other professionals to assess market absorption and the purchasing power of the market and performs or orders a feasibility study, establishing the approximate market value of the project and comparing it with the real price. The developer must be convinced that the project is possible legally and physically and that it is financially vital. Once the results of the market research and the feasibility study have been considered, the developer makes a final decision regarding the RE development project. Then the developer establishes the general leasing or purchasing demands. The agreements for establishing a joint company and the advance RE lease and insurance contracts are signed.
Rational financing acquisition stage	The developer performs a search of alternative financial institutions, analyzes them, negotiations and selects the most rational loan provider. A contract is signed. The developer acquires a lot of land and, if necessary, changes its designation.
Design process	The developer searches alternative designers for the project and negotiates with them. A rational project planner/designer is selected and a contract is signed. The developer analyzes projects of alternative structures and selects the most suitable one. The design process occurs. A construction permit is acquired.
Construction process	The developer performs a search for alternative contractors, analyzes conditions and negotiates. A rational contractor is selected, and a contract is signed. The construction is executed and its technical maintenance ensured. When necessary, the developer approves changes recommended by market research experts and the development team, resolves disagreements regarding the construction, signs invoices and oversees construction work to assure work progress on schedule and according to the established budget.
Object deliverance for exploitation stage	The object is delivered for exploitation.
Real estate portfolio and building management stage	The owner (developer or latest owner) assures effective real estate management (including subleasing) in order to extend the rational economic life cycle of the building and assure good conditions for living and working. Rational management of the real estate portfolio ensures highest economic returns on investment. Moreover, efficient maintenance (e.g. repair, renovation) is necessary to ensure high performance of the buildings for long time.

A developer must reflect on all the remaining stages of the development process at every stage. In other words, a developer must make ongoing decisions knowing well what such a decision means over the entire structure of the life-cycle, not only the closest stage (Kaklauskas, Zavadskas, Bardauskienė, & Dargis, 2015). This way developer assures that the development plan and its physical implementation will become rational and adaptable under the conditions of construction and real estate market instability. Moreover, to ensure sustainable real estate development as a whole, appropriate decisions must be made at macro-, meso- and micro- levels to ensure smooth development process during the period of crisis.

Rational decisions during period of crisis should be based on extensive analysis of the available data, best practices, know-how, etc. For this purpose it is recommended to create database, model base and knowledge base. Data base includes external and internal data on real estate market conditions at macro-, meso- and micro- levels. Model base encompasses quantitative, economic, legal, political, cultural assessment models for decision-making. Knowledge base includes already collected knowledge on legal, political, organizational, management, previous recommendations and other issues.

Basing on the available data, the model provides decision support to stakeholders by following steps:

1. Identification of the global development trends (general regularities);
2. Identification of the crisis management practices in the developed countries;
3. Analysis of the situation in construction and real estate market of Lithuania;
4. Development of recommendations how to ensure sustainable real estate development at macro-, meso- and micro- levels.

3. Application of the model

3.1. Identification of the global trends

It is important to discuss global trends more broadly and employ them in formulating crisis management strategies and tactics in the recommendations provided for Lithuania's policy-makers and social partners.

Loosemore (2000) identified three types of crisis in a construction project management context. Creeping crises are generally systemic – they are often something that should have been anticipated and seen as inevitable at some time or other. A sudden crisis is one that occurs seemingly from nowhere and often appears overwhelming. A third type of crisis is a periodic crisis such as the impact of business cycles, economic cycles and other changes that ebb and flow in a predictable way but where the timing is not easy to accurately predict. The first type of crises is more caused by managerial crisis, the second – the quality of construction works, disasters or similar. In this publication authors mostly concentrate on the third type of the crisis.

The literature offers various early warning models that try to identify leading indicators preceding various costly events, such as currency, banking, and debt crises (Babecký, Havránek, Matějů, Rusnák, Šmídková, & Vašíček, 2012). Authors of the review analyzed many different models, reduced list of variables and presented their own model which consists of 30 early crisis indicators (i.e. BAA corporate bond spread, Gross total fixed capital formation (constant prices), Commodity prices, Current account (%GDP), etc.). Real estate developers have to analyze the global trends for early warnings of the crisis. Several world trends are presented below.

The closed circle tendency:
– As expenses from the national budget are lowered, the incomes of the residents also decrease. People tend to save more. This prompts the economy to shrink, and the national budget incomes decrease even more.
– Countries that do not curtail a growth in unemployment in time find themselves in a closed circle: it becomes necessary to pay out increasing sums for unemployment benefits to the jobless. Meanwhile, to have the necessary funds for this, it becomes necessary to raise taxes or borrow. Furthermore the person who is unemployed more than a half year loses many job skills and it becomes more difficult for such a person to find a job. It is extremely difficult to break out of this kind of closed circle and the clutches of unemployment. This may require as much as three to six years (Katkus, 2010).
– Higher taxes push businesses into the shadow economy. In light of a shadow economy of such a scope, a closed circle forms of uncollected income for the national budget.
– Various changes in economic, social and financial processes (bankruptcies, unemployment, increasing bad bank loans, decreasing salaries and real estate prices and a downfall of various expectations) occur rather suddenly during the period of crisis. These changes are interrelated and they strengthen on another.
– Frequently a spiral process of the closed circle occurs in the life of a country. For example, real estate prices and consumer expectations rose rapidly due to the inexpensive loans during the time of a rising economy. The increasing value of real estate on the market formed conditions for the country's residents and organizations to receive additional loans, which were often used to invest in real estate again.

Economic and financial trends:
– Construction indicators that are traditionally used for various reasons do not give a realistic picture of the situation in construction, its effectiveness and the quality of the work performed therein.
– Minimal debt is a very important safeguard and guarantee that the country's economy will be resistant to any sorts of crises.
– Lately countries have begun using the weakening of a currency as a means to cheapen export products in the world.
– It will only be possible to discuss the realistic effectiveness of crisis management, once the injections of financial incentives into the country's economy are terminated.
– The economy of the United States faced a low interest rate due to the huge inflows of capital from abroad, especially from Asian countries and due to the Federal Reserve's execution of interest rate policy that was not strict. The Asian countries, which had learned their lesson from the 1990 Asian crisis, wanted to artificially uphold currency rates at the export level and safeguard from the devaluation of their own currencies against the United States dollar. Thus they actively began to purchase stocks and bonds from the United States. The banking system was substantially reorganized. New guarantees increased large inflows of the capital from foreign countries (Brunnermeier, 2008). The situation in Lithuania was very similar. Scandinavian banks offered favorable conditions for construction loans. The situation in Lithuania shows that pegging the national currency to the Euro caused a marked growth in the demand for real estate and loans due to the low interest rates. On its own accord, this influenced an even more rapid growth of the bubble in real estate prices.
– Reinhart and Rogoff (2008) studied a longer period of history and revealed an astonishing quantitative and qualitative analogy with the banking crises that had occurred earlier, during post-war years, among industrial countries. The growth of margins and housing prices in the United States (which literature defines as the strongest and most essential indicator of a financial crisis and which is characteristic to countries that faced huge capital inflows) correlates with earlier crises quite accurately.
– The expansions of real estate bubbles were similar in various countries. The increasing number of individual home ownership surpassed the natural size of the market. Most of the society had expectations that housing prices will increase forever. These factors also had a negative impact during the period of crisis: the increased mistrust caused a drop in the num-

ber of people who wanted to keep their savings in a bank. The lower rate of financing by banks reduced opportunities to obtain a loan/credit for purchasing a home and developing a business. The decreased investments encouraged slower growth in the future (Renaud, 1997).

Qualitative trends:

– Differences in economic results can be explained by the different cultural, social and political environments, the mentality of the residents and their traditions and religions.
– People wishing to be more respected and recognized attempt to become successful investors and businesspeople even when they may not have knowledge, capabilities or funds to accomplish such. This also encourages real estate bubble.
– The correlation between average salary and unemployment allowances also determines the scope of unemployment.
– Academic economists consistently defend the view that monetary policy means are unable to do much to resist bubbles. If the predominate expectations in the market are that some certain property will sharply increase in price, even an official, significant increase in interest rates might not affect the bubble. However, such an effort could negatively affect some sector in the economy irrelevant to the bubble. Financial markets are inclined towards bubbles, all on their own accord (Kuodis, 2008).
– The mortality rate of people relates strongly with economic crises – the mortality rate in Lithuania fell stably from the announcement of independence until 2000; after the Russian crisis, it increased again.
– 66% of organizations that had been under threat of bankruptcy survived for more than a decade more, because they changed and learned (Montuori, 2000).
– How real estate buyers and sellers will behave during a crisis depends on various psychological factors.

Quantitative assessment at the beginning of a crisis

Various scholars around the world attempt to determine a quantitative limit, drawing the line where an economic, social or other sort of crisis could begin. Several examples of such quantitative assessments are provided below:

– In the opinion of Nouriel Roubini, a professor of economics in the United States, it was not at all the bank failures that set off the financial crisis but rather the price increase of up to 145 USD per barrel of crude oil. An optimal price for crude oil fluctuates between 75–80 USD per barrel. The price limit of danger is at around 100 USD per barrel. Prices above that can cause damages (Janužytė, 2010).
– Moody analysts also have no doubts that a rising price for crude oil is the sign of a new economic crisis. They remind that a crisis would hit world markets as soon as the United States would begin spending more than 4% GDP annually for crude oil products (Janužytė, 2010).

– The countries most troubled by joblessness face a huge threat of protests and unrest. It is difficult to set the limit at which the public begins to protest. However, such a probability greatly increases, when the unemployment rate surpasses 9% (Katkus, 2010);
– Indicators of the crisis in the construction sector are as follows: decreased number of building permits, reduced volume of works, reduced productivity, low investments in new buildings, limited mortgages, low consumer confidence and interest in real estate, bankruptcies of the construction enterprises, increased number of unemployed workers in construction, etc. These trends are followed by the stagnation of construction sector or the increased debt of the construction sector. It indicates that continual monitoring of quantitative indicators at global and national levels is vitally important to predict the early beginning of the crisis.

3.2. Crisis management measures in the EU countries

Analysis of successful experiences of the EU countries in crisis management is important for development of the recommendations for Lithuania. Some of the examples are provided below.

As explained by Detemmerman (2009), the recovery plan of the European Communities encompassed following measures:

– Increased support for management of climate change and energy saving, investments for infrastructure development;
– Allocation of €5 billion to the broadband and energy infrastructure developments;
– Investment of €500 million to the TEN-T projects;
– Increased yearly EIB interventions by €15 billion;
– €1 billion worth initiative on European energy-efficient buildings;
– Reduction of VAT on housing, green products and services.

Initiatives of the other European leading countries are presented as follows (cited from Detemmerman, 2009; Kaklauskas et al., 2011):

– Germany has developed two recovery plans. The first recovery plan (Nov 2008) (€31 billion), encompassed some measures for construction sector, however, it was considered as insufficient. The second recovery plan (Jan 13, 2009) included spending between €17–€18 billion (out of €50 billion) on renovation of federal, regional and local infrastructures (roads, rails, public buildings). Consequently, creation and maintenance of 200,000 jobs was expected.
– Spain provided €8 billion to local authorities for new public projects. The objective was to create 200,000 workplaces in the construction sector.
– France allocated €10.5 billion to build 100,000 social housing units as well as to extend zero-rate credit for the first-time acquisition of a dwelling, etc.

– Netherlands supported €6 billion to economic revitalization, reduced VAT for construction sector from 21% to 6%, encouraged thermal insulation and refurbishment of public buildings; allocated €400 million to renovation of older districts and public areas, also collected statistics on unemployed construction workers in order to retain them after the crisis.

– In general, all of the EU countries included measures for revival of construction and real estate sector in their crisis recovery plans.

3.3. Experience of the crisis in Lithuania and current trends

Development of construction as well as real estate market directly depends on economic situation in the country. If economy is growing (employment and incomes of households increase, credit conditions are favourable, expectations are optimistic, etc.) the volume of construction increases and, oppositely, during the economic crises decline of construction and real estate market is extremely high.

The enlargement of the EU has influenced development of economy and the housing market in the Baltic States. Notably, in the period of 2004–2008 Lithuania as well as the other Baltic States enjoyed very strong economic growth. Countries were significantly influenced by favorable lending and expansion of private sector credit. Hence, the Baltic States experienced the period of the most dramatic boom in real estate prices globally over the last decade, which was followed by economic downturn, and consequently, the burst of prices bubble. All three countries experienced deep recession by 2009.

The crisis in the building sector hit all EU-28 countries albeit to a different extent. All countries experienced a decline in building production ranging from an extreme reduction of –54.5% in Lithuania in 2009 (Figure 3) to almost stable activity levels in Germany and Austria. In several countries (e.g. Estonia, Ireland, Spain, Latvia, and Portugal) growth rates had already begun to move considerably downwards before 2009 while in several other countries the drop in building activities happened in a more sudden way and was shorter (Eurostat, 2016).

After period of stagnation, construction activity in Lithuania started to show real improvements in 2015 and in 2016, all indicators point that it is back to its pre-crisis levels. In 2016 the number of dwellings for which building permits were granted surged 22.3% y-o-y to 16,765 units in 2016, based on figures from Statistics Lithuania. Dwelling completions increased by 24.8% to 12,703 units in 2016, the highest level ever.

Rapid development of real estate market was strongly influenced by economic growth and positive expectations. In 2016, the economy expanded by 2.2%, amid strong household consumption. The economy is expected to expand by a modest 2.9% in 2017 and by another 2.8% in 2018, according to forecasts of the European Commission. Nationwide unemployment increased slightly to 8.3% in February 2017, from 8% in the same period last year, according to Eurostat. Inflation accelerated to 3.2% in February 2017, up from just 0.7% in 2016 and a deflation of 0.7% in 2015, according to Eurostat.

The new housing loans in February 2017 amounted to €88.7 million, up by 10% from €80.6 million the previous year. Average interest rates for outstanding housing loans fell to 1.64% in February 2017, from 1.73% a year ago.

Investment in residential real estate in Lithuania last year (2016) bounced back to levels last seen in 2007, the year before the financial crisis set in, bursting what was then seen as a real estate bubble. According to some economists, there are signs that new bubble is brewing in Lithuania's real estate market, especially in capital Vilnius. Thus rational decisions in real estate market becoming extremely important.

3.4. Recommendations to stakeholders

Successful construction and real estate crisis management strategies must be developed taking into consideration economic, social, demographical, political, technological, environmental, psychological and other indicators of the country. However, it is not possible to transfer even the best crisis management strategy, no matter how well it was applied in another country. Thus such a strategy for Lithuania must be modeled upon assessing its individual situation.
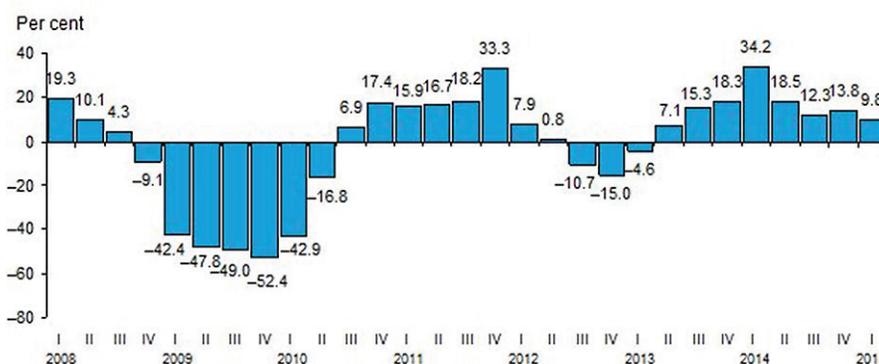

Figure 3. Changes in the volume of construction work carried out within the country, %, against the respective period of the previous year (Statistics Lithuania, 2015)

According to proposed model, the research of the expertise of advanced economies was performed. The expertise was adapted to Lithuania while taking into account its specific economic conditions, history, construction and real estate development trends. Basing on these findings, accumulated know-how, the results of previous scientific studies and practical insights of the other authors, published in monographs (see e.g. Kaklauskas et al., 2015; Kaklauskas, 2016; Tupėnaitė, Naimavičienė, Bagdonavičius, & Sabaliauskas, 2015), specific recommendations to avoid crisis and minimize its consequences in macro-, meso- and micro- levels were provided. Recommendations illustrate holistic point of view and assumption that real estate development consists of creativity, research and art. This point of view has to be used in all stages of real estate development cycle (see Table 1).

Macro level recommendations (for public institutions)

- Laws on the issuance of EU loans minimizing the financial risk of irresponsible actions by customers who do not have sufficient financial knowledge and experience must be drawn and implemented.
- Borrowing from the International Monetary Fund (IMF) must be understood as the final straw to grasp, only when the state is no longer able to receive loans from any other source.
- A model of conservative banking operations should be introduced to diminish the impact of crisis.
- Procedures for receiving EU funding must be simplified and accelerated.
- Construction depends directly from lower inflation rates and interest rates. However, if number of construction units is satisfied according to population existing needs, it is normal a decrease interest in them. The construction must be controlled in a demand and market supply share. Likewise, the agreement of a planned policy of incentives to refurbishment or retrofitting buildings during the crisis period should not be dismissed, but pondered.
- The economic aspects of the multi-unit housing renovation program must be reconsidered. Current financial support model not sufficiently motivates residents to implement multi-unit housing renovations on a massive scale. Massive renovation would support construction sector, which suffered the most from the crisis.
- A lower VAT rate should be applied for residential housing construction.
- Automatic stabilization measures, which would automatically increase state expenditures for social welfare area as the economy weakens and decrease taxes, should be foreseen.
- To reduce the formation of new bubble and encourage efficient use of real estate, rational real estate tax shall be introduced.
- It is essential to form conditions limiting the possibility for interested groups to inflate a bubble artificially.

For example, governmental authorities relished the increasing income received from VAT due to the increase in real estate demand. This greatly improved economic indicators, and filled up the national budget for the country. Favorable conditions were also formed for other interested groups for inflating the real estate bubble. Bank administrators received sizeable premiums. Meanwhile, as buyers kept receiving ever greater salaries, they too optimistically judged their financial perspectives and took loans for housing.

- The economy must become more rational. During the crisis certain businesses bankrupted, however certain production resources became newly segmented.
- An analysis of demand for construction products and services in markets that have not fallen as hard or in markets being stimulated by the state should be more actively undertaken.
- Implementing European public policy standards is recommendable.
- Legal conditions must be formed to enact an acceleration of public procurement in order to accelerate the implementation of construction projects, corruption must be reduced.
- Projects under implementation must be completed. It is essential to support the development of infrastructure with priority to projects that already have allocated funding or that have already been started.
- It is necessary to assure continual political stability in Lithuania. Political instability negatively affects economy of Lithuania, investors need political clarity.
- The business environment requires improvement. There is the endeavor to reduce the regulatory burden on businesses to 30%. There are plans to reduce the spectrum of activities requiring licensing, eliminate and merge institutions regulating businesses with overlapping functions, ease the procedures for business start-ups and closures and implement abilities for companies to register electronically.
- According to trends, investment in sustainable buildings and with greatest benefits for sustainability such as green building and passive house certifications, natural materials uses, reduced energy and water consumption, reduced maintenance costs, reduced Life Cycle Costs during life cycle, must be advisable also in crisis period. The recommendation could be the building certification by a sustainability assessment method, such as LEED, BREAM, or others. However, normally, this type of construction could be more expensive and they are more directed for families with some economic resources. On the other hand, in crisis situation the families with lower resources do not invest in construction. So, it is a contribution to support a specific issue in the construction sector, view in other point of view.
- An analysis of ethics in the economy or finance does not necessarily mean the discussion about breaking

laws. The sharp decline of Wall Street and the billions of dollars losses it suffered during the crisis period will not necessarily prompt accusations or law suits against its leaders. All decisions were made in consideration of the laws in effect at the time. However, their decisions bypassed standards of ethics. Ethics are usually linked to judgments and decisions passed that are not particularly moral (Longstaff, 2008). Therefore an ethical perspective is becoming more and more meaningful when resolving effective, transparent and secure issues regarding market development.

– Performance of crisis management should involve greater consideration of Lithuania's national traditions.

– Education of interested groups needs to be more actively undertaken. Interested groups affected by the crisis must know the history of how the crisis occurred, its consequences and the methods that could be applied to find a more rapid outcome of the situation.

– The 2010 Nobel Prize Winner in Economics P. Diamond in Paris offered to merge the labor exchange and employment agencies into one organization. In this way more people finding jobs rather than scattering their efforts around from one office to the other. A person simply approaches one window and registers as unemployed thereby becoming a candidate for all job openings at once. This greatly simplifies the procedures of job search (Janužytė, 2010).

– Since consumers' behavior change in the period of crisis, businesses have to newly position their products and services according to the new (usually negative) emotional reactions. For example, a company that sales construction technology and machinery may strengthen its leasing segment. When a recession is deep and lasts a considerable time (as the latter), consumers experience structural changes in their values, which could change for a lengthy period. The companies that are capable of quicker reactions to the process of changing values among consumers come out of the crisis as winners.

– It is recommended to include psychological elements (expectations, waves of optimism and pessimism, periods of overall surges of energy or disillusionment, etc.) into the models of the construction and real estate sector fluctuations and to analyze their impact.

– It is recommended to analyze the economics of happiness when deliberating the crisis. Happiness, positive and negative influences, well-being, quality of life, satisfaction with life and an entity of interrelated elements define the economy of happiness.

Meso level recommendations (for enterprises)

– Real estate development must be considered as an iterative process. All the development stages must be adjusted to the market conditions and their forecasts.

– Original, creative, ground breaking solutions shall be implemented during period of crisis.

– The moral aspects of operations in the construction and real estate sector have been systematically ignored for a very long time. That makes it necessary to apply standards of ethics in decision-making as broadly as possible. An ethical viewpoint should be strengthened.

– Efforts must be made to adapt the organizational culture (organizational values, beliefs and customs) to the demands the crisis raises as quickly as capabilities permit.

– Organizations need to have a sense of great social responsibility regarding their employees.

– Efforts must be made to shorten the time of unemployment by investing in new jobs, applying part-time work schedules and other similar tactics. The longer a potential employee is out of work, the more skills he loses. Moreover, psychological stress of being unemployed negatively affects his/her relations with family and relatives.

Micro level recommendations (for individuals)

– The greatest affliction most Lithuanians suffered was placing all their hopes on material well-being alone. An irresponsible media contributed to generating such illusions as a purpose, consistently bringing up materialistic goods. There is only one conclusion: as one worries about material goods, one must be more concerned about one's spiritual health (Argustas, 2010).

– People buying their houses on the basis of a widely disseminated presumption that a huge house is the key to happiness. Often these houses are beyond their financial capacities. This kind of thinking brought many people, as well as some large banks, to the financial disaster. It is this erroneous albeit widely disseminated banal idea that a person can feel happy by acquiring some new thing has led people, as well as entire states, to bankruptcy. Far too rarely people attempt to learn what could actually assure long-term satisfaction and well-being. While the sustainability is associated with the assessment of the attributes of buildings, it actually means to ensure the long-term well-being of people (Conte & Monno, 2012). Thereby it is necessary to essentially change own values and cultural assumptions. First of all, people need to attempt to get to know their selves better. Only then they will be able to assure a more qualitative, moral and cultural content in today's public sphere (Johnson, 2009).

– It is much more difficult to find a job during a period of crisis with a narrow professional or vocational specialty, consequently adoption to the changing conditions in professional sphere is needed.

– It is necessary to pay greater attention to means for reduction of emotional stress, psychological tension and panic during a crisis. Efforts must be made to

avoid acute and chronic stress. It is recommended to interact more with closely related and happy persons, live actively and watch less television since it causes various stresses.

Conclusions

Many models and methods for the analysis of the real estate development and their components have been developed worldwide and discussed in this study. Analysis revealed that currently real estate development is not merely an activity involving investments or engineering but it is also a creative, scientific and artistic effort under the influence of the external environment. Successful construction and real estate crisis management strategies must be developed taking into consideration economic, social, demographic, political, technological, environmental, psychological and other factors of the country.

The developer must maintain a strategy at nearly all development stages for different reasons (e.g., in the case of crisis). Upgrading of the strategy should also be accomplished on the basis of the major stages of the real estate development process, from the initial project idea, construction, till the exploitation of the buildings, their maintenance and demolition. Furthermore, to ensure sustainable real estate development as a whole, appropriate decisions must be made at macro-, meso- and micro- levels to ensure smooth development process during the period of crisis.

Decision support model, proposed by the authors, includes extensive analysis of global trends, best crisis management practices, factual situation and provision of recommendations for different stakeholders at macro-, meso- and micro- levels under conditions of market instability. The model was applied for the case of Lithuania. Authors believe that provided recommendations might be useful for other transitional economies as Lithuania is.

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