SPECIAL EDITORIAL

Kaklauskas, A., Zavadskas, E.K., Bagdonavicius, A., Kelpsiene, L., Bardauskiene, D., Kutut, V. (2010), "Conceptual Modelling of Construction and Real Estate Crisis with Emphasis on Comparative Qualitative Aspects Description", *Transformations in Business & Economics*, Vol. 9, No 1(19), pp.42-61.

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BUSINESS & ECONOMICS

CONCEPTUAL MODELLING OF CONSTRUCTION AND REAL ESTATE CRISIS WITH EMPHASIS ON COMPARATIVE QUALITATIVE ASPECTS DESCRIPTION

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Received: January, 2009
1st Revision: May, 2009
2nd Revision: October, 2009
Accepted: March, 2010

ABSTRACT**. **Research shows that the material welfare and living standards of people have increased in the last decades, yet joie de vivre has not. Research also determines that friends, family, community, the purport of life, and long term goals, which are associated with values and lead to achievement of these values, make inhabitants of the Old Continent happier. The traditional analysis of construction and real estate crisis management is based on economic, legal, institutional, and political aspects. Social, cultural, ethical, psychological, religious, demographic, state of mind, educational and other aspects of crisis management receive less attention. Insufficiently analysed is also the impact of economic crisis on aggravation of social, cultural, ethical, psychological, demographic, state of mind, and other problems of society, which, in their turn, make negative impact on the economic crisis. These problems of society are, however, equally important as the economic crisis. In order to make integrated analysis of the lifecycle of construction and real estate crisis management, such cycle must be analysed as a complex using a thorough system of criteria. The authors have developed the Model for Construction and Real Estate Crisis Management, which includes six stages. Since the research analyses a huge branch of construction and real estate, the article will obviously not be able to cover all the research results. Therefore, the model is illustrated by describing its first stage.

KEYWORDS: construction, real estate, sustainable crisis management, global development trends, alternatives, conceptual modelling, Lithuania.

JEL classification: D20, D21, D43, P2.

1. Introduction: Aspects of the Construction and Real Estate Crisis Management

In their attempts to mitigate the construction and real estate crisis, various countries often chose different strategies and tactics. It is not surprising with economic, market, legal, institutional, technological, technical, cultural, psychological, ethical, and other differences between countries. Furthermore, not all countries understand sustainable construction and real estate crisis management in the same way. Human behaviour is determined by their values, emotions, experience, micro environment and macro environment, as well as other factors; thus the behaviour is not always rational.

Traditional analysis of construction and real estate crisis is based on economic, legal/regulatory, institutional, and political aspects. For instance, Lu and So (2005) state that the sudden collapse of the Asian economies in the 1997 financial crisis has been the subject of many studies, but most studies focus on economic fundamentals. Scientists and professionals are also not sure if the aggregated measures of demand stimulation employed by the US President, Franklin Roosevelt, and intended to handle the Great Depression were efficient. They claim it was war that helped to defeat the depression. Social, cultural, ethical, psychological, religious, demographic, state of mind and educational aspects of crisis management receive less attention. In order to make an integrated analysis of the lifecycle of construction and real estate crisis, such cycle must be analysed as a complex using a thorough system of criteria (see *Figure 1*).

Several criteria of construction and real estate crisis management specified in *Figure 1* are briefly analysed as an example below.

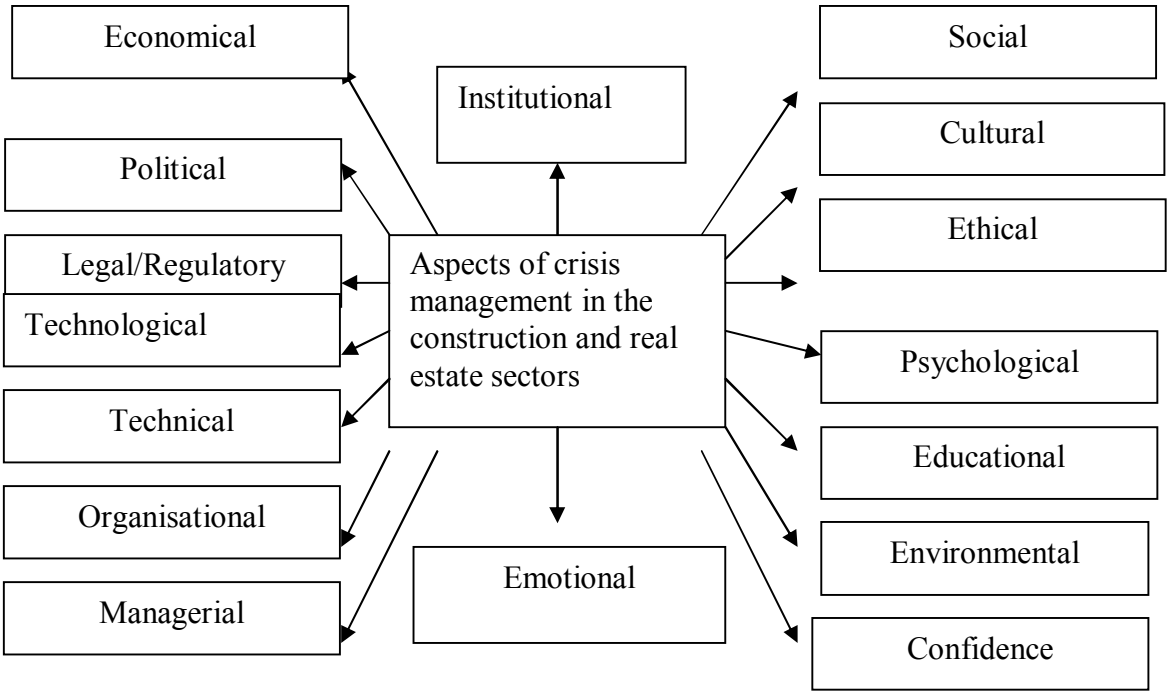


Figure 1. **Aspects of crisis management in construction and real estate sectors**

Fluctuations of product sales, which balance at the level of 20 per cent, are customary in some areas of the construction industry (Yisa *et al.,* 1996). It has been observed that the characteristic cycles of boom and recession related to the development of the construction industry repeat themselves approximately every ten years (Yisa *et al*., 1996). The construction companies which take such cycles for granted and consider them part of reality, manage to prepare for future recessions in the times of boom. Such companies often employ long-term management strategies, which help to survive recession more easily (Lovelock, 1997; Sheridan, 1997).

"Chowdhry and Goyal (2000) provide evidence for the argument that the crisis reflected institutional inefficiencies within Asian economies. As the real estate market is closely tied to the financial stability of any economy, it is hoped that these Asian experiences can shed light on how the real estate lending process could be perfected to help mature the real estate market" (Lu and So, 2005).

"Quigley (2001) argues that the Asian crisis can partly be attributed to the combination of outmoded banking practices and an immature real estate market" (Lu and So, 2005).

Interest margins in Western Europe balance at the level of 1 per cent, while Lithuania is borrowing at an interest rate exceeding 10 per cent. In other words, the worse is your situation, the less willing are others to help you (Chomentauskas, 2009).

When the demand exceeds the supply, the prices go up until they reach the maximum affordability level of buyers. The economic component of demand is the amount of money available to a potential buyer. However, there are also psychological factors. The demand fluctuations caused by the psychological component of demand may be bigger than those caused by the economic component. The psychological value also consists of two parts: item's utility related to satisfaction of buyer's important needs and buyer's future

expectations. Social needs motivate us to be different and to seek prestige. These are the precise reasons why people want to have a huge house and not just any dwelling. The other part of the psychological value is future expectations. If people think their ability to get the things which satisfy their needs will increase in the future, such expectations do not attribute any additional value to purchased things. However, if people foresee difficulties to buy things in the future, the psychological value of such things increases considerably and inflates the price that people are ready to pay. If attempts to shape such expectations among sufficient number of people are successful, the resulting demand exceeds the economic demand. Such psychological factors played an important role in the swelling economy (Legkauskas, 2009).

The European construction market is far from homogenous. The current situation and prospects of each member state depend on its initial state (the needs, the demographic trends, the economic fundamentals, etc.), on the fact whether real estate market corrections occurred recently, on the specific exposure of the national economy to the financial and economic crisis, and finally as to which extend recovery measures will succeed and successfully operate in the construction sector (Detemmerman, 2009).

The behaviour of buyers and sellers of real estate during the crisis depends on different psychological factors. According to Simonson (2008) financial problems are almost always followed by emotional stress and can lead to more complicated psychological effects.

Some think that the rapid price growth is caused not by economic but by psychological reasons-buyers who hunt for housing hysterically and the stakeholder groups which maintain such frenzy artificially through the influx of distorted information into the market. The situation is hardly improved by the slow decision-making process which would help to alleviate the work of real estate developers. For example, the delay to amend the procedure for detailed plan preparation and land purpose changing.

Laws are most often intended to make human behaviour and organisational activities more rational in the current economic and political situation. The studies of *Eurobarometer* show that the deepening crisis makes numerous Lithuanian residents see the future in dark colours; it stimulates decreasing consumption and this, in turn, contributes to aggravating crisis. Thus the legislative process should consider the psychological effect of laws on activities of people and organisations. The "Napoleon's Pay" was often used in the past to reduce the psychological stress in society, when unemployed used to dig ditches and refill them later thus granting them employment and salaries.

"Emotion not only helped lead America into the current economic crisis but may also be helping to keep it there. At a recent conference called "Crisis of Confidence: The Recession and the Economy of Fear" an interdisciplinary panel explored the psychology behind today's economy" (Knowledge@Wharton, 2009).

It seems one of the main shortcomings of the credit-economy is that the credit-economy eventually wipes the boundary between work and business, and pushes regular people into entrepreneurship. Businessmen take the risk because they have specific knowledge of economics, management, finance and other areas, which helps them to control the risk. In the credit-economy, a regular investor who lacks the necessary specific knowledge cannot choose but take part in the pyramid. Formation of the pyramid starts at the moment when investors start investing because other persons invest and enjoy earnings in this area. Such pyramid is exceptionally a psychological phenomenon. The more people are involved and earn money, the more new people join. The end is always the same: those who are the first to enter the pyramid and withdraw in time enjoy good earnings; the bulk of investors,

however, lose their money. The pyramid is a psychological and not a criminal phenomenon (Legkauskas 2009).

When the shares started going down, we have seen the waves of people's fear soon rippling over the world. Between April 2008 and January 2009, the EU Consumer Confidence Index dropped down by 17 points, and the Lithuanian Consumer Confidence Index dropped down by as many as 44 points. As in a vicious circle, the decreased confidence led to reduced consumption, which aggravated the crisis, etc. (Chomentauskas, 2009)

In business relations, the general economic crisis brought about increasing distrust of other market members. A year ago, the CEO of a construction company could make a verbal agreement on the scope of work with a client, and preparation of documentation would start, as well as orders would be placed for materials. Today, however, even contracting parties that know each other well do not take any actions unless the contract is signed.

Expectations and spirits of people considerably contribute to crisis management. When mass media devotes a lot of time to the horrid aspects of crisis, it indirectly motivates people to save for a rainy day. The result is a paradox, because the consumption decreases blowing up the crisis. Thus of late a trend is observed when the leaders of the largest developed countries sometimes even demonstrate exaggerated optimism. The crisis becomes a type of disease that oneself can talk into. It is known for some time that if, for instance, physicians look serious when talking to their patients about administration of a very effective medicine which should cure the patients but inject pure water instead, amazingly a number of patients would recover. Say, the trends of industrial manufacturing in Lithuania are similar (on last quarter basis) to those in Germany and France; however, some politicians and mass media claim that European industry is already recovering while Lithuanian is not. In this case, Lithuanian indicators were compared on year-over-year basis, and these indicators were considerably worse than the last quarter. It can be claimed that, to a fair extent, crisis is also a psychological problem.

The papal encyclical "*Spe Salvi*" was announced right at the time of the first signs of the global economic recession. This document encourages keeping hope even in the most difficult situations of life. The new 7th encyclical of Benedict XVI "*Caritas in Veritate*", which addresses social and economic issues, is not only the internal affair of the Church, it appeals to the entire society, to business companies, and to officials who are in charge of complex economic and political processes; therefore, the idea expressed through the title-love without truth becomes sentimentality and truth without love appears too cruel-is expected to be realised in the attempts to overcome this crisis. Creation of welfare must include all aspects of a human being, including their dignity, as well as cultural, spiritual, and religious dimensions, instead of confining strictly to satisfaction of physiological needs. Having selected "Caritas in Veritate" as the title of his encyclical, the Pope also desires to see the manifestations of mutual respect and love in economic relations, which are already close to losing all human aspects. Without activities based on solidarity and mutual trust, the market even fails to perform its functions. Progress cannot be assessed only by technological achievements of an economy; the real progress also includes such value elements as love and truth (Leka and Jurevicius, 2009).

Human death-rate is closely related to economic crises: the death-rate, which was decreasing stably between the restoration of independence and the year 2000, turned around and increased after the Russian crisis.

Scientists forecast that increasing unemployment will lead to an outbreak of mental diseases and suicides. Scientists of Oxford University are certain that the economic crisis may take thousands of human lives in Europe alone. British experts warn that heart attacks and suicides must be feared most, because these fatalities, just like during previous crises, will be prompted by mental problems of people due to the loss of jobs or income. In their forecasts on the number of lives taken by the economic crisis, scientists compared the most common death reasons and the unemployment rates in Europe between 1970 and 2007. The results show that a one-percent increase of unemployment raises the risk of suicide among people younger than 65 by about 0.8 per cent. This means up to 550 more suicides at the EU level. These authors limited their research only to the analysis of crisis outcomes which affect human death-rates; however, they did not analyse the effect of recession on diseases or the quality of life (Ekonominė krizė, 2009).

Lithuanian people start to value permanent jobs more than better-paid jobs. Safety makes a bigger impact on the quality of life than material welfare.

In times of a crisis, corporate culture affects organisational efficiency. According to Montana and Charnov (2008), the values of a corporate culture influence the ethical standards within a corporation, as well as managerial behaviour. New employees, who join the organisation, might modify corporate culture. For example, the arrival of a new Project Manager (with specific expertise and behaviours necessary for solution of crisis-related construction issues) to the workplace might affect the culture of the organization as a whole.

Underground aspects of countries are increasingly discussed: the underground economy, the underground governments, etc. Many policy-makers worldwide lately hint to the fact that large corporations and banks in smaller countries increasingly take up the role of an underground government. Such trends are lately observed in the banking sector. Therefore, Germany and France seek to regulate the banking sector. Large corporations simultaneously finance the main political parties, which, upon their election, try to pass laws in favour of their sponsors.

Numerous economists proved the direct relation between increasing taxes and growing underground economy. Lithuania is not an exception. The considerable increase of taxes at the beginning of 2009 has led to growth of the underground economy. For example, the amount of payments in cash, which is the most popular payment method in Lithuanian underground economy, decreased by one quarter less than GDP in 2009. Analogically, wholesale consumption of electricity decreased by only about 7 per cent on year-over-year basis. The official GDP, however, decreased several times more in the same period.

Countries of Western Europe also contribute to increasing unemployment in Eastern and Central Europe. Thousands of organisations in Western Europe fired millions of people since September 2008. Upon losing their means of subsistence, emigrants started returning home thus contributing to already high unemployment rates in Eastern and Central Europe.

The contemporary concept of public work is spreading worldwide; the concept states that employees may do public work within their qualifications. Lithuania is not an exception. The Law on Support for Employment, which defines the concept of public work in such way, has been passed this year.

We have a wonderful opportunity to cut the oversized bureaucratic bodies and to answer to the questions: What do we really want from the authorities and what do we authorize them to do? What rights were simply "privatised" by the authorities while we were not looking? Perhaps we should get rid of the excessive governmental functions, and the

problems of unbalanced budget will be gone? After all, with each step one makes, one encounters various regulations, certificates, and permits. Even if you want to cut down a dead tree which you once planted in your garden… (Chomentauskas, 2009)

When we talk about economic or financial ethics, we are not necessarily referring to violations of the law. The collapse of Wall Street will not necessarily involve the indictment and prosecution of any corporate executives. Ethics has a lot more to do with judgment and decision-making. Obviously ethics was sorely lacking considering our current economic crisis (Longstaff, 2008). In such context, ethical issues become more and more significant, for example, how theories of ethics may help markets work in an effective, fair, and ultimately secure manner.

Deepening crisis makes the construction and real estate business less moral. A deliberate bankruptcy is one of the examples. Some building companies publicly announce that due to crisis they are in serious difficulties and thus cannot pay to the banks, subcontractors, and suppliers; whereas they simultaneously transfer most part of their funds to a newly incorporated company. This problem is characteristic not only to Lithuania. The so-called Phoenix Syndrome is being battled throughout Europe. Let us take Ireland as an example (Phoenix syndrome, 2009).

"There has been a seven-fold increase in the number of cases where firms are suspected of collapsing with large tax debts but then resuming to trade under a different name – known as "phoenix syndrome". The Revenue Commissioners examine any suspected cases of this, as well as instances where the same person or people control a number of businesses which systematically build up tax debts before ceasing to trade. The suspected number of such cases being investigated has risen seven-fold over the past six years from less than 400 in 2001, to almost 2,800. Less than a quarter of the cases are proven, however. In those instances, the Revenue moves to have the business liquidated to recover the outstanding tax liability" (Phoenix syndrome, 2009).

The fact that one third of 500 successful companies listed in 1970 were not present in the equivalent list in 1983 proves that failure to adjust to changing conditions, indecision and flustering determine the collapse of an organisation. Just like active life increases the life expectancy, 66 per cent of organisations facing extinction survived more than a decade because they changed and learned (Montuori, 2000).

Nobel Prize 2009 have been awarded to Elinor Ostrom of Indiana University in the USA "for her analysis of economic governance, especially the commons" and to Oliver Williamson of the University of California, Berkeley, CA, USA "for his analysis of economic governance, especially the boundaries of the firm" (Nobel Prize 2009).

Ostrom identifies eight "design principles" of stable local common pool resource management (Ostrom 1990):

1. "Clearly defined boundaries (effective exclusion of external unentitled parties);
2. Rules regarding the appropriation and provision of common resources are adapted to local conditions;
3. Collective-choice arrangements allow most resource appropriators to participate in the decision-making process;
4. Effective monitoring by monitors who are part of or accountable to the appropriators;
5. There is a scale of graduated sanctions for resource appropriators who violate community rules;

6. Mechanisms of conflict resolution are cheap and of easy access;
7. The self-determination of the community is recognized by higher-level authorities;
8. In the case of larger common-pool resources: organization in the form of multiple layers of nested enterprises, with small local CPRs at the base level".

"Oliver Williamson has argued that markets and hierarchical organizations, such as firms, represent alternative governance structures, which differ in their approaches to resolving conflicts of interest. The drawback of markets is that they often entail haggling and disagreement. The drawback of firms is that authority, which mitigates contention, can be abused" (Academy of International Business, 2009). "Competitive markets work relatively well because buyers and sellers can turn to other trading partners in case of dissent. But when market competition is limited, firms are better suited for conflict resolution than markets. A key prediction of Williamson's theory, which has also been supported empirically, is therefore that the propensity of economic agents to conduct their transactions inside the boundaries of a firm increases along with the relationship-specific features of their assets" (National Science Foundation 2009).

In order to manage the risk better, Lithuania applies various mathematical models in practice. For example, the State Tax Inspectorate forecasts the future contributions of taxpayers on the basis of last year payments of companies. An analysis is performed monthly with emphasis on large companies. If the inspectorate fails to receive the forecasted amount, attempts are made to determine the reasons. Transactions between organisations are also analysed in order to prevent attempts to reduce profits and payable taxes through such transactions. Moreover, new exporters are analysed, because zero VAT is applicable to exported goods, while sometimes they are sold in marketplaces and are not accounted by cash registers.

Various stakeholder groups (the European Commission, international rating agencies, financial institutions) are sensitive about most macro-level actions of the Lithuanian Government. For example, they would not welcome reduction of taxes.

The crisis has also some positive aspects. For over a decade all Governments of Lithuania unsuccessfully tried to tackle the national current account deficit (imports considerably exceed exports); however, the crisis solved this problem naturally, without any administrative actions.

Successful strategies for sustainable construction and real estate crisis management should be more-or-less compatible with economic, political, legal/regulatory, technological, technical, organisational, managerial, institutional, social, cultural, ethical, psychological, educational, environmental, confidence and other situations in the country under consideration. A varied spectrum of strategies can be launched, while keeping in mind that the mix of influencing factors and the relative emphasis is on one or other of the factors and overall will depend on local conditions.

Therefore, the best sustainable construction and real estate crisis management strategy of another country cannot just be copied. Strategies may only be adapted into a real economic, social, political, legal/regulatory and provisional situation of a certain state. There is no such thing as a single sustainable construction and real estate crisis management strategy to suit all societies and/or one that could be applied to all countries (Kaklauskas, *et al*., 2009b).

This paper is structured as follows: Following this *Introduction, Section 2* describes a Model of the Construction and Real Estate Crisis management. Case study 1 (interrelation between companies working at a loss and their work quality) is sketched in *Section 3*. In

Section 4 the authors have provided a Case Study 2 (possibilities to use the database of real estate register and market in forecasting of the real estate market. impact of the lack of qualitative factors). Finally, some concluding remarks are provided in *Section 5*.

2. Conceptual Model of the Construction and Real Estate

Various methods and models (Werner, 1994; Bernanke and Gertler, 1999; Goh, 2005; Kala, 2008; Lu and So, 2005; Bond *et al.*, 2006; Nishiyama, 2006; Ocal *et al.*, 2006; Glascock and Kelly, 2007; Minsky, 2008; Pavlov and Wachter, 2009), e.g. time-series analysis using multiple regression, Box-Jenkins analysis, seasonality analysis methods; three-index model, time-varying parameter model behavioral macroeconomic portfolio model of international capital flows, post-Keynesian models, calibrated macro models, for crisis analysis, forecasting, simulation and management in the construction and real estate sectors and in separate segments thereof are today being applied worldwide. Multiple criteria decision making methods developed by authors have already been applied to a variety of problems in construction and real estate sector (Brauers *et al.*, 2008a, 2008b; Ginevičius *et al.*, 2008; Kaklauskas *et al.*, 2005, 2006, 2007; Kapliński, 2008a, 2008b, 2009; Lepkova *et al.*, 2008; Peldschus, 2008, 2009; Plebankiewicz, 2009; Šarka *et al.*, 2008; Thiel, 2008; Zavadskas *et al.*, 2004, 2008).

The Model for Construction and Real Estate Crisis Management suggested by the authors of this article includes six:

Stage 1. Comparative description of sustainable construction and real estate crisis management in developed countries and in Lithuania:

- A system of criteria characterizing the efficiency of crisis management was developed using relevant literature and expert methods;
- Based on the system of criteria, a description of the present state of crisis management in developed countries and in Lithuania is given in conceptual (textual, graphical, numerical, etc.) and quantitative forms.

Stage 2. A comparison and contrast of sustainable construction and real estate crisis management in developed countries and in Lithuania by:

- identifying global development trends (general regularities) of crisis management;
- identifying sustainable crisis management differences in developed countries and in Lithuania;
- determining pluses and minuses of these differences for Lithuania;
- determining the best practice for crisis management in Lithuania considering the actual conditions.
- estimating the differences between stakeholders' knowledge of worldwide best practice and their practice-in-use.

Stage 3. Development of some of the general recommendations as how to improve the efficiency levels for construction and real estate stakeholders and construction/real estate firms.

Stage 4. Particular recommendations for construction and real estate stakeholders and construction/real estate firms were presented at this stage. Each of the general recommendations proposed in the third stage includes several particular alternatives.

Stage 5. This stage includes multiple criteria analysis of components of the sustainable construction and real estate crisis management, and selection of the most efficient version of crisis management life cycle. The compatible and rational components of crisis management determined at this stage are joined into the comprehensive sustainable crisis management process.

Stage 6. This stage includes implementation of the most efficient crisis management solutions in practice, i.e. transformational learning and behavioural redesigning take place.

The above model has already been applied to the development of Lithuanian construction and real estate industries (Burinskiene and Rudzkiene, 2009; Ivanauskas *et al.*, 2008; Jakaitis *et al.*, 2009; Urbanavičienė *et al.*, 2009a, 2009b; Zavadskas and Burinskiene, 2007). Already the above model has been applied in different authors' and their colleagues papers (Banaitis and Banaitienė, 2007; Brauers *et al.*, 2007; Diskiene *et al.,* 2008; Girdzijauskas, 2008; Girdzijauskas *et al.*, 2009; Girdzijauskas and Streimikiene, 2009; Goh, 2005; Grundey, 2008; Kaklauskas *et al.*, 2009a, 2009b; Kavaliauskas, 2008; Melnikas, 2008; Mickaityte *et al.*, 2008; Turskis *et al.*, 2009; Liaudanskienė *et al.*, 2008; Zavadskas *et al.,* 2007; Zavadskas and Kaklauskas, 2007; Zavadskas and Kaklauskas, 2008) for Lithuanian construction and real estate industry development.

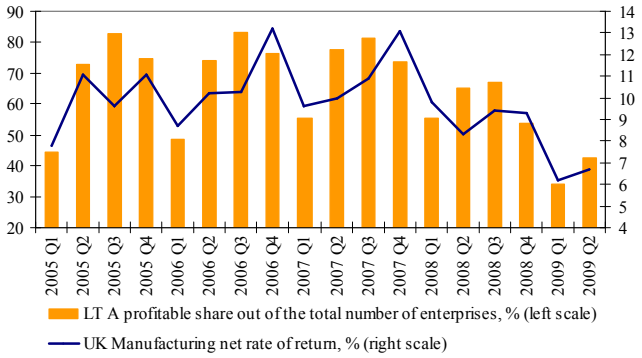
The conceptual model developed by authors covers analysis, modelling and forecasting of a vast construction and real estate sector. It is understandable that the article's scope is not enough to describe all the research results. Therefore, the model is illustrated by describing its first stage.

The first stage of the developed model is briefly illustrated in the first, third and forth parts of the current article. The aim is to demonstrate how the research model may be described using a system of quantitative and qualitative criteria based on a principle of branching tree. The first section of the article presents a first-level system of micro-, meso- and macro-level criteria fully describing management of crisis in the construction and real estate branch. Each of these factors may be examined further. For example, the subsequent part of the article briefly describes the interrelation between companies working at a loss and their work quality. All the above-mentioned factors vary through time, depending on other changes in micro, meso and macro environment. Their forecasting through time (taking analysis of real estate values and sales of residential premises as example) is presented in the forth part of the article. These case studies are described in the following sections.

3. Case Study 1: Interrelation between Companies Working at a Loss and their Work Quality

From numerous suggested criteria of crisis management, we shall take and briefly analyse the interrelation between companies working at a loss and their work quality as an example in this case study.

The blow out of the housing construction bubble caused other highly negative trends in the construction sector: the number of companies working at a loss (*Figure 2*) increased. During the boom, dozens of new construction firms were incorporated, which now try to survive in the construction sector although they lack both the qualification and the resources.



Source: Statistics Lithuania and the Office for National Statistics, 2009.

Figure 2. **Comparison of trends in profitable Lithuanian construction companies and of the UK manufacturing rate of return (Statistics Lithuania and the Office for National Statistics, 2009)**

As shown in *Figure 2*, the trends in profitable Lithuanian construction companies and of the UK manufacturing rate of return are similar.

Analysis of bids submitted for public procurement procedures reveals that the specified prices are often insufficient even to cover the direct expenditures. It is obvious that in such cases the cheapest materials would be bought irrespective of their quality, and the salaries planned for employees would be too small to demand performance of all necessary operations. Such bids show percentages of overhead costs and profits reduced to the absolute minimum. If the company bidding such price were to survive, it is clear that it would lack funds to renew its facilities and equipment, would lack funds for employee incentives, and would cut the number of jobs. The state suffers as well, because work at such prices means lack of money to pay taxes.

Currently, reconstruction operations are most frequent; they are financed by various funds. If the contracts of construction procurement procedures are awarded to companies which specify a price that barely makes up 50 per cent of the price calculated in the economic part of the project, it is clear that both the scope and quality of completed reconstruction work will not meet the requirements specified in the design documentation. After inspection of utilisation of the funds allocated for reconstruction, bad quality will be declared for most part of the work. Analysis of such bids reveals that:

- Construction companies which are close to bankruptcy suggest unrealistically low prices. They only want to survive several months in order to accumulate a certain amount of money and later go bankrupt prior to completion of work.
- Certain part of construction companies take part in all construction procurement procedures announced in Lithuania. However, they often lack both the required number of workers and other facilities to develop their activities throughout Lithuania. Such company hires subcontractors and later does not pay for part of their work. Thus innocent companies which want to work fair suffer and face the threatening bankruptcy due to such unfair actions.
- A new group of companies which take part in construction procurement procedures is emerging; they are awarded contracts with a very small price and then offer other companies to do the work for a certain price.
- A trend is observed when the contract documents favour a certain company. Lately, provisions of some procurement procedures include the requirement to provide the certificates of Occupational Health and Safety Advisory Services (OHSAS 18001) and Social

Accountability (SA 8000), although only two Lithuanian construction companies have the latter.

4. Case Study 2: Possibilities to Use the Database of Real Estate Register and Market in Forecasting of the Real Estate Market. Impact of the Lack of Qualitative Factors

The mass valuation approach is used in property valuation for taxation and other national economic purposes in the entire territory of Lithuania. It is a unified and sufficiently precise valuation approach based on unified principles of valuation. The precision of mass valuation mostly depends on the thoroughness and amount of information available for the valuation procedure.

The information about all completed transactions is accumulated since 1998, after the Real Estate Register of Lithuania expanded the data structure of its information system. The number of transactions makes up about 100,000 per year; about half of them are related to land sales, and about 30 per cent are related to residential buildings and premises. The database of transactions currently holds information about almost one million of real estate transactions (*Figure 3*).

Source: VĮ Registrų centras.

Figure 3. **Number of real estate transaction during 2004-2009 registered in Lithuanian Real Estate Register**

Although the main use of the accumulated data is for national mass valuation purposes of property, the accumulated database, which is one of the most comprehensive sources of information, is, however, an important tool for real estate market information and analysis.

The data about transactions accumulated in the database includes descriptive (cadastre) and legal (register) data about real estate (*Figure 4*). Therefore, the accumulated information defines both the actual market price of a specific property item and the features of the property.

Figure 4. **Information about real estate from Real Estate register data base**

The structure of the accumulated data enables market analysis at various angles and using various criteria. The abundant cadastre indicators which emerged through time allow to analyse dependence of both sales pieces and sold amounts on different parameters of property (e.g. year of construction, materials used for walls, distribution of floor area, etc.), on the location of property, and on other external factors. Both assessment of changes in the market and comparison of characteristics of the objects sold allow estimating a probable value of the object being examined under the current market conditions. This automated valuation system (*Figure 5*) is particularly relevant for the banking sector, which constantly observes changes in values of the mortgaged property as well as the impact of these changes on both liquidity of the property mortgaged to a bank and reliability of the portfolio of the mortgaged property in possession.

Software applications and integration of information flows help to analyse the general market trends or trends in a market segment, to assess the impact of market changes on a certain item, as well as changing demand and price of the item in the market, and to select the most typical items-real estate items sold in the market-for comparison with the analysed item.

If the market undergoes more rapid changes or a sudden change of trends, such events motivate forecasting of the effect of such changes on the market, possible dates of new changes, and the long-term trends.

Since Lithuania encountered one of the first major real estate crises after the restoration of independence and there were several smaller crises and booms in the past, the premises for market forecasting, as well as evaluation of trends and tendencies, started emerging.

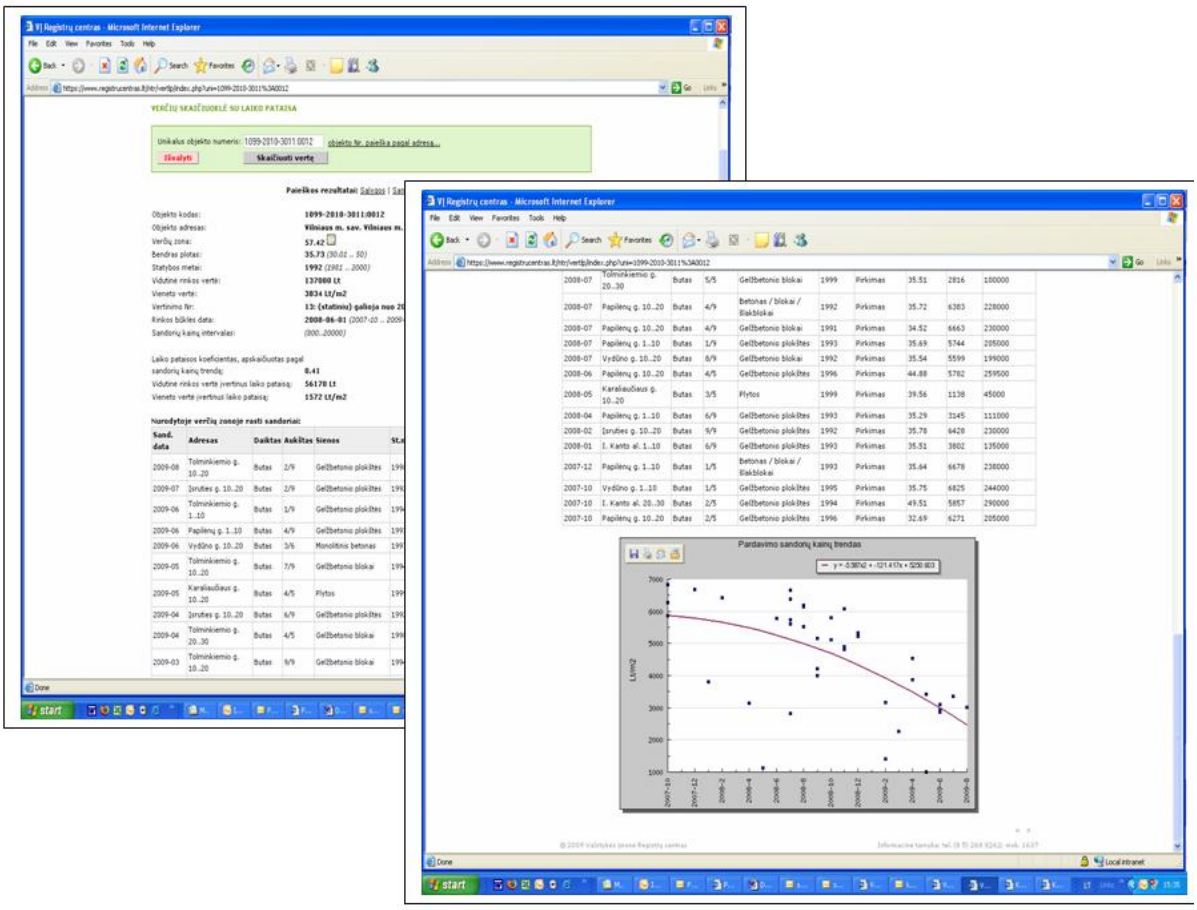


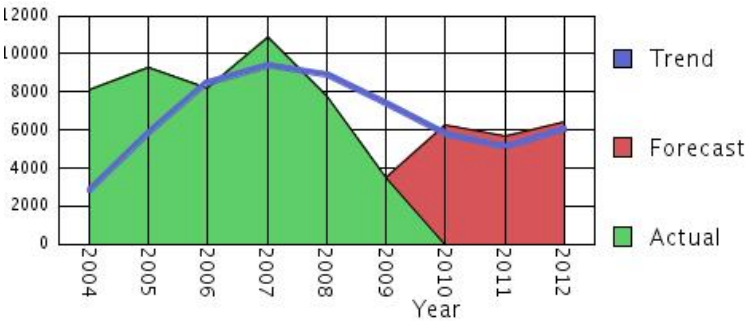
Figure 5. **Spreadheet of the real estate values with adjustment of market changes and time factors**

However, it must be admitted that quantitative indicators of property are not always enough in market analysis, as well as in forecasts of possible development trends.

In order to turn the current speculations and forecasts of experts into forecast variants based on statistical calculations, attempts were made to apply the main principles of statistical forecasting. The market data of the last five years were analysed and the market trends for the coming three years were forecasted using the methods of Simple Moving Average, Single Exponential Smoothing and Double Exponential Smoothing.

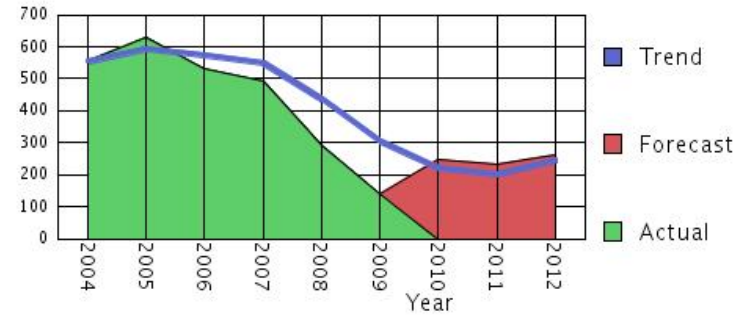
Sure enough, with incomplete market cycle, with lack of historical data about similar cycles in the past and with analysis of only quantitative indicators of the property, the different forecasting methods applied in the process returned unclear results, and a general tendency was not visible in the curve of trends (*Figure 6*).

Forecast for - Flats, apartments,
Municipality - Vilnius city mun.. , Value zone - All,
Measure – amount of sales, Predictions - 3,
Method - Simple Moving Average.



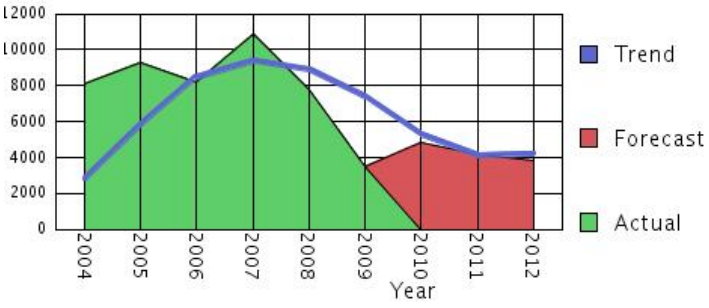
Period	Actual	Trend	Forecast
2004	8116	2869.33	8116.00
2005	9253	5876.67	8684.50
2006	8150	8506.33	8506.33
2007	10902	9435.00	9435.00
2008	7809	8953.67	8953.67
2009	3492	7401.00	7401.00
2010	0	5845.00	6234.00
2011	0	5145.00	5709.00
2012	0	6130.33	6448.00

Forecast for - 1-2 family houses ,
Municipality - Vilnius city mun., Value zone - All,
Measure – amount of sales, Predictions - 3,
Method - Simple Moving Average.



Period	Actual	Trend	Forecast
2004	555	555.00	555.00
2005	631	593.00	593.00
2006	534	573.33	573.33
2007	493	552.67	552.67
2008	292	439.67	439.67
2009	139	308.00	308.00
2010	0	225.67	246.33
2011	0	205.33	231.11
2012	0	246.00	261.81

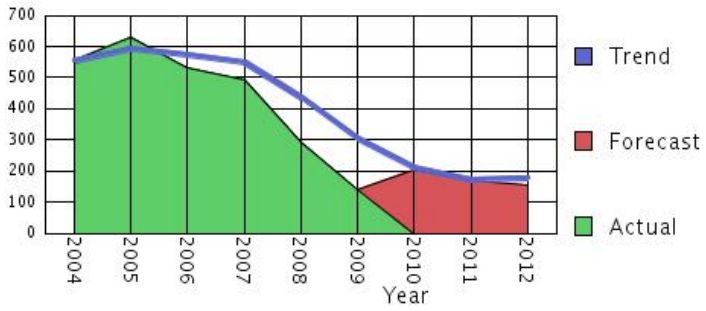
Forecast for - Flats, apartments ,
Municipality - Vilnius city mun., Value zone - All,
Measure – amount of sales, Predictions - 3,
Method - Single Exponential Smoothing.



Period	Actual	Trend	Forecast
2004	8116	2814.33	8116.00
2005	9253	5841.33	8684.50
2006	8150	8506.33	8417.25
2007	10902	9435.00	9659.63
2008	7809	8953.67	8734.31
2009	3492	7401.00	6113.16
2010	0	5367.67	4802.58
2011	0	4147.00	4147.29
2012	0	4256.00	3819.64

Figure 6. **Analysis of the amount of housing sales in the city of Vilnius**

Forecast for - 1-2 family houses ,
Municipality - Vilnius city mun. , Value zone - All,
Measure – amount of sales , Predictions - 3,
Method - Single Exponential Smoothing.



Period	Actual	Trend	Forecast
2004	555	555.00	555.00
2005	631	593.00	593.00
2006	534	573.33	563.50
2007	493	552.67	528.25
2008	292	439.67	410.13
2009	139	308.00	274.56
2010	0	212.33	206.78
2011	0	172.33	172.89
2012	0	177.67	155.95

Figure 6 (continued). **Analysis of the amount of housing sales in the city of Vilnius**

The said analyses would be more precise if they would additionally consider the qualitative criteria, such as social, cultural, ethical, psychological, religious, demographic and other aspects.

Conclusions

This study leads to the conclusion that not only economic crisis makes people less happy. Social, cultural, ethical, psychological, demographic, state of mind and other aspects of life, which are affected by the crisis, have equal impact on the quality of life and human behaviour as the economic crisis itself. Therefore, positive impact on social, cultural, ethical, psychological, demographic, state of mind and other environments may help to overcome the economic crisis faster. The article presents the Model for Construction and Real Estate Crisis Management developed by the authors. This model facilitates simulation of real estate crisis management in an integrated manner (considering economic, legal/regulatory, institutional, political, social, cultural, ethical, psychological, religious, demographic, state of mind, educational and other crisis management aspects).

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STATYBOS IR NEKILNOJAMOJO TURTO SEKTORIAUS KRIZĖS KONCEPTUALUS MODELIAVIMAS, YPATINGĄ DĖMESĮ KREIPIANT LYGINAMŲJŲ KOKYBINIŲ ASPEKTŲ APRAŠYMUI

A. Kaklauskas, E. K. Zavadskas, A. Bagdonavicius, L. Kelpsiene, D. Bardauskiene, V. Kutut

SANTRAUKA

Tyrimai rodo, kad per paskutinius dešimtmečius gyventojų materialinė gerovė ir standartai stipriai išaugo, o gyvenimo džiaugsmas – ne. Taip pat tyrimai rodo, kad draugai, artimieji, bendruomenė, gyvenimo ilgalaikiai ir trumpalaikiai tikslai, susieti su gyvenimo prasme ir vedantys gyvenimo prasmės įgyvendinimo link daro senojo kontinento gyventojus laimingesniais. Tradicinė statybos ir nekilnojamojo turto sektoriaus krizės valdymo analizė grindžiama ekonominiais, teisiniais, instituciniais ir politiniais aspektais. Socialiniams, kultūriniams, etiniams, psichologiniams, religiniams, demografiniams, dvasiniams, su švietimu susijusiems ir kitiems krizės valdymo aspektams skiriama mažiau dėmesio. Taip pat mažokai nagrinėjama, kaip ekonominė krizė pagilina socialines, kultūrines, etines, psichologines, demografines, dvasines ir kitas visuomenės problemas, o šios savo ruožtu neigiamai veikia ekonominę krizę. O kaip tik šios visuomenės problemos yra ne mažiau svarbios, kaip ekonominė krizė. Norint integruotai išnagrinėti statybos ir nekilnojamojo turto sektoriaus krizės valdymo gyvavimo ciklą, būtina kompleksiškai analizuoti šį ciklą remiantis visapusiška kriterijų sistema. Autoriai sukūrė nekilnojamojo turto sektoriaus krizės valdymo modelį, kuris sudarytas iš šešių etapų. Kadangi tyrimo metu analizuojama didžiulė statybos ir nekilnojamojo turto šaka, todėl suprantama, kad visiems pasiektiems tyrimo rezultatams aprašyti straipsnio apimties neužteks. Todėl modelis iliustruojamas, aprašant jo pirmąjį etapą. Aukščiau paminėti ir kiti klausimai detaliau analizuojami straipsnyje.

REIKŠMINIAI ŽODŽIAI: statyba, nekilnojamasis turtas, subalansuotas krizės valdymas, pasaulinės vystymosi tendencijos, alternatyvos, konceptualus modeliavimas, Lietuva.