ISSN 2334-7171

MEST Journal

Management
Education
Science & Society
Technologies

Edited by
Zoran Čekerevac

MESTE Vol. 1 No. 1 January 2013

CIP – Каталогизација у публикацији
Народна библиотека Србије, Београд

005+37+3+66

MEST Journal : Management, Education, Science & Society, Technologies / editor-in-chief Zoran P. Čekerevac. – [Štampano izd.]. – Vol. 1, no. 1 (2013) – – Belgrade : MESTE NGO : Faculty of Business and Industrial Management of the "Union" University Belgrade ; Toronto : SZ & Associates, 2013- (Belgrade : ICIM+). – 30 cm

Polugodišnje. - Drugo izdanje na drugom medijumu: MEST Journal (Online) = ISSN 2334-7058
ISSN 2334-7171 = MEST Journal (Štampano Izd.)

COBISS.SR- ID 196182028

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Publishers

- **MESTE NGO** – Belgrade
- **Faculty of Business and Industrial Management** of the "Union" University Belgrade, Belgrade, Serbia
- **SZ & Associates**, Toronto, Canada

Editor-in-chief: Zoran P. Čekerevac

All published papers have been internationally reviewed

Two issues of journal are published annually

ISSN 2334-7171
Printed by **ICIM+**, Belgrade-Mladenovac, Serbia

www.fbim.meste.org
Address: MESTE FBIM Transactions
Faculty of Business and Industrial Management – "Union" University Belgrade
Kneza Višeslava 27, 11000 Belgrade, Serbia

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MEST JOURNAL

CREATIVITY OF STRATEGIC ALLIANCES AND JOINT VENTURES

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JEL category: **L, L24**

Summary:
Any company that aspires to industry leadership in 21st century must think in terms of global, not domestic market leadership. The world economy is globalizing at an accelerating pace as countries previously closed to feregn companies open up their markets, as the Internet shrinks the importance of geographic distance, and as ambitious growth-minded companies race to build stronger competitive positions in the markets of more and more countries.
This paper focuses on strategy options for expanding beyond domestic boundaries and competing in the market of either a few or a great many countries. In the process of exploring these issues, we will introduce a number of corect concepts-multicountry competition, global competition, profit sanctuaries, and cross-market subsidization. The chapter includes section of market conditions; strategy options for entering and competing in foreign markets, the importance of locating operations in the most advantageous countries and so on.

Keywords:
consumer, organization, research, implication, environment, influence

1. Introduction

Strategic alliances, joint ventures, and other cooperative agreements with foreign companies are a favorite and potentially fruitful means for entering a foreign market or strengthening a firm's competitiveness in world markets (Bleeke & Ernst, 1991) (Hamel, Doz., & C.K., 1989).

Cross-border alliances have proved to be popular and viable vehicles for companies to edge their way into the markets of foreign countries.

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Historically, export-minded firms in industrialized nations sought alliances with firms in less-developed countries to import and market their products locally – such arrangements were often necessary to win approval for entry from the host country's government. Both Japanese and American companies are actively forming alliances with European companies to strengthen their ability to compete in the 25-nation European Union (and the five countries that are seeking to become EU members) and to capitalize on the opening up of Eastern European markets. Many U.S. and European companies are allying with Asian companies in their efforts to enter markets

in China, India, Malaysia, Thailand, and other Asian countries. Companies in Europe, Latin America, and Asia are using alliances and joint ventures as a means of strengthening their mutual ability to compete across a wider geographical area – for instance, all the countries in the European Union or whole continents or most all country markets where there is sizable demand for the industry's product. Many foreign companies, of course, are particularly interested in strategic partnerships that will strenghten their ability to gain a foothoild in U.S. market.

However, cooperative arrangements betweeen domestic and foreign companies have strategic appeal for reasons besides gaining better access to attractive country markets. (Doz & Hamel, 1998) (Hamel, Doz, & Prahalad, 1989) (Porter, 1998). A second big appeal of cross-border alliances is to capture economies of scale in production and/or marketing – cost reduction can be the difference that allows a company to be cost-competitive. By joining forces in producting components, assembling models, and marketing their products, companies can realize cost savings not achievable with their own small volumes. A third motivation for entering into a cross-border alliance is to fill gaps in technical expertise and/or knowledge of local markets (buying habits and product preferences of consumers, local customs, and so on). Allies learn much from one another in performing joint research, sharing technological know-how, studying one another's manufacturing methods, and understanding how to tailor sales and marketing appraoches to fit local cultures and traditions. Indeed, one of the win-win benefits of analliances is to learn from the skills, technological know-how, and capabilities of alliance partners and implant the knowledge and know-how of these partners in personnel throughout the company.

A fourth motivation for cross-border alliances is to share distribution facilities and dealer networks, thus mutually strengthening their access to buyers. A fifth benefit is that cross- border allies can direct their competitive energies more toward mutual rivals and less toward one another; teaming up may help them close the gap on leading companies. A sixth driver of cross-border alliances comes into play when companies are an effective way to tap into a partner's local market knowledge and help it ectablish working relationships with key officials in the host-country goverment. (Christensen, 2001) And, finally, alliances can be a particularly useful way for companies across the world to gain agreement on important technical standards – they have been used to arrive at standards for DVD players, assorted PC devices, Interent-related technologies, high-definition televisions, and mobile phones.

Cross-border alliances enable a growth-minded company to widen its geographic coverage and strengthen its competitiveness in foreign markets while, at the same time, offering flexibility and allowing company to retain some degree of autonomy and operating control.

What makes cross-border alliances an attractive strategic means of gaining the above types of benefits (as compared to acquiring or merging with foreign-based companies to gain much the same benefits) is that entering into alliances and strategic partnerships to gain market access and/or expertise of one kind or another allows a company to preserve its independence (which is not the case with a merger), retain veto power over how the alliance operates, and avoid using perhaps scarce financial resources to fund acquisitions. Furhermore, an alliance offers the flexibility to readily disengage once its purpose has been served or if the benefits prove elusive, whereas an acquisition is more permanent sort of arrngament (although the acquired company can, of course, be divested). An excellent presentation on the pros and cons of alliances vs. acquisitions is given in Dyer, Kale, and Singh's"When to Ally and When to Acquire" (Dyer, Kale, & Singh, 2004).

2. The Risks of Strategic Alliances with Foreign Partners

Alliances and joint ventures with foreign partners have their pitfalls, however. Cross-border allies typically have to overcome language and cultural barriers and figure out how to deal with diverse (or perhaps conflicting) operating practices. The communication, trust-building, and coordination costs are high in terms of management time. (Kanter, 1994) It is not unusual for there to be little personel chemistry among some of the key

people on whom success or failure of the alliance depends – the rapport such personel need to work well together may never emerge. And even if allies are able to develop productive personel relationships, they can still have trouble reaching mutually agree-able ways to deal with key issues or resolve differences. There is a natural tendency for allies to struggle to collaborate effectively in competitively sensitive areas, thus spawing suspicions on both sides about forthright exchanges of information and expertise. Occasionally, the egos of corporate executives can clash – an alliance between Northwest Airlines and KLM Royal Dutch Airlines resulted in a bitter feud among both companies' top offical (who, according to some reports, refused to speak to each other). (Shawn, 1996). In addition, there is the thorny problem of getting alliance partners to sort through issues and reach decision fast enough to stay abreast of rapid advances in technology or fast-changing market conditions.

It requires many meetings of many people working in good faith over time to iron out what is to be shared, what is to remain proprietary, and how the cooperative arrangements will work. Often, once the bloom is off the rose, partners discover they have conflicting objectives and strategies, deep differences of opinion about how to proceed, or important differences in corporate values and ethical standards. Tensions build up, working relationships cool, and the hoped-for benefits never materialize. (Main, 1990)

Even if the alliance becomes a win-win proposition for both parties, there is the danger of becoming overly dependent on foreign partners for essential expertise and competitive capabilities of its own, then at some juncture cross-border merger or acquisition may have to be substituted for cross-border alliances and joint ventures.
Strategic alliances are more effective in helping establish a beachhead of new opportunity in world markets than in achieving and sustaing global leadership.

One of the lessons about cross-border alliances is that they are more effective in helping a company establish a beachhead of new opportunity in world markets than they are in enabling a company to achieve and sustain global market leadership. Global market leaders, while benefiting from alliances, usually must guard against becoming overly dependent on the assistence they get from alliance partners-otherwise, they are not masters of their own destiny.

2.1. When a Cross-Border Alliance May Be Unnecessary

Experienced multinational companies that markets in 50 to 100 or more countries across the world find less need for entering into cross-border alliances than the companies in the early stages were globalizing their operations. (Prahalad & Lieberthal, 2008) Multinational companies make it a po- int to develop senior managers who understand how "the system" works in different countries; these companies can also avail themselves of local managerial talent and know-how by simply hiring experienced local managers and therby detouring the hazards of collaborative alliances with local managers and thereby detouring the hazards of collaborative alliances with local companies. If a multinationl enterprise with considerable experience in entering the markets of different countries wants to detour the hazards and hassles of allying with local business, it can simply assemble a capable management team consisting of both senior managers with considerable international experience and local managers. The responsibilities of its own in-house managers with international business savvy are (1) to transfer technology, business practices, and the corporate culture into the company's operations in the new country market, and (2) to serve as conduits for the flow of information between the corporate office and local operations. The responsibilities of local managers are (1) to contribute needed understanding of the local markets conditions, local buying habits, and local ways of doing business, and (2) in many cases, to head up local operations.

Hence, one cannot automatically presume that a company needs the wisdom and resources of a local partner to guide it through the process of successfully entering the markets of foreign countries. Indeed, experinced multinationals often discover that local partners do not always have adequate local market knowledge – much of

the so-called experince of local partners can predate the emergence of curent market trends and conditions, and sometimes their operating practices can be archaic.

2.2. Strategy knowledge gap

In the knowledge economy, successful strategic management is critically dependent on managing knowledge affectively in socio-cultural business systems. Knowledge is now recognized by business practitioners and academics as one of the most important sources of innovation and new customer value propositions, emanating from individual, organizational and communal nowledge creativity and utilization. While most extant knowledge management theory and application focus on the organization, and improwing its competitive advantages, there is an increasing need to shift this focus to the socio-cultural business system, i.e. understanding and effectively enabling knowledge generation and utilization to enhance the dynamic capabilities of particular socio-cultural business systems.

The purpose of this section is to present three practical frameworks as a basis for understanding systemic strategy-knowledge links. The reader is encouraged to explore the various theories underlying systemic knowledge knowledge creation and utilization, e.g. complex adaptive systems theory and autopoieses theory, (Oliver & Roos, 2000) and theories of how organizations can become "poised" in their knowledge landscapes by co-evolving with other stakeholders in their business system. (Lissack & Roos, 1999)

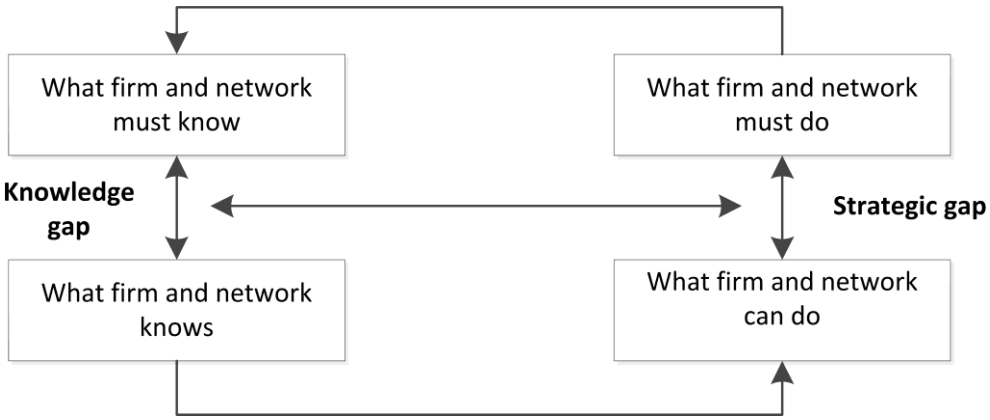

Figure 1 Identifying the systemuic strategy-knowledge gap (Adopted from (Zack, 1999))

3. The Knowledge Creating Process in a Business System

The "raison d'etre" of an organization and the socio-cultural business system of which in forms part is to continuously create knowledge and convert this knowledge into socio-cultural value. Knowledge and the capability to create and utilize such knowledge are the most important source of a business network's existence and its sustainability. Various authors, such as Nonaka, Teece, Drucker, Probst, Von Krogh and Stewart consider knowledge as the most important resource in today's economy. (Nonaka I. , 1991) (Teece, 2000) (Drucker, 1993) (Devenport & Probst, Knowledge Managment Case Book, 2002) (Devenport & Prusak, Working Knowledge, 1998) (Von Krogh, 1997) Nonaka and Takeuchi propose a knowledge-creating model (the SECI model) for a firm that can also be applied to a business network.

In the above knowledge-creating system, knowledge is created through the SECI spiral (see Figure 2.), that proceeds through four models of conversion between tacit and explicit knowledge.

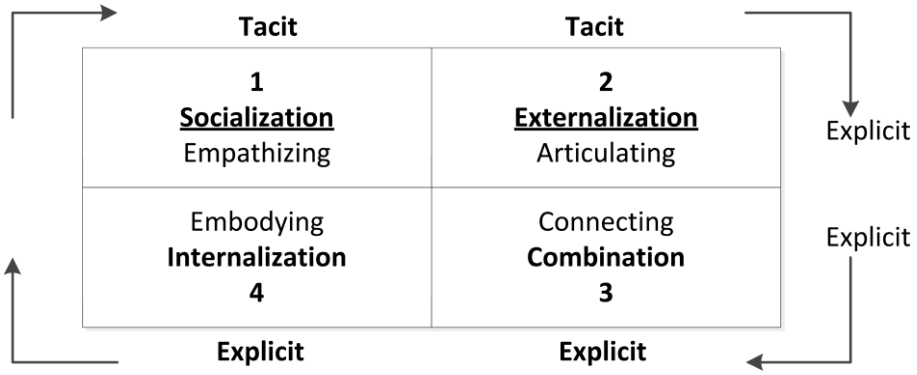

Figure 2 The SECI model of knowledge creation in a business system (Adopted from (Nonaka & Takeuchi, 1995))

A number of authors e.g. Beinhocker, Govindarajan and Gupta, Hamel, and Kim and Mauborgne, have suggested approachess for "changing the rules of the game" (Beinhocker, 1999) (Govindarajan & Gupta, 2001) (Hamel G. , 2000) (Kim & Mauborgne, 1999) Most of these approaches (or frameworks) consider business models from an individual organization perspective. A framework for co-shaping the development of new business models for an organization in systemic contex is presented in Figure 3 which effectively encapsulates the previous framework discussed in this chapter.

Figure 3 indicates that a new business model arises not only from reconfiguring an organization's core business strategy and dynamic capabilities, but also from making sense of socio-cultural dynamics and gaps, reinventing of customer value proposition(s), and reconfiguring the business network and its value chain. A reconfigured core business strategy should be *results* of systemic insight, foresight and sense making.

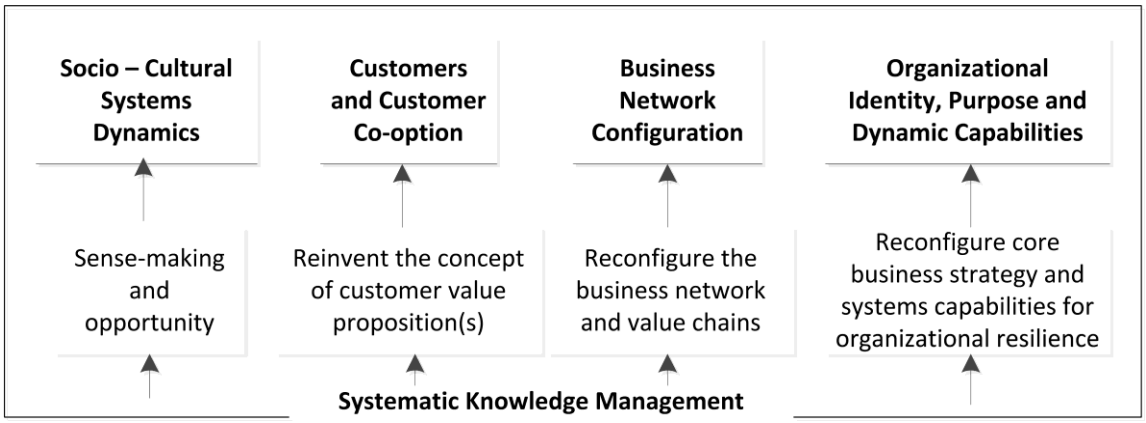

Figure 3 A systemic perspective of developing new business models

4. Strategic that fit the markets of emerging countries

Companies racing for global leadership have to consider competing in emerging markets like China, India, Brazil, Indonesia and Mexico – countries where the business risks are cosiderable but where the opportunities for growth are huge, especially as their economies develop and living standards climb towards levels in the industrialized world. (Prahalad & Lieberthal, 2008) (Arnold & Quelch, 1998) With the world now comprising more than 6 billion people – fully one-third of whom are in India and China, and hundreds of millions more in order less-developed countries of Asia and Latin America – a company that aspires to world market leadership (or to sustained rapid growth) cannot

ignor the market opportunities or the base of technical and managerial talent such countries offer. For example, in 2003 China's population of 1,3 billion people consumed nearly 33 percent of the world's annual cotton production, 51 percent of the world's pork, 35 percent of all the cigarettes, 31 percent of worldwide coal production, 27 percent of of the world's steel production, 19 percent of the alluminium, 23 percent of the TVs, 20 percent of the cell phones, and 18 percent of the washing machines. (Cherry, 2004) China is the world' largest consumer of copper, aluminium, and cement and the cesond biggest for PCs, and it is on track to become the second largest market for motor vehicle by 2010.

Tailoring products to fit conditions in an emerging-country market, however, often involves more than making minor product changes and becoming more familiar with local cultures. (Prahalad & Lieberthal, 2008) Ford's attempt to sell a Ford Escort in India at a price of $ 21.000 – a luxury-car price, given that India's best-selling Maruti-Suzuki model sold at the time for $10.000 or less, and thar fewer than 10 percent of Indian households have annual purchasing power greater than $20.000 – met with a less-than-enthusiastic market response. McDonald's has to offer vegetable burgers in parts of Asia and to rethink its prices, which are often high by local standards and affordable only by the well-to-do. Kellogg has struggled to introduce its cereals successfully because consumers in many less-developed countries do not eat cereal for breakfast – changing habits is difficult and expensive. In several emerging countries, Coca-Cola has found that advertising its world image does not strike a chord with tle local populace in a number of emerging-country markets.

Single-serving packages of detergants, shampoos, pickles, cough syrup, and cooking oils are very popular in India because they allow buyers to conserve cash by purchasing only what they need immediately. Thus, many of developed companies find that trying to employ a strategy akin to that used in the market of developed countries is hazardous. (Tarun Khanna, 2005) Experimenting with some, perhaps many, local twists, is usually necessary to find a strategy combination that works.

5. Strategy Options

Several strategy options for tailoring a company's strategy to fit the sometimes unusual or challenging circumstances presented in emerging-country markets:

- *Prepare to compete on the basis of low price*. Consumers in emerging markets are often higly focused on prices, which can give low-cost local competitors the edge unless a company can find ways to attaract buyers with bargaing prices as well as better products. (Prahalad & Lieberthal, 2008) For example, when Unilever entered the market for laundry detergents in India, it realized that 80 percent of population could not afford the brands it was selling to affluent consumers there (or the brands it was sellng in weathier countries). To compete against a low-priced detergent made by a local company, Unilever came up with a low-cost formula that was not harsh to the skin, constructed new low-cost production facilities, packaged the detergent (named Wheel) in single–use amounts so that it could be sold very cheeply, distributed the product to local merchants by handcarts, and crafted an economical marketing campaign that included painted signs on buildings and demonstrations near stores – the new brand quickly captured $ 100 million in sale and was the number one detergent brand in India in 2004 based on dollar sales. Unilever later replicated the strategy with low-priced packets of shampoos and deodorants in India and in South America with a detergent brand named Ala.
- *Be prepared to modify aspects of the company's business to accomodate local circumstances* (but not so much that the company loses the advantage of global scale and global branding). (Khanna, Palepu, & Sinha, 2005) For instance, when Dell entered China, it discovered that individuals and business were not accustomed to placing orders through the Internet (in North America, over 50 percent of Dell's sales in 2002-2005 were online). To adopt, Dell modified its direct sales model to rely more heavily on phone and fax-order and decided to be patient in getting Chinese customer to place Internet orders. Furher, because numerous Chinese goverment departments and state-owned

enterprises insisted that hardware vendors make their bids through distributors and systems integrators (as opposed to dealing directly with Dell salespeople as did large enterprise in other countries), Dell opted to use third parties in marketing its products to this buyer segment (although it did sell through its own sales force where it could).

– *Try to change the local market to better match the way the company does business elsewhere*. (Thompson, Peteraf, Gamble, & Strickland, 2011) A multinational company often has enough market clout to drive major changes in the way a local country market operates. When Hong Kong – based STAR launched its first satelliet TV channel in 1991, it profoundly impacted the TV marketplace in India: TV Indian goverment lost its monopoly on TV broadcasts, severeal other satellite TV channels aimed at Indian audinces quickly emerged, and the excitement of additional channels triggered a boom in TV manufacturing in India. When Japan's Suzuki entered India in 1981, it triggered a quality revolution among Indian auto parts manufactures. Local parts and components suppliers teamed up Suzuki's vendors in Japan and worked with Japanese experst to produce higher-quality products. Over the next two decades, Indian companies became very proficient in making top-notch parts and country other than Japan, and broke into the global market as suppliers to many automakers in Asia and other parts of the world.

– *Stay away from those emerging markets where it is impractical or uneconomic to modify the company's business model to accomodate local circumstances*. (Thompson, Peteraf, Gamble, & Strickland, 2011) Home Depot has avoided entry into most Latin American countries because its value proposition of good quality, low prices, and attentive customer service relies on (1) good highway and logistical systems to minimaze store inventory costs, (2) employee stock ownership to help motivate store personel to provide good customer service, and (3) high labor cost for housing construction and home repairs to encourage homeowners to engage in do-it -yorself projects.

Company experiences in entering developing markets like China, India, Russia, and Brazil indicate that profitability seldom comes quickly or easeily. Building a market for the company's products can often turn into a long – term process that involves reduction of consumers, sizable investments in advertising and promotion to alter tastes and buying habits, and upgrades of the local infrastructure (the supplier base, transportation systems, distribution channele, labor markets, and capital markets). In such cases, a company must be system to improve the infrastructure, and lay the foundation for generating sizible revenues and profits once conditions are ripe for market takeoff.

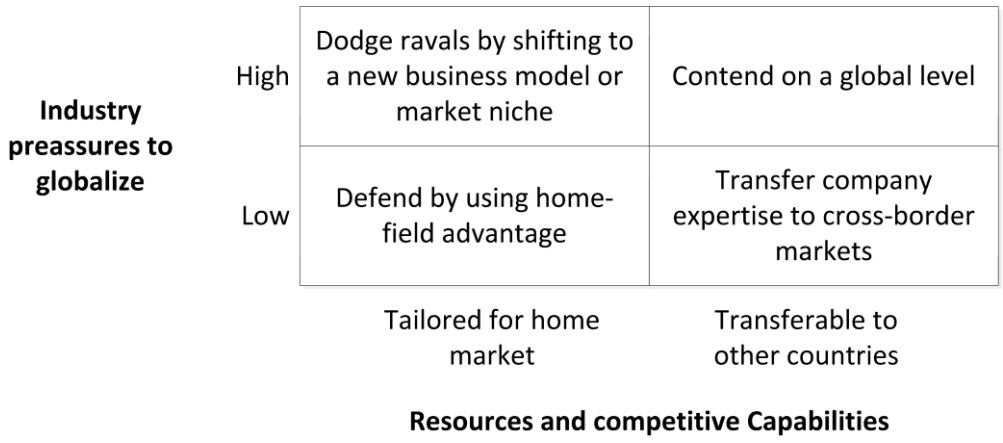

Figure 4. Strategy Option for Local Companies in Competing Against Global Companie (Adopted from Dawar & Frost (1999))

Profitability in emerging markets rarely comes quickly or easily – new entrants have to adopt their business models and strategies to local conditions and be patient in earning a profit.

CONCLUSIONS

Strategic alliances with foreign partners have appeal from several angles: gaining wider access to atractive country markets, allowing capture of economies of scale in production and/or marketing, filling gaps in technical expertise and/or knowledge of local markets, saving on costs by sharing distribution facilities and dealer networks, helping gain agreement on important tecnical standards and helping combat the impact of alliances that rivals have formed. Cross-border strategies alliances are fast reshaping competition in world markets, pitting one group of allied global companies against other group of allieed global companies.

There are three ways in which a firm can gain competitive advantage (or offset domestic disadvantages) in global markets. *One way* involves locating various value chain activities among nations in a manner that lowers costs or achieves greater product differentiation. A *second way* involves efficient and effective transfer of competitively valuable competencies and capabilities from its domestic markets to foreign markets. A *third way* draws on a multinational or global competitor's ability to deepen or broaden its resource strenghts and capabilities and to coordinare its dispersed activities in ways that a domestic-only competitor cannot.

Works Cited

Arnold, D. J., & Quelch, H. A. (1998). *New Strategies in Emerging Markets* (Vol. 40). Sloan Management Review.

Beinhocker, E. (1999). *Robust Adaptive Strategies.* Sloan Management Review.

Bleeke, J., & Ernst, D. (1991, November - December). The Way to Win in Cross-Border Alliances. *Harvard Business Review 69*(8), 127-135.

Cherry, B. (2004). *What China East (and Drinks and....).* Fortune.

Christensen, C. M. (2001). *Corporate Strategy.* 43.

Dawar, N., & Frost, T. (1999, January - February). Competing with Giants Survival Strategies for Local Companies in Emerging Markets. *Harvard Business Review 77, no. 1*, Harvard Business Review.

Devenport, T., & Probst, G. (2002). *Knowledge Managment Case Book.* Erlangen: Publicis / Wiley.

Devenport, T., & Prusak, L. (1998). *Working Knowledge.* Boston: Harvard Business School Press.

Doz, Y. L., & Hamel, G. (1998). The way to win. In Y. L. Doz, & G. Hamel., *Alliance Advantage: The Art of Creating Value Through Partnering* (pp. 127-133). Boston, MA:: Harvard Business School Press.

Drucker, P. (1993). *Past-Capitalist Society.* London: Butterworth - Heinemann.

Dyer, J. H., Kale, P., & Singh, H. (2004, July - August). When to ally and when to acquire. *Harvard Business Review, 82*(7/8), 109 - 115.

Govindarajan, V., & Gupta, A. (2001). *Strategic Innovation: A Conceptual Road Map.* Business Horizons.

Hamel, Doz, & Prahalad. (1989). Collaborative with your competitors. In Doz, & Hamel, *Alliance Advantage: The Art of Creating Value Through Partnering* (pp. 134-135). Boston, MA:: Harvard Business School Press.

Hamel, G. (2000). *Leading the Revolution.* Boston: Harvard Business School Press.

Hamel, G., Doz., Y. L., & C.K., P. (1989). Collaborative with Your Competitors – and Win. *Harvard Business Review*, 133-139.

Kanter, R. M. (1994). Collaborative Advantage: The Art of Alliances. *Harvard Business Review*, 96_108.

Khanna, T., Palepu, K., & Sinha, J. (2005). *Strategies That Fit Emerging Markets.* Harvard Business Review. Retrieved from http://turbo.kean.edu/~jmcgill/global.pdf

Kim, C., & Mauborgne, R. (1999). *Strategy, Value, Innovation and the Knowledge Economy.* Sloan Management Review.

Lissack, M., & Roos, J. (1999). *The Next Common Sense.* London: Nicholac Brealey Publishing.

Main, J. (1990). *Making Global Alliances Work.* Fortune.

Nonaka, I. (1991). *The Knowledge Creating Company.* Harvard Business Review.

Nonaka, I., & Takeuchi, H. (1995). The knowledge creating company. *Oxford University Press*.

Oliver, D., & Roos, J. (2000). *Striking a Balance: Complexity and Knowledge Landscapes.* New York: McGraw-Hil Publishing Company.

Porter. (1998). Competitive Advantage. In Doz, & Hamel, *Alliance Advantage: The Art of Creating Value Through Partnering* (p. 66). Boston, MA:: Harvard Business School Press.

Prahalad, C. K., & Lieberthal, K. (2008). *The End of Corporate Imperialism.* Harvard Business Review.

Shawn, T. (1996). The alliances from hell. *Fortune*, 64 -72.

Tarun Khanna, K. G. (2005). *Strategies That Fit Emerging Markets* (Vol. 6). Harvard Business Review.

Teece, D. (2000). *Strategies for Managing Knowledge Assets: The Role of Firm Structure and Industrial Context.* Long Range Planning - Elsevier.

Thompson, A., Peteraf, M., Gamble, J., & Strickland, A. (2011). *Crafting & Executing Strategy: The Quest for Competitive Advantage: Concepts and Cases.* McGraw-Hill/Irwin.

Von Krogh, G. (1997). *Intellectual Capital.* London: Nicholas Brealey Publishing.

Zack, M. (1999). Developng a Knowledge Strategy. *California Management Review, 41*, 136.

Received for publication: 22.10.2012
Revision received: 23.11.2012
Accepted for publication: 21.12.2012

How to cite this article?

Style – **APA** *Sixth Edition*:
Đorđević, B. (2013, 01 15). Creativity of strategic alliances and joint ventures. (Z. Čekerevac, Ed.) *MEST Journal, 1*(1), 1-10. Retrieved from http://www.meste.org/mest/MEST_1_2013/_01.pdf

Style – **Chicago** *Fifteenth Edition:*
Đorđević, Branislav. "Creativity of strategic alliances and joint ventures." Edited by Zoran Čekerevac. *MEST Journal* (MESTE NGO) 1, no. 1 (01 2013): 1-10.

Style – **GOST** *Name Sort*:
Đorđević Branislav Creativity of strategic alliances and joint ventures [Journal] = Creativity of strategic alliances and joint ventures // MEST Journal / ed. Čekerevac Zoran. - Belgrade - Toronto : MESTE NGO, 01 15, 2013. - 1 : Vol. 1. - pp. 1-10.

Style – **Harvard** *Anglia*:
Đorđević, B., 2013. Creativity of strategic alliances and joint ventures. *MEST Journal,* 15 01, 1(1), pp. 1-10.

Style – **ISO 690** *Numerical Reference*:
Creativity of strategic alliances and joint ventures. **Đorđević, Branislav.** [ed.] Zoran Čekerevac. 1, Belgrade - Toronto : MESTE NGO, 01 15, 2013, MEST Journal, Vol. 1, pp. 1-10.

MEST JOURNAL

WAS MILTON FRIEDMAN A SOCIALIST? YES.

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JEL category: **B, B59**

Summary:
Milton Friedman was a socialist, because his publications and speeches meet the criterion for the definition of this word: government ownership or control over significant sectors of the economy particularly means of production, such as money, roads; and/or redistributionist schemes such as his negative income tax. This is a controversial claim. It is backed up by the evidence.

Keywords:
Milton Friedman, socialist, means of production, income redistribution

1 Introduction

Before we can answer any such question, we must be clear on what socialism is. Then and only then can we ascertain whether, if, and to what extent was Friedman a socialist. But, before we do that,[1] let us reflect upon why it is important to even ask this question, let alone answer it in a careful systematic way. There are several reasons.

First, categorization is an important tool of scholarly scientific pursuit. It is an exaggeration to claim that biology (genus, species, family) and chemistry (the periodic table) consists of *nothing but* compartmentalization; however, there is surely a germ of truth in so outlandish a claim. In like manner, law distinguishes between legal and illegal,[2] philosophy is commonly divided into subjects such as ethics, metaphysics, epistemology, and also into schools of thought

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[1] Since many people will object to this question even being posed

[2] Antitrust law, supported by Friedman (1999), is an exception to this rule. In that case, a businessman can be found guilty of charging too high a price (profiteering, price gouging), too low a price (predatory price cutting, price warfare) or even the same price as everyone else (cartelization, conspiracy).

such as utilitarianism, deontology, ordinary language (analytic), hermeneutics, existentialism, etc.; sociology partakes of both structuralism and functionalism; in economics there are the Marxist, Austrian and mainstream or neoclassical schools of thought; in psychology there are Jungians, Rogerians, Freudians, behavioralists, etc. With all this plethora, is the distinction between socialists and capitalists, alone, to be ignored? Hardly.

A second reason for the present inquiry is that Milton Friedman is known far and wide as a supporter of capitalism, free enterprise, private property rights, etc. Summers (2006) said Friedman's great popular contribution was "in convincing people of the importance of allowing free markets to operate." Here is a similar quote: "(Milton Friedman) advocated minimizing the role of government in a free market as a means of creating political and social freedom" (Donahue, 2007). Here is another: "Milton Friedman was the twentieth century's most prominent advocate of free markets" (Anon, The concise encyclopedia of economics - Milton Friedman (1912 - 2006), 2008). Here is what he said about himself (Friedman M. , 1999) in this regard: "… a believer in the pursuit of self-interest in a competitive capitalist system." According to Doherty (2012), Friedman self-describes as a person "who...preach[es] laissez faire." Can it be that such a description is justified? Or is it the case that the very opposite is far nearer to the truth? The very title of the present essay exhibits the viewpoint on this matter of the present author.

Third, enquiring minds want to know the truth about this issue because in all too many cases, critics of the free enterprise system are likely to say that even Milton Friedman supports some governmental program or other. You, therefore, in not agreeing with this scholar, place yourself outside the realm of responsible discourse. If Friedman, however, is the socialist I claim he is, then this rejoinder is no longer open to the explicit enemies of economic freedom; all such accusations against true libertarians would be at one fell swoop defanged. This, alone, would render the present inquiry justified.

In section 2 of this paper we base our analysis on the assumption that socialism is defined in terms of governmental ownership of the means of production." Section 3 is given over to assessing Friedman's role in terms of the "from each… to each" definition of socialism. The role of section 4 is to deal with objections to our thesis. We conclude in section 5.

2 Socialism: state ownership of capital goods

So we now return to our initial question: what is socialism?[3] The most technical and perhaps the most accurate definition of this concept is, Government ownership of all of the means of production, e.g., capital goods. States Mises (2009): "My own definition of Socialism, as a policy which aims at constructing a society in which the means of production are socialized, is in agreement with all that scientists have written on the subject." The U.S.S.R., North Korea, Cuba, China, many countries in Eastern Europe and Asia before, during and after World War II would qualify under this definition. Clearly, Friedman cannot be a socialist in this sense, since large parts of his career were spent inveighing *against* precisely these types of institutional arrangements.

But, there are socialists, and then there are socialists. Suppose a nation's government owns not 100% of all capital goods, but 90%, 80%, 70%, etc. It what point does such a country cease being socialist, and begin its move toward a mixed economy? The point is that there is a continuum (Block & Barnett II, Continuums, 2008.) in this measurement, as there is in many others.[4] States Hoppe (Hoppe, The Economics and Ethics of Private Property: Studies in Political Economy and Philosophy. Second Edition., 2006) in this regard: "Socialism must be conceptualized as an institutional interference with or aggression against private property and private property

[3] Socialism may be broken down into its voluntary and coercive strands. In the former case, there are the nunnery, convent, kibbutz, commune, collective, syndicalist, cooperatives, monastery, abbey, priory, friary, religious community; in the latter, the economies of socialist countries such as Cuba, North Korea, the USSR, Nazi Germany, etc. We will use the word "socialism" in the latter understanding throughout this paper.

[4] Is a person tall? Short? It all depends.

claims…(Capitalism) on the other hand, is a social system based on the explicit recognition of private property and of nonaggressive, contractual exchanges between private property owners." In like manner, whether a scholar such as Friedman is a socialist or not, depends upon where on this spectrum he lies, in terms of what percentage of capital goods he wants the government to own.

However, outright explicit ownership is only a first approximation. Ludwig Wittgenstein was walking down the street with Norman Malcolm. The first philosopher said to the second, I'll give you these trees, provided you do nothing to them, nor prevent the previous owner from doing anything he pleases with them.[5] The point is, there is ownership, and then there is ownership. Or, to put this in other words, control is what ownership is all about. The Nazi *socialist* government was not extreme in its explicit *ownership* of the means of production. But that version of socialism, that is, fascism, was earmarked by implicit state ownership, or control, of capital goods. The pertinent question then becomes, To what extent did Friedman advocate government ownership *or control* of the means of production.

Let us list the ways.

First and foremost, this economist supported the Federal Reserve System all throughout his professional life.[6] That organization of course does not *own* the money stock, but it certainly *controls* it.[7] Friedman was an inveterate hater of the gold standard, denigrating its advocates as "gold bugs." In the view of Rothbard (Rothbard, Milton Friedman Unraveled, 1971 [2002]): "… Milton Friedman is a radical advocate of cutting all current ties, however weak, with gold, and going onto a total and absolute fiat dollar standard, with all control vested in the Federal Reserve System." Whenever people were free to choose,[8] they chose gold as their money, and sometimes silver. The "gold standard" is, then, properly characterized as free market money. Friedman is clearly on the socialist side of this very important means of production.

Friedman was a road socialist. He favored[9] government ownership and control over the nation's highways and streets (Seagraves, 2008)

[5] Here is the exact quote (Malcolm, 2001, p. 29): "On one walk he 'gave' to me each tree that we passed, with the reservation that I was not to cut it down or do anything to it, or prevent the previous owners from doing anything to it: with these reservations it was henceforth *mine*." I owe this cite to David Gordon.

[6] It cannot be denied that he was disappointed with the fact that the Fed did not follow anything like his famous 3% rule, but he did not join Ron Paul (2010) in calling for the entire elimination of this organization, root and branch. Doherty (2012) gives an alternative view: "Despite his earlier statement that government paper currency monopolies were necessary, as this book's 1984 essay 'Freezing High-Powered Money' shows, the later Friedman was as radical as Ron Paul in his opposition to the Fed. Friedman called for elimination of the Federal Reserve's role in 'determining the quantity of money' and says its regulatory and service role to the banking system 'could, if desired, be continued, preferably by combining it with the similar roles of the FDIC.' In other words, End the Fed!" It hardly seems like an "end" to the Fed if its role is merely transferred to other organs of government. It cannot be denied that Friedman did explicitly support the "end the fed" movement. He stated: *"Any system which gives so much power and so much discretion to a few men, [so] that mistakes -- excusable or not -- can have such far reaching effects, is a bad system. It is a bad system to believers in freedom just because it gives a few men such power without any effective check by the body politic -- this is the key political argument against an independent central bank. . .To paraphrase Clemenceau: money is much too serious a matter to be left to the Central Bankers."* (Friedman M. , 2012A) However, Friedman's ending of the fed is of a very different variety than that of a Ron Paul or a Murray Rothbard. The latter wanted not merely to "end the fed" but to call a halt to *any* government involvement in the monetary stock. Friedman wanted not so much to *end* the fed as to rein it in, *limit* it to following his 3% rule for monetary increase.

[7] For the view that money is a capital good, see Barnett and Block (2005A).

[8] This of course is the title of Friedman (1980), and also his television series (Friedman M. , 2012B). But, we can see that Friedman's advocacy of "freedom to choose" is a rather limited one.

[9] This claim is based on an informal debate I had with Milton Friedman at a Liberty Fund Conference, sometime in the 1980s. However, for an alternative perspective, see Friedman and Boorstin (1951). See also Lindsey (2006).

These are clearly capital goods.[10] As such, this opinion of his further qualifies him as a socialist. Nor did Friedman support the full and entire conversion of all public schools to private hands. Rather, he urged that the state maintain *ownership* of these facilities and *control* them through a voucher system. If that is not support for governmental ownership and/or control over the means of production, then nothing is.

Another socialist and disastrous[11] policy of Friedman's (1962) was to support the concept of "neighborhood effects." This is the idea that since we all affect each other, this constitutes a market failure, and justifies government intervention into the economy. Rothbard (Rothbard, Milton Friedman Unraveled, 1971 [2002]) explains:

"Friedman maintains that it is legitimate for the government to interfere with the free market whenever anyone's actions have 'neighborhood effect.' Thus, if A does something which will benefit B, and B does not have to pay for it, Chicagoites consider this a 'defect' in the free market, and it then becomes the task of government to 'correct' that defect by taxing B to pay A for this 'benefit.'

"It is for this reason that Friedman endorses government supplying funds for mass education, for example; since the education of kids is supposed to benefit other people, then the government is allegedly justified in taxing these people to pay for these 'benefits.' (Once again, in this area, Friedman's pernicious influence has been in trying to make an inefficient State operation far more efficient; here he suggests replacing unworkable public schools by public voucher payments to parents – thus leaving intact the whole concept of tax-funds for mass education.)"

Prof. Friedman also favored eminent domain, the forceful takeover of private property by government, at prices, if any, set by the latter. This is hardly in keeping with the tenets of laissez faire capitalism, which is predicated on *voluntary* exchanges, not coercive ones. According to Northrup (2003, p. 494)

"Milton Friedman provided the theoretical basis for eminent domain … he described the forced removal of particular urban neighborhoods and their populations as a necessary plan for the improvement of the entire city. According to Friedman, as local governments selected neighborhoods for purposes of redevelopment, a decrease in low income housing led to the displacement of poor populations. But the social consequences for slum residents translated into gains for the greater community as luxury apartments and commercial buildings replaced dilapidated buildings…"

Now, it is indeed true that Friedman is in "good company" on this matter, in that virtually all economists, politicians and city planners would agree with his assessment. But, that will not deflect in the slightest the charge that he is a socialist on this issue.

3 Socialism: from each, to each

There is another definition of socialism against which we will now measure the contribution of Friedman. It is not as technically correct as the one we have been utilizing in our examination, but, is also mentioned in the literature: "from each according to his ability, to each according to his needs" (Polya, 2007) (Pena, 2011) (Marx, 1875). This is certainly in keeping with Hoppe (2006): "… there must then exist varying types and degrees of socialism and capitalism, i.e., varying degrees to which private property rights are respected or ignored. Societies are not simply capitalist or socialist. Indeed, all existing societies are socialist to some extent." For, surely, forcing rich people to give their hard-earned money to those poorer than themselves would be a prime instance of disrespecting or ignoring private property rights.

How does Friedman measure up to socialism in this regard? Very well, unfortunately.[12] His negative income tax fits this bill to a "T." Certainly, it constitutes a coercive transfer of funds from

[10] Rothbard (1997) to the contrary notwithstanding. In his view, anything owned by the government must necessarily be a consumer, not a capital good. For a critique, see Barnett and Block (2009A).

[11] I repeat myself here.

[12] Fortunately, from the perspective of the thesis of the present paper.

those with great ability to those presumably in need. What, precisely, is the negative income tax? According to Allen (1993):

"The idea of a negative income tax (NIT) is commonly thought to have originated with economist Milton Friedman, who advocated it in his 1962 book, *Capitalism and Freedom…*

"In its purest form a NIT promised a revolution in American social policy. Gone would be the intrusive and costly welfare bureaucracy, the pernicious distinctions between 'worthy' and 'unworthy' recipients, the perverse disincentives for work effort and family formation. The needy would, like everyone else, simply file annual—or perhaps quarterly—income returns with the Internal Revenue Service. But unlike other filers who would make payments to the IRS, based on the amount by which their incomes exceeded the threshold for tax liability, NIT beneficiaries would receive payments ('negative taxes') from the IRS, based on how far their incomes fell below the tax threshold.

"The NIT would thus be a mirror image of the regular tax system. Instead of tax liabilities varying positively with income according to a tax rate schedule, benefits would vary inversely with income according to a negative tax rate (or benefit-reduction) schedule. If, for example, the threshold for positive tax liability for a family of four was, say, $10,000, a family with only $8,000 of annual income would, given a negative tax rate of 25 percent, receive a check from the Treasury worth $500 (25 percent of the $2,000 difference between its $8,000 income and the $10,000 threshold). A family with zero income would receive $2,500."

One difficulty with this proposal is that it would reduce at least the perceived need for charity from the rich in behalf of the poor, and, presumably, actual donations. Another is that it would further incentivize people to declare themselves poverty stricken, and even to act so as to bring about this result.[13] A further difficulty is that it would entrench "welfare rights" into the tax code, as those with less earnings than the cutoff point would have a "right" to their "negative tax."[14] It is perhaps for these sorts of reasons that Ludwig von Mises dramatically rejected this idea. He is famous for walking out of the first Mont Pelerin Society meeting in 1947 in a huff, stating: "You're all a bunch of socialists" in response to a discussion of the NIT, and other such coercive income redistribution schemes.[15]

4 Objections

4.1 Changes over time.

According to this objection, the leopard has changed its spots. Friedman may have been a socialist early in his career, but he "grew in office," and was much less so later on. There is some truth to this.[16] A much younger Milton Friedman was active in propagating the withholding tax (Rothbard, 2002); an older one actually apologized for this socialistic initiative (Friedman & Friedman, 1998).

Something similar seems to have occurred with antitrust. States Friedman (1999):

[13] Supply curves slope in an upward direction. The more that is paid for a good or service the more of it there will be ceteris paribus, and this applies to poverty as much as to anything else.

[14] Lind (2012); Mullat (2012); Rothbard (1971 [2002]). The title of the former, and its source, is especially telling, given the overall thesis of the present paper. Charles Murray, a "libertarian" of the Friedmanesque variety, makes the point that "not only would people receive money they need, others would [not] know you are receiving money" (RB, 2012). But from a truly libertarian perspective, this would count as an argument *against* the NIT, not in favor of it.

[15] See on this Kaza (1997), Memehunter (2012), Ebenstein (2012). According to Milton Friedman: "The story I remember best happened at the initial Mont Pelerin meeting when he (Ludwig von Mises) got up and said, "You're all a bunch of socialists." We were discussing the distribution of income, and whether you should have progressive income taxes. Some of the people there were expressing the view that there could be a justification for it" (Wiki, 2012).

[16] Mitt Romney has been considered a weathervane of politics, in that he has changed his mind on so many, many issues. See on this: (Romney, 2012); (Huntsman, 2011); (TiMT, 2012); (Saletan, 2012).
In like manner, although certainly to a lesser extent, all of these changes have rendered Milton Friedman a weathervane of political economy.

"My own views about the antitrust laws have changed greatly over time. When I started in this business, as a believer in competition, I was a great supporter of antitrust laws; I thought enforcing them was one of the few desirable things that the government could do to promote more competition. But as I watched what actually happened, I saw that, instead of promoting competition, antitrust laws tended to do exactly the opposite, because they tended, like so many government activities, to be taken over by the people they were supposed to regulate and control. And so over time I have gradually come to the conclusion that antitrust laws do far more harm than good and that we would be better off if we didn't have them at all, if we could get rid of them."

But this is not a root and branch attack on antitrust, of the sort taken by true libertarians.[17] The strong implication here is that *if* these laws could somehow be modified so that they would *not* "be taken over by the people they were supposed to regulate and control" then Friedman's rejection of them would disappear.[18]

There is one topic upon which it can clearly be denied that Friedman became less socialistic as he aged and presumably "learned his lesson": school vouchers.[19] Until the very end of his life, and even after it based upon his inheritance decisions, this socialist was a warm supporter of school vouchers.[20] In his will he left a goodly portion of his wealth to the Friedman Foundation for School Choice.[21] Another is public (socialist) roads, highways and streets. In Friedman and Boorstin (1951) there are some indications of a free enterprise perspective. Not so in the later period (Seagraves, 2008).

4.2 Embarrassment

Anyone who says Friedman was a socialist will bring embarrassment down upon the heads of all proponents of the free economy and the freedom philosophy. There is some truth in this claim, too. After all, this man is widely known if not as the most radical exponent of capitalism ever, at least among its all-time leaders. Anyone who deprecates this claim will be disrespected. Anyone who goes further and even *asks* if he is a socialist will be dismissed out of hand. And, a low rung in intellectual hell will be reserved for such as the present author who gives a positive answer to this question.

As against this, I am not seeking popularity. Rather, truth. And the evidence I have compiled above requires one and only one response: Friedman was indeed a socialist. Perhaps a moderate one. But a socialist nonetheless.

4.3 Context

Suppose we were to rank all people in the U.S. according to their political economic philosophies in the direction of a free society. We would award a score of 100 to anarcho-capitalists such as Murray Rothbard, Hans Hoppe, Lysander Spooner, Lew Rockwell. We would place in the 99th percentile limited government libertarians such as Ron Paul, Ayn Rand and Andrew Napolitano. We would earmark with a zero all those outright socialists, communists, fascists

[17] (Anderson, et al., 2001); (Armentano, 1999); (Barnett, Block, & Saliba., 2005); (Barnett, Block, & Saliba., 2007); (Barnett & Block, 2005A) (Barnett & Block, 2007); (Block W. , Austrian Monopoly Theory - a Critique, 1977A) (Block W. , 1982) (Block W. , 1994); (Block & Barnett., 2009); (Boudreaux & DiLorenzo, 1992); (Costea, 2003); (DiLorenzo T. J., 1996); (DiLorenzo & High., 1988); (High, 1984-1985); (McChesney, 1991); (Rothbard, 2004 [1962]); (Shugart II, 1987); (Smith, 1983); (Tucker, Controversy: Are Antitrust Laws Immoral?, 1998A) (Tucker, 1998B)

[18] Doherty (2012) has been taken in by this supposed change of heart on antitrust: "Friedman tells a similar story while eulogizing his best friend and University of Chicago colleague George Stigler, an economist who became more opposed to the very antitrust laws the 1951 Friedman lauded earlier in the book the more he learned about them."

[19] For a critique of school vouchers from a libertarian point of view, see North (1976) (2011); Rockwell (1998), (2000), (2002); Rome and Block (2006); Rothbard (1971 [2002]), (1994), (1995); Salisbury (2003); Vance (1996); Yates (2002A), (2002B); Young and Block (1999).

[20] (Gillespie, 2005)

[21] Its motto is "Advancing Milton & Rose Friedman's vision of school choice for all children." See on (FF). Also see (Friedman M. , 2003)

who favor income redistribution, complete government ownership and/or control over the means of production, such as Htiler, Stalin, Mao, Pol Pot. More moderate socialists such as Barack Obama, Bernie Sanders, Bill and Hillary Clinton, Mayor Mike Bloomberg would earn a 5 on our scale, and Republicans of the ilk of Mitt Romney, Newt Gingrich, Rick Santorum, Buddy Roemer, Rick Perry, Michele Bachmann, Herman Cain, Rudy Giuliani, Fred Thompson and Tim Pawlenty a 7.[22] Where oh where would Milton Friedman rank in such an undertaking? It is difficult to ignore the conclusion that he would score somewhere in the 90s. Let us award him a 96, arguendo. This means he is more capitalist, and thus less socialist that people falling into the 95th percentile or lower.[23]

From this two conclusions might be drawn. One, it is silly, it is absurd, it is diabolical, it is the ravings of a madman, to consider such a man a socialist. If Milton Friedman falls into the 96th percentile of our socialist-capitalist spectrum in the direction of the latter, then, he *cannot* be characterized as the former. But there is an entirely different way to interpret these statistical assumptions: the entire world is socialist to one degree or another, Milton Friedman along with the rest of his socialist brethren. Just because the entire world has gone crazy, Friedman less so than many others, does not mean that he, too, has not been sucked in to that category.

The first interpretation is a relativistic one: since most people support socialism to a far greater degree than Friedman, he himself is not, cannot be, linked with them; he is not a socialist. Since very, very few people support capitalism to a greater degree than him, he must be counted as a member of that category.

The second interpretation is objective. I claim it is more scientific. It sets up criteria for socialism in terms of government ownership or *control* of basic resources, and redistributionist income schemes. It notes that Friedman fails this objective test in terms of roads, money, school vouchers, negative income taxes, etc. Therefore he is a socialist.

Let us try to make this case by analogy. Right now, there are objective criteria for an observation being considered a kangaroo. At present, there are relatively few such entities. But suppose a gigantic change took place. Most observations now fit into this category. Say, 96% of all things became kangaroos. According to objective criterion, we would then say 96% of things are kangaroos, 4% of things are not. Period. According to relativist considerations, we would be tempted to say that big, or small, or dark, or light, or otherwise distinguished kangaroos were not really kangaroos. After all, a system that categorizes almost everything as a kangaroo cannot be a helpful one. The purpose of enterprises of this sort is to make *distinctions*. Therefore, we cannot *allow* virtually everything to be a kangaroo.

I suggest this is a good analogy. Yes, Friedman is less socialistic than 96% of people, we presume. According to the relativist viewpoint, he cannot be a socialist. But, according to objective scientific considerations, he most certainly is. From the point of view of making distinctions, it is absolute madness to count Friedman as a socialist. The word will lose virtually all, but not quite all, of its meaning, if we do so. However, from the perspective of maintaining an unwavering yardstick, it is *imperative* to view him in this way. How else can we measure how far to the left we have all moved in terms of economic policy prescriptions, well, most of us, if we do not? Mises, as usual, was correct. Friedman is a

[22] In my view, the Republican candidates are somewhat better than the Democrats on economic policy, slightly worse on personal liberties and foreign affairs.

[23] Another way of asking this question is, Under whose economic control would I rather live? Milton Friedman's or, pick your favorite GOP candidate from the 2012 election, mentioned above. The obvious answer is this Nobel Prize winning University of Chicago economist. I could count on him to unilaterally declare full free trade with all nations, rid us of occupational licensure, rent control, minimum wages, and hundreds of other such regulations. None of these others would even come close.

socialist.[24] For that matter, he and his entire Chicago School[25] are a "bunch of socialists."

Some might say in this regard it is not a good way to classify things if most items fall under only one category. It cannot be denied that the system employed in this paper places most people, Milton Friedman certainly included, on the socialist side of the ledger. However, the overwhelming majority of species are invertebrates. Some 95% of all animals lack a spinal chord.[26] Does this render a distinction between invertebrates and vertebrates invalid? Of course not.

4.4 Cognitive significance

According to this objection, I emphasize that Friedman did not fully support the free market, and provide a good list of examples to support this. But what is gained by the extra step of calling Friedman a socialist? It adds nothing to the list of deviations and appears empty of cognitive significance.

But there is "cognitive significance." It is in this way, and *only* in this way, that we can demonstrate how far our society has come from its former embrace of laissez faire capitalism. This objection relies, for its coherence, on a *relative* measure. Yes, in this sense, it is barking mad to consider Friedman as a socialist, since there are so many, many people who are far more socialist than he. However, if and only if we use an *absolute* calculus can we see the movement of the entire society. Let us employ an analogy. According to the Flynn (1984), (1987), (2007), (2012) effect, all of our IQ measurements are rising over time. An individual with a high IQ many years ago might have been 4 standard deviations above the mean. If this Flynn effect long continues, a person with that IQ score will only be mediocre. According to the gist of this objection, it would be untoward to utilize an objective criterion; only a relative one would be significant. But this would hardly hold true if the Flynn effect is actually occurring.

4.5 Mises, too, was a socialist

If "socialist" includes those who favor any government ownership or control, then of course Mises would be a socialist as well Friedman. That may be technically true, according to the author's definition, but then by what criteria to we distinguish Mises from Marx, or Friedman from Marx?

This is a very powerful objection, in that I am very loath to consider Mises as a socialist. However, this objection, too, must be rejected. Mises may have had one or two deviations from true laissez faire capitalism, or anarcho capitalism; Friedman had more than a dozen. 'twas Mises who called Friedman a socialist, not the other way around. Perhaps the most powerful argument undermining this objection is that there is even a case to be made in behalf of the claim that Mises was actually an anarcho capitalist.

I take it as a given that secession, not merely to the state, county, city, borough, neighborhood level, but down to the *individual*, is a form of free market anarchism (Gordon, 1998); (Hülsmann, 2003); (Kinsella, 2009); (Kreptul, 2003); (McGee, Secession Reconsidered, 1994A), (McGee, 1994B).[27] Here are some statements from Mises that are compatible with this stance:

[24] States Rothbard (1971 [2002]): "… as we examine Milton Friedman's credentials to be *the* leader of free-market economics, we arrive at the chilling conclusion that it is difficult to consider him a free-market economist at all."

[25] For criticisms of other members of the Chicago School on these grounds, see on Simons (Block W. E., 2002) (Rothbard, 2002); on Brozen and Posner (Block W. , 1994); on Becker (Murphy, 2008), on Becker and Coase (North, 1990); on Coase (Barnett & Block., 2005B) (Barnett & Block, 2007) (Barnett & Block, 2009B); (Block W. , 1977B), (Block W. , 1995), (Block W. , 1996), (Block W. , 2000), (Block W. , 2003), (Block W. , 2006), (Block W. E., 2010A), (Block W. E., 2010B), (Block W. E., 2010C); (Block, Barnett, & Callahan, 2005); (Cordato R. E., 1989), (Cordato R. E., 1992A), (Cordato R. E., 1992B), (Cordato R. E., 1997), (Cordato R. , 1998), (Cordato R. , 2000); (Fox, 2007); (Hoppe, 2004); (Krauss, 1999); (Krecke, 1996); (Lewin, 1982); (North, 1990) (North, 1992) (North, 2002); (Rothbard, 1982), (Rothbard, 1973); (Stringham E. , 2001); (Stringham & White, 2004); (Terrell, 1999)

[26] (Encyclopedia, 2012)

[27] See also (Secession Equals Anarhy, 2012); (Smithson, 2010) (Smithson, 2010); (Wright, 2010)

"A nation, therefore, has no right to say to a province: You belong to me, I want to take you. A province consists of its inhabitants. If anybody has a right to be heard in this case it is these inhabitants. Boundary disputes should be settled by plebiscite" (Mises L. v., 1969).

"No people and *no part* of a people shall be held against its will in a political association that it does not want" (Mises L. v., 1983).

"Liberalism (Mises' position – present author) knows no conquests, no annexations; just as it is indifferent towards the state itself, so the problem of the size of the state is unimportant to it. It forces *no one* against his will into the structure of the state…. When *a part* of the people of the state wants to drop out of the union, liberalism does not hinder it from doing so" (Mises, 1983, pp. 39-40, emphasis added).

"If it were in any way possible to grant this right of self-determination to every *individual person*, it would have to be done" (Mises L. , 1978, p. 109). For support of the claim that while Mises was not a free market anarchist, he came close, see (Kinsella, 2009)

As to distinguishing Friedman and Marx, the former was a moderate socialist, the latter a radical one.

5 Conclusion

Milton Friedman is a socialist. It matters not at all that most of the world is far more socialist than he. It would not deflect this accusation if he were the most capitalist, the least socialist, of any person on the entire planet. He would still be a socialist, objectively speaking. It matters not one whit that such a conclusion will prove to be an embarrassment among the cognoscenti, the intellectuals of political philosophy.

6 Works Cited

Allen, J. T. (1993). Negative Income Tax. *The Concise Encyclopedia of Economics. Library of Economics and Liberty.* Retrieved November 23, 2012, from http://www.econlib.org/library/Enc1/NegativeIncomeTax.html

Anderson, W., Block, W., DiLorenzo, T. J., Mercer, I., Snyman, L., & Westley., C. (2001). The Microsoft Corporation in Collision with Antitrust Law. *The Journal of Social, Political and Economic Studies, 26*(1, Winter), 287 - 302.

Anon. (2008). *The concise encyclopedia of economics - Milton Friedman (1912 - 2006).* Retrieved from Library of economics and liberty: http://www.econlib.org/library/Enc/bios/Friedman.html#

Anon. (2012, 09 28). *Secession Equals Anarhy*. Retrieved from National Park Service: http://www.nps.gov/liho/historyculture/secanarchy.htm

Armentano, D. T. (1999). *Antitrust: The Case for Repeal.* Auburn, AL: Mises Institute.

Barnett, W. I., & Block, W. (2007, 11). Coase and Van Zandt on Lighthouses. *Public Finance Review, 35*(6), 710-733.

Barnett, W. I., & Block, W. E. (2005A). Money: Capital Good, Consumers' Good, or (Media of) Exchange Good? *Review of Austrian Economics. 18 (2):* , 179-194.

Barnett, W. I., & Block, W. E. (2005A). Money: Capital Good, Consumers' Good, or (Media of) Exchange Good? *Review of Austrian Economics, 18*(2), 179-194.

Barnett, W. I., & Block, W. E. (2009A). Investment and Consumption: A critique of Rothbard's claim that there can be no such thing as governmental 'investment'. *Journal of Public Finance and Public Choice, 27*(2-3), 183-188.

Barnett, W. I., & Block., W. (2005B). Professor Tullock on Austrian Business Cycle Theory. *Advances in Austrian Economics, 8*, 431-443.

Barnett, W. I., Block, W., & Saliba., M. (2007, Summer). Predatory pricing. *Corporate Ownership & Control, 4*(4), 401-406.

Barnett, W., & Block, W. (2009B). Coase and Bertrand on Lighthouses. *Public Choice, 140*(1-2), 1–13. Retrieved from http://dx.doi.org/10.1007/s11127-008-9375-x

Barnett, W., Block, W., & Saliba., M. (2005, Summer). Perfect Competition: A Case of 'Market-Failure. *Corporate Ownership & Control, 2*(4), 70-75.

Block, W. (1996). O.J.'s Defense: A Reductio Ad Absurdum of the Economics of Ronald Coase and Richard Posner. *European Journal of Law and Economics, 3*, 265-286. Retrieved from http://www.walterblock.com/publications/block_oj's-defense.pdf

Block, W. (1977A). Austrian Monopoly Theory - a Critique. *The Journal of Libertarian Studies, I*(4), 271-279.

Block, W. (1977B, Spring). Coase and Demsetz on Private Property Rights. *The Journal of Libertarian Studies: An Interdisciplinary Review, I*(2), 111-115. Retrieved from http://www.mises.org/journals/jls/1_2/1_2_4.pdf

Block, W. (1982). *Amending the Combines Investigation Act.* Vancouver: The Fraser Institute.

Block, W. (1994). Total Repeal of Anti-trust Legislation: A Critique of Bork, Brozen and Posner. *Review of Austrian Economics, 8*(1), 35-70.

Block, W. (1995). Ethics, Efficiency, Coasean Property Rights and Psychic Income: A Reply to Demsetz. *Review of Austrian Economics, 8*(2), 61-125. Retrieved from http://www.mises.org/journals/rae/pdf/rae8_2_4.pdf

Block, W. (2000, Spring). Private Property Rights, Erroneous Interpretations, Morality and Economics: Reply to Demsetz. *Quarterly Journal of Austrian Economics, 3*(1), 63-78. Retrieved from http://www.mises.org/journals/qjae/pdf/qjae3_1_8.pdf

Block, W. (2003, Summer). Private property rights, economic freedom, and Professor Coase: A Critique of Friedman, McCloskey, Medema and Zorn. *Harvard Journal of Law and Public Policy, 26*(3), 923-951. Retrieved from http://findarticles.com/p/articles/mi_go2782/is_3_26/ai_n6640908/?tag=content

Block, W. (2006). Coase and Kelo: Ominous Parallels and Reply to Lott on Rothbard on Coase. *Whittier Law Review, 27*(4), 997-1022.

Block, W. E. (2010B, Winter). Rejoinder to Brooks on Coase and Demsetz. *Quarterly Journal of Austrian Economics, 13*(4), 56-73. Retrieved from http://mises.org/journals/qjae/pdf/qjae13_4_3.pdf

Block, W. E. (2002, Fall). Henry Simons Is Not A Supporter of Free Enterprise. *Journal of Libertarian Studies, 16*(4), 3-36. Retrieved from http://www.mises.org/journals/jls/16_4/16_4_2.pdf

Block, W. E. (2010A). A Response to Brooks' Support of Demsetz on the Coase Theorem. *Dialogue, 2*. Retrieved from http://www.uni-svishtov.bg/dialog/2010/2.10.WB.pdf

Block, W. E. (2010C, Fall). Rejoinder to Boettke on Coasean Economics and Communism. *Romanian Economic and Business Review, 5*(3), 9-90. Retrieved from http://www.rebe.rau.ro/REBE%205%203.pdf

Block, W., & Barnett II, W. (2008., 06). Continuums. *Journal Etica e Politica / Ethics & Politics, 1*, 151-166. Retrieved from http://www2.units.it/~etica/ ; http://www2.units.it/~etica/2008_1/BLOCKBARNETT.pdf

Block, W., & Barnett., W. (2009, June/December). Monopsony Theory. *American Review of Political Economy, 7*(1/2), 67-109. Retrieved from http://www.arpejournal.com/ARPEvolume7number1-2/Block-Barnett.pdf; http://www.arpejournal.com/

Block, W., Barnett, W. I., & Callahan, G. (2005). The Paradox of Coase as a Defender of Free Markets. *NYU Journal of Law & Liberty, 1*(3), 1075-1095. Retrieved from http://tinyurl.com/2hbzd4; http://www.nyujll.org/articles/Vol.%201%20No.%203/Vol.%201%20No.%203%20-%20Barnett,%20Block%20and%20Callahan.pdf; http://tinyurl.com/2hbzd4

Boudreaux, D. J., & DiLorenzo, T. J. (1992). The Protectionist Roots of Antitrust. *Review of Austrian Economics, 6*(2), 81-96.

Cordato, R. (1998, Spring). Time Passage and the Economics of Coming to the Nuisance: Reassessing the Coasean Perspective. *Campbell Law Review, 20*(2), 273-292.

Cordato, R. (2000, 09). Chasing Phantoms in a Hollow Defense of Coase. *The Review of Austrian Economics, 13*(2), 193-208.

Cordato, R. E. (1989, Spring). Subjective Value, Time Passage, and the Economics of Harmful Effects. *Hamline Law Review, 12*(2), 229-244.

Cordato, R. E. (1992A, Fall). Knowledge Problems and the Problem of Social Cost. *Journal of the History of Economic Thought, 14*, 209-224.

Cordato, R. E. (1992B). *Welfare Economics and Externalities in an Open-Ended Universe: A Modern Austrian Perspective.* Boston: Kluwer.

Cordato, R. E. (1997, Winter). Market-Based Environmentalism and the Free Market: They're Not the Same. *The Independent Review, 1*(3), 371-386.

Costea, D. ". (2003, Fall). A Critique of Mises's Theory of Monopoly Prices. *The Quarterly Journal of Austrian Economics, 6*(3), 47 - 62. Retrieved from http://www.mises.org/journals/qjae/pdf/qjae6_3_3.pdf

DiLorenzo, T. J. (1996). The Myth of Natural Monopoly. *Review of Austrian Economics, 9*(2), 43-58. Retrieved from http://www.mises.org/journals/rae/pdf/rae9_2_3.pdf

DiLorenzo, T., & High., J. (1988, 07). Antitrust and Competition, Historically Considered. *Economic Inquiry, 26*(1), 423-435.

Doherty, B. (2012). *The Increasingly Libertarian Milton Friedman.* Retrieved from Reason: http://reason.com/archives/2012/11/20/the-increasingly-libertarian-milton-frie/print

Donahue, P. (2007, 07 14). *Milton Friedman - Greed.* Retrieved 12 2012, from Youtube: http://www.youtube.com/watch?v=RWsx1X8PV_A

Ebenstein, L. (2012). *The Indispensable Milton Friedman.* Washington, DC: Regnery Books.

Encyclopedia. (2012). *What percentage of animals are invertebrates?* Retrieved from Answers Encyclopedia: http://answers.encyclopedia.com/question/percentage-animals-invertebrates-90468.html

FF. (n.d.). *Mission & History.* Retrieved from The Friedman Foundation for education choice: http://www.edchoice.org/About-Us/Mission---History.aspx

Flynn, J. R. (1984). The mean IQ of Americans: Massive gains 1932 to 1978. *Psychological Bulletin, 95*(1), 29–51.

Flynn, J. R. (1987). Massive IQ gains in 14 nations: What IQ tests really measure. *Psychological Bulletin, 101*(2), 171–191.

Flynn, J. R. (2007). *What is Intelligence?: Beyond the Flynn Effect.* Cambridge: Cambridge University Press.

Flynn, J. R. (2012). *Are We Getting Smarter?: Rising IQ in the 21st Century.* Cambridge: Cambridge University Press.

Fox, G. (2007, Fall). The Real Coase Theorems. *The Cato Journal: An Interdisciplinary Journal of Public Policy Analysis, 27*(3), 373-396. Retrieved from http://www.cato.org/pubs/journal/cj27n3/cj27n3-5.pdf

Friedman, M. (1962). *Capitalism and Freedom.* Chicago: University of Chicago Press.

Friedman, M. (1962). *Capitalism and Freedom.* Chicago: University of Chicago Press.

Friedman, M. (1999, March/April). Policy Forum: The Business Community's Suicidal Impulse. *Cato Policy Report, 21*(2), 1-16. Retrieved from http://www.cato.org/pubs/policy_report/v21n2/friedman.html

Friedman, M. (2003, 03 04). Milton Friedman on Vouchers. (C. Michelle, Interviewer) CNBC. Retrieved from http://www.edchoice.org/The-Friedmans/The-Friedmans-on-School-Choice/Milton-Friedman-on-Vouchers.aspx

Friedman, M. (2012A). *End the fed*. Retrieved from The Money Masters: http://www.themoneymasters.com/the-money-masters/milton-friedman-end-the-fed/#header

Friedman, M. (2012B, 05 9). *Milton Friedman PBS free to chose 1980 Vol 1 of 10 Power of the Market.* Retrieved from YouTube: http://www.youtube.com/watch?v=f1Fj5tzuYBE

Friedman, M., & Boorstin, D. (1951). *How to plan and pay for the safe and adequate highways we need.*

Friedman, M., & Friedman, R. (1998). *Two Lucky People: Memoirs.* Chicago: University of Chicago Press.

Friedman, M., & Friedman, R. D. (1980). *Free to chose.* New York: Harcourt Brace Jovanovich.

Gillespie, N. (2005, 05). *The father of modern school reform.* Retrieved from reason.com: http://reason.com/archives/2005/12/01/the-father-of-modern-school-re

Gordon, D. (1998). *Secession, State, and Liberty.* New Brunswick, N.J.: Transaction.

High, J. (1984-1985). Bork's Paradox: Static vs Dynamic Efficiency in Antitrust Analysis. *Contemporary Policy Issues, 3*, 21-34.

Hoppe, H.-H. (2004, 10 11). *The Ethics and Economics of Private Property.* Retrieved from LewRockwel.com: http://www.lewrockwell.com/hoppe/hoppe11.html

Hoppe, H.-H. (2006). *The Economics and Ethics of Private Property: Studies in Political Economy and Philosophy. Second Edition.* Auburn, AL: Ludwig von Mises Institute. Retrieved from http://mises.org/books/economicsethics.pdf

Hülsmann, J. G. (2003). Secession and the Production of Defense. In H.-H. Hoppe, *The Myth of National Defense: Essays on the Theory and History of Security Production* (pp. 369-414). Auburn, AL: The Ludwig von Mises Institute. Retrieved from http://mises.org/etexts/defensemyth.pdf

Huntsman, J. (2011, 10 28). *Romney's a 'perfectly lubricated weather vane'.* Retrieved from CNN Politics: http://politicalticker.blogs.cnn.com/2011/10/28/huntsman-romneys-a-perfectly-lubricated-weathervane/

Kaza, G. (1997, 06). The Mont Pelerin Society's 50th Anniversary. *The Freeman*, 347-351. Retrieved from http://www.fee.org/the_freeman/detail/the-mont-pelerin-societys-50th-anniversary

Kinsella, S. (2009, 08 07). *Was Mises an Anarchist?* Retrieved from StephanKinsella.com: http://www.stephankinsella.com/2009/08/was-mises-an-anarchist/

Krauss, M. (1999, Spring). Tort Law, Moral Accountability, and Efficiency: Reflections on the Current Crisis. *Markets and Morality, 2*(1). Retrieved from http://www.acton.org/publicat/m_and_m/1999_spr/krauss.html

Krecke, E. (1996, 03). "Law and the Market Order: An Austrian Critique of the Economic Analysis of Law. *Journal des Economistes et des Etudes Humaines, 7*(1), 19-37.

Kreptul, A. (2003, Fall). The Constitutional Right of Secession in Political Theory and History. *The Journal of Libertarian Studies, 17*(4), 30-100. Retrieved from http://www.mises.org/journals/jls/17_4/17_4_3.pdf

Lewin, P. (1982, Spring). Pollution Externalities: Social Cost and Strict Liability. *Cato Journal, 2*(1), 205-229.

Lind, M. (2012 , 08 07). Thank you, Milton Friedman: How conservatives' economic hero helped make the case for big government. *Salon*. Retrieved from http://www.salon.com/2012/08/07/thank_you_milton_friedman/

Lindsey, R. (2006, 05). Do Economists Reach A Conclusion on Road Pricing? The Intellectual History of an Idea. *Econ Journal Watch, 3*(2), 292-379.

Malcolm, N. (2001). *Ludwig Wittgenstein: A Memoir.* Oxford: Oxford University Press.

Marx, K. (1875). *Critique of the Gotha Program.* Retrieved from Marxists Internet Archive: http://www.marxists.org/archive/marx/works/1875/gotha/ch01.htm

McChesney, F. (1991). Antitrust and Regulation: Chicago's Contradictory Views. *Cato Journal, 10*.

McGee, R. W. (1994A, Fall). Secession Reconsidered. *The Journal of Libertarian Studies, 11*(1), 11-33. Retrieved from http://www.mises.org/journals/jls/11_1/11_1_2.pdf

McGee, R. W. (1994B, Spring). Secession as a Tool for Limiting the Growth of State and Municipal Government and Making it More Responsive: A Constitutional Proposal. *Western State University Law Review, 21*, 499. Retrieved from http://heinonline.org/HOL/LandingPage?collection=journals&handle=hein.journals/wsulr21&div=29&id=&page=

Memehunter. (2012, 10 29). The Mont Pèlerin Society: The ultimate neoliberal Trojan horse. *The Daily Knell*. Retrieved from http://thedailyknell.wordpress.com/2012/10/29/the-mont-pelerin-society-the-ultimate-neoliberal-trojan-horse/

Mises, L. (1978). *Liberalism (In the Classical Tradition).* Kansas City: Sheed Andrews, & McMeel, Inc.

Mises, L. v. (1969). *Omnipotent Government.* New Rochelle, N.Y.: Arlington House.

Mises, L. v. (1983). *Nation, State and Economy.* Retrieved from Ludwig von Mises Institute: http://mises.org/nsande/pt1iich2~b.asp

Mises, L. v. (2009). *Socialism - an economic and sociological analysis.* Auburn, Alabama: Ludwig von Mises Institute. Retrieved from http://books.google.rs/books?id=dPkB7AiURigC&pg=PA20; http://mises.org/books/socialism/preface_second_german_edition.aspx

Mullat, J. E. (2012, 10 19). *The Welfare Policy Dilemma of a Negative Income Tax System: Normative Approach.* Retrieved from Social Science Research Network - Tomorrow's Research Today: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2165949

Murphy, R. P. (2008, 11 24). *An Open Letter to Gary Becker re: Depressions.* Retrieved from Ludwig von Mises Institute: http://mises.org/story/3220

North, G. (1976). Educational Vouchers: The Double Tax. *The Freeman, 26*(5). Retrieved from http://www.thefreemanonline.org/featured/educational-vouchers-the-double-tax

North, G. (1990). *Tools of Dominion: The Case Laws of Exodus .* Tyler, TX: Institute for Christian Economics.

North, G. (1992). *The Coase Theorem.* Tyler, TX: The Institute for Christian Economics.

North, G. (2002, Fall). Undermining Property Rights: Coase and Becker. *The Journal of Libertarian Studies: An Interdisciplinary Review, 16*(4), 75-100. Retrieved from http://www.mises.org/journals/jls/16_4/16_4_5.pdf

North, G. (2011, 06 30). *Just Say No to School Vouchers . . . Again.* Retrieved from LewRockwell.com: http://lewrockwell.com/north/north999.html

Northrup, C. C. (2003). *The American Economy: A Historical Encyclopedia* (Vol. 2). Santa Barbara, California: ABC-CLIO, Inc. Retrieved from http://books.google.ca/books?id=3DE4P7NdaycC&pg=PA493&lpg=PA493&dq=milton+friedman+eminent+domain&source=bl&ots=mv_HfZ_WtZ&sig=3c13pHNaIuaAf2MHQSCS3xDGbpA&hl=en&sa=X&ei=3z-wUPe2BoGQiQKuvIB4&ved=0CD4Q6AEwAw;

Pena, D. S. (2011, 04 04). *You Might Be a Marxist If ... You Believe in From Each According to Their Abilities, to Each According to Their Needs.* Retrieved from PA Political Affairs - Marxism. Fresh. Daily.: http://politicalaffairs.net/you-might-be-a-marxist-if-you-believe-in-from-each-according-to-their-abilities-to-each-according-to-their-needs/

Polya, G. (2007). 'To each according to his needs' for Spaceship Earth. *State of Nature: An Online Journal of Radical Ideas*. Retrieved from http://www.stateofnature.org/toEachAccording.html

RB. (2012, 02 15). *For the Welfare of All.* Retrieved from Hannah Arendt Center Bard College: http://www.hannaharendtcenter.org/?tag=negative-income-tax

Rockwell, J. L. (1998, 09 1). *Vouchers: Enemy of Religion.* Retrieved from Ludwig von Mises Institute: http://www.mises.org/fullstory.aspx?control=106&id=79

Rockwell, L. (2000). *Education and the Election.* Retrieved from LewRockwell.com: http://www.lewrockwell.com/rockwell/educationandelection.html

Rockwell, L. (2002, 07 02). *Vouchers: Another Name for Welfare.* Retrieved from LewRockwell.com: http://www.lewrockwell.com/rockwell/voucher2.html

Rome, G., & Block., W. (2006). Schoolhouse Socialism. *Journal of Instructional Psychology, 33*(1), 83-88. Retrieved from http://findarticles.com/p/articles/mi_m0FCG/is_1_33/ai_n16118909/?tag=content;col1

Romney, M. (2012, 10 3). *THE REAL MITT ROMNEY - THE WEATHER-VANE CANDIDATE--- A collection of flip-flips and suit changes from the past, present and no doubt the future….* Retrieved from THE REAL MITT ROMNEY - THE WEATHER-VANE CANDIDATE: http://mittromney2012potus.blogspot.com/

Ron, P. (2010). *End the Fed.* New York, N.Y.: Grand Central Publishing.

Rothbard, M. N. (1971 [2002]). Milton Friedman Unraveled. *Individualist*, 3-7. Retrieved from http://www.lewrockwell.com/rothbard/rothbard43.html

Rothbard, M. N. (1973, Spring). Value Implications of Economic Theory. *The American Economist*, 35-39. Retrieved from http://mises.org/page/1412

Rothbard, M. N. (1982, Spring). Law, Property Rights, and Air Pollution. *Cato Journal, 2*(1). Retrieved from http://www.mises.org/rothbard/lawproperty.pdf; http://mises.org/story/2120

Rothbard, M. N. (1994). Vouchers: What Went Wrong? In M. N. Rothbard, *Making Economic Sense* (pp. 1, 8). Auburn, AL: The Ludwig von Mises Institute. Retrieved from http://mises.org/econsense/ch43.asp

Rothbard, M. N. (1995). *Making Economic Sense.* Auburn, AL: Mises Institute.

Rothbard, M. N. (1997, Spring). Value Implications of Economic Theory," Logic of Action I (Cheltenham, UK: Edward Elgar), pp. *American Economist*, 35-39.

Rothbard, M. N. (2002, Fall). Milton Friedman Unraveled. *Journal of Libertarian Studies, 16*(4), 37-54. Retrieved from http://www.mises.org/journals/jls/16_4/16_4_3.pdf

Rothbard, M. N. (2004 [1962]). *Man, Economy and State.* Auburn AL: Ludwig von Mises Institute, Scholar's Edition. Retrieved from http://www.mises.org/rothbard/mes.asp

Saletan, W. (2012, 08 23). *The Abortion Weathervane.* Retrieved from Slate: http://www.slate.com/articles/news_and_politics/frame_game/2012/08/romney_abortion_and_rape_he_s_a_flip_flopper_not_an_extremist_.html

Salisbury, D. F. (2003, 08 28). What Does a Voucher Buy? A Closer Look at the Cost of Private Schools. *Cato Institute Policy Analysis, 486*.

Seagraves, J. (2008, 08 26). *"Privatize The Roads!" Says PhD Economist.* Retrieved from Cutizen Economists: http://www.citizeneconomists.com/blogs/2008/08/26/privatize-the-roads-says-phd-economist/comment-page-1/#comment-950768

Shugart II, W. F. (1987). Don't Revise the Clayton Act, Scrap It! *Cato Journal*(6), 925.

Smith, J. F. (1983, Jan-Feb). Why not Abolish Antitrust? *Regulation*, 23.

Smithson, J. (2010, 02 25). *Secession as a way of achieving anarchy*. Retrieved from freedomain: http://board.freedomainradio.com/forums/p/24619/190802.aspx

Stringham, E. (2001, Summer). Kaldor-Hicks Efficiency and the Problem of Central Planning. *Quarterly Journal of Austrian Economics, 4*(2), 41-50. Retrieved from http://www.mises.org/journals/qjae/pdf/qjae4_2_3.pdf

Stringham, E. P., & White, M. (2004). Economic Analysis of Tort Law: Austrian and Kantian Perspectives. (M. Oppenheimer, & N. Mercuro., Eds.) *Law and Economics: Alternative Economic Approaches to Legal and Regulatory Issues*, 374-392. Retrieved from http://www.sjsu.edu/stringham/docs/Stringham.and.White2005.pdf

Summers, L. (2006, 11 19). The Great Liberator. *The New York Times*. Retrieved from http://www.nytimes.com/2006/11/19/opinion/19summers.html

Terrell, T. D. (1999, Fall). Property Rights and Externality: The Ethics of the Austrian School. *Journal of Markets and Morality, 2*(2). Retrieved from http://www.questia.com/read/1G1-186433151/property-rights-and-externality-the-ethics-of-the

TiMT. (2012, 08 13). *Mitt "The Lubricated Weathervane Candidate" Romney's 18 Flip Flop Positions with Videos. Who is Mitt Romney and Can You Really Trust Him to be Your President?* Retrieved from The People's View: http://www.thepeoplesview.net/2012/08/mitt-lubricated-weathervane-candidate.html

Tucker, J. (1998A, 03). Controversy: Are Antitrust Laws Immoral? *Journal of Markets & Morality, 1*(1), 75-82. Retrieved from http://www.acton.org/publications/mandm/mandm_controversy_35.php

Tucker, J. (1998B, 03). Controversy: Are Antitrust Laws Immoral? A Response to Kenneth G. Elzinga. *Journal of Markets & Morality, 1*(1), 90-94. Retrieved from http://www.acton.org/publications/mandm/mandm_controversy_37.php

Vance, L. M. (1996, 11). Friedman's Mistake. *The Free Market, 14*(11).

Wiki. (2012, 12 02). *Ludwig von Mises*. Retrieved from Wikipedia: http://en.wikipedia.org/wiki/Ludwig_von_Mises#Criticisms

Wright, G. (2010, 01 24). *The secession approach to convert people to anarchy*. Retrieved from Ludwig von Mises Institute: https://mises.org/community/forums/t/13748.aspx

Yates, S. (2002A, 07 06). *"Vouchers and Government Control.* Retrieved from LewRockwell.com: http://www.lewrockwell.com/yates/yates58.html

Yates, S. (2002B, 07 13). *Refuting the voucherites.* Retrieved from http://www.lewrockwell.com/yates/yates59.html

Young, A., & Block., W. (1999). Enterprising Education: Doing Away with the Public School System. *International Journal of Value Based Management, 12*(3), 195-207. Retrieved from http://www.mises.org/etexts/enterprisingedu.pdf; http://www.mises.org/story/2216; http://www.walterblock.com/publications/enterprising_education.pdf

Received for publication: 10.12.2012
Accepted for publication: 28.12.2012

How to cite this article?

Style – **APA** *Sixth Edition*:
Block, W. E. (2013, 01 15). Was Milton Friedman A Socialist? Yes. (Z. Čekerevac, Ed.) *MEST Journal, 1*(1), 11-26. Retrieved from www.meste.org/mest/MEST_1_2013/_02.pdf

Style – **Chicago** *Fifteenth Edition:*
Block, Walter E. "Was Milton Friedman A Socialist? Yes." Edited by Zoran Čekerevac. *MEST Journal* (MESTE NGO) 1, no. 1 (01 2013): 11-26.

Style – **GOST** *Name Sort*:
Block Walter E. Was Milton Friedman Socialist? Yes. [Journal] = Was Milton Friedman socialist? Yes // MEST Journal / ed. Čekerevac Zoran. - Belgrade - Toronto : MESTE NGO, 01 15, 2013. - 1 : Vol. 1. - pp. 11-26.

Style – **Harvard** *Anglia*:
Block, W. E., 2013. Was Milton Friedman Socialist? Yes.. *MEST Journal,* 15 01, 1(1), pp. 11-26.

Style – **ISO 690** *Numerical Reference*:
Was Milton Friedman Socialist? Yes. **Block, Walter E.** [ed.] Zoran Čekerevac. 1, Belgrade - Toronto : MESTE NGO, 01 15, 2013, MEST Journal, Vol. 1, pp. 11-26.

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JEL category: **G**, **G21**

Summary:
The article is devoted to the problem of a choice of businesses' creditworthiness estimation method, criteria of creditworthiness, defining the ways of its estimation based on a system of financial ratios (financial stability, cash flow analysis, business risk etc.)The main attention is paid to small businesses (SB) creditworthiness assessment and a choice of financial ratios, considering credit policy of a bank and operating conditions of SB. For an assessment of SB creditworthiness the authors single out five groups of ratios including liquidity rates, efficiency, financial leverage, profitability and debt servicing. Research of commercial banks experience allowed choosing business risk as an assessment of a client's credit worthiness. The authors focus attention on business risk factors; offer their grouping on stages of funds circulation and SB creditworthiness analysis procedure as follows: carrying out the general analysis of a business and its rating assessment - definition of a credit worthiness class.

Keywords:

credit worthiness, solvency, financial stability, credit worthiness criteria, business risk factors, scoring credit worthiness assessment, rating assessment

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1. Introduction

The development of small businesses in Russia is one of the important ways of solving economic and social problems. As a special sector of market economy SB is at a formation stage and its potential is not completely used. SB makes a significant contribution to formation of the competitive environment, quickly adapting to external conditions and possessing additional ability to modify end products, following the demand.

SB crediting is traditionally referred to the category of the increased risk. The arrears share in this segment in Russia in 2011 showed in significant decrease. The rate of delayed credits decreased from 9,48% to 8,96%and arrears throughout Russia's regions are differentiated. St. Petersburg is most comfortable for banks, concerning problem assets, as of 01.07.12 the arrears level here is only about 5 % that is significantly better than average values on the market. (Brovkina, 2011)

The Northwest and Southern federal districts of the Russian Federation still remain the least attractive to SB crediting. For example, in Adygea, every third credit given in this sector of economy is delayed. This statistics proves the need for search of new effective tools of a preliminary estimation of SB credit worthiness.

2. Analysis

The main problems arising when crediting an SB are non-transparency of this segment and lack of reliable pledges. Experts believe that the estimation of real condition of the borrower on the minimum set of documents is extremely difficult. The full accounting reporting doesn't fully contain all necessary data and doesn't reflect the current business processes. That is why the Russian banks, basing on world experience and their own data, work out various techniques of an assessment of SB creditworthiness, constantly balancing between quality and unprofitability of risk management methods.

Interest of banks to SB crediting is constantly growing. When crediting SB the great importance is given to the correct creditworthiness assessment.

A bank client's credit worthiness criteria define the contents of means of its assessment. These means include: business risk assessment; management assessment; a client's financial stability assessment on the basis of a system of financial ratios; cash flow analysis; collection of information about a client; supervision over work of a client on the spot.

The SB creditworthiness assessment is based on balance data, profit and loss report, loan application, information on the client and its management's history. As a means of an SB creditworthiness assessment the system of financial ratios, the analysis of cash flow, business risk and management are used. The choice of *financial ratios* is defined by a bank's specific credit policy. It is possible to single out five groups of coefficients (ratios):

- Liquidity ratio: (ratios of current liquidity; ratios of fast (operative) liquidity)
- Effectiveness or turnover ratios: (turnover of stocks; receivables turnover; turnover of fixed capital (fixed assets); turnover of assets);
- Financial leverage ratios: (ratio of all debts (short-term and long-term) and assets; ratio of all debts and own capital; ratio of all debts and share capital; ratio of all debts and the material share capital (share capital – intangible assets); ratio of long-term debt and financial (main) assets; ratio of own capital and assets; ratio of working own capital and current assets);
- Profitability ratios: (ratios of the return rate; ratios of profitability; ratios of profit rate per share);
- Ratios of debt service (market ratios): (interest coverage ratio; cover of fixed payments ratio).

Cash flow analysis - the second method of a commercial bank client's creditworthiness assessment based on the use of actual indicators characterizing account turnover of the client in the accounting period. In this way it essentially differs from the method of client's creditworthiness assessment based on the system of financial ratios.

Cash flow analysis is a comparison of outflow and inflow of the borrower's money over a period

corresponding to loan term. Considering the expediency and the amount of the loan, look-ahead information on cash flow for the planned period is taken into account. The forecast of the size of separate elements of inflow and outflow of funds is based on their average values during last periods and planned rates of sales proceeds growth.

When using an SB balance sheet for creating a borrower's cash flow, it is possible to single out both positive and negative moments. The positive issues are the speed and simplicity of this method of calculation. Negative issue is the low accuracy of calculations connected with its being based not on gross but on pure cash flows (the difference in arithmetic results) that is less informative. Besides, in spite of the fact that the total size of cash flow coincides with the size of money change, values of cash flows in different types of activity can be distorted, owing to retained income (loss) in the balance sheet, for example, it is the sum of profits (losses) from operational, investment and financial types of activity. Possible distortion also occurs because of outflows and inflows of money on absolute values comparable to balance currency.

When using profit and loss report as a basis for calculation of cash flow there are many problems. First, the profit and loss report of an SB is constructed on the basis of an accrual concept: both incomes and expenses here are reflected not at the moment of payment, but at the moment of charge. For example, prime cost of the sold goods represents added cost of expenses which practically doesn't coincide with the sum of the paid money relating to this expense item. Secondly, the profit and loss report reflects not only monetary funds, but also non-monetary incomes and expenses. Classical example is the amortization which size is added to realization profit upon transition from one report to another. Thus, at the first stage there is a transition from the added sums to really received (paid) sums of money. At the second stage there is a regrouping of expense items. In spite of the fact that the given total size of sales income reflects the value of cash flow from the operating activities, the remained incomes and expenses are rather difficult to classify between investment and financial activities. Therefore a profit and loss report can be used by a credit organization as a basis of cash flow calculation, but in this case one of principles of drawing up a cash flow report, i.e. division of cash flows into operational, investment and current will be broken.

The direct method of cash flow calculation allows neutralizing minuses of the indirect method.

The main advantage of the direct method is that it shows gross receipts and payments of money. The knowledge of sources of receipts and the directions of use of money can appear useful in the estimation of cash flow in the future. In other words it is possible to define future size of cash flow only on the basis of the direct method. It is obvious that the relative sizes of main types of receipts and expenses in their interrelation with other points of financial reports are more informative than their arithmetic results.

The sums of gross receipts and payments are especially important while estimating a borrower's creditworthiness as they show turnover of inflows and outflows of monetary funds. Absolute values of cash flows of two SB can coincide while inflows and outflows amounts can differ by several digits.

From a forecast of cash flow it is important to take information on buyers which form the main share of receipts into a company accounts, stability of these receipts, the schedule of payments and discipline of their execution by the customers, expenses of SB and their continuity or discontinuity.

Thus, the analysis of a borrower's cash flow represents an effective tool of its creditworthiness assessment, and planning of a cash flow allows predicting behavior of a borrower in the future and estimating the sources of credit repayment. Commercial banks also use in the practice the analysis of business risk as the third way of a client's creditworthiness assessment. The business risk – the risk caused by the fact that circulation of a borrower's funds may not end up in time and with expected effect. The business risk leading to discontinuity and delay in circulation of funds of a borrower, is a way of estimating the risk of a borrower or level of a client's creditworthiness. At the same time factors of business risk depend on the stage of funds circulation a crediting object belongs to. In this aspect the business risk can be considered as a

way of a product risk assessment. Factors of business risk can be grouped in stages of funds circulation: (Stage I - creation of stocks; Stage II - production; Stage III - sale). In conditions of economic instability the analysis of business risk at the moment of a loan grant essentially supplements a client's creditworthiness assessment. (Sevruk, 2012)

The analysis of a business creditworthiness assessment includes two main stages: general analysis of creditworthiness and rating assessment of a business. At the first stage calculation of system of financial ratios is carried out, and the second stage assumes definition of a creditworthiness class. The creditworthiness class of a client is defined on the basis of the main indicators and is corrected taking into account additional indicators. The main indicators should be invariable. A bank's credit policy document and other documents fix these indicators and their standard levels which are sometimes focused on the international standards, but are individual for each bank and the estimated period. A set of additional indicators (the assessment of business risk and management, arrears duration, the indicators calculated on the basis of an SB activity results and its balance analysis) can be reconsidered depending on a situation.

It is possible to determine a creditworthiness class by a scale. For calculation of points a class of indicator is used which is determined by comparing the actual value and the standard, and also a rating indicator (by %). The general creditworthiness assessment is given in points. The point is the sum of product of each indicator rating and creditworthiness class. Class I is given for 100-150 points, class II - for 151-250 points and class III - for 251-300 points.

One more feature of an SB: their heads and workers are quite often members of one family or relatives. The personal capital of the owner mixes up with the business capital. While estimating an SB creditworthiness the financial position of the owner is considered. A bank's assessment system, conducting the reporting in a simplified form, includes the following elements: business risk assessment; supervision over a client's work; interview of a banker with the owner of a business; assessment of personal financial position of the owner; analysis of financial position of a business on the basis of primary documents. (Krjukov, 2009)

The assessment of an individual creditworthiness is based on a ratio of the loan and his personal income, the general assessment of financial position of a borrower and cost of his property, family structure, personal characteristics, studying of his credit history. There are three main methods of an individual creditworthiness assessment: scoring assessment; studying of credit history; an assessment of financial rates of solvency. (Lapusta & Mazurina, 2011)

Scoring assessment determines the system of criteria and related indicators of a borrower's ability to repay to bank a principal debt and interest; indicators are estimated in points within the maximum established by a bank, and the general mark assessment of creditworthiness is therefore deduced. Different models of scoring assessment of an individual creditworthiness are known.

In the model constructed on the point assessment of a system of separate indicators, the importance of indicators of creditworthiness of an individual is defined by differentiation of level of maximal mark assessment. The model groups information on indicators of creditworthiness of an individual. For example, «Paris Credit» singles out three sections in a scoring assessment of consumer credit expediency: (information on the credit; data on the client; financial position of the client).

It is possible to define a class of an individual creditworthiness on the basis of the model containing a scale of points which is constructed depending on an indicator of creditworthiness. Depending on a class the bank defines a scale of deadlines and the credit sum (% of yearly revenue of the client). At the first stage a preliminary estimation of a loan possibility, based on the data of a client’s questionnaire is given. By the results of filling of the test questionnaire the number of points gained by the borrower is defined and the protocol of an assessment of a loan obtaining possibility is signed. If the score is less than 30, the refusal in giving a loan is fixed in the protocol. If the score is more than 30, at the second stage the risk is estimated more carefully taking into account the additional facts.

For an assessment of an individual creditworthiness, the analysis on the basis of studying of his credit history is carried out. To receive information on credit history of an individual in Russia a specialized bureau was created on the initiative of commercial banks.

The assessment of an individual creditworthiness also assumes the analysis on the basis of financial performance of his solvency. The indicators of solvency are based on the data on the income of an individual and degree of this income loss risk. When giving a single loan commercial banks calculate solvency of an individual borrower on the basis of his monthly average income in previous six months which is determined by a salary certificate or tax declaration. The income is decreased by obligatory payments and corrected according to a ratio which is differentiated depending on the income size (from 0,3 to 0,6). The more his income is the more is the adjustment.

Thus, as it was already noted earlier, creditworthiness of a borrower depends on many factors. This already makes difficulties, for each factor, and for bank these are risk factors, should be estimated and calculated.

The analysis of cash flow essentially supplements the conclusion about a client's creditworthiness. It is necessary to give special attention to average ratio of cash flow change during three last R

$$R = \frac{\frac{C_1}{C_0}+\frac{C_2}{C_1}+\frac{C_3}{C_2}}{Q}$$

where:

R - average ratio of cash flow change;
$C_1, C_2, \ldots C_n$ – cash flow during different reporting periods;
Q – quantity of the reporting periods.

As well as to an indicator of a predicted flow (Zabolockaja & Aristarhov, 2009):

$$PFI = C_3 \cdot R$$

where:

PFI – predicted flow indicator
C_3 – change (inflow, outflow) of monetary funds.

The size of a given short-term credit shouldn't exceed the size of a predicted cash flow.

Irrespective of the way of an SB accounting procedure (usual or simplified) the total rating assessment of creditworthiness is the most important and decisive indicator. Value of a credit rating is formed on the basis of the analysis of a set of quantitative and qualitative indicators. The appropriated credit rating is used by banks for various purposes, including:

- determination of placed resources cost (a low class of creditworthiness increases an extra charge for risk, making the attraction of funds less attractive);
- formation of reserves in case of possible loans losses;
- definition of credit limits;
- analysis of a credit portfolio respecting classes of credit rating, with the purpose of estimating credit risk;
- bonuses to the employees placing loan able funds.

In theoretical approach it is necessary to differentiate concepts of a borrower's rating and a loan rating. Both these concepts are closely connected with the credit, however if a borrower's rating is entirely based on his creditworthiness, the loan rating considers additional features of a specific business deal, such as sufficiency and liquidity of pledge, credit term, existence of guarantees and surety ships etc. The credit rating of the borrower is a more general basic indicator in comparison with a loan rating. A world-wide circulation received a concept of obligations rating, similar to concept of a loan rating in Russia. So, leading rating agencies of Russia regularly publish not only credit ratings of SB organizations, but also their obligations ratings taking into account individual conditions of these obligations.

Ratings in Russia differ from ones developed by foreign rating agencies by the fact that in Russia there are not so many classes of rating, and also increasing importance is lent to the factors of a borrower's business stability.

The «+» symbol means that the main characteristics of a bank's conditions are slightly higher than the average level of characteristics of this rating measurement. The «-» symbol means that the main characteristics of a bank's

conditions are a little lower than the average characteristics of this rating measurement.

The assessment of a borrower's creditworthiness represents a process of selection and analysis of the indicators influencing the size of credit risk, their analysis and ordering in the form of a credit rating assignment. The credit rating of the borrower should not only reflect the current financial state of the borrower, but also give a forecast for the future.

Table 1.Ratings scale (Rus Rating)

Rating	Designation
AAA(+-)	A very high degree of creditworthiness. The financial condition is estimated as steady and stable. Low sensitivity to a long stress period. Country risk is low or absent.
AA(+-)	High degree of creditworthiness. The financial condition is estimated as steady and stable. Low sensitivity to a long stress period. Country risk is low.
A(+-)	High degree of creditworthiness. The financial condition is estimated as steady and stable. Low sensitivity to along stress period. Country risk is high.
BBB(+-)	Relatively high degree of creditworthiness. The financial condition is estimated as steady and stable. High stability to medium-term stresses, with hypersensitivity to stresses of longer character.
BB(+-)	Average degree of creditworthiness. The financial condition is estimated as satisfactory and stable. High stability to short-term stresses, with hypersensitivity to stresses of longer character.
B(+-)	Degree of creditworthiness insignificantly below average. The financial condition is estimated as satisfactory and stable. Moderate stability to short-term stresses, with high sensitivity to stresses of longer character.
CCC(+-)	Degree of credit worthiness is lower than average. The main indicators of financial conditions are estimated as satisfactory, but their stability is doubtful. Low stability to influence of stresses.
CC(+-)	Low degree of solvency. The main indicators of a financial condition are estimated as close to satisfactory, with their low stability.
C	Inadmissibly low degree of creditworthiness. The financial condition is estimated as unsatisfactory and unstable. The positive balance is probableafterelimination.
D	Stage of bankruptcy procedure.

The increase of the credit term, as a rule, raises the level of credit risk, suggesting increased requirements to more careful assessment of a borrower's creditworthiness. It is possible to single out some stages of such assessment:

1. the analysis of macroeconomic situation in a country (Macroeconomic analysis);
2. industry analysis (Industry analysis);
3. a borrower's market position (Market position);
4. analysis of the financial position (Quantitative analysis);
5. management assessment (Qualitative analysis);
6. credit rating assignment (Rating).

The main indicator of a borrower's creditworthiness is his credit rating. When assigning a credit rating banks range borrowers on various classes. According to The Basel committee, banks on the average use 10 various classes of creditworthiness assessment. In many respects this is because there is a tendency among banks to coordinate the internal system of ranging with the systems used by the leading rating agencies. The increase of rating classes is characteristic of the banks counting profitability and level of credit risk in dependence on a credit rating.

There are also rating classes which characterize a default (pre-default) condition of the borrower. The number of rating classes has increased

recently, and large banks use more classes in comparison with smaller banks. This is explained by the fact that, on the one hand, the large credit organizations work with big, difficult loan portfolios, and are therefore subject to higher credit risk, and, on the other hand, expanded possibilities of use of material and human resources while introducing an assessment system. Nevertheless, the excessive increase in the number of classes may lead to complication of a bank's work.

Three main ways of modeling of a borrower's creditworthiness level may be distinguished:

- models based on statistical methods of assessment;
- models of a limited expert assessment;
- models of direct expert assessment.

Such distinctions are caused by priority of use quantitative (calculation of financial ratios) and qualitative (opinion of bank experts) ways of analysis. But in practice differences are corrected in various ways. So, for example, information used in statistical assessment methods, is initially processed by the bank workers that gives some subjectivity features. There are also differences in estimations whether some factors are qualitative or quantitative. For example, in some cases such qualitative factors as credit history, quality of management of a borrower, industry practices or geographic location, received a quantitative assessment in points and were further used in quantitative calculations.

Statistical models of creditworthiness assessment represent process of assignment of a credit rating only on the basis of a quantitative, statistical analysis and consequently only some banks fully rely on statistical models. Similar models are based on calculation of a credit rating by a certain formula including both quantitative factors – financial ratios, and some qualitative factors, standardized and brought to quantitative value aspects of a borrower's activity, for example, industry practices, credit history.

The process of functioning of a statistical model passes three stages.

At the first stage variables (financial ratios), influencing the value of a credit rating are defined.

At the second stage, on the basis of statistical data of last periods, influence of each factor on creditworthiness level is defined. This consequently affects the ratio value.

At the third stage the current variables are measured according to their extent of influence and a certain value of a rating, expressed in points, is defined. Various points correspond to various classes of a borrower's creditworthiness. Economic calculations in this case are carried out by application of software thus reducing human factor to minimal value. Such systems of an assessment are generally used for the analysis of creditworthiness of small and medium-sized businesses.

Models of a limited expert assessment are based on application of statistical methods with the subsequent adjustment on the basis of certain qualitative parameters. For example, the numerical score of a rating can be corrected by some points depending on a credit expert opinion. Also a bank can establish the maximum number of points for an assessment of qualitative parameters, thus limiting the influence of subjective factors on the final rating value.

Models of direct expert assessment are used by banks when determining creditworthiness of average borrowers. Such assessment makes it almost impossible to define the influence of this or that factor on the size of a credit rating. Economists count financial ratios, but values are interpreted individually for each borrower. Nevertheless, in certain cases at the initial stage of an assessment, exactly statistical models are used, setting the direction and limits of further analysis.

Influence of a human factor is of great importance for determination of reliability and credibility of a credit rating. Studying of possible motives and interest in distortion of an assessment results allows taking into account deviations from reality.

Besides the analysis of the current position of a borrower and the retrospective analysis, the great role in the further analysis of a credit rating is played by the time horizon during which the rating is valid. Originally the rating is appropriated at an initial stage of relationship between a bank and an SB borrower, i.e. before granting a credit. The Basel committee notes that many banks establish

a rating with the subsequent annual revision. There are two types of time horizons of a rating assessment: «a rating through a business cycle» and «a rating over a certain period of time». The main distinction between these concepts is that the credit rating over a certain period of time is subject to considerable fluctuations depending on a phase of a business cycle, while the rating through a business cycle considers the worst value of a credit rating corresponding to a depression phase. Such rating doesn't test serious fluctuations throughout time.

The analysis of the largest banks activity shows that credit ratings are appropriated not to all borrowers of a credit organization. Quite considerable part of medium-sized and small enterprises in Russia doesn't possess a rating.

The majority of banks in Russia do not limit themselves to definition of a credit rating of a borrower and probability of his default. Thereafter the level of a possible loss in case of a default of a specific type of asset is determined and the securities provided by the borrower together with other possibilities of credit risk reduction are studied. In this case the rating reflects not only the level of credit risk, but also the risk value in separate active banking operations.

The Basel committee recommends using one of two approaches to credit risks calculation: the standardized approach (standardized) and an approach on the basis of internal rating system use (internal rating based system - IRB).

The standardized approach to the credit risk assessment is simpler in comparison with the use of internal rating system. It assumes the use of the differentiated system of risk scale, without demanding bulky calculations. The credit risk scale determination is based on the credit rating appropriated to this borrower/obligation by a third-party organization, specializing in assignment of credit ratings. Bodies of bank supervision form a list of credit agencies, whose ratings can be used in calculations. (Tihomirova, 2010)

The Basel committee suggests to weigh considered type of assets according to risk degrees (table2).

Table 2 The assets weighed by degrees of risk

Credit rating appropriated by an agency	AAA – AA	A+ – A-	BBB+ – BB-	Below BB-	No rating
Risk, %	20	50	100	150	100

Compliance of this or that rating to risk rate is defined by a bank supervision bodies, taking into account objective factors, including historically developed levels (probabilities) of a default.

The approach on the basis of internal rating system (IRB) is based on a system of credit ratings creation, used by a bank independently. Such approach is more sensitive to credit risk and stimulates further improvement of intra-bank systems of rating assessment. The analysis of such systems given by the Basel committee, testifies that banks successfully count indicators of creditworthiness and credit risks on the basis of internal assessment systems:

- systems based on the analysis of a borrower's creditworthiness;
- systems based on the analysis of specific instruments of active operations;
- systems combining the analysis of a borrower's creditworthiness and the analysis of instruments of active operations.

Various bank operations are subject to various degrees of risk. Moreover, there exist not only absolute values of risk, but also the reasons, the factors being in a basis and inherent in each group of active operations. When crediting an organization there occur the following risk components:

- Probability of default (PD) is the main indicator characterizing the level of creditworthiness of a borrower. It reflects possible probability of a default according to

all obligations of a business as the calculation of PD is based on the financial condition of a borrower.

- Loss Given Default (LGD). It concerns the features of active operations. Level of a possible loss is determined by extent of provided obligations on a business deal, existence of received guarantees, use of credit derivatives etc.;
- Exposure at default (EAD). This sum characterizes absolute value of requirements of a bank to the borrower on a specific active operation;
- Maturity (M). It is obvious that the period of credit agreement validity influences the value of a credit risk. The long-term credits are traditionally considered as more risky in comparison with the short-term ones.

At the following stage there is a calculation of scales of separate active operations and weighing of assets according to risk degree. The final stage – comparison of own funds of a bank and the assets weighed according to the risk degree.

3. Conclusion

So, summing up all said above, it is possible to draw a conclusion that financial factors and methodology of their calculation have basic value in an SB borrower creditworthiness estimation. The reason is that financial factors, besides that they can serve as an independent method of a borrower's creditworthiness assessment, are a key factor for transition to a credit rating of a borrower. Despite existing distinctions in modern bank practice, it is possible to single out four groups of such factors: factors of liquidity, turnover, leverage and profitability. The credit rating is calculated on the basis of a set of quantitative and qualitative indicators. Difficulty of their interpretation concerning SB makes a creditworthiness assessment a subjective and insufficiently reliable instrument of credit risk management. The analysis of cash flow of the borrower represents more effective tool for an SB creditworthiness assessment. Planning of cash flow allows to predict behavior of a borrower in the future and to estimate sources for credit repayment.

Works Cited

Brovkina, N. (2011). Tendencii razvitija produktov rossijskogo kreditnogo rynka. *Den'gi i kredit*(3), 37- 43.

Krjukov, S. (2009). O novyh tendencijah v kreditovanii malogo i srednego biznesa. *Finansy*(2), 19-23.

Lapusta, M., & Mazurina, T. (2011). Problemy kreditovanija malogo biznesa v Rossii. *Finansy*(4), 12-16.

Sevruk, V. (2012). Analiz kreditosposobnosti MP. *Den'gi i kredit, 3*, 3-7.

Tihomirova, E. (2010). Kreditovanie malogo i srednego biznesa - perspektivnoe napravlenie kreditnoj politiki bankov. *Den'gi i kredit*(1), 46-53.

Zabolockaja, V., & Aristarhov, A. (2009). Metodika ocenki kreditosposobnosti predprijatij malogo biznesa. *Finansy i kredit*(12), 61-73.

Received for publication: 26.09.2012
Accepted for publication: 16.11.2012

How to cite this article?

Style – **APA** *Sixth Edition*:
Prigoda, L., Paladova, T., & Malceva, E. (2013, 01 15). Small business creditworthiness assessment. (Z. Čekerevac, Ed.) *MEST Journal, 1*(1), 27-36. Retrieved from www.meste.org/mest/MEST_1_2013/_03.pdf

Style – **Chicago** *Fifteenth Edition:*
Prigoda, Ludmila, Tatiana Paladova, and Elena Malceva. "Small business creditworthiness assessment." Edited by Zoran Čekerevac. *MEST Journal* (MESTE NGO) 1, no. 1 (01 2013): 27-36.

Style – **GOST** *Name Sort*:
Prigoda Ludmila, Paladova Tatiana and Malceva Elena Small business creditworthiness assessment [Journal] = Small business creditworthiness assessment // MEST Journal / ed. Čekerevac Zoran. - Belgrade - Toronto : MESTE NGO, 01 15, 2013. - 1 : Vol. 1. - pp. 27-36.

Style – **Harvard** *Anglia*:
Prigoda, L., Paladova, T. & Malceva, E., 2013. Small business creditworthiness assessment. *MEST Journal,* 15 01, 1(1), pp. 27-36.

Style – **ISO 690** *Numerical Reference*:
Small business creditworthiness assessment. **Prigoda, Ludmila, Paladova, Tatiana and Malceva, Elena.** [ed.] Zoran Čekerevac. 1, Belgrade - Toronto : MESTE NGO, 01 15, 2013, MEST Journal, Vol. 1, pp. 27-36.

MEST JOURNAL

MULTIFACTORIAL TESTING OF ROLLER BEARING RELIABILITY

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JEL category: **C0**, **C02**, **C6**, **C63**

Summary:
This paper describes one model of the method of accelerated multi-factorial testing of roller bearing reliability, that represents the result of many years of work and research of the author in the field of technical system effectiveness, and that treats, from the theoretical point of view, a completely new method of multi-factorial reliability testing, which the broader scientific and expert circles are not yet familiar with. The method of accelerated multi-factorial testing of roller bearing reliability, treated by this work, contains significant advantages with respect to all other methods of reliability testing, which have been used so far in the engineering reliability testing practice in the world..

Keywords:
reliability, multifactorial testing, roller bearing, effectiveness

1. Introduction

The basic attributes of the method of accelerated multi-factorial testing of reliability of a mechanical system elements, described in this work, are as described in the text below:

- The function of the diagnostical parameter change in time is attained within the desired scope of the parameter;
- New plans for reliability testing in multi-factorial area (space).
- New statistical method based on regression analysis.
- Enormous decrease of the number of experiments, and thereby of the costs of reliability testing in multi-factorial space.
- Interpretation of testing results is enabled in the form of Weibull distribution law in the whole defined multi-factorial space.

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2. Influential factors

Testing of roller bearing reliability in this example is done in the seven-factor space, where the influential factors are given in the Table 1.

Table 1. Influential factors

Factors	Factor Type	Abbreviation	Unit of Measure	Bottom Level X_d	Top Level X_g	Variation Interval $W=(X_g - X_d)/2$
X_1	Mean value of radial loadnormal distribution	M_r	kN	2	4	1
X_2	Standard deviation of radial loadnormal distribution	σ_r	kN	0.5	2	0.75
X_3	Mean value of axial loadnormal distribution	M_a	kN	0	2	1
X_4	Standard deviation of axial loadnormal distribution	σ_a	kN	0.5	2	0.75
X_5	Viscosity	k		0.1	4	1.95
X_6	Contamination	η_c		0	1	0.5
X_7	Diagnostic parameter	D	mm^2	3	6	1.5

3. Testing plan

The plan-testing matrix is formed in the following way:

The reliability testing plan matrix in a seven-factor area is arrived at, by taking the seven-factor process as the initial basis, whose complete orthogonal plan 2^7 contains 128 different points. The $2^{7-3} = 2^4$ replica, with the number of 16 experiments, is formed by choosing of the next generator, i.e. the corresponding contrast (Koldžić, 1999), (Stanić, 1990):.

$x_5 = x_1x_2$ $\quad J = x_1x_2x_5$

$x_6 = x_3x_4$ $\quad J = x_3x_4x_6$

$x_7 = x_1x_4$ $\quad J = x_1x_4x_7$

$J = x_1x_2x_5 = x_3x_4x_6 = x_1x_4x_7 = x_2x_4x_5x_7 = x_1x_3x_6x_7$

The testing plan and the results are given in the Table 2, where x_1, x_2, x_3, x_4, x_5, x_6, x_7, are the coded values of the factors X_1, X_2, X_3, X_4, X_5, X_6, X_7, so that **1** in the Table 2 represents the maximum factor value (the top level in the Table 1), with **–1** representing the minimum value (bottom level in the Table 1). The experiments are conducted, obviously, only at maximum and minimum values of influential factors. The experimental results are given in millions of (r) revolutions of roller bearings to failure.

Table 2 The testing plan and results

Ian items	Plan matrix Xs							Experimental results Y				
								* $y=10^{-1}\ln r$, $\bar{y} = \sum y / 4$				
	x_1	x_2	x_3	x_4	x_5	x_6	x_7	y_1	y_2	y_3	y_4	$\bar{y}$
1	1	1	1	1	1	1	1	0.7	1.4	2.1	2.3	1.625
2	1	1	1	-1	1	-1	-1	0.05	1	1.4	2.2	1.1125
3	1	1	-1	1	1	-1	1	0.9	1.4	2.2	2.8	1.825
4	1	1	-1	-1	1	1	-1	0.9	1.3	2	2.8	1.975
5	1	-1	1	1	-1	1	1	1.2	2	2.3	3	2.125
6	1	-1	1	-1	-1	-1	-1	1.3	2	2.6	3.2	2.275
7	1	-1	-1	1	-1	-1	1	1.3	2.1	2.7	3.1	2.325
8	1	-1	-1	-1	-1	1	-1	5.4	6	6.8	7.4	6.4
9	-1	1	1	1	-1	1	-1	1.5	2.2	2.5	3.4	2.4
10	-1	1	1	-1	-1	-1	1	2	2.5	3	3.9	2.85
11	-1	1	-1	1	-1	-1	-1	2.1	3	3.8	4.3	3.3
12	-1	1	-1	-1	-1	1	1	6.4	7	7.6	8.3	7.325
13	-1	-1	1	1	1	1	-1	3	3.5	4.3	4.9	3.9
14	-1	-1	1	-1	1	-1	1	4	4.6	5.5	5.8	4.975
15	-1	-1	-1	1	1	-1	-1	1	1.3	2	2.8	1.77
16	-1	-1	-1	-1	1	1	1	7	8	8.4	9	8.1

* *r – number of revolution till failure*

4. Testing results processing

$$X_S = \underset{(16\times 15)}{\begin{Vmatrix} x_0 & x_1 & x_2 & x_3 & x_4 & x_5 & x_6 & x_7 & x_2x_4 & x_2x_3 & x_1x_6 & x_2x_6 & x_4x_5 & x_3x_5 & x_5x_6 \\ 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 & -1 & 1 & -1 & -1 & -1 & 1 & -1 & -1 & -1 & 1 & -1 \\ 1 & 1 & 1 & -1 & 1 & 1 & -1 & 1 & 1 & -1 & -1 & -1 & 1 & -1 & -1 \\ 1 & 1 & 1 & -1 & -1 & 1 & 1 & -1 & -1 & -1 & 1 & 1 & -1 & -1 & 1 \\ 1 & 1 & -1 & 1 & 1 & -1 & 1 & 1 & -1 & -1 & 1 & -1 & -1 & -1 & -1 \\ 1 & 1 & -1 & 1 & -1 & -1 & -1 & -1 & 1 & -1 & -1 & 1 & 1 & -1 & 1 \\ 1 & 1 & -1 & -1 & 1 & -1 & -1 & 1 & -1 & 1 & -1 & 1 & -1 & 1 & 1 \\ 1 & 1 & -1 & -1 & -1 & -1 & 1 & -1 & 1 & 1 & 1 & -1 & 1 & 1 & -1 \\ 1 & -1 & 1 & 1 & 1 & -1 & 1 & -1 & 1 & 1 & -1 & 1 & -1 & -1 & -1 \\ 1 & -1 & 1 & 1 & -1 & -1 & -1 & 1 & -1 & 1 & 1 & -1 & 1 & -1 & 1 \\ 1 & -1 & 1 & -1 & 1 & -1 & -1 & -1 & 1 & -1 & 1 & -1 & -1 & 1 & 1 \\ 1 & -1 & 1 & -1 & -1 & -1 & 1 & 1 & -1 & -1 & -1 & 1 & 1 & 1 & -1 \\ 1 & -1 & -1 & 1 & 1 & 1 & 1 & -1 & -1 & -1 & -1 & -1 & 1 & 1 & 1 \\ 1 & -1 & -1 & 1 & -1 & 1 & -1 & 1 & 1 & -1 & 1 & 1 & -1 & 1 & -1 \\ 1 & -1 & -1 & -1 & 1 & 1 & -1 & -1 & -1 & 1 & 1 & 1 & 1 & -1 & -1 \\ 1 & -1 & -1 & -1 & -1 & 1 & 1 & 1 & 1 & 1 & -1 & -1 & -1 & -1 & 1 \end{Vmatrix}}$$

$$\bar{Y} = \begin{Vmatrix} 1.625 \\ 1.113 \\ 1.825 \\ 1.975 \\ 2.125 \\ 2.275 \\ 2.325 \\ 6.4 \\ 2.40 \\ 2.85 \\ 3.3 \\ 7.325 \\ 3.9 \\ 4.975 \\ 1.77 \\ 8.1 \end{Vmatrix} \quad \hat{Y} = X_s \cdot B = \begin{Vmatrix} 1.56 \\ 1.05 \\ 1.89 \\ 2.04 \\ 2.06 \\ 2.21 \\ 2.39 \\ 6.46 \\ 2.46 \\ 2.91 \\ 3.24 \\ 7.26 \\ 3.96 \\ 5.04 \\ 1.71 \\ 8.04 \end{Vmatrix} \quad B = 16^{-1} X_s{}' \bar{Y} = \begin{Vmatrix} 3.39 \\ -0.93 \\ -0.59 \\ -0.73 \\ -0.98 \\ -0.23 \\ 0.84 \\ 0.50 \\ 0.47 \\ -0.07 \\ -0.27 \\ -0.31 \\ 0.10 \\ 0.48 \\ -0.10 \end{Vmatrix} \quad \begin{Vmatrix} b_0 \\ b_1 \\ b_2 \\ b_3 \\ b_4 \\ b_5 \\ b_6 \\ b_7 \\ b_{24} \\ b_{23} \\ b_{16} \\ b_{26} \\ b_{45} \\ b_{35} \\ b_{56} \end{Vmatrix}$$

Table 3 The testing results

$e_1 = y_1 - \hat{y}$ $e_2 = y_2 - \hat{y}$ $e_3 = y_3 - \hat{y}$ $e_4 = y_4 - \hat{y}$ $e = \bar{y} - \hat{y}$						$m = \frac{\bar{e}}{\lvert\bar{e}\rvert}$ $m = \frac{\bar{e}_1}{\bar{e}_j}$	$\boldsymbol{E}$ $E_1 = e_1 m$ $E_2 = e_2\, m$ $E_3 = e_3\, m$ $E_4 = e_4\, m$			
$\hat{y}$	$\bar{e}$	e_1	e_2	e_3	e_4	m	E_1	E_2	E_3	E_4
1.564	0.061	-0.86	-0.16	0.54	0.74	1	-0.86	-0.16	0.54	0.74
1.051	0.061	-1.00	-0.05	0.35	1.15	1	-1.00	-0.05	0.35	1.15
1.886	-0.061	-0.99	-0.49	0.31	0.91	-1	0.99	0.49	-0.31	-0.91
2.036	-0.061	-1.14	-0.74	-0.04	0.76	-1	1.14	0.74	0.04	-0.76
2.064	0.061	-0.86	-0.06	0.24	0.94	1	-0.86	-0.06	0.24	0.94
2.214	0.061	-0.91	-0.21	0.39	0.99	1	-0.91	-0.21	0.39	0.99
2.386	-0.061	-1.09	-0.29	0.31	0.71	-1	1.09	0.29	-0.31	-0.71
6.461	-0.061	-1.06	-0.46	0.34	0.94	-1	1.06	0.46	-0.34	-0.94
2.461	-0.061	-0.96	-0.26	0.04	0.94	-1	0.96	0.26	-0.04	-0.94
2.911	-0.061	-0.91	-0.41	0.09	0.99	-1	0.91	0.41	-0.09	-0.99
3.239	0.061	-1.14	-0.24	0.56	1.06	1	-1.14	-0.24	0.56	1.06
7.264	0.061	-0.86	-0.26	0.34	1.04	1	-0.86	-0.26	0.34	1.04
3.961	-0.061	-0.96	-0.46	0.34	0.94	-1	0.96	0.46	-0.34	-0.94
5.036	-0.061	-1.04	-0.44	0.46	0.76	-1	1.04	0.44	-0.46	-0.76
1.709	0.061	-0.71	-0.41	0.29	1.09	1	-0.71	-0.41	0.29	1.09
8.039	0.061	-1.04	-0.04	0.36	0.96	1	-1.04	-0.04	0.36	0.96

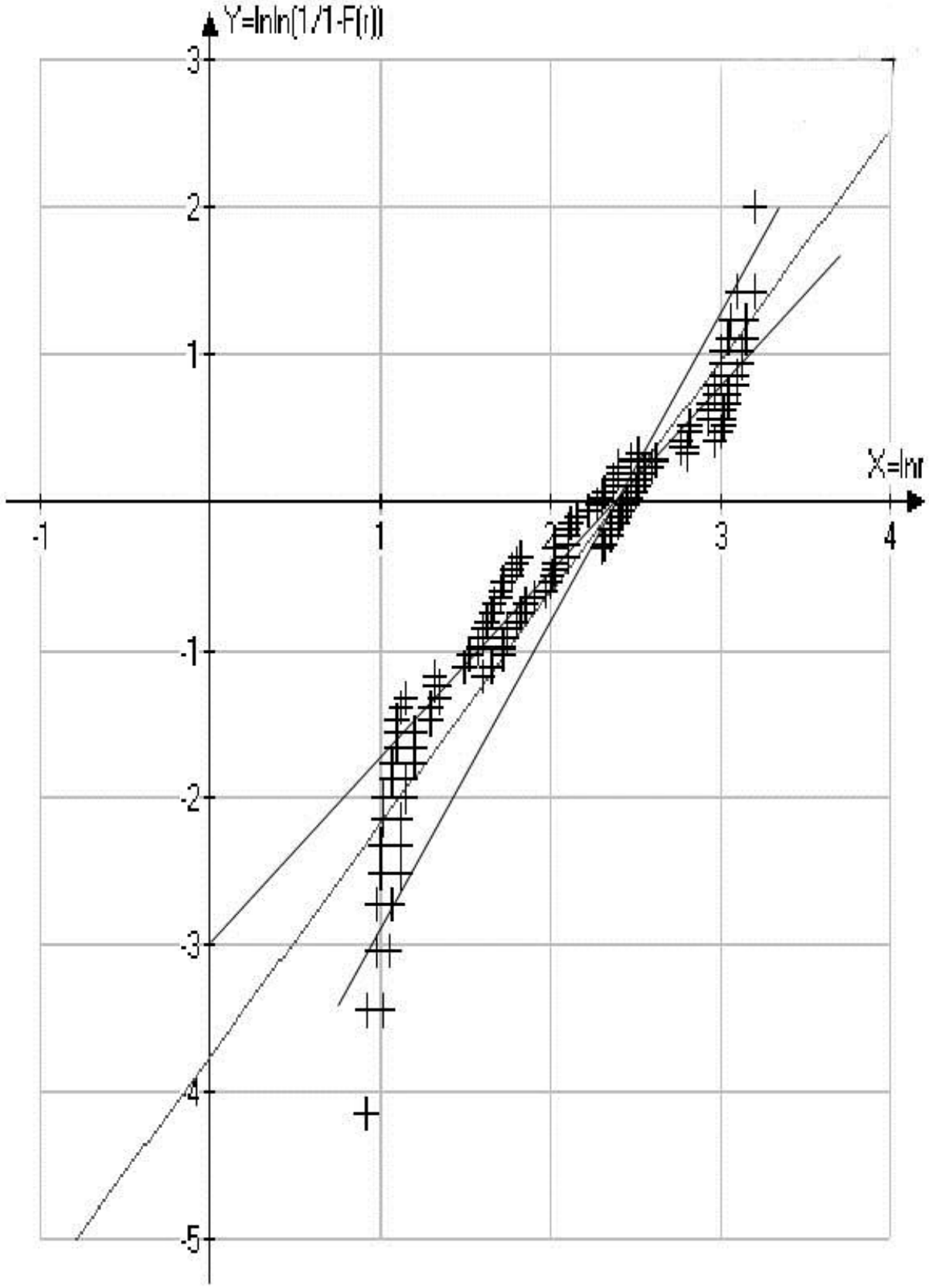

Figure 1 The testing results

Table 4. The testing results

*The remainder E is lined in one column by the rising sequence, and in another one by the declining one. $Y'' = \ln(1-n/N)^{-1}$

$X' = \hat{y}_5 + E$ $X'' = \hat{y}_5 - E$ $Y = \ln\ln(1-n/N)^{-1}$ $N=64$

n	*E	*E	$\hat{y}_5$	X'	X''	$1-n/N$	$(1-n/N)^{-1}$	Y'	**Y**	$(X')^2$	$(X'')^2$	$X' \cdot Y$	$X'' \cdot Y$
1	-1.14	1.15	2.06	0.92	0.91	0.98	1.02	0.02	-4.15	0.85	0.83	-3.82	-3.78
2	-1.04	1.14	2.06	1.02	0.92	0.97	1.03	0.03	-3.45	1.04	0.85	-3.52	-3.19
3	-1.00	1.09	2.06	1.06	0.97	0.95	1.05	0.05	-3.04	1.12	0.94	-3.22	-2.94
4	-0.99	1.09	2.06	1.07	0.97	0.94	1.07	0.06	-2.74	1.15	0.95	-2.94	-2.67
5	-0.94	1.06	2.06	1.12	1.00	0.92	1.08	0.08	-2.51	1.26	1.00	-2.81	-2.51
6	-0.94	1.06	2.06	1.12	1.00	0.91	1.10	0.10	-2.32	1.26	1.00	-2.60	-2.32
7	-0.94	1.04	2.06	1.12	1.02	0.89	1.12	0.12	-2.16	1.26	1.05	-2.42	-2.21
8	-0.91	1.04	2.06	1.15	1.02	0.88	1.14	0.13	-2.01	1.31	1.05	-2.31	-2.06
9	-0.91	0.99	2.06	1.15	1.07	0.86	1.16	0.15	-1.89	1.31	1.15	-2.16	-2.03
10	-0.86	0.99	2.06	1.20	1.07	0.84	1.19	0.17	-1.77	1.43	1.15	-2.12	-1.90
11	-0.86	0.96	2.06	1.20	1.10	0.83	1.21	0.19	-1.67	1.43	1.21	-2.00	-1.83
12	-0.86	0.96	2.06	1.20	1.10	0.81	1.23	0.21	-1.57	1.43	1.21	-1.88	-1.73
13	-0.76	0.96	2.06	1.30	1.10	0.80	1.25	0.23	-1.48	1.68	1.21	-1.92	-1.63
14	-0.76	0.94	2.06	1.30	1.12	0.78	1.28	0.25	-1.40	1.68	1.26	-1.81	-1.57
15	-0.71	0.91	2.06	1.35	1.15	0.77	1.31	0.27	-1.32	1.81	1.32	-1.78	-1.52
16	-0.71	0.74	2.06	1.35	1.32	0.75	1.33	0.29	-1.25	1.83	1.75	-1.68	-1.65
17	-0.46	0.74	2.06	1.60	1.32	0.73	1.36	0.31	-1.18	2.55	1.75	-1.88	-1.56
18	-0.41	0.56	2.06	1.65	1.50	0.72	1.39	0.33	-1.11	2.73	2.25	-1.83	-1.66
19	-0.34	0.54	2.06	1.72	1.52	0.70	1.42	0.35	-1.04	2.96	2.32	-1.80	-1.59
20	-0.34	0.49	2.06	1.72	1.57	0.69	1.45	0.37	-0.98	2.96	2.48	-1.69	-1.54
21	-0.31	0.46	2.06	1.75	1.60	0.67	1.49	0.40	-0.92	3.05	2.56	-1.61	-1.47
22	-0.31	0.46	2.06	1.75	1.60	0.66	1.52	0.42	-0.86	3.05	2.56	-1.51	-1.38
23	-0.26	0.44	2.06	1.80	1.62	0.64	1.56	0.45	-0.81	3.23	2.64	-1.45	-1.31
24	-0.24	0.41	2.06	1.82	1.65	0.63	1.60	0.47	-0.76	3.32	2.72	-1.38	-1.24
25	-0.21	0.39	2.06	1.85	1.67	0.61	1.64	0.50	-0.70	3.41	2.80	-1.30	-1.18
26	-0.16	0.36	2.06	1.90	1.70	0.59	1.68	0.52	-0.65	3.60	2.89	-1.24	-1.11
27	-0.09	0.35	2.06	1.97	1.71	0.58	1.73	0.55	-0.60	3.89	2.93	-1.19	-1.03
28	-0.06	0.34	2.06	2.00	1.72	0.56	1.78	0.58	-0.55	3.99	2.97	-1.10	-0.95
29	-0.05	0.29	2.06	2.01	1.77	0.55	1.83	0.60	-0.50	4.04	3.13	-1.01	-0.89
30	-0.04	0.29	2.06	2.02	1.77	0.53	1.88	0.63	-0.46	4.09	3.15	-0.93	-0.81
31	-0.04	0.26	2.06	2.02	1.80	0.52	1.94	0.66	-0.41	4.09	3.23	-0.83	-0.74
32	0.04	0.24	2.06	2.10	1.82	0.50	2.00	0.69	-0.37	4.39	3.33	-0.77	-0.67
33	0.24	0.04	2.06	2.30	2.02	0.48	2.06	0.72	-0.32	5.27	4.09	-0.74	-0.65
34	0.26	-0.04	2.06	2.32	2.10	0.47	2.13	0.76	-0.28	5.39	4.40	-0.64	-0.58
35	0.29	-0.04	2.06	2.35	2.10	0.45	2.21	0.79	-0.23	5.51	4.40	-0.55	-0.49
36	0.29	-0.05	2.06	2.35	2.11	0.44	2.29	0.83	-0.19	5.53	4.46	-0.45	-0.40
37	0.34	-0.06	2.06	2.40	2.12	0.42	2.37	0.86	-0.15	5.74	4.51	-0.35	-0.31
38	0.35	-0.09	2.06	2.41	2.15	0.41	2.46	0.90	-0.10	5.80	4.62	-0.25	-0.22
39	0.36	-0.16	2.06	2.42	2.22	0.39	2.56	0.94	-0.06	5.86	4.94	-0.15	-0.14
40	0.39	-0.21	2.06	2.45	2.27	0.38	2.67	0.98	-0.02	5.98	5.17	-0.05	-0.04
41	0.41	-0.24	2.06	2.47	2.30	0.36	2.78	1.02	0.02	6.11	5.28	0.06	0.05
42	0.44	-0.26	2.06	2.50	2.32	0.34	2.91	1.07	0.07	6.23	5.40	0.16	0.15
43	0.46	-0.31	2.06	2.52	2.37	0.33	3.05	1.11	0.11	6.36	5.63	0.27	0.26
44	0.46	-0.31	2.06	2.52	2.37	0.31	3.20	1.16	0.15	6.36	5.63	0.38	0.36
45	0.49	-0.34	2.06	2.55	2.40	0.30	3.37	1.21	0.19	6.48	5.75	0.49	0.47
46	0.54	-0.34	2.06	2.60	2.40	0.28	3.56	1.27	0.24	6.74	5.75	0.62	0.57
47	0.56	-0.41	2.06	2.62	2.47	0.27	3.76	1.33	0.28	6.87	6.09	0.74	0.70
48	0.74	-0.46	2.06	2.80	2.52	0.25	4.00	1.39	0.33	7.82	6.37	0.91	0.82
49	0.74	-0.71	2.06	2.80	2.77	0.23	4.27	1.45	0.37	7.82	7.67	1.04	1.03
50	0.91	-0.71	2.06	2.97	2.77	0.22	4.57	1.52	0.42	8.83	7.69	1.24	1.16
51	0.94	-0.76	2.06	3.00	2.82	0.20	4.92	1.59	0.47	8.98	7.97	1.40	1.32
52	0.96	-0.76	2.06	3.02	2.82	0.19	5.33	1.67	0.52	9.13	7.97	1.56	1.45

n	*E	*E	$\hat{y}_5$	X'	X''	1-n/N	(1-n/N)$^{-1}$	Y'	Y	$(X')^2$	$(X'')^2$	X'·Y	X''·Y
53	0.96	-0.86	2.06	3.02	2.92	0.17	5.82	1.76	0.57	9.13	8.55	1.71	1.65
54	0.96	-0.86	2.06	3.02	2.92	0.16	6.40	1.86	0.62	9.13	8.55	1.87	1.81
55	0.99	-0.86	2.06	3.05	2.92	0.14	7.11	1.96	0.67	9.28	8.55	2.05	1.97
56	0.99	-0.91	2.06	3.05	2.97	0.13	8.00	2.08	0.73	9.28	8.84	2.23	2.18
57	1.04	-0.91	2.06	3.10	2.97	0.11	9.14	2.21	0.79	9.59	8.84	2.46	2.36
58	1.04	-0.94	2.06	3.10	3.00	0.09	10.67	2.37	0.86	9.59	8.99	2.67	2.58
59	1.06	-0.94	2.06	3.12	3.00	0.08	12.80	2.55	0.94	9.74	8.99	2.92	2.81
60	1.06	-0.94	2.06	3.12	3.00	0.06	16.00	2.77	1.02	9.74	8.99	3.18	3.06
61	1.09	-0.99	2.06	3.15	3.05	0.05	21.33	3.06	1.12	9.90	9.29	3.52	3.41
62	1.09	-1.00	2.06	3.15	3.06	0.03	32.00	3.47	1.24	9.93	9.37	3.92	3.80
63	1.14	-1.04	2.06	3.20	3.10	0.02	64.00	4.16	1.43	10.22	9.60	4.56	4.42
64	1.15	-1.14	2.06	3.21	3.20	0.00	#DIV/0!	#DIV/0!	2	10.30	10.23	6.42	6.40
Σ				**136.9**	**126.8**				**-32.8**	**325.8**	**284.2**	**-17.3**	**-12.7**

5. Testing result intrepretation

On the basis of the obtained data it follows that:

$$\hat{y} = b_0+b_1x_1+ b_2x_2+ b_3x_3 + b_4x_4 + b_5x_5 + b_6x_6 + + b_7x_7 + b_{24}x_2x_4+ b_{23}x_2x_3 + b_{16}x_1x_6+ b_{26}x_2x_6 + + b_{45}x_4x_5 + b_{35}x_3x_5 + b_{56}x_5x_6 .$$

$$\hat{y} =3.39- 0.93x_1- 0.59x_2 - 0.73x_3 - 0.98x_4 - 0.23x_5 + 0.84x_6 + 0.5x_7 + 0.47x_2x_4 - 0.07x_2x_3 -0.27x_1x_6 - 0.31x_2x_6 + 0.1x_4x_5 + 0.48x_3x_5 - 0.1x_5x_6 \quad (1)$$

On the basis of Table 4 and the method of least squares, and after furder processing of the results, as describe in literature (Koldžić, 1999), using transformation equitation (2) (Koldžić, 1999), (Stanić, 1990),

$$x = \frac{X - X_o}{w}, \; X_o = \frac{X_g + X_d}{2} \quad (2)$$

it is obtained:

α = 1.6

$$\ln\beta = 9.48 - 0.66M_r - 1.3\sigma_r - 1.1M_a - 2.44\sigma_a + 0.39\,k + 4.5\eta_c + 0.33D - 0.84\sigma_r\sigma_a - 0.1\sigma_r M_a - 0.54\,M_r\eta_c - 0.83\sigma_r\eta_c - 0.07\sigma_a k + 0.24\,M_a k - 0.1\,k\,\eta_c \quad (3)$$

The data from Table 4 are entered into the probability chart in Figure 1 and the line, which corresponds to these data.

The obtained reliability indicators relate to the whole defined multi-factorial space, from minimum to maximum values of influential factors, on the basis of wich can, therefore, reliability in each point of the experimental space be calculated on the basis of the expression:

$$R_{(r)} = e^{-(r/\beta)^{\alpha}}$$

where - $R(r)$ reliability depends on the r number of revolutions.

For example, if it has been determined that a roller bearing will operate in the operating conditions where

$$M_r = 2.4; \; \sigma_r=1; \; M_a=1.1; \; \sigma_a=1; \; k = 3.5; \; \eta =0.8 \quad (4)$$

and for the limit value of diagnostic parameter D = 6, so that for the given operational conditions the values of α = 1.6 and β = 963 are obtained, reliability for some numbers of revolution is as given in Table 5.

Table 5 Reliability and number of revolucions

Reliability R(r) [%]	*Number of revolutions r*
90 (0.90)	2280x10^6
95 (0.95)	1505x10^6
99 (0.99)	540 x 10^6

On the basis of the (1) functional dependence, the functional dependence of diagnostical parameter on thenumber of revolutions can be arrived at. Namely, for any known operation conditions the (1) expression looks like this:

$$\hat{y} = \ln\hat{r} = A + 0.5x_7$$

and (Draper & Smith, 1966), (Koldžić, 1999):

$$y = \ln r = A + 0.5x_7 + \varepsilon \qquad (5)$$

where A represent constant value, while ε is a random quantity for the observed population.

After entering of transformation equation (2) into the (5) expressions, the results are obtained in the form of:

$$D = C + 3 \ln r \qquad (6)$$

This is obviously the case of a logarithmic random function, since C is a random quantity for one population and for one level of the diagnostical parameter. This random function can be approximately replaced, within the scope of the diagnostical parameter from $D_{min} = 3$ to $D_{max} = 6$ by a linear random function.

The obtained data regarding the diagnostical parameter enable forming of the most promising and most economical models of technical systems maintenance - the models of preventive maintenance according to condition. The experimental results interpreted in this way, from the point of view of diagnostic parameter enable predicting of operating time to failure (of the number of revolutions till failure in this example), on the basis of only one check-up of the state. Namely, on the basis of the results of the mentioned check-up of the state, the C quantity in the (6) expression can be obtained, so that this random function after one diagnostic becomes deterministic.

CONCLUSION

Briefly stated, the advantages of this method are as follows:

1) Enormous decrease of the number of experiments, and thereby of the costs of reliability testing in a multi-factorial space. As can be seen on the Table 2, the experiments have been conducted four times in each point of the plan, on four elements (roller bearings). Since, according to the testing plan matrix, the experiments are conducted at 16 points, the total number of elements in the sample is 4 x 16 = 64. The number of analytically reached data relevant to reliability in defined multi-factorial space, in this example is 64 x 16 = 1024.
2) Interpretation of testing results is enabled in the form of Weibull distribution law in the whole defined multi-factorial space;
3) The function of the diagnostical parameter change in time is attained within the desired scope of the parameter;
4) This method does not comprise any casual improvisations so that results are absolutely accurate.

Works Cited

Draper, N., & Smith, H. (1966). *Applied Regression Analysis.* New York: John Wiley & Sons.

Koldžić, M. (1999). *The Method of Accelerated Multi-Factor Testing of Reliability of Mechanical System Elements.* Belgrade: University Belgrade, Faculty of Mechanical Engineering.

Stanić, J. (1990). *The Method of Engineering Measuring.* Belgrade: University Belgrade, Faculty of Mechanical Engineering .

Received for publication: 25.09.2012
Accepted for publication: 16.11.2012

How to cite this article?

Style – **APA** *Sixth Edition*:
Arsenić, Ž. (2013, 01 15). Multifactorial testing of bearing reliability. (Z. Čekerevac, Ed.) *MEST Journal, 1*(1), 37-45. Retrieved from www.meste.org/mest/MEST_1_2013/_04.pdf

Style – **Chicago** *Fifteenth Edition:*
Arsenić, Živan. "Multifactorial testing of bearing reliability." Edited by Zoran Čekerevac. *MEST Journal* (MESTE NGO) 1, no. 1 (01 2013): 37-45.

Style – **GOST** *Name Sort*:
Arsenić Živan Multifactorial testing of bearing reliability [Journal] = Multifactorial testing of bearing reliability // MEST Journal / ed. Čekerevac Zoran. - Belgrade - Toronto : MESTE NGO, 01 15, 2013. - 1 : Vol. 1. - pp. 37-45.

Style – **Harvard** *Anglia*:
Arsenić, Ž., 2013. Multifactorial testing of bearing reliability. *MEST Journal*, 15 01, 1(1), pp. 37-45.

Style – **ISO 690** *Numerical Reference*:
Multifactorial testing of bearing reliability. **Arsenić, Živan.** [ed.] Zoran Čekerevac. 1, Belgrade - Toronto : MESTE NGO, 01 15, 2013, MEST Journal, Vol. 1, pp. 37-45.

MEST JOURNAL

REDUCTION OF EMPLOYMENT AS AN ELEMENT OF MANAGEMENT IN AN ORGAZNIZATION- CASE STUDY

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JEL category: **J, J5, J21**

Summary:
The subject matter of the article was adopted considering the problems of labour market in Poland. One of them is employment reduction. The main objective of this paper is to show the negative impact of excessive redundancies on employment fluctuation in a transport - forwarding company "XYZ".
The paper consists of three basic parts. First one is devoted to the issue of employment fluctuations. It defines the notion of staff mobility and discusses problems referring to the nature of staff turnover. Factors determining the phenomenon are defined. The second part presents problems connected with dismissals of employees. Based on literature, it indicates the significance of derecruitment and instances legal aspects of redundancies. In the third empirical part the focus is on presenting a tansport-forwarding company 'XYZ'. The company represents the category of small and medium-sized enetrprises, that constitute the basis of all modern European economies. In the case of Poland, they generate nearly 80% of GDP. The methods used are documents analysis and comparison over time. In this part the author summarizes the results of documents analysis concerning derecruitment of employees in the years 2007-2011. The issues are considered from the employer's perspective.
The subject matter is still current because of the dynamic changes taking place in the labour market, in terms of macroeconomics.

Keywords:
management, workforce, human recources, redundancies, fluctuation

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1 Introduction

The goal of any organization is its smooth functioning by means of performing tasks leading to achieve its objectives. Numerous factors determine success of the company. One is the

fluctuation of employment. The process is affected by the most significant element of an organization – the people who create it and participate in its life. Who they are and how they act influences the company's wellbeing. Staff turnover in a company is inevitable due to the natural flow of human resources and the business cycle. The labour market is a typical example of a process of mutual pervasion of macro- and micro-economy. The primary objective of management should be continuous supervision and monitoring the proper functioning of an economic operator with particular emphasis on personnel selection. Lack of personnel flow may result in significant employment problems in the organization. This issue is particularly important in times of financial crisis, reflected in the employment barrier in structural dimension (qualification and allocation). In Poland, it particularly refers to heavy industry and maritime economy.

The main purpose of this paper is to indicate the negative impact of excessive redundancies on employment fluctuation on the basis of a transport - freight forwarding company "XYZ" connected with maritime economy. The company's name is not revealed due to the management's reservations. Simple statistical tools and the reference method were used in the analysis of the documents.

2 The nature and causes of fluctuations in employment

2.1 The nature of employment fluctuation

Fluctuation in employment also known as staff turnover or labour mobility, is the process of hiring and releasing employees from a company at their own request or following the employer's will within a certain time. It is a natural phenomenon, resulting form the nature of human resources and labour market as well as the human right to choose and change jobs. Employers, frequently owners, are independent in their decisions about people to hire. So are employees. At any time, they may change employers acting in accordance to the Labour Code. This condition is required by law and to the same degree refers to the employer (Kozłowska, 2009). Staff turnover is an inevitable phenomenon, however not always a negative one. If the reason for the fluctuations are mistakes made in the process of recruitment and selection of employees, the turnover can be purifying, thus creating jobs for new employees whose skills, qualifications and personality traits better meet the needs of the company. Hiring new staff as "an injection of fresh blood" for the operator, constitutes a different look at a lot of things, and a new experience. Dismissing employees who have a negative impact on the work and the behavior of other, more valuable employees, is also an advantegous phenomenon. (Cascio, 2001: 37-38). Negative aspect of staff fluctuation are the costs incurred by the company in the event of dismissal. The employer must for example pay gratuity to those being made redundant. Another problem is the cost of hiring a new employee (publication of job advertisement, the initial research, the process of recruitment, training). The lack of a person employed at a given post can contribute to incorrect implementation of a specific task at a certain time. High staff turnover proves improper management of the enterprises. Employment liquidity of 5-10% can become a problem for the organization, especially if its level is higher than in the competitive companies. Small number of suitably qualified persons in the labor market, as well as the departure of staff with the knowledge that can be used by competitive operators can become a cause for concern.

Staff turnover is a normal occurrence. If however, it exceeds a certain level, it may bring damage to the organization. This can be prevented by performing appropriate personnel policy following the sequence of planning, organizing and motivating, stimulating and controlling (Korzeniowski, 2010: 246-258). Within this policy, employees are engaged in the life company, provided opportunities for professional development and access to training. As a result their career paths are developed. Introduction of remuneration systems, dependent on work results is also of significant importance (Mark, 1999: 407; Torrington, & Hall, 1991: 571 -576).

A large number of hired and dismissed workers results in high costs for the organization. Calculation of the amounts designates separate categories of costs: costs of leaving the company, replacement costs, training costs and the monetary difference in value between the discharged and the newly hired employees'

productivity. The costs of leaving may include, among others severance pay for workers affected by redundancies or retirements as well as payments for unused leave. However, the replacement costs encompass expenses generally associated with the adoption of a new employee (placing the advertisement, the process of recruitment, pre-testing), or remuneration for overtime work. The training costs are primarily safety training and training in the workplace by an experienced employee (Taylor, 2006: 50-52).

The costs of management fluctuation are not considered in this article. The managerial staff should be counted as fixed costs. Releasing personnel responsible for finance, marketing, purchasing and personnel of the enterprise is too expensive because of their knowledge and experience in the management of the company.

2.2 Causes of staff fluctuations

Staff turnover depend on many factors that determine its size, directions, forms and causes. These factors can be divided into three groups (Pocztowski, 2007: 57):

- related to the business environment,
- related to the characteristics of workers,
- related to the working environment.

Factors related to the business environment include: the situation on the domestic labour market, economic conditions, labour law and social conditions of workers – social security (Abbott, Pendlebury, & Wardman, 2007, pp. 584-586).

The second group - factors associated with employees - list such characteristics as personality traits, career aspirations, education, gender and age. The third group of factors related to the working environment include the location of the company, pay and working conditions, social relationships and career prospects.

In any organization, you can define factors that have a greater impact on employees' departures. They depend on the conditions prevailing in the organization, on its culture and management style. A sense of stability, safety at work, no reason to be dissatisfied with the job will influence employee's attitude and identification with the company. In such situation an employee is less likely to consider handing in a resignation. An external factor affecting the decision to leave the organization is the availability of attractive job offers in the local market. Awareness of these circumstances allows employers to take effective interventions to prevent departures of employees. Taylor divides the main reasons of staff turnover into four categories (Taylor, 2006:72):

- pull factors (attracting),
- push factors (putting off)
- unavoidable causes,
- involuntary (forced - JT.) personnel turnover.

The attracting factors occur when an employee leaves the company due to a more attractive offer of employment or to improve one's working conditions. They include higher wages, better benefits package, job security, opportunity to build a career, work abroad, better access to jobs or more convenient working hours, which is associated with the so-called non-monetary rewards of employment.

Sometimes, employees apply only to work for some time for a well-known, respected employer in order to enrich their resume and get good references before getting a job abroad. This phenomenon is worrying for the entire national economy.

Concerning the pull factors, an employer can do little. Sometimes one can put off a particular departure but most frequently the employee anyway leaves the company.

The second group of factors, the push factors, are mainly the lack of satisfaction in the performance of the entrusted duties or no hope of improving the working conditions. The employee can never be sure that he or she takes the right decision giving up work just because one supposes that the new employer will be better. However, the reluctance of the current organizational culture, a sense of injustice in the treatment by management, or poor relationships with colleagues cause that the employee takes a risky decision "to leave" his employer. If there occur mainly push factors in an organization, the management should get to know the causes of their employees' discontent, focus on the improvement of employees' professional life, proper selection of qualified management personnel, organizing training or an assessment of the effectiveness of management skills.

The third group of factors is the least influenced by the organization's management. These factors are mainly the result of natural retiring of personnel or drawing disability pension, or taking maternity leave. "A female employee is entitled to maternity leave of: 20 weeks in the event of giving birth to one child at one birth, 31 weeks in the event of giving birth to two children at one birth; 33 weeks in the event of giving birth to three children at one birth, 35 weeks in the event of giving birth to four children at one birth, 37 weeks in the event of giving birth to five and more children at one birth" (Faulkner & Jamroży, 2011, pp. 176-181); The Act of 26 June 1974 on the Labour Code).

Women who use maternity leave and child care often do not return to their jobs. This can be caused by prolonged care taken over a child or children, or finding jobs in a more favourable position related to jobs closer to home, or location of day care nursery.

Forced turnover of staff is the fourth category of employment mobility. This are departures on the initiative of company's management. They can also be the result of negotiations between trade unions and businesses on the perfect labour market. On an imperfect market, as a result of the calculation of marginal costs of employment (marginal cost of resource - MCR) and the marginal revenue of labor product (marginal revenue of product MRP), there also comes to exemptions under the influence of employers (Kamińska, Kubska - Maciejewicz, & Laudańska - Trynka, 2004, p. 164). The mentioned fluctuation is composed of reduction of employment, termination of temporary contracts or disciplinary dismissals.

3 Releasing staff

3.1 The nature of releasing staff

Dismissals, also called derecruitment is a purposeful activity aimed at terminating employment contracts (Golnau, 2008, p. 403). The departure of an employee from the company may be on his own initiative or the initiative of the employer. Dismissals of the employer's will may result from a negative evaluation of the work of individuals or reorganization of enterprises, such as employment reductions. They may be of individual or collective characteristics, that is, where there is termination of contract between an employer and a greater number of workers. Individual dismissals do not require any special action program, but in the case of collective redundancies related to the organizational changes there should be made special preparations for the downsizing. The duties of the employer in this case include notifying employees about the redundancies, cooperation with trade unions, informing employment office and setting an agreement defining the rules of the release. A major problem for managers is to define the criteria by which employees to be released should be classified. They can take into account the effectiveness of the work, qualifications, work experience or position. Factors that determine the decision should take into account the development plans of the company and its effectiveness in a competitive market (Konieczny, & Schmidtke, 2007, p. 215). Individual or group dismissals should lead to self-improvement of the rest of the employed staff. Derecruitment may be affected by a range of factors of organizational, economic, social or technical characteristics. These could be changes in the functioning of the company, the elimination of jobs, change of development plans, the introduction of innovative technologies and ultimately poor financial condition of the company. The management's decision on a release may be taken due to the reasons lying on the employee. The most common of these include reduction of personnel qualifications, the loss of a non-redundant power for the job, reduced work efficiency, non-compliance, conflicts or disloyalty. These in turn may occur due to the incorrectly carried out selection where there was no full recognition of qualifications and the development potential of the candidates. As a result, the right people are not hired. Dismissals from the employer may also be disciplinary in nature. Such separation with an employee may take place in case of severe misconduct when the action or failure was caused intentionally or by gross negligence. The termination may occur if the notification procedures were observed and the employee was informed about the rules one needs to obey. The procedure should provide for the following three-stage approach before disciplinary action is taken: informal oral warnings, formal warnings

made in writing and final written warnings which should contain a statement that any reoccurrence would lead to dismissal (Armstrong, 2002, p. 378).

Dismissals of employer's will are often accompanied by emotions and negative self-esteem of the person made redundant. Anger, a sense of injustice and harm are natural reactions to the startling information. Therefore, an employer, before making a decision to terminate the contract should consider the reasons why the person does not achieve satisfactory performance. This may be due to a mismatch between the job and skills, qualifications or knowledge of a worker. Perhaps the company is able to cope with such a situation by internal rotation. One might consider transferring the person to another position, or suggest appropriate training to fill the gaps, or provide assistance if the reasons lie in his personal life. "The dismissal should occur only if a protracted period of poor performance of their duties without signs of improvement" (Konieczny, & Schmidtke, 2007, p. 215).

The departure on employee's request, is most often caused by the desire to improve working conditions and pay with another employer. Then, the employee oneself, voluntarily requests dismissal. Such resignation may result form the lack of career opportunities in the current organization, bad relationships with management and co-workers or overload. The departure might also be due to the agitation by the company's competitor or "headhunters". This applies mainly to highly skilled professionals desired in the market. These are ambitious and talented people, people who are not satisfied with labor stability. For such people, challenges and the possibility of continuing professional development are the most important. The loss of such workers may pose considerable costs, deteriorating interpersonal relationships, and relationships with customers (Szaban, 2011, p. 332).

In the event of termination by the employee, the employer should carry out a conversation with him, in order to determine the cause of the decision to change job and identify problems that could eventually be solved. The conversation does not necessarily have to aim at persuading people to stay in the organization. If the employer presumes that the employee is willing stay under some condition, and the organization depends on the person, he or she can take steps, following which the employee withdraws the resignation. Moreover, the interview may help to identify the problems that exist in the organization, which could be prevented in the right moment (Armstrong, 2002, p. 379).

Another motive of derecruitment of an employee may be his situation in life. It can be associated with a change of residence, the need to care for a sick child or family member. Legally, dismissal also takes place when the employee is employed under fixed-term contract, retires, takes pension, Or for external reasons such as death of one of the parts of the contract.

Dismissal may be the result of a joint decision of the employer and the employee usually resulting from a significant change in working conditions that cause that both parties seek consensus. This situation refers mainly to highly skilled professionals whose achievements have been highly appreciated by the organization management, but due to changes in the business profile, their qualifications can no longer be used in the company. In this case the manager of the company may take actions that will result in a friendly parting with the employee, such as the granting of severance and assistance in finding a new employer (Król, & Ludwiczyński, 2006, p. 223).

The threat of job loss does not apply to all professional groups to the same extent. The labour market is dominated by two segments which vary in their degree of stability of work. These are primary and secondary markets. The primary labour market is characterized by stable employment, better working conditions and higher wages and career opportunities. However, the secondary labour market is characterized by poorer working conditions and lower pay. The first segment includes people with high qualifications, still developing their skills and having a huge impact on organizational economic or technical processes. The second segment consists of people with low qualifications, requiring supervision and control. They are particularly vulnerable to losing their jobs, especially during economic fluctuations.

'Downsizing' is one of the most demanding areas of people management and for many employers it is not easy. There are "rigid" laws that protect workers and do not allow to terminate the most common contracts, signed for an indefinite period. The second reason for the difficulties in releasing may be an emotional factor accompanying this process especially during the crisis, when it is known that it will not be easily for the dismissed to find a new job. (Szaban, 2011, p. 332).

3.2 Results of dismissals

In my opinion, dismissals should considered as a loss to the organization. Hiring a new employee, the company often incurs costs of training and developing his or her skills. Losing an employee, the employer must fill the created gap, which can be time consuming, difficult and not always possible. Employment reduction should be planned and thought over, but there are situations when the decision is made in a short time. This is usually related to a difficult economic situation of an organization, when its financial liquidity is threatened. In this case, the management looks for savings by reducing the number of workers. This situation may lead to conflicts between the management and the trade unions, and among employees who could lose their jobs there appears a sense of risk and conviction of the employer's ill-will. The image of the company deteriorates, which has a negative impact on the interest in the company in the local labour market.

Redundancy process mostly affects the dismissed. Information about the release evokes feelings of harm, helplessness, depression or disorder of stability in life. There appears anxiety associated with possible problems with finding a new job and consequently financial problems. Such dismissal may also affect the psyche of people who often feel inferior to the employees remaining in the company.

Lay-offs may also have political repercussions. In organizations where trade unions actively function, protests are escalated. It is manifested by organizing strikes or demonstrations in front of the authorities. In extreme cases, this can end in the occupation of the workplace and even fight of the determined with security staff or the police. Such situations can have a negative impact on the macroeconomic environment of the organization.

Analyzing the negative effects of job cuts in the company A. Pocztowski distinguishes "The Dirty Dozen," which is presented in Table No. 1

Table 1. ***Negative effects of forced limitation of the employment, so-called "Dirty Dozen"***

Results	Characteristics
Centralization	Decision-making is done at the highest level of management, the division of power is reduced
Crisis mentality	Focusing on the present at the expense of long-term planning
Losing innovation	Lower tolerance for risk and possible failures associated with taking creative action
Resistance to change	Conservatism in action leading to protectionist practices
Reduced morale	Workers become withdrawn, mutually reluctant
Politicization	The formation of interest groups, leading to the politicization of the atmosphere in the company
Loss of priorities	Reducing conflicts by making cuts across the organization without a clearly outlined priorities
Loss of trust	Managers lose confidence in subordinates, and among employees there grows a sense of mutual distrust
Growing conflicts	Internal struggle over the division of a smaller pie increases
Limited communication	Only good information flow to the top, exchange of information is limited by fear and mistrust
Deficits in teamwork	Individualism and lack of consistency hinder teamwork
Deficits in leadership	Specific leadership anemia caused by application of the scapegoat principle and the philosophy of a besieged fortress

Source: (Konieczny, Schmidtke, 2007: 226-227)

In addition to previously mentioned material costs related to among others the payment of mandatory employee benefits, the management

bears also psychological costs such as loss of reputation, which is associated with loss of value.

4 Analysis of redundancy in a transport - forwarding enterprise "XYZ"

The researched company is a limited liability, transportation – freight forwarding company, operating on domestic and foreign markets since 2004. The company has four offices and storage areas in the Tri-City (Gdańsk, Sopot, Gdynia), where it provides a wide range of services within road, air and sea freight forwarding.

Road freight forwarding operates mainly with its own truck fleet. The company has 10 sets of vehicles with a capacity up to 24 tons, and the same number of smaller vehicles up to 1.5 tonnes. Due to a large transportation base, the company provides a wide range of services ranging from transport of full loads up to 24 tonnes, through transport of containers from and to the sea ports, to express services of LCL and LTL (less than container and less than truck load) transports. The company offers continuous service between Gdynia / Gdańsk - Hamburg, and regular connections to other cities in Germany and the Netherlands, depending on the needs. An asset of the company is comprehensive customer service, which starts with picking up the shipment in the place indicated by the client and ends with the delivery to its destination. Flexibility of services makes it possible to transport dangerous (ADR), specialized, oversized, heavy-duty goods. In the absence of its own, specific, specialist car, freight forwarders are able to accomplish every order, using a broad base of cooperating carriers.

Another field of services is air freight forwarding. With a team of experienced freight forwarders and customs brokers services offered are a guarantee of safety, punctuality and reliability. This form of transport has two important advantages: the shipment reaches its destination in a short time and the delivery area is practically all over the world. A significant advantage for customers is the ability to pickup and delivery of items in the "door to door" system, which, thanks to the cooperation with road freight forwarding, is a convenient option for the client.

Sea freight enables moving cargo in the "port to port" system without geographical restrictions and problems arising at crossing many borders. Relatively low cost speaks for this form of transport. Unfortunately, the time of delivery is much longer. In the case of freight, the company prefers safe delivery of goods in containers.

4.1 Dismissals in company "XYZ" in the years 2007 - 2011

Excessive staff turnover can be a serious problem for any employer. Exemptions cause imbalance of employment liquidity, resulting in abnormal organization of the company. In every company there are priority positions that make up the backbone of the organization. In the case of "XYZ" these are mostly drivers, freight forwarders and customs brokers. The biggest problem is the rotation of drivers. A specific feature of the company is freight with its own car fleet across Europe. The nature of drivers' work is very specific, since they spend about four weeks on the road away from home. The car is both the driver's tool and a "second home". After such a long stay abroad, they return home for about a week as part of the "compensation". Such nature of employment is not accepted by everybody. Sometimes, job seekers, take the job and after a short time due to various reasons (often longing for loved ones) cannot stand it and make a request for early termination of the contract (usually by mutual agreement). Such situations are very unfavorable for employers, mainly because of the time of resignation. In a short time the employer needs to find a replacement for the released position. Haste causes that recruitment is not always carried out properly, which can result in subsequent dismissals either of the employer's or the employee's will. Suitably recruited persons can work in a company as a driver for many years, and they are satisfied with the nature of work, salary, and their employer. It is a comfortable situation for the management, as co-operation with such persons is successful. It is a win-win for both sides - the employer because he has experienced, trustworthy employee and driver pleased with appropriate working conditions and pay. There are a few experienced drivers in "XYZ" company who contribute to the flexibility of work organization. They are able to understand the problems faced by the employer and, if necessary, help to "patch up the gaps" and agree to take the missing jobs.

The problem of redundancies in positions other than the driving position is not so distressing in derecruitment in the company. Of course, any loss of experienced workers is detrimental to the business, but such departures are not of urgent nature. These are most frequently contract terminations with a period of notice or by mutual agreement on an agreed date. Therefore, there is time for the appropriate conduct of the recruitment process and selection of candidates for the position. Proper selection of an employee results in his or her attachment to the organization, satisfaction with their work, and thus the employer's satisfaction with the right choice. A happy employee is a big asset for the organization. However, a negative result in this case is excessive release.

Dismissals in "XYZ" were analyzed on the basis of internal resources, focusing mainly on changes in employment of drivers in the years 2007 - 2011. The analysis was performed with use of comparative methodology.

At the beginning of 2007, the employment counted 37 persons including 18 drivers. The data indicates that drivers constitute 35% of redundant workers. Other workers including customs brokers, freight forwarders, warehousemen, sales representatives constitute approximately 65%. The most common methods of terminating contracts of employment are: mutual agreement - seven people and resignations - six people.

In 2008, the number of employees increased by seven employees in relation to the previous year and counted 44 people, including 20 drivers. Employment growth was due to signing a major contract for the provision of freight forwarding services. The number of drivers' dismissals were around 64% of all redundancy. However, the number of lay-offs with other employees decreased and amounted 36%. Among those released there were two customs agents, one clerk and one assistant freight forwarder. In 2008, there were no terminations by the employer, while the number of contracts terminated by agreement of the parties increased to nine.

The year 2009 brought another increase in the number of released workers. With the workforce at the beginning of 2009 slightly lower than last year (42 people), the company "broke up" with 21 employees, 13 of whom were drivers. The others were: two freight forwarders, two office workers, two managers, and one customs agent and one sales representative. Such a large number of redundancies has been caused by withdrawal from the provision of freight forwarding services by one of the very large companies. The most breakups with employees were carried out by mutual agreement (12), and dismissals with notice (4).

In 2010 the number of employees decreased in relation to the previous year by 8 people and amounted 34 employees at the beginning of the year, including 17 drivers. Termination of contracts also fell and counted relatively: 5 drivers and 10 other employees: three customs agents, two freight forwarders, 2 sales representatives, 2 warehousemen, and 2 office workers. The most common contract terminations were mutual agreement - 8 people, and termination by the employer - 4 persons.

Table 2. ***Number of dismissals in company "XYZ" in the years 2007 - 2011***

No.	Methods of contract termination	Drivers	Other employees	total
1.	Mutual agreement	27	16	43
2.	Dismissal with notice	5	7	12
3.	Resignation with notice	4	9	13
4.	With time for which the contract was concluded	7	4	11
	Totally	43	36	79

Source: Internal resources of "XYZ".

In 2011, the number of employees was going around the same level as in 2010 - 35 people, including 19 drivers. The year recorded the highest number of resignations of employees in positions of drivers - 10 people, and the lowest number of other employees - 2 persons. The percentage of dismissed drivers constituted 83% of overall redundancies. Most breakups with employees took place by mutual agreement - seven people, but there have been no

resignations. The level in staff reduction in 2007-2011 is illustrated in Table 2.

4.2 Conclusions from the redundancy analysis in company "XYZ"

The analysis of dismissals carried out in "XYZ" in the years 2007 – 2011 indicates a very high level of derecruitment, which could have caused disruptions in the operation of the company. Too frequent departures of employees result in imbalance in employment and poor stability of the team. Excessive layoffs were associated with frequent hiring new people to the vacant positions. The process of continuous search for candidates made the management fully involved in the recruitment process (there is not HR "XYZ"). At this time employers could have taken care of the performance of other, more important duties. A solution to this problem could be creating HR department that would take care of the recruitment process in a professional way. So far the managers have done the job. It would be appropriate for employers to resign from the services of an accounting office in favour of employing permanent human resource and accounting workers. At present the company employs about 35 persons and in many situations the lack of the mentioned departments complicates the operation of the enterprise.

Job advertisements often appearing in the media do not have a positive impact on the image of the company. Certainly, the image of the company makes potentially valuable employees looking for stable employment not be interested in the working for "XYZ".

The reasons for dismissals with notice are often neglecting the duties of a person employed as a driver and bad communication between the freight forwarder and the driver, which due to the nature of the work is very important. Less frequent, but still common reason for termination of contract of a driver, is the general negligence in their place of work, namely the truck cabin and the lack of personal hygiene. A driver represents the company so he must take care of its reputation.

In several cases over the analyzed period, the company had to terminate the employment contracts or not to prolong them due to alcohol consumption in the workplace, or the arrival at a place of duty under the influence of alcohol. In case of a driver this is a matter of overriding importance. There was also an accident at work, where alcohol consumption was to blame. While on duty, a driver burnt himself when he tried to cook a soup in the cab of a new truck. As a result, the driver was taken to hospital in Italy, and the employer incurred the costs of cleaning the cab and bringing a replacement driver who could accomplish the order.

Another sensitive issue for the company is stealing fuel. During the analyzed period, it happened several times that the driver tried to "increase the budget of the home" through the sale of fuel to casual people. In recent years this has not been a frequent practice.

Now, when the crisis has also affected the transport industry, many companies, including the "XYZ", are struggling with financial liquidity problems. Employers, though they would like to, often cannot afford to increase wages. The equipment the drivers use also affects the staff turnover. "XYZ" tries to use as new cars as possible. Part of the vehicle fleet is new, most of the lease, but there are trucks and trailers that have worked in the company for several years. Unfortunately, employees often set a condition to work on a specific, new and safer equipment.

Thus the reason of dismissals are also damages to the equipment resulting from incompetent driving. These are damages to be borne by the employer as a result of improper use of the entrusted car, caused intentionally or negligently by the person driving the vehicle (motor seizure, damage to the gearbox). The company also bears the costs resulting from other damage caused by drivers, e.g. by incompetent cargo distribution or damage caused during maneuvers while loading or unloading goods.

Excessive layoffs mean additional employer's cost. When hiring new people the employer has to cover the expenses of initial training and research, and for drivers, of more detailed check-ups (ophthalmologist, neurologist, otolaryngologist). Additional costs are related to the training of new drivers, which frequently means double cast in the cars (new drivers take the first course with experienced staff to learn the nature of the job).

The high level of derecruitment of drivers in 2011 (10 out of 12) was caused by opening the labour market to Poles by our western neighbour Germany. It is known that Polish transport operators constitute large percentage of the European freight forwarding market, and majority of Polish drivers are considered to be good workers. Driving around Western Europe many of them find more favourable job offers and decide to work mainly for the German employer. In this case the company loses the most valuable and skilled workers.

Summing up the last five years of "XYZ" operations in terms of redundancies, it is possible to notice that employers do not have an easy task, especially regarding the people employed as drivers. Excessive rotation causes high involvement of the management the personnel sphere. A positive aspect is that in the near future it is planned to create human resources and accounting departments. These changes should decisively lower the high level of employment fluctuations. This is crucial because in the company is going to increase the fleet of trucks by a few more vehicles, thus creating several new jobs, where the stabilization of employment will be the most desirable.

CONCLUSIONS

Employment fluctuation is a natural phenomenon, resulting form the nature of human resources and labour market, and takes place in any organization. Dismissals in companies with stable employment, where there is a low level of fluctuations are a marginal issue. However, a high level of staff turnover can cause problems in the functioning of an organization. Managers should strive for optimal employment in order to realize the mission of the company and achieve its objectives. Too frequent terminations of contracts and consequently hiring new employees in the company where interpersonal relations are disturbed, are the cause of concern. In such situation, the employer should recognize the causes and find effective solution to prevent a deepening regression of employment.

The economic situation often forces employers to seek savings. The most common and easiest method to save is reducing the number of employees in the organization, which provides immediate financial result. Unfortunately, it happens that decisions on dismissals of employees are taken too lightly. Managers do not consider problems and risks associated with the employment reduction. They do not give any thought to alternative solutions, allowing to maintain a constant level of employment. Sometimes the release process is not properly prepared, which causes complications for the business.

Derecruitment in the organization is an inevitable process, even though it should always be under constant supervision of the management in order to avoid negative effects for the company. Employers should pay special attention to retain valuable employees who achieve the highest scores, since their departure may result in loss of productivity and efficiency. Reduction in employment should be planned carefully and thought out so as not to bring unwanted consequences. It should be noted that derecruitment is not always a negative phenomenon, though. Employment of new, young people with enthusiastic approach to work can result in that the company will be more efficient, as well as an innovative look at the important issues of the organization.

The analysis carried out on the basis of internal resources of company "XYZ" shows that this transport - forwarding company has a problem with redundancies. It mainly refers to the drivers, especially international ones. The nature of their work is one of the most important causes of breakups with employees. Excessive releases in this position and consequently continuous posting of advertisements in the media has an impact on the image of the company in the local market. The continuous search for candidates to fill the vacant posts, interferes with the stability of the organization and generates additional costs associated with the newly hired workers. What follows is that employers should focus more on careful selection of candidates. Properly carried out recruitment and selection process shall bring workers with the right skills for the position, which will increase the chance of their attachment to the organization, and thus leads to longer employment in the company.

From the point of view of the anticipated further development of the company, it is a very

important element of the organization in the future.

Works Cited

Abbott, K., Pendlebury, N., & Wardman, K. (2007). *Business Law*. Hmpshire: SOUTH –WESTERN CENGAGE Learning.

Armstrong, M. (2002). *Zarządzanie zasobami ludzkimi.* Krakow: Oficyna Ekonomiczna.

Cascio, W. F. (2001). *Kalkulacja kosztów zasobów ludzkich.* Krakow: Oficyna Ekonomiczna.

Faulkner, N., & Jamroży, A. (2011). *The Labour code*. Latest updating: May 2011, Warsaw: C.H. BECK.

Golnau, W., ed. (2008). *Zarządzanie zasobami ludzkimi*. Warsaw: CEDEWU.

Kamińska, T., Kubska – Maciejewicz, B., & Laudańska – Trynka, J. (2004). *Teoria podejmowania decyzji przez podmioty rynkowe*. Gdansk: Wydawnictwo Uniwersytetu Gdańskiego.

Konieczny, O., & Schmidtke, R., ed. (2007). *Inwestycja w kadry. Perspektywa małych i średnich przedsiębiorstw*. Katowice: WYG International Sp. z o.o.

Korzeniowski, L. F. (2010). *Menedżment. Podstawy Zarządzania.* Krakow: EAS.

Kozłowska, B., (2009). *Wpływanie na płynność kadr*. "Twój Biznes", 7/2009.

Król, H., & Ludwiczyński, A., ed. (2006). *Zarządzanie zasobami ludzkimi. Tworzenie kapitału ludzkiego organizacji*. Warsaw: Wydawnictwo Naukowe PWN.

Marek, S., ed. (1999). *Elementy nauki o przedsiębiorstwie*. Szczecin: Fundacja na rzecz Uniwersytetu Szczecińskiego.

Pocztowski A. (2007). *Zarządzanie zasobami ludzkimi*. Warsaw: Polskie Wydawnictwo Ekonomiczne.

Szaban, J. M. (2011). Zarządzanie zasobami ludzkimi w biznesie i administracji publicznej. Warsaw: Difin.

Taylor, S. (2006). *Płynność zatrudnienia.* Warsaw: Wolters Kluwer Polska.

The Act of 26 June 1974 on the Labour Code (J. L. 1974 No 24, item141; J. L. 1998 No 21, item. 94 with subsequent amendments). Latest updating: May 2011.

Torrington, D., & Hall, L. (1991). *Personnel Management. A New Approach*. New York: Prentice Hall International.

Received for publication: 18.09.2012
Revision received: 04.12.2012
Accepted for publication: 21.12.2012

How to cite this article?

Style – **APA** *Sixth Edition*:
Tomaszewski, J. (2013, 01 15). Reduction of employment as an element of management in an organization - case study. (Z. Čekerevac, Ed.) *MEST Journal, 1*(1), 46-57. Retrieved from www.meste.org/mest/MEST_1_2013/_05.pdf

Style – **Chicago** *Fifteenth Edition:*
Tomaszewski, Janusz. "Reduction of employment as an element of management in an organization - case study." Edited by Zoran Čekerevac. *MEST Journal* (MESTE NGO) 1, no. 1 (01 2013): 46-57.

Style – **GOST** *Name Sort*:
Tomaszewski Janusz Reduction of employment as an element of management in an organization - case study [Journal] = Reduction of employment - an element of management // MEST Journal / ed. Čekerevac Zoran. - Belgrade - Toronto : MESTE NGO, 01 15, 2013. - 1 : Vol. 1. - pp. 46-57.

Style – **Harvard** *Anglia*:
Tomaszewski, J., 2013. Reduction of employment as an element of management in an organization - case study. *MEST Journal,* 15 01, 1(1), pp. 46-57.

Style – **ISO 690** *Numerical Reference*:
Reduction of employment as an element of management in an organization - case study. **Tomaszewski, Janusz.** [ed.] Zoran Čekerevac. 1, Belgrade - Toronto : MESTE NGO, 01 15, 2013, MEST Journal, Vol. 1, pp. 46-57.

MEST JOURNAL

SUPPORTING GREEN BUSINESS IN EUROPE: ENVIRONMENTAL POLICY INSTRUMENTS

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JEL category: **H, O, H23, K32, O13, O29**

Summary:
The article is devoted to the analysis of European countries financial policy in supporting green business development. Special attention is paid to the definition of the role of the state in maintenance of environmental goods and services market growth, that envisaged analysis of the main directions of environmental taxation, environmental expenditures and other environmental policy instruments. The carried out research enabled to determine countries, which invest the most financial resources in the improvement of the environment that assists to create better living conditions for the society. Also shown the economic expediency of green business development that helped to make the conclusion that this activity has sufficiently high profitability and creates a significant contribution to development of national economies.

Keywords:
green business, environmental goods, environmental services, environmental taxes, environmental expenditures, public-private partnership

1. Introduction - The Green business case for a Green Economy

The issue of global climate changes and environment protection are becoming more and more actual in the existing conditions of the world economy development. The majority of the developed economies have chosen the strategy of sustainable development as one of the main directions in the XXIth century. This strategy is a new model of development, which aspires to improve the economic, environmental and social conditions of the state functioning. Such model is based on the theories of technological dynamics, neo-malthusianism, neo-keynesianism and can be realized through implantation of green economy principles in business activity.

As the industrial activity is today's main source of environment pollution, the key attention of present-day researches is focused on the issue of

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applying in industry the technologies and business-processes, that are able to reduce the negative influence of business activity on the environment. In consequence of spreading of the ideas of The Club of Rome, UNEP and other organizations, a new direction of the economic activity – green business – started to develop in the last years.

Green business, being one of the basic components of green economy, is an activity, which primary objected on getting profit from the sale of ecological goods and services (EGS): a) the production and providing of which envisages the use of the methods and technologies that aim to minimize the integral ecologically destructive impact on the environment; b) the use of which creates maximally ecologically favorable living conditions for the society in both short-term and long-term periods. In addition to the traditional functions of entrepreneurial activity green business has its own specific functions, namely: satisfaction of environmental needs of society, protection of natural environment, minimization of ecologically destructive impact of business activity, providing formation of ecological consciousness, preservation of natural capital.

Thus, the concept of green business suggests that production of environmental goods and servicesis carried out in the sustainable way, and assists improving of the environmental and social living conditions.

2. The state role in supporting of the green business development

A conversion from the extensive type of economic development to the sustainable requires the use minimization of non-renewable natural resources and the effective use of renewable ones, improvement of environmental quality, strengthening of the state's environmental security and should lead to stable economy growth. Such transition supposes to generate and introduce the financial mechanism of green business development, which would create favorable conditions for implamantation of the environmental management at enterprises, expanding of the EGS production, conducting green R&D etc.

Nowdays exclusively position in relation to state interference in the development of green business is not elaborated. Such scientists, as James Meadowcroft (1997) and Michael Redclift (1993) believe that sustainable development requires the centralized planning, which, in its turn, should be supported by the high degree of state interference. At the same time, David Pearce (Pearce D., Markandya A., Barbier E., 1989; Pearce D., Barbier E., 2000) notes, that the centralized planning is inappropriate for sustainable development and that it should be carried out by means of market decentralizing economic tools. On the author's opinion, green business in it's infancy stage requires the state intervention and after achieving the level of self-funding can develop on the market conditions. This is because the traditional entrepreneurs usually ignore the environmental methods of the production aspiring only to maximize their profits and the state can create the conditions which would stimulate enterprises to improve the environment. The establishment of green business considerably depends on the state support and requires, first of all, development of the legal base and economic instruments.

3. Environmental policy instruments for stimulation of the EGS market development

After the adoption of sustainable development strategy in majority of European countries in 2001, the social unity and environmental protection received the immediate state support (Commission of the European Communities, 2009). It has been established by the governments of EU member countries, which support development of environmental goods and services market, that they may use the following groups of tools:

- informative (trainings, recommendations, etc.);
- partner (dialogs, partner programs and other ones);
- financial and economic (economic initiatives, privileges, grants, etc.);
- regulative (laws, norms, rules, requirements, etc.);
- hybrid (strategies, activity plans, etc.).

The government of each country solves independently, which tool to be chosen for stimulation of green business development.

Basically it depends on the country's internal economic and financial factors. The most used group of instruments of supporting green business development among the European countries is the regulative one, as its usage envisages creation of the proper legal base both on the state and local levels. The legislative implamantation of green business principles is very important, because that creates the basement for its development. The other frequently used group of tools is financial and economic one, which is mostly formed from environmental payments and expenditures.

3.1. Tax-based environmental policy instruments to stimulate green business

Nowadays in European countries there are quite a lot of different environmental taxes, one of the purpose of which is to improve the environmental living conditions. These payments can be grouped according to the general tax-base (see Table 1).

The highest number of environmental taxes is used in Denmark, the lowest taxation, as a tool of supporting environmental protection, is used in Cyprus. From Table 1 it is clear that in Europe among the most widespread objects of environmental taxation are the usage of resources, environmental pollution, wastes collection and utilization.

It could be mentioned that in 2010 the highest volume of environmental payments was formed in Germany (€54 164.0 mln) and UK (€40 603.37 mln). However, the share of these payments as a percentage of GDP accounts only for 2.3 and 2.6% respectively. In such countries as Denmark (4.8%), Netherlands (4.0%) and Slovenia (3.6%), the amount of the environmental taxes as a percentage of GDP is considerably higher. If to take into consideration that exactly in Germany and UK the establishment of green business began, then such data can testify that environmental taxes is more effective supporing instrument for the countries in which green business is on the infanty stage, and in the countries where this direction of activity is developed it is needed to apply other tools.

Table 1. Environmental taxes in European countries grouped by the general tax-base (European Environment Agency, 2012)

Country	General tax-base							
	Emission of CO_2	Environmental pollution	The resources usage	Usage of the hazard matters in agriculture	Production and usage of the environmentally	Wastes collection and utilization	Hunting and fishing	Other
Austria	**Y**	**Y**	**Y**	N	N	**Y**	**Y**	**Y**
Belgium	N	**Y**	**Y**	**Y**	N	N	N	**Y**
Bulgaria	N	**Y**	**Y**	N	**Y**	N	**Y**	**Y**
Cyprus	N	N	**Y**	N	N	N	N	**Y**
Czech Republic	N	**Y**	**Y**	N	**Y**	**Y**	N	**Y**
Denmark	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**
Estonia	N	**Y**	**Y**	N	N	**Y**	**Y**	**Y**
Finland	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**
France	**Y**	**Y**	**Y**	N	N	**Y**	N	**Y**
Germany	N	N	**Y**	N	**Y**	N	N	**Y**
Hungary	N	**Y**	**Y**	N	**Y**	**Y**	N	**Y**
Ireland	N	N	**Y**	N	**Y**	N	N	**Y**
Italy	N	**Y**	**Y**	**Y**	**Y**	**Y**	N	**Y**
Latvia	N	**Y**	**Y**	N	**Y**	**Y**	N	**Y**
Lithuania	N	**Y**	N	N	**Y**	**Y**	**Y**	**Y**
Luxemburg	N	N	**Y**	N	N	N	N	**Y**
Malta	**Y**	N	**Y**	N	N	**Y**	**Y**	**Y**
Netherlands	N	**Y**	**Y**	N	**Y**	**Y**	**Y**	**Y**
Poland	N	**Y**	**Y**	N	**Y**	**Y**	**Y**	**Y**
Portugal	N	N	**Y**	N	**Y**	N	**Y**	**Y**
Romania	**Y**	**Y**	N	N	N	**Y**	**Y**	**Y**
Slovakia	N	**Y**	**Y**	N	N	**Y**	N	**Y**
Slovenia	**Y**	N	**Y**	**Y**	**Y**	**Y**	N	**Y**
Spain	N	**Y**	**Y**	N	**Y**	**Y**	N	N
Sweden	**Y**	N	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**
UK	**Y**	**Y**	**Y**	N	N	N	N	N

Note: *«Y» – direction is the object of taxation; «N» – direction is not the object of taxation.*

3.2. Environmental expenditures instrument to support green business

Another environmental policy instrument which advanced sustainable development is budget financing. In Europe there are quite a lot of programs of the state financial support of environmental protection and green business development, that are generalized in Table 2.

The basic object of the budget financing, as the environmental policy instrument, in Europe is investing in green business. Also in European countries at the state levels are actively financed programs connected with the improvement of energy efficiency. There are 20 countries marked in Table 2 that have special state support programs for this direction. Less actively EU

countries financially support agriculture and nature protection (only in one country from 20 this direction of financing is presented). All mentioned testifies, that governments of the European countries actively assist the sustainable development due to stimulation of the innovative activity in the sphere of green technologies and green business.

Table 2. Main directions of the environmental expenditures in European countries (European Environment Agency, 2012)

Country	Direction of environmental expenditures											
	Forestry	Agriculture	Pollution control	Energy efficiency	Investment in green capital	Promotion of green goods and technologies	Public cleansing facilities	Industrial cleansing facilities	Nature protection	Green R&D	Personnel training	Other
Austria	**Y**	N	N	N	N	N	N	N	N	N	N	N
Belgium	N	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**
Bulgaria	N	N	**Y**	**Y**	**Y**	N	**Y**	**Y**	N	**Y**	**Y**	**Y**
Cyprus	N	N	**Y**	**Y**	N	**Y**	**Y**	**Y**	N	N	N	N
Czech Republic	**Y**	N	**Y**	**Y**	**Y**	N	**Y**	N	N	**Y**	**Y**	**Y**
Denmark	N	N	**Y**	**Y**	**Y**	**Y**	N	**Y**	N	**Y**	N	**Y**
Estonia	N	N	N	N	**Y**	**Y**	**Y**	**Y**	N	**Y**	**Y**	**Y**
Finland	N	N	N	**Y**	**Y**	**Y**	**Y**	**Y**	N	**Y**	N	**Y**
France	N	N	N	**Y**	**Y**	N	N	**Y**	N	**Y**	N	N
Greece	N	N	N	**Y**	**Y**	**Y**	N	**Y**	N	**Y**	N	**Y**
Hungary	N	N	N	**Y**	**Y**	**Y**	N	N	N	N	N	N
Italy	N	N	N	**Y**	**Y**	**Y**	N	N	N	**Y**	N	**Y**
Lithuania	N	N	N	**Y**	**Y**	**Y**	**Y**	**Y**	N	**Y**	N	**Y**
Netherlands	N	N	**Y**	**Y**	**Y**	**Y**	N	**Y**	N	**Y**	**Y**	**Y**
Poland	N	N	N	N	N	N	N	N	N	N	N	N
Slovakia	N	N	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	N	**Y**	**Y**	N
Slovenia	N	N	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	N	N	N	N
Spain	N	N	N	**Y**	**Y**	N	N	N	N	N	N	N
Sweden	**Y**	N	N	**Y**	**Y**	**Y**	N	N	N	**Y**	N	**Y**
UK	N	N	N	N	**Y**	**Y**	N	**Y**	N	N	N	**Y**

Note: «Y» - direction is financed, «N» – direction is not financed.

According to the volumes of budget financing of environmental programs, such countries as Italy (€12 378.0 mln), France (€10 863.8 mln) and Germany (€7 690.0 mln) lead in Europe. However in Italy and Slovenia, the share of the budget financing of environmental programmes approached to 1% of GDP, and in Denmark this ratio is 1.1%. Arithmetical mean of the budgetary financing share in GDP among EU countries is 0.4%. Volumes of financial resources, which the state assigns for the green business development from budget, are higher as compared with those invested in environmental protection by subjects of economic activity, as shown in Fig. 1.

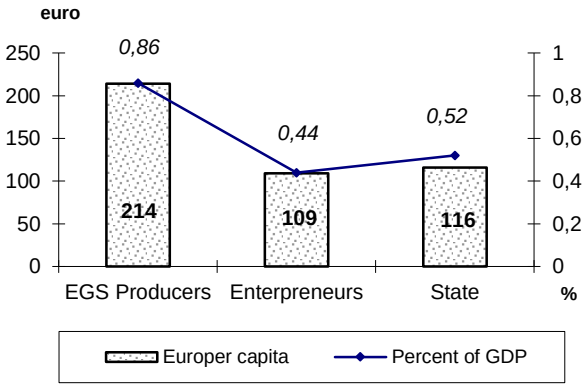

Figure 1 – Environmental expenditures in European countries in 2010 (Eurostat, 2010)

On Figure 1 it can be seen that in 2010 most financial resources assigned for environmental protection were invested by producers of environmental goods and services (approximately €214 per capita). Representatives of other directions of economic activity financed this direction less (on the average €109 per capita). It testifies that producers of the EGS have environmental consciousness, which induces not only the profit maximization but also aims to provide favorable living conditions for the society.

The volume of environmental expenditures of the EGS producers as a percantage of GDP in some European countries reaches 1.74% (see Fig.2). Among the European EGS producers most environmental expenditures are maid in such countries as Italy (€257.82 mln) and Denmark (€238.31 mln), that accounts for 0.99% and 0.57% of GDP respectively. Comparing volumes of environmental expenditures as a percentage of GDP, it is possible to draw the conclusion, that most investments in the environmental protection by the representatives of green busines are maid in Romania.

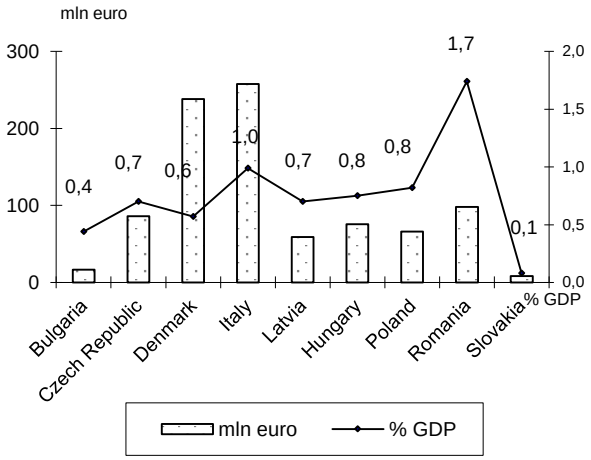

Figure 2 – Environmental expenditures of the EGS producers in European countries in 2010 (Eurostat, 2010)

Usually, on the emerging markets budget financing as the business supporting instrument is not widely used, as it is considered as ineffective method for stimulation of the economic activity development, because, as a rule, enterprises which get the state financial support are not eager to pass to the level of self-funding and are dependable from budget financial resources (Peszko & Zylicz, 1998). Therefore, governments of the European countries try to limitedly apply this instrument under condition that it is the most effective mean for stimulation of the development of certain activity and will have a short-term character.

3.3. Other important instruments of green business support

Deposit-refund systems may be used as a weighty leverage of stimulation of processing and utilization of the environmentally harmful goods. It envisages that the price of potentially polluting products increases on the volume of the legislatively approved rate (rate of refund), which is compensated after the returning (either to the seller or producer) of the used goods, in full volume or partially according to the legislatively fixed rate of compensation. 16 countries of EU use the deposit-refund system as an instrument of environment improvement, majority of them are related to such products and materials, as glass and glassware, packing materials, cars, accumulators, etc. On average, these systems allow to compensate up to 80% of the product's price, which is an influential stimulus for returning of the used goods and creation of the waste utilization and recycling enterprises.

Another effective instrument, which assists to the EGS production is customers' adherence to environmental consciousness. The environmental orientation of buyers supports growth of solvent demand on the green business products and services, which in its turn leads to purchasing more expensive, but environmentally clean and resource effective goods and services (World business consil for sustainable development, 2011; McConnell, 1997).

Conducted by *National Geographic Society*, *GlobScan, Synovate* and *Aegis* researches show that in Europe a new type of environmentally conscious consumers has already been formed. They are eager to improve the environmental living conditions and ready to pay a higher price for the goods of enhanced environmental quality. These studies also show that 96% of EU population consider environmental protection as the important factor of their existence.

Another important method of attracting financial resources into projects, where the state and municipal authorities try to preserve control and organize cooperation with investors, is a public-private partnership. According to the data of the *European Center of Public-Private Partnership Development* there were signed 115 agreements in the sphere of public-private partnership in 2010, with help of which over €18 mln were attracted into various projects. Such countries as UK, Portugal, France, Germany, Spain and Italy are leaders in the number of such agreements. The above mentioned countries accumulate 92% financial resources available in Europe on the conditions of private-public partnership (Kappeler & Nemoz, 2010).

The agreements of public-private partnership aim to attract financial resources in the sectors of economy, in which such co-operation is necessary and can have positive consequences both for the state and society. The sphere of environmental protection obtains the least financial resources through public-private partnership, however the only presence of co-operation between the state and society in this direction assists to the green business

development as it helps to intensify the environmental consciousness of the society.

4. The economic expediency of the green business

In EU state support and above mentioned environmental policy instruments have helped green business to develop in the different directions of economic activity. By turnover, employment and created added value the EGS producers lead in such directions as manufacturing, production of drinking water, cleaning of sewage, R&D in the field of green technologies. In 2009 the highest profit rate had such EGS market directions, as trade (29%) and green R&D (24%), while in other industries the profit rate of green business is below 20%, and for manufacturing this index is the lowest and accounts for 16% (Eurostat, 2010). Besides the profit rate is varied depending on a country. France (€14 341 mln) and Italy (€13 480 mln) have the highest profits from the sale of EGS. It should be mentioned, that exactly in these countries the financial state support of green business is the highest, and such level of profitability can be the consequence of the active state support of this activity. The lowest share from the EGS sales is in Slovakia and accounts only for €30.8 mln.

From above mentioned, it's possible to draw the conclusion, that environmental consciousness of society is increasing year by year, that assists to the demand growth on EGS in Europe. As the production of these goods has a sufficiently high profit rate (on the average 20%), the green business makes considerable contribution onto development of national economies of the European countries.

CONCLUSIONS

Thus, implementation of the environmental policy instruments, their period of usage and role in achievment of sustainable development in EU depend much on availability of acomulation of financial resources, which are needed and may be invested in development of such tools. For this reason in the European countries regional funds for supporting of environmental protection are created, the proper resources from the budgets of EU member countries are assigned for development of the instruments of financial mechanism of green business establishment. As the overall objective of sustainable development will be attained only when green business will become the self-funding type of activity. Thus, in Europe at the state level the powerful system of stimulation of green business development is created, which envisages co-operation of the followings elements: legal regulation of the environmental protection and green business activity; economic instruments; economic levers; institutional support of environmental management and environmental protection. The enhance of environmental consciousness of European nations also assists to the growth of demand for environmental goods and services in the member countries of EU, the production of which has sufficiently high profitability and creates a considerable contribution to development of national economies.

Works Cited

Commission of the European Communities. (2009). *Mainstreaming sustainable development into EU policies: 2009 Review of the European Union Strategy for Sustainable Development*. Retrieved from http://eur-lex.europa.eu

European Environment Agency. (2012). OECD/EEA database on environmentally related taxes, fees and charges, other economic instruments and voluntary approaches used in environmental policy and natural resources management. Retrieved from http://www2.oecd.org/ecoinst/queries/.

Eurostat. (2010). *Environmental statistics and accounts in Europe*. Retrieved from http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-32-10-283/EN/KS-32-10-283-EN.PDF/.

Kappeler A., & Nemoz M. (2010). *EIB Economic and Financial Report: Public – Private Partnerships in Europe – Before and During the Recent Financial Crisis*. Luxemburg: EIB. Retrieved from http://www.eib.org/attachments/efs/efr_2010_v04_en.pdf

McConnell, K. (1997). *Income and demand for environmental quality*. Environment and development Economics, Vol 2, 383–400.

Meadowcroft, J. (1997). *Planning for sustainable development: insights from the literatures of political scienc*e. European Journal of Political Research, Vol. 31, 427–454.

Pearce, D., & Barbier, E. (2000). *Blueprint for a Sustainable Economy*. London: Earthscan.

Pearce, D., Markandya A., & Barbier E. (1989). *Blueprint for a green economy*. London: Routledge.

Peszko, G., & Zylicz, T. (1998). *Envoronmental financing in European economies in transition*. Environmental and resource economics, Vol. 11(3–4), 521–538.

Redclift, M. (1993). *Sustainable Development: Needs, Values, Rights*. Environmental Values, Vol. 2, 3–20.

World business counsil for sustainable development. (2011). *Sustainable consumption Facts and Trends*. Retrieved from http://www.docstoc.com/docs/83452925/The-Business-Role-Focus-Area/.

Received for publication: 25.09.2012
Revision received: 05.12.2012
Accepted for publication: 21.12.2012

How to cite this article?

Style – **APA** *Sixth Edition*:
Stepanenko-Lypovyk, B. (2013, 01 15). Supporting green business in Europe: environmental policy instruments. (Z. Čekerevac, Ed.) *MEST Journal, 1*(1), 58-64. Retrieved from www.meste.org/mest/MEST_1_2013/_06.pdf

Style – **Chicago** *Fifteenth Edition:*
Stepanenko-Lypovyk, Bohdana. "Supporting green business in Europe: environmental policy instruments." Edited by Zoran Čekerevac. *MEST Journal* (MESTE NGO) 1, no. 1 (01 2013): 58-64.

Style – **GOST** *Name Sort*:
Stepanenko-Lypovyk Bohdana Supporting green business in Europe: environmental policy instruments [Journal] = Supporting green business in Europe // MEST Journal / ed. Čekerevac Zoran. - Belgrade - Toronto : MESTE NGO, 01 15, 2013. - 1 : Vol. 1. - pp. 58-64.

Style – **Harvard** *Anglia*:
Stepanenko-Lypovyk, B., 2013. Supporting green business in Europe: environmental policy instruments. *MEST Journal,* 15 01, 1(1), pp. 58-64.

Style – **ISO 690** *Numerical Reference*:
Supporting green business in Europe: environmental policy instruments. **Stepanenko-Lypovyk, Bohdana.** [ed.] Zoran Čekerevac. 1, Belgrade - Toronto : MESTE NGO, 01 15, 2013, MEST Journal, Vol. 1, pp. 58-64.

MEST JOURNAL

CRITICAL INFRASTRUCTURE AND ITS ECONOMY

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JEL category: **H, H54**

Summary:
Globalization, increasing independence and complexity, new technologies and climate change create approach to security based on the concept of critical infrastructure. Concept of critical infrastructure is based on the basic precondition – the State should (is obliged) to fulfill vital State functions (political, economic and social) for its inhabitants. The paper deals with the role and objectives of critical infrastructure, the consequences of disasters and the possibility of their quantification. Definitions of critical infrastructure are provided (different approaches – USA, EU, Slovak republic - Act Nr. 45/2011) and expressed types of failure significant for any critical infrastructure. There are classified key drivers relevant for critical infrastructure in the Slovak republic. Within the paper is described the example explaining the concept quantification of losses. The terms like average annual loss and exceedance probability are explained. At the end of the paper the forthcoming financial mechanism is mentioned. This mechanism is also connected to financing of the critical infrastructure of European Union (EU) member states. In the paper are expressed objectives concerning EU Internal Security Strategy. Under consideration is the Fund for interior security in EU for years 2014-2020 to support the Strategy. The financial conditions of the Fund are briefly described in the paper.

Keywords:
Critical infrastructure, catastrophe, economic impact, quantification of losses

1 Introduction

One of the government's functions is to protect and secure its citizens. Globalization, increasing independence and complexity, new technologies and climate change create new challenges for the government and its approach to security policy. The approach identifies significant assets in terms of State functions and protection of citizens' life in it. This approach underlines the concept of critical infrastructure (CI). It is based on identification of elements that are the most important for the fulfillment of vital State functions.

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Each country is highly dependent on specific operations of CI that fulfill supply of basic goods and services. They are e.g electric energy supply, IT services, waste disposal. Disruptions may have huge impact on the population (business and non-business sectors). Therefore the fundamental objective is to maintain the operability of the CI (within a country as well as EU – speaking about the member state). The specific aspect of CI is that any disruption of a CI element can affect huge economic losses (e.g large scale power blackout, floods and other catastrophes).

The concept of the CI has its political, social and economic dimensions.

2 Catastrophe and its economic impact

Generally, there can be identified different possible trajectories of the disaster consequences (compare (Hochrainer, 2006))

There are different trajectories of possible disaster consequences (e.g. GDP, profit). The possible trajectories are:

- discontinuity of a system; the consequences of a disaster are so substantial that it results into system failure,
- negative long term effect; the trajectory of the long term consequences is under the projected line without additive disaster event,
- positive long term effect; the trajectory of the long term disaster consequences is above the projected line without additive disaster event.

The consequence of a disaster can have positive, negative or neutral impact on the output – in case of a state the representative outcome is GDP (GDP/inhabitant). In practice the isolated disaster (localized in a subregion) can cause fundamental consequences or on the other side (with other aspects of environment) it can start rapid economic growth of the subregion, region or the country.

There are cross-sectional criteria that help to identify elements of critical infrastructure published in the paper. These cross-sectional criteria are based on the law (Nr. 45/2011 About Critical Infrsastructure, 2011, p. 436):

a) the number of vulnerable people, including those killed and injured persons,
b) the economic impact, which includes:
   a. economic losses
   b. deterioration of goods
   c. deterioration in the quality of public services
   d. negative impact on the environment
c) impact on the population degrading the quality of citizens` life in terms of
   a. severity of loss of supply and the recovery time
   b. severity of failure in providing public services and recovery time
   c. availability of replacement supplies
   d. availability of compensation for the services provided in the public interest.

The economic impact of the failure of critical infrastructure can be quantified via direct or indirect economic losses. The other approach to the failure of critical infrastructure will be explained in the paragraph – Quantification of losses.

3 Critical infrastructure

Critical infrastructure (CI) is defined as following: "Include those physical resources, services, information technology facilities, networks and infrastructure assets, which, if disrupted or destroyed would have a serious impact on the health, safety, security, economic or social well-being of either." (EU, 2011), (114/EC, 2008).

The Critical Infrastructure Assurance Office (CIAO): "the framework of interdependent networks and systems comprising identifiable industries, institutions (including people and procedures), and distribution capabilities that provide a reliable flow of products and services essential to the defense and economic security of the USA, the smooth functioning of governments at all levels, and society as a whole. " (Rinaldi & all., 2001)

The Act Nr. 45/2011 on critical infrastructure was approved in the Slovak Republic. It provides a definition of critical infrastructure elements as follows: “Disruption or destruction of civil engineering building, service in the interest of public and information system in the sector, having potentially serious adverse consequences or the conduct of economic and social functions of the Country, and thereby the impact on the quality of life, protection of life, health, safety,

property and environment according the sector criteria and cross-cutting criteria." (Nr. 45/2011 About Critical Infrsastructure, 2011)

Critical infrastructure can be characterized:

- it consists of assets, products, services,
- consequences of its dysfunctions have extreme impact on the whole society (economic and socio-political environment),
- it is a network of assets, products or services, whose activities, performance act in the network of interrelations.

Critical infrastructure relates to interdependency. It is a bidirectional relationship between two infrastructures through which the state of each infrastructure influences or is correlated to the state of the other. Interdependency can be seen as the two-level system:

- First level – a system of relations within the identified infrastructure (e.g. transport)
- Second level – a system of relations to others, different sectors (e.g. relations between transport and telecom, banking and finance) and sub second level defined as coupling order – indicates whether two infrastructures are directly connected to each other or indirectly coupled through one or more intervening infrastructures - compare to (Rinaldi & all., 2001).

There are three types of failure within a critical infrastructure (Rinaldi & all., 2001):

- cascading – when a disruption in one infrastructure causes the failure of a component in a second one,
- escalating - when an existing disruption in one infrastructure exacerbates an independent disruption of a second one,
- common cause – when two or more infrastructures networks are disrupted at the same time.

The key drivers and trends of critical infrastructure in the Slovak republic are:

- the infrastructure is owned and managed by public and private sectors and the average age of structures increases,
- the cooperation between private sectors and state organizations is the challenge for the future; only cooperation can fulfill objectives and increase security,
- the improvement, investments and maintenance costs are rising,
- the government is financing critical infrastructures – it is seen as the state objectives but the financial sources tend be more and more limited,
- the cyber sphere started to be the most critical part of the infrastructure
- functionality of critical infrastructure is also determined by climate change and technological innovations.

4 Quantification of losses

Occurrence of an event – a catastrophe can be quantified by the yearly occurrence probability p_i and related loss L_i. For events from tab.1 is assumed that they are independent Bernoulli distribution that can be described (Grossi & Kunrenther, 2005):

$$P(E_i \text{ occurrence}) = p_i \quad (1)$$

If the event E_i does not occur, then the loss $L_i = 0$. The amount of the expected loss EL_i of an event E_i is

$$EL_i = p_i * L_i \quad (2)$$

The total loss for all events during a year is defined as AAL – average annual loss and can be quantified

$$AAL = \sum_i EL_i = \sum_i p_i * L_i \quad (3)$$

Exceedence probability for a given loss can be computed as:

$$EP(L_i) = P(L \rangle L_i) = 1 - P(L \le L_i) = 1 - \prod_{j=1}^{i} (1 - p_i) \quad (4)$$

The final value EP (Li) gives the yearly probability that the loss will overcome the defined value. EP curve can identify probable maximum loss PML. PML is a subjective measure of risk.

An insurer can apply EP curve (fig.1) to define amount of loss that can be on the predefined probability level. PML can be adversary defined as the yearly probability to overcome pre-specified loss. In the case that frequency of a catastrophe is once per 10 years than it is a 10%

annual probability of exceedence. In the example the frequency of an event is once per 10 years. For PML it is low frontier of loss that shows 10% probability to overcome EP curve. From the Picture 2 is clear that PML is about 2,6 mil.€.

Tab.1 Average annual loss –example (based on (Grossi & Kunrenther, 2005))

Event (E_i)	Probability/year (p_i)	Loss (L_i) (€)	Exceedence probability for a given loss ($EP(L_i)$)	$EL_i = p_i * L_i$ (€)
A	0,001	30 000 000	0,001	30 000
B	0,008	25 000 000	0,009	200 000
C	0,01	15 000 000	0,0189	150 000
D	0,02	10 000 000	0,0385	200 000
E	0,03	5 000 000	0,0674	150 000
F	0,04	3 000 000	0,1047	120 000
G	0,05	1 500 000	0,1494	75 000
H	0,06	800 000	0,2005	48 000
I	0,07	600 000	0,2564	42 000
J	0,08	500 000	0,3159	40 000
K	0,09	400 000	0,3775	36 000
L	0,15	300 000	0,4709	45 000
M	0,18	250 000	0,5661	45 000
O	0,19	150 000	0,6486	28 500
P	0,02	0	0,6556	0
		Average annual loss =		1 209 500

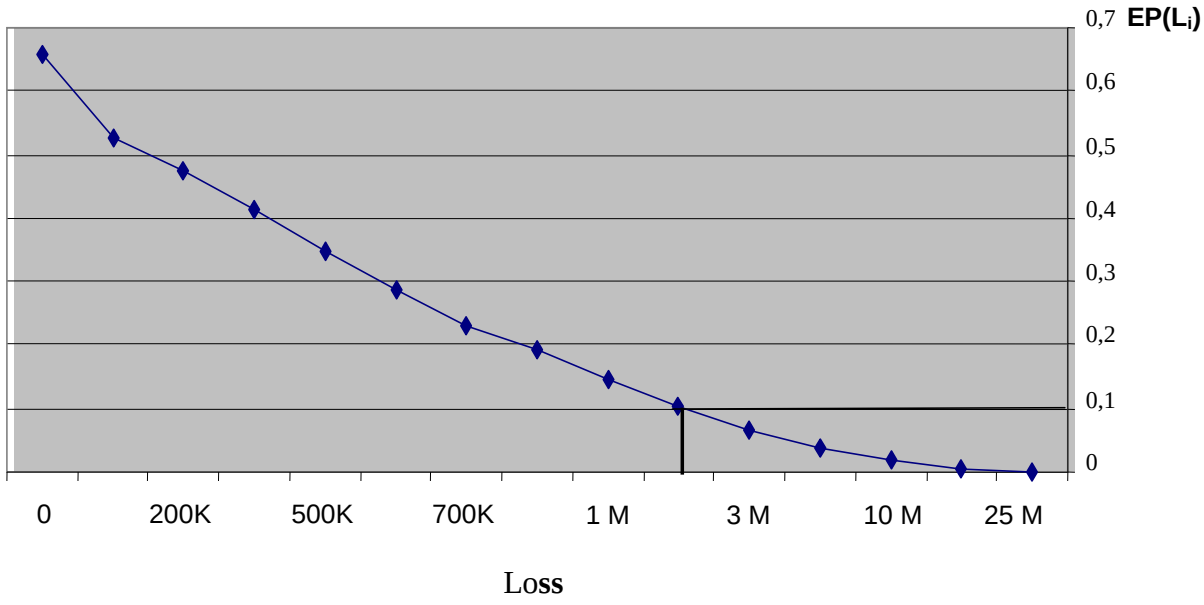

Fig.1 Relation between loss and risk probability

Let us assume that we quantify for different EP (Li) expected losses ELi .

Tab.2 Example based on (Grossi & Kunrenther, 2005)

Return time (years)	EP (L_i)	EL_i Model A (mil.€)	EL_i Model B (mil.€)	EL_i Model C (mil.€)	Linear Combination (mil.€)
10 000	0.01%	40.00	45.00	70.00	50.00
5 000	0.02%	38.00	43.20	69.20	48.40
2 000	0.05%	36.00	42.10	67.20	46.85
1 000	0.10%	35.50	40.10	65.10	45.20
500	0.20%	34.00	38.70	63.20	43.65
200	0.50%	30.00	36.00	60.90	40.73
100	1.00%	27.60	34.50	58.20	38.70
50	2.00%	27.40	32.10	56.90	37.13
20	5.00%	25.00	30.80	54.20	35.20
10	10.00%	20.00	28.60	53.90	32.78
5	20.00%	15.80	25.90	52.10	29.93
2	50.00%	14.20	23.10	51.10	27.88
weight		25%	50%	25%	

In the case we identify EP of an event 0.5% it means that the return time in years is 200 years, otherwise the event will occur with frequency once per 200 years. Other very useful interpretation of the model is – that functionality of a critical infrastructure (any assets) can be identified by the resistance. Following approach is applied in the UK: „as a minimum essential services provided by Critical National Infrastructure (CNI) in the UK should not be disrupted by a flood event with an annual likelihood of 1 in 200 (0.5%)". (Keeping the Country Running Natural Hazards and Infratsructure, 2011) The Government set out explicit standards against which investments could be planned and appraised and suggested that a 1 in 200 (0.5%) annual probability event was a reasonable starting point to protect Critical National Infrastructure from flooding.

For the data in the example at 1-in-10 year event or 10% probability of exceedance, the loss estimates in the interval 20,00 to 53,90 mil. €. By applying linear combination the loss to this frequency is 32.78 mil€

In the example model A, B, C can represent individual sectors and expected losses. Application of different weights we can get data that allow analyzing the current problem in more sophisticated background.

5 Critical infrastructure financing

After identification of elements of CI financing decision taking is needed. The traditional sources are state budget and state transfer to private owners – subsidy to cover additional costs to keep predefined level of security. Based on the Slovak law:

"The operator is entitled to a financial contribution to meet the obligations associated with the implementation of security measures to protect elements of CI and it is entitled towards central authority in the field of critical infrastructure, to the sector the operator is associated and when the central authority will appoint the organization and this obligation is based on the other generally binding legal regulation. The regulation to provide financial subsidies should be submitted by the competent central authority" (Nr. 45/2011 About Critical Infrsastructure, 2011).

The Security belongs to the one of the EU objectives. EU Internal Security Strategy (in 2010) focuses on the following strategic objectives:

- prevention of cross-border, serious and organized crime and fight against it,
- prevent terrorism, radicalization and recruitment,

- increase the capacity for critical infrastructure protection across all economic sectors,
- increase the resistance of Europe to crisis and disasters. (EU, 2011)

With the objective to improve safety there is a proposal (working document) to establish Fund for interior security in EU for years 2014-2020. Financial sources allocated for the Fund will be 1 128 mil.€ for this period. The sum will be split in ratio 50/50 for member states and EU authority – it means 564 mil.€ will be delivered to member states to support national programs and measures of EU. EU will apply the rest (50%) for the measures within direct or indirect subsidies.

CONCLUSION

The concept of organizational resilience can be defined as the ability of an organization to anticipate, plan and respond to the hazards and threats. The infrastructure resilience consists of four elements (Keeping the Country Running Natural Hazards and Infratsructure, 2011):

- resistance,
- reliability,
- redundancy,
- response and recovery.

There is strategically important to build critical infrastructure that is based on the four pillars. The finance and the ability to quantify losses are preconditions. The losses should be identified and also should be identified the relations, dependencies among different items of CI. The objective is to define mechanism that optimizes investments and pre-defined level of CI security. In the long term seems to be crucial to identify financial schemes based on non-state funding.

Works Cited

114/EC, E. (2008). *On the Identification and Designation of European Critical Infrastructures and Assesssment of the Need to Improve their Protection .* Brussels.

EU, C. o. (2011). *Interinstitutional document (working document).* Bruussels: EU.

Grossi, P., & Kunrenther, U. e. (2005). *Catastrophe Modelling.* Berlin: Springer.

Hochrainer, S. (2006). *Macroeconomic Risk Managemenent against Natural Disasters.* Wien: DUV.

Keeping the Country Running Natural Hazards and Infratsructure. (2011). Retrieved 12 12, 2012, from www.cabinetoffice.gov.uk

Nr. 45/2011 About Critical Infrsastructure. (2011). *List of Bills*, 436-450.

Rinaldi, S., & all., a. (2001). *Identifying, Understanding and Analyzing *Critical Infrastructure Dependencies.* Retrieved 12 10, 2012, from www.ce.cmu.edu

The paper was published within the project APVV-0471-10 Security of Critical Infrastructure in Transport.

Received for publication: 25.09.2012
Revision received: 14.12.2012
Accepted for publication: 21.12.2012

How to cite this article?

Style – **APA** *Sixth Edition*:
Klučka, J. (2013, 01 15). Critical infrastructure and its economy. (Z. Čekerevac, Ed.) *MEST Journal, 1*(1), 65-71. Retrieved from www.meste.org/mest/MEST_1_2013/_07.pdf

Style – **Chicago** *Fifteenth Edition:*
Klučka, Jozef. "Critical infrastructure and its economy." Edited by Zoran Čekerevac. *MEST Journal* (MESTE NGO) 1, no. 1 (01 2013): 65-71.

Style – **GOST** *Name Sort*:
Klučka Jozef Critical infrastructure and its economy [Journal] = Critical infrastructure and its economy // MEST Journal / ed. Čekerevac Zoran. - Belgrade - Toronto : MESTE NGO, 01 15, 2013. - 1 : Vol. 1. - pp. 65-71.

Style – **Harvard** *Anglia*:
Klučka, J., 2013. Critical infrastructure and its economy. *MEST Journal,* 15 01, 1(1), pp. 65-71.

Style – **ISO 690** *Numerical Reference*:
Critical infrastructure and its economy. **Klučka, Jozef.** [ed.] Zoran Čekerevac. 1, Belgrade - Toronto : MESTE NGO, 01 15, 2013, MEST Journal, Vol. 1, pp. 65-71.

MEST JOURNAL

FOCUS ON INNOVATION AND EDUCATION AS A PREREQUISITE FOR SUSTAINABLE DEVELOPMENT

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Summary:
Basic precondition for organisations wanting to ensure sustainable development is constant development of their human potential, which represents the ability of organisations to generate new ideas, subsequently put into innovations, while they are also able to ensure the key part which is the implementation of these innovations itself. Deliberate creation and usage of human potential is a precondition of building and development of strengths and competitive advantages of organisations. If organisations want to be "innovative" they should have several characteristic features. In our contribution, we focused on two of them – binding engagement of company management in innovations and creation of so called learning organisation environment. In the questionnaire survey conducted at the School of Economics and Management in Public Administration in Bratislava, we focused on finding out whether and in what extent the given characteristics are dealt with by organisations operating in Slovakia. Analysis of 340 organisations implies that organisations realize direct impact of intensity of innovation and education of employees on their sustainable development at the theoretical level, however, their practical focus on individual characteristics is insufficient. Due to the given reason, we recommended a set of questions with a variety of closed answers on the basis of which organisations are able to find out, using summary tables, where their bottlenecks are.

Keywords:
innovative organisation, learning organisation, present state analysis, human resources management

1. Introduction

Priority source of effective operation and prosperity of each organisation is human potential. However, this statement cannot be understood in general, its validity lies in how it is

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ready for organisation tasks, what its education and culture, ability to cooperate, perception of social and ecological factors of environment etc. are. Systematic creation and usage of human potential is a precondition of building and development of strengths and competitive advantages of organisations. To make it reality, systemically framed management of human resources is necessary, orientating employees to achieve strategic goals and objectives of organisation. (Hitka & Aláč, 2006)

The need of organisations to engage in innovation and education and development of their employees is currently supported also by the European Commission, which issued economic strategy named "*Europe 2020*" on March 3rd, 2010 whose declared objective is to recover from the crisis and prepare the European union economy for the following decade. The Commission defined *three key factors of growth* in this strategy (EU Commission, 2010):

- intelligent growth (support of knowledge, innovations, education and digital society),
- sustainable growth (enhancing efficiency of our production concerning sources, with parallel competitiveness increase),
- inclusive growth (increase of labour market participation, gaining of skills, and struggle against poverty).

Individual growth factors fulfilment is directly influenced by educational level of inhabitants which is, apart from state impact, directly influenced also by education and development provided in individual organisations.

Trends in education of employees are directed toward development and education of employees leading to performance increase and quality efficiency measurement under the influence of increasing pressure on constant change of environment. That results in the need of a change from random, respectively unplanned education (i.e. education when necessary courses and trainings are performed only on the basis of an impulse of a need to gain the given knowledge, respectively experience) to general approach to education, to so called learning organisation. The aim of learning organisation is to reach permanent education of employees focused on performance increase immediately but also within a longer time horizon on the basis of continuously provided feedback. (Stachová & Stacho, 2012)

Process of positive changes requires a mixture of creativity, clear thinking and ability to finalize issues successfully. It requires a close cooperation of people who think with people who can implement an idea in practice. Management of organisation has to create environment with room for development of thoughts, new ideas, and offer means necessary for their implementation. (Čimo & Mariaš, 2006)

If organisation wants to be "innovative" it should have several characteristic features like binding engagement of organisation management in innovations, creative managers, innovative organisational culture, orientation towards customers, open and broad communication in all directions, learning organisation, flexible organisational structure, significant engagement in innovations, implemented talent management, and it should support team work. (Stacho, 2012) In our contribution, we focused on the following two:

- binding engagement of organisation management in innovations,
- establishment of the environment of so called learning organisation.

Justification and level reached by medium and big organisations operating in Slovakia within the two given characteristics of innovative organisation will be presented in this article.

2. Justification of binding engagement of company management in innovations

Innovation can be defined as practical realisation of a new idea for the purpose of present state improvement. Engagement of management in innovations predominantly lies in the fact that company top management has to clearly demonstrate that it supports innovations and tries to implement positive innovations. Participation of management in innovation implementation is important, as each change in company requires significant expert and power background and support. It practically means a well-elaborated approach towards overall solution as well as individual steps, where one can hardly manage without experts. However, it also means, as with each consulting, having an opportunity to rely on

strong powerful authority inside the company which is able to enforce individual steps even against aversion which can arise. On the basis of experience, compliance between expert and powerful promoter of the project is an essential precondition of success in implementation and sustaining of innovative industrial enterprise. (Stacho, 2011)

Conviction of the necessity to innovate, correctness of innovation procedures and implementation tools always has to be initiated by managing employees. They are decisive bearers and it is possible only through them to convince other employees of the necessity to innovate. However, if there are significant doubts and distrust in the upcoming difficult situations and if there is a revulsion from individual steps, it is impossible to expect acceptance by subordinates. It is a very sensitive part of the complex process which has to be rigidly required by top management in whole management hierarchy, and such approach has to be encouraged in all people inside the company in order to establish room for innovation implementation.

Actual innovation in almost each big company will be defeated by politics, procedures and rituals without real zeal of top management. Chairpersons or CEOs can no longer afford to wait for others to come up with creative changes and innovations. They have to risk and support positive proactive changes. Changing things means to have a leader who will manage the change but changing things before all the others means to innovate. (Adair, 2004)

3. Justification of establishment of learning organisation environment

When considering investments in people, many managers worry that sooner or later they will lose these people. However, there is even a worse thing than investing in training and education of employees and losing them – not investing in their education and development and keeping them. Gaining and keeping top people in a company is currently one of the key roles of company managements focused on innovation. (Kachaňáková A. , 2010)

Learning at the company level is supposed to furnish the company with such preconditions which help it fulfil tasks set by the company itself as well as those resulting from quickly changing external environment. (Urbancová & Königová, 2010)

Organisational learning predominantly includes learning in action, learning from own experience and searching new possibilities. In order for organisation to be able to learn, it needs to run as an open dynamic system. It needs to be open to external as well as internal impulses. It needs to establish environment without barriers, without boundaries of “us and them” type. (Hroník, 2007)

Learning organisation deliberately uses the learning process at individual, group and whole system levels in order to transform the organisation gradually towards the direction satisfying interest groups in an increased extent. (Tichá, 2005)

Learning is also nowadays perceived as a necessary evil in many organisations, representing costs which organisation has to exert for employee to be able to press the right button of a new machine. However, successful innovation in organisations depends on whether management is able to perceive learning as an investment in creating an organisation understanding why innovations are carried out and able to manage innovation-related processes.

4. Research characteristics

Objective of the article is to present results of the research conducted in the period from February 2011 to May 2011, aimed predominantly at finding out whether and how human resources management is currently implemented in organisations operating in Slovakia. Regarding extent of the given issue, research was divided into ten partial objectives, while one of them was to identify whether organisations realise the importance of focusing on binding engagement of company management in innovations and on establishment of so called learning organisation environment. This article is going to deal with results of this partial objective.

Set of respondents comprised 340 organisations operating in Slovakia, while the main condition posed on the organisation was the size of at least 50 employees.

Overall size structure of interviewed organisations is given in Figure 1, implying that organisations with the number of employees between 50 and 300 were most represented in the research.

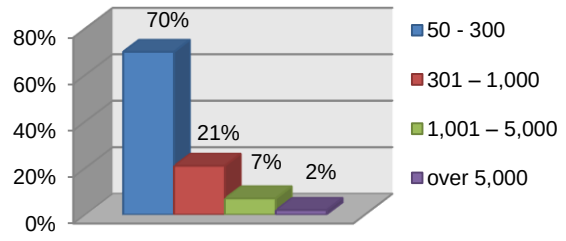

Fig. 1. Size structure of the analysed organisations

5. Binding engagement of managements of organisations operating in slovakia in innovations

For the purpose of finding out whether company managements support innovation implementation, we were primarily interested in whether they realize their importance, and therefore we asked: *"Do you consider important that your organisation deals with innovations (in any sphere)?"* Answers to this question sounded more than positive, as 93 % of executive employees gave positive answer to it. Remaining 7 % stated that it would be financially demanding for them to innovate in any sphere and they do not know if their company survives.

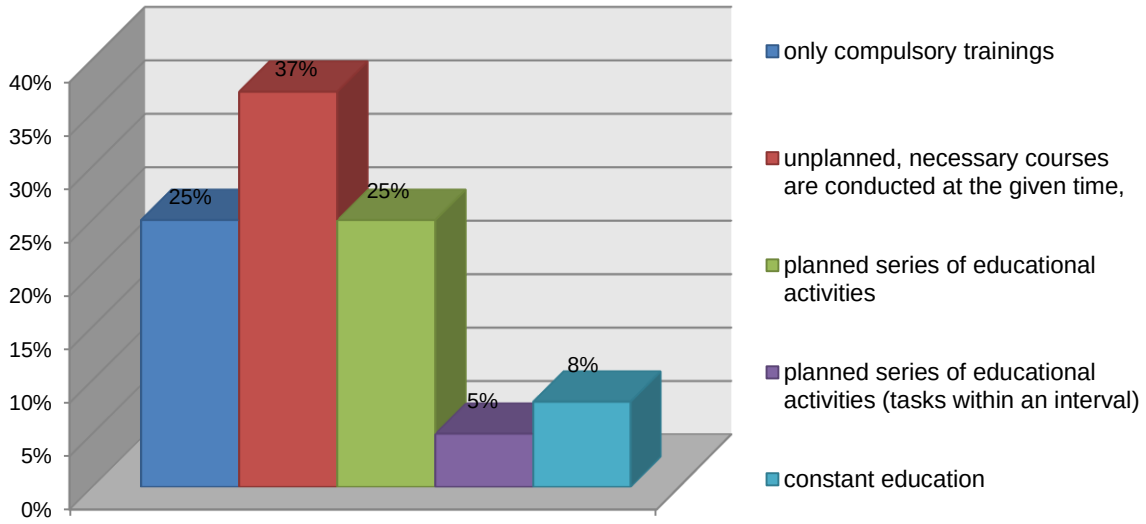

Fig. 2. Formal system of employee evaluation in interviewed organisations

As a result, they do not deal with the issue of innovations at all. From the aforementioned we assumed that even if not all 93 % of executive employees at least majority of them would tend to engage in innovation implementation. However, already second answer disconfirmed our assumption.

The second question: "Has your company elaborated documentation defining mission of organisation, corporate strategy and objectives in the sphere of innovations?" We focused on finding out existence, respectively absence of individual documents, because if management is engaged in the support of innovations this objective to innovate in the company has to be necessarily defined in corporate strategy, and it is corporate strategy creation on which management has a direct impact. Research showed that corporate mission and corporate strategy are defined in writing, respectively in non-written form in approximately 85 % of analyzed companies, however, innovation objective itself is defined in writing in only 23 % of them (Figure 2). These 23 % represent only one fourth of companies which answered positively to the first question regarding importance of innovation, which is very few, since we do not consider innovation objective definition itself significantly financially demanding. Confidence, respectively realization of importance of

innovation need by company management is essential.

Table 1. Percentage of companies with elaborated corporate mission, strategy and innovation objective

	Yes, document in written form	Yes, in non-written form	No
Corporate mission	71%	13%	16%
Corporate strategy	69%	18%	13%
Innovation objective	23%	27%	50%

6. Establishment of learning organisation environment in organisations operating in Slovakia

Within establishment of learning organisation environment, we were primarily focused on employee evaluation, since it is possible to perceive it as a basis of streamlining human resources in company. It serves to obtain information and specify present state of the level of employees and primarily to real determination of objectives for future human resources management. Appropriately elaborated system of employee evaluation results in correct specification of educational process of employees, which subsequently implies their enhanced working performance and increased motivation of employees regarding work quality. Last but not least, it is a well-established evaluation system which enhances justice, transparency and effectiveness in employee remuneration. Each of these features has a direct impact on attitude of employee towards innovations in their company. Answers to question: *"Do you have a formal system of employee evaluation for the following employee categories?* (management, experts and technicians, administrative employees, manual workers)" implied that almost 80 % of interviewed organisations have established a formal evaluation system (see Figure 2).

Within finding out whether evaluation system is focused on all employees or only on several of them, we asked organisations declaring to have established a formal system of employee evaluation the following question: *"Do you have a formal system of employee evaluation for the following employee categories?"* Answers of interviewed organisations showed that employee evaluation is in the greatest extent carried out for the managerial position (see Table 2). More than 60 % of interviewed organisations declared that they have established a system of employee evaluation for all employee categories.

Table 2 Percentage of organisations with elaborated formal system of employee evaluation for individual employee categories.

Do you have a formal evaluation system for:	% of organisations
Managers	82%
Experts	74%
Administrative employees	79%
Manual workers	76%

We subsequently focused on finding out the level of employee education and their will to share gained knowledge. It can be generally applied that effective education needs to be well-arranged, systematic and continuous within a repeating cycle. Answers of interviewed companies showed that 25 % of them use so called organized approach towards education of their employees, which can be marked as the third level of five-level scale, on whose end is so called learning organisation, currently denoted as the most appropriate and purposeful way of education. More than 60 % of companies indicated lower-level approaches towards education, particularly 37 % indicated so called random approach, and 25 % indicated so called zero alternative where education is restricted only to compulsory trainings stipulated by law or directives. Only 5 % of companies use the approach of structured education concept and 8 % indicated their approach towards education as learning organisation concept.

We were interested in answers to question: *"To what extent is knowledge shared in the organisation?"* not only to find out content and frequency of knowledge spreading in organisations but also to find out what value knowledge has for employees. The research

showed that almost 30 % of respondents stated that knowledge at individual departments is shared differently, and therefore they marked two options from the offered scale of answers, while the answers were significantly contradictory in all cases.

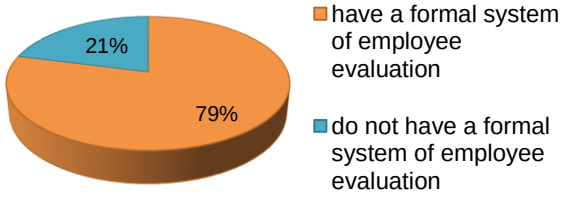

Fig. 3. Graph showing educational process in interviewed companies

Findings resulting from this question sound significantly negative, since most often shared knowledge is knowledge necessary for work (Figure 4). This variant is followed by answer that knowledge is rather shared, and only 21 % of organisations marked that their knowledge is fully shared. In 10 % of organisations, knowledge even becomes a means of securing power and monopoly, for fear of working position loss.

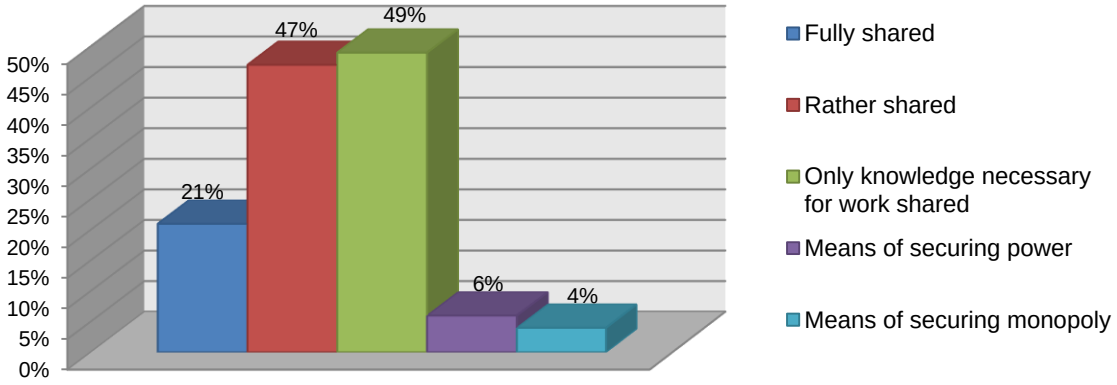

Fig. 4. Extent of knowledge sharing in interviewed organisations

7. Research evaluation and recommendations for present state improvement

Answers of interviewed organisations operating in Slovakia showed that more than 90 % of managing employees realize the importance and need of innovation in their organisation, however, their engagement in written definition of particular innovation objective was not so significant. Research showed that only 23% of medium and big companies had defined innovation objective, while its definition can be considered company´s first step in innovation "initiation" and therefore if management engages in innovation implementation it should insist on this objective definition as necessity. This fact points out that companies usually do not deal with innovative organisation implementation, although they clearly realize the need to innovate.

The following characteristic feature of organisation´s focus on advancement and innovation implementation is the need of change from random, respectively unplanned education towards holistic approach. It means organisation´s focus on education at a higher, respectively more complex level, i.e. creation of learning organisation. Objective is to reach constant education focused on performance increase at the moment as well as in the long-term on the basis of continuous feedback focused on "modifying objectives", i.e. learning on the move. However, research showed that only 13 % of respondents are successfully approaching learning organisation.

In order to become learning organisation, it is also necessary to create atmosphere of permanent

Table 3 Questions analyzing the sphere of binding engagement of company management in innovations, with scoring evaluation

QUESTIONS AND ANSWER VARIANTS
1. Does your company have an elaborated innovation strategy?
a) yes, in written form
b) yes, in non-written form
c) no
2. Company employees perceive changes (in production, services, in the sphere of working potential formation):
a) as a challenge
b) sometimes as a challenge, sometimes as a threat
c) as a threat
3. How does company management present its approach towards innovations?
a) management declares its intention to advance through innovations in every turn
b) management approves of innovations, however it does not present the idea at all company levels
c) management does not present any support of pro-innovative employee behaviour in any way
4. How does company management encourage employees to come up with innovative solutions?
a) management regularly organizes competitions in proposing innovative solutions in different spheres
b) management does not organize any competitions in innovative proposals, however supports eventual innovative solutions
c) management does not organize competitions in innovative proposals and does not support any eventual innovative solutions by employees
5. What is the behaviour of company management in case of aversion of employees upon innovation implementation?
a) company management supports innovation implementation in whole management hierarchy, and is willing and able to support it even in case of aversion of employees
b) in case of aversion of employees upon innovation implementation, manager implementing the innovation is not supported by management

Source: (Stacho, 2012)

educational development which is directly conditioned by team learning, and thus mainly by full knowledge sharing within the organisation, focusing on team. However, the research showed that knowledge is fully shared in only 21 % of respondents.

For the purpose of analysis of the level of binding engagement of organisation management in innovation, the organisation should answer 5 questions (Table 3) and subsequently record the answers in the Table 3. On the basis of the aforementioned, organisation can determine its level itself, and thus determine where its bottleneck is within the given characteristics.

Table 4. Table revealing bottlenecks in the sphere of engagement of company management in innovations

No. of question / answer	1	2	3	4	5
very good	a	a	a	a	a
standard	b	b	b	b	
bad	c	c	c	c	b

Source: (Stacho, 2012)

For the purpose of analysis of the level of establishing so called learning organisation environment, we also compiled a question summary for organisation to answer (Table 5) and subsequently record answers in the Table 6.

Table 5 Questions analyzing the sphere of learning organisation implementation, with scoring evaluation

QUESTIONS AND ANSWER VARIANTS
1. Are company employees willing to learn? a) yes, they suggest courses themselves b) yes, but courses have to be suggested by company c) no, they aren´t, and they avoid courses d) no, they aren´t, and the company is not interested in their education
2. Knowledge in company is: a) fully shared b) rather shared c) only knowledge necessary for work is shared

QUESTIONS AND ANSWER VARIANTS
d) a means of securing power, respectively it is not shared for fear of working position loss
3. Company uses mainly these educational methods: a) self-education, e-learning, outdoor learning, internship in a foreign subsidiary, couching, rotation at workplace, mentoring, lectures, work on projects, videoconferences, assessment centre b) self-education, e-learning, outdoor learning, mentoring, rotation at workplace, lectures, work on projects c) self-education, e-learning, rotation at workplace, mentoring, lectures d) self-education, lectures
4. How is employee education interconnected with carrier growth strategy? a) It is exactly specified which courses, certificates and trainings employee has to attend and complete in order to have an opportunity of carrier growth. b) It is only generally defined what type of courses, certificates and trainings employee should attend and complete in order to have an opportunity of carrier growth. c) It is not defined which courses or certificates employee needs for carrier growth.
5. How is education carried out in your company? a) permanent education b) organized educational activities planned over whole year c) trainings and courses in case they are needed d) only compulsory trainings
6. Does your company evaluate education effectiveness? a) yes, education is systematically evaluated b) yes, but we do not have an elaborated evaluation system c) no

Source: (Stacho, 2012)

On the basis of the aforementioned, organisation can determine its level itself, and thus determine its bottlenecks within the given characteristics.

Table 6 Table revealing bottlenecks in the sphere of learning organisation implementation

No. of question / answer	1	2	3	4	5	6
very well	a	a	a	a	a	a
above standard	b	b	b	b	b	
below standard	c	c	c	c	c	b
bad	d	d	d		d	c

Source: (Stacho, 2012)

8. CONCLUSION

Organisations which want to be competitive need constant participation in innovative transformation process. This process can be successful only in case that organisation creates environment where employees will be able and willing to adapt to constantly changing conditions. Innovative environment in organisation can be created and subsequently retained only under constant active support by management who does not support this environment in organisation only formally but actively encourages and motivates employees by different directed activities to share information, and in their permanent development and education. (Kachaňáková & Stachová, 2010)
The research we conducted showed quite negative findings, particularly:

- only 23 % of medium and big companies operating in Slovakia had defined innovation objective,
- only 13 % of respondents is successfully heading towards learning organisation,
- knowledge is fully shared in only 21 % of respondents.

With regard to found facts, we proposed a set of questions with a variety of closed answers for the organisations regarding both analyzed characteristics of innovative organisation, i.e. for binding engagement of company management in innovations and establishment of so called learning organisation environment, based on which organisation can find its bottlenecks in combination with using the summary table.

We see justification of the given research part in practice particularly in revealing irresponsible behaviour of organisations operating in Slovakia in directing and advancing in the sphere of

education and innovation. On the basis of our presentation of obtained results, organisation managements can compare their own present state within the given spheres to state that interviewed organisations declared, and subsequently consider options of its enhancement. We also consider as contribution the compilation of a block of questions for both analyzed characteristics in combination with the summary table, based on which organisations can find their bottlenecks in individual spheres. At the same time, we consider as necessary to continue in this research in order to improve, modify, enhance and develop individual approaches on the basis of new information obtained from interviewed organisations.

Works Cited

114/EC, E. (2008). *On the Identification and Designation of European Critical Infrastructures and Assesssment of the Need to Improve their Protection .* Brussels.

Adair, J. (2004). *Effective Innovation.* Nový Zlíchov: Alfa Publishing.

Čimo, J., & Mariaš, M. (2006). *Innovation Management.* Bratislava: GeoPARNAS.

EU Commission, .. (2010, 03 03). *Europe 2020: Commission proposes new economic strategy in Europe.* Retrieved from Europa Press releases RAPID : http://europa.eu/rapid/press-release_IP-10-225_en.htm

EU, C. o. (2011). *Interinstitutional document (working document).* Bruussels: EU.

Grossi, P., & Kunrenther, U. e. (2005). *Catastrophe Modelling.* Berlin: Springer.

Hitka, M., & Aláč, P. (2006). Combination of Evaluation Methods in Employee Evaluation From the Point of View of Manufacturing Company Management. *Management in Theory and Practice, 1*, 51-58.

Hochrainer, S. (2006). *Macroeconomic Risk Managemenent against Natural Disasters.* Wien: DUV.

Hroník, F. (2007). *Development and Education of Employees.* Praha: Grada Publishing.

Kachaňáková, A. (2010). *Organisational Culture* (1 ed.). Bratislava: Iura Edition.

Kachaňáková, A., & Stachová, K. (2010). Present State of Employee Permanent Education in the Context of Individual Slovak Regions. In V. Cibáková, & I. Malý, *Dopady vybraných verejných politík na regionálny rozvoj v Slovenskej a v Českej republike* (pp. 21-28). Bratislava: crr.sk.

Keeping the Country Running Natural Hazards and Infratsructure. (2011). Retrieved 12 12, 2012, from www.cabinetoffice.gov.uk

Nr. 45/2011 About Critical Infrsastructure. (2011). *List of Bills*, 436-450.

Rinaldi, S., & all., a. (2001). *Identifying, Understanding and Analyzing *Critical Infrastructure Dependencies.* Retrieved 12 10, 2012, from www.ce.cmu.edu

Stacho, Z. (2011). Innovations and Innovation Culture, or How to Survive. *International Masaryk Conference for Doctoral Students and Young Scientists 2011 (MMK 2011): Textbook of Contributions.* Hradec Králové, Czech Republic: Masaryk University.

Stacho, Z. (2012). *Proposal of Complex Evaluation Methodology of Innovative Industrial Enterprise Characteristics Level. [Doctoral Thesis].* Trnava: Slovak Technical University in Bratislava. Faculty of Materials Science and Technology; Institute of Industrial Engineering, Management and Quality.

Stachová, K., & Stacho, Z. (2012). Condition of effective implementation of innovation is employee education In: . *Menadžment 2012 : Zborník radova Proceedings* (pp. 644-647). Beograd-Mladenovac: ICIM+.

Tichá, I. (2005). *Learning organisation.* Praha: AlfaPublishing.

Urbancová, H., & Königová, M. (2010). Control and Its Role in the Process of Ensuring Knowledge Continuity. *Journal of Modern Accounting and Auditing, 6*(7), 38-45+57. Retrieved from http://www.davidpublishing.com/journals_info.asp?jId=1020

Received for publication: 15.09.2012
Revision received: 09.11.2012
Accepted for publication: 21.12.2012

How to cite this article?

Style – **APA** *Sixth Edition*:
Stachova, K. (2013, 01 15). Fokus on innovation and education as a prerequisite for sustainable development. (Z. Čekerevac, Ed.) *MEST Journal, 1*(1), 72-81. Retrieved from www.meste.org/mest/MEST_1_2013/_08.pdf

Style – **Chicago** *Fifteenth Edition:*
Stachova, Katarina. "Fokus on innovation and education as a prerequisite for sustainable development." Edited by Zoran Čekerevac. *MEST Journal* (MESTE NGO) 1, no. 1 (01 2013): 72-81.

Style – **GOST** *Name Sort*:
Stachova Katarina Fokus on innovation and education as a prerequisite for sustainable development [Journal] = Preconditions of sustainable development // MEST Journal / ed. Čekerevac Zoran. - Belgrade - Toronto : MESTE NGO, 01 15, 2013. - 1 : Vol. 1. - pp. 72-81.

Style – **Harvard** *Anglia*:
Stachova, K., 2013. Fokus on innovation and education as a prerequisite for sustainable development. *MEST Journal,* 15 01, 1(1), pp. 72-81.

Style – **ISO 690** *Numerical Reference*:
Fokus on innovation and education as a prerequisite for sustainable development. **Stachova, Katarina.** [ed.] Zoran Čekerevac. 1, Belgrade - Toronto : MESTE NGO, 01 15, 2013, MEST Journal, Vol. 1, pp. 72-81.

MEST JOURNAL

MEDICAL PROVISION OF CRISES SITUATIONS SOLVING

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JEL category: **I**, **I18**

Summary:
Logistic activities in resolving crisis situations caused by occurrence of the emergency event create an effectively operating system of tasks and measures with the goal of protecting life, health and property. Fulfilment of individual logistic activities and the rate of their fulfilment depends on the extent of crisis situation, its nature and on the time it occurred. This contribution deals with medical provision of crises situations solving as an important part of crisis management in Slovak Republic.

Keywords:
Medical provision, evacuation, veterinary provision, professional medical assistance

1 Logistic support of resolving crisis situations

Logistics, as a management method in market economy environment is focused on satisfaction of customer's requirements, creating logistic chains in order to achieve the required goal based on synchronization, coordination and optimization of material, informational and spatial exchanges.

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In the environment of resolving crisis situations, where saving of human lives, animals and property is often the case, logistics plays a vital role. The subject is formed by principal logistic processes related to material flows (transport, handling, storage) and to the flow of information (planning, dispositions, management, supervision). (Novák & al., 2010) The goal is in optimization of information and material flows aiming at the fulfilment of logistic requirements – to provide for the disposition of the right material, of services and information at the right place and in the right time, in the right quantity and in the

right state, to the right person and with appropriate costs. However, this goal is being achieved in conditions of crisis situation:

- unforeseen and permanently changing conditions as time and space is concerned, during formation of logistic chains which are necessary to secure emergency operations and activities relieving the negative effects of crisis situations.
- priority of humanitarian aspect above others (financial, time, spatial, organizational) in resolving crisis situation,
- limited possibilities of application of certain methods and procedures commonly used in logistics,
- specific requirements on readiness of human and technical resources for complex resolution of logistic support.

There are certain specific aspects of logistic support in crisis situations (Seidl, 2005):

- **Performance aspect**, which defines the performance of services for the customer on the required level. Crisis situations change the priority and difficulty level of the criteria generally used with regard to the quality of logistic performance. In crisis situation, a significant part of the customer's needs is defined regardless of his real desires. His material requirements and services are taken care of in a directive manner and the customer has to comply with the "majority" viewpoint. This means lower customer service quality in all of its aspects – as time, reliability, quality and flexibility of delivery is concerned.
- **Economic aspect**, which defines the efficiency of services for the customer while spending only the minimum level of costs with respect to the given level of service. The strict economic limitation of material and informational flow in resolving crisis situations is not always possible. Time priorities, capacity possibilities, spatial availability and the whole sequence of other factors compel to choose the technologies and resources to provide logistic processes (procurement, transport, storage, handling, distribution, information exchange and other) in crisis situations regardless of excessive costs of the said processes. Operational nature of decision-making and mainly the lack of time may lead also to the wrong choice of more expensive solution alternative. Generally speaking, the customer could not influence disproportional costs of the service provided and because of this he neither has to take part in their reimbursement.
- **Ecologic aspect**, which defines the minimization of the effect logistic processes exert on the environment. The generally contradictory nature of economic and ecologic logistic objectives comes forward also in the activities of crisis situations resolution. The aspects of time, capacity and space already mentioned above usually temporarily outweigh the environmental aspects. Crisis situations themselves nearly always have a negative influence and damage the environment.

Logistics as a management method has its meaning not only within the issues of economic prosperity of subjects but also in the area of crisis situations resolution. The main task of **crisis management** is to perform preventive measures, to create conditions enabling resolution of crisis situations and operation readiness. Organization structure of crisis management is based on three fundamental logistic principles:

- centralization – elimination of duplicity, making system more efficient,
- coordination – streamlining the activities of all participants taking part at resolving crisis situation,
- optimization – the choice of suitable solution in order to achieve maximum effect.

Crisis management deals with issues of prevention against occurrences of crisis phenomena and creates conditions for successful solution of crisis situations caused by emergency event. (Act No 256/2006 Coll.)

Logistic support of resolving crisis situations is a specific execution of logistic measures:

- directly on behalf of persons, animals, objects affected by emergency events,
- on behalf of forces and measures deployed in order to resolve the crisis situation.

One of the unique features of the logistics support system of resolving crisis situations is the fact that the subjects of the system flow mostly comprise

also services, i.e. the flow of intangible processes in the form of medical relief, rescue, relocation, accommodation, protection and etc. (Fig. 1). Even though these intangible processes could be connected with using certain material, the corresponding flow of material doesn't have to be a pre-condition of their existence (utilization of local resources and conditions to provide the mentioned services).

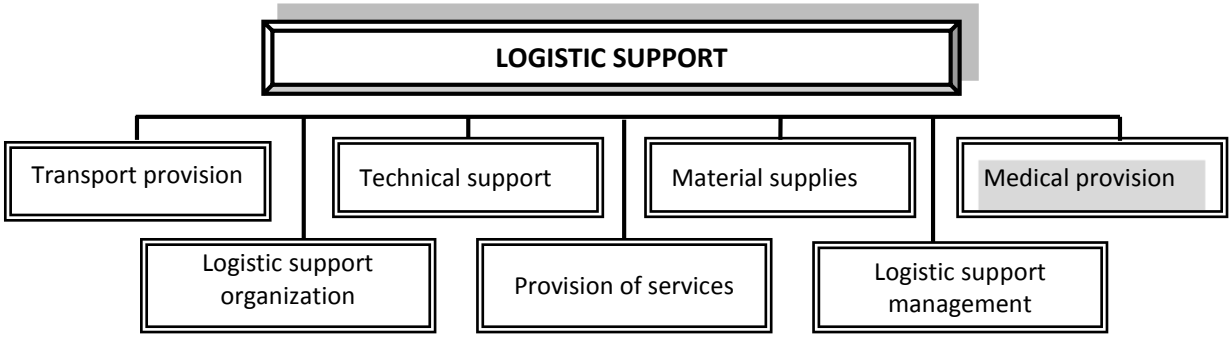

Fig. 1 Structure of logistic support elements to resolve crisis situations (Sventeková, 2009)

Organization of logistic support comprises specification and preparation of organizational units of logistic support (groups, forces, their structure and resources), type of their activation, their deployment, definition and type of utilization of stationary resources for logistic support, division of personnel and material resources in functional units, protection of logistic elements and areas of their activities.

Transportation support means finding solutions of how to transport forces and resources into the area of activity, providing transport of material and equipment, loading/unloading of transported material, transport of material to be relocated including waste resulting from rescue works performance, providing drivability of communications including security and control services.

Technical support requires the renewal of deployed forces and resources with equipment, spare parts, keeping the equipment in permanent state of readiness, performing maintenance to secure operational reliability of the equipment and its efficient utilization, forming locations of technical aid using mobile resources and local facilities, rapid renewal of operational ability of transport vehicles and equipment by appropriate means and appropriate extent of repairs.

Material support includes receiving, preparation, distribution and material stock formation, organization of acceptance, temporary improvised storage and handling of used material, distribution of material from selected storage locations and defined local sources, complex provision of food supplies, medical supplies, water, personal consumer material, fuel, special material to eliminate consequences of the emergency event (chemical agents, protective equipment).

Provision of services comprises organization of alternative accommodation including facilities and complete energy supplies, preparation and distribution of food for the affected persons and for the rescue teams, providing the people have sufficient water intake and rest, providing social services (personal hygiene, washing, cleaning and changing clothes), educational and socio-psychological support, spiritual services and cultural possibilities. A specific type of service in crisis situations is searching, concentration, identification and burial (removal) of human casualties.

Medical provision means providing the appropriate level of medical aid (self-help, mutual help, pre-medical and medical help) in case of injuries and diseases of persons, searching, concentration and removal of the injured and ill persons, blood supplies, distribution of

medication and medical supplies, taking part in elimination of consequences of chemical and nuclear accidents, performing surveys and supervision in the areas of hygiene and epidemiology and performance of complex hygienic and counter-epidemiologic measures. Veterinary measures are also the part of medical care.

Logistic support management presumes the activity of competent officials who are able to solve all mentioned logistic support elements in a complex manner. Logistic planning must be coordinated with rescue operations planning. Managing requires processing of the necessary documents (plans, orders, requirements, notifications), providing relocations and transportation, manage and provide catering, resolve accommodation requirements, searching for and enabling utilization of material resources. Management has to perform integration of logistic support system of deployed forces and resources with material and technical provisions of the affected objects and those in the region, optimization of quantity of logistic support material resources. Optimum functioning of logistic support system necessitates collection, transfer, processing and utilization of the required information.

2 The tasks of medical provision

Professional medical assistance is provided by medical rescue service. Its basic objective in crisis situations is to provide basic medical assistance and medical care not only for persons affected by the emergency event but also for the rescue units and other forces deployed in order to resolve the crisis situation and to determine basic hygienic and epidemiologic measures. The tasks connected with medical provision of crisis situations resolution are fulfilled by the Ministry of Health of the Slovak Republic.
Besides providing medical help, its basic tasks include:

- definition of stationary medical assistance post,
- definition of the location for providing medical assistance,
- medical accompaniment in transport vehicle.

The higher the numbers of the affected persons, the more complicated to get timely medical care and the requirements are increasing. The situation gets more complicated due to the necessity of providing medical care for a wide range of affected population – from new-borns, through hospital patients after the surgery up to the persons providing help to those affected by emergency situation.

In Slovakia, professional medical assistance is provided by terrestrial medical rescue service and helicopter medical rescue service.

Helicopter rescue service is focused on improving complex rescue system quality, for providing rapid help for in-between hospital transports and anywhere, where its rapidity and availability may decrease the risk of transport-related trauma or of later medical complications. It is allocated for:

- the rescue operations in woods and other, hardly accessible terrain,
- operations in case of transport accidents and collective disasters,
- transports of patients in critical state,
- urgent pre-hospital care in remote areas,
- transports for transplantation programme, transports of blood and of medication.

Helicopter rescue service is in the state of alert 24 hours a day in the centres listed in the following overview (Fig. 2).

Fig.2 Centres of professional medical assistance

The types of flights performed by helicopter rescue service:

- primary (in order to provide first aid to the injured),
- search,
- ambulance (transport of patients or medical supplies between hospitals),
- repatriation (cross-border transport),
- to save property,
- to provide medical care.

Medical provision is one of the basic elements of any rescue system. Medical first aid service is an institution with the objective of providing uninterrupted medical care of the patient, even outside normal working hours, in the days of rest and on holidays.

Medical rescue service is intended for out of hospital treatment of serious conditions, it is intended not only for patients but also to operate in the areas of traffic accidents and other emergency situations with a threat to human life. For this kind of operation the medical rescue service is equipped with the required equipment, technical means and material.

In case of emergency call in Slovakia, medical services in the framework of integrated rescue system are provided by:

- terrestrial medical rescue service,
- helicopter medical rescue service.

Medical rescue service providers are the fundamental rescue element of the integrated rescue system which carries out emergency rescue service in the intervention area in accordance with the instructions of integrated rescue system coordination centre and operation centre of medical rescue service. They undergo periodic professional training every 12 months, including:

- principles of management, coordination and evaluation of medical rescue service activities,
- fundraising, assessment of emergency calls and management of response,
- the way of providing voice and data information transfer,
- principles of coordinating activities with rescue units of integrated rescue system,
- principles of crisis intervention and principles of psychological and social first aid.

Medical rescue providers are obliged (Act No 129/2002 Coll):

- to establish and staff the system of continuous supervision, control and coordination of forces and resources of medical rescue service so as to be able to provide a continuous and steady performance of immediate medical assistance based on the orders from operation centre of rescue and medical service or of the coordination centre,
- to provide operating conditions of medical rescue service station and medical rescue service ambulance in such a way, that the ambulance is ready for operation within one minute after receiving the order from the coordination centre and the flight of the helicopter rescue medical service ambulance is performed immediately when the weather conditions enable to do so.

We may recognize three stages of medical activities of terrestrial medical rescue service:

- basic – performed directly in the field, in the area affected by crisis situation,
- specialized – provided in hospitals,
- restoring – includes after-treatment, rehabilitations.

3 Basic medical provision

The basic stage of medical provision logistics support is performed from the acceptance of the emergency request by medical rescue service (ZZS) regional operating centre (KOS) until handover of the last patient to the medical facility. Duration of this stage depends on various factors:

- local conditions (accessibility of the area, time of the day, etc.),
- weather conditions,
- the availability of integrated rescue system units,
- the number of affected persons,
- the number of deployed persons and technical resources,
- the capacity of transport vehicles intended for the transport,
- the possibilities and types of transport,
- medical care organization,
- the activities of crisis committees, disaster commissions,

The basic stage is performed by providing immediate pre-hospital treatment, which is provided by medical rescue service action groups. Action groups set off to the emergency event location immediately after it was reported and constitute the first sequence of professional medical treatment. After obtaining more detailed information and based on the number of injured and the extent of the emergency event, further sources and resources are being activated, in accordance with the trauma plan, which constitute the second sequence. (Sventeková & Dvořák, Information provision of logistics support in civil protection, 2012) Their formation and set off must happen in the fastest possible manner.

The following activities are performed during the first stage:

- ZZS (medical rescue service) regional headquarters sends the first available terrestrial ZZS ambulance,
- communication of ZZS regional operation centre with the first action group,
- reconnaissance of emergency event area and definition of medical requirements,
- recalling other required action groups,
- providing professional medical help within the designated area of emergency event (selection of the injured, professional medical first aid, organization of transport to the defined medical facilities),
- ZZS regional operation centre requirements to free beds in medical facilities in accordance with the situation reported from emergency event location,
- performance of trauma plan measures in say in healthcare facilities (alertness of acceptance clinics, providing sufficient number of doctors, nurses and assistance personnel, providing the necessary medical supplies including blood derivatives, state of alert for all operation theatres, preparation of hospital beds for resuscitation or intensive care at the appropriate acute care departments, providing sufficient number of beds for the injured),
- primary or secondary transport to medical facilities,
- commissioning of back-up hospitals,
- assessment of appropriateness of choice between reinforcement of secondary transports to other hospitals and between establishing of military type improvised field hospital,
- providing medical rescue service in the area without coverage.

Available number of ZZS ambulances sets off in action in accordance with the reported extent. Until arrival of the appointed head doctor of the terrestrial ZZS medical action, the command of medical activities is the responsibility of the first medic of rapid medical rescue ambulance or medical employee from the ambulance of rapid medical assistance, which arrived first on the event location. The appointed head doctor doesn't have to substitute the first medic on the scene in case he carries out his responsibilities well.

Medical action commander performs the estimation of the emergency event extent and provides information on the development of situation to ZZS regional operating centre. Continuous information updates enable the preparation of further required forces, resources and medical equipment. Each ZZS crew gets involved into action in accordance with the instructions of medical action commander.

In cooperation with the commander of Fire and rescue corps and with the members of the police, the medical action commander specifies:

- the location of assembly point for the injured,
- location of the collection point for corpses,
- evacuation site location,
- parking area for ZZS ambulances and other necessary vehicles,
- evacuation direction.

Assembly point for the injured is established in the safe distance from emergency event location. It should be distinctly marked and bordered, with single entry and single exit. The space presumed for one lying patient is 1 metre wide and 3 metres long. The logistics at the assembly point is in the responsibility of the commander of the assembly point for the injured, whose task is to divide the assembly point into three distinctly coloured sectors (Fig. 3).

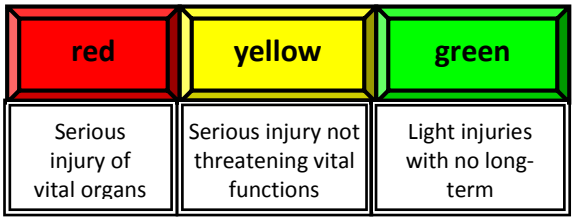

Fig. 3 Division in sector at the assembly point for the injured

There is a commander appointed in each sector who oversees the injured and the order. Medical personnel in the assembly point for the injured provide immediate medical treatment. In this place, it is also necessary to assemble the necessary material, such as medicaments, bandages, tools, equipment, devices and stock.

Medical action commander defines the selection team, which makes classification of the affected in accordance with the extent of the injury. The team performs short investigation, assessment of vital functions, anamnesis of the injuries or illnesses and of the mental state. The injured are classified in groups in accordance with the seriousness and the nature of the injury bearing in mind all the circumstances and conditions enabling provision of the effective medical assistance. Each injured will be provided with a visibly placed card, which accompanies him until the acceptance into medical facility. The card contains consecutive records on:

- the state of the injured person,
- exact time data in the respective stages.

In case the commander pronounces the emergency event location to be a safe place (neither the threat of explosion, nor leakage of hazardous substances nor other negative effects), the classification procedure of the injured could be performed directly in the location where the injured are situated.

In case the area of emergency event area is pronounced to be hazardous, ZZS members cannot enter the area without protective equipment. ZZS provides medical help only after securing and demarcation of the crisis situation activity area by Fire and rescue corps members. In such a case the Fire and rescue corps members bring the affected in front of assembly point of the injured, where the medical personnel provide professional medical help.

In case of unfavourable weather conditions, inflatable rescue tents may be used. These facilitate the work of rescue workers and also create better conditions for the persons affected by the emergency event until they are prepared for medical facility.

Evacuation site location is a place where the authorized person, evacuation commander, organizes transfer of the affected in accordance with the urgency. Evacuation is performed by ambulances equipped with necessary equipment and medical personnel. The choice of evacuation site location should consider the easiest possible arrival and smooth departure of vehicles. Possibility of the whole evacuation route is provided by the police.

Parking area is defined for the necessary number of ambulances which are used to transport the injured to medical facilities, In case of weather conditions suitable for rapid transport of seriously wounded persons, also the ambulances of helicopter ZZS may be used. Thus, in determining parking places it is necessary to define helicopter landing area with sufficiently large safe distance.

4 Specialized medical provision

Specialized medical logistic provision of crisis situations resolution is performed in hospitals and medical facilities. Average time duration of this stage ranges from 24 to 30 hours after emergency event is reported. It is performed in accordance with trauma plan. The responsible person is the medical facility director or a representative authorized by him, who has to be able to execute all instructions of the crisis committee with respect to the current situation.

5 Rehabilitation medical provision

Rehabilitation medical provision includes finalization of treatment and rehabilitation. It is generally performed in spas and at the rehabilitation facilities. This type of medical treatment is not necessary in case of specialized medical care provision in crisis situations; it is possible to postpone its execution. It is not possible to define exactly the time duration; it depends on type and seriousness of the injury.

6 The medical provision of the evacuation

Medical provision and treatment of the ill and injured, but also of the evacuation facilities staff and of the persons participating on the performance of evacuation is an inherent part of the logistics support of resolving crisis situations of the significant extent. Medical provision of the evacuation includes mainly providing basic care for the affected persons, deployed units, other forces in the evacuation centres, on control posts and in the places of accommodation and provision of medical care in evacuation facilities by the doctors appointed on territorial principle based on the circuit area as defined for the state circuit doctor (Tomek & Seidl, 2011).

The task of medical provision of the evacuation is providing medical assistance for the citizens and the definition of basic hygienic and counter-epidemiology measures:

- in the evacuation facilities (evacuation collection points),
- on transfer routes,
- in places of accommodation of the evacuated persons.

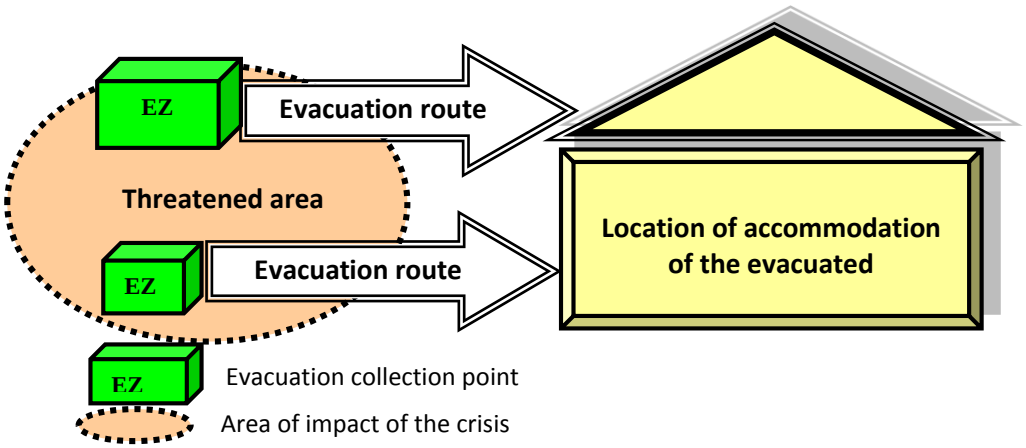

Fig. 4 Elements of medical provision of the evacuation

Medical Provision in the Evacuation Collection Point

There are following activities provided at the evacuation collection point: basic medical assistance, preparation of the acutely ill or the injured into the defined facility to be accepted for hospital treatment, definition of basic hygienic and counter-epidemiology measures. One location for medical assistance provision is established per each 2,000 evacuated.

Personnel and material provision:

- ambulance including crew,
- doctor, nurse with basic medical equipment,
- two Slovak Red Cross volunteers with medical assistance bag.

Medical Provision on the Evacuation Routes

Basic medical assistance during the course of evacuation transport is provided by means of the transport vehicle crew or at the established stationary medical assistance post along the route.

Personnel and material provision:

- **evacuation by busses:** for each 10 busses, there is one medical companion in the transport vehicle (a nurse or Slovak Red Cross volunteer),
- **evacuation by train:** medical personnel is composed of a GP and a nurse, in the locations where the train stops, an ambulance with the crew is appointed to perform transport of the acutely ill or injured into a medical facility.
- **Stationary post of medical assistance along the route:** each 25 km of the route, there is one stationary post of medical assistance planned, composed of the ambulance with a crew, GP for adult patients

and a nurse to support the transport of the ill or injured into medical facility.

Medical Provision in the Place of Accomodation

Primary medical care is provided in place of accommodation of the evacuated persons, basic hygienic and counter-epidemiologic measures are defined and the preparation of transport of the ill or injured into medical facility is performed.

Personnel and material provision:
- GP for adult patients,
- GP nurse or Slovak Red Cross volunteer,
- ambulance with crew available until the end of transport of evacuated persons,
- material provision of basic hygienic and counter-epidemiologic measures which are defined by an appropriate expert in accordance with specific conditions.

Documentation of Medical Provision of Evacuation

As personal and material capacities are concerned, "**Plan of medical provision of evacuation**" is processed, which includes:
- locations of providing basic medical care in evacuation collection points and on transfer routes,
- overview of medical provisions in evacuation centres, evacuation routes and accommodation locations, data on allocated medical transport vehicles,
- type of connection with the crews of the allocated medical vehicles,
- overview of the means of transport participating on the medical provision of evacuation in the municipality, circuit and region,
- data on medical companions equipped with first aid medical bag in transport vehicles to provide medical assistance to the evacuated persons during evacuation transfers.

Besides the Plan of medical provision of evacuation, also the documentation on coordination of logistic control of medical provision of evacuation is kept. This documentation consists of textual part and graphics and contains:
- boundaries of the area under threat,
- evacuation equipment and evacuation routes,
- medical equipment which, during evacuation perform the acceptance of the injured and ill from the locations of accommodation of the evacuated,
- pharmacies which stock has to be have to be used and new locations of medicaments storage,
- areas to perform hygienic cleansing and decontamination of persons,
- areas for contaminated waste storage and disposal.

The crews, from the point of view of medical rescue vehicles have to be equipped with a map which includes:
- evacuation routes and locations of accommodation of the evacuated,
- the list of medical facilities,
- contacts to medical facilities which accept the ill and the injured in the time of evacuation.

7 Social and psychological provision

In case of practical resolution of crisis situations, it is also necessary to consider the occurrence and the impact of various types of psychological stress. The events with collective impact on population and emergency events are the sources of elevated stress for all participants, however mainly for the affected participants of the event. Natural psychological reaction to this kind of stress has its specific features and the negative effect of the emergency event consequences may lead to the development of psychological trauma and the subsequent post-traumatic defect.

The impact of emergency events on the mental state of the affected, on events witnesses, relatives, bereaved, rescue workers, medical staff and crisis managers is a logical consequence of emergency events of different nature. A widespread psychological reaction during and also immediately after the emergency event happened is panic, which is manifested above all by the regression of thought process, distorted perception of the situation, aggressiveness, decreased resistance to manipulation, but also abnormal escape reactions are common. Modern crisis intervention methods help to alleviate the psychological impacts of the emergency event.

Crisis intervention is an effective tool of psychosocial support. It is a method of professional intervention into the life of a person affected by a sudden event with traumatizing potential, whereas this person, due to the extent, intensity or unpredictable nature of this event, doesn't have enough strength and abilities to overcome it. Crisis intervention is a short-term intervention in the acute stage after the event occurrence aiming to support the reinstating of the ability to act, it is focused on providing immediate practical and emotional assistance. It is only a temporary measure in time when full psychological treatment is not yet possible because of various reasons. The services of crisis intervention in emergency events are provided to the affected persons by social workers.

In case of resolving crisis situations with extremely serious consequences (aviation disasters, terrorist attacks, industrial accidents with large numbers of casualties), it is also necessary to provide psychosocial assistance for the members of intervening teams themselves. Even though members of rescue units are specifically trained to cope with stress and elevated emotional strain as a part of their job-related training, there are certain cases when it is necessary, in order to decrease the negative impact on the rescuer's mental health, to provide professional help by the expert. The intervening teams (Fire Corps, Slovak Police Corps, Slovak Armed Forces) have their own specialists – psychologists, who provide psychosocial help and if necessary they are invited directly on the scene of the accident in order to provide acute psychological support. (Hlivák & Svetlík, 2006)

The population affected by the emergency event often occurs in a situation when its health or its lives are under threat. Its survival, besides elemental issues (oxygen, water, food, protection from external influence – cold, heat), also depends on social needs with the possibility to communicate with people, need to be informed, the sense of security and the will to survive.

8 Veterinary provision

Conditions of providing professional veterinary activities and veterinary services are regulated by NR SR Act No. 337/1998 Coll. on veterinary care.

In accordance with this act, veterinary provision in the time of crisis is understood as:

- assessment animals' fitness to undergo evacuation,
- measures preventing the occurrence of epidemics and infections.

The central authority of state administration in the area of veterinary care is the Ministry of Agriculture and Rural Development of the Slovak Republic, which coordinates the cooperation with other subjects of state administration in the area of veterinary provision.It declares veterinary measures by means of the central anti-infection committee.

The emergency veterinary measures in the time of crisis situation include (Act No 337/1998 Coll):

- specification of the focal point of the infection, of the protective zone and of the observation zone, their warning marking and guarding, if necessary,
- veterinary examination and protective vaccination of animals,
- separate housing, isolation, urgent slaughtering of animals,
- elimination or confinement of the sources of occurrence of animal infections,
- confinement of animal transports and movement,
- evacuation of animals,
- prohibition of pasturing, using water sources and feed in the area under threat,
- restrictions of production, processing or putting into circulation of animal products harmful to health.

In case the circumstances of the specific crisis situation require it, other measures might be declared as well, corresponding to the veterinary, sanitary and hygienic requirements and to the current status of knowledge of the veterinary science.

In case the reasons terminate, local veterinary care authority cancels the declared emergency veterinary measures.

CONCLUSIONS

In the time of crisis situation, the standard conditions of system functioning change dramatically. Crisis situations features include

sudden and unexpected occurrence, collective presence of the affected persons without shelter and vital needs, shocked, injured or dead, impact on large amounts of animals, destruction or disruption of infrastructure, disruption of mains supply networks and devices, flooding of large areas with water, mud deposits, wood or other material, occurrence of fires, destruction or disruption of buildings, industrial objects, bridges, transport suspension, damaged terrestrial communications, destruction of cultural monuments and protected natural formations, lack of time for decisions on rescue work management and control, panic and emotional stress, the danger of epidemics occurrence, deterioration of hygienic conditions, overall disruption of the living standards, environment and slowing down the manufacture.

The changes of these conditions often happen suddenly and with impacts which are not always possible to predict precisely. To resolve these situations, there are forces and resources deployed which main objective - rescue of lives and property, localization and subsequent elimination of their consequences – also requires a number of supporting activities of material, transport and medical nature and further necessary services. These are necessary on one hand to support the deployed forces and resources, but on the other hand they have to be used on behalf of people, animals and objects affected by the incident. Logistic support of resolving crisis situation encompasses complex measures of preparation, prevention, response and resolution in the areas of human resources, as material, technical, medical, transport activities and selected services are concerned.

Various rescue units – police, armed forces, and volunteers are called to the crisis location - in accordance with the extent and possible consequences of crisis situations. The role of logistic support organization is to match the activities of all participants of the response, because complications and slowdown of the whole course of rescue works is often encountered from untrained volunteers in their effort to help, mainly in case of their disproportionate ratio to the professional rescue workers and trained volunteers. Also the ignorance of organizational structure may cause unwillingness of the acceptance of operation commander's orders and/or partly uncoordinated participation in rescue works. In case of lacking coordination, synchronization and overall organization of logistic support of crisis situation resolution, the system's own dynamic might lead to the formation of unmanageable situation. A thorough organization of logistic support of crisis situation resolution between all rescue units and other participants on one hand and the operation command and rescue teams and other units and individuals on the other hand from the very start of the operation plays a vital role in saving human lives, animals and property. Medical provision means providing the appropriate level of medical aid (self-help, mutual help, pre-medical and medical help) in case of injuries and diseases of persons, searching, concentration and removal of the injured and ill persons, blood supplies, distribution of medication and medical supplies, taking part in elimination of consequences of chemical and nuclear accidents, performing surveys and supervision in the areas of hygiene and epidemiology and performance of complex hygienic and counter-epidemiologic measures. Veterinary measures are also the part of medical provision.

Works Cited

Act No 129/2002 Coll, .. (2002). *Act No 129/2002 Coll. on Integrated Rescue Systems.* Bratislava: The Act of the National Council of the Slovak Republic,.

Act No 256/2006 Coll., .. (2006). *on details of 256 DECREE of May 22nd, 2006 on the particulars of the system for the prevention of major accidents).* Bratislava.

Act No 337/1998 Coll, .. (1998). *Act No. 337/1998 Coll. on veterinary care.*

Hlivák, M., & Svetlík, J. (2006). Základné postupy záchranných prác jednotiek HAZZ pri dopravných nehodách na cestách. *Ochrana pred požiarmi a záchranné služby* (pp. 34-38). Žilina: FSI Žilina.

Novák, L., & al., e. (2010). *Plánovanie zdrojov na riešenie krízových situácií.* Bratislava: VŠEMVS.

Seidl, M. (2005). Logistika a krízové situácie. *LOGI*, Pardubice.

Sventeková, E. (2009). Logistics support of crises situations solving. *Mechanika Transport Komunikacii*(3), IV-40 - IV-43.

Sventeková, E., & Dvořák, Z. (2012). Information provision of logistics support in civil protection. *Journal of Engineering Management and Competitivenes (JEMC), 2*(1), 1-5. Retrieved from http://www.tfzr.uns.ac.rs/jemc/files/2012/V2N12012-01.pdf

Tomek, M., & Seidl, M. (2011). Vybrané otázky zdravotníckej logistiky. *Logistika v teorii a praxi III*, Zlín.

Received for publication: 15.10.2012
Revision received: 16.11.2012
Accepted for publication: 21.12.2012

How to cite this article?

Style – **APA** *Sixth Edition*:
Sventekova, E., & Dvorak, Z. (2013, 01 15). Medical provision of crises situations solving. (Z. Čekerevac, Ed.) *MEST Journal, 1*(1), 82-93. Retrieved from www.meste.org/mest/MEST_1_2013/_09.pdf

Style – **Chicago** *Fifteenth Edition:*
Sventekova, Eva, and Zdenek. Dvorak. "Medical provision of crises situations solving." Edited by Zoran Čekerevac. *MEST Journal* (MESTE NGO) 1, no. 1 (01 2013): 82-93.

Style – **GOST** *Name Sort*:
Sventekova Eva and Dvorak Zdenek. Medical provision of crises situations solving [Journal] = Medical provision of crises situations solving // MEST Journal / ed. Čekerevac Zoran. - Belgrade - Toronto : MESTE NGO, 01 15, 2013. - 1 : Vol. 1. - pp. 82-93.

Style – **Harvard** *Anglia*:
Sventekova, E. & Dvorak, Z., 2013. Medical provision of crises situations solving. *MEST Journal,* 15 01, 1(1), pp. 82-93.

Style – **ISO 690** *Numerical Reference*:
Medical provision of crises situations solving. **Sventekova, Eva and Dvorak, Zdenek.** [ed.] Zoran Čekerevac. 1, Belgrade - Toronto : MESTE NGO, 01 15, 2013, MEST Journal, Vol. 1, pp. 82-93.

MEST JOURNAL

SITUATIONAL APPROACHES TO LEADING PEOPLE IN THE FIRE SERVICES

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JEL classification: **L**, **L59**, **L89**

Summary:
Current knowledge about the management of people is a result of long-term observation of the proceedings and conduct of people in leadership as well as in subordinate positions. There are different views on the way and methods of on which are defined the different styles of leadership. The paper provides an analysis of leadership approaches, which shows that the leaders in the fire service is the most effective situational approach. This approach is strongly influenced by the leadership situation in which the manager operates. Therefore, its behavior has changed to satisfy the requirements of the situation. The mission leader should be to develop mature team members to be able to effectively achieve organizational goals. In connection with the need to apply situational leadership approach is necessary to provide primarily personal qualities leading to significantly contribute to the ability to influence others head. It is actually a set of subjective factors that make up a qualification leading to fire departments and other prerequisites for the implementation of the tasks.

Keywords:
crisis manager, people management, crisis situation, the commander of the intervention, fire unit

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1 Crisis manager

The crisis manager is ready to identify, analyze and evaluate potential risks, coordinate the preparation of contingency plans in the case of a

crisis, propose emergency measures and procedures to effectively manage their course, effectively coordinate personnel, communicate with employees, the public and especially the media.

Consequently, the crisis manager is ready to address a crisis in the company by performing the following actions:

- decides on the tasks, resources and specific measures required to solve problems quickly, in order to eliminate the consequences of the crisis, monitor and evaluate the situation,
- ensures functioning of the crisis information system, providing effective communication, not only for the team but also to the public,
- manages and coordinates all the activities involved in the crisis, and supports the psychological resilience of the team.

It is clear that the crisis manager's focus of work is decision making, which is important for rapid assessment of the crisis and guiding the team in the effort to reach equilibrium and better protection and security. Appropriate decisions in dealing with corporate crises are based on the available information and its quality. Increasing stress narrows attention and causes the oversight or underestimation of important information. Unclear information and pressure on its fast processing can lead to misinterpretation. Therefore, the crisis manager's decision-making ability is the main source of success when dealing with corporate crises.

The output of the crisis manager's work is influenced by his knowledge, abilities, goals, how much effort they are willing to spend to achieve their objectives, and what their personal and moral qualities are. It is actually a set of subjective factors and other prerequisites for the implementation of the tasks, that form a skilled crisis manager for example:

- Expert knowledge improves the professional crisis manager's readiness to work and it is a result of general and higher education. This includes for example: the knowledge of work processes, work organization, knowledge of law, regulations, standards and the ability to use them properly.
- Life and work experience emphasizes the practice of the manager and how they have gained their experience. They have an important role in crisis management in helping to develop and test organizational skills, management, and teamwork. To successfully manage a crisis, the crisis manager should have some experience with business solutions of the crisis.
- Work efficiency refers to the degree of physical, mental and emotional fitness of the manager in overcoming stress and stress situations. Mental readiness to solve unexpected problems and preparedness allows the crisis manager to cope with negatives, and eliminate stress. High psychological stress in times of crisis can trigger a reaction to seek escape and panic.
- Personal characteristics of the crisis manager positively affecting teamwork are mainly patience, tolerance, sensitivity, emphaty, precision, decisiveness, purposefulness, consistency, ability to work under the conditions of risk. The crisis manager must be able to think independently, flexibly, and know how to apply the results in a particular activity.

2 Analysis of approaches to leading people in the fire department

An important role in crisis management plays the aforementioned personality of the crisis manager, his character, knowledge, experience, skills and abilities, but also the ability to effectively lead a crisis team.

Team crisis management is one of the key joint actions of company management. In essence the process of influencing people, in which the executive , with the use of their power, strives for voluntary and willing participation of subordinates to achieve group objectives, and thereby meet their needs. Management is focused on people, affecting their behavior, in order to achieve organizational objectives. In a crisis – incident, the team is represented by a fire brigade unit.

An effective leader has typical personality characteristics that predispose them to fulfill leadership roles. It is a management approach based on a larger number of personal qualities. The representatives of this approach were examined for important leadership qualities, looking for those that made them successful

leaders. Generally, these qualities can be divided into the following groups(Míka, 2007):

- physical properties (appearance, weight, height, age, etc.),
- capabilities (knowledge, intelligence, eloquence, etc.),
- personal characteristics (courage, dominance, confidence, charisma, etc.).

The representatives of this approach came to a conclusion that most of these qualities are inherited, a successful leader is thus born, so they must be looked for. Newer approaches, respecting the importance of personal qualities (eg, transformational leadership theory), focus on how these properties should be gained.

The application of the approach based on the qualities of the leader has proved difficult in practice. Therefore, more attention is focused on on the behavior of the leader and the related styles of behavior. It is a style of management, ensuring an efficient and effective fulfillment of performance objectives.

Leading and management of a fire brigade unit is an important role of the commander. For the purposes of fulfilling the commander's duties, the command may be divided into:

- Leading and management of direct subordinates,
- leading and management coordination of all divisions of the integrated rescue system and the coordination of their resources,
- implementation of cooperation with other parties and individuals involved in the intervention.

A leadership style can be characterized as a typical way of behavior of the leader, a steady way for exercising the management of subordinates.

In the process of crisis management, during the phase of corporate crisis prevention, the crisis manager should be able to readily identify the outbreak of a crisis, which may be various corporate weaknesses, and flexibly propose options for the elimination of the crisis. It is a common situation in which, in the terms of team management, the manager uses their own style (ie democratic) with the emphasis on:

- The ability to predict future trends, based on the present situation, to see tendencies that are already contained in the present.
- The ability of a wider than average perception and using intuition.
- Integrate predicted and actual changes, and combine them to deduce the future.

Democratic style - characterized by active bi-directional communication between managers and subordinates, and the innovative work activity on the part of the subordinates.

At the time of solving a company crisis, demands on emergency managers are being increased, because such situations usually require a directive leader who can lead the team, and maintain discipline and cohesion.Their executive power is authority that they must gain and continually strengthen. Sometimes, it is recommended that the crisis manager should combine the directive approach with the democratic one. The essence of this combination is that every team and every individual has their designated goal, which is derived from the business objectives and this goal corresponds with the capabilities of the team or individual.(Buganová, 2010)

In the case of rescue units, the directive style of management is automatically used. The commander is responsible for the intervention and that the subordinates (firefighters) fulfill their commands. The objective of rescue and intervention activities is to protect lives.

Head of intervention (commander):

- Is responsible for organizing the activities of the fire brigades and the use of their material resources at the scene and for the principles of health and safety at work.
- Respects the principles of command priority.
- The commander may order persons to leave the scene of the accident, if their presence in not necessary or required..
- Manages interventions by the deployment of appropriate numbers of forces and means of fire brigades.

If the unit does not interfere, it is possible to implement some elements of the democratic management style in the form of a degree of freedom for the subordinates.

The characteristics of the directive management style are:

- performs strongly authoritative,
- has decision-making and commanding powers,
- does not tolerate opposition and is willing to use sanctions,
- decisions are made clearly, quickly, concisely, without any efforts to provide significant reasoning,
- not open to criticism, defend their beliefs, and forces its adoption,
- tends to show their superiority always and everywhere.

If the crisis manager has natural authority, they can lead the team in their own style, which is determined by a unique combination of personal qualities. Their success in working with people is subject to perfect knowledge of motives and motivation mechanisms. The expected result of the work of the individuals inside a team is dependent on their motivation.

In the case of fire it is ideal when the commander has natural authority. The success of the intervention often depends on his decisions so they can directly affect the life of the involved persons. Confidence in the decisions of the commander is therefore necessary, and it is not desirable if the commander does not have natural authority and confidence of his subordinate staff.

3 Situational approach

Practical experience shows that the efficiency of leadership behavior does not only depend on the management style applied. There are emerging requirements for more flexible management styles that would better match the nature of the task-level subordinates and other important situational factors. Current changes in the external and internal environment and the need for the manager to respond flexibly requires a flexible management style adaptation. It this case, we can talk about situational approaches, which do not reject any particular management style, but rather emphasize which management style will be effective, depending on the situation. The situational approach may be expressed as the union of efficient leadership with the actual situation. Based on this, leadership is strongly affected by the situation in which it is being applied.

In this case, the situation is meant as a mutual relation of external and internal conditions of the assignment, manager's personality, level and motivation of subordinates, as well as the leadership style at senior levels in the organization.(Veľas, 2011)

Situational leadership theories assume that:

- a natural leader does not exist
- everything depends on the specific situation that may determine who is suitable for the leader position at the moment
- the situation determines what management style is effective.

There are a variety of situational leadership theories, for example(Majtán, 2008):

1. The theory of variable behavior.
2. Fiedler's theory of effective leadership.
3. Theory of way – objective relation.
4. Hersey and Blanchard theory.

3.1 The theory of variable behavior

The theory of variable behavior, recommends that leaders, managers differentiate their behavior and leadership style appropriately to the particular situation, respectively. circumstances. The most important factors that can affect the management style are:

- managerial strength of personality – manager's value system, trust in their subordinates, tendency to a particular leadership style, a sense of security in some situations,
- power of subordinates who can affect the behavior of the leader (eg, willingness to take responsibility, knowledge and experience, etc.),
- situational strenghts, such as the values and traditions of the organization, the work effectiveness of the subordinates as a whole, the nature of the problem, the possibility of safe responsibility delegation, time pressure.

3.2 Fiedler's theory of effective leadership

Fiedler's theory of effective leadership is based on the assumption that people become leaders, not only because they have the required personal qualities, but also due to the action of various

situational factors, as well as the relationship between the leader and group members. The critical aspects of situational leadership are:

- power of position (function), i.e. power in the organization - leader with obvious and significant power can persuade co-workers easier,
- *structure of tasks* - when tasks are clear, it is significantly easier to control the work of subordinates and designate personal responsibilities,
- *relationship between the leader and group members - this dimension is considered the most important as it affects popularity, trust and willingness of the subordinates to follow the leader.*

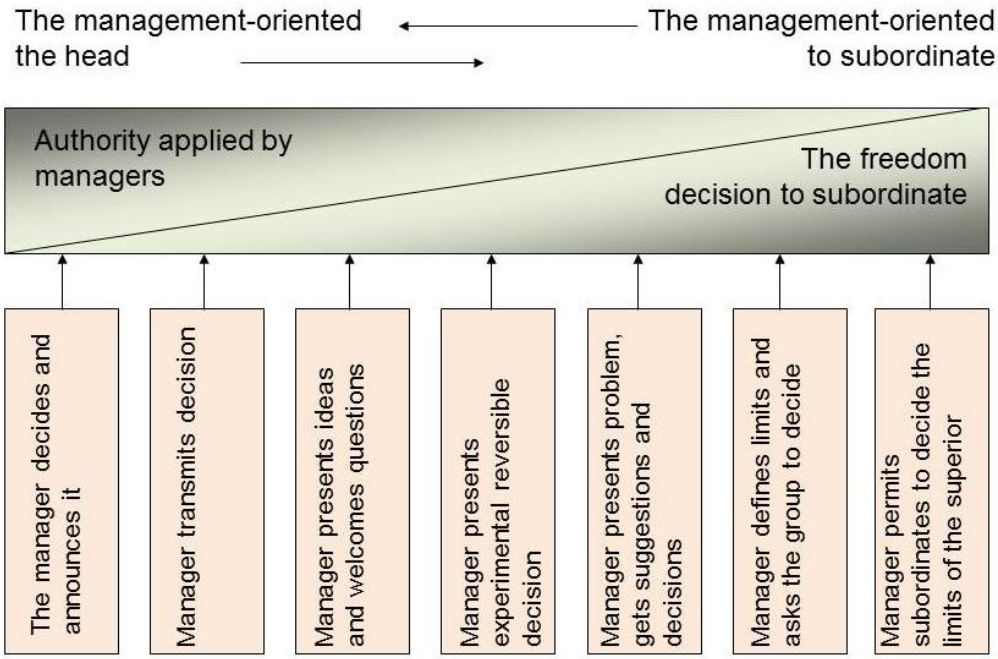

Fig. 1 Behaviour continuum in persons management (Majtán, 2008)

3.3 Theory of way – objective relation

The essence of the of way – objective relation theory lies in the fact that the leader motivates subordinates by clarifying the path to personal success as a result of the achievement of the set objectives. The theory assumes that the leader's behavior is acceptable to the extent that corresponds with the level of the subordinates' satisfaction. Leaders must operate in various environments, which differ structurally. Therefore, their behavior has to change to satisfy the requirements of the situation. In this case, the effectiveness of leadership is achieved in accordance with the situation, so the leader can apply multiple styles of leadership (the need for the leader's flexibility). In theory, situational factors cover the following important aspects:

- *characteristics of employees (needs, self-confidence, ability),*
- *environment factors (job, remuneration, personal relations).*

3.4 Hersey and Blanchard theory

Paul Hersey and Kenneth Blanchard introduced a new variable - maturity. The degree of maturity is expressed by the readiness to perform a task. The leader should choose a management style depending on the maturity of the subordinates. The leader's behavior can be described in two dimensions:

- *supportive behavior (which is the same as respect for people),*
- *directive behavior (which corresponds to the structure of, or orientation for the role).*

The main objective of the leader's work is the development of maturity in the team. The team is then able to achieve organization goals. Even for this theory it is possible to create a diagram to define the four leadership styles, see Fig. 2:

- *ordering,*
- *coaching,*
- *supporting,*
- *delegating.*

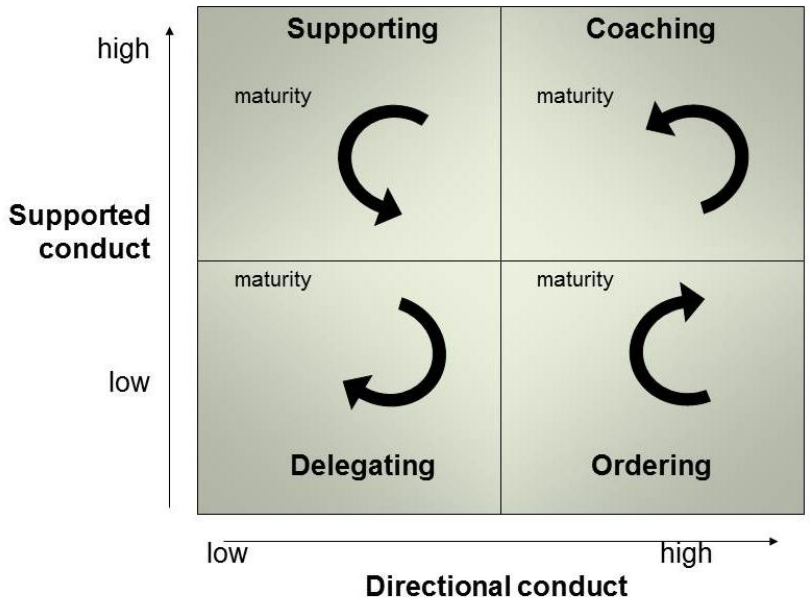

Fig. 2 Situational management (Majtán, 2008)

Table. 1 provides a brief summary of the three most useful (popular) theories of leadership characteristics, highlighting the importance of the situation.

Table 1. Comparison of situational leadership theories *(Donnelly, Gibson, & Ivancevich, 1997)*

Point of comparison	Fiedler's theory of effective leadership	Theory of way – objectives relation	Hersey and Blanchard theory
The basic idea	There is no best style. The success of the leader is determined by the interaction of the environment and the characteristics of his personality.	The most successful leaders are those who increase subordinate motivation by identifying and explaining ways to effective performance.	Successful managers adapt their style to the situation requirements.
Leadership style (range of options)	Oriented to task or relations.	Directive towards the goal.	From the task-oriented behavior to the relation-oriented behaviour.
Research base (number of studies proving)	Broad, in many enterprises (military, education, industry). Some contradictory results.	Medium to small. Usually confirming.	Small, but usually confirming.
Application value for managers	Medium to small. Leaders can not be trained.	Medium.	Medium but growing.

CONCLUSIONS

In relation to the need to understand and apply the integration of current management approaches and principles there have been specified three, mainly personal, qualities that contribute significantly to the ability to lead and influence others. They agree with the majority of styles and are particularly compatible with the situational approach:

1. The leader should be aware of the impact of their behavior on those who they manage. Therefore, they should seek to learn more about their actions towards others.
2. An important capability of effective leaders is to be able to organize correctly, to understand themselves, the tasks given to their subordinates and their situation, they must understand the relationship of cause and effect of individual motivation and behavior, as well as group dynamics and group behavior.
3. Every manager must be able to communicate with subordinates. If they lack this ability, they may be unable to influence others.

Ability to organize

Organization is especially critical for the ability of managers to delegate tasks to individual workers and coordinate their efforts to carry out the work. It requires immense patience with diverse individuals of different skills and abilities to learn new ideas and ways of working.

The crisis manager should have:

- ability to understand the tasks, employing the necessary critical thinking and strategic foresight,
- ability to perform tasks and manage activities and processes that require proactive approach, self-confidence, self-control and flexibility.

The quality of organisation is very important in dealing with corporate crises, so the emergency manager and the team must know exactly:

- how, where and when to do the tasks,
- who has responsibility for which task,
- with whom and in which activities they should cooperate,
- who to manage,
- what are the rights and obligations.

Ability to communicate

Communication should provide the correct information to other teams' personnel, ie. clearly explain the roles and responsibilities of the individual team members, give them guidance and direction regarding the task. The communication process is an important part of all management processes, especially during crisis solving its importance increases significantly. The crisis manager has the ability to choose a method of communication that will allow him to communicate with each team member.

The most important communication skills of the crisis manager are oral and written communication skills, interpersonal skills, ability to think creatively, analyze objectively, effective decision making, as well as the preparation of strategic and tactical plans.
The preparedness of managers to deal with crises should be given sufficient attention. In this context, it is possible to focus on such tasks as:

- improvement of the ability to perceive signals of crisis,
- practicing the performance of tasks during the crisis,
- improvement of communication skills of crisis managers, speakers, etc..,
- carry out exercises on the skills to formulate factual, clear and comprehensive reports,
- practicing management methods and techniques of communication through the media.

A crisis management team requires both the determination and authoritarianism, and on the other hand, sensitivity and understanding (crisis-affected people can be psychically unstable, passive and euphoric, their behavior may be irrational - examples of evacuation of flooded homes - people refused to leave their homes). It is difficult to work on such conditions, and the crisis manager must have the appropriate skills.

The management team also needs good interpersonal relationships and understanding. At its formation, it is important that the members are able to contribute their skills, knowledge and expertise towards the goal. The crisis manager

should trust their skills, be willing to take responsibility for their decisions and behave so that other people trust him, follow and support him. He should treat all employees objectively, because a sense of injustice and inequality adversely affects employee motivation.

Similarly, it is also rescue teams that provide assistance to those in need. Often, teams work together during an intervention, which puts greater demands on management and control of persons who are not directly subordinate to the commander (crisis manager). The commander communicates with the crisis affected people, gaining information from bystanders, cooperates with other divisions of the IRS, which places high demands on communication and management skills.

Leading people in rescue services is directed by internal guidance and routine and information flow are strictly set. Even with this approach to leadership, there is some room for the implementation of various elements of management styles. For example, during the time paramedics spend directly at the scene where they often have to create their own system of coordination and activities that are not explicitly included in any of the known styles. In this case, the commander often applies the democratic management style to give the team identity and build united spirit.

The approach to a subordinate outside the incident scene must be equal, fair and balanced. Preferring or rejecting any of the subordinates can later lead to the failure of the intervention.

Using situational approaches in the fire department is one of the possible and effective tools for keeping people effective in stressful situations such as fire incidents. Firefighters are exposed to different environmental factors and proper management style creates conditions for a successful completion of the action and the protection of life and health in emergencies. The nature of activities and intervention characteristics and readiness of individuals requires often the commander's individual attention.

It should be noted that the management of subordinates could be understood in two ways. The first one is no-intervention activity at fire station, where a superior approach can be partially relaxed for tasks often subject to strict compliance with the orders of the commander.

The second area is the intervention action where the manager may relax their approach to a much lesser extent. Despite this fact, the use of these approaches during rescue works is desirable and the individual commanders should adopt it and use it to communicate with their subordinates.

Works Cited

Buganová, K. (2010). Management of the enterprise in crisis. *Economic Crisis sight from interested* (p. 5). Žilina: Žilinská univerzita.

Donnelly, J., Gibson, J., & Ivancevich, J. (1997). *Management.* Praha: Grada Publishing.

Majtán, M. (2008). *Management.* Bratislava: Sprint.

Míka, V. (2007). *Principles of management for safety managers.* Žilina, Žilina, Slovak Republic: University of Žilina. Retrieved from http://fsi.uniza.sk/kkm/publikacie/mika_ma.html

Veľas, A. (2011). Selection and evaluation of human potential in commercial security in Slovakia. *The quality and price of services in the private security: scientific expert workshop with international participation.* Žilina: Žilinská univerzita.

This paper has been prepared under the projects VEGA 1/1082/11 and VEGA 1/0743/11.

Received for publication: 14.09.2012
Revision received: 07.12.2012
Accepted for publication: 21.12.2012

How to cite this article?

Style – **APA** *Sixth Edition*:
Hudakova, M., & Svetlik., J. (2013, 01 15). Situational approaches to leading people in the fire service. (Z. Čekerevac, Ed.) *MEST Journal, 1*(1), 94-101. Retrieved from www.meste.org/mest/MEST_1_2013/_10.pdf

Style – **Chicago** *Fifteenth Edition:*
Hudakova, Maria, and Jozef Svetlik. "Situational approaches to leading people in the fire service." Edited by Zoran Čekerevac. *MEST Journal* (MESTE NGO) 1, no. 1 (01 2013): 94-101.

Style – **GOST** *Name Sort*:
Hudakova Maria and Svetlik. Jozef Situational approaches to leading people in the fire service [Journal] = Leading people in the fire service // MEST Journal / ed. Čekerevac Zoran. - Belgrade - Toronto : MESTE NGO, 01 15, 2013. - 1 : Vol. 1. - pp. 94-101.

Style – **Harvard** *Anglia*:
Hudakova, M. & Svetlik., J., 2013. Situational approaches to leading people in the fire service. *MEST Journal,* 15 01, 1(1), pp. 94-101.

Style – **ISO 690** *Numerical Reference*:
Situational approaches to leading people in the fire service. **Hudakova, Maria and Svetlik., Jozef.** [ed.] Zoran Čekerevac. 1, Belgrade - Toronto : MESTE NGO, 01 15, 2013, MEST Journal, Vol. 1, pp. 94-101.

MEST JOURNAL

THE ECONOMIC BENEFITS CLASSIFICATION ACCORDING TO THEIR LOCUS NASCENDI FACTORS

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JEL category: **J, J1**, **J3**, **J32**

Summary:
The paper presents the economic benefits classification depending on their production factors placement. The feasibility study, made for the existence of four groups and several subgroups of economic benefits, dominated by one "Siamese" pair has been developed. The classification of economic benefits, depending on their place of production factors that will help to improve the quality and efficiency of decision making on the choice of the optimal production placement, has been made.

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Keywords:
Economic benefits classification, production factors, possible production placement, investments.

1 Introduction

It is known, that economic benefit is something that has the property of value, that is capable to satisfy certain human needs directly or non directly. An example of benefit can be, for instance, car, land, bread, scientific work, performance, software, electrical energy. However, the economic benefit - it is not only something that can directly satisfy human needs, but also something that can be used to satisfy not direct need. The founder of the Austrian school of political economy - Carl Menger proposed a classification of benefits depending on the possibility of their use for the direct satisfaction of human needs: he divided all benefits for the benefit of the first order (this is the benefit that can be used directly for human purposes) and benefits of higher order (second, third and so on, which can not be directly used by man) (Campagnolo, 2010, pp. 43 - 45). According to such a division, the bread it is the benefit of first order, the grain from which its baked – second order, the grain from which flour is made - the benefit of the third order, etc.

Obviously, all benefits are derived from human nature, but they need some exposure to become ready for consumption. Even to eat strawberries, you must first gather, to eat nuts they must first be split. However, a person needs a much wider range of benefits than nature allows. Because people have learned they need to create benefits by influencing the existing in nature goods. The process of creating the right benefits is called production. Thus, benefits are divided on the gift, (non-economic) that are created by nature (air, water, oil), and economic, resulting from human activities (car, bread, gasoline). In economic theory many approaches are known to the benefits classification, but benefits were never classified according to the factors of their locus nascendi (LN) (place of origin, place of birth). (Ahrens, Hoen, & Ohr, 2005) (Buchanan, 1967) (Green & Laffont, 1977) (Hummel, 1990) (Jensen & Miller, 2008) (Samuelson, 1969) (Veblen, 1984) (Chubukova & Synenko, 2010)

2 The concept

First of all we formulate some definitions:

- Place of creation of (LN) benefits. Place which formed non economic benefit or economic produced benefit.
- The factors of benefits creation in a particular place. The reasons which should be considered in order to predict (forecast) the future LN by answering the question “where?” or explaining the already existing (old) LN by answering the question "why here?".

The formation of LN factors benefits creation should be performed by considering the properties of places that are favorable for the benefits creation. In order to detect a favorable place we should be done depending on the properties of the “good’s” side, that include following features:

- the production technology (or creation) benefits;
- the resources needed for technology created good;
- the pollutants that are formed during the process of benefit creation;

The "goods" side (which is created or to be created) and side "place" (which is or should be a goods’ LN) are characterized by a certain set of properties, some of which are factors of LN benefits. Factors, that determine LN benefits can be divided into internal (which include only those "goods" features) and external (those features corresponding to "place"). Thus, we have, on the one hand, the properties of the “goods” part, some of which should be considered as LN benefits factors. On the other hand, the properties of each side of "goods" is corresponding the feature "place", which should also be considered as LN factor’s LN benefit are characterized by a certain set of properties, some of which are LN benefits factors.

First, the general division of benefits from their LN factors appropriate to comply by separating blessings on those LN which is due to the dominant "Siamese" pair of factors (block A benefits general division) and those, LN which is due to several "Siamese" pairs of factors (goods block In general division). In a subsequent study of gift, (non-economic benefits) remain unnoticed because the factors driving LN is the subject of geological survey and other sciences of nature and not amenable to optimization in terms of human interests. Therefore, we consider further investigation of the LN factors on economic

benefits. First, focus on the study of the economic benefits of block A, which are divided into 4 groups, and a number of subgroups within these groups.

2.1 Group 1 of economic factors of A block: Types of benefits for which LN is possible.

The place with the presence of a suitable resource. The concept of source resource includes not only natural resources (mineral deposits, forests, farmland, clean environment, etc.), but also the resources of anthropogenic origin (eg, sugar, cement, relatively cheap emission reductions in the region, while ensuring environmental sustainability or low requirements state to environmental impact). It is clear that extreme volumetric term "resource" potential causes further division types of economic goods group 1 (which includes three subgroups) on LN factors not only within the group but also subgroups.

2.1.1 Subgroup 1 from group 1 of economic factors, block A:

Types of benefits for the production of property "the need for non-mobile resource" is dominant. This subgroup includes kinds of benefits for the production of resource extracted from its source (the development of minerals, timber industry, fishing, relatively cheap emission reductions in the region, while ensuring environmental sustainability, etc.) or are immobile resources (such as transportation use lake energy use of the river, a clean environment, low requirements to the state of the business impact on the environment). For the types of goods subgroup 1 of group 1 pair of Siamese factors LN is a "the need for non-mobile resource" (property side of "good") - "the existence of non-mobile resource's source" (property of the side's place ").

2.1.2 Subgroup 2 from group 1 of economic factors, block A:

The types of benefits for which the "resource-capacity" feature is high (high cost per unit of the relevant resource) is dominant. Level of resource-capacity characterized by resource-capacity index, calculated as the ratio of raw material to goods supply. For example, the resource-capacity index for: oil - 2,5:1; sugar - 7-1; cheese - 9:1; butter - 24:1. Especially demanding are dried mushrooms, fruits and vegetables. For the types of goods from sub 2 Group 1 pair of Siamese factors LN is high "resource-capacity" (the feature of "goods" side) - "sources of resource availability" (the feature of the side' "place "). Resource-intensive production orientation kinds of benefits conditional desire to save on transport costs.

2.1.3 Subgroup 3 from group 1 of economic factors, block A

The types of benefits for which the feature of "use of low mobile resource" is dominant. The production of canned food, wine, juices, etc. focus on sourcing as moving under vegetables, fruit, fish, etc. accompanied by a significant loss of quality or costly to prevent this in the way. For the types of goods subgroup 3 Group 1 pair of Siamese factors LN is "use of low mobile resource" (property side of "good") - "the existence of sources low mobile resource" (property of the parties' place ".

2.2 Group 2 of economic factors of A block: The types of benefits for which LN factor is the the market (consumers) proximity.

Targeting consumers can be seen across the country, region or city. Group 2 kinds of benefits includes six subgroups.

2.2.1 Subgroup 1 from group 2 of economic factors, block A:

Types of benefits for which the property " good's low mobility" is dominant. Low mobile benefit is difficult to transport a long distance through the cost of this (especially when you need to pay duty on export goods), large size (like construction house-building factory), the possibility of loss of quality (bread, flour, some confectionery, dairy products, thermal energy etc.), security issues (such as sulfuric acid, explosives). For the types of goods subgroup 1 Group 2 pair of Siamese factors LN is "good's low mobility" (the side feature of "goods") - "the existence of consumers '(the feature of the side - "place").

2.2.2 Subgroup 2 from group 2 of economic factors, block A:

The benefits types for which the property "weight (volume) benefit exceeds the weight (volume) of the maining resource" is dominant. It happen,

when for the benefit's production to the basic resource, another freely available recourses are added (water and air). Therefore insulating building materials, which are produced by hot air of raw materials treatment (usually clay), have a strong consumer orientation. It is similar with the beverage industry, brewing, production of cooling drinks from concentrates, etc., tangible component of which is water. The world's largest factory concentrate "Coca-Cola" located on the island of Puerto Rico. This product is sent to 1,145 companies worldwide which add water to concentrate and pour the legendary drink in various capacities for retail sale. It is drawing attention, however, to the possibility of exceptions in subgroup 2 group 2. For instance, Heineken beer was never produced in the USA, where it has high demand from consumer, since it's European origin feature is crucial. For the types of goods sub 2 Group, 2 pair of Siamese factors LN is "weight (volume) benefit exceeds the weight (volume) of the main resource" (the feature of "good"' side) - "the existence of consumers" (the property of the side "place") .

2.2.3 Subgroup 3 from group 2 of economic factors, block A:

The types of benefits for which the "negligible spatial differentiation cost of goods' production" feature is dominant. Consumer targeting this subgroup intention is to save on costs associated with the movement (good to customers or consumers to benefit) in the impossibility to save on production costs. For the types of goods subgroup 3 Group 2 pair of Siamese factors LN is "negligible spatial differentiation expenses birth" (property side of "good") - "the existence of consumers '(the side's feature' place").

2.2.4 Subgroup 4 from group 2 of economic factors, block A:

The types of benefits for which the "cultural (mental) relation need of employees with consumers benefit" feature is dominant. Therefore, companies that do not require proximity to customers for technical reasons, are oriented on the need of cultural affinity. Thus, companies that deal in European Union retail via phone or Internet, located in Hungary and Bulgaria, where the business costs will be larger than, for example, in India, but at the same time don't have significant difference in mentality between employees and customers. For the types of goods from sub 4 group of 2 Siamese pair factors LN is a " the need of mental affinity of employees with benefit consumers" (property side of "good") - "the existence of consumers" (property side "place").

2.2.5 Subgroup 5 from group 2 of economic factors, block A:

The types of benefits for which the property "the need of direct contact consumers with employees" is dominant. Direct contact with consumers creates opportunities for rapid response needed to improve the existing benefits of producing new wealth, often customized to individual needs. It also facilitates the organization of the service. For the types of goods subgroup 5 Group 2 pair of Siamese factors LN "the need for direct contact in between consumers and workers" (the "good" feature) - "the existence of consumers '(the feature for the side"place").

2.2.6 Subgroup 6 from group 2 of economic factors, block A:

The benefits types for which the property "immobility good" is dominant (eg, good, producing hotels, shops, restaurants, stadiums, etc.). For these types of goods is important to clearly identify consumer goods and estimate the amount of their demand. If the demand for the good in the jurisdiction is not less than the threshold (the level of demand for the good that determines the feasibility of producing this good), then the appropriate place can be considered as a possible place of production. For example, the stores are profitable when the space catalog (the maximum distance that a buyer is willing to overcome in order to purchase the goods), presented in them is greater than the threshold number of consumers (at least potential customers store needed to sell all the goods). Thus, 66% of food customers spend on their way to store up to 10 minutes, while 25% spend 11-20 minutes on the road, and 7% -21-30 minutes. Similar trends have been observed for other groups.

For the types of goods sub 6 Group 2 pair of Siamese factors LN is "immobility good" (the side feature of "good") - "the existence of consumers" (the side's feature – "place").

2.3 Group 3, economic benefits, block A:

The benefits types for which the feature of "minimal production costs" is dominant. Indicative in this respect is the area of software (the worldwide center of which is India), providing a variety of accounting and consulting services (Poland conducts accounting firms to other European Union countries, including Germany, UK and France), where goods are made with minimal production costs and with help of Internet can be very quickly delivered to customers. Canadian company "Guest-Tek", which specializes in Internet - services for hotels in Poland opened its European Service Centre, with 200 people stuff. The center provides remote technical support for hotels customers, which serve the Canadian company. The companies, that are belonging to them include the network "Accor", "Hilton", "Hyatt", "Intercontinental" and "Mariott" in the United States, Canada and Western Europe. In the U.S. favorable soil and climate conditions zones are used for growing potatoes and are mainly in the northern states on light soils under irrigation, located at a considerable distance 2,5-4 thousand km. from the main centers of consumption, despite the fact that this crop can be grown in the U.S. in almost all states. This situation is the result of good transportability for potatoes. For the group 3 of producing goods Siamese factors LN is "high transportability good" (property of the parties 'production of goods ") -" low cost of production of goods "(property of the parties' place").

2.4 Group 4, economic benefits, block, A

The benefits types for which "the safe distance from major population centers" is dominant. Many types of production goods are dangerous to the environment and population: It is necessary to recall the nuclear accident in Chernobyl, located near Kyiv. The accident at Chernobyl was the worst in nuclear history. It resulted from an erroneous placement of reactor - near densely populated area, close to major cities, reservoirs and rivers that provide these cities. For species producing goods group 6 pair of Siamese factors LN is a "danger to the public" (property of the parties 'production of goods ") -" remoteness from human settlements "(the feature “place”).

In the Table. 1 is given summary for the classification of economic benefits from LN factors, dominated by only one pair of "Siamese" factors. In many cases, the factors of LN benefits are several "Siamese pairs". Indicative in this respect is the requirement of "McDonald's in Ukraine" (fast food restaurants) to possible LN locations: "McDonald's will consider proposals for the purchase or long-term land lease for the construction of its facilities in Kiev and other regions of Ukraine. The company is also interested in acquiring or renting commercial premises for containing the catering requirements for land: location - downtown streets and highways crossing heavy traffic and pedestrian flows, congestion places trade and entertainment. Area: 1500-3500 m^2. Area requirements: location requirements - front side rooms that overlook the downtown streets and highways crossing heavy traffic and pedestrian traffic, subway stations and transport interchanges. Considering also placing in shopping centers - preferred corner room. Area: 350 - 500 m2. The minimum ceiling height - 3,5 m, energy supply: 1) power - 150 kW (Power consumption), II category of energy, 2) water and sewerage - 15 cubic meters. per day, 3) heat - 110-115 Gcal or possible arrangement of their own mini-boiler on natural gas. "

Another example is the automobile factory in Montgomery (Alabama), which was the first manufacturing investment of "Hyundai Motor" in the United States. The value of investing $ 1 billion., Capacity - 300 thousand cars annually. The need for labor - 2000 people, including 1600 - production workers and 400 - managers, maintenance and administration of the factory. Concern named key factors for choosing Montgomery for plant placement: skilled labor availability, relatively low labor costs, good infrastructure and convenient road connection to the rest of the country, a very well-developed network of cooperators, generous package of financial incentives and personal involvement of Alabama and Montgomery authorities. Important were also very attractive area parameters (location and geological conditions), and the proximity of modern sea Mobil port. Since Mobil helded components delivery from Korea, and exported finished cars to the markets of South America. Making a decision concerning factories placing, the "Hyundai" management took into

account even climatic factors. It is worth noting that one of the reasons for rejection of the Mississipi State Authorities proposal was the fact that the proposed placement was too close to the "Nissan" plant, which raised fears for the possibility of competition with the Japanese concern for employees. It should also be noted that placing the company in the United States enabled the company to limit the risks associated with currency fluctuations (this factor has limited space analysis of state boundaries USA). And besides, some people noticed that "Hyundai" traditionally has problems with unions, and Alabama State, as, after all, in most southern U.S. states, can be characterized by weak unions not least because of the relevant legislation.

Table 1. The classification of economic benefits of LN that is determined by dominant "Siamese pair" factors

The group of good production	LN dominant factor		Possible LN place, that has:
	The sides of "goods production"	The side "place"	
1	1.1. The use of non mobile recourse	Presence of low mobile resource source	The sources of certain resources
	1.2.High recource capacity	Presence of resource source	
	1.3. The use of non mobile recourse	Presence of low mobile resource	
2	2.1. Production of low mobile goods	Presence of customers	Customers
	2.2.Weight (volume) of produced benefits exceeding the weight (volume) of the basic resource	Presence of customers	
	2.3.Low spatial differentiation of goods production costs	Presence of customers	
	2.4. The need for customers and employees mental affinity	Presence of customers	
	2.5.The need for direct contact employees and customers	Presence of customers	
	2.6.Low mobility of produced good	Presence of customers	
3	High transportability of produced goods	Low production costs for corresponding goods	The possibility of lowering production costs
4	Danger for the population	The distance from settlements	The distance from settlements

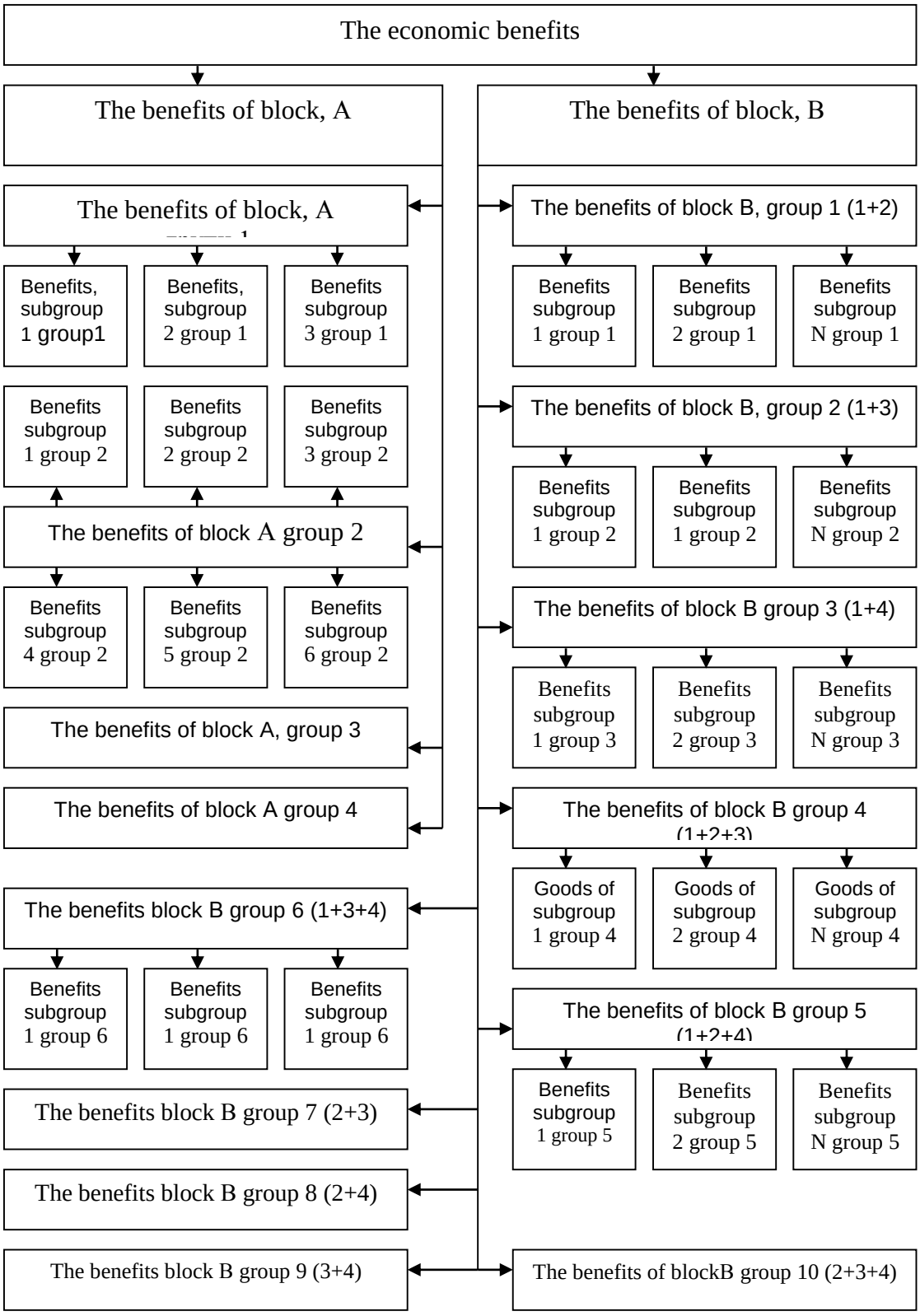

Figure 1. The economic benefits classification according to their LN factors

Table 2. Classification of economic benefits, *which LN* are determined by several "*Siamese* pair*" factors*

The "Siamese pair" factors			The types of goods production			
			B_1	B_2	...	B_N
	1.1	Resource 1.1.1	X	X	...	
		Resource 1.1.2		X	...	
		...			...	
		Resource 1.1.Y			...	X
	1.2	Resource 1.2.1			...	
		Resource 1.2.2		X	...	
		...			...	
		Resource 1.2.Y			...	
	1.3	Resource 1.3.1			...	
		Resource 1.3.2			...	
		...			...	
		Resource 1.3.Y			...	
	2.1			X	...	
	2.2				...	
	2.3		X		...	
	2.4				...	
	2.5				...	
	2.6				...	
3					...	
4				X	...	

In the Table. 2 the classification of economic benefits, which LN is due to several "Siamese pairs" factors. In this table the possibility of providing information about resources is enhanced because both factors of LN benefits may be several different resources.

The groups of production benefits in the block B are formed by various combinations of already established "Siamese" pairs factors. For example, for the benefits of B block, group 1 LN factors will be a combination of factors, "the presence of a suitable resource" and "the existence of consumers" (1+2). The existence of a suitable resource automatically generates the possibility of large subgroups, as shown on Figure 1.

It is similar for all benefits in B group, where among the LN factors appears "the availability of a suitable resource" factor and any one factor: the good block in group 2 (1 +3) and good block in group 2 (1 +4). After all, there are many subgroups and other benefits within a block, where among the factors LN appears factor "presence of a suitable resource" and a few other factors: good block in group 4 (1 +2 +3), good block in group 5 (1 +2 +4) and a good block group 6 (1 +3 +4). Good block in the other groups - 7 (2 +3), 8 (2 +4), 9 (3 +4) and 10 (2 +3 +4) - characterized by the absence of subgroups, as among the factors they LN no factors that generate their necessity.

CONCLUSIONS

The classification of economic benefits from their LN factors will improve the quality and speed of decision making on the location' optimal choice for goods production. Further studies in this area are promising in the field of identifying more LN factors, their possible economic benefits and filling up developed classification schemes with more specific information.

Works Cited

Ahrens, J., Hoen, H., & Ohr, R. (2005). Deepening Integration in an Enlarged EU: A Club-Theoretical Perspective. *Journal of European Integration, 27*(4), 417 - 439.

Buchanan, J. M. (1967). Public Goods in Theory and Practice: A Note on the Minasian-Samuelson Discussion. *Journal of Law and Economics, 10*, 193-197.

Campagnolo, G. (2010). *Criticisms of Classical Political Economy: Menger, Austrian Economics and the German Historical School (Routledge Studies in the History of Economics).* London; New York: Routledge.

Chubukova, O., & Synenko, O. (2010). The place and role of state in contemporary Ukraine's economics development. *The actual economics problems, 8*(110), 79-88.

Green, J., & Laffont, J. (1977). Characterization of Satisfactory Mechanisms of the Revelation of Preferences for Public Goods. *Econometrica, 45*(2), 427-38.

Hummel, J. R. (1990). National Goods Versus Public Goods: Defense, Disarmament and Free Riders. *Review of Austrian Economics*(4), 88-122.

Jensen, R., & Miller, N. (2008). Giffen Behavior and Subsistence Consumption. *American Economic Review, 97*(4), 1553–1577.

Samuelson, P. (1969). Contrast Between Welfare Conditions for JointSupply and for Public Goods. *The Review of Economics and Statistics, 51*(1), 26-30.

Veblen, T. (1984). *Theory celebrating class.* Moscow: Progress.

Received for publication: 18.09.2012
Revision received: 30.11.2012
Accepted for publication: 21.12.2012

How to cite this article?

Style – **APA** *Sixth Edition*:
Stadnickij, Y., Voytsekhovska, V., Simak, A., & Stadnicka., Y. (2013, 01 15). The economic benefits classification according to their locus nascendi factors. (Z. Čekerevac, Ed.) *MEST Journal, 1*(1), 103-112. Retrieved from www.meste.org/mest/MEST_1_2013/_11

Style – **Chicago** *Fifteenth Edition:*
Stadnickij, Yurij, Viktoriya Voytsekhovska, Anastasia Simak, and Yuliya Stadnicka. "The economic benefits classification according to their locus nascendi factors." Edited by Zoran Čekerevac. *MEST Journal* (MESTE NGO) 1, no. 1 (01 2013): 103-112.

Style – **GOST** *Name Sort*:
Stadnickij Yurij [et al.] The economic benefits classification according to their locus nascendi factors [Journal] = The economic benefits classification // MEST Journal / ed. Čekerevac Zoran. - Belgrade - Toronto : MESTE NGO, 01 15, 2013. - 1 : Vol. 1. - pp. 103-112.

Style – **Harvard** *Anglia*:
Stadnickij, Y., Voytsekhovska, V., Simak, A. & Stadnicka., Y., 2013. The economic benefits classification according to their locus nascendi factors. *MEST Journal,* 15 01, 1(1), pp. 103-112.

Style – **ISO 690** *Numerical Reference*:
The economic benefits classification according to their locus nascendi factors. **Stadnickij, Yurij, et al.** [ed.] Zoran Čekerevac. 1, Belgrade - Toronto : MESTE NGO, 01 15, 2013, MEST Journal, Vol. 1, pp. 103-112.

MEST JOURNAL

RISK MANAGEMENT IN AIR TRANSPORT AND INSURANCE

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JEL category: **G2, G3, L9, G22, L9**,

Summary:
Air transport inherently represents one of the most important and dynamic sector of the economy. As an important economic entity it is a key factor in the development of modern society, it is a mean of economic development and it creates one of the largest sphere of the economy. With its character it is significantly involved in ensuring sustainable development of mobility, economic growth and integration of new Member States into the European structures.
Qualitative and quantitative criteria of each method of transport vary in speed, comfort, economical aspect and especially in safety. Based on selected statistical indicators, air transport is the safest method of transport and according to these criteria it maintains leading position. The occurrence of aircraft accidents is in comparison with other methods much lower, but the consequences of accidents in air transport are often, for the crew of the aircraft and passengers, fatal. Air accidents cause injuries, fatalities, property damage and damage to third parties.
The growth potential of air transport is not exhausted. Competition is increasing, there is a boom in airlines, terms of service providing are changing within every individual airline leading to an expansion of the risks and their subsequent elimination. In this paper author focuses on risk management in civil air transport and the possibility of eliminating financial impact of risks by means of insurance.

Keywwords:

air transport, air transport safety, risk, risk management, insurance

1 Air transport characteristics

Despite the fact that air travel is the latest method of transport, it represents one of the most important sectors of the economy. The huge expansion of aviation is dated from the early 20th century, and its volume is still growing.

Within aviation we distinguish civilian and military aviation. Civil aviation involves the transportation of passengers from general public, of cargo and mail for a fee both in scheduled air transport and general (non-scheduled) aviation.

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Scheduled air transport provides passenger and cargo transportation on scheduled flights according to schedule. The term „general aviation“ refers to other uncontrolled civil aviation.

According to the International Civil Aviation Organization, the airlines of ICAO's 191 Member States carried approximately 2.7 billion passengers (+5.6% over 2010) and 51.4 million tonnes of freight in 2011. (ICAO, 2012)

In Europe alone, the aviation industry provides 5.1 million job positions and contributes 365 billion EUR or 2.4% to European GDP. Global air transport, in spite of the current economic crisis, is expected to grow over the long-term by around 5% annually until 2030 (a compound increase of more than 150%). (European Commission, 2012)

The use of aviation throughout the world lags far behind the USA, where this method of transport is annually used by 60% population, while in Eastern Europe it is only 0,4% and in China 0,05% of the population. However, these figures are also highlighting the enormous potential for growth in this sector, whether in Europe or in Asia.

Growth potential of the aviation market and flexibility of conditions have resulted in increased competition that forces airlines to expand or reduce its prices. (Oros, 2010) In comparison to other methods of transport it is at a disadvantage from the financial point of view, but also in this area it leads to improvement through offering tickets at affordable prices via low-cost companies.

Major international organizations, which dominate the market for civil aviation are IATA and ICAO.

International Air Transport Association (IATA) in its nature is one of the most important organizations in civil aviation. It was established on April 19th, 1945 in Havana. Its headquarters is situated in Montreal. The organization currently has a number of regional seats worldwide. The main office is located in Geneva and regional offices are located in Amman, Johannesburg, Miami, Singapore and Beijing.

IATA for more than 60 years represents and provides the needs of the aviation industry. IATA as an international association was founded by the airlines, is composed of representatives of the airlines and most of its activities are carried out in favor of the airlines.

Upon its establishment it had 57 members from 31 countries, mostly from Europe and North America. At the present it is a group of 240 members from more than 126 nations around the world accounting for 93% of all airlines. IATA membership is voluntary. A member of IATA can become each airline performing regular international transport of passengers, goods or mail between two or more states, while the airline that carries the traffic must be registered in a Member State of the *International Civil Aviation Organisation* (ICAO). Each member is required to participate in financing IATA with regular member contributions.

The main aim of IATA is to maintain healthy competition in the spirit of free trade and to encourage airlines in fair competition and unification of prices. Among other things, IATA sets and coordinates fares in international air transport, regulates air tickets, regulates the transport of dangerous goods, assignes codes to air carriers and to airports and grants accreditation to travel agencies, with the exception of agencies based in the USA, etc. (IATA, 2012)

ICAO is the aviation authority of the United Nations. In its character it is a specialized organization of the United Nations and the most important international governmental organization working in the field of civil aviation. It was established under the Convention on International Civil Aviation, which was on 7th December 1944 signed by 52 participating states. This document came into force in 1947, when 26 countries have ratified it.

The ICAO currently unites 191 countries of the world, it is headquartered in the *Quartier International de Montréal* and has seven regional offices: in Bangkok for the Asia Pacific region, in Cairo for the Middle East region, in Dakar for the Southern and Central Africa, in Nairobi for the area of Eastern and Southern Africa, in Lima for the area of South America, in Mexico City for the Caribbean area, North and Central America and in Paris for the area of Europe and North Atlantic.

The ICAO`s main priority is to codify the principles and techniques of international air navigation and

to ensure planning and development of international air transport with the aim to maintain the safety and systematic and sustainable development of civil aviation. It carries out surveys in the field of international transport, publishes statistical data of international air transport and promotes simplification of formalities in international traffic. Its strategic objectives include safety, environmental protection, efficiency, continuity and compliance with legal standards. It provides technical support and assistance to developing countries and cooperates with governmental and non-governmental organizations.

The ICAO acts as an unifying, standards-setting and main authority in the field of aviation. Aims of the ICAO are defined in the Article 44 of the Convention on International Civil Aviation, also better known as the Chicago Convention, whereby the ICAO ensures the development of international civil aviation. Therefore it supports security in international air traffic, set principles, develops technical standards and regulations, supports work on the construction and operation of the transport aircraft intended for peaceful purposes, supports the development of airways, airports and aviation facilities for international civil aviation. Also it controls economy and ensures equal opportunities for the implementation of international air services to all states.

ICAO Committee approves standards and recommended procedures concerning air navigation, prevention of unlawful disruption of airspace and simplifying procedures of transitions across national boundaries for civil aviation. In addition, ICAO defines the protocols for air accident investigation for transport safety authorities in countries signed in the Convention on International Civil Aviation.

ICAO sets standards of safety, regularity and efficiency of international civil aviation. (ICAO, 2012)

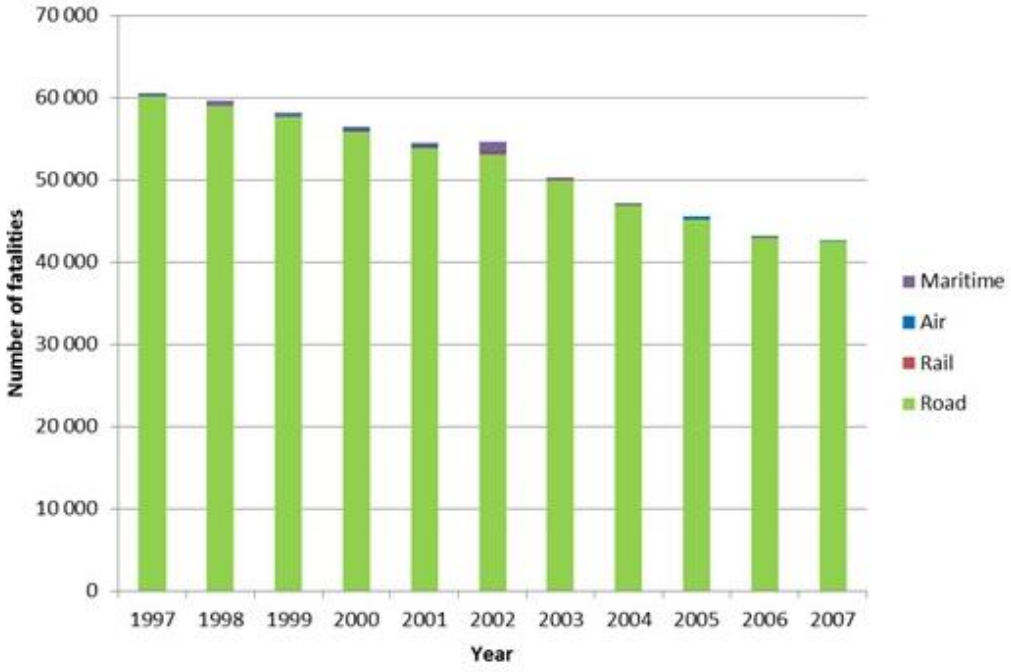

Fig. 1. Number of road, rail, air and maritime fatalities in EU27 between 1997 – 2007
Source: (European Enviroment Agency, 2010)

2 Air transport safety

Significant and most widely discussed issue is the question of security. Statistics point to the fact that with the increasing number of flights is increasing the number of accidents and fatalities. The occurrence of aircraft accidents when compared to other methods of transport is much lower, but the consequences of accidents in air transport to the flight crew and passengers are often fatal. Air accidents cause injuries, fatalities, property damage and damage to third parties. Air transport along with rail transport represents unrivalled the safest method of transport. The European

Commission's report of 2010 provides an overview of the mortality for each method of transport within the Community during 1997 – 2007 (*Fig. 1*).

2.1 History of development in aviation safety

The *Fig. 2.* shows the gradual increase in aviation safety from 1942 to present. The statistics are based on data of the Flight Safety organization and shows the number of accidents and fatalities in different years aboard of aircraft in civil aviation operations.

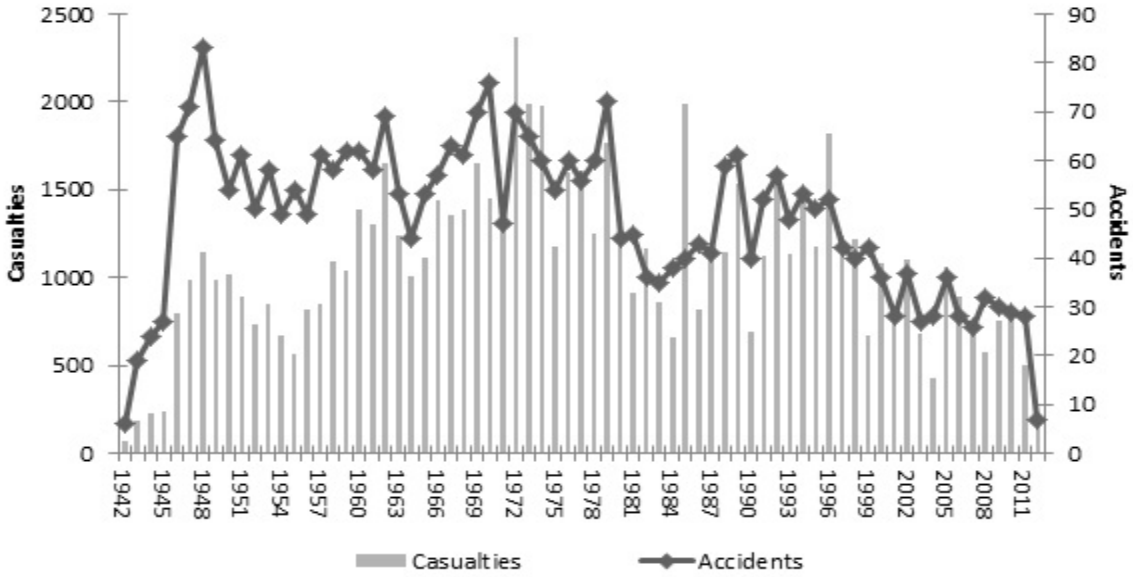

Fig. 2. The number of fatal airliner hull-loss accidents and fatalities (casualties) per year Source: (Aviation Safety Network, 2006)

The evidence of a high level of civil air transport safety in the European Union is a graph showing the statistics of fatalities aboard the aircraft over the territory of the Community between 1970 and 2004(*Fig. 3*).

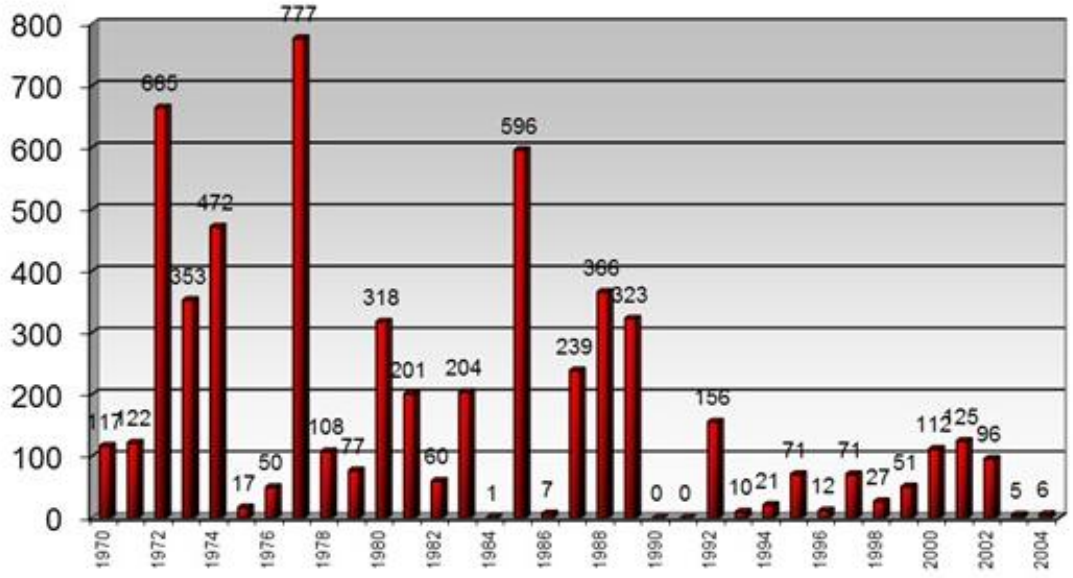

Fig. 3. Fatalities aboard aircraft over the territory of the European Union (Boeing, 2008)

Major impact on air transport safety has had the development of aviation technology, whose influence was over enormous drop in accidents. On the other hand, technical progress has increased the complexity of systems along with the requirements on the crew, leading to an increased number of accidents caused by human factor. Currently 80% of air accidents are caused by failure of the human factor.

ICAO statistics shows the following failure classification (Oros, 2010):

- procedure failures – 40,8%
- communication failures – 9,7%
- knowledge/skills – 9,2%
- staff incapability – 40,3%

Despite tremendous progress in air transport we will still find hidden risks in the design, manufacturing and maintenance of aircrafts. Many sources of accidents can be traced to disruptions in the conception and development of an aircraft. The failure usually occurs in certain stages of components`s life span. Through performing repairs or adjustment to traffic conditions, density of these failures during the main period of life decreases to a minimum. During this period there may occur random failures. In the period before the end of component's life span the number of failures increases due to their wear.

It is also important to mention that within the aviation accidents there, also monitored is the phase of flight. It was found that 50% of all accidents occur within the approach and landing, which represents only 4% of total flight time, plus 27% of accidents occurred during take-off and initial climb, which represents about 2% of total flight time. Simply from the sum thus we found that more than 3/4 of all aviation accidents occurred in these relatively short segments of flight.

The *Fig. 4.* and *Fig. 5.* are illustrating frequency of accidents and casualties between years 1945 and 2012.

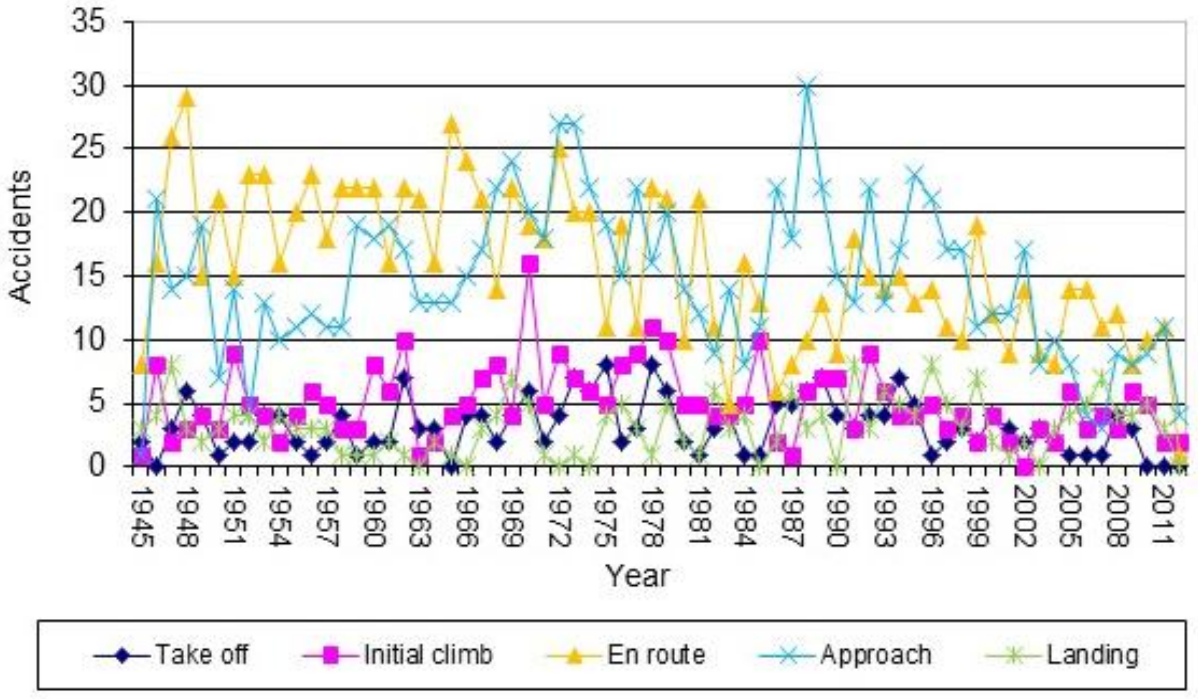

Fig. 4. Frequency of accidents by flight phase (Aviation Safety Network, 2012)

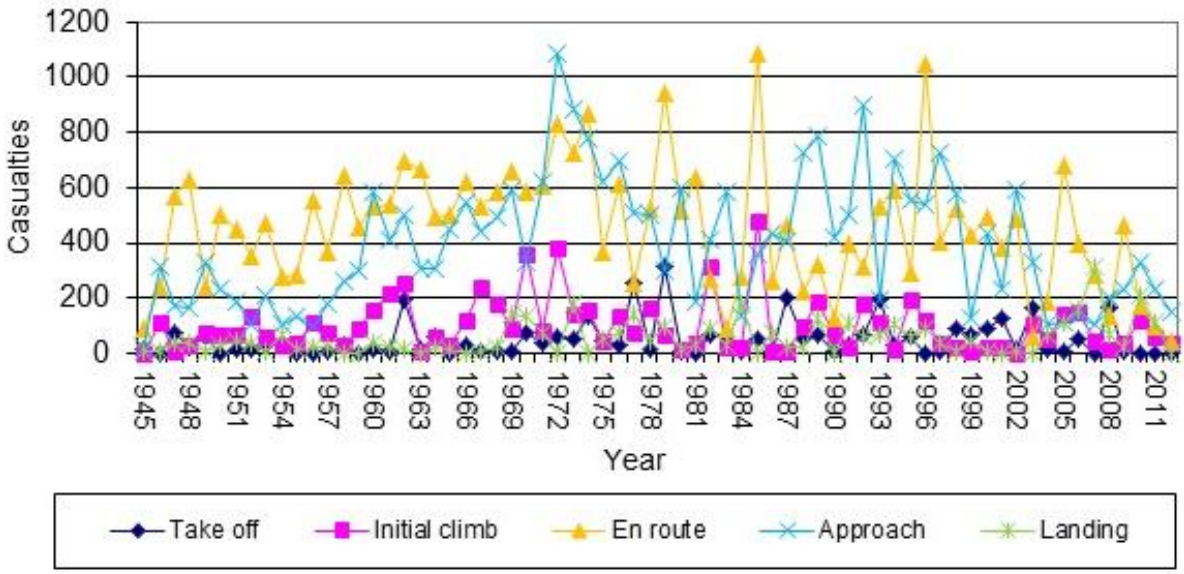

Fig. 5. Frequency of casualties by flight phase (Aviation Safety Network, 2012)

The above charts show that the majority of accidents, whether fatal or without fatalities, occurred during the flight and approach phases. Given that these figures relate to all flight operations, not just civil aviation, they can be regarded as distorted. To assess the safety of the individual phases of flight it is possible to use statistical outputs released by Boeing company, which in their research they focused on business jet aircraft with a maximum gross weight exceeding 60 000 pounds (27 000 kg). Based on data obtained from accident reports published by governments, aircraft operators, manufacturers, from press releases and other sources for the years 2002 to 2011, Boeing conducted the following chart, which presents the percentage of accidents and casualties during the different phases of flight.

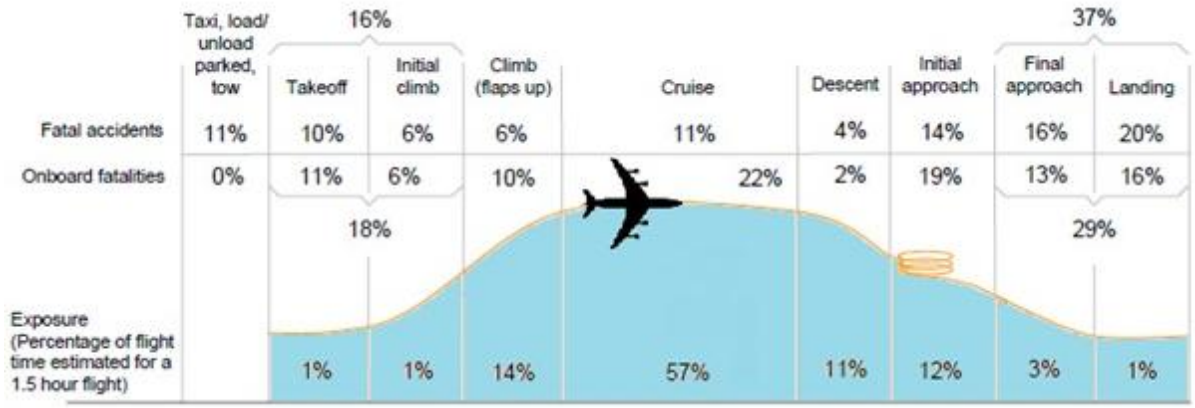

Fig. 6. Percentage of fatal accidents and onboard fatalities between years 2002 to 2011 (Boeing, 2011)

Based on *Fig.6* we can conclude that the most dangerous phases of flight are take-off, initial climb, final approach and landing of the aircraft. In terms of the rate of risk, i.e. percentage of the length of the flight phases within one flight with an average duration of 1.5 hour, these phases totals 6%. On transatlantic flights therefore the rate of risk compared to short-haul flights is negligible.

2.2 Regional statistics according to regions

Fig. 7 and *Table 1.* indicate the percentage of accidentsand related fatalities according to the region of occurrence in 2010.

Except Oceania, accounting for 3% of all accidents, the regional distribution of accidents across five UN regionsis relatively consistent, falling within rangefrom 13% to 29%.

In the terms of fatalities, Asia is the country deserving special attention. While accounting only for 20% of all accidents, but for 47% of all fatal accidents, it accounts for 67% of all fatalities.

In 2010 North America had both the highest traffic volume and greatest number of accidents. Nevertheless of the aforementioned facts there were experienced no fatal accidents in the region.

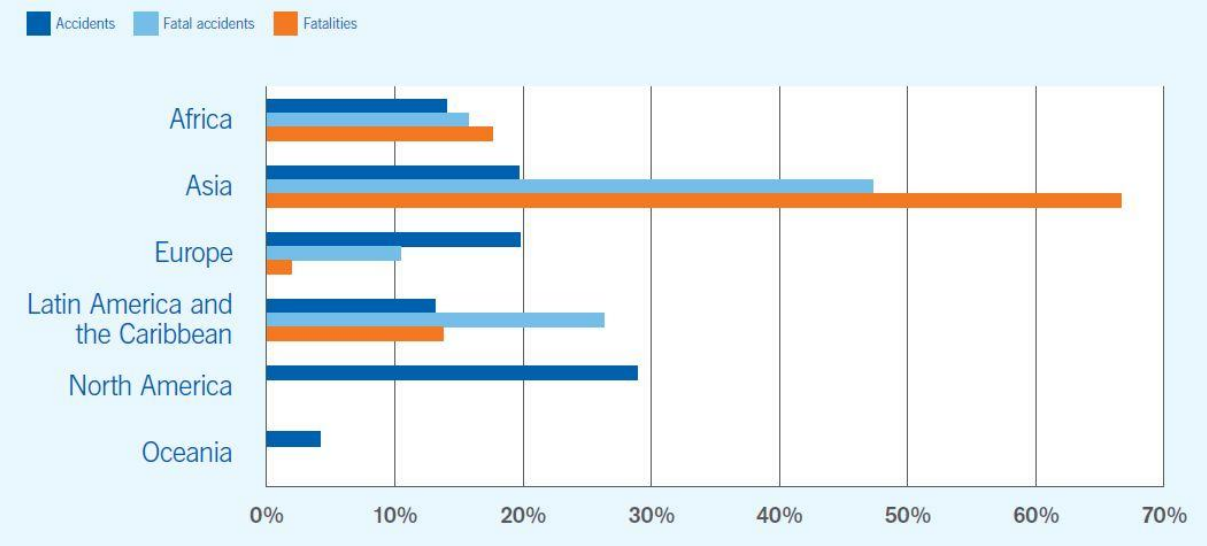

Fig. 7. Accidents by Region of Occurrence of 2010 (ICAO, 2012)

Table 1. Regional statistics according to regions of 2010 (ICAO, 2012)

Year 2010	Accidents	Fatal Accidents	Fatalities
Africa	17	3	125
Asia	24	9	471
Europe	24	2	14
Latin America and the Caribbean	16	5	97
North America	35	0	0
Oceania	5	0	0
Total	121	19	707

2.3 Causes of fatal airaccidents

The *Table 2.* shows the causes of aviation disasters during years 1950 to 2010. Statistics is based on 1085 fatal air accidents. The data collected relate only to commercial aircraft. Private aircraft, military aircraft, aircraft with a seating capacity of less than 18 and helicopters were not included in the statistics.

Table 2. Causes of fatal air accidents (PlaneCrashInfo.com, 2012)

Cause	1950s	1960s	1970s	1980s	1990s	2000s	All
Pilot Error	41	34	24	26	27	30	29
Pilot Error (weather related)	10	17	14	18	19	19	16
Pilot Error (mechanical related)	6	5	5	2	5	5	5
Total Pilot Error	57	56	43	46	51	54	50
Other Human Error	2	9	9	6	9	5	7
Weather	16	9	14	14	10	8	12
Mechanical failure	21	19	20	20	18	24	22
Sabotage	5	5	13	13	11	9	9
Other cause	0	2	1	1	1	0	1

Based on this table, it is clear that the greatest number of accidents in civil aviation are connected with the human factor, namely the error caused by the pilot, who is in the history of aviation responsible for half of the accidents. In addition to human errors, the most common causes of aviation accidents are weather conditions and technical problems.

2.3.1 The human factor

The human factor includes except pilots and cabin crew all aviation personnel engaged in aircraft maintenance. Pilot error can be defined as "non-compliance with the rules to perform flights, incorrect piloting technique, incorrect handling of the aircraft and its management and incorrect navigation of the aircraft." Cause of the accident on the pilot side may be also a lack of attention or inconsistency.

Several accidents were caused by pilot error as a conseqeunce of adverse weather conditions or technical failure of the aircraft, navigation devices, and so on. Accidents caused by human factor other than the pilot error was the result of air traffic controllers error, improper balance of the aircraft, its maintenance or problems with the fuel. Terrorism can be considered as the human factor as well. (Viktoryová, Nesvadba, & Šteffek, 2000)

2.3.2 Technical factor

To technical factors of aviation accidents belong engines failure, equipment failure, damage to the fuel tank and a possible fire, deficiencies in aircraft construction, technical shortcomings of airports and so on.

2.3.3 Meteorological conditions

The most common causes of accidents among meteorological factors are fog, storm, strong winds, lightning, bird collisions with aircraft engines and so on. (PlaneCrashInfo.com, 2012)

3 Risk elimination in civil air transport and possibilities of their insurance

The world, in which we live, is characterized by a number of uncertainties and random events. Negative, adverse and unexpected phenomena that occur in all sectors of human activity are a part of community life. Accompanying feature of

each purposeful activity is the potential occurrence of a random event that represents the existence of risk as a negative deviation from expected result which needs to be insured.

Insurance is a specific non-manufacturing sector, or services sector of the economy, that provides the elimination of risks affecting all human activities.

Insurance is specific national economy sector that specializes in ensuring the functioning of the economic system through the repayable loss prevention and payment of claims, which arose from unpredictable, as well as expected events.

Insurance can be understood as a protection against risks, where the insured transfers their risks, whose potential consequences of the loss ratio from their individual point of view are unacceptable, to the insurer who with a sufficiently large set of risks of a similar nature is not only capable to cope all the taken risks by using collected premium, but they might become also the subject of a profitable commercial activity.

Insurance is a specific kind of financial service, where the insurer for reimbursement provides insurance coverage for the taken risks so that if an insured event occurs, he will provide to the insured the insurance benefit. (Majtánová A. a., 2005)

Insurance, therefore, can be defined as a financial tool to eliminate the negative consequences of random events. (Ducháčková, 2005)

These random events we identify as insurance risks. *Insurance risks* are caused by natural forces, regardless of human activity or directly through human activity. Their impact may cause *damage* to health or property. Quantified damage is called *loss*. Realization of risks leads to the insured event, in which the conditions stipulated in the *insurance contract* will lead to a financial compensation of the insured, i.e. compensation for the damage through *insurance claims*.

Insurance relationship between the insurer and the insured are characterized by:

- *solidarity* - insurance reserves are created from common paid premium,
- *conditional return* - the insurance compensation is paid only in case of insured event,
- *non-equivalence* - the amount of insurance claims is not dependent on the amount of premiums paid.

Other insurance company activities include preventive activity and reinsurance.

Preventive activity is focusing on the prevention of damage, a measure aimed at reducing risk and loss.

Reinsurance is defined by the Insurance Act as "taking insurance risks by a reinsurance company [...], risk valuation and management, management of reinsurance contracts, the creation of technical reserves [...], providing benefits from reinsurance contracts and the providing consultancy services in the insurance industry." (Zákon č. 8/2008 Z.z. o poisťovníctve a o zmene a doplnení niektorých zákonov, 2008)

Reinsurance activity, respectively *reinsurance* can be characterized as insuring the insurance. It is a specific form of insurance, in which the insurance company "transfers to the reinsurer part of the risks that go beyond his financial capacity, and would upset the balance of its portfolio." (Majtánová A. , 2006)

3.1 General definition of risk

Within the insurance industry, risk represents the possibility of an event that is the subject of insurance - insured event. The risk is not an insured event by itself, it indicates only a potential possibility of its occurrence.

In terms of insurance, *risk* is understood as a positive as well as an adverse event in the life of a man. (Cipra, Pojistná matematika v praxi, 1994)

In insurance, the term "risk" also refers to:

- object threatened by random danger (e.g., building, household, machinery),
- event, causing damage and thus represents a source of risk (e.g. accident, theft, natural hazards),
- likelihood of an incident, whose effects are negative for an economic entity. (Chovan, 1996)

The size of the risk is determined by two factors:

- *frequency* – frequency of risk occurrence,

– *seriousness* - quantifiable extent of the damage caused by the implementation of risk.

Event subject to insurance must meet the following criteria:

– *randomness* - it must be random in nature, it is unclear whether it will ever occur and when,
– *identifiably* – the cause of risk, should be detectable,
– *calculability* – loss itself must be quantifiable,
– *economic acceptability* - insurance must be economically feasible for the policyholder and the insurer as well.

In the case of insurable risk, it is necessary to take into account the problem of asymmetric information and systemic risk.

Asymmetric information reflects the differences in awareness of the likelihood of potential losses between insurers and clients.

Systemic risks are dependent risks, which cause at the same time loss to a large amount of economic entities. Since in such cases, the amount of insurance claims paid considerably exceeds the amount of premiums received, insurance companies against such risks provide reinsurance, or geographic distribution of insured risks.

3.2 Risks in air transport and the possibilities of insurance

According to the European Parliament and Council Regulation (EC) nr. 785/2004 and insurance requirements for air carriers and aircraft operators it is necessary under the common transport policy and consumer protection promotion to ensure the lowest possible adequate level of insurance to cover liability of air carrier in respect of passengers, luggage, cargo and third parties.

Aircraft insurance provided by insurance companies is governed by the insurance contract, general insurance conditions, contractual arrangements and generally binding regulations governing insurance. Risks insurance associated with aviation comes under non-life insurance.

3.3 Risks in air transport

In terms of insurance to the risks in aviation belong:

– the risk of damage, destruction or theft of the aircraft,
– the risk of death due to accident or permanent consequences of injury,
– the risk of damage to property caused by aircraft to third parties,
– the risk of death or injury of third parties caused by aircraft,
– the risk of damage to luggage or cargo during transportation,
– the risk of terrorism.

To the risk insurance of the aviation industry are linked the following life insurance classes:

- accident insurance,

The content of accident insurance is:

– insurance against death resulting from an accident - in case of death resulting from an accident within a certain period, the insurance company pays the entire sum specified in the contract
– insurance in case of permanent consequences of injury, respectively insurance against disability resulting from injury,
– insurance of the time required to treat the consequences of an accident,
– insurance of interventions undertaken to treat accident consequences,
– accident insurance of the seats.

- insurance of damage caused to aircraft, which is a form of transport insurance.

Transport insurance is a damage insurance, which may be caused on different types of vehicles or goods, during the transport itself as well as during the preparation of goods for transport. In addition to these losses transport insurance includes salvage costs, screening costs and a contribution to a common accident. The importance of transport insurance is that the carrier is liable only for damages caused by his fault. This type of insurance with coverage of e.g. catastrophe risks or the risks caused by human factors (vandalism, theft etc.) provides wider insurance cover.

Distinctiveness of this type of insurance is the close cooperation of the insurance market participants. Especially the fact when the subject of insurance represents a relatively small number of high value aircrafts, as well as the amount of damage they can cause. The insurance claim

from occurrence of damage in the air transport is moving at high values.

As, such risk cannot be taken by any economic entity or country, there is a use of reinsurance. Nevertheless in some states the cover must be provided by domestic companies and most of the underwritten risk that is ensured is on the international reinsurance market. (Cipra, Zajištění v pojišťovnictví a jeho matematické aspekty)

4 Evaluation of the identified risks

An essential part of the risk management process is to identify all hazards, i.e. risk factors that may affect air traffic and cause higher or lower losses. Risk factors are technical and human characteristics of objects and activities that affect risk, i.e. likelihood of a negative phenomenon and its impact.

With identifying risks we analyse them and we describe the most vulnerable parts of the system. Risk assessment is the final phase of risk analysis and it requires performing an analysis of the likelihood of a negative phenomenon - analysis of abundance, analysis of possible consequences and their mutual relationship.

Mutual combination of likelihood and consequences of identified risks to the company represents the risk matrix. It is a simple tool to assist management decision making and a mechanism to increase visibility of risks.

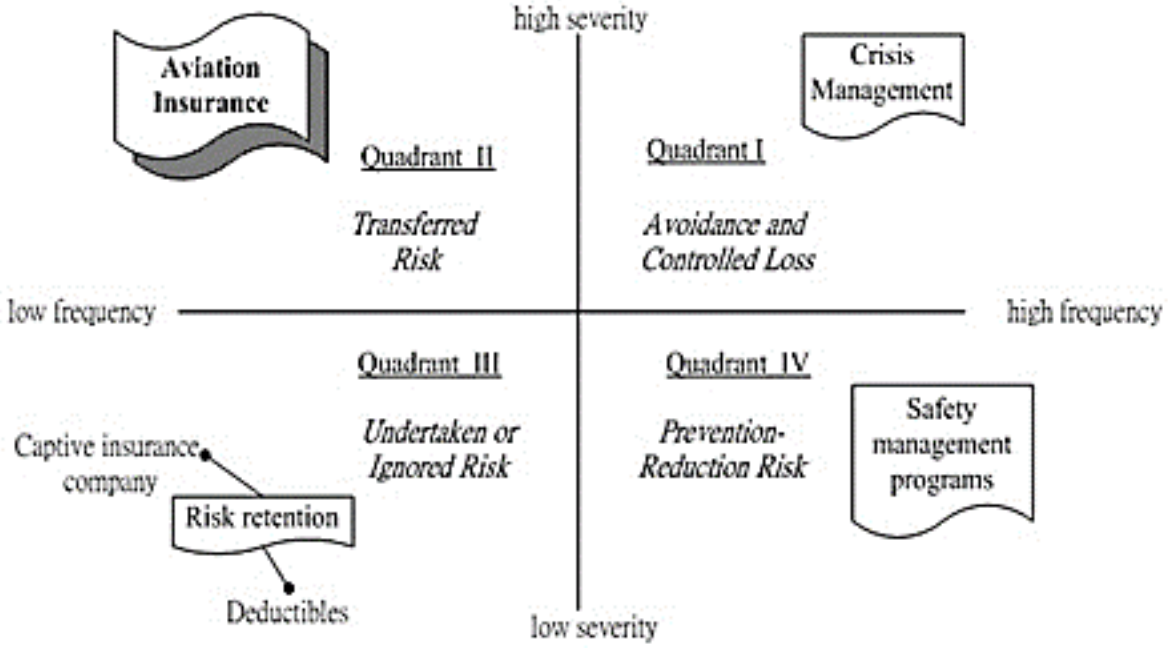

Fig. 8. Frequency-severity analysis matrix (risk matrix) (Chang & Lin, 2008)

CONCLUSIONS

Many airlines nowadays have to face various consequences after the accident in September 2001. Aftermaths of the accident include declining number of passengers, higher costs to service providers, higher insurance premiums and security costs.

With continuous improvements in aviation safety, strict supervision of compliance with safety requirements, ensuring the safety of flight operations and a number of other measures, the number of human casualties in aviation accidents year-by-year is significantly lower.

Works Cited

Aviation Safety Network. (2006). *Fatal airliner hull-loss accidents*. Retrieved March 25, 2012, from Aviation Safety Network: http://aviation-safety.net/statistics/period/stats.php?cat=A1

Aviation Safety Network. (2012). *Airline safety*. Retrieved September 5, 2012, from Aviation Safety Network: http://aviation-safety.net/statistics/phase/

Boeing. (2008). *Statistical summary of commercial jet airplane accident: worldwide operations 1959 – 2007.* Retrieved July 2008, from The Boeing Company: http://www.boeing.com/news/techissues/pdf/statsum.pdf

Boeing. (2011). *Statistical summary of commercial jet airplane accident: worldwide operations 1959 – 2011*. Retrieved September 5, 2012, from The Boeing Company: http://www.boeing.com/news/techissues/pdf/statsum.pdf

Chang, Y.-H., & Lin, Y.-H. (2008). *Significant Factors of Aviation Insurance and Risk Management Strategy: An Empirical Study of Taiwanese Airline Carriers.* Retrieved March 25, 2012, from http://conf.ncku.edu.tw/research/articles/e/20080919/3.pdf

Chovan, P. (1996). *Poistná matematika I.* Brno: MU Brno.

Cipra, T. (1994). *Pojistná matematika v praxi.* Praha: Edice HZ.

Cipra, T. (n.d.). *Sborník prací 13. letní školy JČMF ROBUST 2004 uspořádané Jednotou českých matematiků a fyziků.* Retrieved October 30, 2008, from http://www.statspol.cz/robust/robust2004/cipra.pdf

Ducháčková, E. (2005). *Principy pojištění a pojišťovnictví.* Praha: Ekopress.

European Commission, .. (2012). *EU External Aviation Policy Package.* Brussels: Europa Press releases RAPID. Retrieved 12 28, 2012, from http://europa.eu/rapid/press-release_MEMO-12-714_en.htm?locale=en

European Enviroment Agency. (2010, July 1). *Transport accident fatalities (TERM 009) - Assessment published Jul 2010.* Retrieved March 23, 2012, from European Enviroment Agency: http://www.eea.europa.eu/data-and-maps/indicators/transport-accident-fatalities/transport-accident-fatalities-as

IATA. (2012, September 15). *History - The Founding of IATA*. Retrieved from IATA: https://www.iata.org/about/pages/history.aspx

ICAO. (2012, September 10). *2011 State of Global Aviation Safety.* Retrieved from International Civil Aviation Organization (ICAO): http://www.icao.int/safety/Documents/ICAO_State-of-Global-Safety_web_EN.pdf

ICAO. (2012, September 3). *ABOUT ICAO.* Retrieved from International Civil Aviation Organization (ICAO): http://www.icao.int

ICAO. (2012). *Annual report of the council - 2011.* International Civil Aviation Organization. ICAO. Retrieved from http://www.icao.int/publications/Documents/9975_en.pdf

Majtánová, A. (2006). *Poisťovníctvo: Teória a prax.* Praha: Ekopress.

Majtánová, A. a. (2005). *Poisťovníctvo.* Bratislava: Ekonomická univerzita v Bratislave, Národohospodárska fakulta.

Oros, S. (2010, June 4). *Bezpečnosť leteckej dopravy.* Retrieved March 24, 2012, from AeroWeb: http://www.aeroweb.cz/print.asp?ID=2434

PlaneCrashInfo.com. (2012, September 8). *Accident statistics.* Retrieved from PlaneCrashInfo.com: http://www.planecrashinfo.com/cause.htm

Viktoryová, J., Nesvadba, A., & Šteffek, J. (2000). In *Metodika vyšetrovania leteckých nehôd* (pp. 17 – 20). Bratislava: Akadémia Policajného zboru v Bratislave.

Zákon č. 8/2008 Z.z. o poisťovníctve a o zmene a doplnení niektorých zákonov. (2008). Slovakia.

Received for publication: 26.09.2012

Revision received: 28.12.2012
Accepted for publication: 03.01.2013

How to cite this article?

Style – **APA** *Sixth Edition*:
Kyselova, V. (2013, 01 15). Risk management in air transport and insurance. (Z. Čekerevac, Ed.) *MEST Journal, 1*(1), 113-125. Retrieved from www.meste.org/mest/MEST_1_2013/_12.pdf

Style – **Chicago** *Fifteenth Edition:*
Kyselova, Viera. "Risk management in air transport and insurance." Edited by Zoran Čekerevac. *MEST Journal* (MESTE NGO) 1, no. 1 (01 2013): 113-125.

Style – **GOST** *Name Sort*:
Kyselova Viera Risk management in air transport and insurance [Journal] = Risk management in air transport and insurance // MEST Journal / ed. Čekerevac Zoran. - Belgrade - Toronto : MESTE NGO, 01 15, 2013. - 1 : Vol. 1. - pp. 113-125.

Style – **Harvard** *Anglia*:
Kyselova, V., 2013. Risk management in air transport and insurance. *MEST Journal,* 15 01, 1(1), pp. 113-125.

Style – **ISO 690** *Numerical Reference*:
Risk management in air transport and insurance. **Kyselova, Viera.** [ed.] Zoran Čekerevac. 1, Belgrade - Toronto : MESTE NGO, 01 15, 2013, MEST Journal, Vol. 1, pp. 113-125.

MEST JOURNAL

MEASUREMENT OF ACCOUNTING HARMONIZATION AND STANDARDIZATION

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JEL category: **E**, **M**, **E01**, **M4**,

Summary:
Harmonization and standardization can be traced to two interrelated levels: harmonization and standardization as a process at the level of accounting standards and accounting practices. If the harmonization of accounting standards is observed, then a formal (de jure) harmonization which is operationalized through stages of disclosure (so-called formal harmonization of disclosure) and through evaluation (so-called formal harmonization of measurements) exist. In relation to accounting standards it is necessary to harmonize accounting practices and create a demand for material (de facto) harmonization. Effects of harmonization and standardization can be measured by using generally accepted index (C, H, I) which was successfully presented by various examples and opinions of the many authors. Although, there are certain contributions and controversies of statistical indices use for the purpose of measuring processes and states, it is necessary to develop a unique generally accepted index after accounting harmonization process with the goal of achieving global convergence degree.

Keywords:
harmonization, standardization, accounting practices, generally accepted indices (C, H, I)

1 Introduction

Lately there has been more and more discussed about the need for statistical measurement and determination of harmonization impact. Although the default premise may be considered too complicated, Leo van der Tas, excellent expert in

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statistical characteristics in the field of harmonization measurement, reassures us. Existing research studies depending on the measurement types harmonizing the van der Tas and Tay and Parker, can be divided, at least, into two major groups: material research study (*de facto*) harmonization and formal research studies (*de jure*) harmonization. Most significant research in the field of measuring material harmonization are: Emenyou and Gray (1992, 1996), Canibano and Mora (2000), Aisbitt (2001), Hermann and Thomas (1995), Archer, Dekaville and McLeay (1995), while in the area of formal harmonization measurement the most significant papers are: McKinnon and Janell (1984), Doupnik (1987), Rahman et al. (1996), Aisbitt (2002), Chen et al. (2002) and Fontes, Rodrigues and Craig (2005). Review of these studies in the accounting literature is shown in Table 1.

2 Measuring harmonization with generally accepted index

In the accounting literature (Table 1) there are several possible approaches which can be measured by the degree of harmonization using three different indices: (1) H index for measuring harmonization within the country, (2) C index for measuring harmonization within the country with multiple reporting systems (extent of international harmonization) and (3) I index to measure the international harmonization. Most research studies measuringing material harmonization are are based on van der Tas thinking (Mustaţă, Matis, 2007:5) although in recent years derived approaches appeared which basically elaborate and expand Tas's assumptions.

Therefore, Tas thinking (1988, 1992) is a crucial starting point in the process of clarifying the generally accepted index of measuring harmonization. Comparability can be considered as an increase in the degree of consensus in the choice of alternative accounting methods for the items of financial statements. Increasing the degree of consensus can be forced (mandatory), stimulated or spontaneously. In the first case, the mandatory provisions prescribe or prohibit one or more accounting methods. In the second case it is recommended to use one or more accounting methods. In the third case, the increase in the degree of consensus can not be labeled as intentional introduction of mandatory and optional provisions. (van der Tas, 1988:159). When measuring accounting harmonization, usually, are used Nair-Frank categories (1981) measurement and disclosure: (1) required (use of accounting methods or practices of disclosure certain information is required), (2) dominant practice, (3) minor practice (4) without the use or (5) is not allowed. (van der Tas, 1992:213-214). Comparability increases when business entity choice among alternative accounting methods becomes concentrated in one method or a limited number of accounting methods (van der Tas, 1988:159). Roberts et al. (2008:291) as previously mentioned facts explain that there are many different ways by, which can be measured concentrations, but the generally accepted method is Herfindahl index or H index. H index is used to measure the comparability of the accounting methods used in preparing the financial statements. Basically it is a simple method of measurement comparability which ignores additional information and facts from the financial statements, and because of the simplicity index mentioned above allows multiple interpretations of the results and incomplete results. H index of the form:

$$\sum_{i=1}^{n} p_i^2$$

where:

- p_i proportion of business entities that use accounting method *i*
- *n* largest possible number of available methods.

The main disadvantages of H index are certain difficulties in calculating the degree significance level of harmony and the inability to apply more multiple alternative measurement methods. (van der Tas, 1992:73). Limits interval H index, according to van der Tas (1988:159) are between 0 (disharmony with the infinite number of alternative methods) to 1 (harmonization where all business entities use the same method) which move H index, an interval, indicating level of (non)compliance. For example, an item of the financial statements can be represented, at least, using two different methods (A and B).

Table 1. Review of studies measuring accounting harmonization and standardization

Characteristics	Nair and Frank (1981)	Evans and Taylor (1982)	McKinnon and Janell (1984)	Doupnik and Taylor (1985)	Nobes (1987b)	Van der Tas (1988)
Objectives	evaluate the success of formal harmonization by IASC	determine the impact of the IASC accounting standards on financial reporting (p.119)	analyze the direct and indirect impact on the IASC accounting standards	evaluate compliance of the Western Europe countries to the basic features of accounting practices (p.27) and changes over time	examine the hypothesis how American and British companies do not follow the IASC accounting standards	quantify harmonization and impact of professional accounting bodies
Tested country	37 countries with similar research 3 PW	France, Japan, UK, USA West Germany	64 countries according to a PW survey 1979	16 Western Europe countries	UK and USA	Netherlands, UK, USA
Scope	IAS 1 -10	IAS 2-4, 6 i 7	IAS 3, 4, ED 11 (MRS 21)	IAS 1-8	IAS 3, 4, 22 (USA) IAS 9, 14, 19 (UK)	accounting of deferred taxes
Data source	survey PW 1973, 1975 i 1979	9-10 financial statements of each country in the period 1975-1988	PW survey 1979	PW isurvey 1979; questionnaire	published financial statements for 1985 randomly selected listed companies	national survey
Research methodology	changes in the distribution of countries according to the required categories tested the significance of the Friedman ANOVA	examined reports indicate the level of compliance with IAS for the country in the period 1975-1988	descriptive analysis accounting regulations states IASC. Discussion IASC influence on the FASB and ASC reports	weighted response categories. The calculated average scores across regions and countries using non-parametric tests	content and temporal differences between national and international accounting standards by the degree of compliance with IAS	3 indexes developed to measure harmonization and comparability of the different countries. Changes in the value associated with the legal and professional regulations
Harmonization types measurement	de jure standardization	de facto standardization	de jure uniformity	de jure standardization	de facto uniformity	de facto harmonization
Major findings	IASC existence coincides with the increasing harmonization of accounting standards	IASC had very little impact on the accounting practices of countries (p.126)	IASC didn't seueed in changing the existing standards or set up new accounting standards (p.33)	existence of differences between Western Europe countries (p.33.)	IAS can be accepted (p.13)	it is possible to measure the impact of mandatory and optional provisions on harmonization (p.167)

Source: *Tay & Parker, (1990)*

It is assumed that 50 business entities within the group group of 100 businesses apply the method A in the period 1. The remaining business entities use the method B. In period 2, 70 business entities using method A compared to 30 business entities which accounted certain position by the method B. In period 3 ratios is 90:10 in favor of the method A. The relative frequency and H index may be summarized as follows:

Table 2. Calculations of H index

Period	Method A	Method B	H index
1	0,5	0,5	$0,5^2 + 0,5^2 = 0,50$
2	0,7	0,3	$0,7^2 + 0,3^2 = 0,58$
3	0,9	0,1	$0,9^2 + 0,1^2 = 0,82$

Source: *van der Tas L (1988)*

Furthermore, van der Tas differentiates two level of H index: (1) C index and (2) I index. Walton et al. (2003:26) point that Tas suggestions for harmonization of 1988. (extended in 1992) are explained by using the C index while taking into account, over time, published financial reports and changes in accounting policies indicating the variability of harmonization as evidence that the subjects do not report according to adopted rules. C index measures national harmonization when business entities provide accounting information using several alternative methods for a particular accounting practice (Mustaţă and Matis, 2007:5). C index (multiple reporting) compares the financial statements of compatibility between the countries and measures the number of pairs of countries that follow the same accounting methods or provide sufficient information to allow mutual comparison. Then, the pairs compatible report compares with the maximum total number of possible pairs in the following way: (Roberts et al, 2008:293)

$$C = \frac{\sum(n_i x(n_i - 1))}{(Nx(N-1))}$$

where:

n_i – number of business entities with a method *i*

N – total number of business entities.

For example, let's watch two accounting issues (depreciation (1) inventory evaluation (2)) and three alternative methods of measurement (linear, progressive and methods of decreasing inputs, or FIFO method, LIFO method and weighted average price (PPC)) at twenty business entities shown in table 3.

Table 3. Calculations of C index

Acc. issues	Method A	Method B	Method C	Calculation	C index
1	15	1	4	$\frac{[(15x4)+(1x0)+(4x3)]}{[(20x19)]}$	0,584
2	7	5	8	$\frac{[(7x6)+(5x4)+(8x7)]}{[(20x19)]}$	0,311

Source: *Roberts, Weetman & Gordon (2008:293)*

Interval boundaries for c index, according to van der Tas (1988:164), are ranging from 0 (disharmony with the infinite number of alternative methods) to 1 (harmonization where all business entities use the same method) by which the path C index, an interval, indicates the level of (non)compliance. This method meets three criteria: quantification of harmony level is directly linked with comparability, it is able to take into account more reports and information in the notes, and it is possible to calculate the harmony degree movement using the significance test (regression analysis). C index measures the degree of comparability of each item based on the number of comparable financial statements. It is assumed that the two financial statements are (in)comparable with respect to one type of transaction or event. So there is no comparison between two graduations financial statements since only one type of transaction or event has been taken into account. (van der Tas, 1992:74). There are several reasons for absence of measurement material harmony for aggregate types of transactions and events, but for each type of transaction or event separately. Those are (1) separate measurements provide more accurate results because of the possibility measure of a degree material harmonization for each type of transaction or event presented in the financial report, while measuring the harmony as the sum of all types of transactions or events gives only aggregate results and thus it is difficult to draw conclusions about the politics of measurement and (2) measure of aggregate harmony of transactions or events requires a detailed list of the types of transactions and events and separate measurement of material

harmony for each type of transaction or event is more convenient. (van der Tas, 1992:75).

Van der Tas (1988:165) in the measurement of the international material harmonization emphasizes the need to meet two conditions. Firstly, international harmony is a degree of comparability of financial statements business entities in their home country which means that the harmonization measurement should go primarily of national harmony. Secondly, international harmonization exists at a particular degree of convergence of two or more countries with regard to accounting practices applied in preparing the financial statements. Degree of international material harmonization indicates the degree to which businesses in one country apply the same or only a limited number of alternative accounting methods compared to business entities in other countries. According to Hermann and Thomas (1995:2565) I index measures the international harmonization or harmonization of accounting practices between two or more countries. I index is expressed by multiplying the proceedings business entities for a particular accounting alternatives and aggregating the overall alternative rules until the correction factor, shown in the exponent, is used when examining several countries. The overall shape I index can be represented in mathematical form as:

$$I = [\sum_{m=1}^{M}(\prod_{n=1}^{N} P_{mn})]^{\frac{1}{(N-1)}}$$

m alternative accounting method *m*
n country *n*
P_{mn} relative frequency accounting methods *m* in country *n*

Table 4. *Calculations of I index*

	Country		
Period 1	A	B	I indeks
method 1	1	0	1 x 0 + 0 x 1 = 0
method 2	0	1	
Period 2	A	B	
method 1	0,6	0,3	0,6 x 0,3 + 0,4 x 0,7 = 0,46
method 2	0,4	0,7	

Source: *van der Tas (1988)*

Interval limits of I index according to van der Tas (1988:166) are between 0 (disharmony with the infinite number of alternative methods) to 1 (harmonization of all business entities using the same method) by which the path and index, an interval, indicates the degree of (non)compliance. For example, it is assumed that the two countries (A and B) within a specified time period applied two different methods (method 1 and method 2). The way use of I index is shown in Table 4.

3 Advantages and disadvantages of harmonization with the generally accepted index

Application possibilities of quantifying measurement degree of material harmonization are: (1) to determine the degree of harmonization in relation to the accounting treatment of certain items at a time, (2) to show the fluctuations in the level of harmony and achieved a degree of harmonization, (3) fluctuations in the degree of harmony can be attributed to introduction or amendment mandatory provisions on financial reporting or spontaneous harmonization caused by the development of accounting theory and international events, (4) to identify problem areas in financial reporting (subjects with low levels of harmony) and (5) organizations which are dealing with the harmonization of financial reporting can use measurement methods to set goals in relation to the desired degree of harmony for an item in the financial statements. The degree of harmony is achieved by harmonizing standards or accounting standards. (van der Tas, 1988:166).

Tay and Parker (1990:84) have been working on alternative approaches to the measurement of harmonization although they agree with the proposals of van der Tas (1988). Harmonization activities focused on the comparability of results from different countries and the study on measuring focused the actual reporting practices - *de facto,* not *de jure* harmonization. The level of harmony can be quantified using the index of concentration. Comparing the level of harmony during different periods results in the degree of harmonization or disharmony. The level of harmony can be measured using alternative methods such as non-parametric statistical tests, the measures of concentration, the measures of entropy, the variance of logarithms, Hannah-Kay indices and chi-square test.

Van der Tas (1992:214-215) strongly condemned the attempts by Tay and Parker (1992.) stating that the H index is calculated as the square of the relative frequencies of alternative measurement method for a particular type of transaction.

Concentration of business entities measured using the H index about one or several alternative methods of measurement leads to higher values of H index which indicates an increase in the degree of harmony. Tay and Parker based their opinion on the fact that H index is an index of concentration for which were performed insignificant tests which means a trivial or significant (statistical) variations in the value of the index. Unfortunately, Tay and Parker do not discuss *de facto* method of measuring such harmony C index. C index is not the index of concentration, but the ratio calculated as the quotient of the number of comparable pairs of financial statements and the total number of pairs of the financial report which confirm the non-existence of problems in the application, the usual statistical tests of significance. Advantages of C index are: (1) involvement the degree of influences *de facto* measurement of harmony for multiple reporting and disclosure of additional information in the notes allowing different users to understand financial statements, or (2) the movement of C index can be tested by significance. Unfortunately, Tay and Parker have not presented and devised a different method. The methodology, by the description, seems to be quite complicated and leaves some questions unanswered, such as the significance of the test, which measures the concentration and how to apply method of concentration in detecting problems. Significance test does not imply testing the importance of movement the degree of harmony, but focuses on the significance level of the harmony. The significance of movement the degree of harmony has not been tested in an appropriate way since the proposed measurement method has certain disadvantages as H index. Further disadvantage of T&P methodologies is impossibility to influence the inclusion of multiple reporting or additional information in the notes to the *de facto* measurement harmony since a financial report can be produced only by one alternative method of measurement. It is concluded that the methodology by Tay and Parker is certainly not better to measure *de facto* harmony of the C index.

Table 5 Empirical studies measuring the scope of harmonization of international accounting and used tests

Authors	Used test					
	H	C	$C_{modificiran}$	I	$I_{modificiran}$	x^2
van der Tas (1988)	x	x		x		
Tay and Parker (1990, 1992)						x
van der Tas (1992)		x				x
Emenyounu i Gary (1992)				x		x
Archer, Delvaille and McLeay (1995)			x			
Hermann i Thomas (1995)				x	x	x
Archer, Delvaille and McLeay (1996)		x				
Adhikari and Emenyounu (1997)				x		x
Morris and Parker (1999)		x		x		
Canibano and Mora (2000)		x				x
Parker and Morris (2001)	x	x				x
Aisbitt (2001)			x			
Taplin (2003)	x	x				

Source: *Baker & Barbu (2007:291)*

Tay and Parker (1992:219) commented van der Tas thinking (1992) as follows: General problem associated with the use of concentration measures for quantifying harmony stems from the implicit weighting clusters of businesses (c) about one or more of the available alternatives as opposed to the total number of (n) an alternative method. Harmony increases when c increases or decreases when n increases. However, it is difficult to predict how a measure of harmony reacts when variables (c, n) change at the same time in different directions. The above problem can be overcomed by appropriate measures of concentration such as the H index and measures of entropy (E). Application of entropy method is not appropriate since it is almost impossible, in the sample, to calculate the probability of not using one of the available accounting methods and the relative value of the entropy measure is not in agreement with the absolute values. With this it is concluded, that the H index is more reliable measure of harmonization. General problem with the values of C index is evaluation

index weighting changes of harmony versus changes in disclosure which appear at the same time. View the index used to measure the extent of harmonization of international accounting is shown in Table 5.

4 Measurement material (*de facto*) harmonization

Study of Hermann and Thomas (1995:253) tries to determine the level of accounting harmonization in the European Union (EU27) by considering certain measurement practices in the period since 1992 to 1993 for annual statements of eight EU member states (Belgium, Denmark, France, Germany, Ireland, Netherlands, Portugal and the United Kingdom). Harmonization has been tested using the chi-square test and measured using an "I" index. Chi-square test examines the equality of the accounting methods for these countries while an index measures the level of concentration around the individual accounting measurement methods selected for testing.

Table 6 shows the results of the Hermann-Tomas research. The highest level of compliance is in the area of foreign currency translation on the domestic and valuation of inventories.

Table 6. Summary of the index and the chi-square test

Measurement practice	I index	Chi-square test
Balance sheet	0,9040	7,22
Procedure of foreign currency translation	0,8494	6,88
Valuation of inventories	0,7943	17,89
Income statement	0,6433	54,39
Depreciation method	0,6245	134,82
Research and development	0,4105	38,76
Valuation of fixed assets	0,2852	93,34
Goodwill	0,2457	124,90
Inventory costing method	0,2292	71,88

Source: Herrmann and Thomas, (1995:264)

The relatively high level of compliance has been achieved in the field of foreign currency translation which is surprising since the Directives of the European Commission provide little cover in that area. Using the method of lower prices is the dominant method in the EU. Harmonization of depreciation is very high, with the exception of the German practice, which combines a regressive and straight-line method. However, the results also show that there are significant differences in accounting for research and development, fixed assets, goodwill and inventory costs. In addition, the lack of disclosure of particular accounting practice is worrisome. Specifically, about 50% of the tested business entities don't publish methods for monitoring research and development costs, while 40% of businesses do not publish a method inventory costs. Britain and Ireland have the highest level of compliance measurement practice and Germany and Portugal have the lowest level of compliance. On a regional basis, the United Kingdom, Ireland and France seek to achieve greater alignment with the rest of the EC Member States in contrast to Portugal and Germany. Finally, fairness oriented countries (Denmark, Ireland, Netherlands, United Kingdom) are more harmonized than legalistic countries (Belgium, France, Germany, Portugal) according to a study by Hermann and Thomas (1995:264).

In paper, Archer, Dekvaille and McLeay (1995:67) analyze choice of accounting policies of European companies in the EU27 countries (Belgium, France, Germany, Ireland, Netherlands, Sweden, Switzerland and the United Kingdom). Analyzed Accounting policies are treatment of goodwill and deferred taxes in order to examine the impact of accounting harmonization practices of financial reporting and accounting policy choices by using the C index divided into three components: (1) within-country effects of internal standardization (), (2) the effects of international harmonization (Between-country, so-called BCC index) and (3) disclosure-adjusted comparability index. After conducted analyzes the authors conclude (1995:80) that little progress has been made in the harmonization of deferred taxes and goodwill between 1986/87 and 1990/91, although the Directives brought a significant amount of convergence of national accounting standards in Europe, not only in the member states, but also prospective members and other countries associated with the EU. The reason for this is found in the dual fact: (1) the flexibility of national standards and (2) EU directives have allowed some freedom in the interpretation and application of deferred tax liabilities and consolidated goodwill.

Table 7. Harmonization of financial reporting in the Nordic countries

Categories	1981/2-1992	1992-1994	1994-1998
Cash Flow Statement	▼	▲	▲
consolidation goodwill	▼	▲	▲
depreciation method	▼	▲	▲
valuation of inventories	▼	▼	▼
IAS reconciliation	▼	•	▲
unsettled foreign exchange differences	▲	▲	▲
disclosure a number of employees	▲	•	•
disclosure of segment profit	▲	▲	▲
disclosure group reports	▲	•	•
Directors compensation disclosure	▲	▼	▲
publication of transactions segment	▲	▲	▲
disclosure of accounting policies	▲	▲	•
disclosure of shares owned	▲	▲	▲
disclose earnings per share	▲	▲	▲
assessment of tangible fixed assets	▲	•	▼
U.S. GAAP reconciliation	▼	▼	▲
valuation of investments	▲	▲	▲
legal reserves	▼	▲	▼

Source: Aisbitt (2001:51-72).

The process of "independent" compliance in a population of multinational companies is influenced by other factors, such as IAS and U.S. GAAP standards insofar as they are internationally recognized and benefit from the adoption of internationally recognized accounting method proved outweigh the costs. Such factors can have a significant impact on legal entities which leads to a reduction in the level of national effects internal harmonization regarding to counterweight effect (in terms of international comparability) to increase the effects of international harmonization.

Aisbitt (2001) measured degree of harmonization of financial reporting at national and cross-national level in the case of the Nordic countries (Denmark, Finland, Sweden, Norway) by dividing the observed countries given the degree of compliance with the national legislation in three areas. Observed countries have identical source accounting legislation, in force since 1980, and these countries have developed separate interpretations of laws, regulations and accounting standards as Aisbitt considered sufficient to quantify the degree of harmonization of financial reporting within and between selected countries in assessing the impact of regulations and other factors on financial reporting. Aisbitt observed discontinuous periods (1981/2, 1992, 1994 and 1998) with respect to different combinations of accounting regulations and standards applicable for the relevant period using the C index. Generally it can be concluded that the different regulatory positions resulting in different levels of harmonization is separated into following areas: (1) matching areas of legislation and harmonization, (2) harmonization is independent of the legislation and (3) degraded areas due to the impact of harmonization of legislation as shown in Table 7.

Study by Emenyonu and Gray (1992:49,51,56) has two main purposes. First, it attempts to assess the practice of measuring assets and profit of large businesses in three EC countries (France, Germany and Great Britain) with significant differences in the context of the EC harmonization efforts, mostly in the form of the Fourth Directive (1978) which established measurement methods to be followed in preparing financial statements. Second, it is necessary to quantify the extent of commonality in international accounting and harmony in the three countries. For this purpose, annual reports were collected from 26 large businesses in each country where they observed six key practice measurements of assets and profits: valuation of inventories, depreciation, goodwill, research and development, evaluation of fixed assets and exceptional items. The analysis was performed using the chi-square test and the "I" index to identify significant differences and the extent of harmony de facto measurement practice.

The highest degree of harmonization according to I index has been achieved in the area of inventories valuation (72% of the business entities use a lower cost method), fixed assets

(77% of the business entities apply the straight-line method) and extraordinary items (73% of the business entities include extraordinary items in the current year). Other observed areas are minimally harmonized especially in depreciation where, even 45 total observed business entities occasionally uses linear or degressive method. Follows the godwilla area and the cost of research and development with an I index of less than 0.25. So, significant differences in the rules of measurement between the countries observed exist, thus confirming the opinion that the provisions of the Fourth EC guidelines are flexible, which leads to a general point of view and to a need for significant adjustments in measurement practice between Member States.

5 Measurement formal (*de jure*) harmonization

In the paper by Fontes, Rodriguez and Craig (2005:415) three methods (Euclidean distance, Jaccard's coefficient and the Spearman coefficient) for measuring formal harmonization and success achieved convergence between the two sets of accounting standards (national accounting standards and IFRS) in Portugal for the period 1977-2003 were used. The study was conducted on a sample of 43 accounting issues using weights by Rahman et al. (1996). The obtained results using Euclidean distances are difficult to meaningfully interpret. However, the data can only be used as a broad measure of convergence, but are of little help in providing precise measurements. (Fontes et al. 2005:428). In contrast, the results of Jaccard's coefficient can be interpreted in a dynamic sense (increase results over time indicates a prerequisite formal harmonization) and static sense. These results are related to the coefficient NC and IC phases, which means that the level of convergence (59%) between the Portuguese and international accounting standards is achieved in the period 1989-2003 for the 43 analyzed accounting issues. (Fontes et al. 2005:433). Using Spearman's correlation coefficients were tested hypothesis: H_0 - Portuguese Accounting Standards and IFRS use similar accounting methods and H_1 - there is no significant correlation between the Portuguese accounting standards and IFRS. For the period 1977-1989 (NA) and 1989 - 1995 (NB), the null hypothesis is rejected due to the existence of significant differences between the Portuguese and international accounting standards, and the lack of formal accounting convergence. In the last phase (NC), from 1995-2003, there was a significant correlation between the Portuguese standards and IFRS authors conclude (2005:433). However, the authors (2005:434) point that convergence with IFRS begins in Portugal in 1991, when the Portuguese Accounting Standards Board (CNC) launched the Accounting Standards (DCS) in very similar form to the international accounting standards. When Portugal did not receive support from the EU to regulate the accounting issues, international accounting standards have been adjusted in such way that the Portuguese accounting system becomes more similar to IASB standards (IFRS) for even 50% of the questions slowly reducing French influence. Rahman et al. (1996:337,328,330) examine the possibility to measure formal accounting harmonization among countries which achieved statistical-empirical comparison between the measurement and disclosure requirements for listed companies in Australia and New Zealand. The following typology was used: type 1 - mandatory application of accounting standards for all listed companies, type 2 - recommended application in accordance with accounting standards and national regulatory framework, type 3 - permitted use (not required nor prohibited) and type 4 - accounting practice prohibits the application of certain accounting practices in accordance with the accounting standards or the requirements of the exchange. This approach has enabled the design of the study 518 disclosure requirement in 31 categories and 469 rules of measurement in 28 categories. Set the disclosure requirements are compared with each other with regard to accounting standards, regulations and legislative requirements exchanges.Based on the distance between the interval and proportional relationship between the disclosure requirement and measurements in the case of Australia and New Zealand it can be concluded that there is a greater degree of harmonization required measurements which means that rules of disclosure are less harmonized. Specifically, the survey results show that 50% of the regulatory provisions in selected countries, in the areas of measurement and disclosure are consistent. In the category of

disclosure in accordance with accounting standards, 13 of the 31 categories has more than a half harmonizing representing 42%, while in the category measurements was found inconsistency in 12 of 28 categories, and 43% respectively.

CONCLUSIONS

Accounting globalization process has started with measurable positive and negative effects on the financial reporting of business entities. Globalization and, in this respect, accounting harmonization is based on the view that implementation of global standards in the international application enables achieving higher competitiveness of business entities in the capital markets using a transparent, user-friendliness and simplicity in presenting accounting and balance sheet positions grouped according to uniform criteria. On the other hand, it shows the accounting mismatch in most European countries in relation to a number of IASB initiatives and accounting rules. It is an unquestioned fact of the need to modernize and harmonize the legal norms and regulations in the field of accounting, auditing and company law in the European Union. In accordance with the required amendments to the European Council and Parliament created a favorable environment for strengthening the institutional framework for accounting and auditing which emphasizes the importance of taking care of the return of public confidence and higher levels of security for users of financial reports. The reasons for this are, increasingly, financial scandals. Sure, requested and proposed changes are by no means simple and arbitrary and require compliance at all levels of decision-making given the secondary legislation of the European Union. Therefore, the recommendations as a form of "soft law" do not have the force of law and are not required. Such an understanding of the facts is necessary and justified need, in terms of accounting and auditing, the modernization of the public in terms of monitoring and quality assurance auditors and auditing firms and transparent reporting. On the one hand, the external form of supervision was set to audit compliance with the auditing framework (auditing standards, ethical principles and rules, standards of quality control), while the other conditions were set for the creation of value in terms of timely audits identifying potential threat, weaknesses and risks in the process of auditing the financial statements which were made possible through the initiative of introducing a system of public oversight and quality control systems work.

Works Cited

Aisbitt (2001), Measurement of harmony of financial reporting within and between countries: the case of the Nordic countries, European Accounting Review, Volume 10, Issue 1, pp. 51 – 72. Accessed 2010 Jul 01.

Archer, S., Delvaille, P., McLeay, S., (1995), The Measurement of Harmonisation and the Comparability of Financial Statement Items: Within-Country and Between-Country Effects, Accounting & Business Research [serial on the Internet], 25(98), pp. 67-80.

Baker and Barbu, (2007), Trends in research on international accounting harmonization, The International Journal of Accounting, Volume 42, Issue 3, pp. unavailable

Emenyonu, E. N., Gray, S. J., (1992), EC accounting harmonization, an empirical study of measurement practices in France, Germany and UK, Accounting and Business Research, 23(89), pp. 49–58.

Fontes, A., Rodrigues, L. L., Craig, R., (2005), Measuring convergence of National Accounting Standards with International Financial Reporting Standards, Accounting Forum, Volume 29, Issue 4, pp. 415-436.

Herrmann and Thomas, (1995), Harmonisation of Accounting Measurement Practices in the European Community, Accounting&Business Research [serial on the Internet], 25(100): 253-265. p. 264., Available from: Business Source Complete.

Mustata, R. V., Matis, D., (2007), Measurement of need for harmonization between national accounting standards and international financial reporting standards, Journal of International Business and Economics, 3(VII), pp. 23-46.

Rahman, A., Perera, H., Ganeshanandam, S., (1996), Measurement of formal harmonisation in accounting: an exploratory study, Accounting and Business Research, 26(4), pp. 325–339.

Roberts, C., Weetman, P., Gordon, P., (2008), International corporate reporting – a comparative approach, 4th Edition, Prentice Hall

Tay, J. S. W., Parker, R. H., (1990), Measuring International Harmonization and standardization, Abacus [serial on the Internet], 26(1), pp. 71-88.

Tay, J. S. W., Parker, R. H., (1990), Measuring international harmonization and standardization, Abacus, 26, pp. 71–88.

Tay, J. S. W., Parker, R. H., (1992), Measuring international harmonization and standardization: A comment, Abacus, 28(2), pp. 217–220.

van der Tas L (1988), Measuring Harmonisation of Financial Reporting Practice. Accounting&Business Research [serial on the Internet], 18(70), pp. 157-169.

van der Tas, L. G., (1992), Evidence of EC financial reporting practice harmonization: The case of deferred taxation, European Accounting Review, 1(1), pp. 69–104.

van der Tas, L. G., (1992), Measuring international harmonization and standardization: a comment, Abacus, 28(2), pp. 211–216.

van der Tas, L. G., (1995), International accounting harmonization: American hegemony or mutual recognition with benchmarks?, European Accounting Review, 4(2), pp. 255–260.

Walton, P., Haller, A., Raffournier, B., (2003), International Accounting, 2nd Edition, Cengage Learning EMEA

Received for publication: 22.10.2012
Revision received: 23.11.2012
Accepted for publication: 21.12.2012

How to cite this article?

Style – **APA** *Sixth Edition*:
Mijoč, I., & Pekanov Starčević, D. (2013, 01 15). Measurement of accounting harmonization and standardization. (Z. Čekerevac, Ed.) *MEST Journal, 1*(1), 126-136. Retrieved from www.meste.org/mest/MEST_1_2013/_13.pdf

Style – **Chicago** *Fifteenth Edition:*
Mijoč, Ivo, and Dubravka. Pekanov Starčević. "Measurement of accounting harmonization and standardization." Edited by Zoran Čekerevac. *MEST Journal* (MESTE NGO) 1, no. 1 (01 2013): 126-136.

Style – **GOST** *Name Sort*:
Mijoč Ivo and Pekanov Starčević Dubravka. Measurement of accounting harmonization and standardization [Journal] = Accounting harmonization and standardization // MEST Journal / ed. Čekerevac Zoran. - Belgrade - Toronto : MESTE NGO, 01 15, 2013. - 1 : Vol. 1. - pp. 126-136.

Style – **Harvard** *Anglia*:
Mijoč, I. & Pekanov Starčević, D., 2013. Measurement of accounting harmonization and standardization. *MEST Journal,* 15 01, 1(1), pp. 126-136.

Style – **ISO 690** *Numerical Reference*:
Measurement of accounting harmonization and standardization. **Mijoč, Ivo and Pekanov Starčević, Dubravka.** [ed.] Zoran Čekerevac. 1, Belgrade - Toronto : MESTE NGO, 01 15, 2013, MEST Journal, Vol. 1, pp. 126-136.

MEST JOURNAL

FORMS AND METHODS OF TECHNOLOGIES TRANSFER ADJUSTING IN UKRAINE

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JEL category: **N0**, **N7**, **O3**, **O34**

Summary:
The paper dwells on basic forms and methods of government control of technologies transfer in Ukraine have been generalized: organizational forms are branches, joint ventures, "turn-key" business, technological universities, partnership, research alliances; economic forms are licensing, sale of intellectual property, including patents and trade secrets, franchising, contract researches. The following basic methods of technologies transfer in Ukraine have been exposed: forsite, technological prognostication with use of Delfi-method, method of critical technologies, development of scenarios, travelling flowsheet, technological corridor and forming of expert panels.
The list of normative legal acts of Ukraine concerning government control of technologies transfer in Ukraine has been given.

Keywords:
technologies transfer, form, methods, institutional providing, joint ventures, partnership, franchising, Delfi-method

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1 Introduction - Technologies transfer hypothesis

Technologies transfer is one of basic elements of the national innovative system coming from its role and place in the system of industrial politics and industrial right. Essence and maintenance of technologies transfer represent the processes of new knowledge (technologies) transmission from the stage of scientific development to applying in the real industry.

The institutional providing of organizationally-economic mechanism of technologies transfer adjusting includes: the Commercial code of Ukraine (Commercial code of Ukraine: article 2065, 2009), "About investment activity" (Law of Ukraine "On investment activity": Article 257, 2009), "About scientific and scientific-technical activity" (Gov., 2008), "About scientific and technical information" (UA Gov, 2004), "About scientific and scientific-technical examination" (UA Gov, 2006), "About the dedicaded mode of innovative activity of technological parks" (UA Gov, Law of Ukraine "On the dedicaded mode of innovative activity of technological parks": article 182, 2006), "About priority directions of science and technology" (UA Gov, A law of Ukraine "Law of Ukraine "On priority directions of development of scitech": article 199, 2006), "About innovative activity" (2005), "About priority directions of innovative activity in Ukraine" (UA Gov, Law of Ukraine "On priority directions of innovative activity in Ukraine": article 219, 2008), "About the national complex program of development of scientifically high-tech" (UA Gov, Law of Ukraine "On the National complex program of development of scientifically high-tech" , 2004), "About government control of activity in the field of the transfer of technologies" (UA Gov, Law of Ukraine "On government control of activity in the field of the transfer of technologies" №1436 - V, 2006).

The law in Ukraine is examined as the normatively-legal act accepted by the supreme legislative body of country in the set constitutional order; has higher legal force in relation to other normative acts and is obligatory for implementation by all physical and legal persons (Korel'skiy & Gavrilov, 2000).

A decree in Ukraine is the name of the most essential acts that are signed by yhe head of the state (by a president). (Sukharev & Krutskih, 2002) One of types of legal acts, that President of Ukraine gives out, is the basic type of the real acts and divided into legislative Decrees and administrative (from practice of application of terms, words and word-combinations in jurisprudence).

The legal providing of transfer of technologies is formed by such Decrees of President of Ukraine, as: "About events in relation to the use of space technologies for innovative development of economy of the state" (President UA, 2001), "About the decision of national security and defensive Council of Ukraine from July, 3, 2001 "About urgent events in relation to a overcoming the crisis state of scientifically-technological sphere of Ukraine and creation of the real terms for passing of economy to the innovative model of development" (Decree, 2001), "About sponsorship of innovative activity of enterprises that have a strategic value for an economy and safety of the state" (Decree, 2004), "About the decision of national security and defensive Council of Ukraine from April, 6, 2006 "About the state of scientifically-technological sphere and events in relation to providing of innovative development of Ukraine" (Decree, 2006).

Resolution of Government as constituent of the legal providing of organizationally-economic mechanism of technologies transfer adjusting is to be as follows :1) a normative act of legislative government power - Supreme Council of Ukraine - on organizational questions; 2) normative act of supreme body of executive power - to Cabinet of Ministers of Ukraine - on general problems, problems of economy, industrial politics, education, culture and others like that (from practice of application of terms, words and word-combinations in jurisprudence).

To resolutions of Cabinet of Ministers of Ukraine, that form the legal field in the sphere of transmission of technologies, it is expedient to take the following: "About creation of the State innovative fund" (Resolution, 2000), "About confirm of Statute about the order of creation and functioning of technoparks and innovative structures of other types" (Resolution, 2004, p. 1), "About formation of the Ukrainian state innovative

company" (Resolution, 2007), "About confirm of Order of forming, examination and discussion of priority directions of innovative activity" (Resolution, 2004, p. 182), "About confirm of State registration order of innovative projects and the State register of innovative projects conduct " (Resolution, 2003, p. 42), "About confirm of Sponsorship grant order the subjects of innovative activity due to money of the state budget by reduction of prices of long-term credits" (Resolution, 2004, str. 68), "About events in relation to support of innovative-investment projects" (Resolution, 2003, p. 413), "About confirm of monitoring and control realization of technological parks projects order" (Resolution, 2007, str. 49), "About confirm of Order of realization of state accreditation of physical and legal persons on realization on permanent and/or professional basis of intermediary activity in the field of the transfer of technologies" (Resolution, 2009), "Some questions of realization of Law of Ukraine "About government control of activity in the field of the transfer of technologies" (Resolution, 2007), "About confirm of minimum rates of reward to the authors of technologies and persons that carry out their transfer" (Resolution, 2008).

To Cabinet of Ministers of Ukraine Orders, that touch the problems of the technologies related to the transfer belong the following: "Question of formation of regional centers of innovative development" (Order, 2007), and "About the transmission of Department of education and science of plenary powers" (Order, 2008). Here the order is to be considered as a bylaw management, that is issued by the leader of organization on operative and other questions, in the individual order, and has obligatory force for subjects that it is addressed to (from practice of application of terms, words and word-combinations in jurisprudence).

In turn, an order is a prescriptive legal act that is issued by a management organ, operating on the basis of undivided authority, for the solving of basic in operative tasks that stand before this organ (Anon, 2001).

The transfer of technologies in Ukraine is regulated by the following Orders: Ministry of education and science of Ukraine Order "About confirm of "Statute about the order of realization of monitoring of innovative projects implementation on priority directions of technological parks activity" (Order, 2005), Ministry of education and science of Ukraine Order "About confirm of Order of state registration of agreements on the technologies transfer and the State register of agreements on the technologies transfer conduct " (Order, 2008), An order of Ministry of industrial politics of Ukraine "About confirm of Order of competitive selection of the innovative and investment projects directed on creation and applying of modern technique in industry in the field of an aircraft construction and space industry" (Order, 2007).

2 The organisation forms of technologies transfer analysis in Ukraine

One of the basic organizational forms of transfer of technologies there is a branch of foreign company in Ukraine. This form is related to the direct foreign investments and envisages the hundred-per-cent possessing of the company's assets by an international corporation.

According to the article 95 of the Civil Code of Ukraine (2009) a branch is a separated subdivision of legal entity that is situated out of its location and carries out all or part of its functions. Branches and representative offices are not legal entities, they are provided with property of legal entity to have created them, and operate on the basis of the position ratified by this legal entity. The leaders of branches and representative offices are appointed by a legal entity and operate on the basis of its given warrant. (UA Gov, 2009)

The next organizational form of transfer of technologies in Ukraine are joint ventures - enterprises that are based on the general capital of subjects of economic activity of Ukraine and foreign subjects of economic activity, on a general management and on general distribution of results and risks (UA Gov, 2009, str. 42).

International joint ventures can be based on a contract and also on property. They are, in turn, classified by part of property of an international corporation that can be basic, equal and insignificant.

Another organizational forms of transfer of technologies in Ukraine is the creation of "turn-key" business that is a type of enterprise activity

where are created all necessary pre-conditions in order to begin doing business immediately. It is a form of the ready business that includes material resources (inventory and equipment) and non-material assets, such as business reputation had been created before. The most widespread type of such form of enterprise is a franchise (Ward, 2012).

However, if to examine “turn-key” business in the context of innovative products creation, then it follows to underline that innovations can not be a serial product. And thus this form of technologies transfer should be examined exactly as an innovative project that envisages going into a market with a new product that does not have analogues, and in the moment of going into a market, creates a new niche.

Higher educational establishments (HEE), as a rule technological universities of Ukraine, become basis for creation of new enterprises in the form of "turn-key business". An idea consists in that this decides at once a few problem questions.

Firstly, an enterprise is created for going into a market with an innovative product that must satisfy demand that exists in the market for hi-tech products.

Secondly, specialists that will form the labour collective of the marked enterprise are prepared within the framework of this HEE. At once the problem is finding its solution both in highly qualified staff search, which is to have preparation exactly for the successful realization of such projects, and youth employment after graduation.

Thus, within the framework of such projects activity realization of technological university is not limited to knowledge generating, but also their practical use orientation by means of new products creation competitive both on home and foreign markets.

The transfer mechanism of technologies in Ukraine includes also partnership or strategic alliance. Thus agreements are made between companies about a collaboration that go beyond the scopes of ordinary business relationships between enterprises, but does not envisage confluence, absorption or creation of complete society.

The form of long-term cooperation of enterprises is used with the aim of co-ordination of productive and market activity for the achievement of stable perspective advantages on the market. As a rule, it is a collaboration, an alliance of one company with other, bigger and mightily in a financial relation that can provide resources for the some economic and strategic aims achievement (Lozovskiy, Raizenberg, & Ratnovskiy, 1997).

Research alliances on the basis of agreements on realization of mutual scientific researches are created without formation of new legal entity. Such structures are formed on the stage of commercialization of technology and broken up after gaining aim. This form is the most widespread mechanism of participants’ efforts combination of transfer and technologies commercialization.

3 The economic forms of technologies transfer analysis in Ukraine

In Ukraine the technologies transfer mechanism, besides organizational ones, includes the number of economic forms. One of the main is intellectual property licensing or sale, including patents and trade secrets. A license agreement is the form of contract between two organizations that determines a transmission from one side of agreement to other an exclusive or unexclusive right to use intellectual property that belongs to this side.

The transfer of technology takes place then, when the proprietor of intellectual property (technologies) passes to other side necessary data and legal right on the complete use of this technology in an exchange payment in a that or other form, in particular, including royalty. The recipient of license can stipulate his right to pass to a sub-lisence to other parties also. In case of sale of intellectual property a salesman passes all rights on it to the customer.

The next form of organizationally-economic mechanism of adjusting of transfer of technologies in Ukraine is “franchising” - the entrepreneurial activity according to which contractual basis one side (franchiser) passes to other side for a reward on a certain term or without pointing of such: right for the use of trade mark; sign of service; brandname (trade) name;

services; technological process; specialized equipment; now-how; commercial information that is guarded by a law; other, by the envisaged agreement of objects of right of intellectual ownership (Tsyrat & Krivonos, 2004).

And however on the modern stage of a contract collaboration is the basic economic form of mechanism of technologies transfer adjusting.

Contract research-and-developments are the form of "acquisition" of service of one company by the other. In industry of high-tech there are hundreds of the specialized research companies that render similar services. In this form of collaboration a contractor, as a rule, renounces rights on intellectual ownership of the product of researches.

In Ukraine they distinguish such forms of contract collaboration as: contract production with technical support; administrative contract; contract of studies; consulting contract; contract of research-and-developments; architectural and engineering contract; contracts of management building and others.

The following among the economic forms of technologies transfer is the financial leasing (further is leasing) as type of civil legal relations that arise out of agreement on the financial leasing. By agreement on the financial leasing (further is a leasing agreement) - leasing-giver is obligated to purchase in property thing from a salesman (supplier) in accordance with the set leasing-recipient specifications and terms and to pass in the use of leasing-recipient on a certain term not less than one year for the set pay (leasings payments).

4 The technologies transfer methods analysis in Ukraine

4.1 Forsight

One of basic methods of transfer of technologies in Ukraine is “foresight”. It is the system of methods of expert estimation of long-term prospects of innovative development, exposure of technological breaches capable most positively to influence on an economy and society. That is a strategic priorities of state, region, industries or companies development choice which are based on innovations and are directed to the increase of competitiveness of national economy.

Due to the foresight use the scale national and international research programs are formed. Among them, in particular, Seventh Scope programme on scientific researches and technological development of EU (2007-2013), the budget of that made 54 milliards of euro (Anon, 2012).

On the basis of foresight the long-term, on 25-30 years, strategies of development of economy, science, and technologies are developed that are aimed at the increase of competitiveness and maximally effective development of socio-economic sphere. In the process of foresight the possible scenarios of development of separate directions of science and technologies are estimated, potential technological vectors are determined.

4.2 Technological forecasting

The next method that is included in the complement of organizationally-economic mechanism of adjusting of transfer of technologies is prognostication.

Technological prognostication in Ukraine is considered as a process, during which the prospect of change of consumer qualities of wares, technological processes and equipment, and also adequate changes in charges on a production are determined (Raizenberg, Lozovskiy, & Starodubtseva, 2006).

The most popular approaches to technological prognostication are: the use of Delfi-method and method of critical technologies, development of scenarios and travelling flowsheet, and also forming of expert panels and technological corridors.

Delfi-method is questioning the plenty of experts, to 2-3 thousands, and organization of back-connection (through realization of the second tour of questioning). This method assumes the selection of highly skilled experts, creation of expert panels on separate directions of science and technologies; development of list of themes - the potential scientifically-technological achievements expected in long-term prospect (25-30 years), including fundamental and applied

researches, innovative goods and services that are created on the basis of new technologies.

Experts estimate actuality of every theme for development of economy, society, presence of resources and potential barriers to practical realization. Research results include the erected estimations on every topic, and also analitical reviews on major directions of science and technologies (Sokolov, 2007).

The aim of the use of method of critical technologies is an exposure of priorities of scientific and technical development on a medium-term prospect. This approach is used not only at the level of the country on the whole but also of the separate industries of economy, thematic areas, or regions.

The list of critical technologies is formed on the basis of knowledge of experts that own the greatest qualification in corresponding areas.

For participating no more than 200 experts are attracted in a project, but term of prognostication is to be from 5 to 10 years.

As a rule, the lists of technologies or directions of research-and-developments that require near-term attention become a result (Sokolov, 2007). An additional document - "passport" is prepare for every critical technology, where the areas and sphere of potential additions are included and briefly described, and also the possible terms of practical realization are estimated and the events of state support are offered (Sokolov, 2007, pp. 64-74).

The previous list of critical technologies is formed on the basis of the expert questioning and interviews. Then the list comes into discussion within the framework of the special panels and focus groups in the process of which the final selection and concordance of list of critical technologies is realized.

A "standard analysis"(benchmarking) is sometimes used, i. e. comparing to other countries or regions, that allows not only to define the level of development of technology in a country, region or industry but also correlate it with the level of world leaders, to educe the degree of lag and work out strategy of acceleration of technological development in sectors with most innovative potential. A primary purpose of estimation of critical technologies is an increase of competitiveness of economy and decision of major social problems (Sokolov, 2007).

Development of scenarios includes creation of scenarios of development of those or other technological spheres. Scenarios are created on principle "from below to top" or "from top to bottom" and are based on the analysis of future possibilities and alternative trajectories of development (Sokolov, 2007).

Scenarios are most effective as adding to the researches executed on the basis of other methods – SWOT - analysis (estimations of strengths and weaknesses, possibilities and risks), cerebral assaults, biblemetrical and patent analysis (Sokolov, 2007).

Scenarios describe basic moving forces in the certain pictures of the future and their connection between each other. They expose also different possible ways of development as alternative pictures of the future. In a result there is more exact understanding of prospects of development, existent possibilities and limits of solving of problems (Minks & Bel'kne, 2008).

The method of expert panels is considered basic and often used for development of strategies of development. The groups of experts from 12-20 persons are offered during a few months to calculate the possible variants of the future on the set subjects, using the newest analytical and informative materials and developments. The basic advantages of this method is a presence of experts during all process of work, cooperation between the representatives of different scientific disciplines and areas of activity that it is difficult to organize in other conditions.

This method can complement other approaches. In some cases creation of panels is needed for development of going out information, interpretation of the acieved results or application of method on the whole.

A travelling map (Technology Roadmap) was worked out at the end of 70th by a company Motorola and in Ukraine is used for development of long-term strategies of development of technologies of industry or large company.

The essence of method lies in organizations of the strategic planning, to which experts that present basic component business are brought over, - marketing, finances, productive infrastructure, technologies, research-and-developments. A "Road map" illustrates the transition stages from current status to the phases of development in a long-term prospect due to synchronous development of technologies, products, services, business and market.

The basic advantage of method is forming of the concerted positions in relation to the long-term aims of development of industry or company.

Technological Road map, as an instrument of the strategic planning, allows organizations to prepare to the changes and score advantages from new possibilities. For enterprises it means identification of market tendencies and demand for new products, and make a choice of technology necessary for their production at adequate price level.

Technological Road maps provide two basic advantages. Firstly, the process of their preparation allows the enterprise to estimate threats and possibilities, define priorities and, secondly, integrate major factors (market demand, requirements of consumers, level of competition, technology of production, development of new products, financial management) in a successive strategic plan.

A technological map assists the exposure of bottlenecks (a lack of capital, low technological potential, breaks, in the chains of deliveries) that must be "overcome", and specification of priorities, in the field of investments, selection of staff, research-and-developments.

Technological corridors are a list of obligatory requirements and limitations, that are given to the technical parameters of technologies, consumer products and services, set by the state, with laying out on years and gradual increase of their inflexibility. Such system is built on technical regulations and standards and presents itself the chain of the interdependent limitations directed to the change of technological level of corresponding industry. With application of these standards, the state not only reduces power-hungryness of home economy but also motivates producers to the collaboration with the developers of NT, and also forms powerful long-term demand for their services.

CONCLUSIONS

Thus, penetration of new scientific ideas, technique, technology in Ukraine is not provided automatically. Bringing of new directions of scitech in the system of state administration requires the use of adequate principles, mechanisms, conception of realization of new ideas in economic turnover. In turn, changes in the system of state administration socio-economic development on the basis of introduction of scientific and technical progress suppose the development of the corresponding institutional providing.

The last structural component of organizationally-economic mechanism of adjusting of transfer of technologies in Ukraine is a dataware that includes the following key elements as: report and operative data of enterprises; statistical on-line data; normative and instructional information of all levels (state, regional, branch); planned-prognosis information; certificate-analytical information. It is necessary also to mark that information must be clearly structured, thus each of the above-mentioned elements must be associated. Information of more subzero level (initial), for example, microeconomic indexes, is an entrance for a higher level, regional level (branch, region), i. e. it will be an entrance for a higher level (macroeconomy).

This block is especially important, as modern Ukrainian society is oriented to information (informative society). Accordingly, an orientation on creation of economy of front-rank knowledge is the main key point for the successful functioning and development of socio-economic systems.

Works Cited

Anon. (2001). *Management by organization: Encyclopedic dictionary.* INFRA-m.

Anon. (2012). *Delegation to Russia*. Retrieved from Delegation of the European Union to Russia: http://www.delrus.ec.europa.eu/ru/images/pText pict/694/FP7%20background%20RU.doc

Decree. (2001). Decree of President of Ukraine "About the decision of national security and defensive of Ukraine Council from July 3, 2001. *Official announcer of Ukraine*(34), 33.

Decree. (2004). A decree of President of Ukraine "About sponsorship of innovative activity of enterprises that have a strategic value for an economy and safety of the state" from 20.04.2004 №454/2004 - article 10. *Official announcer of Ukraine*, 109.

Decree. (2006). Decree of President of Ukraine "About the decision of national security and defensive of Ukraine Council from April, 6, 2006 "About the state of scientifically-technological sphere and events in relation to providing of innovative development of Ukraine"". *Official anouncer of Ukraine*(28), 12.

Gov., U. (2008, 05 22). Law of Ukraine "On scientific and scientific-technical activity" . *The Official announcer of Ukraine: article 1272*(38), 22.

Korel'skiy, V., & Gavrilov, R. (2000). M: international relations. In V. Korel'skiy, & R. Gavrilov, *Exchange dictionary: In 2 volumes.* (Vol. 1, p. 288).

Lozovskiy, L., Raizenberg, B., & Ratnovskiy, A. (1997). *Universal business-dictionary.* M.

Minks, E., & Bel'kne, E. (2008). To think the categories of the multiple future . *Forsite, 8*(4), 4-8.

Order. (2005). Order METAL-OXIDE-SEMICONDUCTOR Ukraine "About claim of "Statute about the order of realization of monitoring of implementation of innovative projects after priority directions of activity of technological parks"": by the state on 18.12.2005 article 3140. *Official announcer of Ukraine*(50), 62.

Order. (2007). An order of Ministry of industrial politics of Ukraine "About claim of Order of competitive selection of the innovative and investment projects sent to creation and applying in industry of modern technique in the field of an aircraft construction and ...". *Offical anouncer of Ukraine*(21), 30.

Order. (2007). Order of Cabinet of Ministers of Ukraine "Question of formation of regional centers of innovative development" from 03.05.2007 № 255-r - article 1346. *Official announcer of Ukraine*(33), 44.

Order. (2008). Order METAL-OXIDE-SEMICONDUCTOR Ukraine "About claim of Order of state registration of agreements on the transfer of technologies and conduct of the State register of agreements on the transfer of technologies" from 14.05.2008 № 409 - article 1313. *Official announcer of Ukraine*(39), 85.

Order. (2008, 02 13). Order of Cabinet of Ministers of Ukraine "About a transmission METAL-OXIDE-SEMICONDUCTOR plenary powers" from 06.02.2008 № 252-r. *the Governmental courier*(28).

President UA, .. (2001). Decree of the President of Ukraine: "About events in relation to the use of space technologies for innovative development of economy of the state" from February, 6, 2001 №a 73/2001. *Official announcer of Ukraine*(6), 7.

Raizenberg, B., Lozovskiy, L., & Starodubtseva, E. (2006). *Modern economic dictionary* (5th edition processed and complemented ed.). Infra-м.

Resolution. (2000). Resolution of Cabinet of Ministers of Ukraine "About creation of the State innovative fund" : by the state on 13.04.2000 - article 674. *Official announcer of Ukraine*(16), 95.

Resolution. (2003). Resolution of Cabinet of Ministers of Ukraine "About claim of Order of state registration of innovative projects and conduct of the State register of innovative projects": by the state on 05.10.2004. *Official announcer of Ukraine*(38), 42.

Resolution. (2003). Resolution of Cabinet of Ministers of Ukraine "About events in relation to support of innovative-investment projects" : by the state on 15.05.2003 - article 944. *Official announcer of Ukraine*(21), 413.

Resolution. (2004). Resolution of Cabinet of Ministers of Ukraine "About claim of Order of forming, examination and discussion of priority directions of innovative activity" : by the state on 13.07.2004 - article 1892. *Official announcer of Ukraine, 1*(28), 182.

Resolution. (2004). Resolution of Cabinet of Ministers of Ukraine "About claim of Order of grant of sponsorship to the subjects of innovative activity due to money of the state budget by reduction of prices of long-term credits" from 17.11.2004 №1563 - article 3048. *Official annoucer of Ukraine*, 68.

Resolution. (2004). Resolution of Cabinet of Ministers of Ukraine "About claim of Statute about the order of creation and functioning of technoparks and innovative structures of other types" by the state on 25.08.2004. *Official announcer of Ukraine*(34), 1.

Resolution. (2007). Resolution of Cabinet of Ministers of Ukraine "About claim of Order of realization of monitoring and realization of control after realization of projects of technological parks" from 21.03.2007 №517 - article 877. *Official announcer of Ukraine*(22), 49.

Resolution. (2007). Resolution of Cabinet of Ministers of Ukraine "About formation of the Ukrainian state innovative company": by the state on 08.08.2007 - article 2348. *Official announcer of Ukraine*(59), 23.

Resolution. (2007). Resolution of Cabinet of Ministers of Ukraine "Some questions of realization of Law of Ukraine "About government control of activity in the field of the transfer of technologies"" from 01.08.2007 №995 - article 2306. *Official announcer of Ukraine*(58), 19.

Resolution. (2008). Resolution of Cabinet of Ministers of Ukraine "About claim of minimum rates of reward to the authors of technologies and persons that carry out their transfer" from 04.06.2008 №520 - article 1359. *Official announcer of Ukraine*, 33.

Resolution. (2009). Resolution of Cabinet of Ministers of Ukraine "About claim of Order of realization of state accreditation of physical and legal persons on realization on permanent and/or professional basis of intermediary activity in the field of the transfer of techn..". *Official announcer of Ukraine*(85), 37.

Sokolov, A. (2007). Forsite: look in the future. *Forsite, 1*(1), 8-15.

Sokolov, A. (2007). Method of critical technologies. *Forsite, 4*(4), 64-74.

Sukharev, A., & Krutskih, V. (2002). *Large legal dictionary* (2nd edition - processed and complemented ed.). (A. Sukharev, & V. Krutskih, Eds.) INFRA-m.

Tsyrat, A. V., & Krivonos, E. A. (2004). *Franchising from Z to A: Terminological dictionary.* Kyiv: Association of franchising.

UA Gov, .. (2004, 01 06). Law of Ukraine "On scientific and technical information": article 181. *Lists of Supreme soviet of Ukraine, 13*.

UA Gov, .. (2004, 04 20). Law of Ukraine "On the National complex program of development of scientifically high-tech" . *List of Supreme soviet of Ukraine*(32), 384.

UA Gov, .. (2006, 02 09). A law of Ukraine "Law of Ukraine "On priority directions of development of scitech": article 199. *Lists of Supreme soviet of Ukraine*(22), 832.

UA Gov, .. (2006). Law of Ukraine "On government control of activity in the field of the transfer of technologies" №1436 - V. *List of Supreme soviet of Ukraine*(45), 434.

UA Gov, .. (2006, 03 03). Law of Ukraine "On scientific and scientific and technical examination": article 199. *Lists of Supreme soviet of Ukraine*(22), 832.

UA Gov, .. (2006, 02 01). Law of Ukraine "On the dedicaded mode of innovative activity of technological parks": article 182. *Lists of Supreme soviet of Ukraine*(22), 809.

UA Gov, .. (2008, 12 18). Law of Ukraine "On priority directions of innovative activity in Ukraine": article 219. *Lists of Supreme soviet of Ukraine*(16), 562.

UA Gov, .. (2009). Civil Code of Ukraine : by the state on 10.12.2009. *Official announcer of Ukraine*(94).

UA Gov, .. (2009, 08 05). Commercial code of Ukraine: article 2065. *The Official announcer of Ukraine*(59), 20.

UA Gov, .. (2009). Law of Ukraine "On foreign economic activity": by the state on 23.06.2009 - article 1629. *Official announcer of Ukraine*(48), 42.

UA Gov, .. (2009, 01 14). Law of Ukraine "On investment activity": Article 257. *List of Supreme soviet of Ukraine*(19), 648.

UA017. (2009). *Civil Code of Ukraine.* Retrieved from WIPO Resources: http://www.wipo.int/wipolex/en/text.jsp?file_id=181865

Ward, S. (2012). *Small Business: Canada.* Retrieved from About.com: http://sbinfocanada.about.com/cs/startup/g/turnkey.htm

Received for publication: 22.10.2012
Revision received: 23.11.2012
Accepted for publication: 21.12.2012

How to cite this article?

Style – **APA** *Sixth Edition*:
Manylich, M. I., & Likholet, S. I. (2013, 01 15). Forms and methods of technologies transfer adjusting in Ukraine. (Z. Čekerevac, Ed.) *MEST Journal, 1*(1), 137-146. Retrieved from www.meste.org/mest/MEST_1_2013/_14.pdf

Style – **Chicago** *Fifteenth Edition:*
Manylich, Mychailo Ivanovich, and Sergei Ilyich. Likholet. "Forms and methods of technologies transfer adjusting in Ukraine." Edited by Zoran Čekerevac. *MEST Journal* (MESTE NGO) 1, no. 1 (01 2013): 137-146.

Style – **GOST** *Name Sort*:
Manylich Mychailo Ivanovich and Likholet Sergei Ilyich. Forms and methods of technologies transfer adjusting in Ukraine [Journal] = Adjusting of transfer of technologies in Ukraine // MEST Journal / ed. Čekerevac Zoran. - Belgrade - Toronto : MESTE NGO, 01 15, 2013. - 1 : Vol. 1. - pp. 137-146.

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Forms and methods of technologies transfer adjusting in Ukraine. **Manylich, Mychailo Ivanovich and Likholet, Sergei Ilyich.** [ed.] Zoran Čekerevac. 1, Belgrade - Toronto : MESTE NGO, 01 15, 2013, MEST Journal, Vol. 1, pp. 137-146.

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