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## Content:

1. The carpathian model of regional partnership	
/Author: <i>Ludmila P. Petrashko</i> / .....	01
2. Periodization of responsible investment	
/Author: <i>Romanyok Tetiana</i> / .....	10
3. Financial Viability of Community Pharmacy in Serbia	
/Author: <i>Marina Mladenović, Ivana Mladenović-Ranisavljević, Radmilo Nikolić</i> / .....	18
4. Leveraged buyout financial model	
/Author: <i>Milan Maksimović, Mlađan Maksimović</i> / .....	22
5. The Bishops and Episcopal acts in the system of Church Government of the Byzantine Empire	
/Author: <i>Volodimir V. Omelchuk</i> / .....	29
6. Cast iron processed by electrical erosion	
/Author: <i>Ioan BADIU, Marcel S. POPA</i> / .....	34

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## THE CARPATHIAN MODEL OF REGIONAL PARTNERSHIP

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**Abstract:** *The topicality of this paper is determined by the cardinal shift in the global economical paradigm towards "green" economy, when the sustainable development concept has to be integrated in development strategies of countries for their reorientation towards the creation of efficient partnerships to increase people's wealth, provide social justice, and significantly decrease the risks of environment pollution and natural resources' exhaustion. The main aim of the paper is to identify theoretical-methodological approaches to the formation of the regional cross-sector partnerships as an effective tool for sustainable development of unique areas of the world. It is the international partnership, the author believes, that can consistently implement the principles of sustainability and openness in the practice of corporate social responsibility, using the combined innovative management strategies. A comparative assessment of the socio-economic development conditions, the characteristics of the environment, tourism resources and complexes, the infrastructure of the Carpathian region of Ukraine, Romania and Poland can substantiate the conclusion of the international perspective of the strategies for sustainable development of the Carpathian tourist brand is presented. The model of the named brand and the strategic plan of its realization, which will improve the ecological environmental situation and socio-economic development of the region through the controlled usage and conservation of natural, historical, economic, and cultural heritage of the region is developed.*

**Keywords:** *"green" economy, corporate social responsibility, international and regional partnership, strategy of sustainable development, tourist brand, the Carpathian region.*

**Short Abstract:** *International regional partnerships are described in this paper as an efficient instrument of sustainable development. The Carpathian model is tailored sampling how to save the unique regional ecosystem.*

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## 1. INTRODUCTION

Currently, the actual global challenges are: fast exhaustion of natural resources; accelerating environmental change: from pollution to catastrophic climate changes and global scope of environmental, natural and economic disasters; the increasing demand for food and fuel; the threat to world's security creates a strong need of searching for effective approaches to sustainable development of the world.

The sustainable development concept has been defined for the first time in the World Strategy of Preservation of the Nature (1980) developed at the initiative of UNEP (United Nations Environment Program), the International Conjunction of Wildlife Management (MCOII) and the World Wildlife Fund (WWF) and specified during global political debate, starting from the report on limits to the economic growth, Brundtland Commission (1980), Rio Earth Summit (1992), Conventions of the United Nations on the biological diversity (1993), the World Summit of the United Nations on the sustainable development (Johannesburg Plan of Implementation, 2002), the strategic plan "Aims-

2010" (2002), climate conference of the United Nations in Copenhagen (2009), and finishing with significant data from the reports Global Biodiversity Outlook, The Economics of Ecosystems and Biodiversity (TEEB), (2010). The basic maintenance of the concept of a sustainable development of the world is defined by the thesis that the demands satisfaction of mankind in the present should not undermine ability of the future generations to satisfy its own demands. It means that the concept of the sustainable development is treated as the process of changes in which operation of natural resources, the direction of investments, orientation of scientific and technological development, personal development and institutional changes are coordinated with each other and strengthen present and future potential for satisfaction of human needs for preservation of life-support systems of mother Earth.

Green Economy UNEP is an innovative solution to overcome poverty and the possibility of transition from the "brown" (resource-oriented) economy to a sustainable. It's a reasoned response to the question of how to keep humanity's environmental footprint in a single world. Its goal is to link the need for the environmental change in the course of economic and social consequences, in particular, economic growth, labour and capital markets. UNEP defines a "green economy" as an economy that improves the welfare of the people, ensures social justice, while significantly reducing the risks to the environment and natural resources' depletion.

Radical changes in the world economic paradigm towards "green economy" should bring the agreement reached at the 10th Conference of the participants of the UN Convention on Biodiversity (COP 10) in Nagoya, Japan (18-29th October, 2010), which adopted a new strategic plan for the convention on biodiversity and ecosystems in the years 2011-2020, "Goals 2020" (2020 TARGET, STRATEGIC PLAN), the Protocol on Genetic Resources (Protocol on genetic resources) and announced the development of accounting treatment of "natural wealth" in the national accounts of the countries (World Bank, UNEP) as well as the Mission 2020 (to take immediate action to stop biodiversity loss for the prosperity of mankind.) In the report "Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication, submitted on 21st February, 2011 at the session of the 2011 UNEP Forum (UNEP Governing Council / Global Ministerial Environment Forum), which brought together environment ministers from 100 countries, it is noted that the transition of the global economy to a "green economy" will cost about 2% of GDP, or \$ 1.3 trillion per year. The growth of "green" economy, according to UNEP, in the period from 5 to 10 years will be higher than forecast by "brown" scenarios, this will exclude many of the risks and systemic weaknesses of the latter. The proposed scenario assumes a growth in per capita income with a decrease of almost 50% of the "ecological footprint" of a person in 2050. [6]

The globalization of business activity leads to the increased access to natural resources, labour markets, customers and suppliers. Any successful business requires a stable work environment. In other words, globalization has created a situation where companies can no longer allow themselves to ignore the environmental and social development of regional business location. Thus, the overall trend of business globalization in the area of corporate social responsibility is clearly identified.

The environmental conditions of the companies require constraints in production and lowering of the levels of income, both on domestic and international markets. Because of this, they contribute to the evolutionary transition to full integration of the principles of corporate social responsibility (CSR) in the strategic orientation of companies. Strategic corporate responsibility is defined as the activity of the company, which includes a choice of how the company is voluntarily using its own resources for social purposes. An important argument of the new approach to corporate social responsibility suggests that,

ultimately, economic and social objectives of business organizations do not clash, but unite: economic investments are publicly useful and social investments are economically advantageous.

The financial crisis of 2008 - 2010 became an ordeal, as of the financial stability of the international companies, as well as an indicator of the viability of the concepts, policies, models and tools of their corporate social responsibility. It significantly transformed the meaning and importance of CSR of the companies. During the restructuring, the inevitability of significant personnel cuts, financial difficulties, many international companies have reduced or abandoned their social projects. This is evidenced by the results of the study, "Philanthropy in Crisis", held in the spring of 2009 by the research group "Zircon", by PricewaterhouseCoopers, the Donors Forum and the SAF Russia. According to the data of this research, 65% of 440 respondents (companies) claimed to reduce funding for social projects. [8] This is one of the most important changes to the meaning of CSR, which had previously prevailed and formed the trend aspect of the business realities. The main recommendations for the CSR for companies in the post-crisis conditions are the following: the formation of a strategic approach to CSR planning; filtering and development of clear criteria for the selection of social projects; consistent, regular, high quality and open communication with stakeholders; the introduction of the new formats of the less expensive social projects; the use of innovative management tools. [10]

The scale of current economic and environmental problems proves it to be impossible to match them with the forces and resources of a single state. Solving these problems has to be through the formation of the regional systems of governance that will ensure the stability of social and cultural systems, reduction of the negative environmental impact, ease of the number of ethnic and interstate conflicts, rational use and conservation of nature - the unique resources of the territories and regions. The international partnership is the one who unite all the interested parties in the region: state-owned and business financial institutes, socio-economic partners and non-governmental organizations; these make them possible to gradually implement the principles of stable and open practice of the corporate social responsibility, with the use of united innovative management technologies.

**The main aim of the paper** is to determine the theoretical and methodological approaches to the formation of regional cross-sector partnerships as an effective tool for sustainable development of the unique areas of the world, the argumentation of the conclusion of the international term strategy for sustainable development of the Carpathian region and development of a model of the Carpathian tourist brand, which will help preserve the ecological environment and improve the socio-economic development of the region with the use of control and conservation of natural, historical, economic, and cultural heritage of the region, the use of low-cost, energy-efficient technologies and innovative management tools.

## **2. THE REGIONAL CROSS-SECTOR PARTNERSHIPS - AN EFFECTIVE TOOL FOR SUSTAINABLE DEVELOPMENT**

Regional sector partnerships in the sphere of corporate social responsibility - is a complex process, which requires time and expertise of its members. The concept of a regional cross-sector partnership should be defined as the process of building mutual understanding and mutual respect of different sectors (business, state, civil society) of the states of a regional presence for the common problems of the region. This is a voluntary cooperation, which aims at the sustainable regional development based on combining the

efforts of corporate business, civil society and state structures of territorial presence. Depending on the nature of regional cross-sector partnerships they can be classified as follows: program partnership, political and strategic partnerships, lobbying partnerships, multidimensional partnership. The analysis of recent studies and publications [2,3,4,7,14] for the creation and development of international partnerships in the field of corporate social responsibility, aid in determining the theoretical and methodological approaches to the formation of regional cross-sector partnerships for the successful implementation of "green" standards for regional economic development.

### **3. THE PROCESS OF BUILDING CROSS-SECTOR REGIONAL PARTNERSHIP**

1. Determination of needs
  - Problems and priorities
  - Successful examples of the respective practices
  - Alternative solutions
  - Required resources
2. Potential partners search
  - States of the region
  - Consulting
  - Partnership agreement
3. Partnership program formation
  - Aims and objectives
  - Results
  - Restrictions (legal, political, social, time limitations, territorial)
  - Activities and performers
  - Resources allocation
  - Budgeting
4. Program realization
  - Partners' motivation
  - Administration: authority delegation and support for upward initiatives
5. Technical support of the partnership
  - Interim evaluation
  - Continuous communication support
6. Monitoring
  - Program execution analysis (result achievements)
  - Problems identification
  - Problems solutions development
7. Ending the partnership
8. Partnership program reengineering
  - Evaluation of progress
  - Evaluation of unplanned results
  - Main lessons
  - Best practices
  - Opportunities for program improvement.

The main structural elements of the partnership agreement are the partnership objectives, action plan, performance indicators, resources and their distribution between the partners, the duties of partners, funding mechanisms, the principles of decision-making system of communication, conflict resolution mechanism, the system of anti-risk

measures, procedures for monitoring and evaluation of the effectiveness of partnership strategy completion or exit of the partnership.

The combination of the core competences and strategic goals of participants' partnership ensures its success and effectiveness. Building partnerships around the core competencies of each participant brings new professional skills: resources, roles, behavioural models, and unique opportunities for achieving social and environmental objectives of the partnership.

#### **4. SUSTAINABLE DEVELOPMENT OF TOURISM IN THE CARPATHIAN REGION: THE CREATION OF PREREQUISITES FOR THE DEVELOPMENT OF INTERNATIONAL PARTNERSHIP RELATIONS**

The rapid development of international Carpathian region actualizes the need to harmonize definitions and common rules for the regulation of various processes to a balanced solution of its main issues, from environmental protection to strengthen the infrastructure system. For example, according to the analytical report on the mass population survey of forest areas in the Carpathian region of Ukraine, catastrophic problem of deforestation is determined by 75 - 95% of respondents. [13] The international dimensions of environmental problems require effective cooperation of all countries of the Carpathian region.

The intercultural perspective of sustainable development of the Carpathian region, including Ukraine, Poland and Romania, is aimed at improving the ecological environment and raising the socio - economic development of the region controlled by the use and enrichment of natural, historical and cultural heritage. The basic strategy for sustainable development of the Carpathian region, defined by international initiatives is the development of the Carpathian tourism industry.

The list of 10 key sectors of the "green economy", dedicated «Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication» includes tourism too. In the mentioned report it is proposed to invest in the amount of approximately \$ 135 billion into the "green tourism".

Principles of the World Trade Organization (WTO) define sustainable tourism as a strategy that directs management to meet the economic, social and aesthetic needs while maintaining cultural integrity, the basic ecological processes, biological diversity and the preservation of life. The strategy of sustainable development of tourism in the Carpathian region is based on international experience of cooperation between Ukraine, Poland, Romania and the developed in the framework of international initiatives that have found their coverage in a number of conventions, declarations of the EU and national programs for sustainable development of the Carpathian region. [1,5,9,11,12,15,16]

The illustration of the presence of conditions and prerequisites for the establishment of effective international partnerships in the tourism industry is represented by the example of the Transcarpathian region of Ukraine. Today, in the Carpathian region in the Transcarpathian region of Ukraine more than ten regional public organizations and unions of tourist destination are successfully working. The most active are: Association of tourism enterprises, the regional centre to promote rural tourism, the Federation of sports tourism, public organization "Fund of the regional tourism initiatives" (Toureuurocenter), Union of private growers and winemakers of the Carpathians, the public organization "Union of tourism for people with physical disabilities "(Revival), NGO "Forza" and others. In collaboration with the community organizations and associations such issues as presentation of new tourism products, festivals and celebrations, organization of special exhibitions and the informative tours are solved. One of the important partnership

directions is the cooperation in writing to participate in European grants. In 2010, these were prepared and sent to the contest: a project of the Ukrainian-Hungarian Regional Development Centre - "Management of destinations cross-border cooperation in the border territory of Transcarpathia - Szabolcs-Satmar-Bereg", a project of social organization "Carpathian Foundation" - "Carpathian region as an attractive tourist destination point ", a project of the Transcarpathian Regional Centre to promote rural tourism - "Creating a multinational ethno villages" and "The International School of rural green tourism". In the region there are 16 tourist information centres that provide assistance to domestic and foreign tourists. There is an increasing interest in the Carpathian region, tourist routes for citizens of European states. In order to inform more thoroughly the population of border areas of states with which the Transcarpathian region has a common border, negotiations on the establishment on the basis of Ukrainian consular posts abroad tourist information points were held. The tourism and recreational infrastructure of Transcarpathia is comprehensively developing. The network of health, recreational and tourist facilities count 356 objects, 28 of which were put into operation in 2010. Total number of beds exceeds twenty thousand, 30 % more than in 2004. [17]

On the territory of the Carpathian region the tourist festivals "Euro Carpathians" and "Hutsul turnips" became traditional. At these fiestas the tourist brand "Carpathians" and the brand of rural tourism "Europe in every village" were born. At the level of the Carpathian Euroregion Council the idea of creating an international tourist walking route "Carpathian Tourist Way", which will be held in four regions of the Carpathian region (Transcarpathian, Ivano-Frankivsk, Lviv and Chernivtsi region) and in four neighbouring countries: Slovakia, Romania, Poland and Hungary (the concept of eco-tourist walking routes totalling approximately 380 km) was supported. In the framework of international walking route in the territory of Transcarpathia the Transcarpathian tourist way was laid. This is the theme that has been the subject of training, writing and submission to the competition of European technical assistance of the two projects: "Improving the competitiveness of the border area", "The development of tourism".

With the support of the international institutions the study of three Carpathian regions has been completed: Ukraine -Lviv, Ivano-Frankivsk, Transcarpathian, Chernivtsi region; Romania Fagarash Mountains; Poland-Subcarpathian region to compare their commonalities and differences of socio-economic conditions of the characteristics of natural environment, tourism resources, facilities, infrastructure, and identify common future tourism prospects. Key results of the analysis are:

presence of natural and historical - cultural historical assets attractive for tourists

- lack of common sense of Carpathian identity
- lack of adequate tourism and transport infrastructure
- urgent need to protect the environment in the Carpathian region at the practical implementation of international conventions
- lack of capital and unskilled management of tourism companies.

## **5. CARPATHIAN TOURIST BRAND MODEL**

The policy of the coordination of spatial planning of the border ethnic territory should determine:

- regional and business clusters of mini-networks of travel services
- standards for tourism activity
- creation of cross-border infrastructure in transport services, energy, telecommunications
- efficient use and conservation of natural resources

- strategic planning of urban and rural border areas
- integrated land use planning
- assessing the impact of tourism on the environment

The objective of international cooperation in the sphere of sustainable development in the Carpathian region should be an effective joint structured tourism industry model based on its reorientation in terms of spreading the positive image of the region, coordination of government, business, infrastructure provision, improvement of management (implementation of international standards) and provide "green standards" development.

## **6. CARPATHIAN TOURIST BRAND MODEL**

1. Values: the cultural heritage and traditions, sustainable development, natural and cultural values
2. Organisational structure: Management Coordination Committee of the Carpathian Tourism, Regional Representative Committee, professional tour operators.
3. Infrastructural support:
  - a. transport
  - b. communications
  - c. health
  - d. sports
  - e. cultural
  - f. auxiliary
4. Tourist programs and products
5. Tourist route types:
  - a. Horizontal national tourism products
  - b. Vertical national tourism products.
6. International and national route types:
  - a. Green routes (country tourism)
  - b. Health routes (treatments and relaxation)
  - c. Sport routes (pedestrian, car, bike, kayak, climbing, horseback riding, skiing, swimming, fishing, hunting photos)
  - d. Cultural heritage routes (castles, memorials, churches, museums, cities and villages)
  - e. Gastronomic routes
7. Route maps
8. Tourism service standards
9. "Green" standards of liability of businesses of the environment, territory, community, population
10. Monitoring of the quality of tourism services
11. Business liability standards social audit

## 7. CONCLUSIONS

The international community has formulated the basic principle of resource and environmental security of the world - the principle of sustainable development. The imperatives of sustainable development are based on the idea of harmonizing the interests of states, transnational corporations, national and international businesses through compliance with economic, social, environmental and legal liability. An important trend in the development of CSR is the progressive realization of the business structures that CSR is not only and not so much social and environmental projects and programs, but also one of the most important components of corporate governance, which provides competitive advantages.

Sustainable development of regions towards "green" economy should be achieved through an integrated approach to solving the specific problems of certain regions of the stakeholders within the region (institutions as governance of cities and towns, international organizations, government agencies, public and private financial institutions, socio - economic partners and community organizations, businesses).

The experience of international cross-sector partnerships suggests that the use of the mentioned tool allows you to implement the principles of sustainable development to achieve goals that would be impossible if every interested party is working on its own and forms a distinct competitive business goal. Namely, the formation of a new network of communication channels to extend the levelling of social conflicts and risks, improving relations with the community, region, introduction of new tools of management, harmonization of partners' interests in social responsibility, increasing the social capital of participants partnerships, raising awareness groups stakeholders, mitigate the negative impact on the environment, preservation of unique ecosystems, etc. Cross-sector partnership approach allows its participants to increase their own social impact which contributes to sustainable regional development, strengthening of socially responsible image of the country and enhances its international competitiveness.

The implementation of recommendations for the formation of regional cross-sector partnerships in the tourism sector of the Carpathian region will harmonize the social and business goals of territorial presence. Given the active participation and support of the states, following the experience of successful practices of responsible leadership, a regional cross-sector partnership will become a powerful source of corporate social responsibility to the environment, communities and vulnerable populations, and hence of resource sustainability unique regions of the world.

Of course, in the current economic conditions the process of creating a model of international tourism brand of the Carpathian region is complex and time consuming. The existence of the strategy for sustainable regional development, methodological approaches to the formation of model of the Carpathian tourist brand will help to conserve natural and cultural identity of the region and improve the socio-economic conditions of the population identified areas.

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## PERIODIZATION OF RESPONSIBLE INVESTMENT

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**Abstract:** *The stages of development of responsible investment. We consider a group of key factors that are taken into account when assessing potential targets. The author gives the improved definition of "responsible investment", the basic components of the essence of the category of responsible investing. We prove that the essence of responsible investment is evident in the basic functions of investment and in the responsible investment market itself. We propose to define responsible investment as an investment process in which an investor considering a number of social, ethical, environmental and governance criteria and methods of investing, makes a decision on the formation of portfolio investments in an effort not only to meet his needs in obtaining financial income, but also to assess and create a positive effect of these investments for the society and the environment and to ensure sustainable development and long-term corporate performance.*

**Keywords:** *responsible investing, investments, steps, criteria, methods, periods, transnational business, "green responsible investment", "white responsible investment", "red responsible investment".*

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## 1.INTRODUCTION

Socialization of business due to social, political and economic factors, acts as one of the characteristics of contemporary development of economy and society. That is why recently more attention is paid to issues related to sustainable development. Global trends in the world, including the celebrated population growth and affluence of the population, climate change, shortage of fresh water resources, affect perception and behaviour as individuals and multinational corporations. Corporations, while planning activities, begin to consider three main aspects of their impact on stakeholders: economic, social, and ethical, as evidenced by the appearance of a completely new investment strategy – Responsible Investment.

The transformation of the goal of the corporation: in addition to maximizing the profit interests of all parties are taken into account – employees, customers, contractors, state and society in general. That is, the active development of responsible investment is associated primarily with the spread of the concept of corporate social responsibility, the essence of which lies in the voluntary contribution of transnational business to sustainable development of society by understanding its importance and benefits.

The overall responsible investing is a relatively new investment strategy which transforms the investment of choice for independent individual investors towards investment in the securities market, and which, at the moment, emits their own criteria and methods of investing, market infrastructure and a set of participants. The responsible investment is the result of a religious movement in Anglo-Saxon countries, about 1700, where a particular role in its development, at the time, played the Quakers, Mennonites,

Methodists and other Protestant groups in North America who had special ethical understanding of money. Quakers and other investors, who followed religious beliefs, refused to invest in companies engaged in the manufacture of weapons, alcohol and tobacco, etc.

## **2. THE FIRST PHASE OF RESPONSIBLE INVESTMENT – THE ORIGIN**

Due to the increased religious movement in 1928, the U.S. created the first responsible investment fund – Boston Pioneer Fund, whose investment activities excluded all companies that were related to alcohol, tobacco, casinos, gambling and pornography. In Europe, these funds began to emerge in 1900 on the initiative of religious organizations and religious groups. As a result, the first step in the development of responsible investing has been described as a period of the emergence of responsible investing (in the 60s of XX century.) and the investment philosophy that lay at its core was known as the ethical investing, because it was based on moral values, codes of ethics and religious beliefs and refusal to invest in companies which did business contradictory to these set of principles. As a result, the selection of sites for ethical investing is based on the global (when investors refused to invest in specific sectors or geographic areas) or specific (not investing in the company where 10 % of the profit come from the production of weapons or nuclear energy) exception. Such investment behaviour has become a key feature of the first phase of responsible investment – phase nucleation.

## **3. THE SECOND STAGE – THE FORMATION OF RESPONSIBLE INVESTING IN THE STOCK MARKET**

The current understanding of the essence of responsible investment emerged in the U.S. in 1960, while in Europe, the first responsible funds were established in the 1980s. In 1971 the Pax World Fund was based on the refusal to invest in companies that received the income from the Vietnam War. Also in this period of responsible investment, Global Sullivan Principles were developed whose essence lay in the refusal to invest in companies working in South Africa and which supported the existing apartheid regime there. Investors along with the process of elimination, which was characteristic of ethical investment, begin to apply the method of positive selection when investments were directed to companies that have demonstrated good performance in a specific field of sustainable development, for example, in creating renewable energy and production of environmentally friendly products. In 1983 P. Kinder defined this stage of development of responsible investment as socially responsible investing, which is revealed through the integration of social and ethical criteria for investors in the investment decision making process. [1]. This stage of responsible investing can be described as the period of the responsible investment in the securities market (early 60's – early 90's of the XX century.), where the main purpose was not only the financial gain but also to create a positive social and environmental impact. Among the features of this stage there are: 1) the main investors are the individual investors, mutual funds, public and religious organizations; 2) the spread of ethical funds in Canada, UK, Australia; 3) emerging infrastructure organization specializing in research and consulting in the field of responsible investing (EIRIS, UK SIF); 4) extends the range of criteria to exclude companies from the investment portfolio, the method of positive screening.

#### **4. THE THIRD STAGE - A PERIOD OF DYNAMIC GROWTH OF RESPONSIBLE INVESTMENT**

Since 1990, the role of transnational business in sustainable development, the harmonious development of society, in which economic growth combined with the provision of social protection and minimizing the negative impact on the environment is becoming more evident, and therefore, the interest in responsible investing continues to grow. The increased attention paid to the environmental criteria of responsible investment led to the formulation of principles in 1992, the Coalition for Environmentally Responsible Business, whose main objective was to assess the overall environmental performance of companies. In addition to the traditional criteria statements, investors began to actively practice the "principle of trinity - people-planet-profit." In comparison to the second stage of responsible investment, the third stage, which is characterized as a period of dynamic development of responsible investment, involves investing in companies using comprehensive sustainability criteria that take into account leadership strategies and linkages with relevant areas: the environment, employees, community, suppliers and shareholders. Rather than focus on the fact that the company "must do" investors of the third stage of responsible investment have chosen "the best company in its sector" for investment. At this time there is actually "responsible investment", which is interpreted as a strategy for the integration of social, environmental, ethical and management issues in the management of investments and property in the belief that these factors may affect the improved financial performance. [2]. Depending on which type of non-financial aspect is a priority for investors there is: "green responsible investment", "white responsible investment" and "red responsible investment" [3].

The essence of "green responsible investing" is to avoid investment in companies whose activities cause significant harm to the environment (e.g. use of a number of enterprises in the production of harmful substances), or, alternatively, the choice of companies whose activities help to reduce human impacts on the environment (for example, the production of energy from alternative sources). "White responsible investing" is a subspecies of ethical investment and revealed through refusal to purchase securities of companies that belong to the "sin" industries: tobacco, alcohol, gambling, weapons production and so on. "Red responsible investment" provides investment decisions based on issues related to human rights, such as working conditions and employees in relation to the issuing company securities and its contractors.

#### **5. KEY FACTORS TO BE TAKEN INTO ACCOUNT WHEN ASSESSING POTENTIAL TARGETS**

The evolution of the concept of "responsible investment" promoted a specific method in the interpretation of its essence. Three key groups of factors are taken into account when assessing potential targets, namely:

- Social: human capital (education and training, working conditions and health); social development; labour rights (such as the right to trade union activities);
- Environmental : urban and industrial pollution; global warming; depletion of some natural resources (such as oil) and limited access to others (such as clean water); reducing populations of the world's flora and fauna;
- Ethics: human rights; child labour; production or distribution of weapons; inhumane testing products on animals; hidden support of repressive political regimes; slavery; forced prostitution; and traditional ethical issues related to pornography, alcohol and gambling.

Although the factors structuring these groups have long been agreed by a number of scientists and institutions interpretations of the essence of responsible investment vary between investors from different countries. Most scientists and organizations in the field of responsible investment from around the world, interpreting the essence of responsible investment, taking into account social and environmental components, but some have focused on other factors.

One of the leading organizations in the field of responsible investing, Social Investment Forum USA (US Social Investment Forum – US SIF) in their reports on the development of responsible investing offers the following definition of the essence of responsible investment:

- "Investment process, which involves an analysis of positive and negative social and environmental consequences of investments, and their thorough financial analysis, the process of selecting and investing in companies that meet the basic standards and criteria of corporate social responsibility" [4].
- «Responsible investing through funds, whose activities are focused on building a healthy society, ensuring economic equality and a clean environment and a competitive level of return for investors»;
- «Investment process that is based on the inclusion of positive and negative environmental, social and corporate governance criteria into investment analysis and investment portfolio formation». [5].
- «Responsible Investment integrates personal values and social problems of investment decisions, while considering how the financial needs of investors and investment impact on society." [6].

Thus, the concept of responsible investing, proposed by the Social Investment Forum, was revealed through concepts with similar meaning: social investment, ethical investment, investments, taking into account values.

By the end of 1990 responsible investment was seen in terms of personal (individual) responsibility of the investor.

The definition proposed by Matthew and James Heyem Hazeltonom in 2004 magazine article "Journal of Business Ethics," revealed responsible investment as "a term used for the management of investment funds and financial goals of the investor when combined with their obligations under such social issues as social justice, economic development, peace and environmental protection." [7].

Another influential organization dedicated to the study of various aspects of responsible investment, the European Sustainable Investment Forum (The European Sustainable Investment Forum – Eurosif) proposed to consider responsible investment as "a process that combines investors' financial objectives with their understanding of social, environmental and ethical issues and corporate governance; it is based on the growing understanding by investors, companies and governments ...." [8]. A similar definitions was proposed in the framework of international organizations in the field of responsible investment, as the Australian Association for Responsible Investment (Responsible Investment Association Australasia) [9], the Canadian Association for Responsible Investment (Responsible Investment Association Canada) [10], the Association for sustainable investment and finance of Britain (UK Sustainable Investment and Finance Association) [11]. In addition to the above mentioned organizations specialized in the field of responsible investment, my interpretation of the essence of the concept proposed in 2005 and at the World Economic Forum (World Economic Forum), which in its report «Mainstreaming Responsible Investment» defined it as "a way of investing where the impact of investment is based on both the public interest and the environmental in the present time and for the future account." [12].

As you can see, the universally accepted definition of the essence of responsible investment does not exist. For example, the Association for sustainable investment and finance of Britain (UK SIF) and the Social Investment Forum USA (US SIF) include in their interpretation of the essence of responsible investment the public investment and other economically targeted investments, while other organizations do not address these issues. Similarly, the interpretation proposed by the Association for sustainable investment and finance of Britain and the European Sustainable Investment Forum (Eurosif) take into account the ethical aspects, which are ignored by the similar organizations in Canada and the United States.

## **6. THE MAIN COMPONENTS OF THE CONCEPT OF "RESPONSIBLE INVESTMENT"**

The main components of the concept of responsible investing are:

1) Earmarking investments – responsible investment aim is not only to achieve the investment tasks (as evidenced through obtaining financial income), but also to create a positive social and environmental effects, in which the personal views, beliefs and principles of the investor on specific important social issues are important not only to the end result, but the conditions for their achievement;

2) Return on investments – responsible investment should generate financial revenue, and therefore the investor conducts a thorough analysis of potential targets for conventional parameters "liquidity risk - yield";

3) Integration of individual attitudes and beliefs of the investor – the investor determines criteria and methods of responsible investment, given their subjective beliefs (including religious vision);

4) Analysis and consideration of current and future environmental and social impacts of investment for society – choosing environmental, social, ethical and governance criteria, and methods of investment where the investor is responsible for the consequences of the investment, for the result that it will have on society, the environment, sustainable development and long-term corporate performance, because the first and the foremost goal of responsible investment is to benefit the society, to solve social problems, or at least not cause further damage;

5) Financial analysis of investment – the investor considers the investment consequences in terms of environmental impact, ethical, social and governance factors for companies and their long-term sustainability.

In addition to the above mentioned components the essence of the responsible investment is evident in its functions, which are as basic functions of investment taking place in the context of sustainable development:

1) Control function – responsible investment as any investment, affects the processes of reproduction of capital, economic development, technological progress, social welfare, environment and other sectors of society; i.e. the development of responsible investment is not only a redistribution of capital, but also acts as an incentive to address a range of social, environmental, ethical and management issues, creating favourable conditions for the life of present and future generations;

2) Ethical function – responsible investment enhances the investment market, allowing participants to meet both financial needs (saving and increasing capital) and social (support socially responsible companies, adherence to ethical principles to promote sustainable development);

3) The distribution function – responsible investment distributes the social product in the form of money between different economic actors, levels and spheres of social production activities;

4) Stimulating function – responsible investment encourages recipients of investment to improve the financial performance, modern "green" technologies, human rights, occupational health and safety of employees, motivation, and compliance with corporate governance principles, interaction with local communities and other stakeholders.

In this regard, it is necessary to identify the main components of the responsible investment market as a single segment of the investment market:

1) The appearance of the main participants of responsible investment (investors, issuers and financial intermediaries);

2) Building infrastructure for responsible investment – analytical organizations, groups stock indexes regulatory infrastructure;

3) Forming the basic criteria and methods of responsible investment product structure.

In accordance with the selected elements the responsible investing market can be defined as a set of economic relations between all participants of the securities market on the investment activity based on a number of criteria and methods for responsible investment.

In 2012, the assets of the responsible investment reached 13.568 trillion dollars and today are in many regions and countries – the U.S., Europe (mostly in France, Britain, the Netherlands, Norway, Germany, Italy, Switzerland), Canada, Australia and New Zealand, and Japan (Table 1).

**Table 1. Dynamics of responsible investing in the developed world (in terms of responsible investment assets) billion**

Region/Country	2006 year	2008 year	2010 year	2012 year	Global market share
USA	2 290	2 711	3 070	3 740	27,56%
Europe	1 221,69	3 917,07	7 169	8 717,23	64,28%
• Austria	1,42	1,72	3,01	10,6	0,078%
• Belgium	176,2	416,96	277,7	124,9	0,92%
• UK	923,5	1 408,96	1 346,2	1 592,05	11,73%
• Denmark	-	168,2	347,3	314,78	2,32%
• Spain	29,6	45,2	47,7	73,58	0,54%
• Italy	3,4	357,6	447,92	576,90	4,2%
• The Netherlands	56,2	639,7	567,6	858,73	6,33%
• Germany	6,27	16,3	18,5	800,43	5,9%
• Norway	-	306,77	588,7	739,96	5,45%
• Poland	-	-	1,58	1,51	0,01%
• Finland	-	99	128,2	138,69	1,02%
• France	16,3	144,86	2 653,5	2 428,29	17,9%
• Switzerland	8,8	31	32,98	569,22	4,19%
• Sweden	-	280,8	438,02	487,59	3,59%
Canada	467,4	579,1	530,9	600,9	4,43%
Japan	-	8,1	5,7	10	0,073%
Australia	13,523	72,199	75,73	168,445	1,24%
Other					2,447%

Compiled by the author based on [13-18]

The most dynamically developing market in responsible investment market is Europe, the total volume of critical assets which, as of early 2012 is 8.717.23 billion U.S. dollars, up 7 times more compared to the same period of 2006. A significant growth rate of compliance investment also demonstrates the U.S., the total amount of assets of which are responsible for early 2012, 3.740 billion, and an increase over the period 2006-2012 at 1.450 billion (38.8%).

## 7. CONCLUSIONS

We propose to define responsible investment as an investment process in which an investor considering a number of social, ethical, environmental and governance criteria and methods of investing, makes a decision on the formation of portfolio investments in an effort not only to meet his needs in obtaining financial income, but also to assess and create a positive effect of these investments for the society and the environment and to ensure sustainable development and long-term corporate performance.

Therefore, today there is a moderate awareness of the need to comply with CSR. The responsible investment is becoming a common trend when the investors making a decision on the location of the investment, and are especially taking into account environmental, social and governance criteria.

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## FINANCIAL VIABILITY OF COMMUNITY PHARMACY IN SERBIA

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**Abstract:** *The economics of community pharmacy are under pressure and the business model, particularly for independent pharmacists, is at a turning-point. In Serbia, as in many different markets, revenues are capped, competition is more intense and there is an increasing expectation of pharmacies to play a stronger role in managing chronic conditions. This paper reviews the forces shaping community pharmacy and the impact that these forces could have on the financial viability of pharmacy contractors. It also considers the options for securing the future of the sector and confirms that doing nothing is not an option.*

**Keywords:** *community pharmacy, economics, financial viability.*

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## 1. INTRODUCTION

Pharmacy is one of the foundational pillars of modern medicine and many of today's leading pharmaceutical companies can trace their origins back to a pharmacy entrepreneur. Nevertheless, community pharmacy is now at a crossroads.

Everyone is familiar with community pharmacists and the pharmacy in which they practice. Six out of every ten pharmacists provide care to patients in a community setting. You probably visit the community pharmacist more often than you do any other member of the health team. Pharmacists talk to people when they are healthy and when they are sick; when they are "just browsing" or when they are concerned with an emergency; when they have specific needs as well as when they are seeking advice or information. Pharmacists are playing an increasing role in the "wellness" movement, especially through counselling about preventive medicine. According to one estimate, pharmacists receive more than two billion inquiries a year from their patrons.

Pharmacists serve patients and the community by providing information and advice on health, providing medications and associated services, and by referring patients to other sources of help and care, such as physicians, when necessary. Likewise, advances in the use of computers in pharmacy practice now allow pharmacists to spend more time educating patients and maintaining and monitoring patient records. As a result, patients have come to depend on the pharmacist as a health care and information resource of the highest calibre. Pharmacists, in and out of the community pharmacy, are specialists in the science and clinical use of medications. They must be knowledgeable about the composition of drugs, their chemical and physical properties, and their manufacture and uses, as well as how products are tested for purity and strength. Additionally, a

pharmacist needs to understand the activity of a drug and how it will work within the body [1].

If pharmacists develop a desire to combine their professional talents with the challenge of the fast-moving community pharmacy practice, they will often consider a management position within a chain pharmacy practice or ownership of their own pharmacy. In chain practice, career paths usually begin at the store level with possible subsequent advancement to a position at the district, regional, or corporate level. Many chain companies have management development programs in marketing operations, legal affairs, third party programs, computerization, and pharmacy affairs. The spirit of entrepreneurship and motivation has enabled many pharmacists to successfully own their own pharmacies or, through establishing consultation services, own their own pharmacy practices.

## **2 . PHARMACEUTICAL ASSOCIATION OF SERBIA**

Pharmaceutical Association of Serbia is a professional society of pharmacists, with the primary objective of professional development, advancement of knowledge and the preservation of the ethical rules of the pharmaceutical profession. The mission of Pharmaceutical Association of Serbia is to connect pharmacists employed in: the health care system, production and distribution of drugs, education and research in the field of pharmacy, to improve the health and well-being of individuals and society as a whole.

Pharmaceutical Association of Serbia was established in 1879 entitled Society of Pharmacy in Serbia, and after ten years it changed its name to Serbian Society of Pharmacy. The work of the society was rebuilt in 1946 as the Association of Pharmacists in the People's Republic of Serbia, and after a few changes of the name originated Pharmaceutical Association of Serbia [2].

The first pharmaceutical factory in Serbia, the former Yugoslavia, was founded on 18th July, 1945, under the name of the State Company for pharmaceutical production "Galenika". It is also known as one of the top four producers of penicillin in Europe (1949), streptomycin, etc.

Soon, other drugs factories were established, like "Zdravlje" in 1953, "Hemofarm" in 1960, "Jugoremedija" in 1961, "Farmakos" in 1963, "Srbolek" in 1971, "Zorka - Pharma" in 1976 and "Panfarma" in 1991 [3]. Companies engaged in wholesale of medicines were placed under the administration of the Directorate for Procurement and Distribution of Drugs (so called "GUNRAL"), while the laboratories that produced drugs were placed under the Directorate General for Medical Production ("GUMPRO"). Thus, concessional pharmacy system was abolished and the work of the Pharmaceutical Association was suspended. In 2011 Pharmaceutical Society of Serbia was re-registered as the Pharmaceutical Association of Serbia.

As the only association of pharmacists in Serbia, their sections have brought together pharmacists and hospital pharmacy practice, industry practice, control of medicines, medicinal plants and sanitary chemistry, toxicology, chemical and biochemical practices.

## **3.FINANCIAL VIABILITY**

While everyone recognizes the vital role that pharmacies play in the delivery of front-line care, the reality is that the economics of community pharmacy are under pressure and the model, particularly for independent pharmacists, is at a turning-point.

According to the research about The Future of Community Pharmacy in England [4], five forces were identified to profoundly shape the future of community pharmacy:

**Squeeze on healthcare budgets.** Despite rising demand and volumes, all indications are that the pharmacy settlement will remain flat in real terms. This reflects the pressures on public funding, which stem from the current financial crisis and longer-term pressures on National Health Service (NHS) expenditure as a result of an ageing population. The proposed shift from simply dispensing drugs to providing front-line services is unlikely to bring with it net new money and will be financed by a restructuring of the existing settlement.

**Intensifying competition.** The industry continues to consolidate slowly. With the demise of the high-street and the rise of out-of-town shopping, supermarkets are becoming an increasingly competitive force in the pharmacy landscape. In the race for the new 100-hour licenses, multiple pharmacies have largely won out.

**Transformation of the supply chain.** The nature of innovation is changing and with it pharmacy models. Community dispensing is already dominated by commodity generics. This will become even more prevalent as the higher-value biologic therapies that currently dominate industry pipelines move into hospitals and homes. As manufacturers struggle to make a profit in primary care products, alternative distribution arrangements are being implemented that threaten the wholesalers in the short term and will inevitably impact pharmacies' buying profits in the future.

**Emergence of new alternative channels.** Internet and mail-order pharmacies are gaining strength and research suggests that the Internet has no age limits. If there is one constraint, it is on the side of commissioners who have been slow to see its potential as a way of fulfilling repeat scripts. In Germany, supported by regulatory change and sickness fund policies, mail-order pharmacy has grown rapidly. In the most conservative scenario these new channels should account for at least 20 per cent of all volumes. With the rise of the connected consumer, bricks-and-mortar pharmacies will not be the only way to deliver service.

**Demand for convenience and expertise.** Today's health consumer wants it all. Whether it is prescription services, personal care products, or clinical services, the priority is on expertise, convenience, and accessibility.

Industry experts together with scientist worked to build a scenario model to simulate the impact these five forces could have on community pharmacies' profits [4]. Their findings suggest that the combined impact of these forces could result in a 38 per cent decline in the average profitability of a pharmacy. All pharmacy contractors will have to change to meet the challenge. Independent pharmacies, in particular, will be severely challenged with a very real prospect that up to 2,000 outlets could be closed.

There are two strategies that contractors, regardless of size, should consider in order to survive: to improve efficiency of supply or to become the first port of call in the healthcare system.

**Improving the efficiency of supply.** To meet rising dispensing volumes within a fixed budget, pharmacies need to improve their efficiency in filling prescriptions by at least 20 per cent. This can only happen with greater scale economies of operations and investment in dispensing automation. Multiples will need to centralise dispensing within their own networks. Independents will need to rely on wholesalers to deliver central dispensing services, as is the case in the Netherlands, or develop cooperative or in joint-partnership models.

**Becoming the first port of call in the healthcare system.** As dispensing becomes a commodity, pharmacies need to develop a sustainable revenue stream based

on monetising their role in the front line of healthcare. This may come both from nationally and locally commissioned services.

There is no doubt that multiples will be in a better position to achieve both scale economies in dispensing and provide an improved approach to delivering nationally commissioned services. On the other hand, independent pharmacies and smaller regional chains have the unique opportunity of differentiating their positions by tailoring their offering to local priorities.

These findings [4] suggest that pharmacies that deliver dispensing efficiencies and strengthen the role of services in their business mix, can sustain current profit margins over the medium term. But doing so will require up-front investment and will not be without risk.

Importantly, pharmacists cannot do it alone. Government and regulators must provide an enabling environment and the profession needs to demonstrate leadership in building the capabilities required in the new model. As seen in Scotland with the development of a new, service-oriented pharmacy model, the Department of Health (DH) and the NHS have key roles to play in setting the agenda for change and aligning stakeholders across the spectrum of commissioners, clinicians, pharmacy contractors, and patients [5].

#### **4. CONCLUSIONS**

The pharmacy industry is rapidly approaching a crossroads that offers an opportunity for true transformation. Pharmacy can become a more efficient supplier of medicines and a more integrated provider of care and clinical advice, which can help the healthcare system tackle the burden of an ageing population and rising levels of chronic conditions. Smaller independent pharmacies may be at an immediate disadvantage in achieving a step change in dispensing productivity, but their knowledge and connections with local health economies and GP practices could allow them to build a highly localized approach to service delivery. Independent pharmacies are increasingly coming together to form local partnerships. Larger multiples need to move rapidly to implement centralized dispensing models and standard services to position themselves favourably with commissioners.

Change will not be easy and will require significant investment and commitment from within and outside the industry. Change may also result in the forced or voluntary exit of some contractors. However, this transformation journey will be worth starting as this may be the last chance pharmacy gets to reinvent itself as a credible contributor to the improvement of the health of the nation, and to ensure its financial survival.

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## LEVERAGED BUYOUT FINANCIAL MODEL

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**Abstract:** *The situation in the global financial markets has become very turbulent in the recent decades, and as the main "culprit" we can blame the globalization process. Multinational companies have managed to expand their business and invest the capital around the world and thus contribute to the transformation of the financial markets from the local to the global level. The first part of our work includes the history and definition the LBO model. Further on, the topic is the way of financing the first joint-stock companies, where the structure of debt and its importance are explained. The functioning of the LBO model, starting from the formation of private equity funds and up to the IPO, are analyzed, as well as its advantages and disadvantages.*

**Keywords:** *Acquisition, transactions, capital market companies, investing, market risk, leveraged buyout*

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## 1. INTRODUCTION

During the recent decades global financial markets have been accompanied by insecurity, uncertainty, panic and greed. Multinational companies have managed to expand their business and invest the capital around the world and thus contribute to the transformation of the financial markets from the local to the global level.

With the growth and development of both individual and global companies, the need for some financial institutions that could cope with the growth, in terms of providers of financial services, emerged. The investment banks were some of these institutions, which played a key role in the development of the world financial market.

Looking at the activities of the investment banks, we can see that they are highly profitable institutions that have experienced the heights of enormous proportions, but also bankrupt. These extreme situations show enough about how much of work that they are engaged in is risky and uncertain.

When deciding whether to invest in a company, investment banks can use several evaluation methods that can help them make a decision. One of these methods is the method of venture capital. This method takes into account the cash-flow and its projection into the future can show us whether it is worth investing in a target company, or not. Risk capital is created by the company by forming partnerships, raising funds from various investors. Their goal is to invest in young and weak companies that are becoming modern and which are prepared for the market launch.

The moment when a company becomes public or sold in any other way, a venture capital investment company refunds its investment and generates returns. Starting from the late '60s through the boom in the '80s, and up to now, there has been a common situation in which the risky capital investment makes up only part of the total funds for the purchase of

the target company. The second part of the funds would be borrowed from banks and thus leveraged buyout or LBO model has appeared.

## **2. DEFINITION AND HISTORY OF LBO MODEL**

The very definition of LBO is that it is a form of acquisition, which allows investors to take over the target company by borrowing the most of the funds, and investing a smaller amount from their own resources. At the same time, the collateral for the borrowed capital, in addition to the property of the investors, would be the property of the company that is to be taken over. The main purpose of this model is to enable companies to perform certain acquisitions by engaging a very small amount of their capital.

This acquisition method was first recorded in 1955, when the McLean Industries, Inc. purchased the Pan-Atlantic Steamship Company, and Waterman Steamship Corporation. McLean even borrowed \$ 42 million for the purpose of this, while it obtained the additional 7 million by issuing preference shares. Upon the completion of the acquisitions, \$ 20 million in assets of Waterman Steamship Corporation was used to reduce McLean's debt.

Thus McLean set the model which later investors, Warren Buffett, Victor Posner, Nelson Peltz, Saul Steinberg and Gerry Schwartz developed and applied to their investments and thus contributed to the great popularity of the LBO in the 80s. In addition to this, the model is considered to be the precursor of private equity of companies.

This model experienced a real boom of popularity in the 1980s. The good basis for this was set by three Bear Stearns's bankers: Kohlberg, Kravis and Roberts. In the 60's and 70's they started a series called bootstrap investment. In fact, in those years many family businesses, mainly founded in the period after the Second World War, faced problems in their functioning. The founders did not want to indulge their companies to competitors and they were too small for going public. That's why the buyout by another finance company was a good solution for them. Starting with the acquisition of Orkin Exterminating Company in 1964, which was then considered to be the first large LBO acquisition, in the years that followed, these bankers committed a series of such investments. Some of the acquired companies were Stern Metals, Incom, Cobblers Industries, and Boren Clay. Although the majority of these investments were very successful, it was not the case with the Cobblers where an investment of \$ 27 million resulted in bankrupt. The tensions between the three bankers and their Bear Stearns Bank rose in 1976, so they left the bank and the same year they formed Kohlberg Kravis Roberts & Co company, specialized in LBO transactions.

Taking into account the good fundamentals that Kohlberg, Kravis and Roberts set, another event contributed a lot to LBO boom in the 80s. In January 1982 the former U.S. Treasury Secretary William E. Simon, with a group of investors, took over the Gibson Greetings, a company that produced greeting cards, for \$ 80 million. During the process of acquisition, there were rumours that the amount of the investment was only \$ 1 million. Shortly after the taking over, Gibson Greetings came to stock through an initial public offering and it cashiered 290 million. The huge success of these investments attracted the attention of the media who spread the news around the world and the process of LBO boom started. It is estimated that in the period from 1979 till 1989 there were over 2,000 of these acquisitions in the amount of \$ 250 million or more.

Indeed, the largest acquisition in this period and the next 17 years was the case of taking over RJR Nabisco company (dealing with selling tobacco and food) by Kohlberg Kravis Roberts & Co. in 1989 for 31.1 billion dollars.

Analyzing the acquisitions completed since the beginning of the 21st century, we can state that this period is certainly a period of "mega - buyout". Good ground for such huge acquisitions was made by a combination of lower interest rates, low credit standards and

certainly regulatory changes, primarily the Sarbanes - Oxley regulations which were passed in 2002. In the years that followed, some of the largest acquisitions were: Toys " R " Us, The Hertz Corporation, Metro- Goldwyn -Mayer and SunGard in 2005, Equity Office Properties, HCA Alliance Boots TXU during 2006 and 2007. In the years that followed, the global financial market experienced collapse and new takeovers were disabled.

### 3. PRIVATE EQUITY

Before we discuss the acquisition method with the help of leverage in more detail, we should become familiar with the concept of private joint-stock company (private equity).

The market of private joint-stock companies began to grow in the 70s. The members of these companies are not only big investors such as investment banks, but also individuals, known as *angel investors*. One of the features of this capital is that they are not traded on the stock market, most private equity funds are focused on specific industries and have unique investment objectives. Its main purpose is to be used as an investment in a company. We can also point out that this type of capital can be invested as risk capital (venture capital) or by taking funds (buyout funds).

On the basis of this distribution we can distinguish between the two main ways of private joint-stock companies investing. By forming the risk capital or venture capital, investors aim to invest funds in a young and weak company, to develop it and eventually, usually through the IPO, sell it. During this process, investors invest their funds in a portfolio company through three stages:

1. *Seed capital* - initial, seed capital used to cover costs of production and development;
2. *Working capital* - certainly a core investment, which helps investors to develop a portfolio company and get it ready for the stock market;
3. *Acquisition capital* - represents the capital with which the company can expand its business, all in order to increase profitability.

Generally, a venture capital fund goes through four stages:

- The first phase represents only the raising of the capital for the fund. Note that this part of the work may be performed by an investment bank;
- The second phase is an investment in the shares of the private joint stock company which lasts from 3 to 7 years;
- The third phase, which lasts until the closing of the fund, is the phase of the enhancing of the development the company's portfolio;
- The fourth and last phase is the closure of the fund, i.e. liquidating its positions, which can be done through the IPO, sale of the company or bankrupt.

Another way of investing of private joint stock companies is placing capital collected through the LBO (leveraged buyout). The very definition of this method is given in the introduction, and we will get more familiar with the details of the process of such an investment below.

### 4. STRUCTURE OF DEBT IN LBO TRANSACTIONS

This method of investing is very popular and is usually a win-win strategy for its participants (the investors who borrow the capital and the bank that sold it). Investors can use leverage to help increase their ROE. On the other hand, supporting such projects, banks may

place their funds at much higher interest rate than conventional loans to their corporate clients.

The amount that banks are willing to sell depends on a few key things:

1. The quality of the assets of the company to be taken over (the stability of cash flow, the history of the company, its fixed assets);
2. The amount of capital that the financial sponsor (the company making the acquisition) will engage in the business;
3. The general picture of the financial sponsor (background and experience);
4. Economic environment.

After completing the analysis, the bank decides on the placement. If the targeted company is, for example, engaged in real-estate renting, and its jobs are secured by long-term lease agreements, the sale of the bank can go up to 100 % of the purchase price. On the other hand, if it comes to a "normal" company, with a normal business risk, the placement of the banks can go up to 50-60 % of the purchase price. The amount that banks are willing to sell also depends on the Industry-sectors in which the targeted company operates and the region where it is located.

Depending on the size and cost of the acquisition, we distinguish between two types of loans that banks can offer:

1. *Senior debt* - type of debt that is secured with the assets of the targeted company and which carries a lower interest margin;
2. *Junior debt* (mezzanine) - It is not usually secured with some collateral, but carries a higher interest margin.

One of the characteristics of debt is that sometimes, with large transactions, one of the two types of loans, or at least one their part, may be replaced by releasing so called junk bonds or high-yield bonds. These bonds are characterized by a high degree of risk, but because of that they bring about very high interest rates.

The Bank may, depending on the size of the transaction, sell parts of the debt to other banks and thus diversify the risk the transaction is carrying.

## 5. FUNCTIONING OF THE MODEL

In the chart below we can see how LBO works in reality. It all begins with the initial decision of investors and financial sponsors to buy the target company. A financial sponsor usually consists of several companies, representatives of private capital. They can be pension funds, insurance companies, and even individuals, known as business angels. They join their resources and form a fund in the form of limited partnerships (private equity fund). Once they have combined their resources and agreed on a targeted company, investors start looking for a bank that will provide funding in the amount of 60% - 90% of the purchase price. As previously discussed, depending on the size of acquisitions, the bank decides how to invest the funds. This can be with the help of Senior debt- which is secured with the assets of the targeted companies and usually carries an interest margin of 3% -5%, through Libor or Euribor with duration of 5 to 7 years. Another option is so called Mezzanine debt, which is usually not so well secured, but because of that, there is much higher interest margin, which goes up to 7 % -16 % and usually returns after 7 to 10 years.

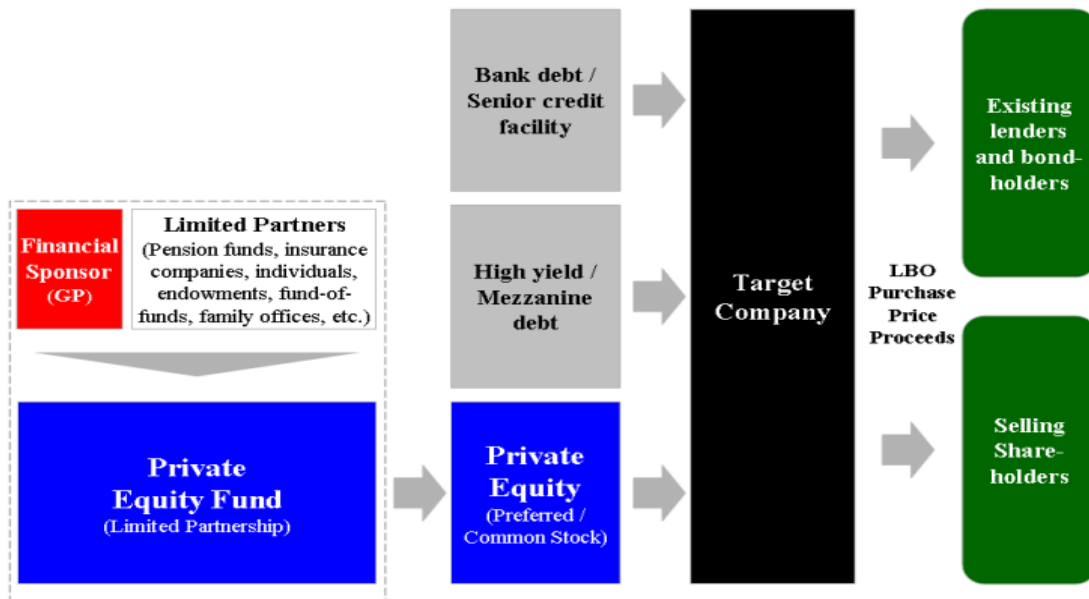


Figure 1. Leveraged\_Buyout\_Diagram

Source : [http://en.wikipedia.org/wiki/File:Leveraged\\_Buyout\\_Diagram.png](http://en.wikipedia.org/wiki/File:Leveraged_Buyout_Diagram.png)

After the conclusion of the agreement with the bank, the targeted company is bought. Soon the new owners modernize the company (possibly decreasing the current management of the company) and prepare it for an initial public offering (IPO). In this way, they collect sufficient funds to repay the debt and benefit from this work.

## 6. TYPES OF LBO

In addition to classical acquisitions with the help of leverage, which we explained in the previous chapters, we distinguish between the secondary and tertiary acquisition. The secondary acquisition is the purchase in which the buying party and the selling party are both financial sponsors. In other words, it's LBO in which the acquired company has previously been acquired with the help of a LBO, and it is owned by the fund established by initial capital investors. Some of the reasons why there is a secondary LBO are:

1. The inability of the IPO because of weak business of the acquired company;
2. A faster way of selling (unlike the IPO);
3. The very nature of the business of the company may be more interesting to financial sponsors, rather than to investors who invest in stocks.

This method of sale, regardless of the fact that it is often described as panicky, can be very profitable. Sometimes it happens that the company that has been acquired enters the stage where it would be very profitable to sell it quickly and this way is the fastest. Also, it is possible that an investor benefits enough from the acquired company, so they can sell it to another investor.

The tertiary LBO is nothing else but when the company purchased with the secondary LBO is sold in the same way to the third investor.

## 7. MBO - MANAGEMENT BUYOUT

A special type of acquisition with the help of leverage is the MBO. In this case, the existing management team buys majority of the stake and becomes the majority owner of the company. This type of acquisition can be justified as follows:

1. The old owners want to retire and leave the business to the management, a group of people that have known each other for years and who trust each other.
2. The old owners do not believe in the business of their company and want to sell it to management who thinks that the company has a future, and thus derive a profit.
3. The management sees potential in the company as the owners do not see it.

It often happens that the management does not have enough capital to take over the business, and are forced to join with the financial sponsor in order to do this together. The very negotiation with the sponsor is the key moment for the management, the team in which they can create some value for themselves. Certainly, financial sponsors take into account such an offer, because if the people who have run the company believe that it will work well in the future, it is more than enough for them to enter the business.

## 8. ADVANTAGES AND DISADVANTAGES OF LBO FINANCIAL MODEL

The main advantage of LBO is that venture capital of the company in these transactions may be minimal, and most of the purchase is financed by debt. The very debt, usually with high interest rates, motivates the company's management to work more efficiently. One example of how LBO can be useful is that the interest costs are tax deductible, while dividends costs are not. Therefore LBO can make so called tax shelter for the targeted company. Also, the acquired company may have huge benefit, considering that after the takeover there will be many reforms that will contribute to the growth and development of the company.

The calculation of a well conducted LBO, hypothetically might look like this:

Assume the following:

1. Purchase price of the targeted company is 8 times EBITDA. If the proceeds from the sale are 500, a margin of 20%, EBITDA amounted 100, the purchase price is 800.
2. We will borrow 50 % of the purchase price, and the other 50 % will be financed under the equity (400 debt, 400 capital).
3. In five years, the company will be sold at a price that is also 8 times EBITDA.
4. EBITDA rises from 100 to 150.

During this period there is a possibility that the company returns 20 units of the debt annually, which after 5 years would be 100 units of the debt. At the end of the period the company is sold for 8 times 150 (EBITDA) = 1200. Three hundred of this is debt, as we have already returned 100 during the period. When we subtract the remaining debt from the purchase price ( $1200 - 300 = 900$ ) we get 900 units of capital, and in the beginning we invested 400, which leads us to our IRR (internal rate of return) of these investments being  $900/400 = 2,25$ .

If poorly implemented, LBO can lead the targeted company to bankruptcy. It is one of the main reasons, apart for the realization of the set goals in general, why the management of

the company should be closely connected with investors - customers of the company. The whole connection can be much stronger if the management team is included in the process of acquisition.

Certainly one of the main risks here is the debt with which the company has been purchased. Unless something unforeseen happens, it is very likely that the entire investment will collapse. Also, it is known that the cash-flow of these transactions plays a role of support, and that it depends heavily on whether the company will be able to repay the borrowed debt. Another risk that investors face in such transactions is market risk. If there are, for example, increased costs, the company will not be able to meet the required level of solvency and can easily fall into a lot of trouble.

Even after a successful LBO there is a possibility of a conflict of interest between management -employee -shareholders. It is known that one of the basic methods of reducing the cost is firing workers. If there are frequent LBO transactions, because of these measures, the unemployment may increase and consequently affect the whole economy.

## 9. CONCLUSION

On the basis of these findings, we conclude that the LBO transactions have been a very popular way of investing in the last 30 years. The main reason for its popularity is actually that it allows investors to engage small portion of their capital, to borrow most of it, and to put the assets and future cash flow of the acquired company as collateral. Investors will certainly, based on their *know-how*, restructure the company, which should thereafter become far more profitable in its business. In this way investors make the odds from which they pay the debt back, and also prepare the company for future sale from which they will certainly benefit. If properly implemented, this way of acquisition is a win-win strategy, from which both the investors and the company itself benefit- the investors after the IPO, while the company itself becomes much larger and more profitable.

In the end we can say that without the investment banks we would not be able to imagine the financial market as we know it. We can blame them for the various scandals that have had a disastrous impact on the world, but it often turned out to be the result of poor, greedy management. On the other hand, we can admire them for all financial innovations which certainly contributed to the efficiency of the global financial market.

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## THE BISHOPS AND EPISCOPAL ACTS IN THE SYSTEM OF CHURCH GOVERNMENT OF THE BYZANTINE EMPIRE

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**Abstract:** *This article examines the episcopal order management in the Byzantine Empire. Episcopal acts identified as an important institution of administrative and ecclesiastical hierarchy. The canonical acts closely corrected with government regulations.*

**Keywords:** *acts, church management system, Bishop, regulatory support*

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## 1. INTRODUCTION

Church hierarchy Patriarchate of Constantinople occupied an important place in the administrative and administrative-territorial system of the Byzantine Empire. First of all, it is about bishops and their acts. Business bishops had not only the canonical, but public-law nature in view of the close church-state relations in romeyskoyu state. Analyzing the development of scientific problems as works of note M. Syuzyumov [15; 16], V. Tsypin[18], S. Udaltsova [17]. Some issues of episcopal administration by already raised in its publications devoted to the canonical norms [6] and acts [7; 9], the canonical law-making [10], human rights and judicial functions of the bishop [8].

## 2. EXPERIMENTAL

The bishops elected its chair in life [16, p.154]. 1 Chapter 123 Novels of Justinian (De diversis ecclesiasticis capitibus) identified the quality of the applicant: they profess true faith, exemplary life. Establish age and educational qualifications for bishop. Those candidates for bishops to this were in the public service or have served in the military were held in the monastery at least 15 years [18, c. 84]. Dedication carried out by all the bishops of the diocese. In case of failure to complete their collection together had come at least three of them, with the express consent of the other missing (comment Aristenos) [12, c. 64]. The agreement was to be expressed by letters. Rule ordination of the Apostles (χειροτονία) call initiation and imposition of hands, and the conciliar decree instruction and dedication election called and determined that the election of the bishop held to as Joint collection of three bishops of the written confirmation of consent is absent (in the charters they indicate that and they support the election, which must spend three bishops). After his election as the approval of its decisions (τελεσιουργία, ie final decision), laying on of hands and dedication Rule pinned to the Metropolitan area in which the election was held (Zonaras comment). Aristenos and Zonaras wrote the bishops elect three candidates, one of whom claimed Metropolitan [13, p.15].

Valsamon added that the Metropolitan himself makes a choice and it holds ordination by one of three presented to him after the election of bishops candidates. Some

bishops who conducted the election of their bishops in the capital with three bishops of dioceses of strangers, or even his own, but without reference to the other bishops of the diocese, referred to Rule 13 of the Council of Carthage. A similar provision contained in Rule 19 of the Council of Antioch [13, p.16]. However, the Patriarch could remove and appoint a new bishop. So in 1342, Patriarch John of Thessalonika Cripple appointed Metropolitan Macarius. After the next release of the Department of Thessalonika Patriarch held elections for a new metropolitan, who became a monk from the monastery Odyhitrios Iakynf [15, p. 33]. To limit the interference of the secular power in the procedure of selection of a bishop VII Ecumenical Council declared elected secular authority had no effect. However, despite these bans such practices occurred in the future [14, p. 398].

### 3. RESULTS AND DISCUSSION

Transfer to another department bishop prohibited. Move the bishop according to the canons of the Cathedral could only [16, p.154]. Clergy and laity in each city had to obey their bishop. They met with him for common prayer and other religious affairs, as long as long as it is not because the Court recognized the wicked or unjust. However, spontaneous resistance bishop separation from him and the organization of some religious assemblies from both clergy and laity, were regarded as an offense; Culprits waiting deprivation positions (clerics) and weaning (the laity). However, sanctions are gaining strength only after three warnings (Valsamon) [12, p. 64]. At the bishops relied on building function of the Church in his diocese, conversion to the non official Church, enforcement of churches and church hierarchs higher level. The decree of March 26, 533 bishops placed the imperial order to protect the flock from the heretical influences. Decree of 6 August against 533 Anfimios, Severus, Peter and Zohar obliged Ecumenical Patriarch Minh bring it to the attention of the bishops [2, p.75]. Bishop of weakening during the municipal organization began to concentrate in the hands of not only spiritual, but also political power in their dioceses [17, p. 94]. They were given oversight of the cities in his diocese, and even used the imperial honors as leaders of the people (δῆμαρχοι) [14, p.398].

To control the number of monasteries, Bishop of the abbots appointed Archimandrite. About archimandrites said in Enotykoni Emperor Zinon and novels (5 and 123) of Emperor Justinian. Subsequently, the control functions have moved to large monasteries sakelarios [11, p. 43-44]. Control of the monasteries by the Bishop acquired various forms, even leading to the closure of monasteries. This is evidenced by the complaints to higher Church leaders and even the Patriarch of Constantinople. It is no accident Patriarch Nicholas the Mystic requested Metropolitan Patrs redress based on the widow of the monastery, who suffered persecution by the local bishop [5, p. 102].

The clergy (clergy) was a complex hierarchical organization. Bishop had advisors (syncellus), which are usually performed later by his successors. Special weight gained position apokrysiarius - Patriarch of trustees to conduct external negotiations. Yuryskonsultantom bishop was ekdyk who designed the civil actions by Roman law. Prominent role in the Bishop and Archdeacon Archdeacon played that normally prepared theological speeches for him.

To obtain various acts under Bishop notariyi were organized into a corporation headed by prymykirios. Head of Archives - hartofilak - went to the office of archbishop. Economic affairs bishop led economy. Guardians treasures were skevofilakos. They have served as treasurers. The lower layer of the clergy belonged to deacons in the presbytery. Deacon performed various assignments priest at services. Large churches had subdeacons

(assistant deacon). Among the clergy were readers who have served the bishop. To lower clergy belonged paramonarios who prepared the room for worship and serve the priest. Deans, mostly lay people, guarding the church and served as the church staff prisons. Personal subservient bishop carried kuvikulyarios (sleeping). The structure of the clergy - employed, burial grounds, diggers. Organization buried along with all expenses to assume lektikarias. In Alexandria, a special position occupied iparavolanus who were in the service of the Archbishop of Alexandria. They provide protection and prosecution archbishop of his enemies [16, p. 157-158].

However, the emperors gradually strengthened its influence on internal church processes. Basil prescribed syncellus (assistant and the patriarch), as was the case with the appointment to the post of Bishop Basil of Corfu [19, p. 198]. With the growing economic and political power and the complicated structure of the church machine, in the tenth century, episcopal senior ranks (hartofilakos, economy, sakelarios, skevofilakos and sakelios) formed a closed pentalogy (five), which is concentrated in the hands of management bishopric. Hartofilak was the head of the episcopal secretion (Office) sakelios and economy - Treasurer bishopric, skevofilak charge of church plate and sakelarios like imperial control functions performed by the financial and economic management of a bishop, first bishop of the monastery controlled [4, p.170].

Among rural parish priests were notarius. They relied administered (sakelarios, primate chorionic etc.) [1, p. 23]. There were catalogs of church positions are clearly defined in each place inside the church hierarchy. So kuvuklios during services held wand bishop. The same duty performed ostiarios who were among the clergy left the choir and belonged to the category of readers [3, p. 236].

So, inside the Church there was a gradual formalization of its own hierarchical system which clearly regulated by internal church (canonical) and church-state rules. The process of becoming romeyos state allows us to trace enhance its Hellenization, a gradual shift from classical Roman legal and regulatory standards confrontation centripetal and separatist tendencies. Diocese also tried to strengthen its independence in matters of domestic life within the one Church. Her organization lined up, given the canonical tradition and the needs of the efficient functioning of certain religious communities in the whole empire.

Church and church -administrative -territorial organization of the Eastern Church has been continuously improved. The order of operation is defined as the state-church, and canonical acts, especially cathedrals decisions (decrees, decisions, canons). Important role in the functioning of the church played as a collective body (especially the Ecumenical and Local Council) and certain church hierarchy (patriarchs, bishops, metropolitans). During the formation of territorial ecclesiastical hierarchy observed both within the diocese struggle for empowerment Church leaders at lower levels and between different dioceses for the expansion of its borders. This was due to the financial status and character. Entry into a separate ecclesiastical structure of the autocephalous status of internal church was accompanied by a prolonged struggle, which was attended by representatives of the government.

Status of Metropolia in the Eastern Church the church hierarchy was determined by a number of factors, especially the church-canonical tradition, making the list of newly metropolis (with a corresponding displacement of old), old bishoprics rise to the rank of metropolis, the change in position of the old metropolis. To determine the status of the Metropolis and the imperial chancellery Patriarchal compiled lists of specific sequences metropolis and bishoprics (Notitiae episcopatum). Place metropolis been manifested in the order of signing letters of bishops in the Patriarchal Synod. The meeting last was participated limited metropolitans, who at the time of its meetings were in the capital.

#### 4. CONCLUSIONS

The clergy (clergy) was a complex hierarchical organization that is regulated by both internal Church (canonical) and church-state acts. Church hierarchy were closely associated with the legal process in the Byzantine Empire. Prominent role in the work of Bishop played *ekdyk* who designed the civil actions by Roman law.

Emperors interfered with the formation of the administrative-territorial structure of the Eastern Church. So the Byzantine Emperor Leo III conquered Constantinople Patriarchate Sicily and Calabria, and the areas of the Balkan Peninsula (Epirus, Illyria, Macedonia, Thessaly, Dacia), which belonged to 731, the Roman Curia. In the V century long struggle of the Church of Cyprus for their autocephalous law. On the other hand, based on the administrative island dependency of local Stratig, Patriarch of Antioch attempted to subjugate the Church hierarchy Cyprus. Intense fighting preceded the recognition of a separate status of Jerusalem bishop. This was strongly resisted the Metropolitan of Caesarea and Patriarch of Antioch. Bishop of Jerusalem subordinate metropolitan of Caesarea, but presided with him in the Palestinian councils.

The right to control the new ranks of the clergy, management elected new Archbishop and Bishops, the general state of the Diocese of Salona, administrators papal estates were interconnected by Justinian in Dalmatia. They were papal representatives (*responsalis*) in the local diocese, and therefore could act arbitrate in disputes between the local archbishop and bishops, church hierarchs and representatives of public authorities.

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## CAST IRON PROCESSED BY ELECTRICAL EROSION

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**Summary:** Erosion processing power is a method for treatment of materials by direct electric current in a working fluid. It is an unconventional method for heavy metal processors. EDM phenomenon consists in the deployment of material at a distance from one another and between which there is an electric potential difference. Introducing the two parts (part that is intended to be processed and the tool that will perform the processing - where cars thread wire or electrode in a car with massive electrode) in a liquid dielectric phenomenon is amplified because the arc is produce between tool and work piece material by local vaporization creates a gas bubble. This creates, in dielectric fluid, a plasma bubble that quickly raise the temperature of the area around 8000-12000°C and that increases and accelerates the phenomenon of displacement of molten material in the surface of the two electrodes. When the potential difference between tool and work piece is interrupted, the sudden drop in temperature causes the gas bubble implosion, creating dynamic forces which have the effect of design molten material out of the crater formed. The amount of material displaced by erosion of the electrode and the piece is asymmetric and depends heavily on certain parameters like : polarity, thermal conductivity , melting point of the material that makes up the piece and electrode characteristics and current applied between the electrode track.

**Keywords:** cast iron, elements, electrical erosion, materials.

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## 1. INTRODUCTION

Electrical discharge machining called erosion processing power, is already used on a large scale in manufacturing, sharpening and hardening tools, forming dies processing, execution micron diameter holes, after cutting complex profiles, removing broken tools (taps, drills). Use electrodes profiling tool corresponding to the surface generated by the processing: for holes of different shapes in the form of a stamp electrode, the cutting electrode in the form of a rotating disc or tape or wire with the translational movement. The electrode-tool is connected to the cathode of the pulse generator frequency. In alloys with iron, carbon can be found in two states: bound carbon compound defined Fe-C iron carbide called cementite and free carbon as graphite. When the changes in the cooling takes place so that carbon is linked to the system is metastable, cementite is unstable and decompose on heating. If changes take place such as to cause the separation of carbon in the form of graphite, the system is stable. If these alloys eutectic transformation occurs after stable diagram and eutectic transformation can be done for both the chart and after the metastable stable. Gray cast irons differ only in the form of nodular graphite irons. Obtaining nodular graphite is achieved by adding some elements (magnesium, calcium, lithium cast iron corresponding liquid composition having a gray cast iron. Nodular graphite is much less unfavorable influence on the resistance characteristics of the material, whereas the interruption of the base metal mass is smaller than in the case of gray cast iron, where the graphite strips act as notches. Gray

and nodular cast irons have a structure consisting of ferrite base board, which are laminated to the formation of graphite in the nodular gray and globular. Nodular pearlitic and pearlitic gray cast irons are made of pearl metallic mass which are formations of graphite. If this font eutectic reaction after diagram arising stable and metastable diagram for eutectoid reaction. Metal Broad gives them good mechanical strength, obtained directly from the hardware. Gray and nodular cast irons have weight pearlitic ferrite-pearlite and ferrite formed metal that are formations of graphite. Ductile cast iron is an iron alloy with a silicon - carbon - graphite structure . Ductile cast iron is that cast iron, the graphite is present in the form of strips . Under the action by a major effort, each blade can lead crack formation . Why gray iron shows a brittle behavior . Cast iron still have some outstanding features : compressive strength , fatigue resistance , corrosion resistance . Ductile or nodular iron is obtained by controlled introduction of a small amount of magnesium in cast iron desulphurisation in advance. In ductile cast iron , spherical graphite crystallized form which eliminates the risk of spreading cracks or tears . Ductile cast iron gray iron is different in its structure and in addition to the quality gray cast iron has the following additional features: high limit of elasticity, elongation importance , shock resistance , tensile .Cast iron shows a brittle behavior. Ductile cast iron is flexible and deformable without the risk of rupture.

## **2. TECHNOLOGY AND CAST IRON MATERIALS PROCESSED BY ELECTRICAL EROSION**

For the realization of the experiment was used electrical erosion machine AR-1300 (figure 1).

The AR series wired Novick can process complex objects such as molds, rims, components, marine, automotive, aircraft, gears and other hard objects processed. You can plan and oblique cut work pieces with a maximum size of 1300x900mm and a height of 500mm. CAD-CAM programming system allows operators to automatically execute the program by drawing directly to the screen or entering waters DXF files from a source external CAD.



Figure 1: Electrical erosion machine AR-1300

In figures 2-21 are shown in the various structures of cast iron processed in electrical erosion machine AR series.

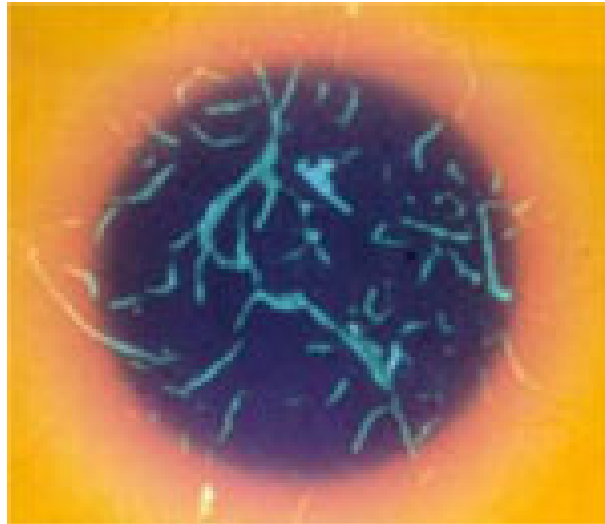


Figure 2: Ductile cast iron

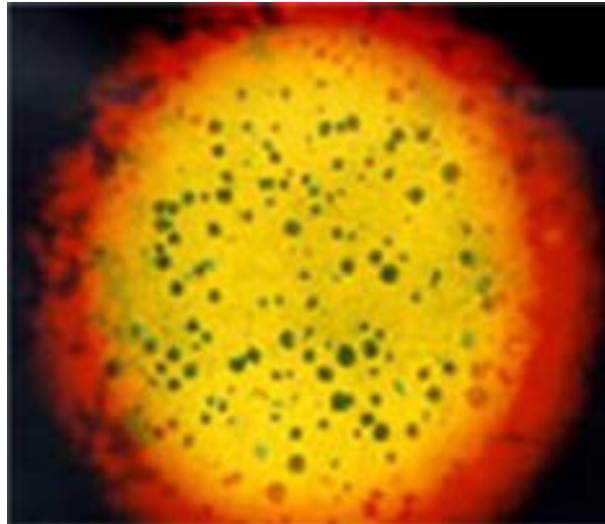


Figure 3: Ductile cast iron

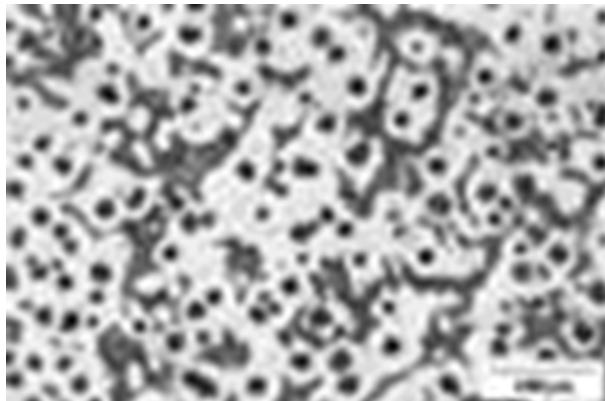


Figure 4: Cast iron composition Fe, 3.52 C, 2.51 Si, 0.49 Mn, 0.15 Mo, 0.31

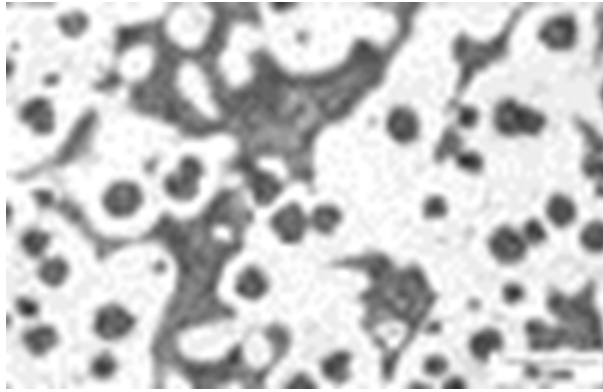


Figure 5: Cast iron composition Fe, 3.52 C, 2.51 Si, 0.49 Mn, 0.15 Mo, 0.31

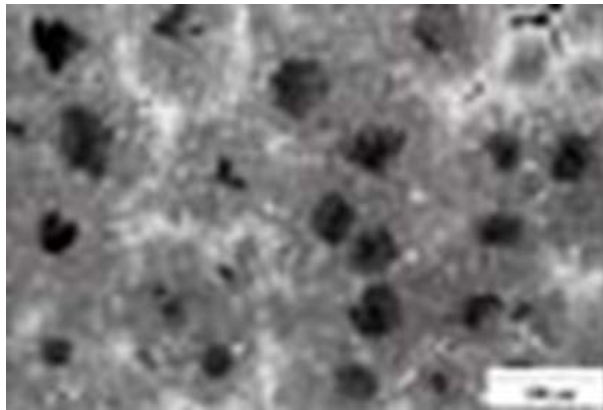


Figure 6: Cast iron composition Fe, 3.52 C, 2.51 Si, 0.49 Mn, 0.15 Mo, 0.31

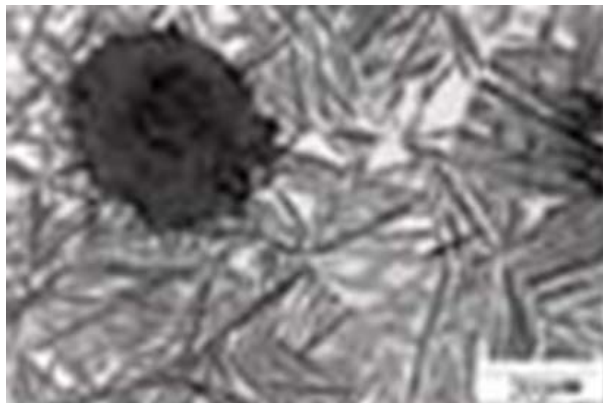


Figure 7: Cast iron composition Fe, 3.52 C, 2.51 Si, 0.49 Mn, 0.15 Mo, 0.31

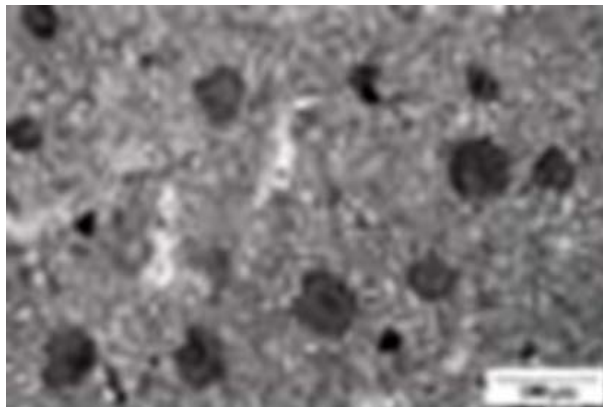


Figure 8: Cast iron composition Fe, 3.52 C, 2.51 Si, 0.49 Mn, 0.15 Mo, 0.31

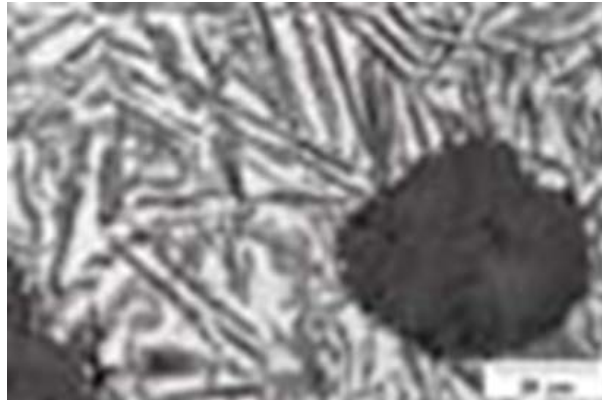


Figure 9: Cast iron composition Fe, 3.52 C, 2.51 Si, 0.49 Mn, 0.15 Mo, 0.31

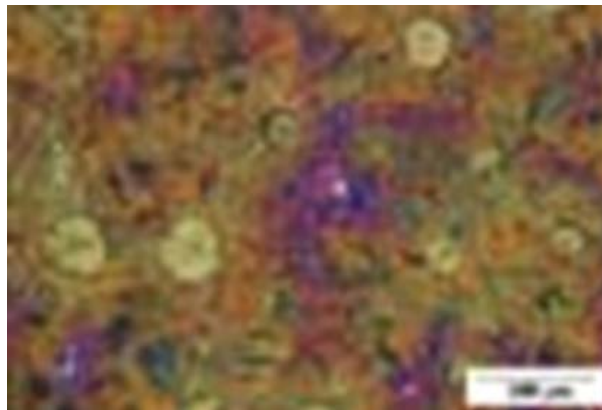


Figure 10: Cast iron composition Fe, 3.52 C, 2.51 Si, 0.49 Mn, 0.15 Mo, 0.31

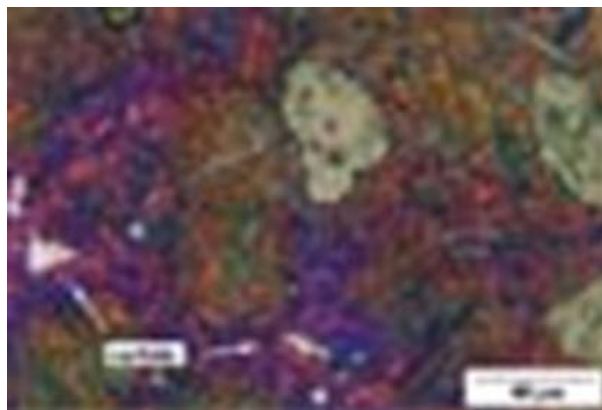


Figure 11: Cast iron composition Fe, 3.52 C, 2.51 Si, 0.49 Mn, 0.15 Mo, 0.31

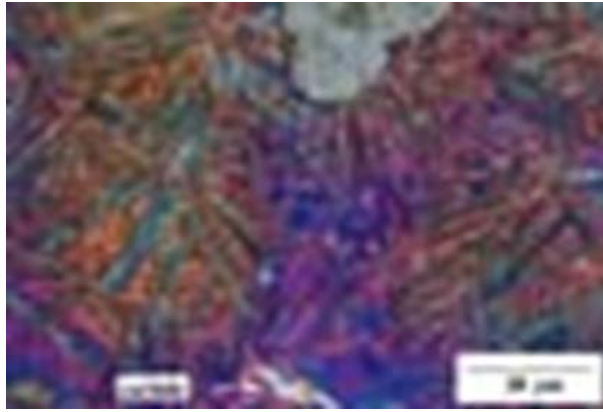


Figure 12: Cast iron composition Fe, 3.52 C, 2.51 Si, 0.49 Mn, 0.15 Mo, 0.31

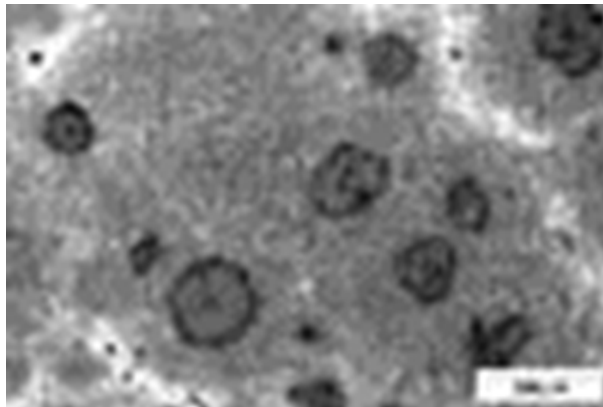


Figure 13: Cast iron composition Fe, 3.52 C, 2.51 Si, 0.49 Mn, 0.15 Mo, 0.31

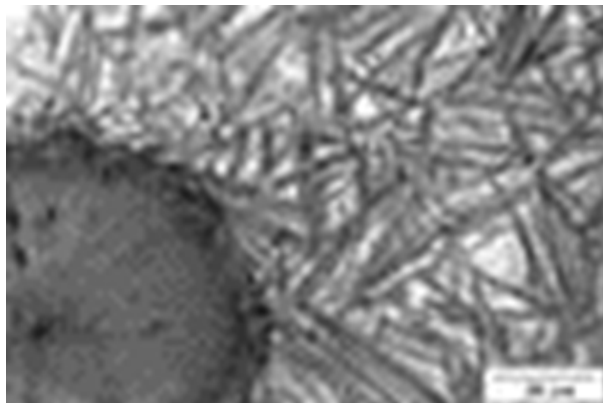


Figure 14: Cast iron composition Fe, 3.52 C, 2.51 Si, 0.49 Mn, 0.15 Mo, 0.31

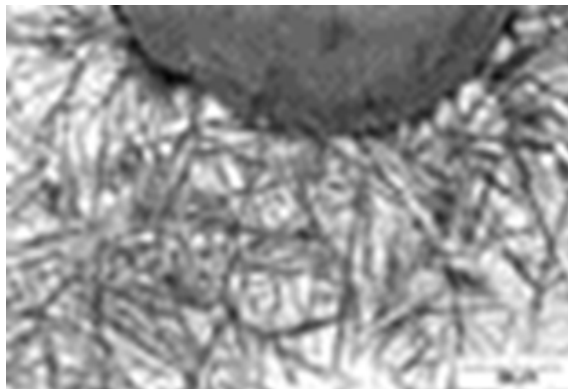


Figure 15: Cast iron composition Fe, 3.52 C, 2.51 Si, 0.49 Mn, 0.15 Mo, 0.31

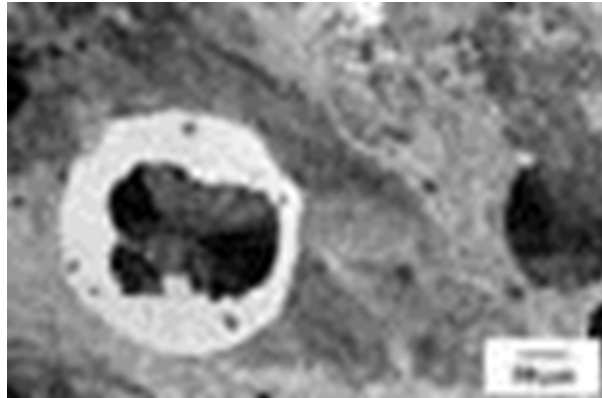


Figure 16: Spheroidal graphite iron Fe, C 3.2, 2.5 Si, Mg 0.

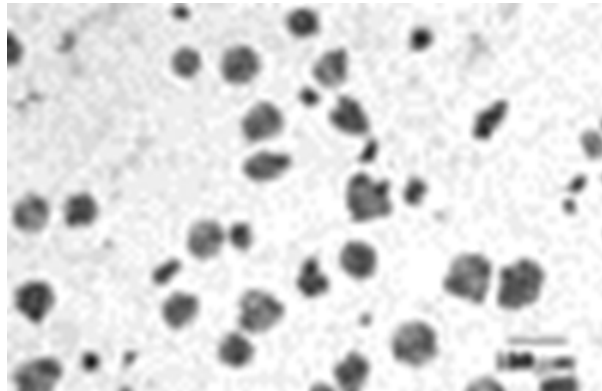


Figure 17: Spheroidal graphite iron Fe, C 3.2, 2.5 Si, Mg 0.

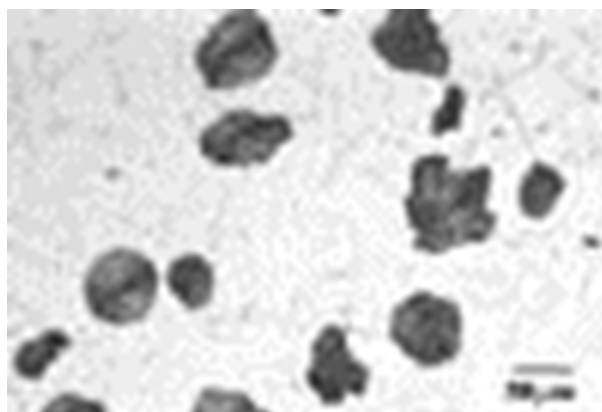


Figure 18: Spheroidal graphite iron Fe, C 3.2, 2.5 Si, Mg 0.

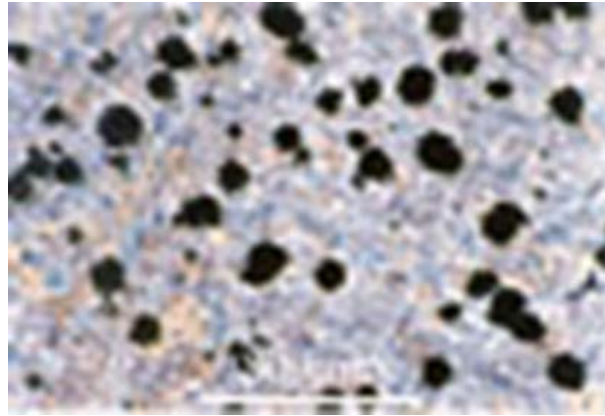


Figure 19: Pearlitic malleable cast iron system, C 2-4

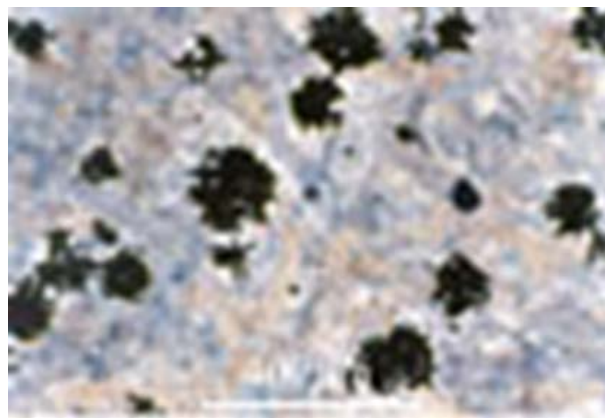


Figure 20: Pearlitic malleable cast iron system, C 2-4

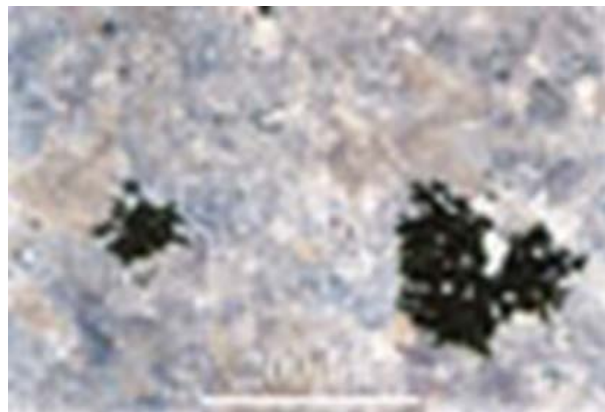


Figure 21: Pearlitic malleable cast iron system, C 2-4.

### 3. CONCLUSION

These cars use a molybdenum wire for each electrode and adopt a type thread rolling processing benchmarks. Geometric accuracy of the machined parts can reach  $\pm 8\mu\text{m}$  and the rough surface best  $R_a = 0.9\mu\text{m}$ . Ductile cast iron (spheroidal or nodular cast iron) replaced the use of cast iron in the manufacture of pipes and fittings. Ductile iron has a tensile strength more than double the usual cast (420Mpa to 180sqm). Easy to splice

can be installed in any weather conditions and often without requiring an embankment. To high resistance factor and factor of safety and quality to adapt to any soil movement has made material for manufacturing ductile iron pipes and their use in a wide range of applications. Cast irons features: high strength, high safety factor, resistance to vibrations.

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Use of abbreviations has to be reduced to minimum.

Conventional units can be used without their definitions.

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