Factor Limitations on Industrial Dynamics in Bulgaria in Conditions of European Integration

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Summary: Structural reform of the Bulgarian economy in transition and the European Union pre-accession period led to many negative phenomena in the national economy of the micro, meso and macro level. Such negative phenomena such as loss of markets, low innovation activity and lack of innovation, lower quality of products and services, inefficient organizational management and production structure, inhibit the growth of business and the economy as a whole. However, analysis indicates that in some sectors of the industry has seen significant and steady growth based primarily on increasing investment, increasing innovation activity in the area of product and technological innovation, increase productivity, etc. In this paper examined the factors that determine sustainable economic growth, followed by their dynamic development for a 8-10 year period. On the basis of such conclusions are drawn on the extent and direction of their impact on industrial developments.

Keywords: Industrial dynamics, economic growth, innovation, innovation activity, investments, sales.

Introduction

The questions of industrial growth and dynamics of its dimension have preserve their currency over the years since the time when the concept of "industrial dynamics" was first defined to date. For the past more than 60 years, a number of studies have been made in the field of industrial dynamics and many authors have aimed their scientific research and academic work at revealing the peculiarities, specifics and characteristics of industrial dynamics as a whole or by its separate parameters and components.

The term "industrial dynamics" was first used by Forrester in 1961 when his monograph of the same name was published (Forrester, 1961[1]). The underlying feature of his theory, which has been accepted by the subsequent researchers, is the "evolutionary approach" to the development of economy defined by Shumpeter[2] already in the 1940s. The main reason that is considered is the presence of "entrepreneurial management" as an economic phenomenon which changes industry from within, thus being a major challenge to industrial growth (Krafft 2005[3]).

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[1] Forrester J.W., 1988, Designing Social and Managerial Systems, System Dynamics Group, Sloan School. Cambridge, MA. Massachusetts Institute of Technology, October 1988; Forrester, J.W., 1961, Industrial Dynamics. Portland, Oregon: Productivity Press.
[2] Shumpeter J., 1961The Theory of Economic Development, New York: Oxford University Press.
[3] Krafft T., 2005, Introduction: What do we know about industrial dynamics?, paper.

The possibility of studying the entry/exit interrelations of the "industry" system by using mathematical tools is crucial for the development of science and practice in the field of industrial dynamics. A number of researchers have focused on the "system characteristic" of industrial development. To that end, the so-called system models of industrial development are created on the basis of the Cobb-Douglas and Solow-Swan production function (Кузнецов & Мичасова, 2007[4]).

In the contemporary research the "industrial dynamics" includes:

• Research and assessment of the level of impact of sector strategies and policies on companies;
• Analysis of companies (e.g. economic analysis, financial analysis, competitiveness analysis, production efficiency analysis, etc.) operating in a broad area and of those of narrow specialization, including the ratio of different groups in terms of the scope of their activity.
• Research and analysis of the degree of vertical integration in the industry sector.

The industrial dynamics not only describes and analyses the current industrial structure[5] but it also deducts the factors that make the "industry" system change over time (Krafft, 2004[6]; Dietrich, 2006[7]). The fundamental assumption is that "[...] for every event there is a cause which is, in its turn, the effect of an earlier cause and so on until the prime cause is found." (Д. Димова, 2008[8]). In this way an assessment is made of the current condition of industrial structure and is compared to the target condition. The obtained objective difference serves for management decision making.. The peculiar thing is that the management decision in the preceding period is posed as a problem in the present moment.

In order to define the elements and measures of the industrial dynamics it is necessary to deduct the highlights when addressing the issues of industrial growth. Here one should note that the industrial growth **is observed at macroeconomic level but can be studied only at microeconomic level**. The reason is that industrial development is taken as a basic result of the process of creation (innovation) of new products and technology; from the process of selection of dynamic markets for operation (carrying out of sale activity); as well as from the capacity of the economic system to retain the "winners" and to eliminate the "losers" (Eliasson and Eliasson 1996, Eliasson 1996,1998, 2000, 2001; Eliasson and Taymaz 2000[9]).

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[4] Кузнецов Ю. А., О.В. Мичасова, 2007, Теоретические основы имитационного и компьютерного моделирования экономических систем, Нижний Новгород.

[5] The industrial structure is an expression of a set of independent units (subdivisions) which determine the composition of the common (e.g. economy, industrial sectors, individual enterprise) and which are characterize by certain interrelations between their individual elements. Thus, by using the systematic approach it is possible to study economic phenomena by observation of microeconomic situations. Author's Note.

[6] Krafft J., 2004: "Entry, exit and knowledge: Evidence from a cluster in the Info-communications Industry", Research Policy, 33, 1687-1706.

[7] Dietrich M., 2006: The Economics of the Firm, Routledge, London.

[8] Димова Д. Д, 2008, Един подход за осигуряване на конкурентноспособност чрез фирмени стратегии, основаващи се на динамично моделиране на производството, 8-ма международна конференция „Авангардни машиностроителни обработки", Кранево, с. 68.

[9] Eliasson, G.,1996. Firm Objectives, Controls and Organization – the use of information and the transfer of knowledge within the firm. Boston/Dordrecht/London: Kluwer Academic Publishers; Eliasson, G.,1998. "Competence Blocs and Industrial Policy in the Knowledge Based Economy". OECD Science, Technology, Industrial (STI) Revue; Eliasson, G.,2000. Industrial Policy, Competence Blocs and the Role of Science in the Economic Development. KTH, TRITA.IEO R 1998-08., Journal of Evolutionary Economics, No. 1, 2000; Eliasson, G.,2001. The Role of Knowledge in Economic Growth. KTH-TRITA, Stockholm. To be published in Helliwell, John (ed.), 2001; Eliasson, Gunnar and Erol Taymaz, 2000. Institutions, Entrepreneurship, Economic

In accordance with the foregoing there are three groups of questions to be answered (Bresnahan and F. Malerba, 2007[10]):

• *To determine the competition in the industrial sector*: What is the connection between the radical sector changes and the level of competition among the entrant companies and the ones of "stable" market positions? What are the mechanisms of simultaneous interaction between the new entrants and the existing competitors? What is the relation between the level of product innovation and the competition between "new" and "old" producers?
• *To determine the relation of the technological change, market structures and institutions*: Is there a unique type of evolutional development of the industrial sector? Are there more than one such types of evolutional development? Which are the reasons for the described situation?
• *The relative advantage of industrial sector*: Are there stable advantages of the sector throughout the entire history of its development? Which are those advantages?

The purpose of this article is to study and analyze the factor limitations of the interrelation between the industrial dynamics and industrial growth before and after Bulgaria's accession to the European Union (2000-2009) as well as to deduce those significant trends in the development of industrial sectors and the enterprises therein for the past decade which can be accepted as limiting (respectively supporting) the industrial dynamics in the country.

1. Analysis of macroeconomic indicators related to industrial dynamics

1.1. Gross Domestic Product (GDP) and Gross Value Added (GVA)

Between 2000 and 2004, the average GDP growth was 5.35 % while in EU-25 the average figure was 2.12 %. In 2005, Bulgaria achieved high economic growth of 6.36 % as for EU-25 it was 1.6 %. Bulgarian economy's growth pace exceeded the 3 % growth on an annual basis as set in the Lisbon Strategy. But the GDP per capita was only EUR 2.771 in 2005 2005 or 32.1 % of the average for the EU-25 (measured by purchasing power parity). Between 1997 and 2004 this index doubled. Until 2008 there was a trend of continuous rise of GVA generated in single sectors, then there was a dramatic drop to -2.7 % in 2009, and a smooth rise in the first six months of 2010 up to 0.5 %. GVA accumulated in the sectors of Mining and Manufacturing Industries, Trade and Repairs, Finances and Credit, Construction, has shown growth since 2004 which was ended by the economic crisis. Over the past three years (2007-2010) GVA generated in the Mining and Processing has been down by 19.95 % (Figure 1).

1.2. People employed in industry

For the period 2000-2008, there was an increase of the number of people employed under full-time and public service employment

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Flexibility and Growth – experiments on an evolutionary model. KTH, INDEK, TRITA-IEO-R 1999:13; Cantner-Hanush-Klepper, 1999, Economic Evolution, Learning and Complexity – Econometric, Experimental and Simulation Approaches; Carlsson Bo and G. Eliasson, Industrial Dynamics and Endogenous Growth, paper, 2001.
[10] T. Bresnahan and F. Malerba, 1997, Industrial dynamics and the evolution of firms and nations competitive capabilities in the world computer industry, paper; Dosi G. and F. Malerba, 2002: "Special Issue on Industrial Dynamics",Industrial and Corporate Change, 11, 619-622.] S. Winter, Y. Kaniovski, G.Dosi, 1998, Modeling Industrial Dynamics with Innovative Entrants, International Institute for Applied Systems Analysis, IR-98-022/May 1998.
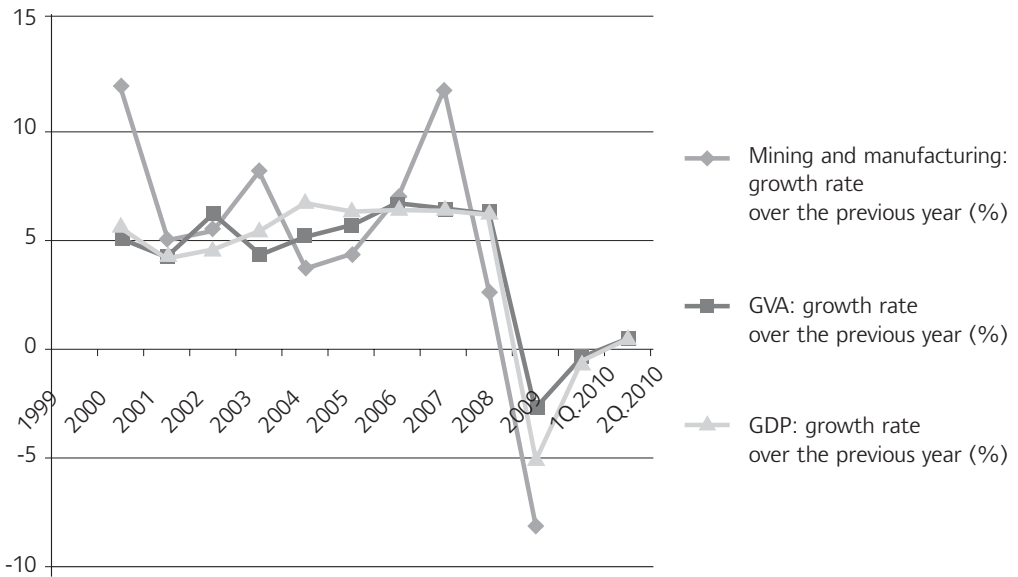
Figure 1. Growth Rate: GDP, GVA, GVA from Mining and Processing Industries at prices from the year 2000[11]

contracts (Figure 2). Most people were employed in Manufacturing Industry: for the period their share varies in the range between 25 % and 30 %, as there has been a slight drop since the beginning of the global economic crisis (2007).
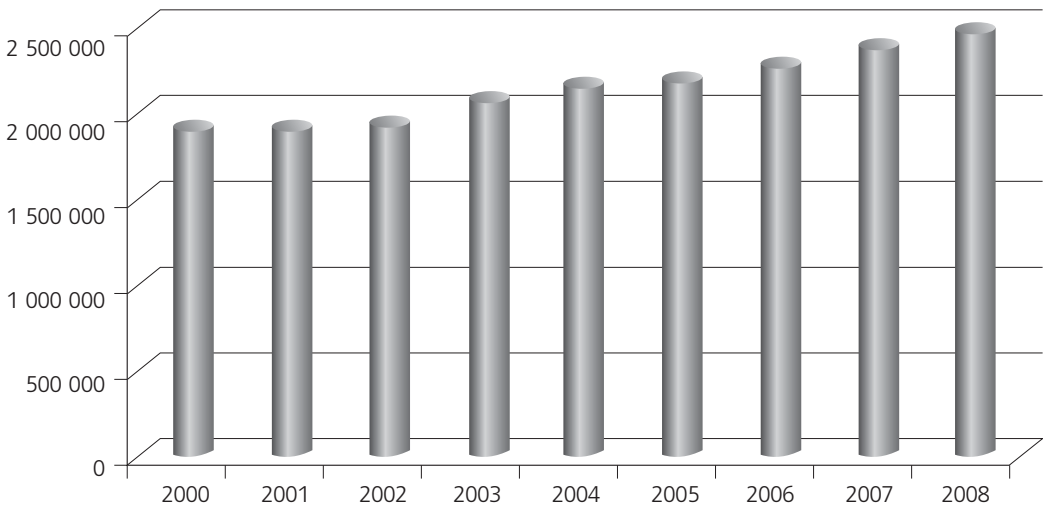

Figure 2. Average payroll staff employed under full-time and public service employment contracts

[11] NSI, GDP and GVA at prices from year 2000. http://www.nsi.bg

The quantity and quality of workforce employed in the Manufacturing Industry are of crucial importance for the competitiveness of individual economic activities, introduction of innovations and investment activity by the part of the companies.

1.3. Costs for R&D and Innovations

Over the past seven years the costs for R&D and innovations in enterprises have been limited. The only economic activity of which there are registered costs for R&D and innovations is the *Manufacturing Industry* (*Table 1*). The sector of Manufacturing Industry[12] includes: *Manufacturing of textile, clothes, footwear and other products of processed leather with the hair removed and leather processing; Manufacturing of products of rubber, plastic and other non-metal raw materials; Manufacturing of food, drinks and tobacco products; Manufacturing of base metals and metal products, without machinery and equipment; Manufacturing of chemical products; Manufacturing of timber, paper, cardboard and products made of these (without furniture); printing; Manufacturing of machinery and equipment of general and special purpose, etc.* These are economic activities (branches) where changes are observed in the technological terms, in terms of the production and organizational structure and in market positioning.

One of the most important indicators reflecting the rate of change in the industrial dynamics is the indicator of innovation activity of the enterprises in the sectors of economy. The data from studies carried out so far on European level show that 23 % of the newly-formed enterprises have

Table 1. Costs for R&D in the sector of enterprises by economic activity[13] *(in BGN thousand)*

Economic Activities	2002	2003	2004	2005	2006	2007	2008*
Total	29324	34539	45707	44804	60401	85065	101112
Agriculture, hunting forestry, fishery	185	67	..	..	..	..	
Mining	..	-	..	..	..	626	
Manufacturing industry	15154	16654	20562	13383	25134	29101	
Generation and distribution of electric and heat energy, gaseous fuels and water	..	-	-	-	-	..	
Construction	-	-	-	-	-	176	
Trade in, repair and technical service maintenance of motorcars and motorcycles, chattel and household goods	..	..	695	..	729	659	
Hotels and restaurants	-	-	-	-	-	-	
Transport, warehousing and posts	..	..	..	..	8629	..	
Financial intermediation	-	2708	..	13096	4319	..	
Operations in real estates, renting activity and business services	6781	7186	10651	13580	21336	30366	
State government and defense and others	294	524	536	371	223	117	

".." = confidential data
"-" = no cases
* – preliminary data*

[12] The name "sector" is according to the Classification of Economic Activities (КИД-2008).
[13] НСИ. НИРД и иновации. http://www.nsi.bg/otrasal.php?otr = 16

reduced share in innovation costs as a direct re-sult from the economic crisis which, in its turn, has negative impact on the industrial dynamics at macro level. 29 % of companies state that their costs for innovations in 2009 were lower than the costs made in 2008 as only 9 % of the companies had reduced costs fro innovations in the period 2006-2008[14]. The main hypotheses reflecting the influence of innovations on the industrial dynam-ics in the context of the impact of the global eco-nomic crisis could be in the following directions:

First: Companies of higher level of innovation tend to cut their costs for innovations to a lesser extent.

This, to a great extent, contradicts the general notion that companies with higher costs for innovations will be more prone to cut them. This is a positive finding and it presumes that the innovative companies are a generator of economic growth;

Second: Companies pursue different innovation strategies and depending on them they are more or less prone to cut their costs for innovations.

Broader innovation strategies of greater scope (i.e. ones that include consumption of innovations and ones having broad access to innovations, transfer of innovations, etc.) make companies more resistant to economic shocks.

Third: Companies operating and servicing international markets and dealing in public contracts are less prone to cut their costs for innovations.

In order to measure the effect of innovations on the industrial dynamics the attention should focus on a group of questions showing the actual situation in the companies in two main directions:

1. Realized innovation activities that directly influence the company's economic growth rate;
2. Potential innovation activities, which would be carried out in future as a result of the rising growth rate.
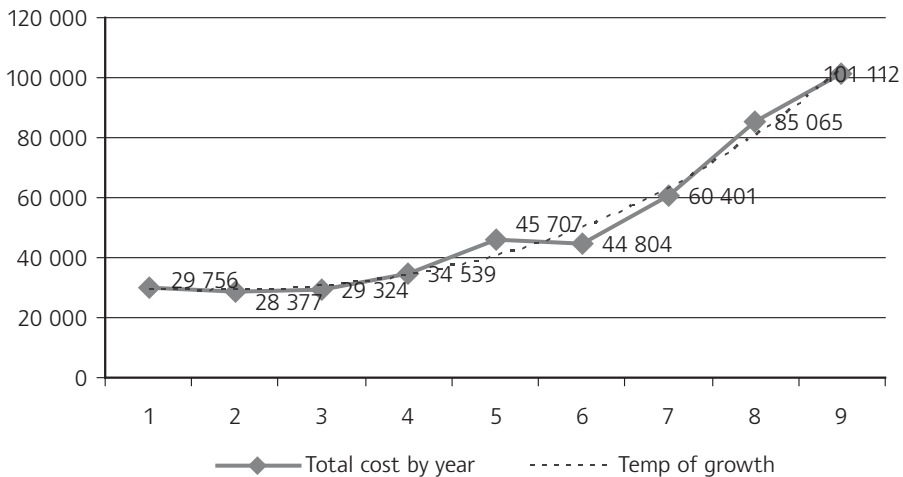

Figure 3. Total costs for innovations of enterprises in Bulgarian economy (in BGN thousand)

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[14] Kanerva M., H. Hollander, The Impact of the Economic Crisis on Innovation. Analysis based on the Innobarometer 2009 survey, MERIT, Maastricht University, 2009.

Research should reflect the activity of the companies in the following directions:

• Acquisition of new or considerably improved machines, equipment and software;
• Purchase and licensing of patents, inventions, know-how as well as other types of knowledge;
• Training to support innovative activities;
• Design (graphic design, packaging, process, product, service or industrial project);
• Patent application or industrial design registration application.

The innovation costs should be assessed as an aggregate of the costs for each of the following activities:

• costs for R&D carried out inside the company;
• costs for R&D to the benefit of the company but carried out by other companies or scientific units.

For the period 2000-2008, the total costs for innovations in Bulgarian enterprises show a steady growth rate (Figure 3).

To trace out the genesis of the industrial dynamics dictated by the reported innovation activity of the Bulgarian enterprises, the matter of differentiation of the costs made for innovations by the size of enterprises is another point of interest (Figure 4).

Generation of steady rate of increase of the costs for innovations as reflected in Figure 3 is mainly dictated by the growth of innovation costs of medium-size and big companies as shown in Figure 4. In this direction it could be said that micro enterprises and small enterprises are a carrier and generator of industrial growth in much lesser degree than the medium-size and big ones. In contrast to the medium-size and big enterprises the micro and small enterprises have greatly cut their costs for innovations for the past two years due to the impact of the global economic crisis. Considering that the micro and small enterprises account for 90 % of the economically active units in real economy it could be said that the reserve for generation of industrial growth of the national economy in mid-
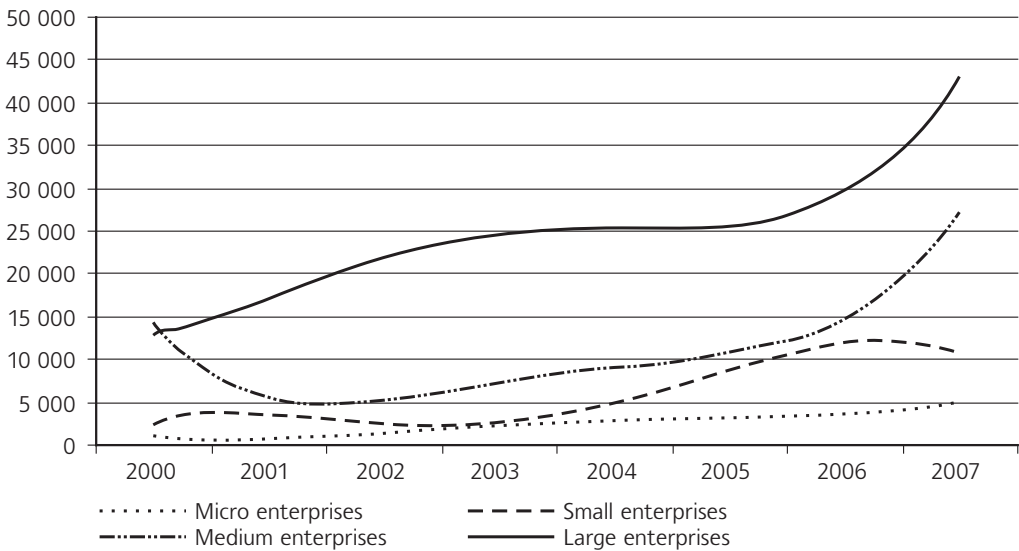

Figure 4. Rate of change of costs for innovations of Bulgarian enterprises differentiated by size (in BGN thousand)

and long term lies precisely in the intensification of their innovation activity.

1.4. Foreign Direct Investment (FDI)

The attraction of foreign investment to the country is a result of the economic development of economy and the presence of profitable investment opportunities. A factor for economic growth are not the cash flows from FDI which increase the GDP in the country in terms of accounting, but the accumulation and creation of capital (physical, human and institutional) which determines the increase of labor productivity, leads to technological renewal and contributes to dynamics in sectors to which the foreign direct investment are directed.

According to the preliminary data the foreign direct investment to the country in January-September 2009 amount to EUR 2.112,1 (6.3 % of GDP)[15]. A trend of increasing FDI (Table
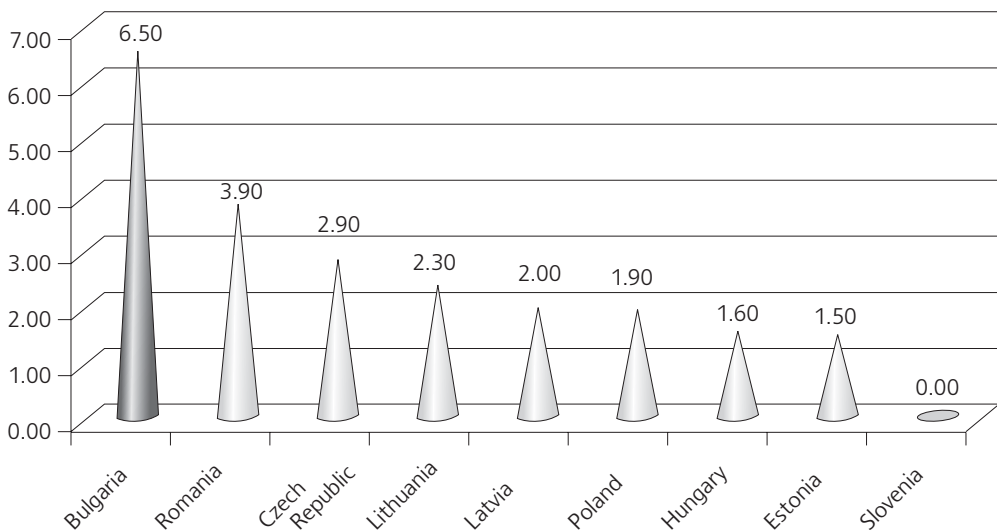

Figure 5. Forecast of Foreign Direct Investment, % of GDP, 2010[16]

Table 2. Inflow of FDI to Bulgaria by type of investment in the period 1998 – 2009 (in EUR mln)

Indicator	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008*
Share in Capital	569.4	527.9	838.7	627.0	631.6	1075.2	1831.9	1789.3	3234.1	4765.1	3309.0
Other capital	-19.8	372.8	201.7	269.4	260.1	553.3	462.7	954.1	2030.0	2801.6	2705.7
Reinvested profit	55.6	-34.7	62.8	7.0	88.3	222.0	441.4	408.7	957.5	1029.1	534.3
TOTAL	605.1	866.0	1103.3	903.4	980.0	1850.5	2735.9	3152.1	6221.6	8595.8	6549.0

*) preliminary data
Source: Bulgarian National Bank, Last updated on 19th November 2009

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[15] Месечен макроикономически обзор. Министерство на икономиката, енергетиката и туризма. Ноември 2009 г. www.mee.government.bg
[16] Ministry of Economy, Energy and Tourism 2009 http://www.mee.government.bg

2) is observed in the period 2000-2008. The predominant share of FDI is preserved as *share in capital*. By branches, in 2009 most investment was attracted by finance intermediation (EUR 841.9m), operations in real estates and business services (EUR 390.6m) and transport, warehousing and communications (EUR 226.7m). The economic activities according to the Classification of Economic Activities (КИД – 2008) that are attractive for FDI are a matter of interest for the purposes of this study. According to the 2008 data these are nine economic activities, and namely: *Manufacturing of textile, clothes, footwear and other products of processed leather with the hair removed and leather processing; Manufacturing of products of rubber, plastic and other non-metal raw materials; Manufacturing of food, drinks and tobacco products; Manufacturing of base metals and metal products, without machinery and equipment; Manufacturing of chemical products; etc.*

Most investments for the nine months of 2009 were attracted from the Netherlands (34.6 %

of total FDI), Romania (11.9 %) and Austria (9.2 %). The forecasts for 2010 are that Bulgaria will be a leader in terms of the volume of attracted FDI and the expected share of FDI in GDP is 6,9 % (Figure 5).

1.5. Assessment of the competitive advantages of Bulgarian industry

The competitive advantages of Bulgarian economy are determined by using the Balassa Index[17] by sectors. The Bulgarian economy has competitive advantages in the following sectors (Table 3).

2. Analysis of the change of production and sales at national and sector level

Over the past ten years there has been observed a sustainable growth in production and sales in all industrial branches of economy. The questions that many researchers and

Table 3. Competitive advantages of Bulgarian economy by sectors[18]

Metallurgy
Non-food raw materials, save for fuels (charcoal, copper ores and concentrates, oil-bearing seeds, scrap metal, synthetic rubber, synthetic yarn)
Drinks and tobacco
Energy raw materials (coal, oil, gas, electric power) and oil products
Various ready products (clothing and footwear, sanitary products)
Chemical substances and products (fertilizers, perfumery and cosmetics, non-organic acids)
Food and livestock
Animal and vegetable oil
Products classified mainly by the type of material (leather, yarn, cement, building materials and structures, cork, glass products)
Machinery, equipment and means of transportation

[17] Balassa Index is an index used to determine the comparative advantages of individual countries based on the trade specialization of each individual economy. It is used to determine the competitiveness of economies.
[18] Calculations of the Ministry of Economy, Energy and Tourism, Common Economic Policy Directorate, http://www.mee.government.bg

practitioners are asking themselves are: are there limits to that growth and how far could one go in changing the sale relations in the country?

The data from the past year show that the continuous growth of sales is not attainable. The change of the overall sales is differentiated, to a great extent, for individual markets and product sectors. This once again gives rise to the question: which external and internal factors influence the sales of the enterprise, the market of the whole economy of a country? The answer to the question so posed identifies and measures the impact of those appropriate quantitative or qualitative indicators which are directly or indirectly related to the market performance of industrial companies.

The identification of appropriate factors is possible under the strict definition of the main hypotheses determining the dependency of between the industrial dynamics and the functioning of the market system, and namely:

1. The industrial dynamics is a complex process reflecting the organization's behavior (organizational behavior). To a great extent such behavior may depend both on external factors such as innovation potential, technological and technical transfer, staff potential and on internal factors such as competitive pressure, consumers' expectations, etc.
2. According to the aforesaid the industrial dynamics may be viewed as a synthesis of the different directions of company management: production, innovations and investment, finances, human resources, marketing, etc. This provides grounds to look for the limitations caused by the company's marketing activity. To a great extent they relate both to the ability to develop new products (company's innovations); the ability to form and maintain a minimum cash income from sales (company's finances) and to the potential of the structural unit supporting the marketing of the enterprise (human resources).

3. In the literature, the difference is sought between product and company growth (two different components of the industrial dynamics). In this case the question to be resolved is as follows: is it possible to create and maintain company growth by means of the enterprise's marketing activity and how could this be related to the product growth (i.e. the market development and the relations that have been created on that market)?
4. The aforesaid gives rise to the need of a detailed examination of the market system, and its influence on the growth of the enterprise and the products sold by it. It is precisely out of the analysis of the market system that the main market limitations, which presently prevent the Bulgarian enterprises from realizing a sustainable industrial growth, can be deduced (at both micro-, mezzo- and macro level).
5. The examination of the market system enables us to use the possibilities of mathematical modeling of production systems by using the so-called production function. Upon the formation thereof it is possible to look for the set of significant factor limitations which create and maintain the dynamic development of business. However, here there are many possible options depending on the set parameters and variables in the production function. However, this enables us to seek a better model: e.g. whether the dynamic development should be looked for in the increase of turnover, profit on the market; the number of products sold; the number of product varieties; the number of product markets formed; the number of real product innovations; the number of competitive markets, etc.
6. A possible option from the marketing point of view is to form the production function in a manner that presumes the establishment of stability in the development of the market system and the market relations created therein. But this gives rise to new questions: in which period should such stability be looked for: in short-, middle- or long term period. The reason is that there is a serious discrepancy in the needs

of the market in short- and long term period. Is it possible that the company's behavior create dynamic development in the future by the simultaneous satisfaction of both the short- and the long term needs and wants of the individuals and the society?

2.1. Factors influencing the functioning of the market system

The study of industrial dynamics is also related to the deduction of the factors that determine an enterprise's choice of what, how and why it is to produce and sell. The deduction of an orderly system of market factors determining the dynamics in the business growth is based on the understanding of the market system.

The market system is defined as the aggregate of all persons or organizations being directly or indirectly concerned with respect to the completion of a transaction of purchase and sale of very particular product. It is important to note that each of these persons and organizations may bring a change to the market system by his/her actions or omissions on the occasion of the completion of transaction.

The main peculiarities of the subjects of market system leading to a more considerable change of the market system can be identified in the following directions[19]:

• competitive situation on the market, respectively it is likely that the market is controlled by administrative and hierarchical means. In the different competitive situations the enterprises have different degree of freedom

to choose independent managing (including product and market) decisions which ultimately reflects on the dynamics of production and sales of the individual enterprise (micro level) and also on the dynamics of the whole industrial sector (mezzo-level);

• change of the needs and wants of the market, respectively it is likely that products will be produced which are not in demand on the market. In this situation there is instability of production and sales in time. To a great extent the satisfaction of consumers' needs may be presented as a function of the product and technological innovations (respectively, investments in their creation or implementation) of the individual business unit, the industrial sector or the country's economy as a whole.

In their extended form[20] the factors influencing the change of market can be summarized into three groups and traced out in Figure 6:

▸ characteristics of the state of purchase: they include the conditions and factors which lead to a change of consumers' behavior when making a purchase, including the phases of buyer's readiness; peculiarities of the product and the effect of the purchase:
• *State of readiness for purchase:* they present the different phases in which the consumer may be before making the decision to buy, including:
   • need (**C**): a sense of urgent lack of satisfaction of basic human necessities[21].
   • want (**F**) is a privileged form of satisfaction of human needs[22].
   • demand (**R**) is a want claimed on the market. i.e. expressed not only in a desire to buy but also in purchasing power to acquire a product, a service or an idea.

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[19] For more details, see Макаров А., Маркетинговая ориентация предприятия, Менеджмент: теория и практика, № 1-2, Ижевск, 2002.
[20] For more details see: Тогунов И., Концептуальная модель маркетинговой системе, как рыночно ориентированная парадигма, 2001, http://www.marketing.spb.ru/read/sci/1.htm
[21] Дойль П., Менеджмент – стратегия и тактика, Изд. "Питер", Москва, 2001, с. 55.
[22] Дойль П., nak там.

- action (**T**) is an act of receipt of the desired good against the offering of something other in exchange[23].
- *Product peculiarities:* they include the descriptive characteristics of the very act of purchase and sale of the product, including:
  - product offer (**H**): the characteristics of the product which are being sought and which are perceived as significant by individual consumer ir by the target market as a whole.
  - transaction (**M**): the additional services received by the consumer upon purchase or use of the main goods or services.
  - qualification (**O**): it is an expression of the degree of commitment of the staff to the performance of the act of transaction. To a great extent commitment is a function of the competences possessed by the staff, including also qualification skills.
- *Effect of purchase*: it is expressed in the benefits as sensed by the consumer from the purchase, use or possession of the product, including:
  - welfare (**K**): it is an expression of the difference between the common value of the product for the consumer and his common costs as the value for the consumer is the aggregate of all perceived benefits from the acquisition of the product (efficiency when in operation, product design, convenience of delivery, brand image, etc.), and the costs for the consumer are made up as a result of the price paid by him and the costs he has to make in the course of possession of the product (costs for installation, costs for training, costs for service maintenance, etc.).
  - satisfaction (**W**): the level of gratification is functionally dependent upon the consumer's expectations about the product (its characteristics, peculiarities of transaction, etc.) and on the actually

perceived features and characteristics of the product offer.

▸ system subjects, including the factors that directly determine the conditions of purchase. This includes both the two main parties to the transaction and the main professional and social groups determining their behavior before, during and after the purchase is made:
- *Parties to the transaction for purchase and sale:* this includes the representatives of the two parties: buyer and seller:
  - producer (**P**): the business organization that decides what product, on which market and under which conditions it sells. In contemporary theory it is accepted that the producer must make what he can sell provided, however, that there are sufficient benefits from the sale for him.
  - consumer (**J**): it includes all persons and organizations who have actual or potential interest in the offered products. The consumer will not buy if he is not ready to do so or if he can not see his benefits from the transaction.
- *Social groups*: this includes all social and economic groups that indirectly influence the decisions of both the consumer and the producer. Regardless of the fact that the economic theory accepts the leading role of purely rational behavior of the market subjects (especially for products bought every day or organizational products), there are a number of indications that the decision of both the consumer and the producer is a result of communication with other subjects on the market, indirect commitment to the transaction for purchase and sale, and namely:
  - economic group (**E**): it includes all private individuals belonging to the social or sociocultural community of the consumer.
  - consumer group (**G**): it includes all persons who buy, possess or use the same products. It is associated with the market

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[23] Котлер, Ф. "Маркетинг менеджмент" , изг. "Питер", Москва, 1998, с. 40.

segment to which the individuals and the organizations being consumers belong.

- professional group (**I**): it includes all organizations having common economic, social and other interests. A typical example for a professional group is a manufacturers' association or a cluster of companies.

▸ fundamental components: they include the main environment factors which determine **What** is to be produced (respectively bought), **How** it is to be produced (respectively bought), **Why** it is to be produced (respectively bought), etc.:

- *Macro factors*: to a great extent the change of the macroeconomic environment may reflect on the level of production of the individual enterprise. Under crisis conditions (similarly to the current crisis from the end of 2008) the enterprises reduce their activity in order to reduce the risk of increasing inventory or becoming insolvent. We can add to the main factors determining the market dynamics:
  - factors of external economic environment A): this includes all trends that change the market performance at global, national, regional or sector level. thus the factors of external economic environment may have different impacts (including the direction of impact) on individual enterprises. For instance: even under the conditions of a global downfall of the sales there are a number of business organizations that show stable growth of their sales.
  - wage (N): the level of wages and respectively the rate of change of the ;labor costs in national economy could have material impact on the growth rate of individual enterprises. If there is a low level of labor compensation the enterprises and sectors of high labor intensity, including with respect to the payment for scientific research, have competitive advantage.
  - product quality standard (D): it is an expression of the level of acceptable quality

of a product offer adopted by consumers and society. To a great extent this determines the level at which the competitive struggle will take place. For example: in EU and in USA there are different levels of perception of quality even when the same product is concerned (including one by the same manufacturer).

- *Factors of product market*: they determine the specific form of each sector of economy:
  - product image (B): the image of individual products in the society. It is typical to build a differentiated perception of products for different regions.
  - product value (Q): it is expressed in the benefits created by the product. In a number of cases the value of a product also depends on its image created in the society.
  - service level (S): it includes the acceptable level of supplementing services that determine the value of the product. It should be noted that the service level may considerably influence the size of the products being manufactured and sold.
  - units of products made (V): it includes the production potential of individual business organizations or of all enterprises from the sector. If compared to the market potential one can determine the level of competition among the companies in the sector.
  - consumer's solvency (L): it is expressed by the income set apart by the consumers for some products or for others. It should be noted that the priorities of society or social groups change and this leads to changed solvency of individuals.
- manufacturing factors: they are related to the common technological level in the country's economy. A higher technological level also presumes faster pace of change of markets. For example: the technology in the sector "Metal Production and Foundry" is from mid 1960s and therefore the markets change slowly and with difficulty. On the contrary, the sector of Telecommunication Services

changes very rapidly which is a premise for the rapid development of both the sector and the companies belonging to it. The main production factors influencing the decision on the production level are:

- labor compensation (U);
- efficiency of production (Y);
- input units of labor (X).

2.2. Dynamics of Sales in Bulgaria

The study of the dynamics of sales is made by observations and analysis of the development of the main market indicators identifying the nearing or realization of growth in economy:

- Rate of change of production;
- Rate of change of sales;
- Rate of change of price level.

In this way the analysis of the sales dynamics gives also an answer to the question: What is the condition of Bulgarian economy at present?

The analysis of the aforesaid indicators is made on the basis of 117 observations of their changes, i.e. on their monthly changes for the period from January 2009 through September 2009. The analysis is based on the smoothing of the change in order to overcome seasonal or chance reductions of some of the indicators. The smoothed curves have been conformed to the deduced cyclic recurrence in economy, sinusoid type. The average level of each indicator for the year 2009 is sued as a basis for their observation, thus enabling the delimitation of the accumulation of changes due to changed value of money in the different periods when the information was collected.
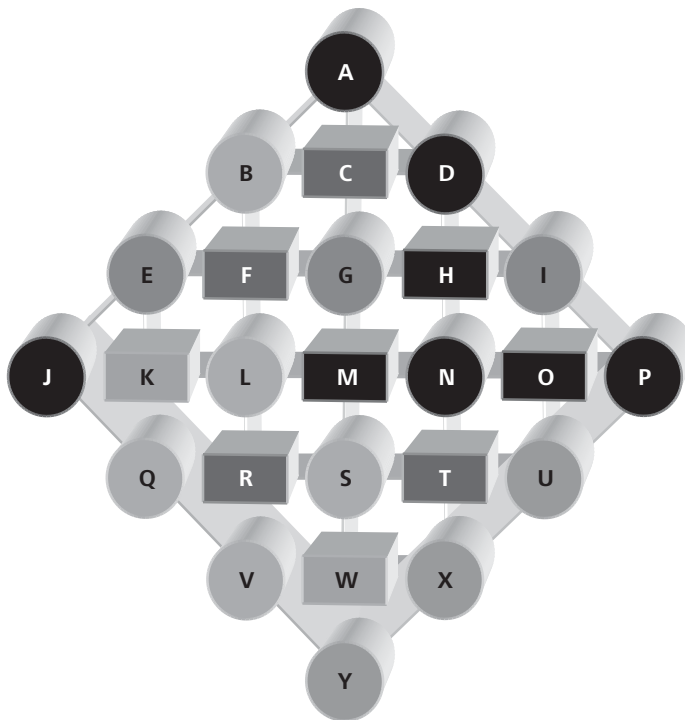
Figure 6. Conceptual model of market system

The change of the three indices is given in summarized form in Figure 7.

According to the information about the Bulgarian industry (*Figure 8*) the following conclusions could be drawn:

First, as a whole for the period from January-September 2007 all three indicators rose uniformly. Changes to the rate of change of the observed indicators are found after the third quarter of 2007. The serious change of the rate of production in the country for the past one year makes a strange impression. Since early 2008 the volume of sales started to fall down under an increasing volume of production and rising manufacturer's prices. These are the first signs of forthcoming changes to the observed trend. The volume of production responded to the reduced by a six-month slowdown to the reduced demand and showed downward trend while the manufacturer's prices responded after eighteen months.

Second, for the period until the first crisis moments there was a normal process of inventory management in production (non-material discrepancy between the curve of supply and the curve of manufacturing and sales in Bulgarian industry). The first signs of a impeding crisis can be traced back to early 2007 when data show a considerable discrepancy of the rates of change of production and sales. A considerable gap emerged in this direction between the expected sales and the sales actually made in mid 2008.

Third, for almost the entire observed period the prices uniformly changed up. There was no difference not until the first quarter of 2009, when the rate of change of prices headed toward stabilization of the same level, even with a slight decrease.

The following conclusion can be made based on the stated results: the Bulgarian economy is undoubtedly in a state of "crisis" but it can be defined as a crisis of "overproduction": and is
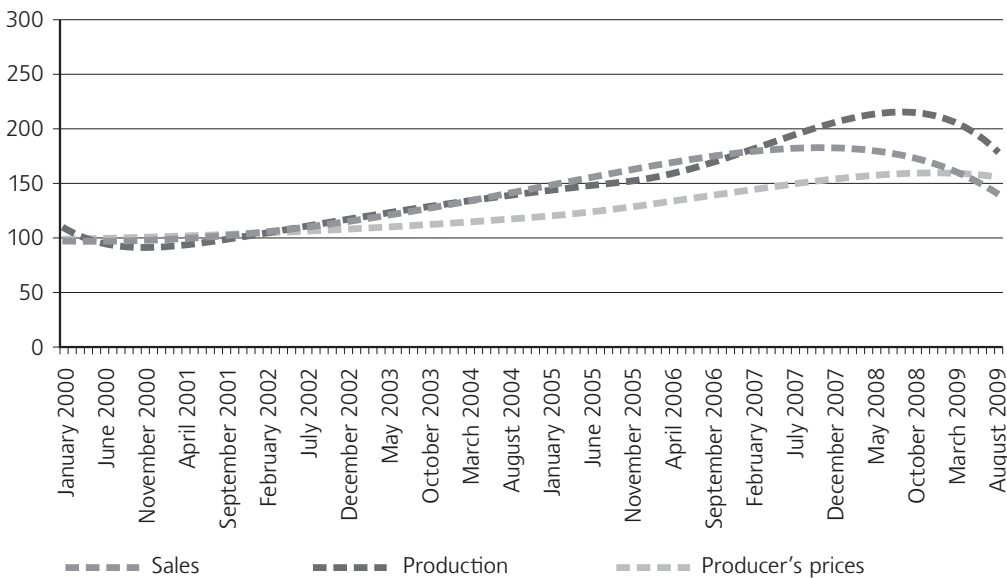

Figure 7. Rate of change of production, sales and manufacturer's prices of Bulgarian industry for the period January 2000 – August 2009

not related to a sharp reduction of price level in the industry which is typical for the "global economic crisis." The signs for such type of crisis are observed as early as in mid 2006 when the managers optimism grew due to the increase of manufacturer's prices and hence overproduction of industrial products that can not be realized on the Bulgarian market or on the international market.

One of the characteristics of industrial demand is the so-called derivative demand where the demand at each level of industrial chain is determined by the demand for products at the higher level for the highest level in the chain is the demand for consumer goods.

Thus the change in the income of citizens which led to the emergence of the crisis is manifested most rapidly in the sectors manufacturing consumer goods. Respectively, the enterprises that extract raw materials responded most slowly to the crisis changes.

The sector analysis of the crisis can be presented by comparing the crisis measures in different sectors of industrial chain, beginning with the sector of "Metal Ore Extraction" through the processing sector of "Metal Production and Foundry", then the manufacturing sector of "Machine Production" and ending in a sector that manufactures products directly for consumers such as "Food and Drinks Manufacturing."

The change of the observed three measures of crisis (rate of change of sales, rate of change of production rate of change of prices) for the said four sectors of Bulgarian industry can be traced in Figure 9.

The following conclusions can be drawn from the figure:

First, each of the observed sectors is characterized by specific rates of change. The thesis stating that in case of an upswing the industrial sectors in the beginning of the
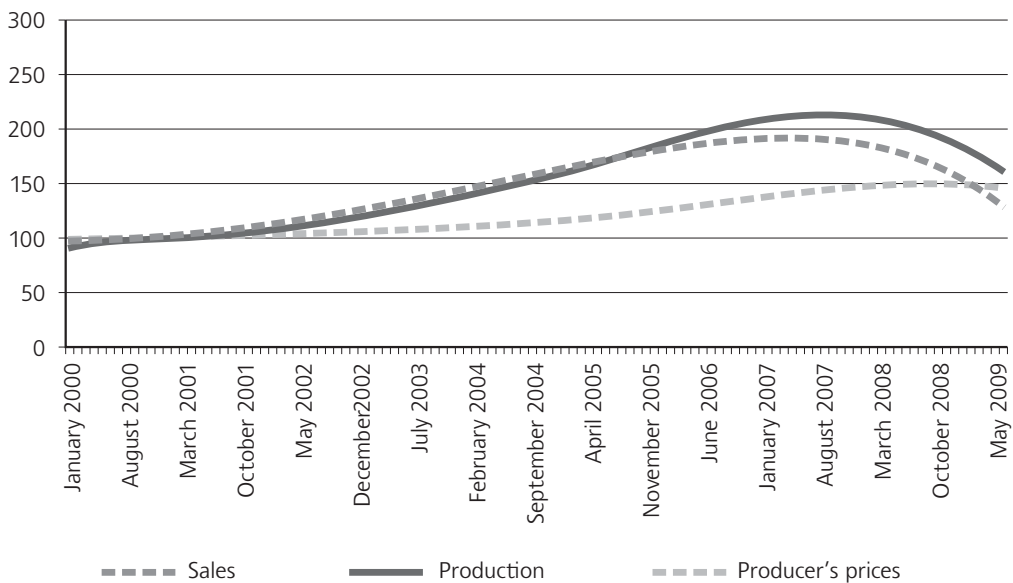

Figure 8. Rate of change of sales, production and prices in Bulgarian industry for the period January 2000 – September 2009

industrial chain change more rapidly while in times of crisis the changes are more abrupt is confirmed. Thus in the sector of "Food and Drinks Manufacturing" there have been weak, even almost insignificant drop in sales over the past year as the rate of increase of sales in this sector is assessed as moderate for the entire period under observation. On the contrary, in the sectors of "Metal Production" and "Machine Production" there was an outpacing development in the period May 2002-September 2006 when a considerable drop began which has been decreasing in the past months of 2009.

Second, it makes an impression that the rates of change of production in industrial sectors oriented to industrial customers do not significantly differ from demand. There is certain slowdown that leads to accumulation of inventory. But this could be considered a normal phenomenon. The serious excess of food production of with respect to the sales of food products makes impression. This shows a considerable level of inventories which may have repercussions in the future with respect to the period of getting out of the crisis. But here one should note that the response of the sector to the changed
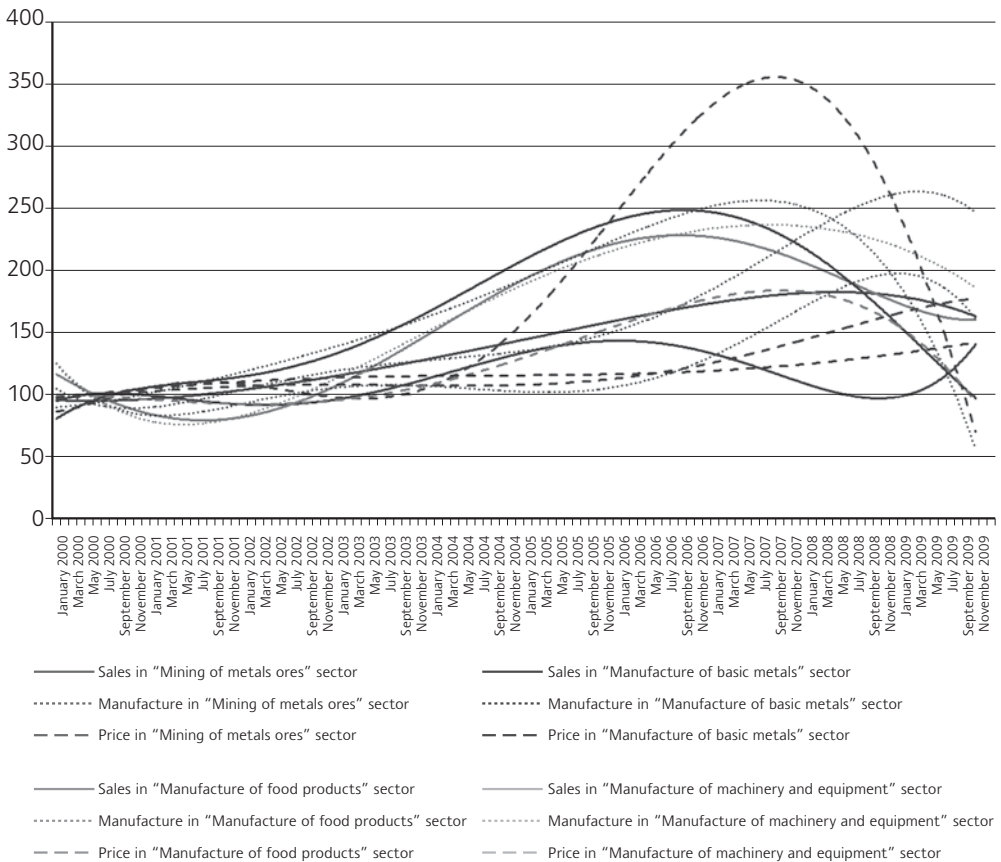

Figure 9. Rate of change of production, sales and manufacturer's prices by industrial sectors for the period January 2000-September 2009

demand is some times faster than the one of the manufacturing sectors.

Third, the change of prices can be defined as insignificant; even in the sector of "Food and Drinks Manufacturing" there is a continuous increase of the prices. The abrupt decrease of prices of metal ores and metals can be explained by the steep change of prices on the international metal exchanges in 2008.

In conclusion, we could summarize that the theses as aforesaid have been confirmed, namely the ones stating that the crisis in Bulgarian industry over the past year can be explained by the overproduction of articles which could not be realized due to the overall downturn of the purchasing power of citizens and companies. Also confirmed is the thesis that in all sectors there were signs of a crisis situation as early as in late 2006 and early 2007 as the rate of change after the crisis situation was realized had more significant effects on the companies distant from the end customer.

Conclusion

Undoubtedly, the study of some basic questions related to the industrial growth and the dynamics of its development can be accepted as quite topical in a satiation of shrunk sector, national and international markets.

The revealing of the peculiarities of the dynamics of Bulgarian industry should not be seen as the only alternative of a way out of the crisis but the complex study of the industrial dynamics presents the interrelations between "factors" and "industrial growth" that can be underlying for the crisis management at company, sector and national level.

One of the peculiarities of the phenomenon of "industrial dynamics" eis that it can be observed only on macroeconomic level but can be studies only if there is sufficient information about the development of individual enterprises. For that reason the factor limitations on industrial growth are studied at two separate levels: national (or sector) and company level.

At present the crucial question is: which are the effects for the past 10-15 years that determine the development of industrial system now and that will determine it in the coming short- or mid-term period?

On the basis of the above analysis for the period 2000-2008 the following conclusions can be made as regards the effects on national and sector level, which can support or hamper the industrial growth in the country for the coming 5-7 years:

• Bulgarian economy's growth pace exceeds the growth of the European Union countries if measured by purchasing power parity but it is still at a very low level.
• For the past 9 years there have been a continuous increase of the number of people employed under full-time and public service employment contracts. A similar conclusion can also be drawn with respect to the quality of workforce in the country.
• Over the past years the costs for R&D and innovations in enterprises have been on the rise at a much lower pace than the pace of increase of FDI. The main reason is that this investment is made mainly in the form of share in the capital of Bulgarian companies.
• The analysis of sales shows that until the end of 2005 the amount of industrial output manufactured and sold increased at a rapid pace but after 2007 the condition of Bulgarian economy is defined as a "crisis of overproduction" and is not related to an abrupt reduction of price level in industry which is typical for the "overall economic crisis."

In conclusion, the factors considered have effects on the industrial growth in the country in many directions. While not exhaustive the data provide grounds to deduce the following main changes in the factor impacts of mezzo- and macro level which could support the country's industrial growth at the present:

• Preservation of the rates of development of labor resources, especially in terms of the quality of workforce. The increase of labor quality reflects on the increase of the labor efficiency and the quality of manufactured products which ultimately leads to an increase of the country's GVA.
• Preservation of the growth rates of the attracted foreign investment. A change is needed with respect to their use as a greater portion of FDI should be directed to new products, equipment and technology.
• Reduction of the downturn rates of sales. This can be achieved by using sufficiently motivated incentives for Bulgarian industrial enterprises to invest in manufacturing of new (and respectively, not modified) products.

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