

European Economy

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**REASONS FOR INSUFFICIENT INNOVATION
IN THE POLISH ECONOMY**

Abstract

In spite of the innovation's permanent place in economics, it deserves a new look. Consequently, the level of innovativeness is the responsibility of the individual, the economic agent. The aim of the paper is to reflect on searches for answers to numerous questions touching on how? How can influence be exerted on individual's level of innovativeness without being in conflict with natural processes to which he as a subject is subordinated? How can we arrive at such a situation where everyone, irrespective of position held or social and professional role played, would want, know and be able to undertake effective realization of innovative activity, taking advantage of the knowledge he possesses for beneficial purposes. How to achieve a given level of management of the individual's innovativeness, which would guarantee an increase in corporate innovativeness, including the economy as a whole? How to merge marketing mechanisms with the facilitating role of the state in innovation management, so that they could satisfy demands of the globalizing economy that is based on knowledge and human capital?

Key words:

Innovations, innovation processes, economic activity, social, educational and infrastructural mechanisms, innovativeness.

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1. Introduction

The relevance of the topic is confirmed by the continued low innovativeness of Polish companies. Meanwhile, in the prevailing conditions of globalization, which is based on knowledge and human capital economies, innovativeness appears as a need of higher necessity. As a result of the country's position, as well as the success of individuals and business aims of companies, innovativeness has become an indispensable factor in managing competitiveness. Assumptions relating to the instrumental nature of innovativeness with respect to competitiveness are commonly accepted by both theoreticians and practitioners. The fact that it is acceptable also to politicians is its presence in various documents of strategic nature, such as the Lisbon Strategy, Poland's National Development Plan, the European Framework Programmes, especially the 6th and 7th. Innovativeness is seen as the ability to put innovations into practical use [1].

In spite of innovation's permanent place in economics, it deserves a new look if only for the mere fact that from just one of many factors of socio-economic development it has grown to become a primary determiner.

Joseph Schumpeter (1883–1950), the Austrian economist, is the acclaimed pioneer of the theory of innovation. In conducting researches on economic development, he pin-pointed the instances of introducing major changes into production, a new combination of factors of production that occur occasionally. These instances later referred to as innovations are «characteristic phenomenon of development» which in Schumpeter's understanding is development [2]. Innovations enable technical advancement [3]. Limiting innovations only to spheres of production is without grounds in prevailing conditions of global capitalism. Innovation serves as the base for technical advancement and development of hi-tech industries, but it also covers other fields of activity, including social, political, spiritual, health, consumption and knowledge (entovation). This has led to the emergence of new issues of research including those linked with the necessity for a holistic understanding of their circumstances with a re-valued subject approach since the current level of human development, the stage of developing economies based on knowledge and information society demands it.

Innovation is completely dynamic in nature: the substance, causes and effects. They are changes that remain under the influence of assorted changes that lead to varied changes. As a result, they demand continual description and explanation, as well as renewal, augmentation, and up-dating of knowledge. In spite of the existing rich literature, there still does not exist the basis to acclaim a well structured, internally cohesive theory of innovation. One of the reasons is the need to integrate research studies of various scientific disciplines concerning innovations and innovativeness as an ability to put them into practical use.

The widest scope of interest in problems of innovation and innovativeness occurs among sciences of organization and management. They seem to be especially predestined to deal with this issue, hence the on-going debate. The

grounds for researches in this area were prepared by Peter Drucker in his works *Innovation and Entrepreneurship; Practice and Principles* [4]. The possible role of the theory of organization and management in explaining reality is better seen in his words i. e., management integrates human values and activity while the society and intellect benefit from economics, politics, mathematics, political science, history and philosophy. Management is a study in humanities [5].

The question that therefore arises is: has rationalism not dominated thoughts about innovations and requirements for their practical use in contemporary innovation management? Does laying emphasis on objective requirements not conceal the factual reasons, which are not unconnected with the man being treated as a subject, for a given level of innovativeness? If it is assumed that any of the man's action is determined by intrinsic factors, objective factors or by extrinsic factors i. e., subjective factors, then why should logic be ignored in innovative activities? Is this because the description and study of the subjective aspect of innovativeness are more difficult, burdened with high subjectivity perhaps due to lack of complete standardization? The scope of potential solutions is delimited by answers to three basic questions i. e., WHAT? > WHO? > HOW?

Issues related to WHAT is needed for the development of innovativeness are the subject of several studies by scientists, strategic documents of governments, as well as national and international non-governmental organizations. The list of accusations at organs responsible for socio-economic policies is unending. They are often addressed non-personally but usually as WHO OUGHT TO. This usually leads to situations as THEY ARE RESPONSIBLE! Thus, very little change takes place in spite of subsequent governments taking steers. Chances of re-addressing the situation seem to be in overall approach to the management of innovativeness that assigns parallel role status to all subjective determiners.

Innovativeness has been accepted as just one dimension of subjectivity. Consequent upon this, it is the responsibility of the individual, a subject, for the level of innovativeness; the individual performing varied social and professional functions simultaneously; the individual capable of making beneficial use of given knowledge resource, and the individual that possesses a defined intellectual capital.

Consequently, the aim of the paper is to reflect on searches for answers to numerous questions touching on HOW?

- How can influence be exerted on the individual's level of innovativeness without being in conflict with natural processes to which he as a subject is subordinated?
- How can we arrive at such situation where everyone, irrespective of position occupied or social and professional role played, would WANT, KNOW AND BE ABLE to undertake effective realization of innovative activity, taking advantage of the knowledge he possesses for beneficial purposes.

- How to achieve a given level of management of the individual's innovativeness, which would guarantee increase in corporate innovativeness, including the economy as a whole.
- How to merge marketing mechanisms with the facilitating role of the state in innovation management so that they could satisfy demands of the globalizing economy that is based on knowledge and human capital.

The views presented here are theoretical in nature, but, as an instrument, offer chances to be aware that factual prerequisites of innovativeness are psycho-social in nature rather than technical. Hence, the conclusion that various obstacles, technical in nature, could have been overcome through the existence of specific conditions at the subject level that arise as a result of investments in human and intellectual capital.

2. Reasons for Increasing Interest in Innovativeness

When taking a country's position, success of individuals or aims of business enterprises into consideration, **innovativeness** is often associated with higher needs. It has become an indispensable feature in developing **competitiveness**. It is accepted as the ability to put innovations into practical use. Its significance is gaining in importance along with the increasing complexity and changeability of business environment.

Our civilization is presently at a turning point politically, socially and economically. Profound acceleration in technological and civilization changes is being observed in all spheres of human endeavours. In consequence, changes are also being observed in the functioning of markets, nations, businesses, individuals, and whole communities.

New **information and communications technologies** (ICT) are leading the way to completely different methods of doing business. This has been made possible through the speedy growth in knowledge, and skills that allow access to it as well as its use in the achievement of expected results. Moreover, it places individuals and society, including firms and the national economy in a better position thereby enhancing a higher increase in their quality of life and productivity.

The strength of all these changes is not unconnected with the leading role of knowledge including its assigned functions. Knowledge is often seen as:

- a factor of production,
- a component of prosperity,
- a growth motivator,

- an instrument of competition,
- an article of trade,
- an instrument for creating or obtaining new knowledge,
- an investment,
- a building element for intellectual capital.

Knowledge, as an economic resource could have been seen as something complementing traditional factors of production during the pre-teleinformation technology revolution era. This notwithstanding, modern knowledge has become the most important endemic factor of production [6], contributing significantly to its growth and extending the limits of balanced growth [7].

The approach that accepts knowledge as a component of prosperity portrays the need to create the fundamentals of material wealth based on non-material knowledge i. e., wealth of individuals, social groups and nations. In contemporary times «huge incomes are no more attainable either by just processing and transferring goods and objects or controlling money. The only and perhaps the main producer of wealth are information and knowledge» [8].

Knowledge as a growth motivator has, in the words of many authors, finally met with approbation [9]. The extent of researches in economic development had been largely limited to economic factors [10]. It is now a known fact that growth economics ought to look beyond economic aspects since «factual sources of growth are rooted in non-economic spheres like education, organization and discipline as well as in political independence and a nation's awareness of independence» [11]. In the words of the author, «transfer of useful knowledge is a gift infinitely more precious than any material support. (...) While material gift would make people dependent, the gift of knowledge, if it is appropriate, will on the other hand bring freedom. The specific nature of intellectual gift is that its results are more durable and precious for development».

Knowledge as an instrument of competition has found its usefulness in key competences becoming «the only source of comparative advantage» as the supply of natural resources and availability of capital no more «fits into the competitive equation» and we now live in an age where the industrial sector is based on human intellectual potential [12].

Treating knowledge as an article of trade depicts its commercial nature. The fact that hidden knowledge does not at a given period of time display the characteristics of a good due to the difficulty of its description or definition does not mean it cannot with the passing of time become an item of trade.

One functional aspects of knowledge is its occurrence in the role of instrument for creating or obtaining new knowledge in accordance with the principle that the richer and more diversified the knowledge acquired is, the more it becomes a perfect instrument through its application since it is capable of self-improvement. It is a marvellous property that is not associated with any other re-

source. Humanity according to the OECD report is yet to attain a level where it can systematically apply knowledge in the creation of further knowledge [13].

Knowledge is also understood as an investment [14]. Thus, it has been transformed into capital. The technique for implementing this investment is through joining and exchange of knowledge [15]. Due to its specific features the resulting capital is referred to as intellectual capital [16]. It may refer to people and known as human capital or to organizations, structural capital which covers both organizational capital and relational capital [17]. The use of the term capital is to buttress the fact that it is about such intangible assets capable of yielding profits to its owner.

Knowledge is the building structure of intellectual capital. Thanks to the different forms of knowledge, intellectual capital is made up of varied component parts which include [18]:

- 1) human capital (know-how, skills, aptitudes, education, vocational qualifications, work-related knowledge, psychometrics and work related competencies, occupational assessments, entrepreneurial spirit and so on),
- 2) organizational capital which covers:
 - intellectual property capital (patents, copyrights, design rights, trademarks, service marks and so on),
 - infrastructure capital (information systems, data base, networking systems, corporate culture, knowledge dissemination systems and so on),
 - innovation capital (management philosophy, corporate product policy, rate of product turnover, preferred sources of innovation, pro-innovation climate, methods of financing R&D, research department and so on),
 - process capital (technology, technological secrets, trade secrets, procedures for reacting to market signals, procedures for dealing with complaints, participatory procedures at fairs and shows, personnel recruitment procedures, environmental protection related procedures, scope of outsourcing and so on).
- 3) relational capital (experience gained from co-operating, backlog, reputation, relationships, loyalty, various contracts and agreements, business collaborations and so on).

Knowledge comes from human senses and through it knowledge can be applied beneficially. Hence, the expression intellectual capital as it has been observed that certain non-material assets often difficult to ascertain but for sure related to knowledge or indeed the result of the application of knowledge and can enhance accruing benefits much higher than would traditional forms of capital i. e., material and monetary capital.

Knowledge is contained in the minds of men in the form of mental constructions, imagination, impressions, intuition, opinions, conceptions, beliefs, ideas, as well as in various carriers such as documents, standards, procedures, and practical processes. In the end, it may through human endeavour become meaningful and useful. It is man who can turn this into capital. They can either turn it into intellectual capital or squander it. The resultant effect depends to a large extent on the human's level of innovativeness.

Functions assignable to modern knowledge are innumerable but defining what exactly knowledge is has met with numerous difficulties. For the sake of this paper, the definition accepted is «knowledge is information organized like a thought model of reality» [19]. This definition is however so wide that it covers all non-material resources related to man's intellectual production such as hidden, quiet, unravelled knowledge, and available, precise, unveiled knowledge [20].

The dominating importance of knowledge and its replacement of traditional capital has become the premise for prevailing viewpoints about the emergence of a new economic order known as knowledge-based economy (K-BE). This type of economy has for the last several years emerged as an important area of theoretical thoughts and political activity at regional, national and global levels.

In Europe, this is concurrent with the implementation of the so-called Lisbon Strategy, a socio-economic programme of the EU adopted in 2000 at the European Governing Council seating in Lisbon. It was decided then that it is necessary to bring the EU into new line of development in which quick dissemination of already existing practical knowledge, as well as the application of new knowledge, becomes the driving force. It was accepted that in order to achieve economic growth, full employment and economic uniformity the development of knowledge-based economy should be uppermost. K-BE is in definitions contained in both eEurope Action Plan and ePoland, described as a new economic model the management of which is based on maximal exploitation of knowledge and innovative resources, as well as on universal access to information. Stopping at this definition would however be a disservice as the role of companies which in a market economy are the sole element crucial to a bustling economy thus leading to generation of incomes, the new value. Of the other two remaining entities, households engage in consumption, while the state is mainly for redistribution, although it is somewhat an entity of two dimensions and roles. The state plays a redistributive function improving standards of competition, maintains macroeconomic stability as well as socio-economic uniformity.

While considering companies' contribution – an input that is dependent on the success of their activities – to national wealth, it is worth to note that a knowledge-based economy is such an economy, where knowledge is the determinant of competitive advantage for all players. In emphasizing this point one can refer to a submission which postulates that [21]:

- 1) the economic sector influences the rate and scope of societal transformation,

- 2) knowledge-based economy is fundamental in an information society,
- 3) an information society will stay competitive as long as its economy remains knowledge-based.

Discussions on knowledge-based economy at its present level refer only to highly developed economies. Among these are seven to ten countries, USA, Canada, Japan, France, Great Britain, Germany, Finland, Republic of Ireland, Sweden and the Netherlands [22].

Less developed countries can not expect their economies to become knowledge-based as a result of market forces. It is imperative for them to embark on building a knowledge-based economy i. e., creating an environment that enhances the setting up and success of firms whose comparative advantage is based on knowledge. The huge role that science, education, technology and authority, especially persons who are not only actively involved in these areas but also with awareness of interdependency play in this process is noteworthy. For purposes of analysis, a study of the integrated relationships between these spheres in establishing the so-called pillars of knowledge-based economy can be stated that:

- science ought to ensure adequate and sufficient supply of knowledge and its «products» within the framework of a strong and efficient innovation system (regional and national);
- education is responsible for making ready the so-called «societal knowledge» i. e., knowledgeable people capable of widespread application of this knowledge in rational decisions about choice alternatives in individual and group activities;
- technology is to facilitate quick and cheap access to knowledge as well as its utilization through the development of information infrastructure;
- the authority is responsible for creating adequate institutional framework and a system of innovative, educational and economic incentives amongst others.

Knowledge-based economy as a field of study is still at its early stage of apprehension. There are yet many issues to be determined. This has to be conceded as knowledge in practice can be applied to «instruments, processes, products, (...), labour (...), and at present in knowledge itself» [23]. The question about a universal instrument that would enable a perpetual use of knowledge and its unlimited application in practice is therefore fundamental. It seems that innovation complies with these requirements. They serve as specific instruments for the application of knowledge in the economy. This means that the number and spirited growth of diverse innovations will determine advancements made in the process of building the knowledge-based economy. In order to achieve the practical implementation of these ideas, the level of innovativeness must be determined.

In publications dealing with knowledge-based economies, attention is paid to certain issues that are crucial to the development of K-BE in post-socialist states like Poland. These issues include [24]:

- a widespread approach to innovativeness, especially by companies and institutions of higher education, as a spin-off of the dominating influence of knowledge over social and economic development,
- an open economy as a pre-condition for embracing processes and mechanisms of globalization that propagates modern knowledge,
- the democratization of knowledge being the result of evolutions in information supply through the proliferation of the Internet in open economies and societies,
- the participation of highly qualified employees in the economy,
- the participation of carriers of K-BE such as hi-tech industries, science, R&D, education, business services connected with K-BE and social information services in employment and sales,
- the level of development measured as the value of GDP per capita,
- the growth of services within the GDP structure,
- the level of financing allocated to research and development, including its share in GDP, does not only create the physical base for innovative activities, but also a suitable intellectual climate, which to a very large extent is decisive in spreading the importance of knowledge in the society, thus providing substructures of a new value system,
- the emergence of new professions and the possibility of multiple change of jobs in the course of a man's life due to fast growth in knowledge,
- shortening product life cycle and organizational structures, etc.,
- the existence of dual economies i. e., traditional and knowledge-based.

All the abovementioned issues are directly or indirectly linked with innovativeness, which buttresses the growing interest in it by politicians, academic and corporate environments. This order of their interest is not accidental.

The development of a knowledge-based economy and information society has become Poland's development goals as a member of the EU. They have been included as horizontal goals in the *National Development Plan 2004–2006* (Table 1).

Table 1.

Poland's Growth Aims Contained in the National Development Plan as EU Member

Strategic goal: DEVELOPING KNOWLEDGE SOCIETY Knowledge Society = = Information Society (IS) + Knowledge-Based Economy (K-BE) Detailed goals:	
STRUCTURE OF K-BE	Developing education Developing science and its R&D base including detailed economy oriented studies Developing the industrial sector, hi-tech industry Developing K-BE related business services Developing Information Society services
DEVELOPING IS	Educating Information Society Creating expansive Internet content offer and services Cheap, fast and safe Internet Access
INTEGRATION WITH EU	Creating Polish Research Area Co-creating European Research Area Participating in EU outline programmes Maximum utilization of EU Assistance Funds.

Source: *Procesy innowacyjne w polskiej gospodarce*, Raport 26, Warszawa: RSSG 2005 s. 96.

The goal of developing the society is also contained in the assumptions for the National Development Plan for 2007-2013 periods as a political priority that should be relevant even after 2013.

Results of studies and evaluations of advancements made in Poland's economy in the aspects of building a knowledge-based economy are not encouraging. The rate of task realization, as well as level of indices obtained in other EU countries, is not that optimistic.

It is stated in Poland's governmental documents that the level of the country's competitiveness at international levels, ensuring prosperity of Polish families, strengthening their economic independence and increased safety consciousness depends on being able to cope with social and technological demands [25]. The capacity to cope with modern developmental demands seem to be persistently limited in all areas, including economic, institutional, infrastructural, educational reforms and more so in facilitating innovativeness.

3. Low Indicators of Innovativeness of the Polish Economy and Their Reasons

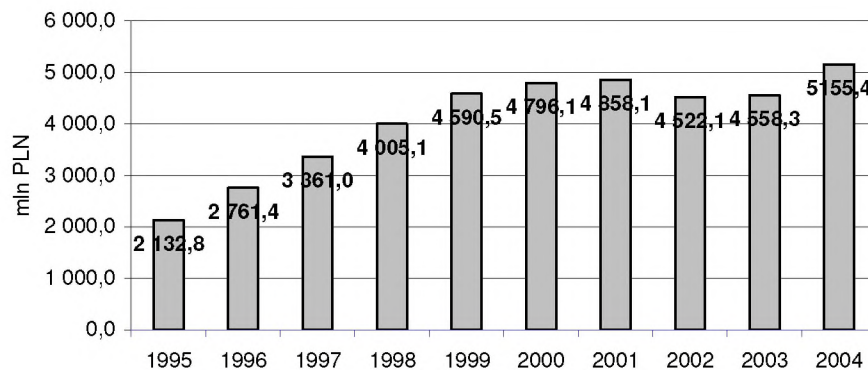
The results of multifaceted analysis have shown that the country's socio-political transformation has not led to technological transformation of the economy. The level of innovativeness of the Polish economy has been assessed as unfavourable in spite of the improvements in some indicators of innovativeness in 2004.

A measure of expenditures on R&D is the Gross Domestic Expenditure on Research & Development (GERD) indices. The value of GERD in Poland expressed in current prices rose from PLN 2.1 billion in 1995 to PLN 5.1 billion in 2004. This however amounted only to US\$ 66.8 per head in 2004 while the corresponding figure for the EU was US\$ 493.1 [26].

Put in long-term perspectives, the level of Poland's GERD in relation to GDP decreased systematically, dropping to the lowest level among countries aspiring to the EU amounting to just 0.58% of GDP in 2004 (Figure 2).

Figure 1.

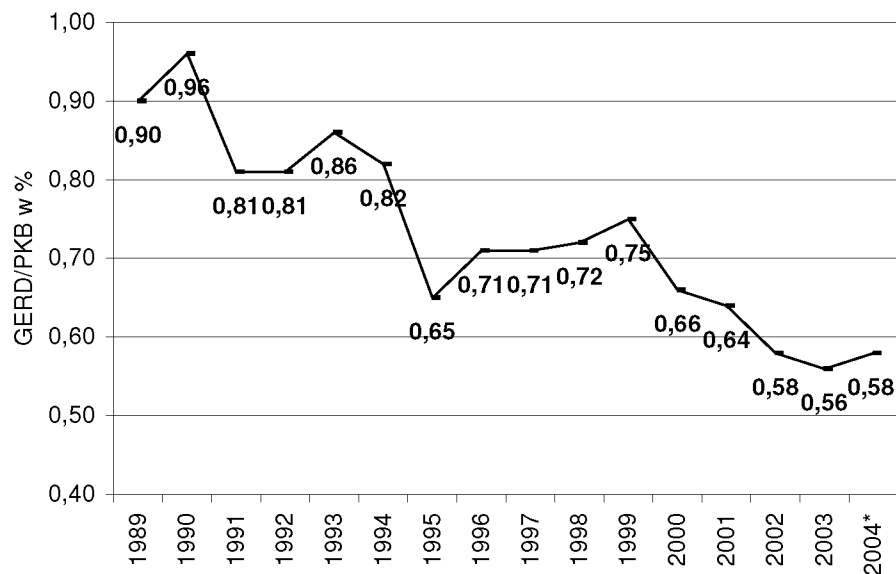
Gross Domestic Expenditure on Research & Development Activity in Poland during 1991–2003



Source: *Innovation Activities in Industrial Enterprises in Poland in 1989-2000*. Information and statistical papers, Warsaw: Central Statistical Office, 2002. *Statistical Yearbook of the Republic of Poland 2004*, Central Statistical Office, Warsaw 2005; *Science and technology in Poland in 2004*, Central Statistical Office, 2005, www.stat.gov.pl

Figure 2.

Share of GERD in GDP in Poland during 1989–2004



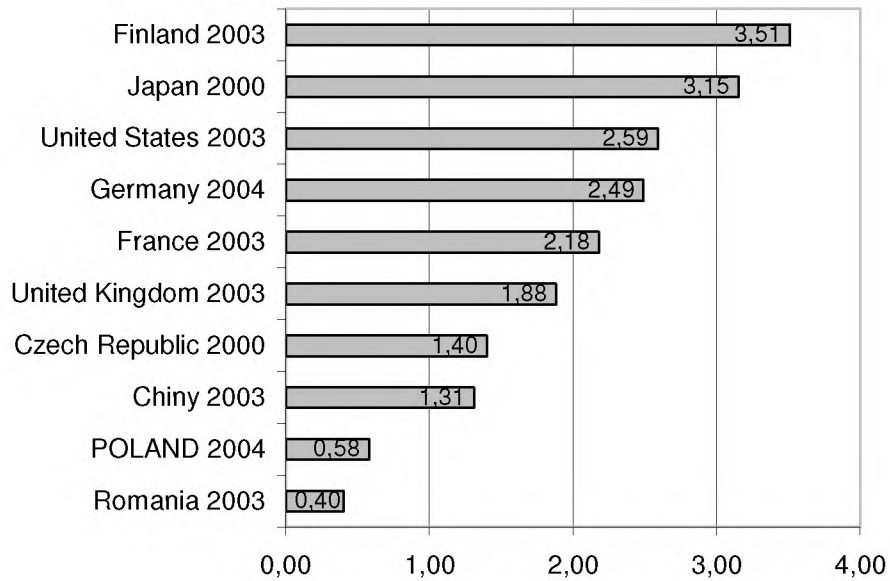
Source: *Science and technology in Poland in 2001, Information and statistical papers*, Warsaw: Central Statistical Office, 2003; *Science and technology in Poland in 2004*, Central Statistical Office, 2005, www.stat.gov.pl

Assumptions of the Lisbon Strategy are that investments in R&D ought to equal 3% of GDP in 2010. In the opinion of various authors, however, the level of investments in R&D ought to attain at least 2% of GDP. This level has never been achieved since post war periods in Poland. What is however disheartening is that the level of budgetary financing for the last 4 years been at a level lower than the critical level of 0.65% of GDP and has continued its fall. The consequences of the situation are two-fold. Such level of resources is barely enough to cover maintenance costs of research centres. Besides, there is lack of encouragement for the private sector to increase their level of participation by increasing their resources for innovative activities. The level of expenditures on R&D in the opinion of some authors is balanced on the threshold of social catastrophe and threatens collapse in civilization that will become noticeable after many years [27].

The fact that even in countries with very high level of R&D activities the value of this index is approximately 3% goes to confirm this point of view (Figure 3).

Figure 3.

GERD as a Percentage of GDP in Selected Countries (%)



Source: Eurostat.

Investment patterns in R&D in Poland as per their source of financing are similar to that in most less developed countries. The percentage of investments sourced from the state budget oscillated around 60% while corporate involvement did not attain even 25%. Increasing investments by international organizations and foreign institutions are for the most part financial resources from the EU (Table 2).

The majority of resources engaged in R&D activities are from non-governmental sources especially from corporate bodies in highly developed countries. This in essence means a less participation of public funds in financing R&D (Figure 4).

A visible negative phenomenon in Poland is the high percentage of basic research in the structure of investment types in research (Figure 5).

Table 2.

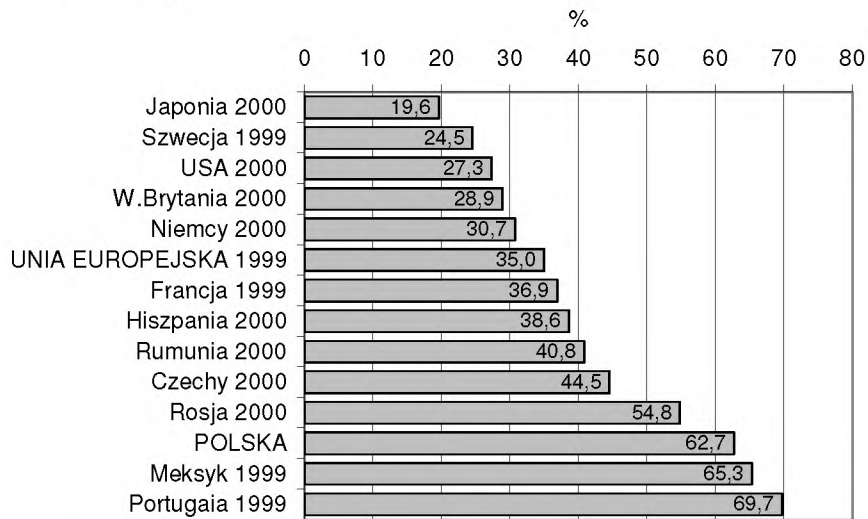
**Pattern of Gross Domestic Expenditures on R&D Activity
by Source of Funds (%)**

Specification	1995	1999	2000	2001	2002	2003
Total	100.0	100.0	100.0	100.0	100.0	100.0
Funds from:						
the state budget	60.2	58.5	63.4	64.8	61.9	62.7
economic entities	24.1	30.6	24.5	24.3	23.0	23.5
scientific units of the Polish Academy of Sciences and branch research-development units	11.6	7.5	7.7	6.2	6.3	5.9
international organizations and foreign institutions	1.7	1.7	1.8	2.4	4.8	4.6
Others	2.4	1.7	2.6	2.3	4.0	3.3

Source: *Science and Technology in Poland in 2002*, Information and statistical papers, Central Statistical Office, Warsaw 2004; *Statistical Yearbook of the Republic of Poland 2004*, Central Statistical Office, Warsaw 2005

Figure 4.

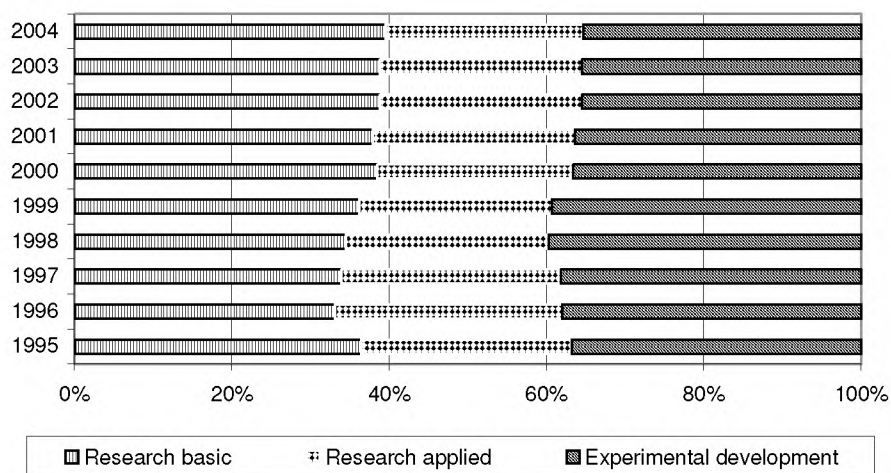
**Share of Funds from the State Budget in Gross Domestic Expenditures
on R&D activity**



Source: Eurostat; *Science and Technology 2001*, Central Statistical Office, Warsaw 2004.

Figure 5.

**Structure of Expenditures on Research and Development Activity
by type of activity**



Source: Science and Technology 2004, Central Statistical Office, Warsaw 2005.

Changes in volume, structure and trends in organizing expenditures on Research and Development activity reflect the level of inventive activities. Both the number of inventions declared and those granted patents have continued to fall since the beginning of Poland's socio-economic transformations. The increasing inflow of ready and new technologies from abroad, especially over the last few years has had its impact. The number of active foreign licences in Polish companies has increased from 118 in 1996 to 328 in 2003 (Statistical yearbook, Central Statistical Office). This source also provides the following:

1. Share of sales due to technologically new and improved products in sold production of industrial products, measured in current prices during 2000-2004 equalled 16.4%, 16.8%, 20.7% and 19.6% respectively.
2. Percentage of hi-tech products in imports in 2003 equalled 2.7%, while their percentage in exports amounted to 9.5%.

The structure of sold production in manufacturing sector by levels of technology during 2002-2004, according to the Statistical Yearbook of industry 2005, the situation is as follows:

	2002	2003	2004
• - high technology	5.4	5.1	4.5
• - medium-high technology	21.2	23.5	25.6
• - medium-low technology	29.8	29.7	31.3
• - low technology	43.6	41.7	38.6

Results of researches carried out using the Oslo methodology as part of the third round of CIS programme concerning innovation activities in the service sector in 2001-2003, and published by the Central Statistical Office show that:

1. The percentage of the so-called innovative companies in Poland which introduced at least one technical innovation during 2001–2003 was 22.0% and it rose by about 1.4% from 16 to 22% when compared to the 1997–1999 period;

2. The percentage of innovative companies in Poland's service sector was higher than the participation of innovative companies from the industrial processing sub-sector i. e., 17.1% and 16% respectively;

3. Despite the increase in participation of innovative companies from Poland's service sector, these indices were lower than in EU-15 and EFTA countries. The studies were also conducted using the Oslo methodology. The overall indices of participation in EU 15 countries was 36%, the highest of 53% was in Iceland; 49% both in Germany and Portugal but were lower in Great Britain – 26%, Italy – 24% and Spain where it equalled 23%.

4. The percentage of innovative companies in industry was generally higher than in the service sector in most countries where the researches were carried out with the exception of Greece, Portugal, Iceland and Sweden. On the whole, the difference between the participation of innovative companies in industry and service sector for EU-15 countries was 8%;

5. State run companies in Poland showed higher innovativeness than private companies both in the industrial and service sectors, the indices being 39.5% and 21.0% respectively;

In data analysis, especially with respect to factors inhibiting innovation activities, attention is often paid to basic issue of undertaking and managing innovation. In light of the prevailing acceptance of innovation as the main instrument of creating corporate and economic competitiveness, Polish entrepreneurs in the service sector claim that the main reason for not undertaking innovation activities during 2001–2003 was the absence of the need in the then existing market situation. Over 36% of responding companies from the service sector expressed this opinion (CIS-3). Conclusion should not however be drawn from this that competitiveness does not exist in the Polish market. These researches were actually carried in a period preceding Poland's accession to the EU, but it should be noted that intense competition in the Polish market occurred much earlier due

economic transformation. The attitude of entrepreneurs could be a signal that there yet exist other easier ways of achieving revenues than through innovation.

Companies, which, according to results of CIS-3 studies during 2001–2003, did not undertake innovation activities, made up 49.9% of all the companies covered by the study. A list of answers with reasons offered for this situation is as follows:

- 13.6% due to absence of need, as they introduced innovation in previous years,
- 36.2% due to absence of need resulting from existing market situation,
- 11.7% as a result of factors inhibiting innovation activities.

Factors that forestall the undertaking of innovation activities, in the opinion of entrepreneurs, are mainly economic, such as relatively high costs of innovation, lack of appropriate sources of financing and interest rates on loans. Other factors mentioned include insufficient flexibility of legal regulations, standards and rules. The dearth of information about technologies and markets were of little significance. It is worthy of note that all the afore-mentioned factors are external to the company and are as well objective in nature. This goes to confirm the underrating of subjective approaches among reasons for insufficient innovativeness.

As a way of summing up, it is worthwhile listing the main reasons for low level of innovativeness in the Polish economy as enunciated by a representative of the Polish Government at the meeting of the Board of Socio-Economic Strategies [28]:

1. Low budgetary expenditures on science and its inappropriate pattern,
2. Lack of clearly identified factual economic needs of R&D as well as lack of co-ordination between them and research priorities,
3. Insufficient focus of research communities on undertaking economic development oriented researches,
4. Lack of economic mechanisms to encourage private sector investments in R&D,
5. High costs of design and implementation of innovations that in most cases exceed the financial capacities of companies,
6. Lack of developed network of interrelationships between science and industrial sector,
7. Dearth of suitable qualitative and quantitative services offered by institutions to business community,
8. Insufficiently developed infrastructure to access on-line information and public services.

In the light of these issues, the question that arises is: Will actions be taken to facilitate innovation activities in the form of new organizational and financial instruments, which, on the one hand, are to provoke «suction» of innovation in the market, whilst on the other, are to trigger off increased incentive for co-operation between scientific centres and the economy turn out to be effective in transforming the existing situation?

4. In Search of a Subjective Approach to Innovative Research

4.1. Premises for Change of Approach

The accessibility of data relating to level of innovativeness has not been unconnected with the implementation of systems of statistical researches on innovation in Poland over the last 10 years. This system complies with recommended international methodological procedures prepared by OECD and Eurostat experts contained in the *Frascati Family Manual*, an international series handbook.

The *Frascati Manual* is a global source of widely accepted methodology of collection, analysis, interpretation and application of statistical data relating to research and development activity. An outline of this methodology was adopted in 1963 at a conference organized in a summer resort town of Frascati near Rome. The book has been reviewed several times and translated into many languages.

The third in the series of these books is the *Oslo Manual*. The name reflects the fact that the original version was prepared by the OECD and Nordisk Industrifond – Oslo. It has become a widely accepted international standard of statistical research on technical innovations both in industry and in the market services sector.

The *Cambera Manual*, named after the place where the coordination conference OECD and Eurostat experts took place also belongs to the *Frascati Family Manual* series. Its subject area is human resources for science and technology. Such a group is normally made up of persons currently or potentially engaged in activities concerned with the creation, development, dissemination and application of scientific and technological knowledge.

The international centre of statistical research, *Community Innovation Survey – CIS* is based on the *Oslo Manual*. Four stages of the research, CIS-1, CIS-2, CIS-3, CIS-4, have been undertaken till date. They have become the main source of information on varied aspects of innovative activities of over 30,000 western European companies. Another source of information on activi-

ties of western European companies is the *European Innovation Scoreboard* [29]. It covers 17 indices relating to four groups of issues i. e., human resources; knowledge creation; transmission and application of knowledge; innovation finance, output and markets. They serve as the base for drawing up the composite innovation index, applied in evaluating the innovative efficiency of national economies.

Research and Development statistics or to be more precise statistics as it relates to science and technology is currently one of the most important components of economic statistics. It is a useful instrument in taking decisions relating to national policies on science and technology.

Ongoing changes in the field of Research and Development influenced by various factors including those connected with globalization of technology are urging for steps to be taken in formulating new generations of science and technology indices. They are to be much more suitable in describing information society and knowledge-based economy. In line with this trend, a new edition of *Frascati Manual* was published in 2002, work was begun on the subsequent version of *Oslo Manual*, whilst a special research programme, New S&T indicators for a Knowledge-based Economy was initiated.

The *Frascati Manual* recommendations that are also applied by the UNESCO are suitable for the evaluation of levels of innovativeness for purposes of international comparison. They enable the recording of various states, thus indicating the need for innovativeness. They express the results of innovative activities in various aspects. They seem however, not to be enough in discerning the real reasons for, especially unsatisfactory, corporate innovativeness that is pivotal in ascertaining overall economic innovativeness as well as its competitiveness. Steps towards improving the unfavourable situations seem even far-off. The role and degree of influence of factors external to the company such as the state of the economy, limited market demand, industrial policy, insufficient offers from scientific research institutions, as well as lack of tools for transfer of technology, is becoming more pronounced [30]. Although internal factors are also taken into consideration, the lack of qualified staff, trained to undertake research and development studies, and the lack of skills in managing innovations have often been mentioned. This does not however entirely explain the overall issue of prerequisite of innovativeness.

Existing approaches to innovative research can be described as objective. Although the Oslo methodology recommends the subject approach, it however assumes the subject to be the company as a whole. The object of research is the so-called innovation dynamo, which is an intricacy of factors affecting innovative activities at corporate level. The list of factors obtained from researches applying the Oslo methodology has confirmed without doubt that it is an objective approach. Although it recognizes the role of human resources for science and technology, it fails to bring to light the causative role of the manager or executive personnel who function in given teams. It is well known that the number and rate of research for or creation of new solutions including their practical im-

plementation depends on their attitude. Fallout of the theory that innovation is the product of human activity is the need to ask questions about the subjective requirements of innovativeness. Subjectivity as an attribute of the man postulates that the man can both transform himself and the surrounding environment in accordance with his own needs.

The main issue being discussed is the need to emphasize human abilities

- 1) in self-determination in various situations, especially professional, socially and self creation;
- 2) in linking with specific legal regulations, as well as accepting the burden of responsibility;
- 3) without proliferation of opposition or shedding responsibility on others.

A typical way of organizing social life has for ages been the hierarchical order whose effects are yet visible in various forms, attitudes and behaviours. The turn of the XX century in Poland witnessed the collapse of existing political system, economic disintegration and axiological chaos. At the same time, however, attempts were made to build a new social order in which issues of subjectivity would seem a natural phenomenon.

The proposed approach to innovative research is an attempt to include it in trends, investigating suitable standards of innovativeness, especially as it affects companies. It is a way of drawing attention to aspects of innovativeness that are not covered by existing systems of statistical standards. This also is the area where the primary reasons for innovativeness originated from. The introduction of the idea of subjective approach to innovative researches demands that attention be paid to the understanding of innovation, precisely to its redefinition.

4.2. Proposals for Redefining Innovation

Innovation as a main category of the theory of innovation is yet to be precisely defined. The descriptive definitions being offered overwhelmingly in literature on the subject of innovation and innovativeness, as well as in recommended methodologies, not only do not depict the significance of the ongoing debates, but also do not give proper identification of the object of description. Researches seem to emulate the forerunner of the theory of innovation, Schumpeter by naming instances accepted by him as innovations. A definition that offers no explanation but from which it is understood that innovation is an idea, practice or object that is accepted as new by a person or any accepting body is of limited usefulness [31]. Authors often describe situations how innovations come about, but not what they are. Of course, it can be assumed that the term innovation is so frequently applied that it is understood by all. It does seem however that this approach has led to grave misunderstandings. Partners cannot presume they are

talking about the same thing but have to accept that their contents fit into a given terminology. The deeper we deal into the issue of innovation, the more we become convinced that Drucker's 25 year old words, we still cannot elaborate the theory of innovation, are still factual. Much is however already known to be able to confirm when, where and how to systematically seek opportunities for innovation and also how to ascertain their success chance as well as the attending risks in case of failure. We already know enough to at least formulate an outline of the practice of innovation [32].

In order to analyze the issue of innovativeness the following definition is proposed.

Innovation is the implementation of changes that result in specific benefits, be they economic, social, ecological or any other.

The good point about this definition is its magnitude and functional nature. It can serve as an instrument for isolating from the generality of such changes that possess stated qualities thus qualifying them as innovations. It is observable from the definition proffered that each innovation is a change, but not all changes are innovations. Propagating the proffered definition could stall all on-going discussions on what innovation is, whilst drawing attention to ways of their enhancement.

This proffered definition consists of three components, i. e.,

Change <<<>>> Implementation <<<>>> Benefits

These categorized components have a structural nature. The absence of any of them may predestine innovation or lack of it. The categorized components have attributed values. They must be present to ever make mention of innovation.

Change signifies the fact of substituting a new state for an existing one. It means introducing something new. The high degree of generality permits its applicability to any reality, not only economic. It postulates that innovation's standpoint is not only technical or business, but also all aspects and spheres of human endeavour. Even though the term *new* is not a definitive idea, its usage is always void of misunderstanding. It is useful to grasp it from the perspective of various levels i. e., first degree novelty (of global scale), second degree (national scale), third degree (sectors) and fourth degree (at company level) [33]. This same interpretation is contained in the Oslo Manual which in reference to technical innovation points to worldwide TPP innovation i. e., new products and processes on global scale; new products and processes at national and market level in companies operate; firm-only TPP innovation i. e., products and processes new only to a company but already introduced in other companies, other lines of business or countries.

Implementation is treated as structural component of innovation to buttress the fact that change can not be confined to the sphere of conception. If a

most original new idea that could substitute for existing one is not put to reality then it has no chance of becoming an innovation. Although this issue has been resolved by introducing the idea of invention in literature, there are yet situations where invention is wrongly assumed to be innovation.

Benefit as a structural component of innovation is growing in importance in contemporary world. The arbitrary nature of benefits does not permit its limitation to economic benefits as they do not guarantee complete usefulness in the understanding of the theory of individual prosperity [34] as well as theory of societal prosperity [35].

Trusting in only economic effects i. e., obsession with economic turn-outs may result in social inequalities, taking advantage of one's position with respect to others. Disregard for ecological, social, genetic, etc. consequences is a proof of lack of corporate responsibility. Individual responsibility, company responsibility and corporate responsibility as a whole can be delineated business life [36]. The issue of corporate social responsibility became the subject covered in the Green Paper published by the European Commission [37]. It can be reiterated that the positive summary benefit as discussed above is a definitive condition for accepting implemented changes as innovations.

Any resignation from these enunciated benefits, as a component of structural innovation, would lead to situations where implemented changes cause negative ecological or health results though often referred to as innovations. Emphasizing the diversity of benefits, including cultural and spiritual benefits, is immensely important as innovation is often considered by many only from the technical aspect. Peter Drucker in 1985 wrote that innovation is rather economic and social as against technical. Social aspects of innovation have at the beginning of the XXI century been linked with the wider issue of corporate social responsibility (CSR). The concept of corporate social responsibility was the subject of debate at the European Union Commission.

The procedural nature of innovativeness is being increasingly given attention in publications. One cannot help but agree with the submission of placing innovation within the framework of activities with procedural nature. Practice has proven that innovations are introduced as a result of many teams being engaged. The Oslo methodology talks of a systemic model to buttress the fact that innovation is the outcome of several complex interactions between individuals, organizations and the environment in which they function. This does not however change the essence of innovation understood as implemented changes resulting in defined benefits achievable in modern reality only in situations where there exist varied forms of co-operation between participants in the process of production, exchange or consumption.

Therefore, no discrepancy exists between the definition proffered and the systems oriented approach as they touch on different aspects. The definition shows the essence of innovation while the systemic model illustrates the conditions for putting innovation into reality.

4.2.3. Concepts for a Subjective Approach to Innovativeness

The concept is an attempt to supplement and bring into a whole the vision of innovativeness. It is based on the premise of man being a causative agent; the idea of him being subjective. He, as a subject, initiates actions, shows initiative, makes a choice, determines the probability and value of the consequences of a chosen action, assumes responsibility for risky undertakings including for his own failures and defeats [38].

At the same time it is worth mentioning that «the category of man's subjectivity is not empirical and it is not seen as a directly observable life phenomenon» [39]. The approach here presented is not about studies and confirmation of subjectivity but the application of idea thus appealing to basic qualities of humanity. The search has led to the acceptance of innovativeness as one of the features of subjectivity. A consequence of this is the assumption of one's responsibility as a subject for the level of innovativeness, an entity that fulfils varied social and professional roles simultaneously, one that is capable of taking benefits of given resource knowledge and that is in possession of intellectual capital.

This conception has secured itself place in publications of this subject area since the term ability is used to refer to innovativeness. Various authors apply the term ability in their definitions, while in researches and statistics innovativeness is associated with the intensity of innovative activities. The author of this paper is, however, in favour of innovativeness being associated with the ability to put innovation into practice.

In practical terms however, this means the ability to implement innovative processes effectively. The innovation process embodies a group of activities which are indispensable in the realization of innovation and which reflect the interactive linkage between science, technology, production and market. Significant changes permitting the emergence of subsequent generations of innovation processes occurred in the area of modelling approach to innovative processes. Multidimensional dynamic models presume a mutual, parallel interplay of all participants of researches, marketing and implementation tasks connected with the dissemination of innovation [40]. While not forgetting networks of integrated relationships, it was accepted that innovativeness is the ability to seek and / or create new solutions, to adapt them to specific conditions, to apply them in practice and next to disseminate them.

The term ability in the context of its aptness is an idea positively associated. It is seen as something desirable and good. It embodies hope or even optimism that the lack of this ability can be overcome. The specificity of abilities is that they can be acquired, in other words, they are learnable.

The *Preparedness* to undertake activities is connected with man's emotional sphere. It is as result of being aware of the magnitude of a problem which in essence means being decided on something. It remains under the influence of perceptible needs and one's acceptable values as well as those of the society to which he belongs. Its level is influenced by such factors as creativity, flexibility, communicativeness, constructive dissatisfaction, and risk taking [41]. The essence of being prepared for activity is explained by the concept of *homo hubris* [42], with an elaborate development need, high level of empathy and nonconformity. Man is used to acts of transgression i. e., to continual expansion of the scope of one's own physical, intellectual, manual or mental possibilities, thus extending the limits of cognition, overcoming barriers and stereotypes for the realization of much visible needs of achievement [43]. All the mentioned properties do influence the formation of the so-called motivational reinforcement. Important as it is with respect to all kinds of activity, it is however indispensable with innovative activities.

The existence of motivational reinforcement at a level expected depends on factors relating to the individual, environment in which he operates, the socio-economic situation of the country, region and world. In other words, the ability to act is governed by the free will of the individual (subject), as well as external factors. The proper management of this aspect of individual behaviour is very valuable, as sources of positive thinking and seeing external incentives as challenges and not threats are inherent in it.

Skilfulness means «being an expert in something, the result of the fact that we do know such thing». More defined, however, is knowledge, since owing to it man is in position to accept and undertake new activities. Skills in undertaking innovative activities in a given company derive from general and specialized education acquired by employees and managers, skills gained through continual education and experiences. They are proportionately related to the course of teaching and learning processes. The efficiency of these processes manifests itself in the form of specified competencies.

Skills can be gained at various periods of an individual's life and company's development. The bases of a given level of skill are already created before the individual becomes an employee. It therefore follows that the company has very little influence on the course of the learning process. During the process of recruiting staff, the company can however, apply the «filter model» to obtain employees with sought after skills. The next stage is deciding on conditions to enrich and complement these skills. A higher responsibility for the quality of skills ultimately rests on the employee instead of on the company. The role of the state, especially in creating institutional and administrative framework, is in this respect vital.

Possibilities in their elaborate sense are schemes that permit the realization of something. This also means various forms of dispositions that enhance achievements in a given field. Schemes that enhance the realization of innovation are financial, economic, technical, institutional, administrative, etc. condi-

tions. Their prevalence depends to a larger extent on the state and sometimes on the company or individual. It is not that an entity should bear the financial burden of innovations implemented in the company, but that it should use resources at its disposal through participation in the seeking financing for new solutions. Such dispositions together with preparedness and skills do determine the efficiency or realizing innovation processes. In analyzing Marciniak's approach to the role of human capital [44], it can be said that conditions complementing the set of prerequisites for the existence of individual's innovativeness are embedded in answers to questions such as: Is it able to exploit existing sources of knowledge?, Can it create new knowledge? Is it able to store, multiply and disseminated knowledge?

In analyzing each component of innovativeness, attention was paid to three subjects that create conditions for the course of innovative processes i. e., the individual, the company and the state. This does not, however, change the fact that it is the individual functioning as man, employee, manager or government representative that conditions favouring or inhibiting the search, implementation and dissemination of innovative changes depend on.

These factors mentioned are complimentary in nature. They must all occur together to achieve a defined goal. They compliment each other in a given sequence though their input in specific situations may be differentiated. Any insufficiency in one area can be compensated for by a higher potential of another area. An expression of this acceptable relationship is a situation where man sees himself as the source of action (WANTS), he understands it (KNOWS, has knowledge) and is able to overcome adversities of the realization of his actions (IS ABLE).

Despite this being theoretical definition, it gives, as an instrument, the chances to be aware that factual prerequisites of innovativeness are psychosocial in nature rather than technical. Various obstacles, technical in nature could have been overcome through the existence of specific conditions at the subject level that arise as a result of investments in human and intellectual capital.

The methodological assumptions thus postulated will no doubt be put to empirical verification. Subsequent upon this theoretical concept are solutions which through a logical analysis demonstrate their capability to initiate processes that induce and liberate innovative attitudes.

5. Conclusions

For the interest of the national economy, various companies and society, it is required that management of innovativeness be given a holistic approach. The fulfilment of this postulate requires paying attention to the subjective aspect of innovative processes. Its realization will remain unachievable unless fundamental transformation in our awareness and behaviour takes place. Propagating innovative attitudes based on subjectivity is a long-term process. It demands a systematic and gradual introduction of principles and models for seeking new, discovering, acquiring values and well-considered self-realization for one's own and others' good.

Despite their imperfection, marketing mechanisms still remain the best methods for organizing economic activity. Preference ought to be therefore given marketing mechanisms in influencing innovative attitudes and behaviours. The market however is a mechanism that appeals to human egoism, which expresses itself as individualized income motivation often treated as successful productive capacity of the individual or society. The result is the attainment of equilibrium through instability and violation of socio-economic cohesion. This necessitates the inevitable state intervention in economic processes.

The science and technology, including educational sectors as areas of fundamental importance for innovativeness are not free of this market imperfection. Hence, the need for the state to create mechanisms that would initiate desired processes to stimulate innovativeness in accordance with demands of economies based on knowledge and information society, thus optimizing socio-economic coherence.

Components of the concept presented earlier, which are parts of man's natural behaviour as a subject, can be used to indicate these mechanisms.

The main types of mechanisms include the following:

- Social mechanisms aimed at strengthening motivation and developing social capital (in context of WANT);
- Educational mechanisms aimed at strengthening education, i. e. endowing people with skills for acquisition of knowledge, as well as skills needed for existence in information society (in context of CAN);
- Infrastructural mechanisms directed at creating chances of realization (in context of BE ABLE).

Social mechanisms seem to be fundamental as they appeal to biological (health), psychological, and sociological essence of human existence. They are decisive on whether we have to do with a society that is fit, full of energy, with desire to act and co-operate with culturally developed individuals or with social capital of suitable quality. Achieving such a level is unfortunately a long-term

process. Hence, it is not desirable to delay the realization of the principle of equality of chances as a basic element of motivation, strengthening ethical basis, reduction and limitation of poverty, exclusion and marginalization, honouring professionalism, and propagation of a healthy style of living. In practice, these issues seem to be further down in hierarchy of individual or group behaviour.

Educational mechanisms are of grave importance in coping with demands of knowledge-based economy. This is for example observable in strategic programmes' documents of information society (ePoland, eEurope). They are based on the principles of awareness and competence. They arouse awareness of the existence of the need to apply varied methods of making choices in K-BE and the necessity to emphasize innovativeness. Those who possess skills to enable themselves to benefit from knowledge resources will find their place in the information society. This knowledge ought to serve not only for the improvement of the quality of private or professional life, but also to create knowledge-based resources for the good of the individual and that of others. Educational mechanisms are interwoven with existing education and university systems, practices of taking benefits of experiments, and continual education system. Marketing mechanisms deserve multidimensional support hence the indispensability of multiplicity of mechanisms such as these:

- current and perspective system for coordinating education, labour market and co-operation between schools and companies,
- flexible systems for creating skills of adaptability, creativity and entrepreneurship,
- associating teaching with education towards co-operation, honesty and citizenry,
- aiming at a flexible adaptation to new challenges (creativity, continual education, entrepreneurship),
- liberating strategic thinking,
- preparing to take benefit of knowledge and to create knowledge-based resources.

Infrastructural mechanisms in the form of interdependent components that initiate processes to arouse innovativeness refer to the creation of technical, information and information technology as well as economic infrastructures for managing knowledge. They are thus complimentary in nature. The efficacy of two previous groups may not be guaranteed without investments in information and telecommunication technologies. The efficacy of this infrastructure devoid of social and educational mechanisms would be limited. Infrastructural mechanisms cover the creation of realization possibilities and ensure conditions for virtual reality including freedom of information and knowledge flows.

Three groups of mechanisms aimed at developing innovativeness from the subjective view-point can distinguished. They must, however, be in harmony

with mechanisms that fall within the scope of economic policies directed at market enhancement. This is mostly about structural policies that transform technological abilities to attain economic competitiveness, facilitates the development of R&D sector especially investments in R&D, subvention for local centres of innovation, thus guaranteeing continual flow of fresh ideas and conceptions, facilitating transfer of technical know-how and inflow of businesses including the creation of business consultancy services network, etc.

The instruments initiated within these mechanisms can arouse and unwind innovative activities only if they are supported by appropriate code of conduct i. e., various formal (legal) and informal (acceptable thinking, activity and value systems) institutions. Majority of these institutions can in various direct and indirect ways influence innovative standards and behaviours. For example, these could include the scrupulous upholding of constitutional order by the state that guarantees freedom of choice of the individual, law enforcement, controlling corruption, protecting intellectual copyright law, mechanisms that limit the quest for state benefits, quality management systems in administration, increased diversification of public forms of activity in non-market spheres. It should not be forgotten that innovativeness is also a function of inherited stereotypical search for something new or cultivation of traditions by generations.

Due to the nature of social, economic and cultural experiences of Poland's past, the process of developing changes compactable with knowledge-based economy will not be an easy one, especially with propagating the subjective approach that creates conditions for increased independence and full responsibility.

Proposals for subjective approach to innovativeness as it affects concepts and transformation still remain in education. A new view on education doctrines and symmetrical upbringing would lead to paradigmatic subjective education. Increasing scientific reflections combined with intuition of educationists, parents and others who can influence the education and upbringing of a person, who is explorative and seeking after new things, is a specific social capital and relevant social force.

Developing the attitudes characterized by openness, imagination, capability for continual self-education and intellectual autonomy is an important step towards designing and developing the innovativeness of the people who later become employees, entrepreneurs, managers, clerks, and decision-makers.

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