

BUDGETARY REFORM OR RESTRUCTURING OF RESEARCH?

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Abstract: *In twenty-one years after the start of transition to democratic capitalism in Romania may find that problems of this complex were grown and become more difficult to resolve, the crisis is deepening and inadequacies have multiplied. One of the biggest problems is understanding the transition process to define the role of science in this process, problems, moreover, identified and Joseph E. Stiglitz, who show concern about the low budget for research and considered as the major research support transition and the fight against poverty.*

Keywords: research, development, innovation, budget restructuring, reform research

1. Introduction

Recent developments and prospects of the economic crisis out of the crisis and further development of European Union countries through science and technology and adapting to globalization should lead a new attitude of Romania in terms of effectiveness and competitiveness reforms in European integration. Twenty-one years after the transition to democratic capitalism in Romania may find that problems of this complex were grown and become more difficult to resolve, the crisis is deepening and inadequacies have multiplied. To that end, **Joseph Stiglitz** (former World Bank chief economist) remarked that "*experiences of countries in the transition process, is the most important economic and social experiments, among which were ever made, and these should be an learning opportunity for researchers to understand the deep knowledge of economic reform and the expected benefit both countries, again, the benefit of development*" (Joseph E. Stiglitz, Whither Reform? Ten Years of Transition, World Bank Annual Conference on Development Economics Washington, April 1999).

One of the biggest problems is understanding the transition process to define the role of science in this process, problems, moreover, identified and Joseph E. Stiglitz, who show concern about the low budget for research and

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considered as the major research support transition and the fight against poverty.

Articles published in specialized international publications in the field show that the productivity and international competitiveness of a country depends on the rapid accumulation of knowledge and effective transfer of technology and positive experience.

2. SWOT Analysis Romania

Most government interventions in the technology have been directed to correct the market drops or the tendency to under-funder private sector technology development. Lack of interaction between 'actors' system, discordances between basic research and applied research in the public sector industry, malfunctioning technology transfer organizations, information gaps and absorption of companies led to a decrease in Romania's innovation performance. Types of public policies are needed to prevent and / or correction of systemic falls, specifically targeting the development of networks and improve the absorption capacity of firms. Developing network diagrams (Networking) increases the reliability of interaction between 'actors' system and the interdependence of institutions within national innovation systems. Such policies focus on research related activities ("Joint Research) and other technical cooperation between enterprises and public sector institutions. Schemes to promote research and technology partnership with the government are particularly valuable in this context. This policy attaches importance to high levels of co-patenting, co-publishing and mobility of staff and implementing intellectual property rules, apply specific measures and changing labor market programs to facilitate continuing such cooperation. These policies recognize the importance of knowledge and information flow network access technology, infrastructure and policies that are implemented to support information technology. Such policies encouraging the development value of beam charge and the innovative producer of close relations among business users and, on this view, determine the appropriate competition policy. In general, these policies seek to protect streams and augmentation of innovative networks, linkages and partnerships in the most efficient manner. Strengthening the innovative capacity of firms is another policy priority. From the perspective of innovation systems, this means improving the ability to access the right company, to find and identify relevant information technologies and adapt this knowledge to their own needs. This means an overall increase in technical capacity, managerial and organizational applications from companies, which requires greater investment in its research, training and information technology staff. The goal is improving the ability of

firms to acquire information and technology, either domestic or foreign, and is absorbed on a continuing basis. Technology policies aimed not only to broadcast equipment and technology to companies, but also increase their ability to find and adapt themselves technologies. Technology policies aimed at not only technology-based firms, but smaller firms with technological capabilities in both the traditional and mature industries and services sectors.

These policies focus on increasing the capacity not only individual firms but also on strengthening networks and innovative performance of firms and sectors beams. Summarizing, it can be assumed that processes soft as innovation and learning are those which lead to the breakthrough of economic competitiveness, whether they are at the firm or the nation. In this respect, the most general way, Professor RON Johnston, Executive Director of the Australian Centre for Innovation and International Competitiveness at the University of Sydney wrote: *"... innovative systems are today recognized as the heart economic development, causing these technological competitiveness of nations. These systems are built on combinations of factors such as national industrial organization, research capacity, professional and financial resources, all of whom were strongly influenced by national characteristics"*.

None so far, political and civil society have come to recognize the role that science could have on the reforms. Redefining the role of science in crisis should be based on reformist idea that science and technology are key factors for economic and social development. The measures set out in regulations adopted on science, statements Legal reform should be established. To achieve its beneficial effect, these measures must be supported by a wider recovery specialists and to revive the institutions that will be necessary for future development of Romania. Following the set, SWOT analysis for Romania is as follows:

Strengths:

- Large work force, low costs and acceptable levels of initial education, natural resources, energy resources, a series of successful manufacturing sectors and in the number of primary specialist ICT

Weaknesses:

- Concentration in sectors with low added value / low cost strategy based on extremely low-level R & D and innovation and about the fragile economy, weak entrepreneurial culture developed / underdeveloped SME base
- Reduced size capitalization SMEs
- Difficult access to finance and to information in business
- Low degree of market sophistication
- High energy intensity

- Obsolete technology / high production costs (less labor costs), degraded infrastructure and poor / low accessibility within and outside country
- Inadequate environmental-management (including in terms of infrastructure), inefficient agriculture (over-intensive work), farmland excessive fragmentation
- Underdeveloped tourism infrastructure and inadequate marketing
- Reduced adaptability of the workforce and low lifelong learning
- Important segment of the population affected by poverty and social exclusion
- Underdeveloped administrative capacity State-level organization of organized crime, supported by the Romanian presidency
- A privatization program and interested poorly managed

Opportunities:

- EU integration
- Size (the second country in population in the NMS-10 +2)
- New sources of investment, including Structural and Cohesion Funds
- FDI
- Romania as a tourist destination
- Niche travel
- Potential node regional natural gas transmission and power-full liberalization of public procurement
- Modernization, market liberalization and business models
- Business development infrastructure, e-commerce, e-government
- Modernization of agriculture
- Modernizing capital and other key urban centers
- Need / accept the need for change

Threats:

- Competition, higher exposure to global markets
- Long period of stagnation / decline in European or global economic
- Migration of industries to lower-cost foreign locations
- Strengthening position / image of Romania as an economy based on low value added sectors
- External migration of workers with a high educational level
- Climate change / environmental degradation

3. Dynamic connection between R & D investment and trade

Strategies to support R & D as a means to ensure international competitiveness and higher incomes, are priorities of many national development policies. Recent popularity spread of neo-technological trade theory and economic outlook presented studies showing the great consensus on the pivotal role of technology policy for long-term macro-economic success. Trust in national policy designed to increase investment in technological activity usually assumes the existence of a causal chain that includes two vital

connections (Figure 1). The first stage consists of three phases: the transformation of R & D investments in the production of useful technologies (I), followed by innovation of production (II), which leads to sectoral productivity growth, international competitiveness and trade performance. The second stage includes the assumption that commercial success will have a positive influence on the growth of economic welfare. While this model applies generally at the sectoral level, interdependence and diffusion effects support the existence of these macro-scale connections. It's more than obvious that causal links from stage 1, are very strong and direct.

Already, several studies found a positive association between high levels of domestic business R & D and production business performance. Despite this, many of these tests have to be suffering an "static" on account that examines these connections only at a time, leading to possible removal from the analysis of trends is vital for science policy and technology, in particular, the potential erosion of spatial association between R & D and economic outcomes, as suggested by "globalization hypothesis. This view is argued in that interaction, the spread of multinational enterprises, enhance international cooperation in research and joint type joint venture, developed systems to communicate and transport and greater mobility of scientists and other resources, was characteristic dominant world economy over 50 years.

Consequently, the geographical connection between technological efforts and economic benefits may be a necessary and may be a gradual and pronounced dissolution event, co internationalization. If globalization is a realistic assumption, it would be necessary for deeper arguments supporting policy-oriented science and technology to stimulate regional or national level, in order to draw a use of trade or other economic activities.



Fig. 1 – Connections between technology policy and trade policy

In stage 2 (Fig. 1) modern technology, the commercial success of the trade has a positive effect on economic welfare. This is explained, in general, the impact of technology on productivity, technological diffusion (beyond the limits of the company, industry or region) and increasing export earnings. The assumptions of this model are the relevant performance test dynamic economies of East Asia, where, for example, South Korea, during 1981-1997, increased expenditure on R & D of about 17 times, which was pushing up through the export of GDP by about 4 times. However, recommended caution in designing national development policies through science and technology as necessary to perceive more deeply, the effects of globalization. It also considers the relationship between R & D investment and economic performance is still insufficiently exploited. Such policies place emphasis on research related activities ("joint research") and other technical cooperation between enterprises and public institutions. Schemes to promote research in technology, in partnership with government, are particularly valuable in this context. This policy attaches importance to high levels of co-patenting, co-publishing and mobility of staff and implement intellectual property rules, apply specific measures in the labor market and promote programs to facilitate continuing such cooperation. Also, these policies recognize the importance of information flow of knowledge and access to technology networks. Therefore, infrastructure and policies are implemented to support information technology.

These policies encourage the development levy value innovative bundles and that of the close user-producer relations among firms and, on this view, determine the appropriate competition policy. In general, they seek augmentation of innovation networks and to design flows, links and partnerships in the most efficient manner.

United States, the National Science Foundation (NSF), U.S. investment in nation's future and its strategic vision is reflected in the model by which to select specific projects to be financed through an evaluation process based strictly on their merits, using two criteria: intellectual value of the proposed activities and their impact. Direct results of NSF investments can be described by the following strategic objectives: People, Ideas, Tools and Organizational Excellence. Long-term impact of NSF investments specified in its mission "To promote scientific progress, support the national health, prosperity and welfare, national defense and other purposes." Although short-term difficulties were encountered in linking research projects indicators of long-term impact, global assessment has shown, every time, that public expectations have been met in relation to the amount of research and training in science and technology. The decision on the successful completion of each objective is based largely on information contained in reports from external bodies to assess NSF programs and activities. Staff NSF review ratings and statements

relating to significant accomplishments to ensure that judgments are justified. In addition, there must be evidence or examples to support these judgments. Selected targets are reviewed and validated each year by third parties. The alignment of budget and performance indicators, targets NSF and categories of resources are put in direct correlation with specific budget resources. In essence, S.U.A. their development policies based on the concept "social contract of science" which implies the existence of special mechanisms, which ensure balance of responsibilities between government and science.

4. Performance evaluation of current research development and innovation in Romania

Productivity and international competitiveness of a country depend on the rapid accumulation of knowledge and effective transfer of technology and positive experience.

Peters L. Daniels tried to find a dependence between the cost of research development and innovation (RDI) and changes in global exports.

The study was conducted by Peters L. Daniels on three categories of countries

- Highly industrialized (USA, UK, Canada, France, Germany, etc..) - Newly industrialized (South Korea, Thailand, Malaysia);
- Developing countries (Argentina, Chile, Colombia, etc..).

In accordance with the conclusions of this study, which was developed based on statistical data in the range of years 1978 - 1988, shows that there is an explicit relationship between costs and changes in exports RDI, respectively, the variation of GDP - site.

However, they observed two interesting phenomena.

First, many highly industrialized countries (U.S., Britain, France, Switzerland and Belgium) had high failure exports, despite large investments in RDI. However, three of the most dynamic countries of East Asia (Singapore, South Korea and Japan) have had huge gains in exports, from investments made in RDI. Although it is difficult to generalize this observation, it nevertheless suggests that records of transfers of high technology influences on export growth.

It is possible that the study cited were not taken into analysis and other possible influencing factors.

However, this discrepancy suggests other influences, which could explain the decrease in export potential of Western Europe and North America.

Dimensionless indices to define the variation of GDP and RDI, as follows:

$$\partial_{\text{GDP}} = [(\text{GDP})_f - (\text{GDP})_i] / (\text{GDP})_i$$

$$\partial_{\text{RDI}} = [(\text{RDI})_f - (\text{RDI})_i] / (\text{RDI})_i$$

the indices have meaning:

and - at the beginning of the analysis;

f - the end of the analysis.

To calculate, using these relations and statistical data, changes in GDP and RDI during 1987-1997 for a group of ten countries, among which Romania.

Figure 1 shows the change in GDP, in line with changes in costs for RDI in those countries during a decade (1987-1997).

After a period of 10 years, when powerful group of industrialized countries (USA, France, England, Italy), shows that while the allocations for RDI (% of GDP) fell GDP increased its index variation having values below 0.3. In Germany, although allocations for RDI decreased more pronounced, however, GDP has increased significantly, the index of variation of which is $\partial_{GDP} = 0.5$.

By contrast, expenditures for RDI Japan and Canada have increased, given that the increased GDP is ∂_{GDP} of 0.34 for Japan, respectively, 0.25 for Canada.

Phenomenon appears more pronounced in the case of New Zealand, which at one $\partial_{RDI} = 0.38$ corresponds to a $\partial_{GDP} = 0.73$, so quite a pronounced increase in GDP.

South Korea has a $\partial_{RDI} = 1.2$, ie a large increase of expenditure RDI, which corresponds to a $\partial_{GDP} = 1.16$, which means a large increase in GDP.

As regards Romania, the index of variation of costs for RDI has a value $\partial_{RDI} = -0.54$, which corresponds to a $\partial_{GDP} = -0.46$. These variations show that if RDI costs have dropped sharply, just as drastically decreased and Romanian GDP.

From these calculations and observations we estimate that there is an explicit dependency relationship between costs and changes in GDP, RDI, which means that the analysis should take other factors of influence.

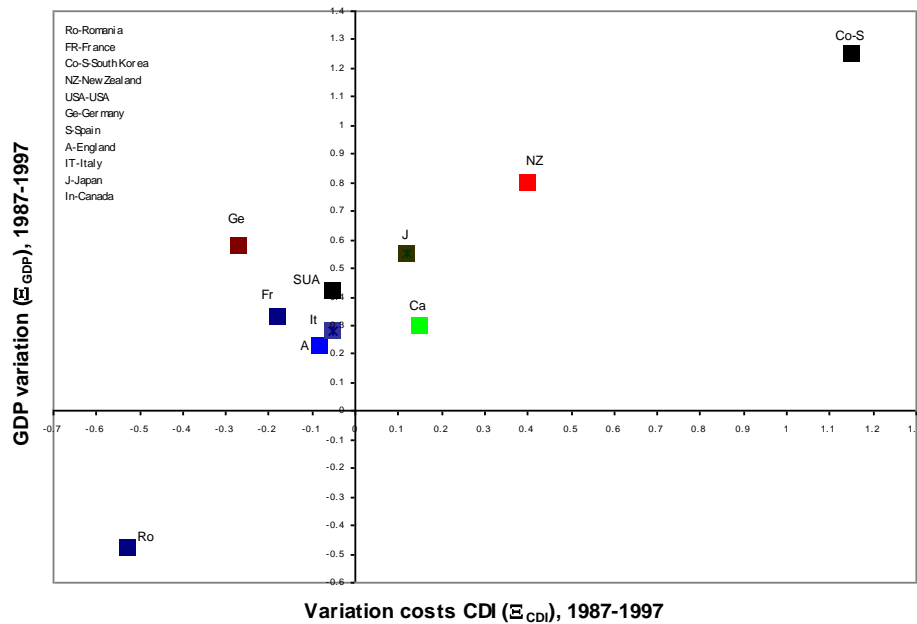


Fig. 2 - Change in GDP, in line with changes in expenditures for RDI

One such mitigating factor, as Fukuyama, could be capital. As a social factor influence suggest that property and effective exploitation depend much on the set of common values and sociability. Trust, for example, is what forms the basis of effective relationships between businesses and maintain innovative performance in the interests of business and GDP growth.

On such reasoning could be identified and other factors influence GDP, in order to find the relationship of dependency explicit relationship in which a significant share an investment in the RDI.

It requires thorough research, because innovation, the process is more than a means to redress the problems of transition and development through the balance of payments.

As a first approximation, one can assess that the mere investment in RDI not automatically solve the problem of GDP. This investment should be associated with capital, innovative capacity and other factors of influence.

In view of these interpretations, innovative company is operating with a complex network of cooperation and fair competition is with other companies and organizations that build a performance range of innovative combinations and links with suppliers and customers.

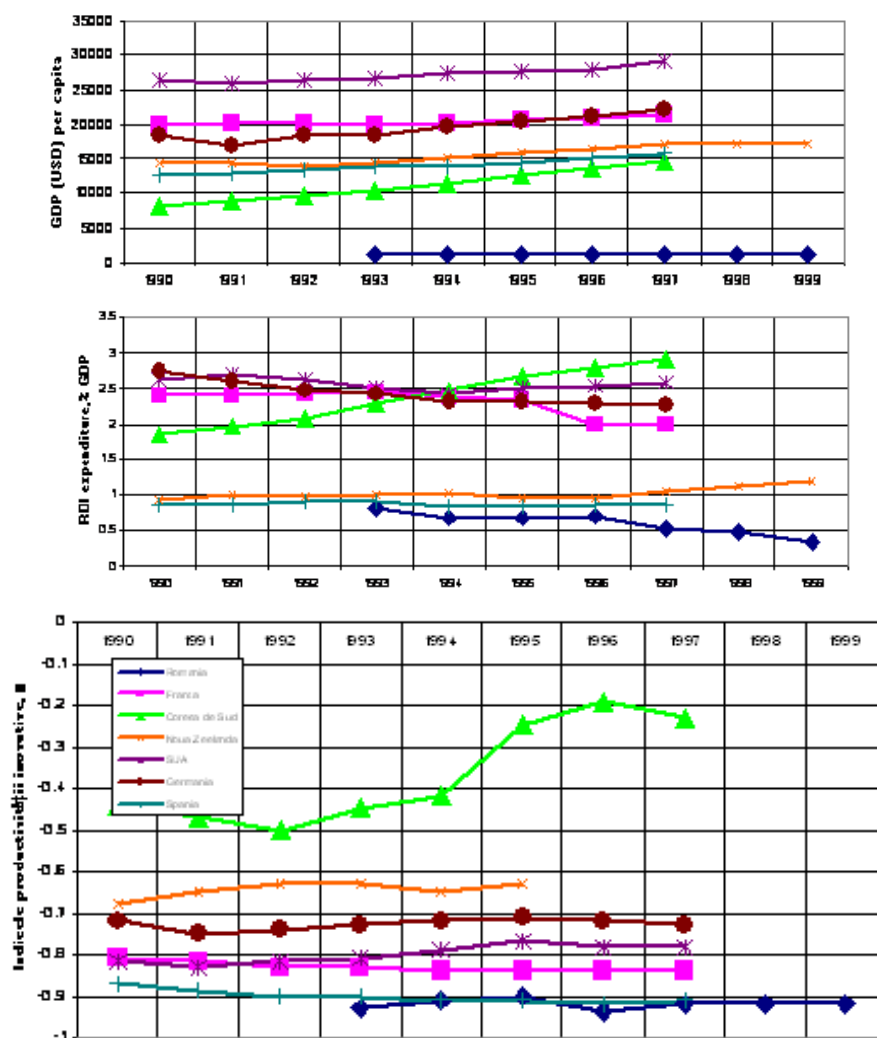
Innovative productivity is defined by the relationship:

$$\partial_i = (C_1 - C_0) / (C_1 + C_0)$$

where: C_1 - RDI costs incurred by a researcher, Euro / researcher;

C_0 - RDI costs incurred by a patent, Euro / certificate.

Innovative productivity index values were calculated for a group of seven countries, among which Romania. These calculated values are plotted in Figure 2.



**Fig. 3. Evolution of GDP per capita,
in conjunction with innovative productivity change index**

Figure 3 is presented developments in time, the following parameters for development through RDI:

- GDP / capita, considered as an indicator of welfare;

- expenditure on RDI;
- innovative productivity index.

It is noted that for countries with high levels of GDP per capita, and expenditure related RDI, corresponding values of ∂_i and closer to zero. Typically, $C_0 \geq C_1$ and therefore ideal case is given by $C_0 = C_1$, in which $\partial_i = 0$. Thus, the U.S., which has the highest GDP per capita and large expenditure as RDI, made an innovative productivity index with values from - 0.77 to - 0.83, while South Korea made $\partial_i = - 0.19 \dots - 0.5$.

Romania is ∂_i and the closest value of "-1" ($C_1 = 0 \rightarrow \partial_i = - 1$), which means a very low productivity, innovation, as reflected in GDP per capita modest, with values between 1120-1346 USD per capita.

Observations of the same type can be made with the other countries examined. What should be noted, that obviously is that present innovative productivity index values as close to zero, as the growing costs of RDI / researcher and as costs decline RDI / patent.

This means that stimulation of human, technical and scientific facilities associated with a corresponding increase of income per capita, so the GDP.

In these countries, but generally, even if it increased the number of analysis parameters (∂_i , RDI costs, population, number of researchers, the number of patents, GDP), the relationship of dependency with GDP remains below default. This means a remarkable presence and other factors behind these figures and curves.

These factors, which are more socio-cultural, must be studied deeply, and for countries in transition, this research represents a major scientific stake, but also a pragmatic.

To understand the functional relationship between parameters to be associated with the creation of a nation's welfare should be studied further influence innovative productivity and expenditure on the development of RDI GDP.

Without fail to reveal anything other than a default dependency, the results obtained in the study show that in the context in which it operates and some socio-cultural, innovative productivity and costs RDI influence a large percentage change in GDP site.

This shows that more research is needed, continue to have the original Romanian reality, psycho-sociology of the Romanian people, to define the transition not only a pragmatic project, but also as an innovative project-socio-cultural complex.

The results of this research could provide Romania's success in developing and transition process by making the company an innovative and adaptive culture, so this breakthrough technology to support emerging and a corresponding rapid increase in the competitiveness of Romanian.

Analysis of evolution, long periods, the Gross Domestic Product (GDP) show that investments made in IDUs, with 4 - 5 years previously, implicitly reflected in GDP growth.

Studying these two parameters on a group of four countries, among which Romania (Figure 3), there is a similarity between the previous shape of the curve RDI and posterior aspect of the curve GDP.

During 1981-1986, South Korea made RDI expenditure worth USD 12.9 billion, which led, in combination with other factors, an increase of 1.2 times GDP in 1990 to 1986. The same pattern is observed in other parts of the curve, the corresponding periods of 4 - 5 years.

France, in the same period, has allocated U.S. \$ 121.9 billion for RDI. In the next period, this show in 1990, a GDP of 1.14 times in 1986. Also, New Zealand, which has allocated 1.91 billion USD for IDUs in the period 1987 - 1991, obtained a GDP growth of 1.2 times in 1996 compared to 1991.

For Romania reverse phenomenon is observed. Thus, it has allocated 1.5 billion USD for RDI during 1989-1993, corresponding to a GDP in 1998 almost equal to that of 1993. The same phenomenon, much worse, is repeated in the period 1993-1997, with the result even more pronounced decrease in the rate of damage, GDP, the effect of a policy of continuous decrease inadequate investment in RDI.

Regarding welfare in Romania, it has fallen sharply in the period under review, while it increased in countries that have consistently invested in RDI (Fig. 4). In comparison with 1989, Romania's GDP per capita dropped by half in 1999, which explains the high rate of poverty today.

In a period of 10 years, between 1987-1997, France's GDP / capita increased by 17% in South Korea it has doubled, and in New Zealand increased by 1.5 times. Returning to Romania's problems, we can specify that in accordance with our concepts and beliefs, scientific research is part of the culture of our country. In addition to issues of originality and constructive contribution, one of the local research objectives is to provide access to understanding and using knowledge from other countries for integration into the international values.

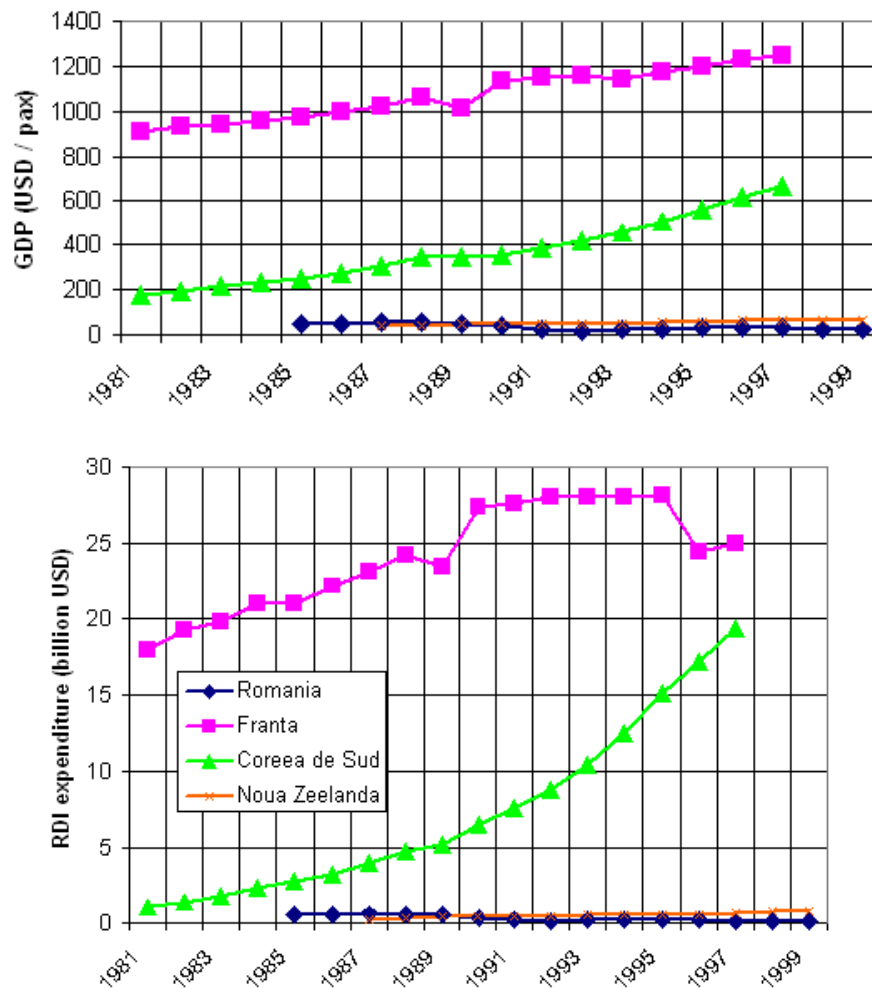


Fig. 4 - Development costs RDI, in conjunction with the evolution of GDP

Romanian researchers to become supplier of power in the national economy and improving the technology taken similar.

While ensuring high standards of education and innovation, research leading to the formation of those new researchers, which are needed in research system and the entire Romanian society.

Research we can provide concrete results and can give a boost Romanian development of new products.

Without research we can not have prosperity, so that research is essential for the spiritual and material condition of the nation in future.

Romanian research must be an independent and significant part of global research.

Meanwhile, the Romanian research is part of European culture and world, but Romania should contribute to ensuring continuity of this culture.

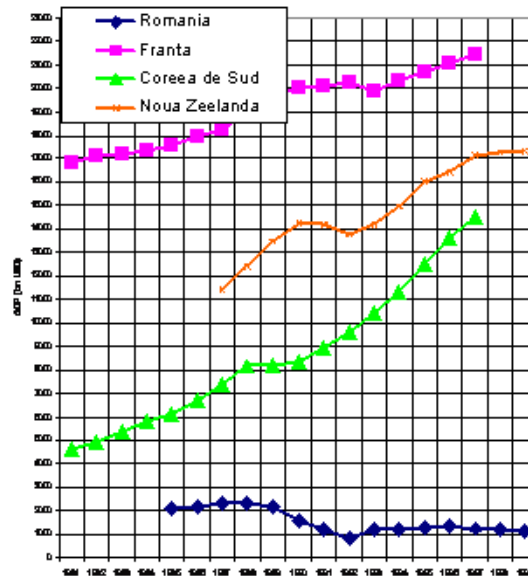


Fig. 5 - Evolution of GDP per capita

5. Deep recession, an uncertain future

Romania has experienced in the past 20 years a diminishing industry primarily determined by a deep crisis of the system. Factories were closed mono-industrial cities representative. They lost hundreds of thousands of jobs in industry. Some national brands in the industry have been saved through privatization, others not. Of course, they have created hundreds of thousands of jobs in services. Of course, services in developed economies have a higher share of GDP than industry - but where this phenomenon occurred more slowly and certainly not by lowering industry, but by relocating to other countries or industrial by faster growth of tertiary sector than the industry. Of course, the quality of local production has progressed especially but not exclusively, in companies with foreign capital. Foreign capital has come to realize over 80% of turnover in the industry, an agent that is not found itself in trade balance statistics, which remains deeply unbalanced. For 21 years, Romania runs for industrial policy. There is however nothing wrong in having an industrial policy. The European Union, including strategy and promote Europe in 2020. The United States had even a national effort to re-industrialization in the 80s, and are found today before a new re-industrialization, especially after the financial crisis demonstrated the fragility and volatility of an economy based too much on speculation. An industrial

policy is needed especially in the context in which Romania has abandoned many of the levers of macroeconomic public policy: trade policy through EU membership, the flat tax policy (without feedback on it here), and is preparing to abandon the currency and monetary policy in euro area entry (maybe too early in terms of structural reforms still unfinished). And that industrial policy can not seek re-industrialization than Romania. This does not mean a new productive capacity or excess inventory, as was the case before 1989. This does not mean an attempt to nationalization - the state have the opportunity to intervene in the economy at the strategic level without affecting the structure and nature of ownership.

Re-industrialization of Romania is required to exploit the potential of production and entrepreneurship, and especially to radically change the model of economic development. Growth model based on consumption of certain goods from import duty has been denied the economic crisis. Productivity growth in industry was done on account of staff - but what is missing today Romania, perhaps more than any, is very labor employed in the formal economy. Four out of ten Romanian able to work illegally working and the country's budget will not recover until a sustainable part of them do not find work.

Romania's re-industrialization can only state. However requires an integrated approach to public policy level. It requires investment in infrastructure is needed to link external funding with the objective of re-industrialization, we need consistency in the act of decision.

On the supply side, Romania has several competitive advantages as the cost of redundancies (which practically does not exist for individual dismissals), the protection of investors and linking payments to productivity - a chapter in which moral hazard, represented by the emergence of the crisis, returned things right track after wages had increased in the period 2004-2008 more than productivity. We have several drawbacks in the normal range, including access to loans for investments could be improved after the needs of state loans to finance the deficit will moderate. Instead, there are many competitive disadvantages with strong intensity, which affects competitiveness and public policy interventions need to be resolved. Protection of intellectual property and employment flexibility can be addressed through legislative levers. But the quality of infrastructure and educational system and requires more research - requiring massive investment, which Romania is struggling to afford higher under deficit limits imposed by the IMF and the Maastricht criteria (if required preparations the euro). Here comes the paradox actually Romanian economy, which has become an investment-based economy without having ensured normal operation of production factors.

Economic literature identifies four types of stages of development of economy: based-economy factors (inputs), investment-based economy, innovation-based economy (R & D expense - innovation), degree of sophistication market, welfare-based economy (where redistribution has become a priority, which reduces the overall competitiveness of the economy - when the Scandinavian countries). Romania was an economy based on factors, particularly natural resources and cheap labor. During communism, Romania, along with other eastern countries, tried to be what Janos Kornai called a "premature welfare state", meaning that excess accumulation of national wealth redistribution. In the first decade of XXI century, Romania has taken important steps towards an economy based on investment, if we consider the stock of FDI (which exceeded 50 billion euros) and very high growth rate of gross capital formation fixed (investment rate). Investment rate (Table 1) exceeded the savings rate during the boom's \rightarrow and the trend began to reverse when the crisis started in late 2008.

Savings rate and investment rate, % GDP

Table 1

	2004	2005	2006	2007	2008
Saving rate	15,3%	14,7%	16,1%	17,6%	19,1%
Investment rate	23,7%	23,3%	26,5%	31,1%	31,4%

6. Policy options for achieving an economy based on innovation

What can we do continue to become an economy based on innovation?

The lack of vision and the wrong funding policy, promoted in the budget 2010, the accelerated development of Romania is pushed deep recession and to an uncertain future. It is imperative to restructure the relationship between society civil science and public administration. Current framework of these relationships is strong disrupted and adversely affect the scientific community and civil society, with high risk impact on the development of Romanian society as a whole.

Solving this problem may be with the help of civil society, considering of its desires, namely strengthening democracy and circulation of ideas in developing long-term benefit of Romania. In the context of transition to democratic capitalism, Romanian society was not yet proposed a vision and integrative perspective involving development through science and technology, which object of a social agreement. This agreement could be a

"social agreement science. Existing agreement suggests preferential treatment given community science by the government. Consumption as a public good, science is an investment in culture and development. But on account of ideology and government funding drastically diminished the science, we see that science is not considered a good production.

A major feature of the agreement would be the existing social science mechanisms special responsibility to ensure balance, between government and science.

This equilibrium values would be considered both government accountability, and the the autonomy associated with an independent professional community. Significance Agreement describes the social relations within the scientific community. In this size, social science agreement could be charged and that an agreement within which scientists agree to abide by rules implicit in the production knowledge, rules such as truth and accuracy of reports on results recognition of others ideas, etc. duty. Thus, membership in community Scientific leaves each free, but require the same time, devotion to ideals scientific work. The idea of social agreement for researchers would be justified rules on professional conduct and basic support of self-regulation.

Unresolved problem will lead to a lack of strategic vision. Overall necessary political fundament development through science, the disturbance democratic process, to develop science and corruption in public administration at further loss of competitiveness of scientific research, long-term effects the catastrophic economic and social development of Romania.

Allocation of budget state for research in 2010 to only 0.26% of GDP will lead to dramatically lower the contribution of research to remove Romania the crisis and to ensure its continued development, to compromise commitments through international collaborations and contracts, the destruction the physical and moral wear modern equipped laboratories in recent years, availability of a large number of researchers, many of whom will be young.

Initially, Romanian Government is committed to funding of 0.8% of GDP on research. In research conditions in which no reform will be realized, reducing financing for RDI is a policy mistake that will have serious consequences medium and long term. The general objectives of government industrial policy post-December were:

- Increased competitiveness
- Increase research and development role
- Promote sustainable resource management and environmental protection
- Improving training and employment.

Post-Revolution government failed to fulfill these objectives, the national economy there are still weaknesses, as follows:

- Industry still has a high degree of concentration in value-added sectors low;
- Low R & D and innovation and loosely coupled with the economy;
- Poorly developed entrepreneurial culture / the small underdeveloped;
- Thin capitalization of SMEs;
- Difficult access to finance and to information in business;
- Low degree of sophistication of the market;
- High energy intensity - outdated technology / high costs of production (more less labor costs);
- Degraded infrastructure and poor / low accessibility inside and outside the country;
- Inadequate environmental management (including in terms of infrastructure)-inefficient agriculture (over-intensive work), excessive agricultural area fragmented;
- Underdeveloped tourism infrastructure and inadequate marketing;
- Low adaptability of workers and low level of lifelong life;
- Important segment of the population affected by poverty and social exclusion;
- Insufficiently developed administrative capacity.

In the years after the revolution, have accumulated more government failures, namely:

- Romania has adopted an industrial policy based on a development model by science and technology, through a genuine reform of research in order its connection to economic demands.
- The government made the mistake of making the policy applied research field education, when were logical and natural that it be part of industry.
- Hesitations of authorities to underpin the National Plan for Research, Development, Innovation and the Operational Programmes have led to an inability to subsidize developing research infrastructure and research results to obtain significant for the national economy.
- The Research - Development - Innovation (RDI) from Romania, is not able to ensure the promotion of industrial development, due to weaknesses its most important among them are:
 - RDI expenses extremely low, compared to industrialized countries;
 - Total or near total absence of research - development sector enterprises, which is, in fact, the main driver of innovation;
 - Fragmentation of public sector RDI orientation and its failure to industry needs;
 - Weakness of publicly funded RDI institutes;

- Excessive priority given by some of these institutions, basic research, applied research at the expense of fragmentation of scientific research, the effect structure-specific means of financing the universities and sectors academic;
- Lack of adequate incentives in favor of RDI;
- Mismanagement of funds for research;
- Surface recovery results RDI;
- Poor fitting of RDI activities;
- Lack of regular analysis of actual correlation between the Romanian society needs and priority programs under the direction of research NPRDI so to ensure an increase in the share of priority projects, which will be awarded by auction public and particularly those of interest (eg drinking water, wastewater, waste management, air and soil pollution, energy, health);
- Discouraging innovation activities through the application of excessive charges in relation to Inventors income;
- Bid evaluation criteria of RDI projects and in discrepancy with goal with options for professional industry associations.

I believe that urgent measures are required following:

- Allocation of budget for research 0.8% GDP.
- Develop a national industrial policies that rely on these requirements:
 - Eradication technology system coexistence of different ages;
 - Technology transfer, granting the list of "approved products" of Union Europe;
 - Redeployment of industrial activities;
 - Increasing industrial efficiency and product quality;
 - Stimulating foreign investment in activities that use leading technologies;
 - Initiation and development of core-and-innovative entrepreneurial activity centers that financial and intellectual capital used Romanian or mixed;
 - Providing strategic management of technology package that uses in Romania's industrial recovery, the purpose of diminishing and increasing import export;
 - Establish national research system reform - development - innovation in to restructure the connections between science, technology, economy and society civil, so that the market be left to decide the primary distribution of resources and RDI to accelerate commercialization of scientific and technological results.

National RDI reform goals should be:

- Changing the organizational structure of national research system - development - Innovation.
- Switching topics from the traditional model of IDU (poorly) to model emerging, which calls for transdisciplinarity and strategic relevance.

- Duplication of resources to finance RDI system financing.
- Change Management System RDI units.
- Stimulate the formation and operation of new research organizations (public capital or private).
- Change the evaluation system of research results.
- Improving the communication and dissemination of research results.
- Stopping the flow of migration / emigration of specialists from RDI.
- The fundamental aim of national industrial policy will be quick implementation new technological concepts, organizational initiatives for stimulating material production, operations and services.

National industrial policy objectives and tasks will be:

- Correction of the tax system and tax and credit policy and subsidies for innovative technological activities in the economy;
- Optimizing the legal conditions for the establishment of new organizational forms (in research, production, services) to facilitate and increase responsiveness to new technologies;
- Development of computer network systems for the acquisition, processing and accessing data in order amplification of decision support systems, including a system for technological and marketing enterprises benefit;
- Increasing financial motivation of developers and applicator technologies;
- Reform the national research - development - innovation;
- Supporting and developing independent organizations (NGOs) to technology transfer;
- Enhance technological research inventive performance by increasing systematic public funds for research and development;
- Development of innovative technological research areas whose results without profits in the economy;
- Developing industries that are significant activities innovative economy, particularly in the field of industrial development "high-tech";
- Restructuring and privatization of economic entities correlated with inclusion technological research institutes specialized in the structure of the major undertakings production or technical universities;
- Developing positive attitudes in the community innovation process by use the educational system at every level. Educational programs will includes elements to ensure students to assimilate knowledge applicable in exact and technical sciences;
- Development of infrastructure and institutions that support technological activities innovative links between research and development sector and the economy;
- Development of trade with the results of scientific research and grant support

for the establishment and development of technology transfer organizations;

- Developing relationships with foreign scientific and technological cooperation and creating optimal conditions (political, legal and economic) with favorable investment foreign capital and imports / exports of technology.

To achieve these objectives and tasks management tools will be used and fiscal and other tools to ensure efficiency of policy practice foreshadowed industrial.

In terms of management tools is important to create mechanism to stimulate the formation of management structures and management group professional to take over state-owned units, to conclusion of the privatization of industry, research and agriculture.

In terms of fiscal instruments, they will be:

- Improving system performance to ensure that expenditure technology to be included in the cost benefits obtained;
- Total net of the benefit subject to taxation, expenditure for capital investments in new technology implementation in a period of more than one fiscal year;
- Tax exemption for individuals and companies creating new technologies and, especially the invention;
- Matching on technology areas, the system of taxes and tax exemptions to stimulate export of competitive products.

Other incentives will be:

- Providing loan guarantees economic entities that use the term medium or long, with local banks, with preferred conditions, unless such officer to be used to implementation new technologies, especially those arising from national research and development;
- Introduction of new legal and institutional rules to boost applications based production technologies, developing and venture capital funds by empowering commercial banks for loans under a plan business or warranties not only on moral and collateral materials;
- Insurance against investment risks related to implementing new technology;
- Coordination of licensing policy with scientific and industrial policy in that restructuring the economy and technological development are supported budgetary means;
- Stimulate inventiveness and increase protection of inventors, inventions and legislation labor;
- Development of co-financing of budgetary funds to implement new technologies were selected and conducted with the participation of the national system Research – development

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- Supporting development NGOs and innovation profile providing subsidies for innovative technology projects.

In agreement with such a national industrial policy, imposed emergency measures restructuring the national system of research - development - innovation, such as:

- Achievement in the National Authority for Scientific Research of a database data, open access, which will include all research on thematic approaches areas, conducted by research entities - development over the last 20 years;
- Analysis of periodic real correlation between the Romanian society and needs priority objectives of research programs within NPRDI;
- Increase the share of projects awarded by public auction in achieving targets of interest;
- Simplifying the methodology of participation in competition for projects, evaluation will be made on the supply of scientific and business plan;
- Multidisciplinary independent collective training for evaluating proposals projects;
- Elimination of corruption in public competition system projects;
- Restructuring and increasing the research budget, in order to optimize quality simplify funding and settlement operations;
- Thorough inventory of appliances and equipment purchased by entities of RDI to transform them into databases with multiple users;
- Improvement of the communication - dissemination of research results by subsidies enhance scientific publications and publishing a directory of results scientific research in Romania.

7. Need to promote a government program of reform and development of competitive national system of research, development, innovation

Motivation: The current economic crisis motivate increased investment in education and research in the context of their reform, investment in these areas representing a strategic way out of crisis. The current system is RDI Oversized and developed gradually after 1948, in the context of planned economies. This system is rigid, outdated and incompatible with economy market and economic globalization. No reform and underfunding education and research, activities of medium and long term impact will lead to widening economic crisis, and the narrow spectrum of solutions for solving it. Research must be coupled with reform of education reform, to strengthen research in universities.

Program Objectives:

The aim of the reform program and national research - development and innovation is to restructure the connections between science, technology, economy and civil society so as to be left to decide the distribution market RDI and primary resources to accelerate commercialization of scientific results and technology.

RDI national reform **objectives** are:

- I. Changing the organizational structure of national research -development – innovation system.
- II. Switching topics from the traditional model of RDI (poorly) to model emerging, which calls for transdisciplinarity and strategic relevance.
- III. Multiplying resources and improve financing of RDI system financing.
- IV. Change Management System RDI units.
- V. Stimulation of formation and operation of new research organizations (capital public or private).
- VI. Change the evaluation system of research results.
- VII. Improvement of the communication and dissemination research.
- VIII. Stopping the flow of migration / emigration of specialists from RDI.

Short-term measures (2010):

- a) Formation of a team to design a government program on medium and long term reform and development of competitive system National R & D and innovation.
- b) Review all existing legislation regulating the field of RDI know.
- c) Request the Court of Accounts to conduct a performance audit National Programmes RDI.
- d) Reorganization of the National Research scientific, to strengthen his position in the economy recovery of research results funded by the state budget, by expanding in powers technology transfer and creating the National Register of Results Research.
- e) Decreasing the number of R & D funding agencies (now there are five Funding agencies: NASR, NURC, UEFISCU, CNMP, AMCSIT). After my opinion, based on experience that has AMCSIT could take RDI funding only programs. No option is ruled to be a new and unique finance agency has to be abolished and existing ones, thus making large savings in the budget.
- f) Establishment of expert appraisers Corps RDI projects under the authority NASR, for eradication of corruption phenomena research.
- g) Review of RDI projects in funding to finance further only those projects which are viable and economic opportunities and social others will be suspended from financing;

- h) The reorganization of institutes and research centers, as these criteria:
- Scientific coordinator sector institutes to merge by absorption with university profile, in view of strengthening education and Scientific coordinator of the university Romanian, that this will turn into "universities and doctoral Research;
 - Institutes of technology sector companies to merge by absorption with national and autonomous specialized in applied research to strengthen the their
 - Strategic area or social institutions to remain as such, or be merged as appropriate, under/coordination of ministries in the field;
 - Setting up a technological park and science national platform to Magurele;
 - Liquidation of those institutions which have no economic or strategic relevance.
- i) Protecting certified researchers from institutes, which will reorganize by:
- Taking scientists by universities or state-owned companies, based on "Finance director and project team follows";
 - The assumption by researchers and regional development agents and by Programme Management Unit of the purpose of valuing competence them in preparing bids for projects and stimulating the absorption of funds EU.

Conclusions

The current economic crisis motivate increased investment in education and research in the context of their reform, investment in these strategic areas representing a way out of crisis. The current system is RDI Oversized and developed gradually after 1948, in the context of planned economies. This system is rigid, outdated and incompatible with economy market and economic globalization. No reform and underfunding of education and research, activities of medium and long term impact will lead to economic crisis, and the narrow spectrum of solutions for solving it.

Research must be coupled with reform of education reform, to strengthen research in universities. Analysis of existing legislation, it follows that these measures can be implemented through a package of decisions of Government, measure except for revising all existing legislation which RDI regulates field.

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