

New Economy

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**SCIENCE AND EDUCATION
IN FORMATION OF «NEW ECONOMY»
IN UKRAINE**

Abstract

The article formulates the concept of radical change in the role of science and education in the Ukrainian society and the ways of employing this transformation as the basis for economic reformation. The authors design the Ukrainian pattern of the new economy, the competitive capacity of which to be ensured through development and utilization of knowledge in the spheres of material production and services. Ukraine must find its specific scientific and technological priorities, concentrate financial resources at ensuring global leadership in certain fields, and change its economic structure in consideration for national scientific achievements. Education and science must develop not only as an important social function of the state, but also as a successful domestic and global business.

Key words:

Anglo-Saxon culture, Bologna Declaration, venture philanthropy, venture capital, higher education, State Budget of Ukraine, knowledge economy, educa-

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tion economy, economic reform, exports of knowledge, human capital, imports of knowledge, innovation, internationalization of knowledge, knowledge, knowledge economy, science, scientific and technological priorities, research traineeship, scientific and technological policy, science-intensive production, new economy, education, educational services, demand for scientific services, recreation resources, demand for educational services, market of educational services, transfer of foreign specialists, centres of new economy formation.

*Left to go – way to lose,
Right to go – horse to lose,
Forward to go – head to lose...*
(Folk tales)

The growing interest to science and education as the objects of research and practice is connected with the concept of «new economy». Our publications define this phenomenon as «the production and implementation of new knowledge and its transformation into an independent factor of production, which plays the leading role in the system of production factors; and the development under the «old» laws which function in a new way under new conditions, as well as under the new laws which stipulate accelerated development» [35: 28]. The professional literature views new economy as «knowledge-based economy», «knowledge-intensive economy», «knowledge economy», etc. Nevertheless, in spite of the terminology used to define this phenomenon, the critical point of the coming economy will be the sphere of science and education. We can admit that knowledge, similar to land, labour, and capital, has gained the meaning of an independent production factor. Moreover, it is science and education that will dominate in the economy as the most valuable and scarce factor.

The scientific foundation for researching the economic essence of science and education are the views of such well-known economists as A. Marshall (knowledge as the most powerful engine of production, and organization just encouraging its application), A. Schumpeter (knowledge as a considerable element in creation of innovations), R. Nelson and Wilson (firm as a «cloak-room» of knowledge), B. Lundwall and K. Friedman (national systems of innovation). We could also mention other approaches, but it is more essential to acknowledge that since the 90-s of the XX century the interpretation of knowledge has started to change so as to perceive it as a substantial element of an enterprise's strategic potential, the role of which increases year after year.

A landmark in approaching the economic essence of education and science is the assertion by I. Nonaka – the forerunner of research in organizational knowledge management: «The only reliable source of competitive advantage is knowledge. When markets change, new technologies appear, numbers of competitors grow, and goods become obsolete in almost a night, only those enter-

prises succeed that continuously create new knowledge, diffuse it in the whole organization, and transform it into new technology and products. This is called «a knowledge-based company engaged in a single business of systematic innovations'» [18]. Along with that grew the interest of scientists, in particular F. Baumard, W. Bukowitz and R. Williams, P. Drucker, D. Skyrme, M. Zack in the knowledge matters [1; 3; 4; 22; 23; 24].

The aim of this paper is to show that Ukraine needs a powerful knowledge industry. Moreover, this is the primary task, not the one which can be postponed until all urgent problems are settled. The authors assert that the only chance for Ukraine to become a developed country is to develop the knowledge-based economy. They also substantiate some practical approaches to implementing this idea. To be more convincing, some sections are supplemented with overviews of foreign experience.

1. Quo Vadis, Ukraine?

Numerous challenges are to be faced by the Ukrainian elite that strives for leadership in the society which realized itself as a sovereign state though, still, cannot understand why the country which has been in the lead of the former Soviet Union republics turned into the «leader» in the figurative meaning of this word if to compare the number of governmental mistakes and the rate of economic growth with the other post-socialist European countries. Suffice it to analyze Table 1, which shows that in 2002 the Ukraine's real GDP constituted only 50.1% of the GDP in 1990. At that, the GDP growth has started only after 2000 and its rate does not meet the requirements of the accelerated growth which should have taken place in view of preceding economic recession.

Ten years of «retreat» in the Ukrainian economic development can be considered as at least a twenty-year fall behind the countries which moved forward. As seen from Table 2, Ukraine (given a 10% annual growth rate) can reach the level of 1990 only in 2010. Of course, this is a **simplified approach** and, hopefully, a **pessimistic forecast**. Twenty years do not only mean recession or growth of an economy. They also mean certain qualitative changes. These changes take place primarily in production and consumption, formation of highly-qualified labour, and integration into the world economic environment. These are the changes that – under favourable conditions – provide an opportunity to attain a new positive economic quality and rapidly approach the leaders.

Some recent results, in particular the 5 to 9% growth rate reached in the past three years, promise to bring the country out of the economic crisis. The forecasts of the Ukrainian National Bank and the Bank Austria Creditanstalt predict that the economic growth may reach nearly 5% in 2004 [6:800]. Gross investments in 2001 grew by 13%, in 2002 – by 6%, and in the early 2004 they are expected to grow by 15%.

Table 1.

Gross Domestic Product of Ukraine

Years	1990	1991	1992	1993	1994	1995	1996
Nominal	167	299	5033	148273	1203769	54516	81519
Real*	160	146,1	131,9	113,2	87,3	77,6	69,8
Real, in% to previous year	100,0	91,3	90,3	85,8	77,1	87,8	90,0
Real, in% to 1990*	100,0	91,3	82,4	70,8	54,6	47,9	43,6

Table 1 continued.

Years	1997	1998	1999	2000	2001	2002
Nominal	93365	102593	130442	170070	204190	220556
Real*	67,7	66,4	66,3	70,2	76,7	80,2
Real, in% to previous year	97,0	98,1	99,8	105,9	109,2	104,6
Real, in% to 1990*	42,3	41,5	41,4	43,9	47,9	50,1

Note. Cost parameters of nominal GDP for 1990–1994 are in bln. karbovanets, for 1995–2001 in mln. hryvnyas; real GDP – in bln. karbovanets.

Source: [33]; www.econstats.com.

*Authors' calculations.

Table 2.

**Ukraine's projected reaching the 1990-level given
the 10% annual growth rate ***

Роки	2003	2004	2005	2006	2007	2008	2009	2010
Реальний ВВП	84,7	93,2	192,5	112,7	124,0	136,4	150,0	165,0

* Authors' calculations.

Nevertheless, all these favourable developments are opposed with considerable risks. Western analysts primarily relate them to political insecurity. As D. Franke says, «the majority of conditions are unstable, and the political calmness disconcerted after the parliamentary elections in March 2002 is subdued very slowly. Internal political struggle, which is probably postponed until the presidential elections in autumn 2004, will continue. Meanwhile, the pace and scale of future political and economic reformation are yet unknown. In particular, the rates of privatization do not meet expectations... Moreover, the economy and banks suffer from over-regulation and often face solid bureaucratic barriers. Corruption and criminality are also the factors of risk which should not be ignored. According to the analysis of Transparency International, Ukraine belongs

to the most corrupted countries in the world. Expecting large-scale «money laundering» in Ukraine, the Bundesanstalt für Finanzdienstleistungsaufsicht issued an order in January to conduct thorough and detailed revision of payments circulation between German and Ukrainian banks. Despite this aspect of security was removed, the heightened caution and attention is necessary» [7:803].

Such facts outweigh recent positive transformations because they show that Ukraine may become desolate in its attempt to increase its economic potential. And economic isolation threatens to restrain any development in general and its innovative component in particular. This is unbearable for any country, even the most developed one.

2. Ukraine at the Cross-Road

Everyone knows from childhood the folk tales and epics about Prince Ivan, Illya Muromets and other folk characters that, having arrived at the cross-road, picked out the most difficult road at the end of which they should have perished («be killed», «pay with one's life»). The folk heroes chose the most dangerous way, fought with enemies, and achieved glory. Our forefathers must have constructed allegorically this dilemma especially for the present Ukraine. Indeed, there are no absolutely lossless decisions. We must always bring something to the altar of victory. What should it be?

Let us primarily define what Ukraine is and what it possesses. What does it contribute to the world as an independent state? Along with that, we should take into account that Ukraine is not rich in resources, though it has some unique and rare resources. The latter include black soil, recreation resources, and a considerable stock of human capital, which, unfortunately, is rapidly shrinking. The country exhausted resources for renovating traditional economic industries. These are the assets that bring our country to a cross-road. It is worth noting that current competitive advantages may be lost if the existing growth potentialities are not employed.

Nevertheless, which path should Ukraine take? There is the only answer: the one which is the shortest to integration into the circle of leading countries. From this standpoint, we understand that only knowledge, primarily the new scientific knowledge, provides an opportunity to succeed. Thus, we can draw an analogy with a young man, who, having acquired advanced knowledge and experience in some area, considerably outperforms his elder competitors. Similar behavioural pattern could be chosen for a modern country under conditions of global economic transition to knowledge economy.

Obviously, knowledge primarily means science and education. On the whole, science and education implies national production of new knowledge, adoption of foreign scientific achievements, and mastering these advances to

reach economic leadership. Knowledge means any intellectual product – literature, poetry, music, art, architecture, historic relics and values, etc.

The advantage of knowledge in comparison to other developmental factors is its accessibility. As soon as a researcher makes an invention, the whole world can use it. Succeed only those who possess the most progressive knowledge, as well as entrepreneurial and managerial talent. This is the path where some past attainments will be lost, but at the same time, the nation's intelligence and skills of its use as an economic resource will be developed.

Can the new way of development have ramifications? This question should be answered positively. Naturally, not everyone can be involved in science and education, the same as not a single nation, even the largest, can engage in all industries. We must define what should we take into the «Noah's Ark». In view of this, let us analyze the commodity structure of our economy. Today, the commodity-producing industries account for nearly 67% of the overall structure. Their value-added is lower than their share and equals 53.4%. These figures tend to decrease (in 1990 they totalled 76.6% and 70.7% respectively) though, still, they are at the level when the idea of new economy may seem to be a fairy tale with a magic tablecloth serving meals when needed. Nevertheless, fixed capital investments are directed mainly into production. Hence, in 2002, 44.6% of investments came into the fixed capital of industry, 4.3% – agriculture, 4.7% – construction, and only 1.0% – education. But it is also worth noting that certain tendencies will influence the development of the new economy positively, in particular, the share of investments in transports and communication is 19.4%, and in hotel and restaurant business – 1.2% [33].

Our country can not fully rely on all industries that have traditionally dominated in the Ukrainian exports. This primarily refers to metallurgical cluster. In 2002, Ukraine exported rolled ferrous metals in value of \$2759.0 mln., ferroalloys – \$452.6 mln., open-hearth pig iron – \$113.4 mln., iron ores and ferrous concentrates – \$352.3 mln., foundry iron and ferrous metal pipes – \$407.6 mln., crude aluminium – \$280.8 mln., which in aggregate accounted for 19.8% of total exports or 30.3% of commodity exports. Naturally, such a specialization can conserve the country's position among those economies, which have become the developed countries' appendage and a «global dump».

One might rebuke that it is impossible to abandon commodity production. It is true. Not a single country can afford doing this. Nevertheless, incontestable is the fact that science-intensive production and services dominate in the modern economy. This is just the path that Ukraine should choose and move forward. At that, when adopting and implementing the experience of others, we should aspire to lessen its role in the economic development. Only the sustainable growth of original, exclusive, and purely national factors will allow attaining the leading position in the world market and become equal to the great ones of this world. At the same time, it would be infeasible to abandon those businesses which currently serve to accumulate resources for further development. Liberalism regarding these businesses should be combined with elaboration and em-

ployment of economic levers for channelling capital to those spheres of production and services which create the new image of the country's economy.

Defining state science and innovation priorities is a critical, complicated, and responsible task of the Ukrainian government. Wrong decision when «all stakes are bet on» means absolute bankruptcy of the country, since it is impossible to become a leader in the science and technology policy in a moment. It should be realized that compiling knowledge is a cumulative process. Investments in science and education will pay off only if they are stable or growing in the long-term perspective. Aborted financing at any stage of the research will not be recompensed, even if its size increases, in the future.

The principal criterion of priority selection in Ukraine is deciding on whether the country will search for absolutely new economic approaches or compete in the spheres which are being developed by other countries. The analysis of international experience proves that within the framework of the EU research policy, the studies related to genetic nature of live organisms, improvement of quality and prolongation of human life are starting to force out those aimed at informatization of manufacturing, services, and education. In the USA, information technologies and Internet are of critical priority. Russia – the country to compare our achievements with – in its medium-term program of social and economic development prioritized only aviation engineering and information technologies, even though the country can claim to be a leader in the markets for nuclear technology, space engineering and services, military aviation, and some products of electronic industry. Moreover, Russia expects to raise its share of high-technology trade from the current 0.3 to 10–15% by the middle of this century [29: 12].

We doubt whether there would be at least anyone in Ukraine to delineate clearly the priorities of national research and technology in the medium- and long-term perspectives. The Ukrainian community should discuss this problem extensively, formulate its understanding, make subsequent decisions and laws, and after that – gradually occupy a niche in the market of research and technical products.

3. Knowledge is the Direction of Ukraine's Movement

In this century the social and economic state, the relations among countries, and the ability of the latter to overcome critical situations will be determined by science and education. The US social survey states that more than 50% of population consider the improvement of quality of education to be the principal task of the President George Bush Jr.'s administration [36:37]. The EU's task for 2003–2008 is building the most effective and competitive knowledge-based economy in the world. «If Poland wishes to participate in the achievements of globalization», says Jerzy Burek, Poland's ex-prime minister, «it should join the

economies which determine science and qualification to be the critical factor of their growth» [9: 4].

Strange as it may seem, but the Ukrainian leaders do not understand what had been understood and accepted in the civilized world long time ago. At least, this problem must be set even though, unfortunately, we are notorious for «fooling ourselves with smooth talks» about any worthy affair. In addition, the Ukrainian community, and its elite in particular, does not understand that presently the science and education provide a basis for economic development not only in terms of enlightenment, but also in the pragmatic sense. What concerns the Ukrainian reality, the achievements obtained during the period of independence are usually expressed in the two following conceptions: a) we are getting poorer («so far»), but we are not waging civil wars; b) our economy is poor, but it has stabilized recently (it is not mentioned, however, that stabilization means only the suspension of the recession, and the economy will need many years to reach at least the 1990 level).

In view of global tendencies, the greatest concern for legislative and executive authorities, as well as the entire Ukrainian community, is weak innovation growth and poor development of effective and consistent policy for its stimulation. In other words, the country's production and application of knowledge slowed down. Fortunately, this issue is sometimes discussed at the governmental level, yet the real state of affairs gives no grounds to hope that honest intentions to realize effective economic transformations prevail over current political considerations. Noticeable also is the misunderstanding of the fact that «the notion of innovation underwent dramatic changes. It is interpreted not as a philosophy of a unique creative act, but as a complicated social mechanism conditioned by new production processes and manufacturing of new goods» [19].

Innovation growth in Ukraine is mainly hampered by great losses of scientific and technical potential. In 2002, the number of employees in research institutions comprised 178,243 persons, which constitutes 36.1% of the 1990-figure (494,197). The financing of research and technical projects in 2002 amounted to 2,821.6 mln. hrn. against 5,054.1 mln. karbovantsi in 1990. In addition, about 23% or 645.7 mln.hrn. were invested by foreign countries.

The fall in research and technical potential already affects real production negatively. In particular, the number of enterprises which introduced innovations shrank from 2,181 in 1994 to 1,503 in 2001, and their share made 26% and 14.3% respectively. The number of introduced technological processes decreased in 1991 –2001 from 7,303 to 1,421. Nevertheless, the number of new products increased from 13,790 in 1991 to 19484 in 2001. Unfortunately, the statistics on science-intensity of these products is not available and, therefore, we can not draw conclusions on the quality of this indicator. It is also empirically difficult to name the new brands of Ukrainian products which were really competitive in the world and domestic markets.

Contrary to all drawbacks in the production of knowledge and intensifying lag in scientific, research, and technical area, Ukraine has no alternative other

than to build a knowledge-based economy. First, it is destined to take this path because any other will lead to deficient economy that would depend on leading countries. Second, Ukraine has traditionally been leading in the science and education area. Its human potential (even decreased) is effective and capable of self-regeneration at the highest world level. According to evaluations, the level of professional preparation in the former Soviet Union corresponded to average (in some areas even the highest) European and global standards. Undeniably, the attainment of Soviet higher education was its universality and fundamentality, which – then (and even now) – favourably distinguished its alumni from the western ones, trained in particular specialities [26: 45].

Employing Ukraine's scientific potential to integrate into the European knowledge-based economy is an exceptional historic mission of the current generation, especially its scientific, political, and business elite. This task demands clear understanding that the aim can not be achieved by self-development. Considering the real state of the Ukrainian science and economy, it is a great challenge to retain the distance between Ukraine and the EU countries. Nevertheless, this task is the minimum below which not a single development program should be approved. At the same time, we must do everything in our power (in this context, it would be more reasonable to say – everything beyond our power) to start catching up.

We must also remember that Ukraine is the least developed in the information sphere. Today, the ICT analysts are talking about a transatlantic digital gap. On the one hand, the developing countries are lacking information and communication facilities, and on the other hand, the lower sections of the information society lag behind. «At that», writes P. Glotz, «the chances of the Europe's lower third part are better than those of the majority of less developed countries» [8: 41].

Using these estimates, one can argue that the majority of the Ukrainian population belongs to the lower sections of the information society. This view should be classified as optimistic, since it assumes that people tend to lag behind in the capability to use media- and computer technology rather than in technological providing. And here exists a sufficient potential for catching up. One should only find the levers to increase the demand for knowledge and skills of using information and computer technology.

4. The Ukrainian Market of Knowledge and its Integration into the Global Economic Area

Since Ukraine has proclaimed its course for economic reformation, it managed to build up a more or less market economy and start up its mechanisms. But so far not all elements of the market function evenly. The commodity and services market is on the rise, the securities market is idle, while the knowledge market has practically not been created yet.

The knowledge market is absent primarily due to a large-scale crisis in the system of research and science-and-technology institutions. The crisis was caused by substantial reduction in traditional sources of financing – the budget fund and the centralized funds of Ministries and Departments. Moreover, national enterprises have low demand for research and development (R&D).

While analyzing the challenges of the Ukrainian knowledge market in integrating into the global economic area, one should keep in mind that here the competitive advantages pertain to innovative products of higher quality and consumption properties rather than to prices. Since innovative processes intensify as long as businesses stay interested and the state provides stimuli, the competition in high-tech products and services on closer examination turns into the competition in tax systems, scientific capacities, education systems, health care, cultural development, and human potentialities among different countries. Moreover, science is featured as the basic element based on the society's knowledge, while the state should primarily ensure financial providing for creating national competitive advantages.

The principal financial instrument of national science and technology policy is budgetary funds. From 1/5 to 1/2 of national research expenditures are budgeted. According to the 1999 figures, Japan budgeted 19.3% of total expenditures for science, USA – 38.6%, Germany –33.8%, and Italy – 51.1%. This does not mean that the share of expenditures for science in the developed countries is large compared to gross state expenditures, but on the contrary – it constitutes from 3 to 5%. As a matter of fact, state budgets fully finance university research and private sector research (on a contractual basis), as well as development of the most sophisticated and expensive experimental devices, such as accelerators, telescopes, space stations, etc. Industrial countries spend from 6 to 22% of total science expenses for fundamental science. Expenses for defence industry R&D absorbs most of the science budgets only in the USA and Great Britain, amounting to 53.2% and 34.9% respectively in 1999 [28: 99–100].

According to the 2001 data, expenditures for science in the Ukrainian master budget constituted 783.4 mln. hrn. (that is 0.4% of GDP), while expenditures for industrial support made 8,273.5 mln. hrn. (or 4.1% of GDP). Already these two figures can prove that the country has great capabilities of financial support

for the new economic policy directed at establishing the knowledge-based economy. But would it be reasonable to finance the sphere which should become a source of budgetary receipts? Undoubtedly, a deep analysis of budgetary spending would allow to apportion sufficient funds to R&D, thus ensuring that the country joins the world leading states at least in two or three spheres. At that, the reference point could be set as follows: reaching the level of science financing which existed under the socialist economy in two or three years, and surpassing it later on.

In addition, the Ukrainian market of knowledge can develop by producing knowledge for Ukrainian and international businesses. The formation of demand for knowledge which can be produced by the Ukrainian companies, especially for the international market, requires that the companies be well-informed about its conjuncture. Consequently, certain managerial skills, such as marketing, financial engineering, and management of intellectual property rights, which are traditionally low in the science sphere, must be developed. Along with this, it should be noted that research institutions will have to spend dozens of thousands of dollars to secure patents outside of Ukraine. Therefore, at least at the initial stage of creating the national knowledge market, many research institutions will have to work in the interim regime for R&D institutions and business companies.

Integration into the international network on the most favourable terms demands the institutes and companies look for relevant strategic alliances. These can be created with the help of marketers and consultants, whose salaries will depend on the effectiveness of a particular research institution. The sporting experience could be replicated here – when a highly-paid coach is hired to train the team, and the latter includes skilful and even outstanding foreign sportsmen. One form of international marketing could be the training of the research institution's staff in the West, where it could gain experience and, at the same time, establish relevant contacts and conclude contracts. Any form of entering the international market of knowledge is cheap, but the target can be hit with the assistance of international donors (for instance, by winning grants) or staff exchange programs.

It should be stressed that scientific institutions provide services to foreign clients mostly because the national economy is under-developed and lacks R&D financing. But, at the certain stage, this is the only way to support the efficacy of the science sphere, retain human potential, and keep pace with other national and international institutions. At the same time, we can expect that the strong national investor will change the proportion of domestic and international services in favour of the former. This trend would result in growing exports of science-intensive products.

The methods of entering the knowledge market for an educational institution can be illustrated on the example of the Institute of Catalysis near Novosibirsk (Insertion 1).

*Insertion 1***A Scientific Institution's Catching-up Program
and Entering the World Market**

(the case of the Institute of Catalysis near Novosibirsk)

The Institute of Catalysis is experienced in joint work with industries and in conducting commercial research. Since 1985, the Institute has been coordinating an intersectoral science and technology complex «Catalyst» that involved the entire Russian industry in the development of catalytic chemical processes.

Contrary to many Russian institutes, the top-management of this organization created the system of stimuli and the organizational structure owing to which the institution succeeds. Its laboratories independently attract financing from different off-budget funds. The management of the institute consists in the self-financed centres [56] which deduct money to the central fund (55%). This system allows involving young scientists and stimulates the contract receivers. Applied research and development accounts for 70% and fundamental research makes 30% of all activities of the institute. Compared to the Soviet period, the Institute has considerably turned to contractual R&D and external markets. Nearly 75% of income comes in from the contracts (mainly foreign), and 30% is financed by the budget; 50% of commercial income accounts for R&D contracts, 30–40% – for licensing, and 10% – for other activities. In 1996, the Institute concluded partnership agreements with a number of large foreign and national companies, thus ensuring its sustainable growth.

Unlike the majority of Russian research institutions, the Institute of Catalysis has developed certain managerial functions, in particular marketing, financial management, and management of intellectual property rights. Thus, in 1996, \$70 thousands were allocated to secure patents outside of the country.

The major question of the institute's further development is whether it will manage to accumulate new knowledge or its major asset will be the knowledge base left over from the Soviet period. Surveys show great discrepancy in approaching this question. The institution wishes to increase its income from licensing in relation to contract work, which is considered less capable of accumulating the knowledge base and increasing investments. The Institute operates within the Russian Academy of Sciences as an interim form of an R&D institution and a commercial company. In spite of these controversial features, it has managed to preserve its organizational integrity so far. Nevertheless, uncertain is its ability to preserve its integrity in view of Russia's regenerated industry, which might conduct R&D independently.

The Institute of Catalysis is a striking example of favourable opportunities and reasonable R&D system's orientation toward external activities. Nevertheless, in our opinion, after 10 years of following this strategy, the Russian economy must set a certain threshold against which to determine whether it is productive or not. The institute's external orientation is caused by under-developed national industry, which had low demand for R&D. Meeting the demands of foreign clients and facing the necessity to create its own long-term research database, the Institute, as we see it, will not be able to accumulate new knowledge at the speed necessary for its sustainable growth. The sale of national proficiency and know-how via scientific and technical services and (much less) licensing (capitalized knowledge) lets it stay afloat, but it does not generate enough for domestic consumption and participation in global networks. The regained national demand for R&D will produce great effect on the institute and provide it with an opportunity to develop in other directions – as an institution oriented at fundamental research or as a branch institution in

the Russian chemical industry. Under these conditions, the cooperation with national industry plus the experience of participation in international networks will constitute a solid base for further development of the institute.

Finally, the integration into the international networks on more favourable terms requires that the institute engage in strategic alliances. To meet this requirement, the institute needs a result-oriented marketing consultant or a cooperation agreement with a western research institution of similar profile, which would provide for leading staff members of the institute to undergo a 5–8 week traineeship at western partner institution, adopt its experience, establish contacts, and conclude relevant contracts there. These two schemes are not cheap. However, the resulting external initiator effect should justify the participation in this work of the public sector (for example, in the form of a grant from international donors) on the parity basis.

Source: [29].

The knowledge market can also be developed through popularization and stimulation of the venture philanthropy which originated in the USA and succeeded in Silicon Valley. It includes both the principle of venture capital (reckless but conscious risk resulting in profit) and the principle of traditional charity (contributions for the welfare of society). These two extremes converge in various combinations. A typical example of venture philanthropy is the IBM Corporation's project in computerizing schools in Guatemala, the latter being the projected sales market for ICT. The project can turn out immensely profitable. Moreover, even if it does not achieve its commercial aim, it will perform its charity task. School students will profit from computers even if Guatemala does not become a competition-free sales market.

It is time to interest the Ukrainian people of influence, primarily the oligarchs, in modest venture philanthropy. Their public work is so far limited to sports sponsoring. They sometimes contribute to culture and publishing, even though these actions are rather rare than typical. Usually, the public doubts the legality of the philanthropists' wealth. And even though some economists assert that the sources of wealth accumulation of the «barons-robbers» (in the USA in the XIXth century or in the modern Ukraine) make no matter, living in a democratic society can not be free of public opinion.

Venture philanthropy could take on the form of joint projects, plans, or foundations executed by state authorities (city councils, local administrations, ministries, government) and private business. Such as, for example, organizing the preparation of elite specialists at the university master or candidate study programs, distinguished foreign professors being their tutors. This can become a sophisticated marketing strategy of attracting western universities into the research process. Another way to realize venture philanthropy is to construct a plan of regional recreation complex with relevant infrastructure and forms of tourism, and to market it.

Insertion 2.

Gaining Noticeable Trust: the Joint Work of Private and State Influential Individuals in Making Changes

In the middle of 1970-s, Rio de Janeiro was in a crisis, its economy depressed. In 1933, the city mayor, following an example of advanced planning in Barcelona (its revival was crowned with Olympic Games held in 1992, which favoured the city's further development), designed a draft of long-term planning, which became unique throughout Latin America.

The whole process was based on the marketing strategy. At first worked a small group of founders. These were the three energetic personalities: the Secretary in City Development appointed the Mayor's Representative, the President of Trade Federation, and the President of Rio de Janeiro's Commercial Association. After that, they elected the full-time Managing Director —a person of excellent communication skills. He managed five regular employees supported by a group of external consultants. This small executive committee was in charge of the routine work and design of the development plan. In its turn, the committee was accountable to a more numerous Managing Board (consisting of 24 city leaders including the representatives of trade unions, higher educational institutions, private sector, mass media, and the government), which gathered every month and actually performed the role of the top decision-maker. In addition, twice a year the City Council called in a meeting (of 400 people representing all strata of the society) which managed the process according to current legislation by handling applications and ratifying major decisions. As a contribution to the financing of activities, the city mayor provided the Managing Board with offices and paid nearly one third of the project costs. Worthy of not is the fact that two thirds of total financing were derived from the private sector. A consortium of 40 companies was established, each of them assigning 1 thousand dollars per month to a general fund. The mayor succeeded in defending the plan from excessive political influence during the overall period of its realization. On any occasion the mayor stressed that it was not «the mayor's but the city's project». It took a year and a half to design a city development plan and officially approve it.

And even today its results are impressive. Even before the plan was approved, it gained a great respond. The project played an important role in determining the major investment objects (i.e. city infrastructure, education, learning, and other areas of social development) and the perspective business projects in services and manufacturing. A number of joint initiatives were carried out by private and public sectors the spheres of distance learning, tourism development, apartment construction, and infrastructure. Some of them reached the level of specific, often rather complicated, financing agreements. But most importantly, the process of joint work on the project provided the possibility of changing the public opinion and replacing its quiescence with a progressive movement. In general, to our mind, the city came out of the crisis and entered the period of rapid growth.

Source: [29].

5. Educational Services Market as a Component of Knowledge Market and its Integration into the Global Economic Area

«Education must be the utter priority in any country's budget and favour the development of all kinds of creative activity», – this thesis is the result of the Noble Prize Winners Conference «On the Verge of the XXI Century: Challenges and Prospects» held in 1998 in Paris. This is the self-evident truth, but it nevertheless needs to be proved in Ukraine so that to convince the government that the majority of situational societal demands should be «sacrificed» and the funds should be focused on education, which will ensure the «break-through» in international and domestic competition. Many people still remember how the deputies of the Supreme Council of second convocation struggled to set annual financing for education at no less than 10% of GDP, and yet, the State budget of 2003 allocated only 3.7% of its funds for these expenses.

When we compare the market of knowledge in Ukraine and that in the developed countries, a known saying occurs in our mind: they are rich because they can spend big money on education and science. As a matter of fact, as W. S. Zhuravskiy notes, the situation is quite the opposite: «They became rich because they directed money to universities in time» [26: 46]. This is a secret of the «economic miracles» in Japan, Italy, Germany, South Korea, Singapore, and other countries, the last century's success of which made them leaders today. Moreover, these countries, apart from increasing the financing of science and education, did a lot to increase its role in production.

Incidentally, the EU countries are elaborating the programs of «modernizing» the «old» universities now. These are the universities which possess large human potential, but lack sufficient material resources for its most effective use. Thus, in 2004, the J.-W. Goethe University in Frankfurt on Main (Germany) will celebrate its 90th anniversary. This is the largest University in Hessen having 42,500 students. The Presidium of the University has adopted a package of festival measures under the motto «Knowledge Creates Future». At that, the objective is pursued to involve the community and state authorities in realizing the plan of becoming the most advanced European university. It will need investments to do this, primarily for construction of a new campus in value of more than 600 mln. euro. Naturally, the financial support is expected to come in mainly from Federal Government of Hessen and from the sale of existing buildings of the university in the centre of the city [21: 9].

The development of new economy radically changes the situation for governments, since under the new conditions the economic achievements both in long-term and short-term perspective are the result of knowledge diffusion. And what is more, education should be considered as a form of business, and its value-added should intensely increase.

While studying the educational services market, it is reasonable to distinguish two categories – the education and the study. Study is the process of receiving knowledge, while education means the level and quality of the knowledge received as a result of study. In Ukraine, with continuously decreasing population, the number of studying individuals remains nearly the same. Hence, in 1990/1991 study year, the total number of students made 9,430 thousands, while in 2001/2002 – 9,217 thousands. At the same time, the growth of demand for higher education tends to increase. Consequently, the number of students at higher educational establishments of III-IV accreditation level in 1990/1991 totalled 881 thousands, while in 2001/2002 – 1,548 thousands.

In forming the new economy, Ukraine has a great potential for enlarging educational services and integrating into the global business in this market. This can easily be achieved because the system of education creates human potential for all branches of national economy and thus, it can replenish its knowledge resources with highly qualified graduates.

When solving the problem of entering the global educational services market, one must take into account its current tendencies. The overall inflows of financial resources to the countries which educate foreign students made nearly \$20 bln. in 1999 [31: 30]. The world leader in international educational services is the USA. In 2000, the inflow of foreign students generated \$12.3 bln. of profits for the US national economy. In the 1999/2000 academic year, about 515 thousand students studied there. For Great Britain this indicator was more than 220 thousand students, 180 thousands – for France, and 70 thousands – for Australia [37: 16]. Russia accounts for nearly 1% of consumers of these services. On the whole, only 1.3 mln. of young people can afford to study at foreign universities [37: 16].

Ukraine has an insignificant position in the world market of educational services. In as much as 15 thousand foreign students study in the country, Ukraine meets only 1.2% of the world market demand for educational services. Over and above, the country's structure of services is one-sided: one half of the total amount of students studies at educational institutions under responsibility of the Ministry of Health; one third of foreign students is hosted in Kyiv.

The market of educational services in Ukraine and its inclusion into the global processes should be developed within the following framework:

1. The state-mediated sale of knowledge (state order):
 - to the citizens of Ukraine;
 - to foreign citizens;
 - transfer of national specialists to work at educational institutions of foreign countries;
2. The commercial sale of knowledge:
 - to the citizens of Ukraine;

- to foreign citizens (exports of knowledge);
3. Imports of knowledge:
- studying abroad;
 - training abroad;
 - transferring foreign specialists to work at higher educational institutions in Ukraine.

6. Organizational Forms of Ukraine's Entering into the World Knowledge Market

In searching for organizational forms of Ukraine's entering into the world market of knowledge, one should not start «from bland print». Some patterns have been already developed in other countries, which could be of service to Ukraine. When examining them, it is necessary to keep in mind that success can not be replicated and that the accumulated experience will help to find one's own original decision (better or acceptable depends on the conditions).

To meet the challenges of the development of international cooperation among the institutions of higher and secondary education and to increase exports of educational services, the management should be more centralized and the role of intermediary structures should increase. The latter can be performed by the Ukrainian State Centre for International Education which has been recently established at the Ministry of Education and Science of Ukraine. At the same time, it is reasonable to open a Centre for International Educational Services that would ensure perform marketing activities in the external markets (including the public relations of the Ukrainian educational institutions), encourage foreign students to study in Ukraine, apply for grants, attract investments into the area of education, realize projects funded by international organizations, and establish the subsidiaries of the Ukrainian universities abroad. This Centre could have the status of a joint-stock company, whose founders would be the interested educational establishments. The shareholders would determine quantitative and qualitative tasks for the Centre.

The major task of this Centre for the nearest future should be to increase the amount of foreign students to the pre-reformation level. The Centre's main tasks should be to establish the image of the Ukrainian education abroad and to resolve the paradox of the Ukrainian specialists demanded all around the world, but the Ukrainian diplomas not recognized.

The Europe now goes through active convergence of national educational systems. This process was started after the adoption on June 19, 1999, of the Bologna Declaration about the European common higher education area, ac-

ording to which an all-European area for higher education and the system for its global support should be created in a short time (no later than the first decade of the third millennium). It is easily understood that the newly established Centre for International Educational Services at the Ministry of Education and Science of Ukraine could engage itself with realization of the obligations proclaimed by Bologna Declaration, especially those concerning the development of the system of clear and comparable degrees (specifically, by introducing diploma appendices); introduction of a credit system (similar to European credit system); elimination of barriers to effective mobility. The orders for these services could be placed by the Ministry of Education and Science of Ukraine, educational institutions, and foreign juridical entities on a contractual basis.

The urgent task faced by state educational structures is to create in a short time the supporting services for large-scale student mobility. The students should be provided an opportunity to receive credits both at higher educational institutions and beyond (including life-long study establishments) under condition that the universities recognize these particular organizations that evaluate students. In addition, a procedure should be developed for the students to have free access to the whole range of services. With regard to teachers, researchers, and administration staff, they should be provided an opportunity to participate in the European research and study without having their rights infringed.

The principal organization form of educational institutions which provide high-quality educational services is university. It is worth noting that Ukraine has suspended the establishment of new universities. We develop the existing ones, and there are no grounds to oppose this decision. Nevertheless, we must face the fact that in the historic periods in development, the new structures are also highly effective. Take, for instance, the 70-s of the last century when the regional affiliations of the Academy of Sciences were established all over the Soviet Union and the universities were created in Donetsk, Dnipropetrovsk, Lviv, Kharkiv, Novosybirsk and other big cities. This gave a great impetus to the development of science and education, the efficacy of which is noticeable even today.

In the process of making the decisions concerning university education and science in the Ukrainian conditions, we should always take into account the broad experience of the old and the new world, as well as the reasons of the Europe's failure in competition with the USA in the area of higher education, especially in those related to the development of digital technologies. The latter started to develop immediately after 1945, when the Europeans allocated fixed capital to renovation of national economies.

Along with that, the existing higher education network in Ukraine operates on the old (backward) scientific, pedagogical, methodological, organizational, and economic bases. Therefore, can not fully and rapidly enter global educational environment because it is burdened with the «old» staff, which is not old not in its age, but in its style of thinking, working, living. New trends in research and pedagogy, policies, and forms can hardly «force their way through» in these universities, since they primarily lack favourable environment because these

universities were created under different conditions and were intended to operate in limited political, economic, and geographic space.

Now Ukraine badly needs two or three Universities with the advanced research, information and general infrastructure established within at least 10–15 years. They would create new competitive situation in the country's research and education sphere. They should meet the highest world standards – starting with staff, teaching methods, and research, and finishing with wages. The best national and foreign scientists should be invited to work at these universities. Everyone who wishes to study should have free access to these institutions irrespective of nationality. The language of teaching should mainly be English.

The market of educational services will not manage to enter the global network if business schools are not established. Unfortunately, Ukraine does not have a single school which would follow the principle of internationalism. Moreover, the demand for such schools in the country is large. This could be explained not only by financial considerations but rather by national motives. Since the demand for business school services is temporarily limited, the establishment of these learning institutions based on the principle of internationalism will provide an opportunity to have the educational establishments of the world standards, which will be able to meet national demand irrespective of its fluctuations.

Insertion 3.

The Internationalism of European Business Schools

The internationalism of European business schools is reflected in the composition of students and teachers. Thus, among 600 students admitted to the MBA program at one of the leading Business Schools – French INSEAD – the French students account only for 9% (teachers –16%) , the British and the Americans account for 10%, while the others come from the rest of the world.

At Rotterdam School of Management (Erasmus University) the Dutch students make only 5% of total number of students, and in the Swiss IMD the share of the Swiss students is even less – 4%. European business schools are inter-related, and the students are free to cross the borders and change one school for another.

American Business Schools prefer to enlist the citizens of the USA. As the 2001 figures prove, the non-American students in the USA accounted for over 30%, and this figure is growing.

In October 2002 in Berlin (Germany), there a private business school – the European School of Management and Technology was established, which is expected to compete in the future with the leading European business schools (in particular, INSEAD, IMD). This school is supported by large German companies (such as Daimler-Creiser). It will specialize in principles of technical management. The school intends to attract foreign students and teachers. They will teach only in English. The classes will start in 2004.

Source: [26: 45–53; 25: 6].

7. Introducing Anglo-Saxon Culture into the Education System and Business Life

Each nation that lags behind in its development faces the task of adopting the achievements of the advanced countries. This process is adjusted for national peculiarities. At the same time, the national life can hardly avoid influence of certain models, norms, and cultural traditions of the advanced nations. Naturally, it is significant to find those specific patterns which would preserve national identity and enrich it with the best attainments of other cultures. Here, it would be a good thing to mention Shevchenko's epistle:

*«Gain knowledge, brothers.
Think and read,
And to your neighbours' gifts pay heed, –
Yet do not thus neglect your own...»*

Today, every country in the world faces this challenge, since there is hardly anyone who is perfectly advanced in all areas. Take, for instance, the United States of America. This is the monster which consumes everything and everybody that contributes to its economic development. The countries of the European Union are a step lower in development after the USA and, nevertheless, have to employ American achievements in business, military, culture, and other fields. What is the use of expanding English-language programs of specialist preparation, especially at European universities and business schools? The ambitious Europeans must take into account that the Masters taught in their native language are less demanded than those trained at the similar programs in English.

Europe faces a new wave of reformation in science and education. In this connection, the lessons of the USA are discussed. The matter in question of scientists and politicians is who should study and from whom? The discussion held in the Austrian city of Alpbach ended with a conclusion that the American system should not be copied. A mere replication of structures has no sense because (and this is very important) Austria itself has a rather good education system, and in some areas (e.g. professional education) it is even better than in the USA. Nevertheless, in some aspects, especially in the ways of organizing the educational supply, Austria could learn from the American experience [15].

The European post-socialist countries, whose strategy is to integrate into the European Union, are facing a similar challenge. Thus, the Council of Ministers in Poland in the document named «Poland-2025» prioritized among other the strategic goal of «increasing the status of science by employing its achievements in solving social and economic problems of the country, and creative integration into the European civilization and its cultural development» [5:35].

The problem of restructuring the scientific and educational field of the European countries (including Ukraine) is primarily the issue of using the USA

as a bench-mark. The educational systems on the North-American and European continents can hardly be compared. Too different are their structures and policies, especially in terms of the role of the state. Yet, a look from abroad at the strengths and weaknesses would contribute much to the improvement of the existing systems.

What concerns American education, there goes a saying in the scientific circles that the USA have both the best and the worst schools and universities. This is true, since some universities employ more Nobel Prize winners than the number of professors in other universities' staff. But other educational establishments find it very difficult to distinguish themselves among the successful ones. They merely exist. At the same time, the system which functions in the developed economy must also be advanced. Otherwise, the economy will not be able to hold the position of the leader. Thus, it is clear that each country, when it launches reforms – especially as large-scale as in Ukraine which is transforming from socialism to capitalism – should orient at the best practice, even if the latter surpasses its level of development.

The greatest concern with regard to replicating the US experience should focus on the autonomy of higher education, which consequently gives rise to the entrepreneurial approach to education. Higher education is considered to be a market-regulated activity which is also market-oriented. The activity's result is the product for a market. Consequently, even state universities are financed from public funds by 50%. The rest of the receipts are generated by the realization of services and products (about 22%) and tuition fees (18%). The US universities have no option but to search for the required markets and succeed in the policy of offerings, which conditions a great amount of the latter. The range of educational institutions in the USA is rather wide: from research universities to state and private universities to specifically education-oriented colleges.

What is interesting to note is that there is hardly a person in the USA who will admit that graduates from different universities meet similar standards. In the Ukrainian higher education, it was very much the other way. Here, a special type of student and teacher mentality has been fostered for a long time, according to which all universities and institutes of the same accreditation level were considered to provide similar level of education. This entailed uniform directions of specialist training based on uniform academic curricula. The attempts of the universities extend their rights in specialist preparation has not yet succeeded due to the accreditation system, which is also centralized and based on the regulations developed by one university appointed by the Ministry of Education and Science of Ukraine.

The critical item to be put into the ground of reformation policy should be the American experience of organizing the higher education. Thereby, the following principles should be adhered to: the extension of rights of the universities and the university-type educational institutions, and the intensification of market principles in their activity. The system should not allow rating some universities as elite and automatically approving all programs developed by them, since

these programs are the basis for other institutions' activity regardless of the quality of the program and the personnel involved in its elaboration. One must find such a mechanism when only the market will make the final decision.

Naturally, it is unrealistic to create such a market-oriented school of higher education in Ukraine which would completely reflect the American type. Anyhow, it becomes more and more obvious that the existing system of governmental order does not meet the integrated needs of economic specialists and future heterogeneous demand. Higher educational establishments need state financing, but the funds should also be allocated within the institution specifically to professional (Bachelor) preparation, new trends, support for promising students, placement of orders abroad, and research.

The Anglo-Saxon culture should be perceived through ideological and pedagogical activity. At that, the efforts should be focused on introduction of such features of American culture as openness and creativity. These were the peculiarities that played a significant role in solving the problems of the Silicone Valley development, which is sometimes called the regional system of industry based on the network of self-organizing companies [12: 453]. The features of this system favoured the collective study processes and the producers' elastic adaptation to new production needs. Competing, the firms collectively studied owing to participation in common initiatives and personal informal contacts. California is known for the well-developed network of professional contacts and an open labour market which promotes entrepreneurship and innovation. The possibility of creating something new and innovative is valued more than the stabilization of the company's operations [12: 447].

The first step in preparing the nation to meet the requirements of globalization will be intensive introduction of English as a second business language. In this way the problem is settled in other post-socialist countries. «Under the conditions of Poland's integration into the European structures», notes J. Kotynski, «the core of any educational program should be the generally recognized program of foreign language study» [5: 42]. The settlement of the problems of a nation's language integration into the EU should begin with teaching foreign languages to children in their early childhood. It would be reasonable to introduce free English language academic courses for gifted young people at higher educational establishments and secondary schools, and paid courses for the rest of the students.

In addition, the measures should include retraining of teachers and academic staff to lecture in English. The lessons in this area could be adopted at the educational institutions which have already trained specialists for teaching abroad under the agreements of the former Soviet Union with the countries of «the third world». As a rule, the training took one academic year in the specialized educational establishment. During that period a teacher managed to improve his/her foreign language and develop didactic materials in that language.

Integration of Ukraine into the European Union demands that the activities conducted in English be expanded. In particular, it is worth to determine the

types and sizes of the reports to be prepared in English. Moreover, the companies with foreign capital should have an opportunity to choose the language used in reporting –Ukrainian or English. Most of the banking operations should be conducted in English. Mass media, especially radio and TV, should broadly practice English-language programs and add English-language subtitles to the Ukrainian – and the Ukrainian subtitles to English – programs (news, films, etc.).

Ukraine still has a chance to take part in the establishment of both the common European research area and the knowledge-based economy (new economy), and become its integrated part. This kind of Europe will be fenced in by the Polish borders if Ukraine does not drastically change its strategy and prioritize the mastering of the Anglo-Saxon culture, especially in terms of science and education organization, as well as the language, which will open access to the achievements of science, technique, education, and culture and become the principle of conducting business on the world market.

8. The Principles of Educational Economics Formation

In the basis of educational economics has always been the understanding of the role of its state financing. The former Soviet Union adhered to a firm statement that the most rightful system is the one that is financed from public sources. The developed countries were not unanimous in this respect, but nevertheless, this approach dominated in certain periods, especially in the 1980-s.

The stand of the adherents to state budgeting of education was expressed by one of the most distinguished Western experts in this field, T. Schultz: «The allocation of resources to educational services in higher education is neither efficient nor socially just» [22: 2]. The criticism is focused on the problems of distribution, especially on insufficient effectiveness of the stimuli and perverted consequences of fiscal measures, in particular on discrepant approaches to investments into tangible and human capital. In the period of shaping the economics of education, a traditional argument in support for state financing of education was the assertion about externalities and defective capital market. Likewise, the scientists also tried to ignore the concept of external effectiveness and bind the state financing of education with the theory of marginal efficiency.

Modern achievements of the growth theory allow to approach the understanding of investments in education in a new way. State financing is not viewed as a single correct economic decision. The Friedman's thesis on anti-natural effect of distribution became very popular in the scientific literature [7:105]. As a result of selection, which is natural in the educational systems, a situation may occur when mainly the children from the upper classes will study. This will produce a regressive effect on distribution because even though the burden of financing the education should be imposed upon all sections of the society

through the system of taxes and contributions, only the upper classes will benefit from this.

Therefore, one of the fundamental issues for economists to solve when developing the educational policy is whether the rich people gain more from the state-financed education than invest into it with taxes and relevant contributions. This question can be expressed in other words: whether the poor households contribute more to the state budget for the development of education than receive from it. To solve these and other questions, the budget process should be made more transparent, especially in conformity of allocations with their use. Even the countries with a stable practice of democratic distribution of state budget funds face difficulties in answering this question, but this must not serve a reason to avoid the answer.

Another challenge for the economics of education is the pay-back period of educational costs. It should be settled comprehensively within the framework of national economy rather than on the microeconomic level. Financing, accounting, and auditing should be carried out according to qualification and professional classes and be completed on the microeconomic level with the budgets of households and individuals. This approach will arouse heated social discussions, thus giving impetus for social educational effect to increase. For example, a salesman was found to pay with his taxes for the dentist's training. Consequently, the latter should pursue his pricing policy so that to account for this.

Therefore, be it equipped with this information, the community would choose the proper technique to increase the efficiency of educational and public relations. On the other hand, the absence of information causes frequent unjustified claims of different population groups raised against each other. That is why the requirement called «net-transfer-calculation» [1:239] should be extensively introduced in the Ukrainian economics of education. Western scientists proved that people with no higher education and low income bear 90% of the costs of providing specialists with higher education [10].

The scientific literature models the problems of the so called social contract. It means the regulation of relations among the community member with different levels of education and income [20]. Incidentally, the following questions are set:

- a) What is more advantageous for people with no higher education – to attract foreign or to prepare national specialists?
- b) Is it reasonable to get education in the countries with low tax rates because human capital is not subsidized by their governments?
- c) Is it feasible to make state investments in the education of those community members that are able to invest in it on their own?

In the Ukrainian conditions, these questions are rather pressing. First of all, state financing and regulation of education resulted in the depreciation of

teachers' salaries and diminishing quality of education. On the other hand, there is an opportunity for the rich to «buy» state financing of education cheaply in their home country. As a result, children from poor families are placed into the category of those who must pay tuition fees and vice versa.

The formation of educational economics in Ukraine is a complicated and, most likely, long-term process. It primarily presumes the creation of market relations within the «state-teacher-student (pupil)» triangle. Within this triangle should the market prices for educational services and the labour costs (payment to academic staff) be determined. Similarly, a developed labour market is needed, where ability, knowledge, and skills would be fully assessed. These very criteria should constitute the basis of financial relations development among the state, community, and educational establishments for creating human capital of the nation.

9. A Model of the Knowledge-Based Economy for Ukraine

The new or knowledge-based economy is not the only one for all times and peoples. Each country takes its own way of development, preserving its national authenticity. This is why Ukraine can not borrow ready-made practices. It must choose and determine its own way of development. Nevertheless, it does not mean that Ukraine will not adopt world experience accumulated by other countries. But it is inadmissible to replicate it in full. One or another model can be implemented to different degrees.

Insertions 4 and 5 present the analysis of two models of new economy – the Californian and the Singaporean. These countries were chose because, according to evaluations of international organizations, the USA and Singapore are the countries with the most powerful competitive capacities [14]. These countries' experience is very important for Ukraine because they radically differ in their potential and preconditions for development, which resulted in different ways of reaching their final goal – the establishment of knowledge-based economy.

In view of Californian and Singaporean experience, Ukraine should orient at first at the Singaporean model, especially with regard to dominance of the centralization principle. Unlike the Californian variant where market mechanisms prevailed, the Ukrainian economy needs state intervention and revolutionary changes. A person who is seriously ill can hardly recover without medical aid, but on certain stages his organism could be left alone for self-treatment.

Insertion 4.

The Decentralized Model of the Knowledge-Based Economy (the case of California)

The driver of the California's development was the power of the free market, which was scarcely supported by the managerial mechanism. The Californian spontaneity did not look traditional. The city would not reach any of its achievement without support of federal government. Along with that, the Californian model prioritizes private and public initiative.

The California of the XXth century symbolizes the development of an economy based on high technologies. Electronics, computer science, multimedia techniques and biotechnology – these were the fields in which the development was the most dynamic. California managed to succeed owing to the influence many economic, social, political, and cultural factors.

At the primary stage of high-tech industrial development, Stanford University and its Vice-President, Frederic Terman, played an important role. He progressively realized the idea that the university should be the supplier of innovations for industry. As a result, the symbiotic dependence appeared between the university and the industry. The university conducted research in the field of electric power (since F.Terman wished to train engineers for practical work in companies), thus entering into competitive struggle with Massachusetts Technological Institute, which conducted similar research. Consequently, the graduates filled up the domestic labour market, while the companies sent their personnel to Stanford to undergo retraining. During the «cold war» period, the university conducted research for the Pentagon which financed them. In 1951, on the initiative of F.Terman, the first industrial park was established, where scientists conducted research for the production needs. A number of the distinguished information firms, such as Varian Associates and Hewlett-Packard, were created on the basis of this park.

The Silicone Valley developed on the basis of local educational and research institutions, Stanford and Berkeley playing the major role among them. They both quickly adapted their academic curricula and research to real market demand. The prestige of the Silicone Valley allowed attracting the US and the world's most famous scientists.

An important factor of high-tech development was the strategic decision to concentrate the military bases (Moffet Feld Naval Air Station) and Lockheed companies in San Francisco area. It was the period of «cold war», and the Pentagon became one of the «fathers» to the development of California. In its turn, California turned out to be quite mature for reorganization. In 1955, state expenditures for R&D in the region of California accounted for 39% of total expenditures for R&D. These were the largest R&D expenses in the USA, totalling \$36.1 bln. (to compare: Michigan accounted for \$13.3 bln., New-York – \$10.9 bln., Massachusetts – \$10 bln., New-Jersey – \$9.1 bln., Texas – \$8.4 bln.).

One of the principle peculiarities of the region was venture capital. Its demand and supply were in equilibrium and attracted innovative companies to California. The Silicon Valley gained the reputation of the region where a new innovative company, which needs external support, could be established on the only grounds of its owner having a perspective idea for further implementation.

For many years, the Silicon Valley has specialized mainly in semi-conductors. In 1980-s, the new companies appeared, which specialized in computer system, software, and network design. At the same time was the multimedia industry created, which em-

played the experience of the Californian technological firms and the new ideas of the cultural industry of Hollywood.

It is worth noting that the elastic Silicon Valley model of cooperation will not succeed in the poorly concentrated industry. On the whole, the geographic proximity is critical for the development of the fields which require frequent and direct contacts to realize the learning processes and transfer of knowledge.

Sources: [12:10].

Insertion 5.

The Centralized Model of the Knowledge-Based Economy (the case of Singapore)

One of the Asian tigers, Singapore succeeded because, apart from market possibilities, an important role belonged to the strategy of thinking and the state structures which took advantage of every opportunity provided by global processes. At that, «the Singaporean lead» was not traditional, since it never opposed the market forces but, on the contrary, completely relied on them.

In 1965 Singapore gained independence from Great Britain. The island's governments formed and progressively introduced the strategy of economic development that entailed the following: development of industries with foreign investments; investing into the development of community and infrastructure; creation of favourable conditions for the cooperation of the government, employees, and industries; ensuring stable and predictable macroeconomic environment by pursuing relevant financial and monetary policies. This strategy was founded on the attraction of trans-national corporations thanks to stable social and political environment ensured by the government. Though local companies were dissatisfied with this approach, yet the TNC were better prepared for the industrial development.

An interesting peculiarity of the state administration is the existence of the Statutory Boards, which were established by the Parliament and were responsible for particular areas of social development, such as construction, industrialization, infrastructure and services, tourism, public transportation, etc. The Economic Development Board (EDB) coordinated their activities. In addition, the EDB was assigned a duty of protecting foreign investments. One of the EDB's rights was to make decisions concerning preferential terms for foreign investors. Thanks to its competence, the EDB established considerable close contacts with TNCs, thus becoming one of the major economic Singapore's «actors». Approved were the measures for improving the quality of infrastructure and business services in order to create favourable investment climate. One of the latest initiatives was to make Singapore an «intelligent island» which implied introduction of many innovations based on information technologies. In 1999, Singapore was the first to win the title of the «Intelligent City of the Year» granted by the World Teleport Association and The Telecommunications Magazine.

Extensive involvement of TNCs in economic development plays an important role in introducing high technology, initiates learning by doing, and ensures knowledge spillover; this justifies the preferences granted to the investors. Since 1990-s, the government has pursued the policy of providing support to local companies and their cooperation with

TNCs. Likewise, the clusters are pressed for development of innovative production processes in cooperation with private companies and TNCs. In addition, the support is provided to domestic businesses which employ foreign investments.

In the late 1990-s the government found it reasonable to orient the economy mostly at the informational services that are capable of substituting for production. The government prioritized Singapore as a main centre of logistics and services in the South-Eastern Asia. At that, it took into account that nearly 3 thousand international corporations operate in Singapore, 500 of which are regional.

An important strategic goal of Singapore is the development of R&D infrastructure. Foreign enterprises are dissatisfied with the domestic resources of the scientists. In the middle of 1990-s, more than 20% of researchers were foreigners. From this standpoint, the Singaporean government initiated the program named «Science and Technology – 2005», which has the following objectives: to create conditions for employing local potential; to carry out closer cooperation with global research institutions; to attract distinguished researchers from abroad; and to establish highly effective research institutions. In addition, the program of supporting the development of industrial high technology clusters by Research Institutes and Centres (RIC). The government determined the task of re-orienting the studies conducted at state institutions at meeting the industrial needs. Likewise, efforts are made to support the R&D in the modern economy. The Technopreneurship Investment Fund was established, its capital amounting to \$1 bln.

In general, the development of Singapore was mainly ensured by state authorities. At first, the style of management was defined as authoritarian. The state policy changed after 1980-s, when the consulting mechanisms were introduced in the priority areas. At present, state enterprises continue to cooperate with TNCs. But recently, the efficacy of the centralized model of knowledge-based economy has been reconsidered.

Sources: [12; 10; 11].

Hence, the first step should be that the state commits itself to development of the knowledge-based economy. Moreover, this commitment should be personalized and imposed on the President of Ukraine, since he is the only one in the system of executive power who has guaranteed four-year powers. The President's team would develop a step by step program approved by the Supreme Council (Verkhovna Rada). The failure to realize any part of this program at any stage will lead to the President's and the Supreme Council's resignation and the election of a new one. In a three-month period subsequent upon election, a new program should be approved, the fundamentals of which comprise the pre-election programs of the President and the parties that won at the election to the Supreme Council.

A key element of the model is proper selection of the centre for the new economy formation. Ukraine – large in territory and population – should rely on the Californian experience and learn the lesson about the expediency of directing governmental measures to a region with high industrial concentration. In view of this, we can examine two regions alternative – Kyiv and Donetsk. Their

priority is evident, since they have recently become the key competitive economic centres in the country.

When comparing Kyiv and Donetsk regions as probable centres of knowledge-based economy formation, worth of note is the priority of Kyiv, the capital, with concentrated monetary resources, research institutions, higher educational establishments, and transport communications. Donetsk region has more industries, developed scientific and educational infrastructure, highly qualified technical staff, great resources of trades, attractive real economy for foreign capital, and, first of all, leader ambitions which tend to increase. To our mind, the Ukrainian model of the new economy would prefer Donetsk region, where state resources are concentrated. As for Kyiv region, it should be oriented at self-development based on market resources. This will provide an opportunity to appraise a purely market-type model.

Donetsk region is destined to change the structure of economy. Traditional industries, which were formed in Donbas, outwear and fail to compete with similar foreign industries. Under favourable conditions, the capital of these branches can come into new production and services.

One of the major areas to be developed in Donetsk region is the small-batch individual machine-building. For this, its R&D base should be consolidated and its technical facilities renovated.

It is reasonable to develop the Donetsk centre of new economy formation in Ukraine in the direction of high-technology industries concentration. The market of high technologies can be created according to the principle: «Innovation creates another innovation». Therefore, Donetsk region will need fewer costs for attracting foreign specialists to work at R&D institutes and higher educational establishments. Donetsk region can become advantageous for the development of venture production.

Donetsk region has good prospects of becoming an intermediary in the partner relations of the CIS and the world. Moreover, the region did not lose contacts with its Eastern neighbours and continues making export-import deals with them (exporting Donetsk products to them and importing their products to Ukraine). A lot of Donetsk businesses continue to cooperate with Russia, Kazakhstan, Belarus, and other post-socialist republics. In this case, we can replicate the experience of Singapore, which aims at intensifying its role as a major centre of logistics and services in South-Eastern Asia.

Substantial support for one of the centres of new economy development does not mean that the other regions will lag behind the modern development. This approach is required to succeed at least in one economic centre. The other centres will, at the same time, search for policies, techniques, levers, and sources for development that would meet their peculiarities.

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