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**OCCUPATIONAL PATTERNS AND EMIGRATION OF DOCTORATE DEGREE HOLDERS IN
MODERN UKRAINE**

**WORKSHOP ON USER NEEDS FOR INDICATORS ON CAREERS OF DOCTORATE HOLDERS
OECD, Paris-La Défense, 27 September 2004**

Contact: Dr. Igor Yegorov, Science Policy Department Head, Dobrov Centre for S&T Potential and Science History Studies (STEPS Centre), National Academy of Sciences of Ukraine, Kiev, 01032, Ukraine; Tel: +380 44 219 14 86; Fax: +380 44 216 95 91; E-m: egorov@egorov.kiev.ua

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Ukrainian R&D: Soviet heritage and some recent trends

1. Soviet R&D system had significant achievements in the past. It is really difficult to overestimate significance of S&T for the Soviet political and economic systems in the period, starting in 1930s. In conditions of relative isolation from the other developed countries, S&T were among key factors that helped Soviet leaders to keep pace in their competition with the Western world. Unfortunately, the involvement of the Soviet scientists into the processes of the world S&T development has been limited as key indicators of scientific activity show.¹

2. Almost 20% of the Soviet R&D personnel and above 16% of the total R&D expenditures in the USSR were placed in Ukraine.²

3. Decline in many sectors of the Ukrainian economy was really dramatic in 1990s. Some industries, such as electronics, disappeared almost completely. A lot of qualified specialists have lost their jobs in these sectors and had to search for new carriers. In R&D the number of employees has dropped by more than 50%. It is important to note that the decline in financing R&D was more substantial than decline in the number of researchers and engineers. This means that resources devoted to R&D are much smaller in early 2000s than at the beginning of 1990s. In contrast, in some Central and Eastern European countries in 1990s decline in R&D personnel was faster than decline of R&D budget. Instead of reducing the number of employees, R&D organizations reduced their material costs to minimum but tried to save their "human capital". This step cannot be explained in terms of an apparent intention to preserve the best and the most experienced researchers. Scientific organizations in Ukraine must pay considerable social benefits to dismissed persons. In fact, the system of financing S&T organizations proportionally to the number of their employees is still in operation in Ukraine. But even such practice could not prevent mass 'exodus' of specialists from R&D sector.

4. In fact, not the Academy of Sciences or universities, but so-called branch institutes in different sectors of the economy comprised the lion's share of the Soviet R&D potential. Even now, from the formal point of view, Ukraine still has the highest share of people with the University education diploma in engineering in total population³ but majority of these people are not working according to their university specializations. Some of these specialists have emigrated, some others have moved to low-intensive sectors, such as merchandise trade.

5. At the same time, the number of students grew steadily in Ukraine in 1990s. Almost 30% of all young people of the student's age are studying at the universities and the higher education institutes.

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1. Dyker D. Radosevic S., eds. Innovation and Structural Change in Post-Socialist Countries: A Quantitative Approach. - Kluwer Academic Publishers, Dodrecht, N.Y., Boston, 1999.
 2. Skhema Razvytya y Razmeschenya Otrasy Narodnogo Khozyastva SSSR Nauka y Nauchnoe Obsluzhyvanye.- Moscow, 1990, GKNT. (in Russian)
 3. World Development Report, WB, Washington, DC, 2003

Number of new universities and higher education institutes has been doubled since early 1990s. Absolute majority of them were founded in such areas as management, economics, accounting, legal sciences, not technical or natural sciences. Number of post-graduate students ('aspirants') grew by almost three times since the beginning of 1990s to 25,300 in 2002. It would be difficult to say that the growing number of graduates could compensate losses of the national R&D from emigration and moving of qualified specialists to knowledge-intensive sectors of the national economy, as the general level of education in technical and natural sciences is declining, and the share of graduates in these disciplines is shrinking in Ukraine.

Sources of data on dynamics of the highly-qualified R&D personnel

6. Ukraine has inherited Soviet-type system of scientific degrees, which includes Candidates of Sciences and Doctors of Sciences. To obtain the first degree it is required to have a University diploma and, as a rule, the completion of the three-four years post-graduate program. Usually, Western Universities or companies recognize Candidate's diploma holders as PhD holders but it depends on University and the discipline.⁴

7. In Ukraine, the State Committee of Statistics (SCS) collects data on dynamics of the specialists with scientific degrees. These data are contained in special forms №1-nauka and the General Register (database) of Doctors and Candidates of Sciences⁵. The General Register contains data on Doctors of Sciences (since 1991) and Candidates of Sciences (since 1998), including information on changes in professional occupation, areas of scientific interests, and the place of work and emigration. Initial data come from more than 1500 organizations that are registered as scientific organizations, and from those companies and state bodies, which have Candidates and (or) Doctors of Sciences among their employees.

8. As to data on emigration, SCS collects information on those who emigrate from the country and those who immigrated to the country, including persons with scientific degrees. All emigrants and immigrants are divided into several groups depending on their education. Persons with higher education diplomas, as well as specialists with scientific degrees of candidate or doctor of sciences constitute separate groups.

9. Main source of data about emigration and immigration is the special statistical form M-14DB (in accordance with Ukrainian statistical classification). The form contains data about official emigration and immigration, including distribution of emigrants and immigrants among all 27 main Ukrainian regions. State Committee of Statistics of Ukraine has special department that is responsible for demographic statistics.

10. Initial data on emigration are received from the special local departments of the Ministry of Interior Affairs that collects individual forms from all immigrants and emigrants. This form also contains data on those foreigners who have been registered in Ukraine not permanently, but for the period of 3-12 months. Every immigrant or emigrant has to fill special form by himself (or herself), than this form has to be checked by the Ministry official. In accordance with Ukrainian laws, all immigrants and emigrants have to be registered in local offices of the Ministry of Interior Affairs.

4. As a rule, in exchange programs for post-Soviet scholars, the degree of Candidate of Sciences is considered as a minimal obligatory precondition for participation. This practice is common for Fulbright Program, Liverhume Trust Fellowships, DAAD program for senior scholars and some others programs.

5. It is worth to mention that Ukraine preserves Soviet-style system of scientific degrees. Usually in the West both candidates of sciences and doctors of sciences are considered as rough equivalent of PhD, but a lot of particularities depend on the evaluators.

11. Unfortunately, important information about those who left the country on long-term contracts or those who are working abroad illegally by using tourist visas is not available.⁶

12. National Academy of Sciences of Ukraine collects data about the emigration on the regular basis about all its employees. These data are not representative as only about quarter of all R&D personnel are working in the Academy. Other ministries, state agencies and universities are also trying to collect statistics on emigration from the country, but their information is incomplete because of two reasons.

13. First, not all companies and universities collect information about emigration.

14. The second, in many cases people first quit from the job and then emigrate. Very often periods between actual emigration and leaving the job comprise several months, and in their forms people have to mention the last (often temporary) place of work that changes real picture of emigration.

15. Sometimes, Ukrainian sociologists conduct surveys on emigration from the country. But even in special surveys, estimates, not exact figures, have been used.⁷

16. There is no need for Ukrainian citizen to ask special approval from the state authorities, if she or he has not been involved in the military- related activities during the last five years. If the person knows some state secrets, emigration could be even prohibited.

Dynamics of specialists with Candidate's and Doctorate's degrees

17. Specialists from technical and natural sciences still constitute absolute majority of specialists with doctorate and candidate degrees but their share has declined substantially since early 1990s. Main problem is quick ageing of these groups of scientists. Every two years average age of doctors and candidates is going down by one year. As a result, an average age of doctors of sciences is now over 60 years (that is higher than official pension level in Ukraine), and an average age of candidates of sciences is 51 years. The share of 'old' scientists is growing steadily (see tables 1 and 2).⁸

Table 1. Distribution of Doctors of Sciences by age, 1991-2002 (SCS, 2003)

Age groups\years	1991	1995	2000	2001	2002
Total	8133	9759	10339	10603	11008
Under 30	1	1	2	1	2
31-40	148	270	232	221	225
41-50	1188	1826	1698	1650	1654
51-55	1992	1461	1658	1730	1726
56-60	1537	2604	1639	1513	1489
61-70	2573	2671	3778	3950	4193
Above 70	694	926	1332	1538	1719

6. In 2002, Russia introduced special statistical form recently to count those scientists who are working abroad for more than 3 months per year without official emigration. It seems that Ukraine will follow Russia very soon.

7. Klochko Y. Salient Findings of the Ukrainian National Study on Intellectual Migration. - Proceedings of the International Seminar on 'Brain Drain Issues in Europe. - UNESCO - ROSTE, Venice, Italy, 25-27 April, 1993, pp. 42-55.

8. There are no corresponding data for candidates of sciences for 1991-1994.

18. The subgroup of doctors of sciences who are above 70s is the fastest growing group among the whole group of Doctors of sciences. As to Candidates of sciences, situation is very similar, with one important exception; the share of candidates of sciences who are working outside R&D sector is growing permanently over the recent years.

Table 2. **Distribution of Candidates of Sciences by age, 1995-2002 (SCS, 2003)**

Age groups\years	1995	2000	2001	2002
Total	57610	58741	60647	62673
Under 30	1104	1815	2184	2639
31-40	11463	9305	9408	9829
41-50	17426	16654	16620	16794
51-55	8003	9365	9935	9793
56-60	12097	7398	6599	6574
61-70	6488	12201	13435	14338
Above 70	1029	2003	2466	2706

19. Some years ago, we have created a model, which described the mobility of doctors and candidates of sciences in Ukraine⁹. The results of simulations show that the number of both groups will grow steadily till 2015, but their scientific productivity will decline as a result of relocation of these people from R&D to other sectors and to the smaller shares of technical and natural sciences within the structure of Ukrainian scientific community. Recent dynamics of Doctors and Candidates of sciences proves our suggestions.

Emigration of Doctors and Candidates of Scientists from Ukraine: official data and unofficial estimates

20. As to the emigration, according to some surveys, initially, about 30% of emigrants from Ukrainian cities had higher education degrees¹⁰. This means that every year in early 1990s more than 10 thousand persons with higher (University) degrees have left the country; about 1500 of them had Candidate or Doctorate degrees. But official data differ from the survey results and scholar's suggestions.

21. Problems with unofficial emigration are serious in Ukraine. According to recent estimates, 4-5 millions of Ukrainians are working abroad,¹¹ mainly in Russia and the EU countries. Most of them are staying in these countries illegally, and usually they occupy low-skilled jobs, especially in the EU countries. Some scientists have long-term contracts and do not inform Ukrainian authorities about their work abroad. There are a number of cases when people are staying abroad for years but remain registered as permanent citizens of Ukraine.

22. Official data on emigration of Candidates of sciences and Doctors of sciences show that emigration was not significant in recent years (see tables 3 and 4). Distribution of Doctors of sciences by age shows that age group of 41-55 dominate among emigrants, while for candidates of sciences this age is lower (31-50).

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9. Egorov I. Dinamika kadrovogo potentsiala ukrainskoi nauki v 1990-e gody. - Problemy Nauki, N.11, 2000, pp. 31-38 (in Russian)
10. Klochko Y. Outflow of specialists from the scientific organizations in Ukraine. - Science and Science of Science, N 1-2, 1994, p. 173-180 (in Ukrainian).
11. Zerkalo Nedely, July 24, 2004

Table 3. **Distribution of Doctors of Sciences who emigrated, by age, 1995-2002 (SCS, 2003)**

	1995	1998	1999	2000	2001	2002
Total	59	19	32	26	23	27
Under 30	-	-	-	-	-	-
31-40	2	-	-	1	2	2
41-50	15	8	7	7	9	8
51-55	11	2	6	4	3	9
56-60	15	3	5	3	4	4
61-70	14	5	12	9	4	3
Above 70	2	1	2	2	1	1

Table 4. **Distribution of Candidates of Sciences who emigrated, by age, 1997-2002 (SCS, 2003)**

	1997	1998	1999	2000	2001	2002
Total	129	98	104	125	139	128
Under 30	6	3	4	4	9	4
31-40	39	33	31	40	35	39
41-50	33	33	30	45	52	45
51-55	10	10	13	15	21	12
56-60	22	7	7	10	11	10
61-70	16	10	15	7	10	16
Above 70	3	2	4	4	1	2

23. As to main direction of emigration, it differs from neighboring Russia slightly, first of all, thanks to emigration from Ukraine to Russia (see tables 5 and 6), despite Germany and the USA take the lead in this process.

Table 5. **Distribution of Doctors of Sciences who officially emigrated from Ukraine in 1995-2002, by country of destination (SCS, 2003)**

Country of destination/ year	1995	1998	1999	2000	2001	2002
Total	59	19	32	26	23	27
Israel	10	2	2	2	3	-
Germany	3	2	10	6	1	4
Russia	20	6	6	3	5	3
USA	19	6	6	9	6	5
Poland	2	2	2	2	1	2
Sweden	-	-	3	-	2	1
UK	-	-	-	1	1	2
Others	2	1	3	3	4	10

Table 6. **Distribution of Candidates of Sciences who officially emigrated from Ukraine in 1995-2002, by country of destination (SCS, 2003)**

Country of destination/ year	1997	1998	1999	2000	2001	2002
Total	129	98	104	125	139	128
Israel	12	10	14	15	8	4
Canada	5	4	10	12	13	14
Germany	18	13	22	14	29	25
Russia	36	23	12	31	32	20
USA	33	37	24	34	35	27
Poland	3	2	1	2	2	3
Others	22	9	21	17	20	35

24. To great extent, emigration to Russia has its roots in ‘traditional’ (and more or less balanced) movement of population between two states but in 1990s emigration to Russia outnumbered immigration from Russia to Ukraine. Key reason of this situation is a better possibility to find job in Russian Federation, especially for people from the Eastern (neighboring) regions of Ukraine and from the military-oriented R&D institutions and design bureaus. In the military -industrial complex emigration is not on a massive scale, but Ukraine is losing its best specialists in the most important areas of R&D, possessing knowledge urgently needed now for the Russian defense industry. A vivid example is Professor V. Utkin, predecessor of S. Korolev and the heir of M.Yangel in the position of Director of "Yuzhny mashinostroyitelny zavod" (Southern Machine- Building Factory) - the biggest missile-building complex of the former USSR.

25. Usually, ethnic reasons are not important in making decisions on emigration to Russia but it is worth to mention that for some groups of population ‘national question’ has its meaning. So, as the latest Ukrainian census (2001) showed, that the number of ethnic Russians declined by almost 50% in Western Ukrainian regions since 1989.¹² As activists of Russian community note,¹³ substantial number of ethnic Russians has been forced to leave the region because they were discriminated on the national basis by local activists of the nationalistically oriented parties. Decline the number of ethnic Russians in the region could be also explained by the withdrawal of the Soviet Army and ‘voluntary changes’ of ethnicity in passports.¹⁴ But even in the heyday of nationalistic movement popularity in early 1990s, relations between two main ethnic groups (Russians and Ukrainians) were generally peaceful with very few open conflicts.¹⁵

26. Distribution of emigrants to different countries is changing from year to year. So, in 1989-1991, about three quarters of all emigrants were emigrants to Israel. Now this share is several times lower.

27. Emigration to other countries (except emigration to Israel) is relatively new phenomena for Ukraine. Officially, only about five thousand scientists (more than half of them had candidate of sciences or doctorate degrees) emigrated from the country in 1990s. These figures do not appear to be very high.

12. Statistika Ukraini, N. 4, 2002, p. 96

13. Russkoe slovo, N.2, 2002

14. During the last census (2001) about four million people have reported the changes of their ethnicity. Ukrainian sociologists explain this phenomenon by the wish to overcome results of Russification of the Soviet times.

15. Bremmer J. The Politics of Ethnicity: Russians in the new Ukraine. - Europe-Asia Studies, Vol.46, N.2, 1994, pp. 261-283

But in some sectors they are much higher than average. As sociological surveys show, share of specialists in mathematics, physics and biology among emigrants from the institutes of the National Academy of Sciences of Ukraine are extremely high. It reaches 40%-50% in some institutes¹⁶. This means that for some specific areas losses, related to 'brain drain' were critical. Scientific schools in some priority disciplines, once productive and growing, tend to deteriorate irreversibly when their key talented individuals leave the country.

28. Very often emigrants from Ukraine, and indeed from the rest of the former Soviet Union, could not find work in accordance with their qualifications in recipient countries just after emigration but in many cases later people could find proper place in the high-tech companies or Universities.

29. But the main problem with statistics is that the real size of emigration of specialists with doctorate or candidate degrees from Ukraine is much higher than it is demonstrated by the official data from SCS. This suggestion could be proved by an example of the National Academy of Sciences of Ukraine. Academy has its own forms for calculations of inflow and outflow of specialists from research institutions. Presidium of the Academy collects information not only about the 'pure' emigration, but also about other types of migration of scientists and engineers. So, according to official information, approximately seven hundreds specialists leave the Academy every year for long-term research visits and participation in training and exchange programs¹⁷. More than one third of them have not returned to Ukraine, although they are still considered as members of the Ukrainian research institutes. Most of them are likely to stay abroad for a long time. At the same time, usually these specialists do not cut ties with their research institutes and even keep Ukrainian passports, despite they are spending almost all their time outside the country. These persons prefer to preserve their Ukrainian citizenship thanks to a number of reasons, namely tax regulation, difficulty or inability to find work for relatives in the foreign country and so on. Examples of such situations are numerous. The most prominent Ukrainian biologist and the member of the National Academy of Sciences Yu. Gleba is spending the lion share of his time in the Princeton University, USA. He uses his Institute for Cell Biology and Genome Engineering in Ukraine as a partner in joint projects. Gleba has founded a couple of commercial companies in the USA that attract Ukrainian specialists for development of new biological products for the American market¹⁸. Famous Ukrainian mathematician A. Skorokhod is working in Michigan University since 1993, but officially he is considered as a principal fellow in his former institute.¹⁹

30. Some experts suggest that the number of 'administrators from science' and the number of 'real scientists' among those who emigrated from the country are equal. The most radical of them also assume that those scientists who have not left Ukraine are 'simply more patriotic persons than those who emigrated and they have plans to work in their own country despite all hardships'.²⁰ This position is close to the position of many top Ukrainian officials. Unfortunately, for Ukraine this is not true.

31. Preliminary estimates, made in some institutes of the National Academy of Sciences, show that the number such 'temporary migrants' outnumbers the number of 'permanent emigrants' as one to five.

16. Savelyev A., at.al. Young scientists in the Academy of Sciences of Ukraine. -Report 3-NC2000, Kiev, STEPS Centre, 2000 (in Ukrainian)

17. Reports of the National Academy of Sciences (Various issues for 1990s and 2000s) - Kiev, NANU (in Ukrainian) 1990s-2003.

18. Zerkalo Nedely, October 28, 1998

19. Visnyk NANU, N.7, 2001, p. 78

20. SolovyovV. Healthy Conservatism is not so bad. - Zerkalo Nedely, March 13, 1999 (in Russian).

32. As it was mentioned above, the situation could be changed by introduction of the special statistical form that takes into account the number of long-term research visits²¹.

New tendencies in the emigration of scientists from Ukraine

33. In the second half of 1990s- early 2000s three new tendencies appeared in the patterns of emigration of Doctors of sciences and Candidates of sciences.

34. First, emigration has become ‘less ethnic’, but ‘more professional’. There was a strong evidence of outflow of specialists irrespective of nationality in Ukraine in 1995-2002. In early 1990s, ‘ethnic component’ of emigration was very strong with a number of Jewish specialists left the country. In recent years, for the first time Ukrainians have begun to receive permissions to emigrate as specialists, not as refugees or family members, to developed countries. Canadian example is, probably, the most vivid in this respect. This country ‘selects’ immigrants on the base of their professional qualities: more than 40% of all emigrants to Canada from Ukraine (including children and other family members) have University degrees, 3%-4% have Doctorate or Candidate of sciences degrees.

35. ‘Ethnic motives’ remain important in emigration patterns of some ethnic groups in Ukraine, mainly people of German, Jewish and Hungarian origin but the shares of these groups drop down quickly in Ukrainian population in recent years (except Hungarians).

36. Second, the determination to emigrate grew stronger among young specialists. In our earlier survey we have predicted this situation,²² when almost 30% of young scientists from the institutes of the Academy had expressed their intentions to go abroad for a job. Unfortunately, we have had no opportunity to conduct another comprehensive and scientifically rigor study of preferences of youth from research institutes in the second half of 1990s- early 2000s. But there are surveys, which show that almost half of Ukrainian students and post-graduate have not come back after their graduation from Western universities. A lot of them prefer to obtain doctorate degrees in the Western countries (EU, the USA or even Australia), but not in Ukraine. A number of young qualified researchers are also going abroad without defending their dissertations in Ukraine.

37. Third, sharp growth of temporary emigration, when specialists are spending abroad substantial part of their time but still remain associated with their research institutes in Ukraine. Some of these people could come back to Ukraine but their decisions would depend on the future situation in the country.

38. In any case, it is important to stress that the problem of internal relocation of candidate and doctorate degrees holders is more serious than the problem of emigration to foreign countries. Low wages and lack of orders for intellectual products have led to an outflow of millions of educated people to other sectors of the national economy, and primarily to private businesses.²³ This process could not be considered as purely negative, because the effectiveness of the whole economy could rise as a result. The pressure on state budget is eased and preconditions for old colleagues from R&D institutions are usually maintained. The diffusion of former researchers from R&D sector and engineers from the military – industrial complex into other sectors of the economy could bring positive results at the present stage of

21. Zayonchkovskaya Zh. A. Labor Migration of Russian Scientists. –Problemy Prognozirovania, № 4, 2004, p. 98-108 (in Russian)

22. Egorov I., Herman Yu. Studies of Problems of Young Scientists and Specialists. - Naukovedenie i Informatika, N35., 1991, p.57-71 (in Russian)

23. Bogorosh O. Emigration of Scientists as a Result of Crisis of the Science and the Power. – Problemy Nauki, N. 8, 2000, pp. 11 - 17 (in Ukrainian).

economic recovery. Unfortunately, the absolute majority of former scientists and engineers have undertaken relatively simple work that does not require the scientific qualifications they have.

39. An important threat to the intellectual potential of Ukraine comes from hidden emigration. This type of emigration is based on a combination of formal maintenance of workplace in a scientific institute or design bureau while pursuing other work that is not connected with R&D. This is a widespread practice in modern Ukraine. Many specialists formally associated with R&D institutions or former military-industrial complex enterprises spend the bulk of their time on outside activities and mainly in retail trade. The main reason for this situation is the above-mentioned lack of demand from the side of industry. But, in fact, the state supports this kind of activity indirectly by compelling people to take long unpaid leaves or by delays in salary payments. Declining level of education and the quality of research (as a result of inability to conduct experiments due to low financing and absence of commercial contracts) have emerged as serious problems in recent years, especially in technical and natural sciences.

40. Several controversial factors will affect emigration patterns of doctorate and candidate degrees holders in the near future.

41. First of all, the differences in salaries of these specialists in Ukraine and in developed countries, and even differences between Ukraine and neighboring Eastern European countries will remain significant. Now it exceeds 10-50 times for the same (or similar) job. This is an important incentive for emigration. Even such countries as Poland, Hungary and Czech Republic have become more and more attractive for emigrants from Ukraine. It is evident that economic reasons will dominate patterns of emigration in the near future. Ethnic similarities with Russian, Polish, Slovak and some other neighbouring nations will make the processes of adaptation easier in the new countries. Ukrainians could substitute workers in some Central and Eastern European countries, as the citizens of these countries would try to find better jobs in Western Europe or in the North America.

42. On the other hand, relative political stability and economic recovery make ethnic or political reasons not so significant in decision-making process on emigration.

43. The need for self-realization would be the second important factor for emigration. As it was mentioned above, is that some industries, such as electronics do not exist more in Ukraine. Specialists of these industries could not find adequate jobs in the country. The same is true for scientists who have no modern equipment and money for their researches.

44. It is possible to expect that the emigration will remain approximately at the same level, as it is now or even decline slightly. Economic recovery in 2000-2003 has created some preconditions for improvements of the situation in R&D. For the first time in more than a decade, the state has fulfilled its research budget, and even provided special funds for purchasing new scientific equipment. The only problem is that a lot of the most active professionals have already left the country.

45. The second reason for possible decline of emigration from Ukraine is connected with the fact that the quality of education in technical and natural sciences is not so high in Ukraine now, as it was in the Soviet times. The number of qualified people, who have good chances to make carrier in the West in these disciplines is not so large. Carrier of an entrepreneur or a banker attracts talented Ukrainian much more than the poorly paid and non-prestigious positions in R&D sector. Professions of economists or legal advisers are much more popular than professions of scientists or engineers.

46. So, prospects for changes in the pattern of emigration for Ukraine are not clear, and a lot will depend on the policies of the Ukrainian government and the policies of potential recipient countries.

Conclusion

47. Ukrainian people, including scientists, were actively involved in migration flows in 1990s. The country was mainly a 'donor' in this process. 'Brain drain' itself is just an indicator of much important, but rarely explored issue of allocation of talents between different spheres of activities in the economy in transition. The traditional notion of brain drain addresses the problem of the depletion of existing stock of human capital, while the notion of allocation of talents focuses on the accumulation of human capital. For Ukraine, the problem lies not in emigration itself, but in de-intellectualisation of work, and primary orientation on development of traditional sectors, such as ferrous metallurgy, production of basic fertilizers and coal mining. This drives young talented people and already experienced specialists out of the country, although magnitude of brain drain from Ukraine is relatively modest if you use official statistical data. A lot of specialists are working abroad on temporary contracts for years, and the perspectives of their return are not bright. Prospects of retaining a large number of qualified specialists in the most dynamic sectors of the economy are also bleak. There are few dynamic innovative companies in Ukraine, and innovative activities of the enterprises are much lower than in developed countries.

48. It is possible to expect Ukraine will remain a donor for other European and North American countries in the near future. This assumption is based on the patterns of allocation of talents in the Ukrainian society and tendencies of shrinking the area for application of modern knowledge in the Ukrainian economy. Exact parameters of emigration are really difficult to predict, they will depend on a number of factors that were discussed above.

49. In any case, there is an urgent need to make changes in the system of existing statistical indicators to adjust them to new reality, when official data on emigration and the real flows of specialists, who are working abroad for years, have almost nothing in common.