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How Can Talent Abroad Help Reform Institutions at Home: A study of Russian technological diaspora¹

Skilled diasporas can help to identify and develop dynamic and better performing segments of Russia private and public sector. This is the main hypothesis of the paper applied to Russia and its technological diaspora. On the basis of a survey and structured interviews, the paper describes several patterns of interaction of Russian science and technology talent abroad with its domestic economy.

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Introduction: Main objectives of the project

Russia's science and technology diaspora is too visible and successful to evade attention from home. However, the public debate in Russia so far has been focused almost exclusively on return migration and on science diaspora, rather than on successful techno-entrepreneurs. The primary objective of the current **Chapter** is to help to refocus the debate on 'brain circulation' – facilitation of business links between high-tech entrepreneurs in diaspora and in home, and for this reason to understand better the current

demand in Diaspora for stronger contacts of this kind, as well as identify the existing barriers that hamper such cross-border business contacts.

Another objective of our analysis is to identify a number of success stories and key people behind such successes -- so-called ‘overachievers’ in the diaspora (successful individuals in the position to share their professional success with the business community in the home country). These people may become a core of future diaspora networks that could be instrumental in upgrading the nature of Russia-diaspora cooperation. As experience of other countries suggests, such networks have a potential for supporting various Russia’s initiatives in the area of innovation policy, including promotion of early stage venture capital, innovation start-ups and spin-offs.

In summary, the immediate research objectives of the project were as the following:

- Understand the extent of diaspora’s interest to cooperate with Russian partners
- Understand the emerging formats of such cooperation
- Identify factors that may influence diaspora’s interest in getting engaged
- Develop recommendations for government policy

To achieve these objectives, our research included the following components:

- On-line survey of Russian technological and scientific diaspora
- Face-to-face interviews with selected Diaspora ‘overachievers’, as well as with the government officials responsible for the country’s science and technology policy
- Preparation of the position paper with the main findings

This Chapter is prepared as part of the broader project sponsored by the MacArthur Foundation and the World Bank Institute aimed at understanding emerging patterns in cooperation with diaspora networks and best practices in diaspora mobilization. Other countries covered by this project are Argentina, Mexico and South Korea. The implementation of Russian part of the project was carried out jointly by the World Bank Institute and Moscow State University Science Park.

1. The scope of Russian skilled diaspora in the OECD countries: ballpark estimates

This section presents some very rough estimates on the number of Russian skilled migrants. It is based primarily on OECD sources², in particular on the one time OECD census of foreign-born population undertaken in 2000 and additional data on annual migration flows. To the best of our knowledge, the OECD data are the best dataset on this issue.

Still, these are highly imperfect estimates for two primary reasons. First, the 2000 data are clearly outdated, and they do not reflect the change in migration patterns happened in Russia during the years of recent economic boom of 2000-08. Significant improvements in Russia’s economic conditions, including growth in dollar wages (in excess of 20% a year on average) and improved funding of educational and R&D activities, may have had a profound impact on net migration outflows in recent years. However, the scale and even the direction of such change are not easy to estimate. On one side, improved domestic opportunities had clearly reduced the migration premium for skilled labor, and may slowed-down the outflow of mature professionals, and in some cases stimulated the return of earlier migrants and “brain

² <http://stats.oecd.org/wbos/Index.aspx?usercontext=sourceoecd>

circulation". On another side, various political developments under the president Putin alarmed some segments of Russia's educated class and further fueled interests in migration. In addition, the recent period was marked by major growth in numbers of Russians enrolled in tertiary education in the OECD countries (at both undergraduate and graduate levels).

The second critical deficiency of the OECD data related to the fact that it does not cover Israel, a key migration destination for skilled Soviet and Russian labor during the period until approximately mid 90s. We would guess that Israel could be a home to about a third of the number of the total skilled Russian-speaking migrants, who were registered in the OECD countries in 2000.

Table 1 present the data on annual inflows of registered Russian migrants to the OECD countries. The average migration inflow for the entire period of 1996-2006 amounted to about 85K per year. There has been a clear declining trend since 2002. The 2006 immigration flow declined by 30% from its all time high in 2002.

At the same time, the migration flow became much more diversified by the destination country. At the beginning of the period, migration to Germany and the US dominated within the entire migration to the OECD (the combined share of these two countries was 75% in 1996). In 2006 the share of these two countries declined to 40%. The decline was due primarily to the shrinking share of Germany, which halved to 23% of the total.

Table 2 presents some characteristics for the structure of the Russian emigrants, as reflected in the 2000 OECD census (stock data). The main highlights of this structure could be summarized as follows:

- About 1.5 mln people were registered in the OECD countries as migrants from Russia. 61% of these people resided in Germany, and further 19% in the USA.
- About 65% of all emigrants were of primary working age (25-64).
- About a quarter of all migrants (380K) could be considered as highly skilled, i.e. they have a tertiary degree (ISCED 5/6). However, there is considerable cross-country variation by education level. Among immigrants in the US more than half are highly skilled, while among those in Germany – only 17%.
- 80% of all skilled Russian migrants in the OECD resided just in two countries, US and Germany. As of 2000, these two countries had roughly similar stocks of Russian immigrants (about 155K each) of skilled migrants, but showed drastically different dynamics.
- About 65% of skilled immigrants (247K) were employed at the time of the survey.
- Only about 14% of the total immigrants could be considered as new immigrants, who stayed in the destination country for less than 5 years by the time of the survey. But the structure of this new inflow was quite different from the rest of migration body. It was much more educated and more US-centered. Among new immigrants 41% were highly skilled versus 25% in the sample on average. The share of the US in the new inflow was about 41% compared to only 19% on average for the entire sample. Overall, the data suggests a dramatic decline in popularity of Germany as a destination country, especially among skilled migrants.
- On average, skilled migrants left Russia more recently. 23% of all skilled migrants were in the destination country for less than 5 years, while in the entire sample only 14% were new immigrants.

Finally, using some bold assumptions, we did try to estimate the current stock of skilled Russian migrants in the OECD countries. We were using the following assumptions:

- Annual inflow of migrants in 2001-2008 was at the average level for the period of 1996-2006, i.e. 85K

- The share of skilled migrants in this flow was at the average level for the period 1996-2000, i.e. 41%

This would make the 2001-08 overall inflow of new skilled migrants to the OECD at the level of 280K. Taking into account the 2000 stock, and assuming some retirement of earlier migrants and modest rate of return to Russia, our best guess would bring the 650K as an estimate for the current stock, out of which about 450K skilled migrants are employed. More than half of these people would live and work in the US. We would also guess that Israel may be a home to additional 150-200K of highly skilled people of Russian origin.

Table 3 presents summary of Russian official statistics on labor migration. This is the best data from Russian sources we were able to locate. The main features of this data set could be summarized as follows:

- Russian labor outflows has been growing steadily since 2000, from about 46 to 73 thousand persons a year
- About half of all migrants move to work in the developed countries of Europe, USA and Canada. Meanwhile, labor migration to Europe has been rather stable recently, while the one to the US/Canada shows a strong trend towards expansion.
- Most reported migrants (more than 80%) are male
- About third of all labor migrants have a university degree
- At the same time, the prominent feature of the Rosstat data set is that it captures largely short term migrants: the share of those who intend to stay abroad more than a year was less than 8% in 2008³, i.e. registered migrants are mainly the people who have short term contracts and are likely to return.

The above Rosstat data set has 2 obvious limitations:

- 1) It reflects only officially registered labor migrants, i.e. people who do explicitly report that their reason for leaving Russia is their labor contracts with foreign employees. As such this statistics would not capture 3 important channels of labor migration - a) studying abroad and staying after graduation, b) explicit emigration (w/o labor contract), and c) labor migration labeled as tourism (“went to see friends abroad for a week and stayed forever”). For these reasons, the above data may underestimate the actual migration outflows.
- 2) At the same time, the reported data contain a lot of double counting because almost 70% of all people registered as labor migrants leave for less than 6 months. Many of these people are seasonal migrants who are going back and forth every year and as such do not contribute much to the increase in the stock of Russian migrants abroad. The prominent example of such migrants is Russian crews of foreign ships. For this reason, the Rosstat data overestimate the net migration outflow.

These two biases may to some extent balance each other. If one makes a bold assumption that the two biases perfectly match each other, then it is possible to produce a rough/conservative estimate for the current size of Russian migrants staying abroad (current stock). To do this we would assume that the average annual labor outflow for the last 20 years was about 50 thousand people (the average for 2000-04 in the Rosstat data set). This would result in a ballpark estimate for the current stock of new Russian emigrants of 1 mn people, out of which skilled migrants would make about one third, i.e. 300-350

³ This may be underestimation of actual intentions. Migrants may have incentives to hide their real intentions to stay abroad for longer periods of time.

thousand. This is considerably less than the earlier estimate of 650 thousand people that derived from the OECD data. In the environment of poor data availability, these two numbers together may be useful to identify a potential range of possible estimates.

Table 3. Number and characteristics of Russian citizen left to work abroad, annual flows, 2000-08

	2000	2005	2008
Total number of labor migrants, thousand	45.8	60.9	73.1
By destination, %			
- Europe	48.3	36.0	28.5
- Asia	37.9	31.4	24.3
o/w: Cyprus	18.0	17.2	11.1
- USA	2.5	12.2	18.7
By education, %			
- Share of university graduates	36.8	34.3	33.6
By length of stay abroad, %			
- less than 6 months	26.4	49.7	68.8
- 6-12 months	35.6	32.1	23.3
- more than 1 year	38.0	18.2	7.9

Source: Rosstat.

Table 1 Emigrants from Russia (Inflows of foreign population by nationality) into the OECD countries, thousand

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	average
Germany	33.70	28.93	26.41	32.84	32.73	35.93	36.48	31.78	28.46	23.08	17.08	29.77
United States	19.66	16.62	11.52	12.32	16.94	20.31	20.77	13.94	17.41	18.08	13.19	16.43
TOTAL OECD	71.27	65.95	67.88	72.25	89.75	106.97	108.32	90.89	94.86	87.19	75.57	84.63

Dataset: International Migration Database, OECD

Table 2. Structure of the immigration stock in OECD countries, 2000, thousand

	Stock of all immigrants	Working age (25-64) immigrants	Share of working age, 25-64	Skilled migrants, ISCED 5/6	Share of skilled migrants	Employed skilled migrants	Share of employed skilled migrants	All new immigrants, < 5 years	Share of new migrants	New skilled immigrants, < than 5 years	Share of skilled migrants in the new inflow	Share of new migrants in the pool of skilled migrants
Immigrants from Russia	1524.4	989.3	64.9%	379.6	24.9%	246.9	65.0%	207.4	13.6%	85.7	41.3%	22.6%
o/w: in the US	287.5	184.9	64.3%	152.9	53.2%	97.4	63.7%	85.7	29.8%	48.1	56.1%	31.5%
in Germany	929.8	614.6	66.1%	155.2	16.7%	92.4	59.5%	53.3	5.7%	5.6	10.5%	3.6%
Immigrants from the FSU	87.6	60.7	69.3%	32.5	37.1%	22.8	70.2%	12.5	14.3%	7.2	57.6%	22.2%
Share of the US	18.9%	18.7%		40.3%		39.4%		41.3%		56.1%		
Share of Germany	61.0%	62.1%		40.9%		37.4%		25.7%		6.5%		

Source: OECD

2. Russian skilled diaspora in a cross-country perspective

The paper by Docquier and Marfouk (2004) provides a useful global perspective on incidence of Russian skill migrants. Their estimates suggest that in 2000 Russia had a relatively large stock of such migrants in the OECD countries (263 thousand), making Russia the 19th largest source country in the world⁴. At the same time, the emigration rate, at 1.3%, among Russian citizens with tertiary education was among the lowest in the region (11st lowest emigration rate in the global sample). For comparison, the similar emigration rate for Poland, Romania, and Hungary exceeded 10% in 2000, which means that at least one in every 10 university graduates in these countries has moved abroad by 2000. This data suggests that as recently as in the 90s the mobility of Russian skilled labor, despite all dislocations and shocks associated with early transition, remained relatively low by global standards.

Moreover, within the global migration system Russia plays a much more prominent role as a destination country for migrants from the rest of the FSU and some countries in Asia than as a source of its own migrants. Kapur and McHale (2005), using the UN data, point out that by 2000 Russia has become a home to 13.3 mn migrants (9% of its population), i.e. the 2nd largest destination country in the world after the USA⁵. It is worth pointing, however, to essential differences in the skill structures of Russia's immigration and emigration flows. While Russia exports significant quantities of skilled labor, its labor inflows are considered to be predominantly low skilled (construction, retail, and agriculture workers). At the same time, while the exact share of professionals among new immigrants to Russia is unknown, there has been anecdotal evidence that in large Russian cities skilled migrants hold an increasingly larger share of jobs in education, healthcare, and engineering (particularly in housing construction and housing maintenance services).

Another important observation by Docquier and Marfouk (2004) is that 60% of all skilled migrants worldwide are based in the US. Thus, studying the pool of skilled migrants in the US is often sufficiently informative for making broader conclusions about global trends in the stock of such migrants. And the US labor statistics and specialized diaspora surveys in several instances do provide additional insights on the current trends in Russian skilled migration.

It's interesting that public perception of the scale of Russian skilled migration and its impact on domestic economy is much more negative than the above migration statistics would suggest. Russian domestic debate tends to view the country's brain drain as a catastrophe and this perspective seems to be shared by many international observers. Global Competitiveness study by the IMD reflects this pessimistic assessment in its Brain Drain Index, which puts Russia at the lowest 60th position in the sample (i.e. considers Russia as the most affected among the group of OECD and leading developing countries). At the same time, Russia is rated relatively highly (28th) among the places that are attractive to foreign high-skilled people (Table 4). The existence of this gap between being attractive for skilled foreigners and non-attractive to skilled locals (whose emigration causes a massive brain drain) makes Russia's position in the WCY somewhat unique and even bizarre. In our view, this gap is largely explained by inflated perceptions of damage caused by the actual brain drain, which are not consistent with the available data on scale of Russian skilled emigration⁶.

⁴ Docquier and Marfouk (2004) in their estimates consider only those who emigrated from Russia after 1991 when it became an independent state. All pre-1991 emigration from the Soviet Union in their study is treated separately, which leads, in our view, to at least 50% underestimation of the stock of Russian migrants. This bias, however, would not change much the nature of their main observations about Russia's emigration rate during the 90s.

⁵ The more recently quoted estimated is that Russia hosts almost 15 million new migrants, mostly from the countries of the former Soviet Union.

⁶ These estimates may need a caveat, however. They are coming from the survey of international corporate managers that have been doing business in Russia. This group has been commonly known for being rather pessimistic on Russia with respect to almost everything except their own business prospects. Our own survey results have revealed the same pattern in perceptions.

Table 4. Brain drain and foreign labor indices, ranks for selected developing countries

	Brain drain Index: Does brain drain undermine competitiveness of the country?	Foreign labor Index: is the country attractive for high-skilled foreigners?
India	21	32
Brazil	30	29
Hungary	36	18
Slovakia	42	45
Mexico	45	39
Poland	49	50
Argentina	53	59
Romania	56	55
Russia	60	28

Source: WCY, 2005. The sample includes 60 countries and territories.

Table 5 presents data on the number of foreign PhD recipients in the USA in 2002-08 and on their intentions to stay in the US after doctorate receipt. Russia holds the 10th position in this ranking with the average annual number of new PhD holders of 195. This is quite a modest share of the US market for these degrees, which is 18 times smaller than the share of China and 7 times less than the one of both India and Korea. And the number of PhD recipients from Russia did not show any growing trend. In fact, it declined in 2008 to 171, below the period average, while the numbers of new PhD holders from Asian countries, especially from China and India, further increased.

At the same time, Russian PhD holders have higher "stay" rates (intentions to stay in US after graduation) of 80.5% than most other countries, except for India and China. The average five-year stay rate of PhD recipients in the US in 2005 has reached 68%, its highest level yet (Finn, 2007). Overall staying rates in the US have been traditionally high even for high income OECD countries such as Germany and Japan, which emphasizes attractiveness of the US labor market for global talent.

The above data suggests that recent growth in the stock of Russian skilled migrants in the US has been only marginally dependent on young people who came to America to complete their education and then decided to stay. The number of new Russian PhD holders in the US is drastically smaller than the most conservative estimates of annual inflows of skilled migrants. The profile of a typical Russian migrant with academic degree is quite different from migrants from many other source countries, especially from Asia: educated Russians living in the USA are the people who completed their education in Russia and moved to the US as (often young, but not necessarily) professionals, not as students. For those in academia it usually means an acceptance of Post-doctoral position in an American university as an entry point to the US labor market.

It is commonly believed (Egrev, 2000, 2007) that the above peculiarity of educational background among Russian migrants makes a major difference for their career prospects. Lack of American doctoral degree and relatively late arrival makes Russians less integrated into the US academic labor market and generally less competitive. 20 years since the major liberalization of Russian migration policy, many observers comment that Russian researchers in the US are disproportionately concentrated at the lower end of research hierarchy, holding temporary jobs and not being able to advance to the positions of permanent professor and manager of independent research project⁷. As a result, because Russian emigrants have relatively fewer people at managerial positions, their combined influence on research and cooperation policies of their organizations is more limited than their gross numbers could suggest. Overall, this would considerably reduce the cooperation potential of Russian diaspora from the home country perspective.

⁷ One of the participants at the Russian academic internet forum provided the following evaluation of the current (2009) situation with Russian representation in the US academia: A dozen have managerial positions, few dozen have established themselves as leading research figures, low hundreds have positions of professors, while thousands remain with temporary contracts and work as academic helpers ("na podhvate").

Table 5. Temporary visa holders among doctorate recipients in the US and their intension to stay in the United States after doctorate receipt, by country of citizenship, 2002–08

	Number of PhD recipients	% staying in the US
China	25,037	89.6
India	9,627	87.9
South Korea	9,549	64.6
Taiwan	4,579	53.0
Canada	3265	57.2
Turkey	3062	61.2
Thailand	2,329	22.5
Japan	1,750	51.1
Mexico	1,486	45.8
Russia	1,364	80.5
Germany	1,346	62.9
Brazil	1,127	40.9
Argentina	717	64.7
Chile	428	36.2

Source: NSF (2009) <http://www.nsf.gov/statistics/nsf10309/start.cfm>

If one looks at the overall number of Russian students enrolled in universities of OECD countries, there is also little evidence of major growth in such enrollments and therefore no potential for either major expansion in numbers of Russian skilled migrants in the near future or for a significant shift in its current qualitative structure. According to the OECD Educational database, there were about 36.6 thousand Russian university students in the OECD countries in 2007, about 1.4% of the total number of foreign students. This is a modest number relative to the students from China (15.2% of the total) and India (5.7%). While the number of Russian students shows a drastic increase relative to the early and mid 90s, its recent rate of expansion was moderate, about 16% for the entire period of 2004-07. This is lower than the average growth rate in the total number of foreign students in the OECD, which was almost 10% a year in the middle of the previous decade.

It is worth noting that geographical distribution of Russian students in the OECD countries is rather different from students that come from Asian countries. Russian students are much more concentrated in continental Europe, especially in Germany that accounts for one third of Russia's total foreign student population. Students from China and India more often chose to study in the USA and UK. For instance, 23% of Chinese foreign students are in the US (compare to only 14% of Russian students), and only 7% are in Germany. This difference in destination preferences seems to have a significant effect on expected students' return rates after graduation. Much more flexible labor markets in both US and UK provide more opportunities for foreign students, who want to stay, to remain in these countries. Thus, the current strength of Russian student body abroad and its geographic patterns do not suggest a possibility for rapid future growth in a total number of skilled migrants through an inflow of younger and better integrated newcomers.

Available US statistics shows that rapid growth in a number of foreign students in US who study science and engineering has been one of the key drivers for simultaneous growth in a number of foreign-born employees of technological companies (Table 6).

Table 6. S&E Graduate Student Enrollment and Employment in STEM (science, technology, engineering, and mathematics) Occupations

S&E Graduate Student Enrollment			
Year	1985	1995	2005
Foreign-Born	79,940	102,885	146,696
Total	404,021	499,640	583,226
Foreign-Born Share	19.8%	20.6%	25.2%
Employment in STEM Occupations (in thousands)			
Year	1980	1990	2000

Foreign-Born	284	542	1,150
Total	3,459	5,046	6,871
Foreign-Born Share	8.2%	10.7%	16.7%

Source: As reported by Hart (2009).

Several studies of diaspora entrepreneurship in the US suggest that on average educated immigrants with science and engineering background are highly entrepreneurial and over the last 20 years they made a major contribution to the formation of new companies in the American high-tech sector. However, these studies did not identify any significant presence of entrepreneurs from Russia/FSU, especially when compared to a very visible presence of entrepreneurs from China, India, and other Asian countries.

Hart et al. (2009) report the results of a recent survey of a nationally representative sample of rapidly growing high-impact, high-tech companies (HIC)⁸ in the US. This group of companies accounts for a disproportionate share of job creation and economic growth in the economy. They found that about 16% of the companies in the sample had at least one foreign-born person among their founding teams. This estimate, which is lower than several previous studies of high-tech immigrant entrepreneurship in the US⁹, still shows that immigrants play a crucial role in this vital economic activity. An important peculiarity of immigrant-founded companies in the sample is that they are about twice as likely as native-founded companies to state that they have a strategic relationship with a foreign firm, such as a major supplier, key partner, or major customer. This observation once again points to attractiveness of diaspora-run businesses as a source of potential partners to local firms in developing countries.

The 250 foreign-born entrepreneurs on whom this study collected the data came from 54 countries in all regions of the world. India is the largest source country, accounting for 16% of this group, followed by the U.K. at 10%. Russia is represented at the level of 2.8% (7 firms out of 250), which does not strike as exceptionally high.

Analysis undertaken by Saxenian and Shin (2008) focuses on the role of emigrants in transformation of Silicon Valley in the last third of 20th century. By 2000 more than half of engineers and scientists working in the Valley (53%) were foreign-born, compared to fewer than 10% in 1970. The dramatic labor market transformation became a critical source of the region's competitiveness in high technology in the 80s and 90s. Foreign-born technology workers have also become a resource for local companies for developing global connections, promoting export and investments. This change was driven by important changes in national immigration policies, openness of American universities to qualified foreign students, tendency of immigrants to concentrate and the growing demand for skills in the Valley. In the 90s the entire growth in high-tech workforce in the Valley was due to immigrants, largely from Asia. European immigrants contributed about 14% of the total increase in foreign-born labor force in high-tech in the 90s. Some fraction of this European inflow is clearly of Russian/FSU origin, but Russia is not shown in this analysis as a separate source country. In the view of the authors of that paper, in contrast to several other migrant groups, Russian entrepreneurs in Silicon Valley have never played a sufficiently large role to deserve a more detailed analysis.¹⁰

Our reading of the available data on the American high-tech entrepreneurs of foreign origins seems to support the hypothesis that in per capita terms Russian skilled migrants are less entrepreneurial, as measured by the number of established successful new companies, when compared to their peers from several Asian and European countries. This observation is fully consistent with the analysis of large-scale

⁸ HIC is a firm the sales of which have at least doubled over the most recent 4-year period and which has an employment growth quantifier of 2 or greater over the same period. There were 376,605 HICs (approximately 2.2% of all companies) in the United States between 2002 and 2006.

⁹ Among founders of larger and generally more successful high-tech companies the role of emigrants may be even higher. Wadhwa et al. (2007) find that 25% of high-tech companies founded between 1995 and 2005 that had achieved more than \$1 million in sales or employed more than 20 people had CEOs or chief technical officers (CTOs) who were born abroad. And immigrants were CEOs or lead technologists in 52 percent of Silicon Valley startups.

¹⁰ From private communication with the authors.

skilled migration from Russia/FSU to Israel, where in the last two decades these migrants formed a considerable portion of total employment in the booming IT sector. However, the number of new high-tech companies established by these migrants is considered to be negligible (Breznitz, 2007). And this makes the latest wave of Russian emigrants quite different from Russians who came to the US in the pre-communist era (before 1917), who were seen as highly entrepreneurial.

It is worth mentioning that we do not consider this weaker entrepreneurial drive among recent Russian emigrants as a common feature of the entire Russian population, a kind of anti-business legacy of the communist system. Overall, over the last two decades there has been an improvement in supply of entrepreneurial skills in Russia. In the global competitiveness survey by the IMD the quality of entrepreneurial skills in Russia is rated relatively high: Russia holds 36th position in the sample of 60 countries and locations (WCY, 2005)¹¹. This is reasonably close to the entrepreneurial ranks of India (32) and Korea (28), and significantly above the similar ranks of e.g. Argentina (56), Germany (49) and Japan (59). The issue seems to be related to some anti-entrepreneurial self-selection bias among Russian skilled migrants. Our own hypothesis, which got considerable support from our interviews, is that Russia's transition in the 90s was a time of great business opportunities at home for entrepreneurial types of all sorts and various educational backgrounds. Thus people with entrepreneurial skills had lower incentives to leave Russia during that period. In contrast, those with a stronger interest in migration were driven not as much by new business opportunities abroad but by a desire to continue their established professional (non-entrepreneurial) career, opportunities for which in Russia deteriorated drastically in the 90s due to budget squeeze and institutional changes. And those who actually emigrated looked for a possibility to stay within their established academic and engineering careers, and their employment of choice was with universities and large corporations, but not with start-ups (Dezhina, 2008).

Our conclusion from the available research on skilled diaspora in the US and elsewhere is that key characteristics of Russian diaspora are likely to be considerably different from those much larger diaspora groups from Asia (China, India, South Korea, Taiwan), on which this literature has been largely focused¹². We expect that, due to the reasons discussed earlier in this section, Russian diaspora to be on average less professionally advanced and less integrated into respective specialized labor markets in the US. While Russian emigrants to the US have on average a higher level of education and academic credentials, they remain under-represented at the management level in both academia (department chair level) and especially high-tech business (managers and founders of new, dynamic high-tech companies). This may, again on average, limit both their interest in cooperation with Russia (benefits of which could be seen as too risky) and their ability to influence their organizations in favor of such cooperation. At the same time, this conclusion about "averages" does not prevent a possibility of meeting a group of over-achievers who may have a noticeably different motivation.

From the level of both professional advancement and self-organization, the following simple classification of skilled diasporas may be seen as an informative:

- China, India, Taiwan, South Korea – advanced diaspora, with members who collectively control significant amounts of investment and managerial resources
- Russia, Argentina, Iran – an intermediate case with much weaker organizations and less prominence at the senior managerial level
- Philippines, Mexico – relatively young but rapidly growing skilled diasporas

¹¹ For most institutional indicators Russia has ranks in the bottom quintile.

¹² This statement requires a qualification. Not all large Asian diaspora groups are similar. For instance, Philippines' diaspora is massive and well established. However, historically it used to be largely a low skilled diaspora. Its high skilled segment has been growing recently, but still remains relatively young and less established/prominent when compared to several other skilled diaspora groups.

3. Recent studies of Russian academic diaspora

Over the last few years, several studies were undertaken in Russia to explore the prevailing motivation and attitudes of Russian skilled migrants. The peculiar feature of this research is its focus on academics (scientists whose primary employer is a non-commercial entity). This analysis was based on either mailed-in surveys or on face-to-face interviews, and commonly the samples and response rates were rather low¹³.

Egerev (2007) argues that the usually cited numbers of scientists of Russian origin who work abroad are highly inflated. This is because they reflect the professional background of emigrants, but not their current employment status. In reality, as he claims, most these migrants, especially in Germany and Israel, were unable to obtain a research position and had to change their professional occupation. In his view, based on the analysis of actual publications and conference activity, there are not more than 30,000 active scientists from Russia that work abroad, out of which 60-70% are based in the US and Canada. In addition, roughly the same number of scientists has been working abroad part time, regularly sharing their work between Russian and foreign research entities.

Furthermore, the recent Russian diaspora research¹⁴ points to the existence of considerable interest among diaspora members in cooperation with Russian partners, but this interest remains largely unrealized, and there is a significant room for expansion in cooperation. At the same time, the studies did not find any real potential for return migration among the respondents. The papers also note that the diaspora perceptions of cooperation with Russia have improved since the late 90s, but at the same time they still reflect prevailing skepticism towards the government policies for research international cooperation. There has been also a common theme of diaspora complaints about problems in the Russian institutional environment (bureaucracy, inflexible funding arrangements, insufficient openness of academic institutions), as well as inadequate demand for foreign cooperation from Russian research organizations. Tvorogova (2009) also makes the point that administrative barriers for cooperation are particularly strong for more junior diaspora members, who are unable to mobilize large amounts of resources and secure long-term cooperation programs between foreign and Russian organizations.

Based on her own analysis of the current trends, Dezhina (2008) argues that instead of currently popular calls for designing a new government program to facilitate returned migration of Russian scientists, there is a much more practical need to intensify day-to-day academic contacts and build research partnerships with diaspora academics. This may require an ideological shift in a way how Russian research establishments are managed. Egerev (2009) makes a point that to facilitate such cross-border cooperation it is important to address various legal and administrative barriers that hamper international research cooperation, such as e.g. administrative limitations for short term employment of foreign researchers in Russia.

4. Government Initiatives to expand collaboration with the skilled diaspora

The Russian government policy of cooperation with skilled diaspora remains largely focused on cooperation with and potential return of Russian academics working abroad. This topic remains popular among general educated public in Russia, which has a nostalgic feeling about times when Russia, as many still believe, used to be a global leader in fundamental science. The theme received additional public attention in September 2009, when a large group of Russian scientists working abroad sent an open letter to the Russian President and Prime Minister called "Fundamental Science and Future of Russia"¹⁵.

¹³ It was noted that these almost simultaneous and uncoordinated survey attempts around 2008 by the researchers based in Russia to undertake several email-based surveys of Russian diaspora created some comprehension within the diaspora community (Egerev, 2009). In the environment of insufficient trust, this comprehension could also contribute to a relatively low response rate in our own survey.

¹⁴ Egerev (2009), Dezhina (2008), Sterligov (2009), Tvorogova (2009).

¹⁵ http://www.hep.phys.soton.ac.uk/~belyaev/open_letter/ The letter ultimately was signed by about 200 scientists.

The letter's authors believe that upgrading country's capabilities in the area of fundamental research is critical for Russia's development and called for urgent measures to expand research funding, reform mechanisms of both research financing and program evaluation, and move aggressively toward global integration of Russian research programs.

The major recent policy development in the area of diaspora cooperation relates to the approval in 2008 of the new initiative (so-called "Action 1.5") within the government program "Academic and teaching staff of innovative Russia". This initiative is explicitly aimed at strengthening research cooperation with diaspora academics through competitive allocation of small research grants to joint Russian-diaspora teams. The key requirements for participants include (i) at least two month stay of diaspora team member in Russia, and (ii) participation of young researchers from the Russian side. It was expected that about 100 grants would be given annually and the program would help facilitate the transfer of global knowledge to the new generation of Russian scientists.

The program implementation was launched in January 2009 and it received 380 applications from the joint research teams, out of which 110 were selected as winners. The average amount of grant was about \$US 65K, half of which could be spent on the salary of foreign partners. More than a quarter of diaspora winners were based in the US, but more than 20 countries were represented overall. The important institutional partner from the diaspora end was Russian-speaking Academic Science Association (RASA)¹⁶. The RASA members participated in the review and evaluation of applications.

At the same time, the first reactions¹⁷ to this government initiative from Russian academic community were quite cautious. The usual list of concerns was expressed that relate to the gaps in administrative infrastructure to support the cooperation with diaspora (unresolved issues with multiple visas, work permits, recognition of foreign academic degrees, etc.). Nevertheless, the early experience with this program was positively assessed, and the government made the decision to scale it up. The next round of funding would allow support for 3-year joint research programs with the total grant up to \$US 3 mn. In addition, the Government announced a separate program of competitive grants aimed at attracting additional diaspora-based human capital to Russian universities. This program will be opened for diaspora researchers, who are interested in teaching and joint research. The total program budget is Rbl 12 bn (\$US 300 mn) for 2010-12.

With respect to the applied science and research commercialization, it were the major state corporations, such as RusNano and RVK (Russian Venture Corporation), which recently had been actively exploring various potential formats to engage the diaspora, in particular the diaspora members with the global experience in venture financing and technological entrepreneurship. There have been active discussions on establishing special advisory and expert panels with diaspora representation, which would help senior managers of these corporations with specific project selection as well as with addressing a broader challenge to upgrade Russia's institutional and regulatory framework for investing in high-tech start-ups. There has been also a systemic effort by RusNano to reach out to the Russian technological diaspora, including within the framework of Russian Nanotechnology Forum. As of late 2009 all these activities remained largely at the stage of active discussions and concept development, while there is also evidence of strong diaspora interest in terms of participation in the Nanotech Forum and other high level events sponsored by the government.

Another 2009 policy development in Russia relates to the adoption of a new federal law that allows state universities and research entities for establishing new business subsidiaries whose primary purpose would be commercialization of intellectual property owned by these universities and research entities. There have been strong expectations that this law would trigger a major change in attitudes among research and education establishment in Russia towards commercialization of research findings and more generally towards strengthening the linkages between academia and industry. To extent that the law may help to realign the incentive structure within the Russian academia and make it more interested in systematic

¹⁶ The Association was founded at the workshop in France on 5-11 October 2008. According to the Association website, it had about 100 registered members in the early 2010.

<http://www.dumaem-po-russki.org/about.html?PHPSESSID=fhht9s25jeb9pgqidr7qugte5>

¹⁷ http://www.nkj.ru/news/14700/?ELEMENT_ID=14700&print=N

search for a commercial return from investments made in research, it may encourage research administrators to start building new partnerships with the players who have stronger marketing and commercialization expertise, including those from diaspora.

In addition, the Government has launched the top level initiative called Innograd Skolkovo, under which a separated new research town and high-tech business development area will be established in the proximity to Moscow. The location will have a special tax and regulatory regime aimed at attracting the global high-tech players and global research talent. Expectations are high that the new center will be able to attract diaspora researchers and entrepreneurs. The Government announced its plans to spend \$US 2.5 bn in two years on the development of Skolkovo¹⁸.

On a separate development, in May 2010 the Russian parliament adopted new legal amendments aimed at creating a more attractive working environment for highly-skilled foreign specialists. The new law lowers taxes for foreigners working in Russia and simplifies the complex process of obtaining work permits. The work permits will be issued now for 3 years and qualified foreign workers would have the right for their multiple extensions. The law also regulates employment rules for workers from the countries with which Russia has a visa-free travel regime (which includes Israel).

5. Main conclusions from interviews

The detailed interviews¹⁹ (about 20) we had were very informative and helped to provide us with better understanding of both motivation that drives the Russian diaspora activists as well as the main constraints they are facing in attempts to expand their professional and business links with Russian organizations.

With respect to the government policy makers, we have been lucky to meet senior officials from the two major state high-tech corporations (Rusnano and RVK), the former CEO at the state Foundation for Support of Small Businesses in Hi-Tech Sphere, the general manager of the Science Park from the Moscow State University as well as the senior department director at the Ministry of Science. At these meetings we made a lot of exploration of what has been known by our counterparts about actual experiences of Russian-Diaspora cooperation in the high-tech area.

Our interviews with the diaspora representatives were undertaken according to the preliminary developed format. The key themes of the interviews related to respondent's business experiences, including in Russia, views on Russia's business partners and counterparts, views on the government (qualifications of government counterparts, ease of doing business, assessment of government innovation policies), motivation of doing business in Russia and business expectations, recommendations on policy reform priorities.

The main messages from the interviews could be summarized as following.

1. Russian skilled diaspora has several peculiar features, which makes its quite different from the well-studied diasporas from Asian countries. Overall, these features limit the medium term "cooperation potential" of Russian diaspora.
 - The origins of expatriate talent that migrated to the OECD countries from Russia are very different from the one from Asia. In Asia the typical career path relates to students who went to study abroad, stayed in the country which gave them education, gained practical experience and then either went home (as in South Korea, Singapore and increasingly China) or engage with the country in brain circulation mode (as is often e.g. for Taiwan). In contrast, in Russia (also in Mexico and Argentina) a typical expatriate is a person who was formed professionally in the home country and moved abroad to advance her/his careers. And this pattern seems to re-produce itself, as the above data on a number of

¹⁸ Vedomosti, 2010, 26 April

¹⁹ We had both face-to-face and telephone/Skype based interviews. In addition, two interviews were recorded for us by our partners in the Higher School of Economics, Moscow.

Russian students abroad suggests. Late arrival of diaspora members limits both their career prospects in destination countries and their ability to initiate productive cooperation with the home countries.

- The level of social capital within the Russian diaspora community is relatively low, which is reflected in the low pace of formation of Russian diaspora organizations. Russians in diaspora show low propensity of bonding with each other at the community level. This may be related to the post-Soviet legacy with weak tradition of civic engagement, participation in community organizations, etc. It is in strike contrast with various other diasporas, such as e.g. Armenians that have a century-old tradition of building and sustaining organizations to support cultural and charitable activities.
 - The entrepreneurial skills and instincts within the Russian diaspora are somewhat weaker than among Asian diasporas. This may be a reflection of self-selection bias among those who left Russia during the 90s (as noted in the earlier section). This also may reflect the above-mentioned weakness of local social networks within the diaspora, which limits the scope of informal support a new entrepreneur may rely upon.
2. Several specific institutional features of the current Russian business environment complicate the technology cooperation between Russian organizations and Russian diaspora. As a result, the existing potential for diaspora cooperation, which is not enormous to start with, is heavily underutilized. The following barriers are worth special mentioning.
- Russian economy has a fundamental problem which is insufficient demand for innovation. This is the economy, in which large chunks of economic activities remain state controlled (despite respective firms are sometimes privately owned), which has access to huge resource rents and is a host of a number of giant state controlled corporations. The level of market competition remains depressed, while reforms in the innovation system have been slow (“import of new technologies to Russia is hampered by lobbying of local academics and bureaucrats who do not need competition”). The structural deficiencies of Russian economy were further aggravated by the high growth rate of Russian market in 2004-07, which further undermined demand for innovation. While public spending on R&D has expanded recently, this happens within the established institutional structure and without adequate expertise and accountability. The bottom line is that the main economic players, large corporations in particular, do face insufficient competitive pressures and have little incentive to either undertake/contract R&D or try practical implementation of new ideas, and this triggers the whole set of consequences, including lack of interest in building new partnerships, domestic and foreign alike.
 - Russian organizations, including those in R&D, remain inflexible and insufficiently open for cooperation. This problem goes much beyond the matter of international cooperation, but affects the intensity of cooperation at the domestic market as well²⁰.
 - The business environment remains challenging with high entry and transaction costs, which makes life especially difficult for small companies and new players. Instead it is large organizations that are best positioned to deal with the existing administrative barriers. As a result, many representatives of Russian diaspora, whose efforts are not backed by large foreign corporate structures, find out that doing business in Russia is too taxing. “It is too slow, too expensive, and generally not competitive when compared to China.” Our respondents have been complaining about Russian customs (“takes a year to import chemicals that are necessary for ongoing research”), Russian embassies (“continue to treat former Russian citizens as traitors), difficulties with obtaining multiple visas, etc.
3. Despite the existing constraints on both supply and demand side, the interviews reveal that there has been considerable amount of experiences in diaspora cooperation, and we did identify a number of impressive success stories. As expected, there is tremendous heterogeneity of diaspora players that show a high degree of variation in capabilities, motivation, and strategies. But, as our

²⁰ This seems to be consistent with the IMD survey data: the assessment of global competitiveness gives Russia 48th rank out of 60 for the quality of her inter-firm technological cooperation, i.e. it is at the level similar to what is observed in Argentina, Greece and Turkey. Taiwan (15th), India (18th), and Korea (19th) have much stronger capabilities for inter-firm cooperation.

interviews suggest, such success stories remain rather isolated events, driven largely by strong motivation of their diaspora backers with practically no support from organizations from any side of the border. There is little follow-up and replication, and these positive experiences remain little known and poorly reflected by policy makers, and formation of effective diaspora networks that have reliable partners in Russia has been slow.

4. The wealth of experiences with diaspora cooperation reflected in the interviews could be, with some simplification, classified as follows. It is clear that each of these cooperation formats brings considerable benefits to Russian partners and Russian economy as whole, and as such they all deserve some support and recognition from Russian policymakers. The government policy should avoid a potential trap of excessive focus on dealing with the diaspora mega entrepreneurs and investors. Instead, a broader inclusive policy that would also expand opportunities for smaller players would be much more appropriate given a high level of diversity (heterogeneity) of the diaspora.
 - Mega star entrepreneurs. Example: IPG Photonics is the world's leading provider of high-power fiber lasers and fiber amplifiers that are revolutionizing performance in an array of materials processing, telecommunications and medical applications. The company was established by Valentin Gapontsev in 1990 in Russia and since then has expanded globally. In 2009 it had about \$0.5 bn capitalization with 1,400 employees worldwide, out of which 25% are based in Russia (involved in both manufacturing and R&D).
 - Managers of large multinationals that were instrumental in influencing their corporate development strategies in a way that they would result in expansion of corporate operations in Russia, including establishment of R&D facilities in Russia. The better known stories of this kind of cooperation include Russian operations of Boeing, Intel, Microsoft, and EMC.
 - Traditional high-tech start-up entrepreneurs, which for various reasons decided that a significant part of their business (often it is R&D activities) would be based in Russia.
 - Traditional outsourcing to Russia undertaken by software firms of different types and size. The case studies suggest that Russia has occupied its own niche at the market for software outsourcing where it is highly competitive, but this niche is relatively small. There is limited potential for expansion of this business line in Moscow city due to labor constraints, but the situation seems to be much more promising in a number of other industrial centers.
5. There are also signs of promising institutional developments, i.e. emerging institutional structures that with time may become “bridging institutions” that are capable of supporting more intensive Russia-diaspora technological cooperation. These examples include:
 - Tomsk Technical University (TUSUR) has recently become a national leader in developing close links between its traditional training and research programs and operations of numerous local high-tech firms. The university supports operations of the modern alumni association, which serves as a primary tool for bringing private investors to the university incubators and mobilizing private firms owned and managed by TUSUR’s graduates to cooperate with the university in various ways. A number of such alumni investors who in recent years have opened subsidiaries at the TUSUR incubator are from the diaspora, and they do provide the entire local business cluster with improved access to the global marketplace and expertise.
 - AMBAR, association of Russian businessmen in California. This is rather typical for California “ethnic” IT association, which in a very typical way started its activities with the heavy focus on addressing immediate business needs of its local members (networking and career development). As experience of similar associations suggests the AMBAR has a potential to reach the stage when it is capable of initiating and sustaining collective cooperation programs with Russian partners.

- Moscow State University Science Park is one of the most advanced Russia's high-tech incubators and know-how commercialization facility. Because of the park's high profile and sophisticated management team, it seems natural that with time it may expand its bridging role to outreach to diaspora partners as a source of marketing, technical, and investment expertise.
6. The discussions with diaspora representatives are commonly gloomy and negative perceptions dominate the conversations. But diaspora members, who are among the most successful in their dealing in Russia, often admit "that the reality on the ground is less difficult than the perceived risks as seen from diaspora". Those in diaspora, who do not have immediate business experience from Russia on their own, generally tend to over-estimate the scale of real problems. This observation is similar to experiences of other diasporas, e.g. Armenian. This negative bias derives from poor communication, in particular a severe shortage of information on diaspora success stories. In our own analysis we came across several cases of rather successful Russian diaspora companies with well-established operations in Russia, but were unable to arrange an interview with companies' principals. Some people as seems are reluctant to share their success stories and prefer to stay away from publicity ("below the radar").
 7. It was unexpected that many successful stories of diaspora cooperation we have gathered are happening outside of capital cities (Moscow and St. Petersburg), but in the industrial centers of the 2nd level (Novosibisk, Niznii Novgorod, Kazan, Tomsk, Chelyabinsk). This is an industrial heartland of Russia with the established universities and research facilities, but at the same time these are cities with limited access to either resource or administrative rents. Much smaller rents in combination with relatively strong human capital base are likely to explain that these cities are facing competitive pressures that result in a much different incentive structure. And their administrations become more strategic in their dealing with potential investors, including those from diaspora.
 8. Diaspora representatives with stronger business engagement in Russia are driven by a usual mix of motivation. Their 'enlightened self-interest' often prevails as an immediate justification for their Russia's ventures: talent in such a short supply, that access to a pool of high quality Russian human capital at reasonable cost is often seen as a major attraction. But their other motives are also on display as well. This is a personal pride of self-made men that need recognition at home (A. Maslow (1971)' hierarchy of motivation, specifically self-actualisation and self-esteem). There is also evidence of a traditional alumni incentive: Paying back to the alma mater (local university or local research facility that were critical in shaping the member's professional career).

6. Findings from the survey²¹

Empirical research on emerging Russian diaspora networks has been growing since the Russian government designed a specific policy to get professional emigrant workers better integrated into the Russian research and education system. Since 2008 several surveys have been launched (Higher Schools of Economics, Ministry of Education and Science). However, these studies have been focused on academics and their interaction with Russian partners, and, according to our knowledge, our study is the only one to date that focuses on emerging networks that cover relations between emigrants and their colleagues in Russia not only in academia, but also in business-oriented fields.

²¹ The quantitative characteristics of the Russia's survey sample (as compared to two other countries) are as follows: Mexico: 565 were invited, 283 participated, 205 are being used in the comparable dataset. Argentina: 200 were invited, 139 participated, 102 are being used in the comparable dataset. Russia: 578 invited, about 120 responded and 109 are being used in the comparable dataset.

6.1. Survey overview

The survey targeted professionals of the Russian origin (both Soviet Union or Russia-born emigrant engineers and scientists) with the aim to document their emerging networking arrangements with home country institutions and individuals and also study factors that affect intensity and scope of these interactions. We expect that the insider-outsider position of emigrants, accompanied by their specific capabilities (such as access to partner institutions both in the new and native lands, knowledge of business customs and social traditions, understanding of potential customers and suppliers, language abilities) create some opportunities conducive to high-tech cross-border entrepreneurship. Emigrants may see new opportunities at home country markets, having a larger “search space” in which opportunities are sought (Carlsson and Jacobson, 1997). On the other hand, there is a reason to expect that relatively recent immigrants, who left in search for secure and well compensated professional positions abroad, may show lower propensity to get engaged in business in Russia.

The sample for the survey was constructed from a random listing of people, registered with different professional associations outside Russia, universities, research labs and immigrant communities. Thus we have followed the sampling strategy first tested in the survey of Silicon Valley immigrant workers (Saxeinian, 2002). The long listing was comprised of about 600 names; all potential respondents received the letter of invitation to take part in the on-line survey. Among other matters the letter of invitation stressed the non-disclosure commitments of survey organizers.

Sources of information for the survey database included:

- Alumni Associations of the leading Russian universities
- Russian Technology Investment Conferences in Silicon Valley
- key US conference proceedings (eg NASA conferences, US nanotechnology conferences)
- key US academic publications (eg American Physical Society meeting papers)
- Forbes publications
- Personal contacts of the authors

The long listing of people whom we have approached with the proposal to answer the questionnaire looks adequate in terms of its geographic coverage: out of 600 people about two thirds reside in the US and Canada, about 15% in the EU, while the remaining 20% are from the rest of the world, including Israel and various countries in Asia (Singapore, Taiwan, Korea). About 90% of the people in the database hold PhD or its equivalent. However, only about 25% have clear affiliation with high-tech businesses. The rest were primarily academics with ex ante unclear involvement in commercial applications of science. In other words, despite our best intentions to focus the survey exclusively on applied scientists and people who have direct commercial experiences, it proved to be impossible to follow this principle strictly. This is in part because researchers are generally more visible than businessmen. The researchers search personal recognition through publication of their papers and presentation at the conferences. Business people tend to promote their businesses, not their personalities, so it is not always easy to identify the Russia's origins of successful corporate founders. At the same time, as already mentioned, Russia's skilled diaspora may include by far more academics than business people involved in start-up activities and high-tech entrepreneurship. In this sense, the professional structure of the database may be a natural reflection on realities on the ground.

In terms of professional specialization, the people in the listing were roughly equally divided between medical/biology (incl. genetics, pharmaceutical, physiology, etc.) professions and those in mathematics, physics and IT applications.

The survey questionnaire was restricted by 40 questions to be short and focused, and it included the core block of comparable questions with the similar surveys of emigrants of the Mexican and Argentinean origin. The additional questions included in the “Russian” questionnaire reflect peculiarities of professional migration from Russia and include issues related to recent liberalization of migration legislation, particular aspects of competitiveness of high skilled workers at the international scene, shocks during the transition that impoverished Russian domestic research organizations, low level of high tech

entrepreneurship in Russia. In addition, we added several questions related to the respondents' interactions with the government in line with the recent government initiatives.

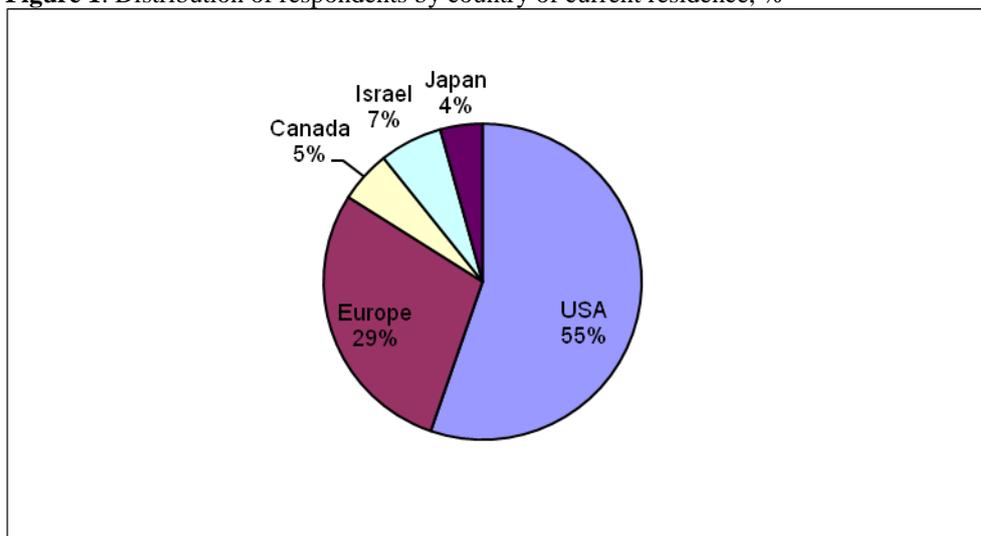
One of the active professional associations of Russian diaspora workers in USA - AMBAR – duplicated at its website both the survey instrument and the letter of invitation. The questionnaire was only available through internet and only in English. The survey remained online for four months. The final sample is comprised of 103 observations. The response rate accounted for about 15%.

From analytical perspective, one important question might be how well this sample represents the entire population of USSR/Russia - born emigrant professionals? Since our knowledge about the size, structure and behavioral models on the Russian emigrant community is pretty scarce, we can only recognize that the sample is not representative of the unknown general population of diaspora professionals and likely to be biased towards more active respondents. Though not strictly representative, the sample may inform us about the specificity of the active part of the Russian professional diaspora in terms of its propensity to get integrated into international networks and effect home country high tech entrepreneurship.

Our respondents share the common characteristics of diaspora – as a rule they are the first generation emigrants, born in Russia/Soviet Union, they left for the new location after graduation from the university and getting some work experience in the native country. Contrary to expectations, a significant share of respondents reported experience of studies abroad or they have studied both in Russia/Soviet Union and abroad (38%, including 12% who received their highest degree abroad). They have settled outside Russia between 1955 and 2007 in search for international academic or entrepreneurial advancement and career. However, majority (87%) settled abroad after 1990, when reforms in Russia have liberalized labor migration. On average, respondents spent 16 years outside Russia. Academic researchers dominate the sample (two thirds of respondents), the rest is divided equally between the group of people working in high tech businesses and independent/owners. USA leads as a country of current residence (55% of respondents), followed by Europe (29%, Figure 1). Germany is the main host country for Russian respondents in Europe. With respect to the employment status, majority reported non-managerial occupations in both business and research.

Another specificity of the Russian sample: it is predominantly male (almost 80%) and of mature age (90% older than 40 years). And more than half of the sample graduated from two most prominent Russian schools – Moscow State University and Phystech (Moscow Institute of Physics and Technology). Majority (65%) hold a PhD degree.

Figure 1. Distribution of respondents by country of current residence, %



6.2. Involvement of Russian emigrant professionals in international knowledge networks

Our analysis of international knowledge networks is driven by the idea of assessing so called social capital of Russia-born skilled emigrants. Higher social capital may potentially reduce costs of access to valuable resources – money, talent, contacts and knowledge (Hart, Acs and Tracy, 2009) -- and help to build mutual trust that is usually scarce among individual emigrants. One question of interest might be whether diaspora organizations may serve as an entry point to development of linkages with the home country and provide an important platform for collective action of Russia-born researchers and engineers.

The survey showed that about 62% of the sample reported membership at international professional organizations. One third of respondents are members of the organizations that have established connections with Russia. How this membership affects the nature and intensity of interactions with the home country? To study this, we have looked at the distributions of members and not members of international networks across groups that reported visits to Russia, participation in business ventures in Russia and interest to help Russia-based colleagues to gain access to international markets (Table 7).

The distributions show that general membership does not increase significantly the likelihood of business involvement in Russia, while the established connection of the network with Russian individuals and institutions is associated with higher frequencies of business ventures in Russia: among respondents who reported membership and links of their network in Russia the share of people with business ventures in Russia accounted for 26.9% compared to 10.4% for the rest of the sample and 15.4% as the sample average. Visits to Russia are neutral to membership, though general network membership slightly increases intensity of visits. Positive answers to the question “Please indicate if you could assist/help (or may be already helping) high-potential Russian firms/entrepreneurs to gain access to international markets for new technology as buyers, sellers or collaborators” appeared to be strongly associated with both membership in international networks and linkages of these networks with Russia: the share of those who is ready to help is almost threefold higher among members of international associations compared to non-members and two fold higher among members of associations with ties to Russia.

Table 7. Distribution of respondents, participating in business ventures in Russia, visiting Russia and intended to help the home country by membership in international networks

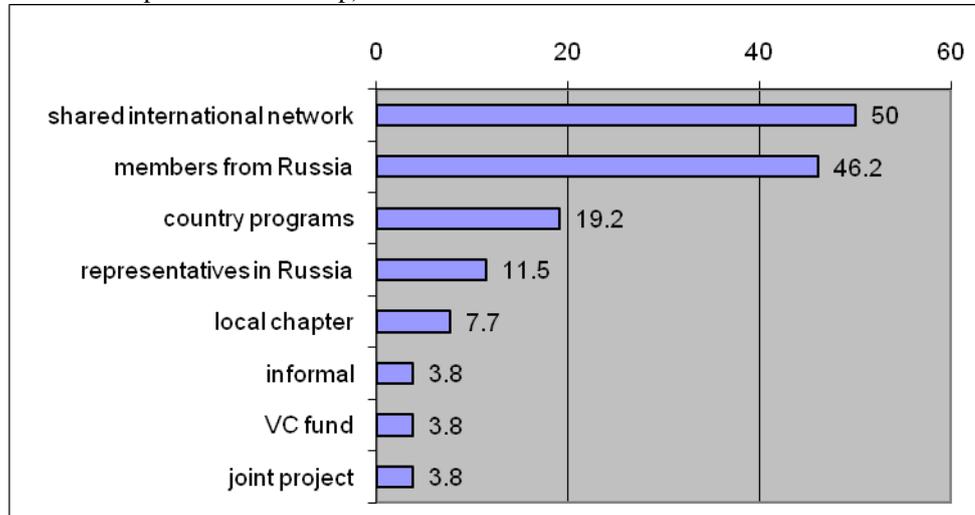
Groups of respondents who reported	% of groups among members and non-members of international networks			% of groups among members and non-members of international networks with connections to Russia		
	Members	Not members	Chi-sq.test, P	Members	Not members	Chi-sq. test, P.
Business ventures in Russia	18.8	7.7	0.123	26.9	10.4	0.039
Visits to Russia	75.0	71.8	0.720	80.8	71.4	0.349
Interest to support Russia's businesses	42.2	15.4	0.05	53.8	24.7	0.06

Note: participating in business ventures is a group comprised of respondents who reported either the existence of a joint venture, or subsidiary, or commercial contracts with Russian institutions or individuals. Group “visits to Russia” is comprised of respondents who visited Russia no less than once in two years. Inclination of respondents to help – is a group who positively answered the corresponding question. All missing answers in above mentioned groups as well as missing answers in the question about international networks have been treated as a “no” answer.

Thus we may conclude that international networks help to accumulate social capital among Russian professional immigrants, and channel this capital towards re-establishment of their business relations with Russia, especially in cases when networks are already connected to Russia. At the same time, we should admit that expressed interest to help is more strongly associated with international networks than the existence of actual business projects and visits.

Figure 2 demonstrates that the most common instrument of interaction within the networks is joint membership of Russian and diaspora participants in professional organizations. More formal initiatives – specific Russia country programs, local representation and alike -- are ranked much lower among reported types of network interactions.

Figure 2. Types of connections respondents' professional networks have with Russia (% of respondents among those who reported membership)

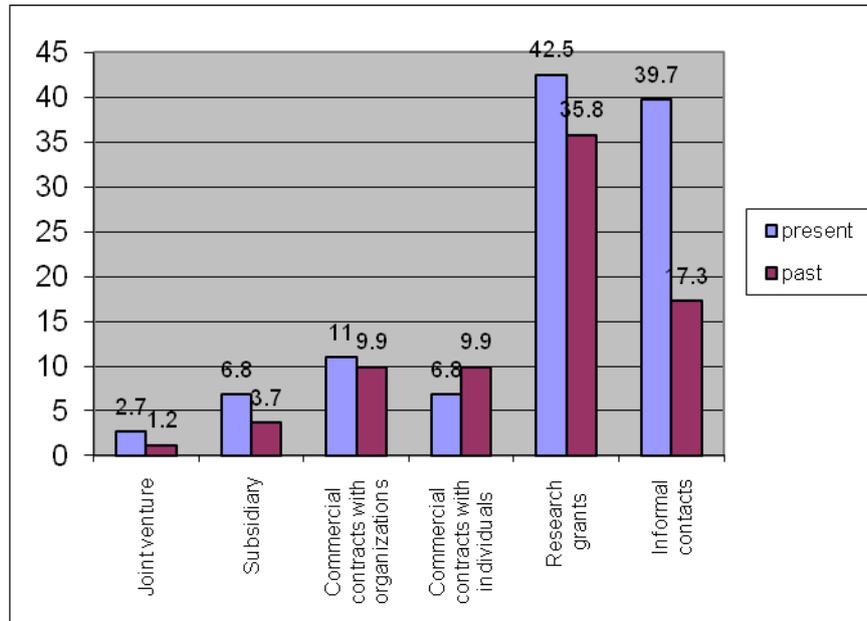


It is worth mentioning that international professional networks have already been acknowledged as legitimate and effective partners of the Russian government in facilitating linkages to skilled diaspora. According to the Russian science and education Minister Andrey Fursenko, professional associations of emigrant researchers were consulted by the government on the structure and focus of the 2009 government program of joint research grants and they also participated in evaluation of received applications (See www.mon.gov.ru).

6.3 Linkages with domestic institutions and individuals

In general, 71% of respondents reported some activity of their organizations in Russia, either formal or informal. Informal contacts and research grants are leading instruments of cooperation, followed by commercial contracts with Russian organizations, and these priorities did not change recently as compared to the past, except for the visible growth of informal contacts (Figure 3).

Figure 3. Linkages of organizations, where respondents work, with Russian institutions and individuals, at present and in the past, % of respondents among those who reported the links



Predominantly informal character of the existing linkages, as shown by the structure of information sources and forms of interaction, may be the result of the nature of knowledge circulation itself. Networks, cultural values, personal attitudes rather than organizational hierarchies and established rules often guide the interests of our respondents. We may suggest that professional linkages are often started through informal contacts and then gradually become more formal/institutionalized. Therefore, recent significant growth in a number of informal contacts could indicate that the nature of cooperation has a potential to become more intensive and more formal in the coming future.

Russia-born researchers and engineers maintain relatively weak business links to the home country, if compared to the Indian or Chinese diaspora. Though even this modest level of interaction appeared to be above our expectations, given long isolation of Russia, a low professional emigration rate as compared to other countries with long tradition of labor movements, and prevailing negative perceptions of emigration in Russia. The underdevelopment of high-tech entrepreneurship in Russia may also serve as a demotivating factor for business knowledge circulation, since there is reason to believe that diaspora workers willing to contribute to home country's high-tech businesses would be attracted by the synergy of local and global entrepreneurial environment. Moreover, as informal interviews demonstrated, some regions in Russia appeared to be more conducive to knowledge circulation than the country on average due to the relatively more developed local innovation clusters (the city of Tomsk, for example).

Below we look in more detail on the patterns of circulation of information, people and businesses.

Circulation of information

How well are Russian emigrants informed about the state of affairs in the home country and which sources of information are most frequently used by them? We may expect that increasingly open flows of information result in diversity of information sources, with the shifting focus from informal personal exchanges to more organized information hubs facilitated by international professional associations or government agencies.

The survey proved that this expectation is premature: the nature of information exchange remains largely informal, personal links being much more important than official or organized flows. Russian diaspora is not well informed about events directly related to the perspective of technological collaboration between Russia and emigrant professionals.

The distribution of information sources about Russian technological and business opportunities across different groups of respondents with linkages to Russia and in the sample on average (Table 8) shows that the overall pattern for all groups is to rely primarily on colleagues who remained in Russia. This source of

information in the most popular, followed by colleagues outside Russia. Much less frequently the emigrant professionals rely on formal institutions within the academic and technological sphere: government, firms or professional organizations are ranked low in the list of information sources about technological business opportunities in Russia (even in case of government programs concerning diaspora). International professional networks are only emerging as coherent organizers of information flows about Russian business opportunities, being somewhat popular (above the sample average) only among the groups of respondents who reported business ventures in Russia or expressed interest in assisting Russian technological entrepreneurship.

Table 8. Frequencies of answers to the question “Indicate your two the most important sources of information about technological exchange opportunities or technological business opportunities in Russia”, by groups, % of respondents within the group

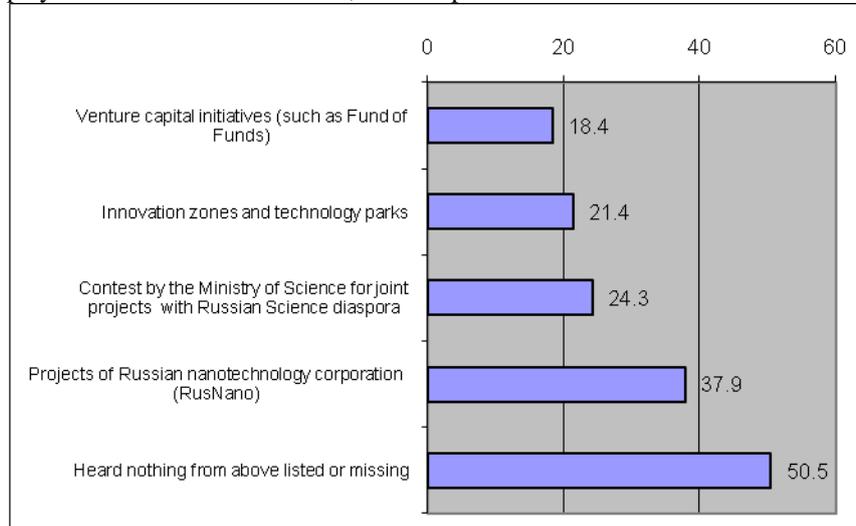
Groups of respondents					
Sources of information	Group of respondents who reported business in Russia, %	Group of respondents who reported frequent visits to Russia, %	Group of respondents willing to assist Russian technological entrepreneurs, %	Group of respondents who reported awareness of the Russian government program of joint research grants, %	Sample average
Colleagues in Russia	93.9	75.6	93.9	92	69.1
Colleagues outside Russia	53.3	53.7	45.5	44	42.3
Friends/family	0	9.8	6.1	8	19.6
International professional organizations	13.3	7.3	12.1	0	9.3
Media, internet	6.7	7.3	6.1	92	5.2
Firms, subsidiaries in Russia	3.4	4.9	6.1	0	2.1
Firms outside Russia	0	4.9	3.0	0	2.1
Russian professional organizations	0	0.0	0.0	0	2.1
Government	6.7	0.0	3.0	0	1
N obs.	15	41	33	25	103

It is also interesting to note that links to the colleagues in Russia do not only support information exchange but also promote practical joint projects. Our interview with the head of international department of the Russian fund for basic research (RFFI) Alexander Sharov revealed that diaspora researchers take an advantage of the linkages to Russia and participate in competitions for RFFI research grants, conditioned by their Russian citizenship (they often hold double citizenship) and “good relations” with local players. The Russian lab or institute is usually interested in adding the emigrant’s resume to their team, thus increasing the strength of the bid and chances for winning the grant. In turn, a diaspora researcher may be interested in preserving his/her social network in Russia and strengthening it through real joint projects.

The survey provides only limited information on the general awareness of respondents about the state of affairs in Russia. We can only assess how well diaspora is informed about most recent government initiatives on the basis of answers to the question “Are you aware about recent initiatives of the Russian government to bring new international players into the innovation field?” The results show that half of the sample knows nothing about any of these initiatives that are directly related to diaspora professionals.

Projects of the Russian state nanotechnology corporation are better known than other recent initiatives (almost 38% respondents are informed about them), followed by joint projects with diaspora by the Science Ministry and by innovation zones. To sum up, Russian skilled diaspora is not adequately informed on recent policy developments (Figure 4).

Figure 4. Share of respondents, who reported awareness about recent initiatives of the government to bring new international players into the innovation field, % of respondents

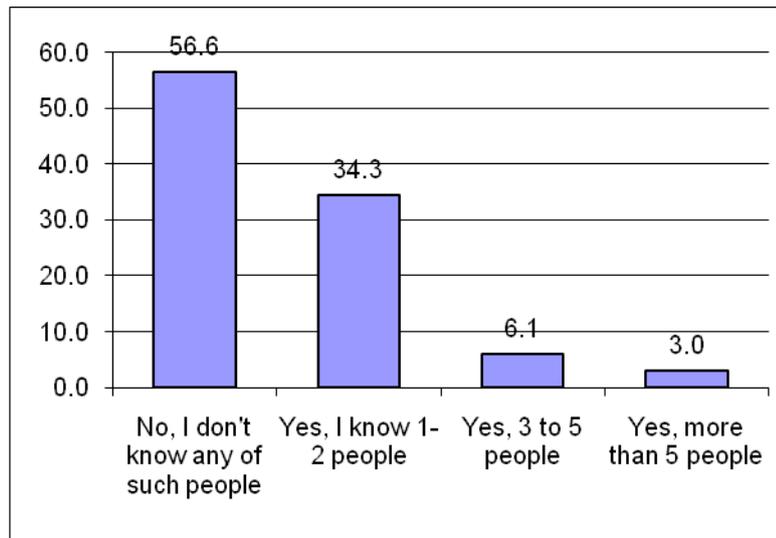


Circulation of people

Since the basic nature of information sources about technological opportunities in Russia remains informal, it is only logical that majority of respondents – 80 percent - tell that they travel to the home country, including 40% being frequent travelers (annual visits or more often). Only 30.3% visitors travel for regular business purposes, while family affairs and participation in conferences remain the main motivation for travel to Russia.

With respect to the interest in returning to the country of birth, we did not find enough evidence to support the finding of Saxenian (2002) that foreign-born professionals often regard residence abroad as a temporary home and that the majority thinks about return. Though almost half of our respondents tell than they know people who returned to Russia to participate in the development of technological firms there, these cases seem to be exceptional, i.e. there has not been a scalable return (Figure 5). This result does not vary by age, frequency of visits to Russia or intentions to provide technological assistance to the home country.

Figure 5. Distribution of answers to the question “Do you know people who have recently returned to Russia (or spend most of his/her time there) to participate in the development of new technological firms and/or conducting technological research?”



The survey asked specifically about attitude to the idea of returning to Russia to get involved in technological business ventures. In general, 17.5% of respondents report that they may be willing to locate in Russia during the next 3-4 years, assuming the right conditions and incentives. We have checked how this consideration differs across groups, distinguished by age, position, frequency of visits and specialization (Table 9).

We did not find evidence of negative relationship between age and willingness to return. Younger people, in spite of possibly weaker links to their new country of residence, are not seen among more eager potential returnees. People positioned as independent/owners are more likely to consider returning to Russia, as well as frequent visitors. Specialization is a significant predictor: respondents specialized in natural resource sciences and IT are most likely to consider returning and running business in Russia, while people specializing in life sciences, business, management and law are much less willing to return. However, when we have checked associations between specialization and intention to return in a regression that controls for age and other personal characteristics, only IT specialization kept statistical significance with a positive coefficient.

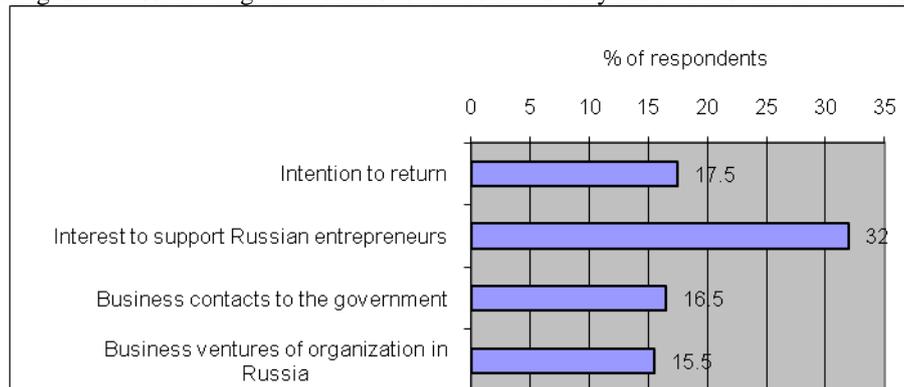
Table 9. Frequencies of positive answers to the question “Are you willing to be located during the next 3-4 years for most of your time in Russia with the intention of participating in businesses or technological cooperation initiatives?” by groups

Groups	% of respondents interested in returning in the group	% of respondents interested in returning in the rest of the sample	Chi-sq. test, P
Age: 40 years and younger	30	16.1	0.272
Frequent visitors to Russia	26.8	11.3	0.042
Independent position	46.7	12.5	0.01
Specialization			
IT	46.2	13.3	0.04
Life sciences, bio	8.5	25	0.028
Nanotechnology	11.1	18.8	0.434
Nat. resources	45.5	14.1	0.01
Engineering	22.2	17.0	0.695
Basic research	18.4	16.7	0.820
Business, management, law	50.0	15.5	0.031
Education	0	18.4	0.291

Circulation of technological business and commercial research

One of the key findings of the survey is that 15.5% of respondents reported some kind of business relations of their organizations to Russia. We measure business linkages by asking “What kind of activities does your organization undertake in Russia?” and aggregating the responses on joint venturing, subsidiary and commercial contracts to Russian organizations and individuals. Generally those Russian partners are small scale businesses (with on average 16 employees). The share of respondents reporting business ventures of their organizations in Russia is comparable with the share of respondents who had experience of business contacts with the Russian government (Figure 6). Much more people expressed interest in supporting Russian technological entrepreneurs (32%). As shown above, 17.5 % of respondents may be considering the return to Russia to get involved in technological business ventures.

Figure 6. Linkages of Russian emigrant workers to the home country institutions and individuals



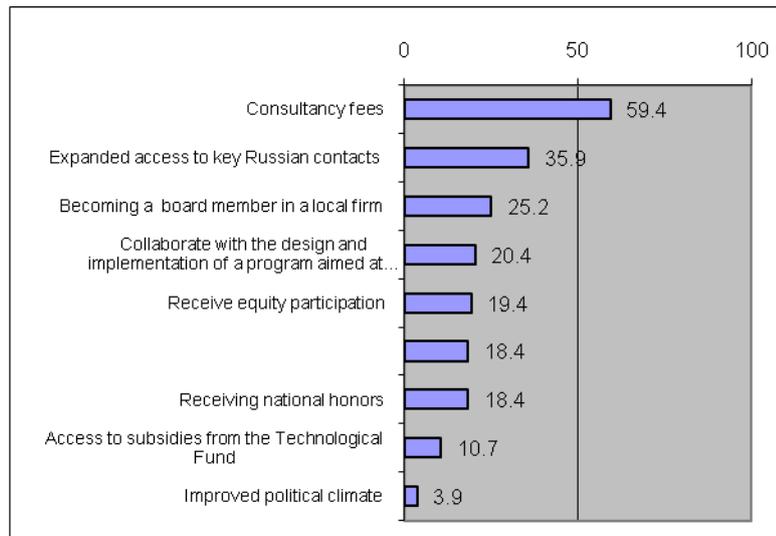
Note: Frequent visits – visits every year or more frequently; interest to support Russian entrepreneurs – positive answer to corresponding question; business ventures in Russia – either established joint ventures or subsidiaries, or commercial contracts with Russian institutions or individuals.

Potential technological collaborators with Russian partners see their possible role in Russia as consultants, contributors to product design and mentors rather than entrepreneurs or hired managers (Figure 7). Moreover, consulting fees lead among possible incentives that may inspire diaspora professionals to return to Russia and get integrated in a local technological business (Figure 8). Thus there is a reason to believe that potential returnees are more likely to get engaged in technological cooperation with the existing institutions than in taking entrepreneurial risk in Russia themselves.

Figure 7. Specific forms of possible assistance to Russian technological entrepreneurs, % of respondents among those who reported willingness to render assistance



Figure 8. What types of incentives would encourage you to actively participate and/or collaborate with Russian firms or government agencies (tick as many options as you consider relevant)?



Regression analysis of business linkages to Russia

We also have conducted regression analysis to control the revealed correlations for different individual characteristics of respondents – age, gender, position and specialization, frequency of visits to Russia, availability of former business experience and education. The model of binary logit regression was employed.

Our study relies on several indicators of business linkages, including the fact of existing business ventures in Russia, interest in assisting Russian technological entrepreneurship and interest in returning home as dependent variables. All dependent variables are coded =1, if the answer is yes, and =0 if not. The fact of frequent – at least once a year – visits to Russia is used both as a dependent variable and as a predictor in other models. This is because we do not only try to find associations between involvement in business and circulation of people, but also to understand factors that drive this circulation. Our research hypotheses are summed up in Table 10.

Table 10. Main hypothesis about drivers of linkages to Russia tested in the analysis

Hypothesis	Explanation	Indicators
Factor of age/experience and international exposure	Interest in cooperation with Russian partners is age and experience dependent. We expect that people, who are well established abroad (50+, also senior managers) will be better represented in the group of those with established business links to Russia.	Age of respondent Foreign education
Mobility factor	Those who travel to Russia regularly are more prepared to get engaged with Russian businesses.	Frequent visits to Russia
Networking factor	Membership in international professional associations is positively correlated with actual business ventures and potential interest in cooperation with Russian partners.	Membership in international associations, especially in those with connections to Russia
Path dependency	Better informed and experienced entrepreneurs are less pessimistic than the “theoretical entrepreneurs”. And they are more prone to get engaged with Russian partners.	Answer to the question “Indicate if you are either currently involved in operations of any technological business venture or used to be involved in such a venture

		at some point in the past”
Trade-off between job security and entrepreneurial risks	Academics or people with secure employment in firms would be less interested in taking the risk of entrepreneurship in Russia.	Respondents with independent position/owners vs. academics and people employed in firms

The results of regression analysis confirm (Table 11) that Russian emigrants positioned as independent /owners are more likely to get involved in business ventures in Russia and also to express interest in supporting home country technological entrepreneurship. Experience and path dependence also matter, but in a different manner than we have predicted. Age appeared to be insignificant in all specifications of the model, though the negative sign of the coefficient warns us that Russian emigrants do not become more entrepreneurial, risky and mobile as they get older. Experience of studying abroad, on the contrary, significantly increases the likelihood of business ventures, interest in supporting Russian technological entrepreneurship and in traveling back- and- forth, including interest in returning to Russia. People with any business experience are more likely to volunteer support to Russian businesses, but this factor is insignificant in case of actual business ventures in Russia or tendency to travel frequently and to return. Membership in international networks does not increase probability of business ventures or mobility, but significantly increases the likelihood of interest to return. Membership in international associations with linkages to Russia is the strongest predictor of frequent visits and interest in supporting Russian businesses.

Table 11. Results of regression analysis

Predictors	Dependent variables													
	Business ventures in Russia		Interest to assist				Frequent visits				Interest to return and work in technological ventures			
	B	Sig.	B	Sig.	B	Sig.	B	Sig.	B	Sig.	B	Sig.	B	Sig.
Frequent visits	1.594	0.045	0.630	0.228	0.021	0.972					2.058	.008	1.503	.064
Foreign education	2.103	0.013	0.924	0.093	0.947	0.086	-1.063	0.029	-1.300	0.019	1.615	.037	1.726	.024
Age	-0.027	0.540	0.000	0.989	-0.020	0.574	-0.035	0.295	-0.063	0.109	.043	.307	.021	.617
Gender	1.544	0.251	1.213	0.152	1.372	0.112	0.014	0.982	-0.337	0.608	.965	.420	1.381	.256
Position: independent/owner	3.847	0.004	2.292	0.096	2.508	0.068	0.447	0.691	0.798	0.543	.821	.533	1.124	.396
Position: employee of the firm	3.045	0.040	1.506	0.284	1.314	0.358	-1.412	0.269	-2.501	0.092	-.302	.851	-.246	.876
Position: academic	1.143	0.405	1.253	0.382	1.470	0.297	-0.913	0.464	-1.152	0.428	-1.833	.223	-1.383	.345
Business experience	0.708	0.546	1.158	0.093	1.293	0.068	1.037	0.103	1.071	0.129	.700	.492	-.539	.590
Membership in international networks	-0.015	0.985	0.881	0.119			-0.192	0.684			1.991	.035		
Membership in international organizations with connections in Russia					1.351	0.035			2.273	0.000	2.058	.008	1.085	.146
Constant	-7.356	0.066	-6.006	0.046	-5.014	0.095	2.756	0.279	4.483	0.128	-7.664	.037	-6.440	.083
Model	binary logistic													
Nobs	95		95		95		95		95		95		95	
RsqNagelkerke	0.446		0.287		0.312		0.12		0.32		0.433		0.385	

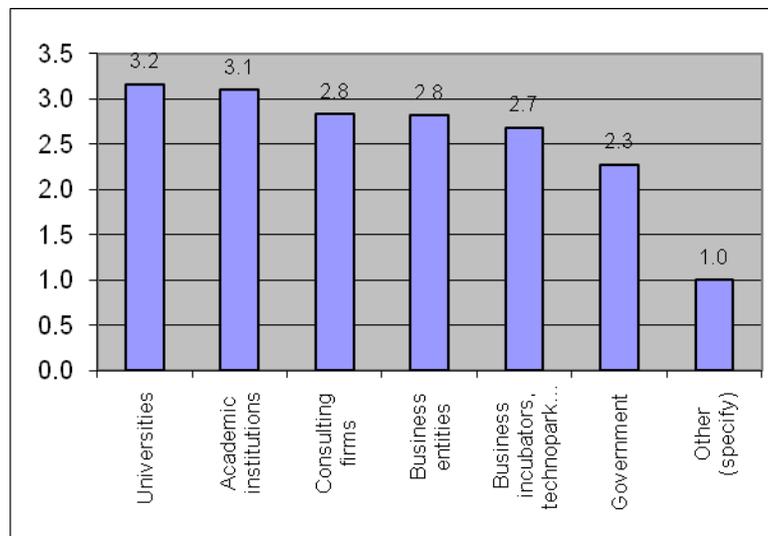
We have studied additionally the model, in which the business position of respondent was replaced by his/her specialization with control for all other predictors, since specialization and position are highly correlated. The results showed that the likelihood of frequent visits falls (with 1% significance) in the group of biologists and is neutral for all other professions. Specialists in nanotechnologies are more likely to want to assist. The latter result is most probably related to activities and relative wealth of the Rusnano corporation. However, belonging to the groups of biologists, specialists in nanotechnologies and fundamental researchers significantly reduces the likelihood of being currently involved in actual business ventures in Russia. This is understandable, since these research specializations are more distanced from know-how commercialization than other professions.

6.4. Relations with the government

The attitude of diaspora professionals to the Russian government is somewhat ambiguous. On the one hand, majority think that the government is an inefficient partner, hardly capable of changing and becoming open for collaboration, and it is also seen as responsible for the poor investment and political climate in the country – the main barrier to international collaboration. On the other hand, some government agencies are considered to be better than others, and there is a view that the government may potentially serve as a supporter of business ventures and be a source of administrative resource, while eligibility to state procurement contracts is ranked second among possible measures that may stimulate international business ventures with participation of emigrants.

The government is ranked low among various Russian organizations – potential partners for international business ventures (Figure 9). The low grade of the government is not altered if we look separately at the group of respondents with actual experience of business contacts in Russia, though this group gives preference in their ranking to business entities and consulting firms rather than to universities and research institutes. Moreover, only 8.7% of respondents believe that the government is receptive to change and open for collaboration as compared to half of respondents who believe in changeability of universities, academic institutes and private firms.

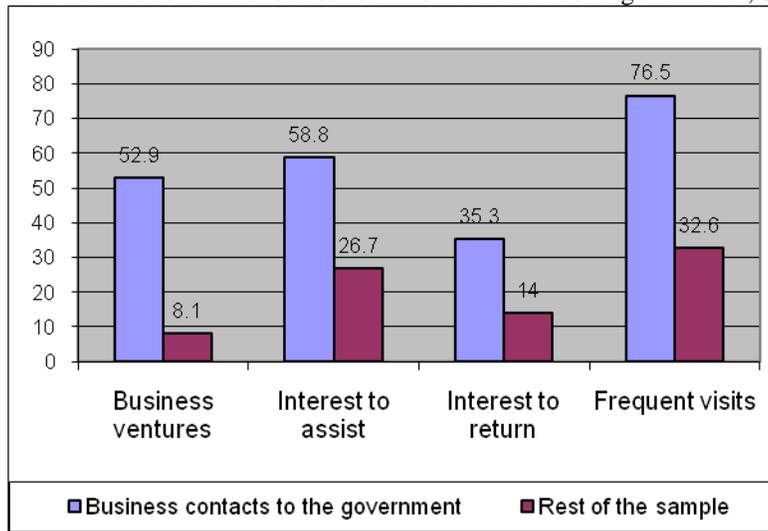
Figure 9. Average capacity of Russian organizations as potential partners for international business ventures (1- the weakest, 5 – the most efficient), mean grade



Few Russian diaspora professionals (only 5.8% of the sample) reported regular business meetings with Russian government officials. Slightly more meet government officials from time to time (11%). Informal interviews suggest that the purpose of these meetings as a rule is either to encourage involvement of

emigrants in both technological ventures or in external expertise of government programs. Sometimes, the government wants to collect comments on matters concerning legislation, innovation infrastructure, links between universities and industry and other matters surrounding the development of domestic institutions. The survey shows that the objective of such meetings for emigrants normally is to mobilize the “administrative resource” in support of their own actual or potential business in Russia: the group of respondents with actual business contacts to the Russian government correlates significantly (with 1% significance) with the group of those who reported business ventures in Russia. It also shows statistically significant correlation with frequency of visits, potential returnees, and willingness to provide assistance to local technological entrepreneurs (Figures 10). All this may be interpreted as an indication that doing successful business in Russia makes maintaining contacts with the government necessary.

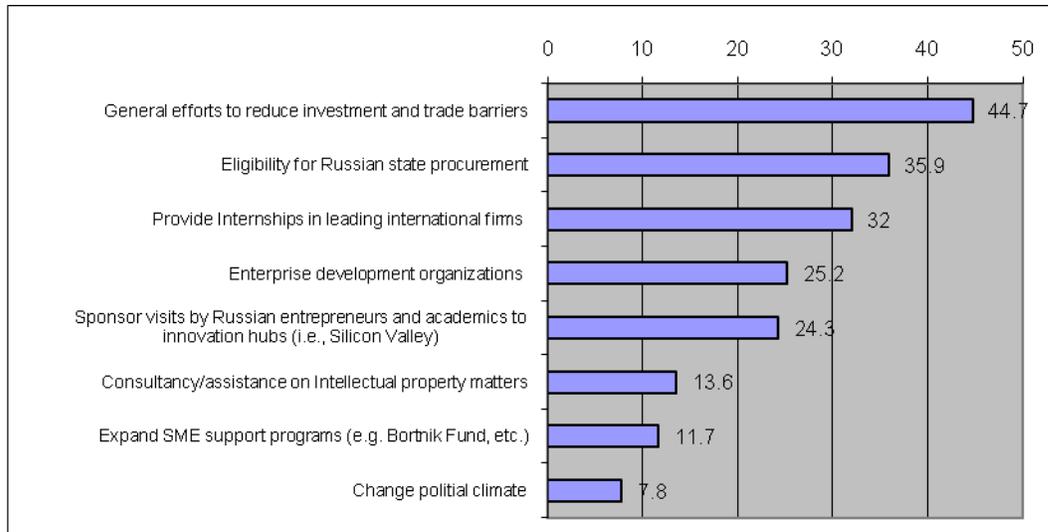
Figure 10. Frequencies of business ventures, interest either to assist or to return, and frequent visits to Russia by the groups which have and do not have business contacts with the Russian government, % of respondents



The respondents understand that the government is not homogeneous, and its overall inefficiency does not exclude better relative responsiveness of some agencies. Thus Ministry of education and science and RusNano state corporations are mentioned as entry points for business contacts with the government more frequently than other agencies.

With respect to a policy advice on how to enhance international linkages of Russian firms, the top recommendation of respondents is to reduce general investment and trade barriers, supported by almost 45% of respondents (Figure 11). This means that potential collaborators think that the main barriers to joint business lie on the side of domestic environment. Interestingly, respondents see more potential in accessing the Russian state procurement funds than in the use of less commercial incentives, like internships abroad or strengthening business development organizations. This sounds as another sign of not entirely consistent perceptions among respondents: at least some of them think that seriousness of government’s administrative barriers may become less damaging if the government expands its payable demand for technological products.

Figure 11. What actions should be supported by the Russian government to enhance international linkages of Russian firms (select up to 3 the most promising activities)



Generally speaking, the survey results point to a critical gap between the new government policy on diaspora integration and limits of its current practical capabilities. The tools, which in theory should allow the government to play an effective role in supporting the emerging international technological linkages, remain grossly inadequate. Probably, the government is not fully comfortable with the idea of diaspora cooperation because it cannot control or regulate it in a manner it regulates domestic agents and finds it difficult to put emphasis on global networking logic in their programs and decisions. Diaspora in turn finds it difficult to build trust to the government of the country, which political rules do not fit their sense of justice and democratic values.

6.5. Benchmarking Russian responses to other countries

The survey instrument allows some benchmarking of the replies of the Russian respondents to the rest of the sample and to Argentina and Mexico separately. The purpose of this section is to learn what is common and what is different in the perceptions of emigrants across the three countries and to assess the drivers of cooperation with the sending country institutions and individuals.

6.5.1. Limitations of the benchmarking exercise

We understand the limits of comparative analysis of this kind, not only because professional labor migration in the three countries differs in its nature, duration, and purpose. Structures of the country samples are also hardly comparable: Russian respondents are significantly more mature, overeducated, and more academic than their colleagues from the rest of the sample²². Thus we may expect that their entrepreneurial drive is lower. When we compare Russian academics to Mexican managers - these professions dominate the respective national samples – we risk reflecting on the difference between professions rather than the variation between national models of diaspora integration with the home

²² It should be taken into account that contrary to the general benchmarking chapter for the purposes of this comparative analysis we removed additional 6 incomplete observations from the Russian data set (103 left at the end). We also did not divide the frequency of responses by the number of respondents in case of multiple answers, and therefore often the sum is not equal to 100%. In case of several key variables, analyzed here (e.g. intention to assist home country entrepreneurs, actual activities in the country of origin, home visits with business purposes) missing observations have been treated as negative answers, because we believe that if the respondent does not know, whether he or she has activities in the home country, most probably he/she does not have any.

country. Therefore, the simple comparison of means, without control for profession and specialization, should be taken with caution. On the other hand, it is interesting to search for and interpret common patterns, if any, because structural differences of emigrants' population may serve as a robustness check for the findings. Ironically enough, emigration proved to me more global than the project instrument foresees: thus in the Argentinean sample we may definitely trace some Russian names, therefore treating our target countries as pure sources of global brain workers would be misleading.

In addition to the structural differences listed above, we also have expected that for fundamental cultural reasons the Russian respondents would be more pessimistic in their replies than their counterparts in the other two samples. On the ground of our previous experience with empirical studies in Russia, we were ready to warn the reader about a need to be cautious about Russian emigrants' replies, given the entrenched cultural tradition to be gloomier than the circumstances stipulate. We were wrong. Though Russian respondents are most critical in their views about the potential of the Russian government to cooperate, be flexible and change, nevertheless, their other responses, which foresaw guesswork and beliefs rather than definite knowledge, proved that Russian diaspora strongly believes in the existence of dynamic segments in the home country's society. Moreover, more than 80% of respondents from all three countries believe in the existence of competitive advantage of their home country's organizations at least in one area of R&D specialization (Table 12).

Table 12. The degree of optimism: share of respondents, who believe in the existence of a receptive segment among the home country's institutions and individuals, of the dynamic segment in the local government and of long-term competitive advantage in their R&D field of specialization

	Russia		Argentina		Mexico	
	% of respondents, who believe in the statement	N obs	% of respondents, who believe in the statement	N obs	% of respondents, who believe in the statement	N obs
People and agencies in home country are receptive to cooperation	80.5	82	60.5	76	42.4	177
Dynamic segment in the local government does exist	14.5	62	43.8	48	47.1	119
Home country R&D has competitive advantage (at least in one area)	78.6	103	100	102	85.6	205

Thus we may assume that respondents from all three countries strongly believe in the potential of their sending nations to get integrated into the international research and business community and in a competitive advantage at least in one area of R&D. Credibility of the national governments in this respect is estimated much lower, with Russians being most pessimistic in assessment of the domestic government as a potential cooperation partner.

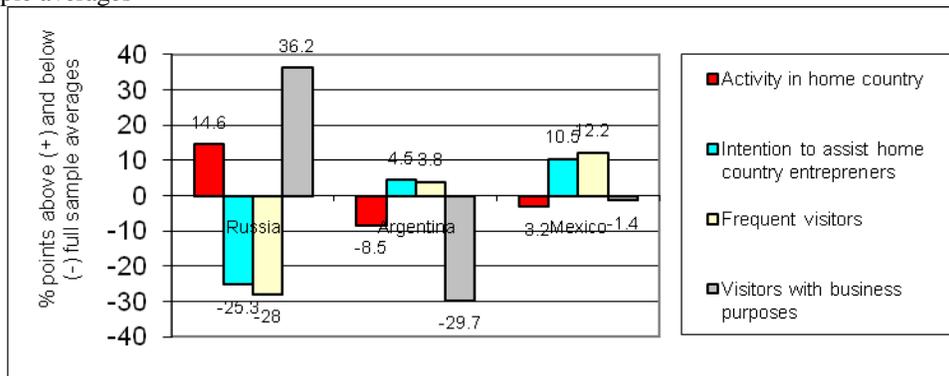
6.5.2. How significantly is the diaspora involved in the sending country's development?

The questionnaire allows us comparing the strength of existing linkages by at least four indicators: (i) intentions to support the home country's entrepreneurs, (ii) actual contacts of the organization, where

respondent works, with the country of origin, (iii) instances of frequent visitors to the home country, and (iv) share of visitors with business purposes. The results did not confirm our expectation that Russian diaspora would demonstrate lower commitment to cooperate, given their relatively recent emigration and short supply of supporting institutions in the host country. The picture is at least mixed.

Figure 12 demonstrates that Russian respondents are ahead of the sample averages by the share of respondents who work for organizations that have actual contacts in Russia and by the frequency of visits to Russia with business purposes, while they are far behind in the inclination to support the home country’s entrepreneurs and by the share of frequent visitors. Actual contacts include joint venturing, commercial and non-commercial contacts to individuals and organizations in the country of origin, while frequent visits – visits more than once in a year.

Figure 12. Frequencies of linkages to the country of origin across countries, as compared to the three countries’ sample averages



Mexican emigrants lead by both the share of frequent visitors (which is understandable, given the short distances to the main destination of their emigration – USA), and especially by being enthusiastic about support to the home country’s entrepreneurs: 67,8% of Mexican respondents would like to support entrepreneurship in home country, while only 32% Russians have similar intentions. Thus we may suggest that the development impact, if measured by the influence of emigrant brain workers on the home country entrepreneurial culture in the high tech sector, would be the highest in the Mexican case and lowest in the Russian one. However, Russians seem to actively leapfrog from their later start. Their frequent and business-oriented visits to the home country, as well as more established linkages of the organizations, may help them to catch-up.

Given structural differences of the national samples, we have controlled the answers by professional position of respondent, expecting that specificity of the Russian linkages would be significantly related to the academic position of the majority of Russian respondents. Again the results are mixed: Table 13 shows that intentions to assist the home country’s entrepreneurs are indeed always higher among independent respondents in all surveyed countries as opposed to other positions. In Russia this gap being the highest (60% of independent workers are willing to assist as opposed to only 31% among academics). However, Russia is lagging behind other countries not only in the sample average, but across all professional groups, suggesting that the entrepreneurial drive, including drive to cooperate in general is lower among Russian emigrants.

Table 13. Strength of linkages to the sending country by professional group, % of respondents

Professional	Intention to assist			Actual contacts to the country of origin			Visits to the home country with business purposes		
	Russia	Argentina	Mexico	Russia	Argentina	Mexico	Russia	Argentina	Mexico

group									
Independent	60	72.7	89.1	80	13.6	26.1	40	18.2	63
Employee of the firm	33.3	82.1	64.4	46.7	38.5	25	80	7.7	42.3
Academic	30.8	53.2	61.7	35.9	4.3	21.3	78.2	14.9	36.2
Sample average	32	61.8	67.8	41.7	18.6	23.9	75.7	13.7	42

Russia is leading in involvement of respondents in intensity of actual contacts with home organizations – both commercial and non-commercial. And this leadership is not sensitive to the professional position of respondents. Russia and Mexico are characterized by a relatively high share of emigrants paying business visits to the home country as compared to the modest indicators for Argentina.

6.5.3. Drivers of linkages

The data allows us checking several hypotheses about factors that may influence the likelihood of business and other contacts of emigrants to the country of origin. In addition to structural specificities, we may expect that linkages in all three countries are sensitive to (1) the membership of respondents in international professional associations; and (2) the business climate and quality of institutions in the sending country.

In the previous paragraphs it was stated that membership in international professional associations with links to Russia significantly increases probability of different types of involvement of Russian diaspora with the sending country. Is this true for the other two countries? Table 14 shows vital commonality: in all three countries members of international associations are more dynamic and have stronger home country connections. However, statistical tests proved that this correlation is significant in the case of both Russia and Mexico and less significant for Argentina. Likelihood of actual contacts increases in Russia more significantly than in the other two countries. The share of business visits is sensitive to membership mostly in Mexico.

Table 14. Distribution of respondents, reporting contacts to the country of origin, intentions to assist and business visits by country and by membership in international networks with connections to the home country

Groups of respondents who reported	% of groups among members and non-members of international networks with connections in the country of origin								
	Russia			Argentina			Mexico		
	Members	Not members	Chi-sq.test, P	Members	Not members	Chi-sq.test, P	Members	Not members	Chi-sq.test, P
Intention to assist	53.8	24.7**	0.006	72.2	56.1	0.108	81.2	61**	0.004
Actual contacts	69.2	32.5**	0.001	19.4	18.2	0.876	29	21.3	0.23
Business visits	80.8	74	0.488	86.1	86.4	0.972	58	33.8**	0.001

** - statistically significant at 5% level

Home country institutions often serve as a push factor for professional emigrants: people choose career abroad because of the poor business climate at home. We may expect two opposite patterns in the way institutions affect current linkages to the country of origin. First, poor quality of institutions at home may prevent emigrants from participation and investment of their expertise and capital in the development of the high tech sector in the country of origin. Or on the contrary – emigrants, with the insider knowledge and increased capacities to stay on float whatever the local circumstances are, may have a significant

comparative advantage as opposed to other foreign players in the environment with poor local institutions. Overall poor institutions could be a neutral factor, not significant for intensity of emigrants' linkages with home. Moreover, it might be the case that poor institutions lead to more frequent visits to the home country, especially when a respondent has launched business there and needs to check on it more frequently than he/she would do in a more favorable investment climate.

Descriptive statistics of correlations between engagements with home countries and institutions is presented in Table 15.

Table 15. Distribution of intentions to assist, intensity of contacts with the home country and frequency of visits with business purposes by the assessments of the quality of government and business institutions in the home country, % of respondents

	Quality of government institutions						Quality of business in a home country					
	Russia		Argentina		Mexico		Russia		Argentina		Mexico	
	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low
Intention to assist	44.4	30.9	63.2	61.4	72.4	66	53	44.1	70	77.1	78	62.5*
Activities	44.4	41.5	10.5	20.5	29.3	22	67	50	23.3	28.6	29	18
Business visits	77.8	75.5	10.5	14.5	39.7	43	93	73.5	13.3	17.1	52	43

*- Statistical significance at 10% level

Note: The dummy for the quality of institutions was constructed from the answers to the question "Please, assess the existing average capacity of various organizations as potential partners for international business ventures (1- the weakest, 5 – the most efficient). Responses with low quality are those which rated from 1 to 3, high quality – from 4 to 5. Missings were treated as low quality.

Data from Table 15 shows that high assessment of government and business institutions only slightly increases the likelihood of linkages in the Russian and Mexican cases, proving similarity of emigrants' behavior from the two countries in this respect. Statistically significant correlation is observed, however, only in case of intentions to assist for Mexico: high assessment of local businesses as potential partners is associated with the frequency of positive intentions to assist home country entrepreneurs. Argentina is remarkably different: people, who reported frequent business visits and activities in the home country, have a more negative view of local institutions. May be they are better informed...

To check the above mentioned hypothesis, we have regressed dummies for linkages, which may depend on individual behavior of respondent - intentions to assist and visits to the home country with business purposes. The exercise was carried out for the integrated sample and separately for the country samples to track differences and common patterns.

The main finding from the regressions relates to significant similarity of the factors affecting linkages to the home country between Russia and Mexico. In spite of a large gap in the level of reported intentions to assist entrepreneurs, the likelihood of these plans in both countries is strongly associated with membership in international professional associations. Female emigrants from both countries are less likely to be interested in providing assistance, though statistical significance is observed only for Mexico. Quality of business institutions matter first of all for Mexico and sample as a whole. In all three countries independent workers are more likely to get engaged than other professional categories. This may be explained by the suggestion that independence or self-employment is a certain sign of individual commitment to risk and entrepreneurship. In all three countries the perceived quality of government institutions appeared neutral to the willingness to assist. Thus it may be suggested that emigrants are more or less equipped to cope with the inadequacies of local government institutions in spite of their complains.

With respect to visits with the business purposes, Russia and Mexico seem to have more commonalities than differences, while Argentina is almost always different from these two. Thus the likelihood of business visits is strongly associated with the positive view of local business as a cooperation partner in both Russian and Mexican cases, while this factor is neutral for Argentina.

The results of the survey confirm that Russia-born emigrant workers are increasingly involved in the circulation of information, people and business activities between their native and new home countries. We learnt from the survey that both path dependence and accumulated personal experiences have an effect on diaspora's interest in contributing and establishing business connections with Russia. Though this knowledge has not much to do with the age of respondents, it is associated with better understanding of the rules of the game, inclinations to take entrepreneurial risk and other competences received through former business experience and studies abroad. Academics and people employed by firms are less likely than business owners / independent get involved in Russian business ventures and other forms of connections. We may conclude that in terms of specialization, sectors, where Russia keeps strong competitive advantage and which are located closer to the commercial part of supply chain, are more attractive for potential returnees: among surveyed professionals IT specialists and people specializing in natural resources demonstrated a significantly higher interest in the idea of returning to Russia.

Informality of ties still dominates the interaction process and formal hubs of information exchange and "brain circulation" are slow to emerge.

From the benchmarking exercise we may conclude that, when we talk about business linkages and entrepreneurship, Russian emigrants are less engaged in their home country's development than their Argentinean and Mexican counterparts. But this gap is not as large as it seems, given much stronger engagement of foreign organizations, where Russian emigrants work, whatever the form of this engagement is, and high intensity of business visits to the home country in spite of distances and costs. We have found remarkable similarities in the behavior and perceptions of Russian and Mexican emigrants, while Argentineans seems to be almost always different. Membership in international networks, receptiveness of local businesses to change and cooperate seem to drive linkages in these two countries more than the other factors. Individual choice to take risk is strongly associated with linkages to the home country in all three countries.

There is a reason to believe that barriers to more intensive involvement of Russian educated diaspora into the development of home technological business lie on both sides. Home country institutions – especially the government – are inefficient, resistant to change, and slow to accumulate capacities needed to interact with networks. Emigrant workers, in turn, are not ready to take entrepreneurial risk and prefer well paid business consulting to real business uncertainties. And there is limited knowledge of business success stories that could encourage a broader follow-up.

7. Policy recommendations

Four main recommendations emerge from this study. First, a need to shift a policy focus from the current emphasis on the emigrants' return to support for joint projects (brain circulation). Second, the diaspora cooperation strategy should be diversified towards much more focus on joint business projects with diaspora entrepreneurs and managers, in addition to joint projects with academic diaspora, which are already increasingly popular among Russia's policy makers.

Third set of recommendations is about modalities, the 'how to' of the engagement with the diaspora.

Both the interviews and the surveys revealed that diaspora networks emerge in a bottom-up fashion: these networks link entrepreneurs from Russia and its diaspora. Both groups of entrepreneurs are aware of numerous problems of the Russia business environment but they manage to figure out solutions how to ameliorate these problems. As an illustration, Russian business environment is viewed as more receptive and friendly by diaspora members engaged with joint projects with Russia in comparison with those who are not. This somewhat counter-intuitive observation also has emerged in other countries of the survey (Argentina and Mexico) and is supported by the earlier studies (Saxenian, 2008).

The survey and the interviews show that the major limitation for productive diaspora engagement with Russia's business and academic sector derives from inflexibility of domestic organizations and vested interests at home. Yet domestic organizations as well technological and academic diaspora are both not uniform. Thus, the immediate priority would be to put additional resources in support of those relatively few partnerships that are already established by first movers from both sides of the border to help them to scale-up whatever they have been doing and become a visible model for replication.

Also in the short term, the government may consider important to improve communication with diaspora, and make a systemic effort to disseminate the concrete success stories of particular diaspora members. It is insufficient to discuss the matter at the level of broad government initiatives, potential diaspora partners would like to know how it works at the level of individual projects.

In the medium-term, the central policy question is how to match the dynamic segments of diaspora members and dynamic segments of institutions at home (not necessarily within the government). We propose here a two-prong approach: (a) centralized framework (which is up to the government to establish) that would make diaspora members feel welcome in Russia and assure basic rules of their engagement, and (b) institutional space for bottom-up creativity and initiative of all agents involved.

Needless to say, striking such a balance is far from trivial and the experience suggests that the heavy emphasis on the top-down government interventions is unlikely to become effective. At least, the establishment of ministries for diaspora (as e.g. in India) so far proved to be at best of limited value for facilitating brain circulation. The relevant policy analogy is promotion of innovation. To make the economy innovation friendly, one indeed needs a tolerable innovation climate, yet it is private agents, not the governments, which make innovation happen. One practical approach for blending bottom-up creativity with an explicit national framework of 'rules of the game' could be realized in the format of national contest of diaspora initiatives (competitive grant scheme).

Drawing on the existing initiative of Ministry of Education and Science, such a proposed contest would provide matching funds to Russian R&D and educational organizations interested in articulating and running diaspora initiatives that would advance their own missions and objectives. Such organizations would formulate their proposals for the Diaspora Contest committee and be considered receiving matching fund contributions.

Operational details for such a program remain to be specified but this type of contest will have to have clear eligibility criteria and can, for instance, support institutionalized diaspora initiatives for a period of up to three years with a limit of \$100,000 matching grant per year. It could support initially 10-20 focused initiatives. Ideally, each diaspora initiative would be characterized by the following features:

- (a) The ability to identify and manage strategic first movers from diaspora. Strategic first movers are individuals with a longer than usual planning horizon. These individuals are crucial because new organizations, they create in the home country, provide a demonstration effect for others.

- (b) Focus on mentoring and skill transfer as a key feature of joint projects between diaspora and home country organizations. Another way to describe a search function of diaspora members is to characterize them as mentors who are not expected to do the work but help home country organizations do their work better.

To counteract a likely initial shortage of creative initiatives of diaspora engagement focused on joint commercially-oriented projects, the federal government can consider two measures. First, a national workshop followed by a website focused on emerging best practice in diaspora cooperation. Second, a portfolio of 2-4 pilot initiatives at a sub-national level co-financed by national and regional governments. As already noted, Russia's secondary capitals – major cities such as Kazan, Novosibirsk and Nizhni Novgorod – figured prominently in the ongoing diaspora interactions with Russia. These secondary technological and scientific capitals can create elite diaspora networks similar to Global Scot (Chapter ...) or Chile Global.

Our fourth recommendation relates to the suggestion for public investing into the Russian talent base in major global centers of scientific and technological excellence. Simply put, we propose a subsidy for master and graduate-level training in science, engineering and technical discipline in global centers of technological entrepreneurship such as USA, UK, Israel or Taiwan. Arguably, this is the most controversial of our recommendations and three observations are in order.

First of them is about objective and logic of such investments. The objective is not skill formation in terms of closing the gap between the advanced skills the country requires and the skills domestic higher education can supply. The expectation is that the majority of the graduates (75-80%) will not return to Russia upon graduation. Rather, the objective is explicitly to foment and ferment brain circulation networks. Consequently, the proposed subsidy to higher education abroad is to be conceived within a package of initiatives including the investment into brain circulation networks so that the graduates remaining in global centers of excellence remain connected with the home country.

Second observation is about the program design to reduce possible rent-seeking. Elite higher education is a position good which is usually reserved for the upper-middle class and for country's elite. Obviously, subsidy to the elite is a nonstarter. To prevent rent-seeking, one could think of a simple rule such as full tuition subsidy for those admitted to a graduate course in the top ten universities in the US, top three in UK and the like in the approved fields of study. Maintaining the bar sufficiently high would mean a relatively small number of subsidy recipients and less leakage.

Third observation is about institutional home for the proposed program. The program which subsidizes brain drain (at least in the medium-term) is bound to be unpopular and will be subject to budget pressures. As the thrust of the program is the strategic bet in the country's future, it could be initiated on a pilot basis as a philanthropic gesture by few Russian oligarchs with a vision and/or as part of a major innovation initiative such as Skolkovo Innograd discussed earlier.

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