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How can Russia successfully overcome the challenges of international R&D projects?[1]

Abstract

This article discusses the challenges arising from international R&D projects in Russia. Specific problems are identified and discussed, namely: integration management; geographic factors; international networks; and virtual innovation teams. Meanwhile, market and customer perspectives, and knowledge and technology transfer, as well as the challenges arising from transnational processes and ICT are also going to be considered. Furthermore, inter-firm R&D partnerships are reviewed, with potential solutions suggested and general guidelines for Russian enterprises examined. In addition, cultural and historical aspects, as well as economic and political constraints, are taken into account. Ultimately, it could be concluded that even relatively small Russian enterprises should be able to benefit from the proposed solutions due to networking effects. This should have a positive impact on the Russian economy and contribute towards a significant reduction in its dependence on natural resources.

Keywords: *R&D, leadership, management, globalisation, investors, institutional strength*

Introduction

The former Soviet Union had developed an enormous R&D infrastructure but largely failed to commercialise its research results (Yegorov, 2009: 600). Soon after *perestroika*, Russia had to realise that many of its businesses were not able to compete in global markets (Bruton and Rubanik, 1997: 68). Even today, Russia's economy is still heavily based upon the export of raw materials. However, the country's natural resources will, eventually, come to an end. Hence, it is important to start stimulating other sectors of the economy and pursuing research and development (R&D) activities in order to develop new products and increase export intensity (Podmetina *et al*. 2009: 295). It is likely that collaboration with other countries will be needed to achieve this goal. Hence, Russian enterprises need to understand how to master successfully the challenges arising from international R&D projects.

Furthermore, labour unions may well be interested in increasing their members' skills, which would be a side-effect both of setting up home-based augmenting sites, as well as of launching home-based exploiting sites (Kuemmerle, 1997: 61ff.).

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There are multiple major challenges of international R&D projects that can be identified. This is partly due to global R&D being rather complex. Above all, one should consider that managers no longer simply have one function but, rather, need to focus on integrating multiple processes. Furthermore, R&D units need to be integrated into international networks and inter-firm R&D partnerships need to be managed. Hence, R&D is often decentralised and requires the use of virtual innovation teams. In addition, overlaying structures need to be created, (transnational) processes and interfaces need to be managed and the value of knowledge and human resources needs to be realised (von Zedtwitz *et al*. 2004: 27ff.).

These challenges are accompanied by a stronger orientation towards global markets and knowledge areas and require far more advanced co-ordination (Gassmann and von Zedtwitz, 1999: 231). Indeed, six fundamental dilemmas have to be faced: namely, one has to decide whether to go local, global or 'glocal'; one also seems to have to choose between creativity and discipline; process and hierarchy; person interaction and ICT; as well as control and open source; and, in addition, one needs to select either short-term or long-term strategies (von Zedtwitz *et al*. 2004: 46). Many of these approaches are contradictory and companies still seem to be in an experimental state (*ibid*: 25).

Integration management

First of all, it needs to be pointed out that the manager's role has changed dramatically. He or she needs to focus not only on research and development, but also needs to structure and maintain all supportive business structures in order to create an integrated and well-functioning R&D environment. This includes, but is not limited to, logistics; distribution; technology; and production ramping-up (*ibid*: 27). Hence, it could be stated that the tasks of project managers, as well as those of general managers, have become far more complex and diverse and are not simply limited to a functional perspective. In a country like Russia, which does not have a long-standing capitalist tradition, it might be particularly challenging to find well-trained and experienced project and general managers. After all, most of the world's leading business schools are located in countries that have been relying on capitalism for a long time. However, it should be positively noted that Russia has been making significant progress in developing its business schools: St. Petersburg State University is now even a member of the CEMS network.

The outlined integration challenges can only be successfully faced by creating efficient communications structures (Allen, 1986: 215). Furthermore, a suitable board needs to be established in order to guarantee consistent R&D standards within an organisation (Baysinger, *et al*. 1991: 209).

In addition, managers need to be sufficiently trained in all the tasks they have to carry out. This could be achieved through appropriate recruitment processes as well as continuing education programmes. One can only define the ideal recruitment process by taking into account the specific requirements of the project. Generally, it could only be stated that a purely scientific background is, most likely, not going to be sufficient for the successful management of an international R&D project: one needs to have a significant amount of emotional intelligence and be able successfully to master multiple business tasks. A pure business background is also very likely not to be sufficient since

one needs to maintain authority among researchers. Being an established scientist would, on the other hand, be likely to create favourable circumstances. Hence, it could be argued that international R&D projects should be managed by researchers with a business background.

Furthermore, these managers should be familiar with Russia's cultural differences.

On a positive note, it could be mentioned that, during the Soviet area, Russia's universities trained multiple scientists who have, later on, turned into business representatives. Hence, this combination of business and science already seems to be established to a reasonable degree in Russia.

Location

It is often argued that R&D projects need to be located near centres of technology creation (von Zedtwitz *et al*. 2004: 27). It has been stated that the centre of excellence structure is advantageous if the product is global and designed for undifferentiated markets, or if the host country has particularly important market or technical knowledge (Chiesa, 2000: 347). It could also be added that a firm could benefit from technology spillovers from rival companies in the same technology creation area (Belderbos *et al*. 2008: 26). However, it could also be argued that a firm could suffer from technology spillovers to a rival company. Hence, R&D centre location remains a delicate issue.

One could argue for or against research centres being located in technology hubs or isolated areas. In many cases, there is no ideal solution; one needs to take into account all aspects of individual cases. In particular, one should ask whether a firm is big enough to work on its own or whether one needs to communicate with other experts. Generally, face-to-face communication tends to be preferable.

Also, one should consider the availability of talent. It is probably going to be easier to find qualified researchers near Harvard University and MIT in Cambridge, Massachusetts, than in a small village in Siberia. In Russia's specific case, large distances and cultural differences tend to be particularly problematic. Hence, the establishment of research hubs could be considered disproportionately advantageous.

International networks

Furthermore, R&D projects and units need to be incorporated into international networks in order to cope with technological advancements, industry structure and economic developments (von Zedtwitz *et al*. 2004: 29). Some companies have indeed expanded their R&D networks through mergers and acquisitions, whereas others have developed them organically. Hence, very different structures and R&D cultures have evolved, and it becomes increasingly challenging to pay close attention to all of them. These differences in structures and R&D cultures can create significant obstacles to successful collaboration.

Improvements in communications can only help to integrate international R&D activities if these structural and cultural challenges can be overcome (*ibid*: 29). Learning in interacting might be one way to approach this issue. If teams are obliged to interact with each other, they will get to know different R&D cultures and structures and eventually become more open-minded (Gertler and Levitte, 2005: 483). However,

it should be mentioned that inter-unit rivalry could limit this learning process (Criscuolo and Narula, 2007: 657). Hence, all attempts to build a unified and open-minded R&D structure and culture should be considered carefully before being implemented. This is particularly true regarding collaborations with countries that might induce unpleasant historical memories. Even in the 21st century, western populations still appear to be afraid of espionage activities. Hence, Russian companies might find it difficult to gain a foreign firm's unlimited trust as a result of Russia's history of successful secret service activities. This obstacle needs to be overcome by building up and maintaining a reputation for honest and fair business transactions.

Transfer of knowledge and technology

Effective innovation is based on the transfer of knowledge and technology, but it is rather intuitive that this transfer process needs to be taken into account when discussing the challenges of international R&D projects. It should be stated that many R&D projects are characterised by geographical distance, organisational dispersion and functional, as well as hierarchical, structures. These communications barriers need to be overcome. One possible solution might be the establishment of overlaying structures (von Zedtwitz *et al*: 29), while social networks should also be taken into account, since there appears to be a link between non-redundancy in organisations' social networks and their ability to transfer knowledge and skills (Argote and Ingram, 2000: 162). It should also be kept in mind that making knowledge or technology does not happen at 'zero-cost' (Teece, 2003: 246). Hence, project managers need to decide when and how to ensure the transfer of information, technology and knowledge. This does not necessarily depend upon the number of involved parties but, rather, upon the structures of employment (Inkpen and Tsang, 2005: 149).

Addressing the challenges arising from the transfer of knowledge and technology is rather complicated: similar to other cases when it comes to international R&D projects, there is no 'one size fits all' solution, and approaches tend to depend upon individual circumstances and the characteristics of specific projects. However, a few general recommendations can be made. Social networks can be fostered through face-to-face interaction. This is a rather costly step, but it does tend to generate trust and people become more likely to share their knowledge. This is particularly true for Russia due to its long distances. However, Russia's ethnic diversity should also be taken into consideration. It is rather evident that face-to-face interaction is particularly important in order to overcome cultural differences. Furthermore, an incentive system should take the transfer of knowledge and technology into account and pay special bonuses to employees who stimulate such levels of exchange.

Virtual innovation teams

Also, decentralised R&D processes, as well as the increasing relevance of virtual innovation teams, is becoming a challenge for many international research and development projects. This is particularly true where companies depend on external sources of information and need to incorporate external experts into their projects. ICT structures might help in the setting-up and managing of virtual teams, but they do not address all aspects of the issue (von Zedtwitz *et al*. 2004: 30). For example, decentralised R&D

structures are relatively difficult to control (Nobel and Birkinshaw, 1998: 481). It should also be taken into account that work in virtual teams may be either permanent or temporary and may involve different boundaries depending upon the nature of the specific task (Gassmann and von Zedtwitz, 2003: 244). Virtual teams are often culturally diverse and spread all over the world, they do not have a common past or future and they are mostly, or exclusively, operating electronically, so it can be difficult to establish trust (Jarvenpaa and Leidner, 1998).

These issues could be addressed in multiple ways. First of all, one could try to build trust through team events. One could organise an initial meeting at the beginning of the project and dedicate one full day to team-building activities. Obviously, this could be problematic for team members who join the project after the initial meeting. One could solve this problem by also launching intermediate meetings during the project. However, the significant costs, such as travelling expenses and the loss of time due to Russia's large distances, would also have to be taken into account. One could also create control mechanisms for decentralised R&D structures. For instance, one could established a centralised control centre. R&D activities could be carried out locally, but all the results (in terms of patents) should, nevertheless, be managed from the headquarters. Furthermore, it is essential to combine the adoption of IT equipment with adequate human resource practices in order to compensate for the increased skill requirements (Bartel *et al*. 2005: 32).

Market and customer focus

International R&D projects also need to be market- and customer-focused. One cannot simply limit R&D projects to technology-push thinking; there is a requirement to listen to the market. This requires at least some presence at the local level (von Zedtwitz *et al*. 2004: 30). One could argue that market orientation should also take competitors and inter-functional co-ordination into account (Narver and Slater, 1990: 29). A high level of responsiveness to market intelligence should also be created (Kohli and Jaworski, 1990: 6). In order successfully to create market-driven innovation, an orientation towards the market and learning seems to be essential (Hurley and Hult, 1998: 44). The internalisation of markets for knowledge-based R&D activities usually requires a market presence (Narula and Dunning, 1998: 381).

These challenges could be addressed in many different ways. In the first place, one might spread R&D centres all over the world in order to listen to the market. This would, however, create control and management challenges. Secondly, one could centralise R&D activities and simply ask the local marketing and sales departments for feedback. However, this approach is questionable since marketing and sales departments tend to lack the technocratic expertise required for the development of R&D projects. Furthermore, marketing and sales departments tend to be rewarded for revenues and not for the development of new products. Hence, one would have to change the entire incentive system and the culture of marketing and sales departments all over the world in order to receive valuable input.

One possible approach might be to combine global R&D centres in headquarters operations with small, local R&D hubs in the relevant markets. The overwhelming majority of a team may be working on the development of new products in the head-

quarters, while a small minority could be entrusted with the task of locally supervising a market. This 'glocalisation' could help to maintain control while also allowing the organisation to listen to its customers. In Russia's case, one could imagine having a headquarters in St. Petersburg or Moscow and establishing research hubs from the border with Ukraine to the border with China. In addition, one might consider creating research hubs in other former parts of the Soviet Union, such as Kazakhstan and Belarus. Due to the heightened tension with Ukraine, this is probably not the best moment to create research hubs on Ukrainian territory. However, this option should still be on the table in the long-term.

Managing interfaces

Managing interfaces also tends to be a major challenge in international R&D projects. One needs to balance the focus on fundamental technology breakthroughs with the development needed in order to satisfy customer expectations. Geographical distance, differences in reporting structure, controlling concerns, different time horizons and knowledge backgrounds, as well as cultural gaps, need to be taken into account when managing these interfaces (von Zedtwitz *et al*. 2004: 30ff.). Different stakeholders are likely to have different needs: some might be looking for peer evaluation, recognition, autonomy, personal development or service to mankind; while others might be more concerned with organisational recognition, plans, procedures, policies, rules, team work and increased organisational status. The same tends to be true for time horizons, preferred projects and ambiguity tolerance, as well as bureaucratic and professional orientation (Griffin and Hauser, 1996: 196).

In order successfully to manage these different interfaces, a manager must be aware of all of these issues and actively address them. He or she needs to align organisational strategy with environmental uncertainty as well as with organisational and individual factors in order to close the integration gap (*ibid*: 198). Flexible structures need to be created and there will be the need to have appropriate regard for all stake holders. In particular, the Russian mentality and social dynamics should be taken into account during this extraordinarily important process.

Managing transnational processes

Managing processes in transnational R&D could also be considered a major challenge. Activities such as invention, testing cycles, further development, production and sales tend to occur in multiple countries all over the world. R&D is very unpredictable, so it is almost impossible successfully to introduce common standards since this would also limit creativity and, hence, potentially have detrimental effects on output. Therefore, managers in charge of transnational R&D projects do not only have to deal with the characters involved in completely different activities, but also with different cultures and mindsets. This phenomena is frequently accompanied by reduced quality of communications (von Zedtwitz *et al*. 2004: 31).

In order at least partly to overcome the challenges arising from transnational R&D projects, top management should define a unified framework for global innovation processes. It is important that this framework is not too rigid and leaves sufficient flexibility for radical invention where necessary. Top management then needs to com-

mit to this framework (*ibid*: 31). Globalisation strategies should be evaluated separately for each basic unit of analysis before defining such a framework. Critical knowledge centres should be defined (Gerybadze and Reger, 1999: 261). This ensures that the framework takes the needs of the research and development process into account, which will facilitate its implementation. It should also be locally responsive and respect political and legal systems (Snow *et al*. 1996: 52).

There are multiple aspects that cannot be ignored when developing transnational teams. It needs to be ensured that their purpose is aligned with the overall business strategy and that all team members are equipped with a sufficient amount of social skills. Leadership roles should be clearly distributed and communications and decision-making technologies defined in advance. Cross-cultural management ideas need also to be given the room to flourish. This should help to create a safe and trusting environment with a sense of camaraderie. Flexibility, dependability, shared responsibility and commitment are important elements of this process (*ibid*: 52). All of these aspects should be fully respected when planning transnational R&D projects. Furthermore, foreign team members should be assisted during the process of adapting to Russian culture. Overcoming linguistic and cultural barriers can be a major challenge and should not be underestimated under any circumstances.

The use of ICT

Furthermore, the use which can be made of ICT can also be considered a potential problem area confronting international R&D projects. It is particularly challenging to share tacit knowledge, or create interdisciplinary collaboration, via ICT. In particular, time and cultural differences might create difficulties on top of those presented by the original project (von Zedtwitz *et al*. 2004: 32). There also seems to be a statistically significant interaction between ICT intensity and workplace organisation that should be taken into account during the planning process (Hollenstein, 2004: 22).

Regular meetings might help to build trust and at least partly overcome the challenges arising from applications of ICT in international R&D projects (von Zedtwitz *et al*. 2004: 32). However, project managers should also try to optimise ICT in their communications strategies. For example, introductory forum posts on a limited-access blog might help team members introduce themselves and partly substitute the initial small talk, which is so often eliminated during ICT communications. One could draw upon Russian traditions and sayings in order to establish common ground by appealing to team members' familiarities.

Managing knowledge and human resources

Managing knowledge and human resources has also become a major challenge to international R&D projects. First of all, individuals must have sufficient flexibility in order to be creative and to develop innovative ideas (*ibid*: 32). Secondly, it needs to be ensured that they share their ideas with the firm and do not run away with their knowledge after having been paid for the development of their thoughts. Thirdly, intellectual growth should be stimulated and external know-how should be incorporated. This involves recruiting talented and well-trained employees.

Cross-cultural job rotation might be one way of internalising external know-how. By hosting visiting researchers from other countries, a team can benefit from their knowledge and may be intellectually stimulated (Gassmann and von Zedtwitz, 1998: 156). Furthermore, commitment can be built up by fostering a social climate based on trust, co-operation and shared language. Thereby, a combination of knowledge and the opportunity for exchange could be achieved (Collins and Smith, 2006: 545). Ideally, foreign researchers fluent in Russian would be chosen at the beginning of this process in order to facilitate the transition phase.

This knowledge and exchange combination could be measured in multiple ways. First of all, it needs to be assessed whether employees actually believe they may benefit from exchanging and sharing their ideas with their peers. Secondly, it could be measured whether employees believe that such exchanges help them to become more efficient. Thirdly, it needs to be understood whether employees believe they may learn from each other and whether they have developed proficiency in exchanging and combining ideas (*ibid*: 559).

Such a culture of knowledge exchange should result in strong social ties and encourage employees to stay with the same firm in order to avoid losing their scientific network, which they may well perceive to be essential for their own research and development success. Commitment is an important aspect of knowledge internalisation and should, therefore, be fostered (Cummings and Teng, 2003: 41).

Managing inter-firm R&D partnerships

This has also turned into a major challenge facing international R&D projects. Increased internationalisation has undoubtedly affected R&D projects; however, inter-firm partnerships may also lead to loss of control, declining collaboration and a lack of trust (Hagedoorn, 2002: 486).

The loss of control is a rather evident phenomena. For instance, it can be very difficult for a Russian manufacturer to supervise joint R&D activities with a Chinese partner in Beijing. This is particularly challenging if the partner is a state-controlled enterprise and the R&D activities are being carried out in the partner‘s own country. The long distance from Moscow to Beijing could further complicate this matter. It is, therefore, important to adopt a cross-cultural perspective and address social needs while providing mentors (Adekola and Sergi, 2007: 252).

Joint ventures might allow for the continuous monitoring of joint R&D activities if each sponsor is represented in the management of the joint venture (Hagedoorn *et al*. 2005: 182). However, sharing knowledge is inevitable when it comes to joint R&D projects. Joint venture partners might still take advantage of each other, especially if they are located in a country with weak institutions and loose private property rights. Hence, it is essential to locate joint venture R&D activities in a neutral third country which should, ideally, be an essential market for all the partners and have strong institutions and private property rights.

This is a challenge for Russian firms since foreign investors frequently do not believe that Russia has strong institutions. Hence, it is essential that both the government and private enterprises make a joint effort to establish more ideal conditions for partnerships with foreign firms. The interdependence of market position, firm resources

and governance structures should also be taken into account (Oxley and Simpson, 2004: 746ff.), while excessive bureaucracy should be avoided (Sampson, 2004: 484).

Involving Russian labour unions

Russian labour unions have a vested interest in playing an important role in the development of R&D activities. First of all, they do not want Russian R&D to lag behind, since this would inevitably lead to the transfer of such activities to foreign countries and, hence, to a loss of jobs in Russia. Furthermore, highly-skilled employees, such as members of renowned R&D teams, could give considerable power to Russian labour unions. Once a company starts to rely upon certain researchers for its R&D activities, it cannot easily get rid of them. If these researchers are actively involved in labour unions, these might in turn gain considerable bargaining power. It might be challenging, but feasible, to replace factory workers during a strike, but it can be almost impossible to find adequate substitutes for leading researchers. This would cost a considerable amount of time and money, which Russian enterprises may not be well-placed to afford.

Both the government and private enterprises should become aware of the role that labour unions might play in this process. The unions are likely to be interested in gaining additional bargaining power, so they might also consider asking their members for particular sacrifices in order to achieve this goal. These sacrifices could be essential in the creation of an open-minded and willing-to-travel atmosphere. Hence, this could turn into a win-win-win situation for government, private enterprises and labour unions themselves. However, one needs to proceed carefully, since research has suggested that R&D rises with union density up to a certain point, after which it might decrease (Menezes-Filho *et al*. 1998: 929). In fact, it has even been suggested that innovation might be less important for union firms than for non-union ones (Hirsch and Link, 1987: 323).

General guidelines

Last but not least, a few general guidelines might be useful. It is most likely that there will be five major trends in international R&D in the near future. Namely, international R&D projects will be characterised by increased system orientation; reductionism; mobility; open networking; and harmonisation (von Zedtwitz *et al*. 2004: 46). It is important to be aware of these trends, which will shape future challenges, and adapt to them as early as possible.

Increased system orientation refers to the idea that more unexpected functionalities, alternative uses and different cultures will have to be integrated into future products (*ibid*: 46). This means that engineers and entire R&D teams will have to be more flexible and culturally diverse. Ideally, they will consist of people with multiple different backgrounds. This should be taken into account when planning the future of Russian training institutions.

Physical and mathematical models have changed the predictive power of research. Experimentation is frequently being replaced by simulation. Hence, an increased reductionism will radically change international R&D projects (*ibid*: 46). Therefore,

R&D managers should ensure that their teams are sufficiently flexible and open-minded in order to adapt to these changes and to embrace new research methods without loss of commitment.

It has been highlighted in this article that ICT plays an important role in international R&D projects but is still characterised by multiple weaknesses. However, increased mobility, namely advances in transportation, are likely to compensate for these shortfalls (*ibid*: 46). It is, therefore, extraordinarily important that the managers of international R&D projects make use of advances in transportation and also dedicate a significant budget to enabling face-to-face meetings.

Increased competition should be mastered through increased networking. By exchanging knowledge with other firms, even small enterprises will be able to use significant economies of scale (*ibid*: 46). Project managers should actively encourage their R&D team to develop strong ties with other firms and stimulate increased networking.

Increased harmonisation will also help achieve higher levels of efficiency and collaboration in international R&D projects (*ibid*: 46). Common standards and training programmes will help employees better understand each other, overcome cultural obstacles and improve collaboration. They will also create a sense of community and this needs to be built on as regards the staff involved.

Conclusion

Several major challenges to international R&D projects have been identified in this article. Namely, it has discussed managers' increased functional diversity; more integrated R&D networks; inter-firm partnerships; decentralised structures; and virtual innovation teams; as well as overlaying structures and transnational processes (*ibid*: 27ff.). Five major trends which are likely to shape the future challenges of R&D have also been mentioned, and general recommendations and specific suggestions for improvements included. It must be acknowledged that there is no 'one size fits all' solution for most challenges in international R&D, but that contextual factors need to be taken into account when developing a specific approach to an individual problem. It should also be remembered that individual and team creativity is a necessary, but not sufficient, condition for innovation (Amabile, 1996: 1). One has to create an appropriate environment in order to obtain valuable R&D results.

It is crucial that Russian enterprises capture the solutions to the challenges outlined here which arise from international R&D activities and develop more innovative products. This will help the country reduce its dependence on the export of natural resources and become an even more important part of the global economy. Due to the mentioned networking effects, even small Russian enterprises should be able to achieve significant economies of scale and play an important role in corporate R&D. However, it should also be noted that adopting solutions that have been successfully implemented in another country might only be part of the answer. In any case, Russia will have to modify such solutions, adapting them to its unique local conditions (Stewart, 2003: 42). In this regard, the country’s enormous size and cultural diversity will have to be taken into account.

Russia will also have to overcome its imbalance between inputs and outputs. It will have to look at various indicators of innovation and base its analysis not on R&D intensity alone.

Furthermore, R&D activities should be financed not only by the state; private investments must also be encouraged (Gianella and Thompson, 2007: 6). One could take the United States's silicon valley culture as an example: thousands of young entrepreneurs are attracted to this area and primarily financed by venture capital firms. Russia should not approach this problem by obliging oligarchs to invest in innovative start-up companies but rather create the sort of institutional environment that makes investment in small, high potential businesses attractive. For example, reducing corruption will help to create more trust in the legal framework. Corruption limits economic growth and development, and could thus be considered a barrier to innovation (Qerimi and Sergi, 2012: 83). No venture capitalist is going to invest in a promising young firm if he or she has any reason to fear that the young entrepreneur could simply bribe a few officials and run off with the venture capital firm's money.

However, it should also be mentioned that Russia has already made significant steps towards a promising R&D industry. Compared to other emerging economies, it has extraordinarily high R&D spending rates and a large number of scientists in employment (Gianella and Thompson, 2007: 6). If it follows the guidelines outlined above, it is likely to achieve significant R&D successes within the next two decades. In addition, its relatively low tax rates and its attractive social security policies might even help pull in foreign researchers and investors. This is likely to be particularly true if its infrastructure continues the current rate of development. Russia could further expand these initiatives by adopting labour subsidy and cash grant policies in order to create additional incentives for innovation (Gradev *et al*. 2013: 262). In any case, it should be noted that only sustained flows of assistance can ensure the take-off of R&D in Russia (Wamboye *et al*. 2014: 354).

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