

Knowledge and Technology Transfer in Post-Socialist Russia:

Formal Institutions and Informal Mechanisms

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1. Introduction

The process of transformation in Russian economy exerted its influence on many different areas and also on science. As a result of reforms, the government ceased to interfere with most economic processes including relations between science and industry. Simultaneously, the level of state funding for scientific organizations was reduced. Economic problems led to brain drain from scientific organizations abroad and into other fields of activity. Since the end of the 1990s, some stabilization has been observed. Nevertheless, there are quite different attitudes towards the contemporary state of Russian science. Opinions vary in a wide range from the „death of science“ and doubts regarding the possibility of its revival to admiration for certain research results and dynamic processes treated rather as a „Renaissance for Russian science“ (Bush 2004). Applying a narrow definition of science (understood exclusively as basic research), the shift away from epistemic interest and an increasing share of applied research and, as a result, a brain drain from the public sector into the private one can be considered as the „death“ of science. The broad definition includes applied research. To avoid such misunderstandings, I prefer to talk about research organizations.¹ Actual processes in research and development are most easily understood if we look at strategies of knowledge and technology transfer developed in research organizations.

2. Historical and Institutional Context

Transfer of knowledge and technology under central planning was regulated mainly by government structures. Many research projects, even those with a focus on application, were not implemented because the system of central planning was not suited to deal with a vast number of innovations. The intermediary function of state authorities was an additional obstacle, since state bureaucrats were not sufficiently qualified to link the actual needs of industrial enterprises to the potentialities of science. When researchers used informal channels in search of customers, research projects for the needs of enterprises were often the result of „conspiracy“ which allowed enterprises and research organizations alike to improve their statistical indicators in the field of „innovativeness“ respectively „practical application“. Such proceedings were possible because benefits under central planning were distributed according to fulfilment and over-fulfilment of the plan. With the introduction of market reforms the situation changed. Economic reforms at the beginning of the 1990s are associated with private property rights, price liberalization and privatisation. Although most research organizations were not privatised, one can speak about a shift from public to private research. Indicative of this is the increasing share of private funding, an emerging private research sector and the informal or network privatisation of science.

Shock therapy and the conversion of the Military-Industrial Complex resulted in the loss of funding. Since investments in research and development are extremely risky, the banking system preferred other, more profitable forms of investment. Industrial enterprises were on the verge of bankruptcy. Therefore, even if in some rare cases enterprises still commissioned research and development, researchers might receive money only two or three years later, and because of high inflation they received much less than expected. Because of the high level of uncertainty, relationships between research organizations and enterprises could be characterized as distrustful.² To reduce the number of links in the chain of uncertainty, many research organizations turned into associations combining research and production. As a result, the previous division of labour within and between organizations changed.

Institutions of patenting and licensing were developed with the expectation that they would reduce the level of uncertainty for research and development under new market conditions. The key objective of the patent system is to protect authorship and to create conditions for knowledge and technology transfer on the basis of intellectual property rights.³ As a result, relationships between science and industry can become more formalized. Patents, however, appeared to be „different things in different places“ (Laet 1998: 217). While in Western countries patents are considered an efficient means of transferring knowledge and technology, in the Russian transitional economy they failed to achieve this result. Most enterprises were unable to purchase licences, whereas patent fees and annual payments for maintenance of patents in force increased more than 100 times in just five years (Dezhina 2001: 20). The patent system appeared to be too expensive. For this reason researchers have lost interest in taking out patents as a mechanism of knowledge and technology transfer.

3. Network Structures of Knowledge and Technology Transfer

When formal institutions are working inefficiently, economic actors tend to rely to a greater extent on social ties based on mechanisms of reciprocity and trust.⁴ It is therefore necessary to take a look at informal structures of knowledge and technology transfer. Despite essential differences in their situation, research organizations have in common the use of network channels of transfer, i. e. knowledge and techno-

logy transfer via spin-off practices and „embodied knowledge transfer via scientists' migration“ (Zellner 2003). The boundaries between public and private research become blurred. The low level of salaries in public organizations makes their employees look for additional earnings. The phenomenon of „double citizenship“ is one of the key strategies. In most cases scientists combine a position at public research institutes with a job in private firms. In this situation researchers can apply for public funding as scientists, and as employees of small science-intensive enterprises they can apply for credits on favourable terms and for tax privileges. This strategy generated networks based on individual migration and slightly more formalized inter-organizational networks.

After perestroika the state made an attempt to combine state property and private benefits in the form of „intra-enterprise partnerships“ treated as „heterarchies“ (Stark 2002).⁵ Later most of these partnerships turned into formally independent firms. These recombinant practices were also observed in Russian research organizations (Sedaitis 2000, Olimpieva 2003). Most interesting forms are to be observed in branch institutes dealing with applied research for the needs of particular industrial branches. In the Soviet economy most of them were monopolies or quasi-monopolies. For this reason it was essential to use recombinant practices in order to decentralize these organizations. As a result, large research institutes are surrounded by a network of private spin-offs, often attached to particular departments of the same institute and situated under its roof. Spin-offs organized on the basis of a research institute enjoy considerable privileges by using office space and equipment, and physical proximity facilitates more intensive information exchange.

Simultaneously with „intra-enterprise partnerships“, there emerged a lot of independent research groups. Later they had to formalize their status by establishing a firm. Because of a high level of failure of small high-tech firms, industrial enterprises were distrustful of their products. The key factor of trust in the realm of technology is organizational reputation. Therefore, spin-offs relating to established research institutions had essential advantages. In addition to this, one can observe the growth of successful, independent high-tech enterprises. To keep the status of small enterprise, they split into several organizations with the same trademark, creating a network of high-tech firms. Such firms actively invite research-

chers from the public sector to join them. In this case there are no formal agreements between private firms and public institutes. Research groups working as quasi-firms under the roof of private organizations try to commercialise ideas they are developing at public institutes. Here it is important to emphasize that knowledge is transferred not only from public to private organizations, but also the other way around. Researchers are allowed to use knowledge and information they acquired in private organizations for purely scientific purposes.

Many researchers prefer simple migration or cooperation with already existing firms. In such a way they reduce costs connected with creating a new infrastructure and a new reputation; simultaneously they receive financial support. Some small enterprises made a similar choice in favour of cooperation. But they preferred cooperation with state assistance. Such organizations are working under the roof of Innovation Technological Centres (ITC) or technological parks created as an element of state policy. In this case they have additional financial and infrastructural advantages and use the reputation of the ITC. Situated under the same roof as similar small enterprises, they have access to different channels of communication. Thus, governance structures of knowledge and technology transfer developed on the basis of big institutes, new high-tech associations and Innovation Technological Centres have considerable similarities that can be defined as essential autonomy of groups and cooperation between them.

4. Conclusions

The transformation of Russian science led to the development of new methods of knowledge and technology transfer that can be conceived as a network privatisation of science. Old structures were highly inflexible. In order to improve the situation, researchers had to redefine rules of interaction not so much between science and industry, but rather within and between research organizations by using the strategy of „double citizenship“ and creating start-ups. The privatisation of science and the commercialisation of knowledge are usually associated with secrecy. The situation is, however, quite different in the case of the network privatisation where the boundary between private and public research is vague. In this context information disclosure and secrecy cannot be explained by the dichotomy of the public versus the private sphere, because interaction between private

firms and public establishments is carried out through employees who occupy positions at the intersection of channels. Information exchange can be mutual and profitable for both private and public organizations. This strategy of knowledge and technology transfer is connected to the current tendency to shift from a linear model of innovation to a spiral one. Changes in this direction are proceeding more rapidly in the Russian economy than in the more developed market economies.

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- 1 The paper is based on the results of field research in different research organizations (11 case studies). Most of the material was gathered during research projects at the Center for Independent Social Research (St. Petersburg).
 - 2 Formal constraints expressed in a third-party enforcement were developed to reduce uncertainty and to increase trust (North 1991). In the Russian situation formal constraints had only started to develop and for this reason laws and regulations were often controversial and difficult to follow. Because of the long waiting line in the arbitration tribunal, judicial hearings could take several years to start.
 - 3 In Soviet times researchers obtained rights to authorship, but they were not allowed to commercialize knowledge.
 - 4 This corresponds with the argument of social embeddedness (Granovetter 1985).
 - 5 Unlike markets and hierarchies associated with independence and dependence, „heterarchy“ means interdependence, organizational heterogeneity and a minimum of hierarchy (Stark 2002: 55).



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