State-Owned Enterprises as innovation agents in Russia: new developments or innovation deadend?[1]

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Starting from 2000 Russian corporate sector is characterized by constant and ongoing nationalization and consolidation of some most important assets under federal control. Nationalization, using terminology of Russia`s leading researcher of corporate sector Yakov Pappe (Pappe, Antonenko, 2014b), proceeded in several different modes – " true" nationalization, with concentrating of some key assets under federal control (using big holdings and state-owned banks), "forced" nationalization of companies hit by 2009-2010 and 2014 crises as a saving measure, and quasi-nationalization – when corporate assets were transferred under control of the state-owned banks for debts.

Whatever the mode, up to 2009 most important and biggest state-owned enterprises (SOEs) and so-called State Corporations (SCs, de-jure a non-profit organizations, in most cases are holdings, concentrating assets of strategic defense or dual-use enterprises) evolved as a nation-wide economic superactors. Key "tzars" of different industries were "Gazprom" and "Rosneft" in oil and gas sectors, Rosatom Nuclear Power Corporation (former Ministry of Atomic Energy) in both civilian and military nuclear industries and power generation on Nuclear Power Plants, United Aircraft (OAK) and United Shipbuilding (OSK) Corporations, and Rostekhnologii (since 2013 - Rostec) in defense, security and broad civilian or dual use manufacturing and service sectors[2]. These bigger actors are surrounded by a nebula of a smaller, but still important SOEs – mostly joint stock companies, some of them being natural monopolies (like Rosseti in transmission and distribution grids), some – leaders in precise market niches or industrial sectors (like Aeroflot, RusHydro for power generation from large hydro power plants or Almaz-Antey for anti-ballistic missile and air defense systems).

Despite problems in identifying actual role of state sector in the economy, even by moderate assessment SOEs and SCs present much more than 20% of Russia`s GDP (by some expert assessment up to 50% considering subsidiaries, affiliates, minority shares in different assets, etc.) and almost half of all internal procurements.

Setting aside the issue of controllability and security as an important issues for nationalization and consolidation of industries, up to 2007-2009 a new logic and role was presented for the SOE/SCs. Enormous economic power as well as concentration of Russia`s most high-tech[3] and significant portion of medium-tech industries resulted in the logic of assigning to the SOE/SCs role of quasi - multinational corporations for better competing on global markets and providing Russia with its own "market integrators" essential for the rise of manufacturing and other industries (Danilin, 2010). This logic, originally going back at least to the middle of decade, was

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[2] Among all SOEs and SCs Rostec is the most diversified – up to 663 subsidiaries with more than 2000 enterprises in about a dozen different industry and service sector areas – from jet fighter engines to heavy duty vehicles, ICT and healthcare. The reason of that "dispersed" diversification is still unclear for almost all researchers (Pappe, 2014b).

[3] Except strong sector of Information and Communication technologies which is private, and some high-tech market niches like laser technology, occupied by effective small and medium enterprises.

in a most systematic way articulated in Vladimir Putin's programmatic article in "Vedomosty" newspaper (Putin, 2012) "About our economic tasks".

Starting from 2008-2009 a new logic appeared which strongly coincided both with "market" mission of SOE/SCs and with rising attention for the innovation policies in Russia (Klochikhin, 2012, 2013; Gokhberg L., Roud V., 2012; Russian Economy, all issues). A very restricted results of previously executed policies for stimulation of venture industry development (with originally high expectations of new innovative industries "bursts") and bigger private businesses (including Special Economic Zones) lead Russian leadership to the idea of important "additional" role of SOE/SCs as lead consumers (von Hippel, 2005) and "integrators" for national innovation markets and as sources for innovation breakthroughs by developing and introducing new, disruptive technologies in respective industries.

This ideology, originally inspired by then-President Dmitry Medvedev, resulted in a series of regulatory decisions, creating a more or less comprehensive system of support and "enforcement" of innovation activities in SOE/SCs. The most renown measures were start in 2010 of so-called Programs for Innovation Development (PIRs), an obligatory corporate-level strategic planning documents for medium-to-long-term time frame (up to 2018-2020), fixing SOE/SCs' key innovation development direction, flagship and supportive projects and programs, and resources assigned to the respective activities. PIRs were supplemented by a significant amount of additional initiatives, aimed at rising SOE/SCs involvement in National Innovation System (NIS) development, cooperation and support of academic and university science, venture businesses, etc., including the following ones:

- Technology Platforms – formally a functional analogues of the same EU instrument for Public-Private Partnership and inter-actor communication for defining research and development (R&D) goals and shared vision for some technology areas development, and associate activities (Dezhina, 2013);
- Innovation Territorial Clusters - a cluster initiatives with infrastructure development and innovation actors communication and cooperation tasks;
- Involvement of SOE/SCs in Skolovo project – in order to form a qualified and sustainable demand for Skolkovo resident companies innovations;
- Stimulation of SOE/SCs to engage in venture capital (VC) activities;
- Roadmaps and other documents in support of Small and Medium Enterprises, development of services, rising innovation-related procurements and other activities – organized by the Agency for Strategic Initiatives (a body, created in 2011 by Vladimir Putin, which enjoys significant political influence) and others.

Nevertheless, despite true and "official" enthusiasm demonstrated by SOE/SCs to innovation "enforcement" policies, since 2010 the overall innovation capabilities of Russian NIS and SOE/SCs themselves didn`t advanced noticeably (RAO Expert, 2012; Gershman, 2013). Even shale gas and oil revolution was almost lost by "Rosneft" and "Gazprom" – despite their huge financial and market power, dependence on global market, and relatively good reach to both Russian and international R&D resources.

Even authorities acknowledged an insufficient results gained (Gorbatova, 2011; Stenographic report of the meeting of President's Commission for Modernization and Technological Development of the Russian Economy).

From a formal point of view, the explanations of that are clear. Most of Russian SOE/SCs are either defense/security or dual use, which effectively limits both their areas of commercial innovation (most important as to their assigned role of innovation leaders) and potential for support of outside industries. Also, it is an axiomatic statement, that government or government-related bodies are bad innovators, inflexible and not sensitive to market signals and

non-defense technology trends. Finally, a clear set of general economic reasons played a role of "natural" limitations of any innovation-related economic activities in Russia: starting from lowering competitive factors such as relatively cheap and highly qualified labor force, underutilization of assets, etc. (OECD, 2011), aging technology assets and ending up with prohibitory high levels of inflation and interest rates, that restricted access to the long-term capital, needed for innovations.

Despite all these objective factors, current Russian policies rose an important question of whether the accent on SOE/SCs as key or one of the key innovation actors can be effective, justifiable and prospective. From the formal point of view, history clearly indicates that the government itself and its agents - SOEs or affiliated big private businesses - may and did played important role in science and technology advancements, as well as in the industrial development (Perez, 2002; Rifkin, 2011; Atkinson R., Ezell S., 2012; Mazzukato, 2013; etc.). So, whether it is only objective economic reasons or also other gaps that results in Russia`s moderate results?

It seems that in parallel with "normal" economic explanations, some decision-making and management issues are important in understanding this problem. In turn, they are most convenient to analyze using basics of Contract theory and Principal-Agent interaction models. Following text present a *conceptual framework* for the analysis of Russian SOE/SCs innovation development policies as part of the efforts to create and support of Russian NIS, while some implications of it presumably may be applied to the general problem of SOEs role in innovation development in emerging or transition economies.

In preparation of this study author interviewed employees of several Russian SOE/SCs from the power generation and transmission sector – which, simultaneously, are far more open for researchers than defense or dual-use sectors; until recently enjoyed significant influx of financial resources due to the federal support and market growth; and planned large-scale innovative projects due to obvious need to modernize, revitalize and further develop Russian aging energy power system in response for the new challenges.

A challenge of controls

Analysis of data and interviews reveals that one of key problems for the "game" between Russian SOE/SCs (Agents) and Federal Government (Principal) are concentrated in the articulation of the Principal's interest and creation of effective system of controls and motivation of the Agents – as key features of the "game" overall efficiency and success and lowering Principal's risks.

One of the biggest challenge originates in the difference between Principal-Agent interactions in the industrial (manufacturing) and high-technology development "games" and *innovation* development experience. Speaking about catching-up development (which is obviously the case of Russian Federation) the former present much less challenges than the latter. Traditional industrial, also high-tech catching-up development model, exploited by nations like South Korea, China, and even afterwar Japan, presupposed clear set of well-defined goals. They were based on characteristics of industrial and technology complexes and markets of leading developed nations and had clear set of quantitative or controllable qualitative tasks and subtasks – starting from planning of volumes and categories of manufacturing output, productivity levels, capital accumulation, infrastructure development, and machinery acquisition and ending with creation of institutional establishments like banking system or export support activities. In other words, mostly "physical", tangible matter of industrial/high-tech development and clear vision of desirable target state always reduced Principals's risks and costs for defining controls, monitoring, assessment, and motivation of the Agent – and provided strong motivation for the Agents to play the "game" for getting new developmental benefits.

The *innovation* development is far less certain and quantifiable since innovativeness itself is not a clear measurable category or well-defined process or feature. First of all, *real* innovation processes – if we are speaking not about incremental solutions, but about indigenous and advanced/disruptive innovations – can be measured only aftermath of implementation and/or in medium- to long-term time frames. As seen by the dynamics of biotech industry, even after years or decades, payback of innovations may not be actual. The real set of economic, societal, and even technology consequences and benefits are also revealed years after implementation of innovation - like in case of the Internet.

The same problem is revealed in a try to determine clear goals and target state of innovative development, that theoretically should define both monitoring system, Principal and Agent motivations, controls and their values (including intermediate results or "gates" – using "stage-gate" innovation management metaphor). When economy, or industry, or enterprise becomes "innovative"? The answer is almost philosophical in nature and also could be defined only by complex post factum assessments, in many cases only indirectly.

Secondly, the measurement of innovations itself proves to be effective only with combination of both quantitative (sales growth, market share, capitalization as investor`s confidence measure, etc.) and expert or other qualitative (like assessment of life cycle and macroeconomic effects, possibilities for integration with pre-existing system and stimulating knowledge and technology spillovers, etc.[see also: Rogers, 2003]) parameters or indicators. "Classic" quantitative development indicators like R&D expenditures, number of patents, availability of qualified labor force, investments in machinery or other in most cases could *indirectly* depict relative potential for innovations, but are no way guarantees of innovative development or, a fortiori, innovation breakthroughs. I.e. despite empirically we know, that success of innovative development in general is proportional to greater amount of different resources invested, it is not rare when this quantitative approach is misleading without proper qualitative assessments. An almost classic example here is analysis of technology, innovation and manufacturing potential of advanced developing and leading developed nations using trade statistics and value added data. The former data signs at skyrocketing growth of capabilities of developing nations, while the latter reveal still prevailing, despite gradually degrading positions of the USA, Western Europe, and Japan in global innovations and high-tech markets – despite visible and really impressive advancements of China and other emerging economies [OECD, 2012; OECD, 2014; NSF, 2014].

Theoretically, measures based on value added or other composite indicators could be helpful, but they are in many cases hard to calculate (thus presenting challenge and additional costs for both Principal and Agents) and also not always measure innovativeness per se. Even some most "obvious" metrics not always reveal the actual potential of innovations – consider so-called Solow paradox [Brynjolfsson, 1993; Solow, 1987] of minor or no influence of ICT on labor productivity – despite really huge effects on market growth, creation of customer value, bettering of life for billions of people and affecting growth potential of almost all enterprises.

On the NIS or industrial innovation systems level this problem appears to be even more complicated if taking into account "intangible" resources of innovation, which are widely considered as key for innovation successes. Basic theories and different publicized general concepts of innovation development [Lundvall, ed., 1992; Chesborough, 2003; Etzkowitz, 2008; Horowitt, Hwang, 2012] stresses the importance of communications, interactions, and cooperation between actors as key success factor for innovative development and construction of effective innovation system. But these processes are hard to measure directly and are even more problematically assessed in terms of efficiency.

The problem of controls and monitoring system of Agents compliance is even greater when it comes to disruptive technologies or projects (addressing the other part of SOE/SCs innovation

development approach). As shown by A.Sen (2014) the disruptiveness itself is a very ambiguous and even misleading category for science and technology, and for policy support as well.

But despite target state, principles, measures and parameters of Government monitoring system over SOE/SCs innovation activities are very hard to define clearly, the control system – reflecting overall goals – however, should be nevertheless constructed. (This is also due to the high stakes of innovation development for the nation and elites which makes such a system absolutely necessary). Resulting solution leads to two connected situations in the Principal-Agent relations, which effectively explains some key features and effects of Russian innovation policies to SOE/SCs.

First of all, absence of a clear set of controls and target state descriptions, unclearness of replicable reference cases on behalf of the "leader nations" aggravates further the information asymmetry on the Principal`s side and results in a higher possibility of subjective solutions and requirements.

One of the best example for that are so-called "priority areas of technology breakthrough", formulated by President Dm.Medvedev in 2010 (energy efficiency and energy conservation, nuclear, space, "strategic" – i.e. disruptive and advanced – ICTs, and medical technologies). Not even speaking about the fact that these priorities differs greatly in the essence – since "medicine" is a very broad category unlike nuclear tech (understood mostly as non-energy radiology technologies), or space tech – the criteria of "breakthrough" were never clearly set and reasons for choosing precisely that list never fully explained.

Secondly, since any monitoring and motivation in Principle-Agent interactions should be based on some measurable or at least traceable processes and facts, the Government faced a challenge of choosing between two unoptimal indicator systems. One was based on different market indicators (share of market, market dynamics, etc.), which mostly reflects current and possible middle-term Agent`s performance, not necessarily connected to the innovations - and in Russian situation also was complicated by the industry specifics of the Agent. Second was measuring innovation processes indicators (research and development expenditures, number of patents, quantitative assessments of cooperation with universities and research organizations, etc.), considered as important for innovation activities and long-term innovative success.

Considering monitoring costs, formal accordance to "innovations" and other factors the latter indicators were set as central for monitoring of SOE/SCs compliance to Federal "innovative" policies. Unsurprisingly, "average" values for abovementioned indicators in western industries were chosen as reference. The choice in favor of process indicators also helped to downsize the problem of unclear target state of Russia's innovation policies: providing absolute and relative levels of innovation support of some most developed nations and other quantitative indicators in this case automatically should have meant reaching a desirable state of NIS and needed innovation development level of the nation.

The problem with this mode of control, however, lays in the fact, that unlike supporting really innovative culture, institutions or activities they orient the Agent, on one hand, on the demonstration of a process, not results, and on the other hand, on a kind of "halo effect" (or "sympathetic magic" practices – using terminology of J.Frazer`s "Golden Bough") - imitation of most successful global practices without their proper adaptation or reengineering.

The most visible example for the first situation are cases of R&D expenditures and R&D intensity. After special accent, made by President Medvedev on these peculiar indicators, they play a very important– despite not the central – role in PIR`s monitoring by Russian Federal ministries.

But despite being derived from commonly used OECD and other international organizations and expert metrics, R&D intensity per se do not equals innovativeness. For example, Apple for years enjoyed status of unchallenged innovation leader, while for at least significant part of that time its R&D intensity was moderately low in comparison with industry`s average. The other example is posed by comparison between Finland, South Korea and the USA innovation systems – despite higher R&D intensity, Finland and South Korea by many possible metrics and common sense couldn`t be viewed as a much more "innovative" or high-tech economies, than the USA.

More than all, from the pure logic point of view for the big companies high R&D expenditures and R&D intensity could indicate not only on innovativeness or efficiency of corporate innovation system, but also – if not much more – on significant technology or technology-related hurdles (e.g., need for create a product, which complies with complex regulation, or fast rate of market evolution), or on gaps or failures of the business model.

Not less important is that accenting R&D expenditures without appropriate investments in design and engineering, testing/piloting, manufacturing or market activities, business model elaboration, etc. do not make much sense. Even in linear innovation model overload of the innovation "conveyor" with too much R&Ds can result in higher losses, not necessarily in advancements.

The other example is presented by the case of PIR`s stimulation for creating of corporate venture funds or cooperation with existing venture capital entities. Despite this is a quite successive instrument for the established companies with elaborated business and management procedures, long-term innovation cultures and other important features, an analysis of Russian situation with all risks and costs calculated, inevitably results in conclusion that VC support could be a case only for very small group of SOE/SCs, mostly in ICT or ICT-related areas. Just one fact is quite illustrative: even to acquire a start-up (or any other enterprise) some of Russian SOE/SCs need to get approval of Board of Directors, that consists also from Governments officials – thus, prolonging procedures for months.

Considering abovementioned factors and risks and costs associated with them for the Agents, Russia`s PIRs controls in many cases produce on the SOE/SCs side an unsubstantial, sometimes economically unoptimal signals and results, oriented on the very formal compliance with the Federal requirements, not real. For example, despite 4 years of PIR existence and sharp rise of R&D expenditures and some other indicators, innovation intensity and results of Russian SOE/SCs are far from optimal (also revealed by the monitoring of PIRs – see Gershman (2013)) – even in comparison with Chinese "best practices". Of course, more time is needed for accumulation of resources, experience, competences and other factors, but there is strong belief that the problem is not just time.

Redefining the Principal

Considering abovementioned innovation policies (as any other Principle-Agent interactions) we automatically limit our analysis to the specific "game" between the Government/State and SOE/SCs, in most cases considering it as a "black box". But for full understanding of the "game" and its features it would be rational to apply a System of Systems approach, looking at it in the context of other "games" played by both Principal and Agents.

From this more broad perspective we have to redefine established roles of the actors and associate factors.

First of all, despite in a narrowly interpreted innovation "game" approach we are considering Government or State as Principal, more general approach shows us, that in reality its role is more complicated. Eventually this is not the State who is final "customer" or Principal for the innovation development "game", but economic entities (for whom this is an issue of

competitiveness and profits) and general public (for which this is a case of current and long-term welfare and employment).

Considering State/Government as an Agent for those Principals in a bigger, meta-game adds a lot to the understanding of limits and directions of its behavior as a Principal in the innovation "game" with SOE/SCs.

First of all, Government`s role as an Agent of the society and economic actors dictates it fulfillment of some additional, unignorable socio-economic obligations, that appears to be an important externalities for its role as a Principal in the "game" with SOE/SCs.

There is little doubts that innovation process eventually leads to the public good, public wealth, rising competitiveness, profits and other benefits for economic actors, elites and for general public. But the this process is no way linear and creates significant socio-economic turmoil on its way - from crises and up to extinction of "old" enterprises and whole markets (see, for example: Perez, 2002) – which is the essence of J.Schumpeter's "creative destruction". Thus an entrepreneur or other economic actor adds to the public good not directly, but by rising economic efficiency in some industry or market *at the expense* of the others (using P.Drucker`s definition - shifting resources to a more productive area).

It should be mentioned that this situation differs greatly from industrial/high-tech catching-up development "games", where rising employment and welfare were considered as predefined and reachable goals due to labor-intensive nature of some industries and clear "success stories" of other nations. Innovation, unlike this situation, is always a risky game with unknown result.

Since these negative socio-economic effects are considered as highly undesirable by different social forces, existing market leaders, and the Government itself, the Government as an Agent of these actors can shift several "protective" requirements or limits for the innovation development - as a Principal in innovation development policies. This is especially true when it comes to the SOE/SCs in Russia, since they are both considered as an Agents in the innovation development "game", and as an *agents* of Government`s general socio-economic policy with important general obligations for public.

Analysis of Russian innovation policies toward SOE/SCs generally supports this assumption. Established formal and informal PIR requirements, as well as number of ministerial, Presidential and Governmental "recommendations', methodologies and decrees in many cases creates a visible contradiction between innovation development and efficiency stimulus on one hand, and socio-economic obligations of the State on the other. The most visible two examples are productivity growth and energy efficiency. In first case we see mutually contradictory requirements for PIRs to rise labor productivity and simultaneous to rise employment of high-paid high-qualification specialists[4], all withhold massive layouts of other labor categories. In the second case, the energy efficiency policies and energy innovations, including framework 261 Federal Law, are if not stalled than effectively restrained by so-called cross-subsidization of public consumer's energy prices, lower price for gas on Russian market and other Federal socially-oriented energy efforts (see, for example: Volkova, Danilin, Pullins, 2012).

An important note should be made, that this effect is analogous, though not similar, to the situation even in the most developed nations. For example, in the USA innovation policies under President B.Obama declares creation of new jobs as one of the key rationales and soft requirements for support of "disruptive" innovation activities like green technology or advanced manufacturing - despite in most cases new technologies results in a vice versa effect.

[4] Decree #596 of the President of Russian Federation of May 07, 2012 "On the Long-Term National Economic Policy". URL: http://graph.document.kremlin.ru/page.aspx?1610833

For the Agent – especially for SOE/SCs – innovation activities in compliance with all set of Principal's requirements could lead to a significant amount of additional costs and risks associated both with the essence of requirements and arising risks neutralization, administrative costs of compliance (especially considering number and controversial nature of these requirements) and resulting low flexibility of the system in general.

This situation results in risks of losing momentum for innovation development and of growing desire of the Agent to uncomply with set of requirements – which, in turn, pose risk for the Principal's interests and for the game itself.

But it is not only Agents that suffers from higher risks and costs because of this situation. An obvious innovative policy bifurcation affects also Principals set of goals, instruments, and monitoring costs, since it is forced to form a more or less coherent policy for development of disruptive technologies and supporting of existing social and economic stakeholders – including reimbursement of SOE/SCs rising costs and risks.

The other implication of a Principal-Agent redefinition lays in the essence of Government and SOE/SCs relationships. Despite SOE/SCs clearly acts as an Agent, in some cases for the situation of Russia (and, presumably, some other developing nations) it also appears to be a kind of a Principle in a more general economic policies "game", especially since they play a very important role in the economic life. Thus, they find the ability to at least guarantee their benefits directly, not by compliance in the innovation "game", which should negatively affects the efficiency of the national innovation policies. More than all, theoretically this creates a situation, where Principle due to a enormous importance of an Agent and information asymmetry is forced to overspend resources in response to the latter's unjustified and uncontrollable requirements. Indirectly this is partly proved by the fact of strong support of the government to the flagship innovation projects of the SOE/SCs without discussion of their real advancements, and by comparatively high number until the recent times of gigantic SOE/SCs projects with unclear benefits for the economy (like high-speed train connection between Moscow and Kazan).

Conclusions

Key problems of the "games" reviewed could be reduced to several most important problems positions:

a) problems with defining of target states, controls and other features could be attributed to the unexisting market and living innovation institutions;
b) abovementioned fact leads to the assigning part of these institutional functions to the Agents (which are considered to be well-compensated due to their size and almost monopolistic roles);
c) SOE/SCs Agents generally loosely perform institutional functions, more than all, in an ill-defined, information-scarce (both for Principle and for Agents) "game" with weak loopbacks, this result in prohibitively high risks and costs for the them – effectively lowering their will to comply even though they understand potential benefits;
d) attempts to replicate industrial-era successes lead to use of mobilization, hierarchical instruments, that are ill-fit for innovation activities with qualitative, loosely accountable signals and controls and heterogeneous, horizontal (not top-down) nature of interactions.

From a pure formal point of view that leads us to a quite predictable conclusion, that creation of proper institutions and general conditions for innovations seems to be much more natural role for the State as Principal, than a try to create an innovation Agents from non-innovative and inflexible SOE/SCs.

But despite simplicity or even banality and attractiveness of this idea, the key problem of "game" construction and Principal-Agent interactions in this case still persist, since institutions and conditions do not appear independently.

Simple copying of foreign institutions in the same "halo" logic is always unhelpful, since factors defining their quality and quality of innovation activities, are heterogeneous in nature and frequently much dependent on national specifics. Implantation of unadapted institutions could affect some national processes or actors, but in a very restricted or even distorted way. Russian innovative initiatives and policies are the best example of that. Despite having almost all known instruments for support of innovative development – starting from venture capital fund of funds (Russian Venture Company) and ending with cluster initiatives and creation of international networks, it still didn`t produced enough tangible results.

A not less painful issue in this case is choosing proper Agents for institutional activities – existing Agents do not perfectly fit innovation institutional tasks, whereas new, pro-innovative and different-culture Agents could only emerge in a proper institutional framework. Intensive inclusion to global markets could be best solution considering "organic" transfer of experience and competences –and, finally, institutions, but without straightforward proactive national policies, and at least potential agents of change, success is nor predefined.

And, finally, there is still some unique resources and possibilities on behalf of SOE/SCs – like a possibility for a much longer planning due to the predictable cost compensation or resource mobilization – that are rational for exploiting in the innovation policy area.

A possible solutions for these dilemmas could be both in moderate fragmentation (where possible and without necessarily destruction of existing organizational bodies) of SOE/SCs Agents, and step-by-step alienation (where appropriate) them from a direct Government control and support, also by creating a substitute financial or quasi-business intermediate bodies. Simultaneously, the "game" itself should be enforced with communication loopbacks for both SOE/SCs and the Principal (with possible inclusion of a special information Agents, consisting of representatives from public, corporate, SMEs and professional communities groups). Another important desirable feature, derived from analyses of Russian SOE/SCs experience in last years, are diversified training "games" for both Agents and the Principal, in order to create "game" experiences, alleviate possible hurdles and create confidence and competence capital – also with some global dimension.

Construction of pro-innovation policies is never an easy solution, especially when it comes to the nations with traditional vertical, top-down cultures as in Russia. Mobilization memories are another aggravating factor, since past successes create illusion of universal nature of already used instruments and false confidence in the rules of "games", played in the past. But since innovation is the only way of success in the modern world, there is no choice except playing new type of "games" with gradual rising awareness of new possibilities and inclusiveness in global y in processes. Only in this case SOE/SCs would have a place in the future of innovation policies.

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