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Interim Report **IR-00-019**

Why Is the Russian Bear Still Asleep After Ten Years of Transition?

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23 March 2000

Contents

Acknowledgments

A number of persons have been involved in collecting the data upon which this report is based. We gratefully acknowledge the help and support from the following persons:

For the case study in Murmansk Oblast: Sveinung Eikeland, Vigdis Nygaard, Norwegian Insitute of Urban and Regional Research (NIBR) Alta, Norway; Lyudmila Ivanova, Institute of Economic Problems, Kola Science Centre Apatity, Murmansk Region, Russia.

For the case study in Arkhangelsk Oblast: Mikhail Yu. Varakin, Institute of Economics, Finance and Business Management, Arkhangelsk State Technical University, Arkhangelsk, Russia.

For the case study in the Republic of Karelia: Markku Tykkyläinen, Department of Human Geography, University of Joensuu, Joensuu, Finland; Minna Piipponen, Karelian Institute, University of Joensuu, Joensuu, Finland; Svetlana Gurova, Institute of Economics, Karelian Science Centre (of RAS), Petrozavodsk, Republic of Karelia, Russia.

For the case study in Moscow Oblast: Andris E. Kleinhof, Department of Economics and Foreign Relations, Moscow State Forest University, Moscow, Russia.

For the case study in Krasnoyarsk Krai: Vladimir A. Sokolov, Nastassia Sokolova, V.N. Sukachev Institute of Forest, Russian Academy of Sciences Siberian Branch, Krasnoyarsk, Russia.

For the case study in Tomsk Oblast: Alexander S. Sulakshin, Union of Forest Industrialists in Tomsk region, Tomsk, Russia; Olga V. Cherkashina, OOO “Anemon”, Tomsk, Russia.

For the case study in Irkutsk: Yuri Blam, Institute of Economics and Industrial Engineering, Siberian Branch of the Russian Academy of Sciences, Novosibirsk, Russia.

For the case study in Khabarovsk Krai: Dmitry F. Efremov, Far East Forestry Research Institute, Khabarovsk, Russia; Alexander S. Sheingauz, Department of Natural Resource and Infrastructure Problems, Economic Research Institute, Khabarovsk, Russia.

For the Swedish mirror study: Astrid Fell, Department of Business Administration and Social Science, Luleå University of Technology, Luleå, Sweden.

Among other persons who have collected valuble data for our project we would like to especially mention: Barbara Lehmbruch, Department of Political Science, University of California at Berkeley, USA; Tomas Malmlöf, Department of Business Administration and Social Science, Luleå University of Technology, Sweden; Olga Mashkina, Univeristy of Missouri-Columbia, USA; Minna Pappila, Faculty of Law, University of Turku, Finland; Marian Mabel, Department of Environmental Science, Policy, and Management, University of California at Berkeley, USA.

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Lars Carlsson, Nils-Gustav Lundgren and Mats-Olov Olsson

Introduction

Russia holds a tremendous amount of resources, minerals, oil, forests, etc. For example, its forests are dispersed over eleven time zones on a territory that contains more than 20 percent of the world's growing stock (Nilsson and Shvidenko, 1998). One has to multiply the Canadian forest resources about 3–4 times to reach the volumes encountered in Russia. An efficient but sensible exploitation of these resources could serve as a driving force in the transition towards a market economy that started with the dismantling of the Soviet State in 1991.

However, after almost ten years of transition timber production is smaller than ever. For example, in Arkhangelsk,[1] one of Russia's largest forest regions, harvesting reached a peak in 1987/88 with a total of around 25 million m^3. Since then, cutting has decreased significantly and, in 1996, the harvesting level was only about 29 percent of that in 1988. Between 1990 and 1996 the production of commercial wood dropped from 19.4 million m^3 to 7.2 million m^3 and in 1994 production fell below the 1940 level. The situation is virtually the same for the whole of Russia (Moiseyev, Uusivuori and Burdin, 1998:21 ff.).

By virtue of its former importance in the Russian economy and its future prospects for wealth creation the forest sector is a good illustration of the Russian dilemma. The nation seems to have it all: resources, people, endless needs to be fulfilled and, compared to many poor areas of the world, a production apparatus already exists, however underutilized. Yet, despite deliberate efforts to induce the "blessings" of capitalism, the "Russian Bear" still seems to be asleep. How can this be explained?

Answering this question is the task of this article. Presumably the answer is relevant not only for the forest sector but for other sectors of the Russian economy as well. The

[1] The authors of this article are working in the Forest Resources Project at the International Institute for Applied Systems Analysis (IIASA), Laxenburg, Austria. The Arkhangelsk study is one among a number of case studies dealing with institutional aspects of the Russian forest sector that has been published by the project (see Carlsson and Olsson, 1998a, 1998b; Carlsson, Lundgren and Olsson, 1999; Carlsson *et al.*, 1999; Kleinhof, Carlsson and Olsson, 1999; Efremov *et al.*, 1999; Fell, 1999; Jacobsen, 1999; Lehmbruch, 1998, 1999; Malmlöf, 1999; Piipponen, 1999; Pappila, 1999; Ivanova and Nygaard, 1999; Blam, Carlsson and Olsson, 2000; Sokolova, 2000; Carlsson, 2000a; Nysten-Haarala, 2000; Mabel, 2000; Wignall *et al.*, 2000.

article aims at increasing our understanding of the creation of a market economy by providing the fundamental insight that there are no easy top-down procedures that automatically lead to this goal.

Institutions and the Development of Markets

It has been argued that a general problem with many of the proposed measures for improving the situation in Russia is that they presuppose the existence of an already well functioning institutional framework (North, 1997; Brezinski and Fritsch, 1997; Carlsson and Olsson, 1998a; Stiglitz, 1999; Carlsson, 2000a). This objection is easy to understand if one appreciates that institutions should be understood as "the rules of the game" in a society, not as organizational entities (North, 1990; Crawford and Ostrom, 1995). Thus, an institutional framework consists of those formal and informal rules that *de facto* are used by a set of actors. More precisely, institutions can be defined "as the legal, administrative and customary arrangements for repeated human interactions, […] the prevailing institutional framework in a society consists of formal and informal rules" (Pejovich, 1998:23). This implies that the institutional framework of a society is composed of a large number of institutions.

Ramazzotti (1998) discusses the idea of *dominant institutions* or a *dominant institutional setup,* i.e., "one which is both persistent over time and extensive over economic space. It is the one most likely to affect a great deal of other institutions and related setups" (p. 7). Thus, we can conjecture that the reason why vital markets, for example, in the forest sector, have failed to appear is because a dominant institutional setup still exits that negatively affects the new and more market oriented institutions. If so, an overarching institutional umbrella might effectively prevent the efforts of restructuring that has been pelting on it for almost ten years of transition. To summarize, the reason for the fact that economic development has failed to generate welfare for the Russian people is to be found in its institutional framework.

Institutions make the world predictable. In a market economy, institutions, such as the bank system, commercial law, conduct of trade, well-defined property rights systems, etc., are essential. For example, a reliable credit system distributes economic risks among parties. Thus, resources can be acquired on fixed terms, firms can confidently make investments and plan for the future, and so forth. A basic assumption behind any suggestion to deliberately change institutional arrangements is that institutions affect strategic choice and that the behavior of each actor depends on his or her *expectation* of what others may do (cf. Coleman, 1988; 1990; Knight, 1994; Benham *et al.*, 1995; Gaddy and Ickes, 1998b).

North (1997:2, ff.) has suggested four institutional features that are associated with low-cost transaction and creditable commitment, so essential for the functioning of any market economy:

- The cost of measuring.
- The size of the market.
- Enforcement of rules.
- Attitudes and perceptions.

The *first*, the cost of measuring, has to do with the fact that when no, or poor, standards exist with regard to the quality of goods and services, the behavior of agents, etc., every single transaction might be subject to endless deliberations. The same applies when property rights are ill defined. For example, in the Russian forest sector no branch organizations such as, for example, the Scandinavian forest measuring societies, have yet been developed, and it is a well-known fact that property rights are poorly defined (Sheingauz, Nilsson and Shvidenko, 1995; Petrov, 1997; Fell, 1999).

The *second* feature is the size of the economy. When interpersonal exchange dominates, friends, relatives, or clans are the main players. When markets grow exchange becomes more impersonal and more elaborate (and expensive) ways of constraining the parties might occur. However, market competition has demonstrated its capability to (cheaply) constrain the actors.

The *third* feature is the enforcement of rules. When parties dispute or break the rules they should have recourse to cheap ways of solving their differences. This is the logic behind the idea of third party solutions. The legal system in a society performs this function. It should also be emphasized that the cheapest enforcement occurs when people have internalized certain conducts of behavior as norms. When it comes to the Russian forest sector we have strong indications that the third prerequisite, that of effective enforcement, has still not been developed (Hendley *et al.*, 1997; Hendley, 1998; Hendley, Murrell and Ryterman, 1999; Pappila, 1999; Fell, 1999).

The *fourth* feature of importance for understanding institutions and the development of markets has to do with the mindset of the actors. Many authors have emphasized the cultural aspects of the Russian people as an important "variable," and perhaps also an obstacle, for transforming the Russian society to a democratic market economy (Kaminski, 1992; Kharkhordin and Gerber, 1994; Benham *et al*., 1995; Obolonsky, 1996; Gareyev *et al.*, 1997; Jensen, 1997; Kennaway, 1997). Two main attitudes prevail, one emphasizing the special experiences of almost eighty years of "Soviet thinking" and the other stressing the inheritance from the period before this, from Tsarist times. In essence, however, both lines of argument are based on the same idea of a still existing collectivist attitude pulling in another direction than what is suitable for the current transformation of society. This attitude tends to foster and retain rules that are not suitable for a market oriented forest sector. In this connection, the problem of trust is central (Rose, Mishler and Haerpfer, 1997; Mishler and Rose, 1998; Huemer, 1998). Clearly, beliefs and attitudes nourished during decades of communist rule still prevail and affect people's conduct.

> While the subjective models individuals employ may be, and usually are, a hodgepodge of beliefs, dogmas, 'sound theories', and myths, there are usually elements of an organized structure to them that make them an economizing device for receiving and interpreting information (North, 1997:9).
>
> Although formal rules may change overnight as the result of political or judicial decisions, informal constraints embodied in customs, traditions, and codes of conduct are much more impervious to deliberate policies (North, 1990:6).

How Do We Identify Movements Towards Markets?

It would be presumptuous to assess Russia's performance simply by comparing it to the situation in Western countries. The evaluation criteria that we use should therefore rather be seen as a set of "baseline principles". Thus, we assume that a specific institutional configuration is conducive to a sustainable Russian forest sector and useful for the whole economy if the following conditions are met:[2]

- Constitutional rules are acknowledged and transparent.
- The structure of property rights is settled and well defined, i.e., private actors can acquire property or get the right to utilize property for their own benefit.
- Rules and regulations from official authorities are regarded as legitimate, and apply equally to similar actors.
- The market decides the price of property and goods.
- Decision-making regarding collective choice and operational rules is decentralized.
- Private investors can realize the returns on their investments.
- Rules are enacted aimed at preventing the devastation of natural resources.
- Legitimate authorities take measures against violations of rules.

In the subsequent parts of this article we shall illustrate what has been demonstrated in our previous studies,[3] namely, that these criteria are poorly met in the Russian forest sector. This article, like the whole investigation, is based on the fundamental assumption that efficient markets are built from below, albeit with the assistance of the political structure, and that the central actors in this "construction project" are the managers of individual firms.

Market Building and the Virtual Economy

The guiding hypothesis explaining why vital markets have failed to appear in the forest sector is that enterprise managers generally have weak incentives to restructure and thereby to reduce their firms' *distance* to the market. We conjecture that the behavior in the forest sector is basically dictated by the logic of "the virtual economy" as described by Gaddy and Ickes (1998a). In line with this theory, the main reason why the forest sector does not seem to move towards a market economy, i.e., why firms have not yet restructured in order to shorten their *distance* to the market, is that the virtual economy provides an incentive structure which, in fact, discourages managers to do so. Consequently, the current failure in the forest sector cannot be explained by bad management, lack of money, or absence of customers. Nevertheless, some argue that the

[2] These are the evaluation criteria used in our IIASA case studies, see footnote 1.

[3] For a list of our case studies, see footnote 1.

"lack of money" in the forest sector should mainly be blamed on bad management. This argument might have some merit, but it is more likely to confuse us regarding the institutional aspects of the problem. In order to understand some of these institutional hurdles one must start from the assumption that individuals act in a rational way, under given circumstances. Thus, with Gaddy and Ickes (1998b:2), we assume "that managers are rational and that the environment induces them to postpone (avoid) restructuring".[4]

Being one of the cornerstones in the former socialist economy, the forest sector is an especially good "case" for testing this hypothesis. It can also be assumed that the forest sector is a fairly good representative for the industrial sector in general and that our conclusions will be relevant for other sectors of the Russian economy as well. What are the characteristics of a virtual economy and what logical effects on business behavior would such an economy have?

> The new system can be called Russia's virtual economy because it is based on an illusion about almost every important parameter: prices, sales, wages, taxes, and budgets. At its heart is the pretense that the economy is much larger than it really is. This pretense allows for a larger government and larger expenditures than Russia can afford. It is the real cause behind the web of wage, supply, and tax arrears from which Russia cannot seem to extricate itself (Gaddy and Ickes, 1998a:1).

This type of economy might continue to work only if it is insulated from market competition, e.g., through an extensive use of barter, which effectively breaks the market based price signals and allows the use of fictitious prices of goods and services quite separated from their market values. This practice maintains the "pretense" of value creation, while industry might in fact be a "value destructor" (Gaddy and Ickes, 1999a). Consequently, if this assumption is right, there are "hoards" of would-be unemployed workers, engineers, bureaucrats, etc., in Russia today.

Business Behavior in a Virtual Economy

The managers of Russian enterprises have strong incentives to continue to run their firms independent of their profitability. The social responsibilities associated with running firms are part of the explanation. Our investigations, as well as other studies, show that barter, tax offsets and other non-monetary solutions are common features in the enterprises' activity. In addition, the lack of effective bankruptcy and arbitrage systems contribute to postponing a "creative destruction" of firms in the sense Schumpeter envisaged as a driving force of a market economy (Swaan, 1996:229, ff.). Thus, firms can continue to produce although their outputs are paid for by other means than with cash. Such a production is aimed at generating "soft goods" that can only be traded in virtual "quasi-markets" rather than in real commercial markets. Why then do managers avoid restructuring?

Most Russian forest firms have a substantial distance to travel before they can meet the demands of competitive wood markets. Their first option should be to invest in making production more effective but, as we have discussed above, this solution has its own

[4] Hendely (1999) provides a number of examples of how enterprises might develop strategies to survive in the virtual economy.

problems. The other option, according to the Gaddy and Ickes (1998b) virtual economy theory, is to invest in "relational capital", e.g., to perform services for the local authorities, to negotiate for privileges, etc. (Figure 1).

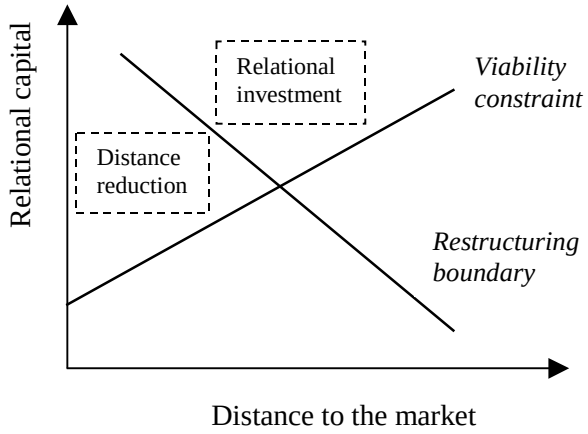

Figure 1. Business behavior in a virtual economy (after Gaddy and Ickes, 1998b).

Thus, the more fraternizing with bureaucrats, the more tax offsets, privileges, etc., one can obtain, the more investments are made in this kind of "capital". Moreover, and given the fact that in most cases the distance to competitiveness is significant, such "investments" are cheaper and, thus, preferred. These circumstances have the nasty effect that we cannot, in fact, conclude that an enterprise that shows relatively high production volumes is more successful than a similar enterprise producing smaller volumes. Such an enterprise might as well be a "value destructor" and a producer of "soft goods" still having a long distance to travel before it can survive in a competitive market.

Whether forest firms choose to invest in relational or physical capital depends upon the initial (inherited) stock of such capital in their possession. The managers will simply prefer the type of investment that is most profitable and it is obvious that the Soviet type of integrated forest industrial system (that was inherited in 1991) provides a rich fund of relational capital from which to profit.

It should be emphasized that the slope of the viability line in Figure 1 basically reflects the institutional setup. The more firms have to invest in relational capital in order to stay viable the steeper the line would be. This also tells us that the intercept point to some extent could be regarded as the "corruption level". However, even in a society with very low corruption firms must invest in relational capital, such as networking or goodwill activities. The restructuring boundary in Figure 1 is the demarcation line separating firms that would engage in restructuring rather than make relational investments (Gaddy and Ickes, 1998b:25). To summarize, whether a firm chooses one strategy before another depends on where it is located in the space in Figure 1, i.e., it depends upon the quality of the capital it already possesses, and the costs for moving in one direction or the other, as well as on how its investment decision will influence future profitability. Why should a director strive to generate cash if this money ends up in the hands of tax

authorities or in the pockets of criminal groups? Moreover, it is risky to be the first to enter a world of uncertainty:

> Enterprises that move too fast to the market economy bear a disproportionate share of the tax load. Thus the decision to invest in distance reduction depends on expectations about what other enterprises will do. This is why multiple equilibria arise. […] If all other enterprises chose to keep $\Delta k_t = 0$ [i.e., no investments in tangible capital] then an enterprise that invests faces high taxes which make no-investment the dominant strategy for the enterprise. If all other enterprises are investing, however, informal activities may be very costly, and hence formal production may be the dominant strategy for the enterprise (Gaddy and Ickes, 1998b:27).

Cooperation is an evolutionary product, but the Russian state is "new" and the present situation in Russia might as well be characterized as a kind of Prisoners Dilemma, i.e., a dominant, negative equilibrium exists. In such a world, it is better to defect independently of what the other players do. In his seminal book, "The Evolution of Cooperation" Robert Axelrod (1984) has demonstrated that an overall winning strategy is to cooperate when others do and to answer with defection when other players do not cooperate.[5] This requires, however, that the "shadow of the future" is fairly long, i.e., we are rather certain that the game will continue for a while and that not everyone begins their interaction with the assumption that they will be cheated.[6] A basic prerequisite for this is the existence of rules and norms — institutions — that compel people, e.g., enterprise managers, to take the first step and, thus, inviting others to cooperate rather than defect or totally abstain from interaction.

Business Behavior in the Russian Forest Sector

Applied to the Russian forest sector the discussion above gives rise to a number of methodological as well as substantial questions: What indicators do we have that firms are actually operating in a virtual economy as has been depicted above? How should the institutional framework of the Russian forest sector be characterized? For example, do we have any indications that "cost of measuring" is too high, that "enforcement of rules" are lacking, that inappropriate "attitudes and perceptions" prevail? Is "the size of the market" still too small for real competition to arise? And, more interesting, is all this reflected in the behavior of the forest firms? For example, do they invest in tangible or relational capital? How extensive are their engagements in the production of soft goods? Do they have "real" customers and can they acquire enough timber? How are payments made and do they have problems with broken agreements? And, if so, do they have access to reliable third party solutions? And so forth.

The answers to these questions are based on a study conducted among 221 Russian forest firms in eight Russian regions. In order to provide a possibility to compare the Russian results with more "normal" market circumstances a mirror study has also been

[5] See also Axelrod (1997).

[6] For an analysis of how this concept might apply to the management of common-pool resources, see Barkin and Shamaugh (1999).

conducted. In addition to the Russian firms the database contains information about 24 Swedish forest firms.[7] The findings are summarized in Table 1.

The first issue to be discussed is investment. While investing is a major prerequisite for the renewal of the outdated production apparatus it can be noticed that only 36 percent of the Russian firms that we studied make any investments (Table 1). As can be seen by consulting Appendix 1 joint ventures invest significantly more than other types of firms. More export-oriented firms are likely to invest more, the same is generally true for newer enterprises as well as for firms that are *not* owned by the state. Most of the firms that do invest utilize their own financial resources without any involvement from the banks. This is reflected in the poor contacts that forest firms generally have with the banking system. Only 17 percent of the firms report that they have such relations.

One would expect that a lack of timber would not be a problem in a country that has among the world's biggest forest resources. However, as Table 1 indicates, 44 percent of the firms perceive a shortage of wood. Typically these are larger processing industries that require huge amounts of wood. They are the firms that in the Soviet era constituted the "backbone" of a centralized forest management and delivery system.[8] It can also be noted that almost 2/3 of the Russian forest firms in our survey do not export any of their products. Given that the local market for wood is underdeveloped this is striking. Another indication of the malfunctioning of the supply system is that there are greater shortages of timber in regions with large exports, thus indicating a general inability to respond to increasing demand (cf. Piipponen, 1999).[9]

Buying and selling wood not only require providers and customers. It is also a matter of payment and contracting. In essence, these problems are institutional, i.e., they are linked to the existing "rules of the game". First, it should be noticed that like many Russian firms forest enterprises are also heavily engaged in barter trade, while this behavior is totally absent among the Swedish firms.[10] What is more striking, though, are the sales arrangements. While only 4 percent of the Russian firms accept payment after delivery this is the most common procedure among Swedish forest firms. It is easy to imagine how this expression of lack of trust affects the economic activity. As can be seen in Table 1, Russian enterprises encounter significant problems when they sell and buy their products. Violation of agreements is the rule rather than the exception. In comparison, none of the firms in the Swedish group regards violation of agreements as a big problem.

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[7] See the description on how data was collected in the whole project, e.g., in Carlsson and Olsson (1998a).

[8] For example, in Tomsk, we noticed how one of Russia's biggest plants for particle board was depending on a system of raw material supply that was tailored for deliveries of full length trees by train directly onto the factory premises. Since the logistics of this system no longer worked the plant had to rely on other types of wood and other methods of delivery. As a result the plant did not get sufficient amounts of timber.

[9] Moscow Oblast with its concentration on furniture production is an interesting example of the inability to utilize local resources, see Kleinhof, Carlsson and Olsson (1999).

[10] For an illustration on how this trade might be organized in the forest sector, see Ivanova and Nygaard (1999: 64 ff.).

Table 1. Attributes of forest firms in Russia and Sweden. Percent.

	Russia N=221	**Sweden** N=24
Activity of firms		
Forest management	8	8
Harvesting	24	4
Sawmill/harvesting	25	33
Sawmill	31	33
Pulp/paper	4	4
Trading/consultant	8	17
Background of firms/ownership		
Public	24	29
Privatized	42	0
New private	34	71
Investing in company?		
Yes	36	85
No	64	15
Social responsibilities		
Yes	54	83
No	46	17
Export of production		
Great >40% of the volume	24	21
Less <40% of the volume	10	4
No export	66	75
Bank relations?		
Yes	17	82
No	83	18
Amount of timber supply		
Enough	56	78
Shortage	44	22
Method of selling payment		
Cash	56	100
Barter and cash	44	0
Arrangement of selling payment		
On delivery	37	0
Before delivery	48	4
After delivery	4	96
Mixed	11	0
Violation of buying agreements		
Big problem	44	0
Small problem	30	4
No problem	26	96
Violation of selling agreements		
Big problem	59	0
Small problem	23	12
No problem	36	88
Obstacle for operation of firm		
Taxes	49	8
Forest legislation	17	25
Business/export legislation	16	25
No big problems	18	42
Important change in forest sector		
Taxation system	23	20
Forest legislation	18	30
Business legislation	13	25
Ethics/politics	11	25
Investment/technology	19	0
State coordination	17	0

Russian firms have extensive social responsibilities, such as provision of housing and transport for their labor, health care, childcare, and provision of fuel wood. A majority of the Russian forest firms have such responsibilities. It should be noted, however, that Swedish enterprises also engage in social activities, but here the engagements are different. Typically, Swedish firms are engaged in different kinds of sponsorship, for example, support of local clubs or individual athletes. One firm even buys textbooks for a local school. Some of the larger Swedish companies provide housing for some of their employees, but never for the entire work force as the Russian firms might do.

The representatives of the forest firms were asked what they regarded as the most binding restriction for running their enterprise. The answers are summarized in Table 1. It should be noted that finding a market is not mentioned as a major problem, while the tax system is said to be the biggest hurdle. This result certainly reflects a number of well-documented odd features of the Russian tax system, such as the multitude of taxes and tariffs, the in-transparency of the system, and the draconian sanctioning practice.[11] Other obstacles mentioned both by Russian and Swedish firms can be attributed to forest and business legislation. When asked to suggest changes that might possibly improve the situation both Russian and Swedish managers suggest lower taxes and changes in legislation. It should be noted, however, that the existing forest legislation is regarded as a bigger problem among Swedish than among Russian enterprise leaders. From the comments it becomes clear that it is the perceived strictness of the environmental legislation that is the problem. It should be noted, however, that this attitude most likely illustrates the fact that the Swedish institutional framework is transparent and well defined, meaning that both monitoring and sanctioning work quite well. Accordingly, rule compliance is also high. Therefore, in the eyes of individual Swedish business leaders the environmental clauses are regarded as a restriction on the profitability for the individual firm.

Finally, one major difference between Russian and Swedish firms should be mentioned. Around 20 percent of the Russian firms call for a general renewal of technology and about the same amount suggest that the state should coordinate the forest sector. Nothing similar can be observed among the Swedish firms. In fact, there are a number of Russian firms that openly wish to "become state owned again". This can be interpreted as an indication of the fact that the disintegration of the Soviet management system has not been replaced by alternative and well functioning ways of organizing the sector based on market economic principles. If the situation is chaotic and market mechanisms do not work, the calls for formal coordination is understandable.

[11] Between 1991 and 1996 the Russian taxation code has been changed 256 times. This has given the system a quality of unpredictability. Taxation experts have characterized the tax penalty regime as "draconian" with fines of 100 percent for the first violation, 200 percent for the second, etc. (Rogfalk, 1996:7 ff.). According to a survey conducted within the framework of the New Russian Barometer (Rose *et al.*, 1998: 16 ff.) 56 percent of the population are of the opinion that there is no need to pay taxes if you do not want to do so. If caught, 27 percent think the problem could be solved by paying bribes.

Production, Productivity and Employment

How can the current situation in the Russian forest sector be explained? Answering this question is the task for the subsequent sections of this article. First, the relation between productivity, production and employment will be discussed. Second, the Gaddy and Ickes hypothesis will be tested; do the firms in our sample behave in accordance with what is anticipated by their theory of the virtual economy? Finally, it is demonstrated what type of attributes, such as size and ownership, explain different types of enterprise behavior.

In this section we concentrate on the first issue, productivity. It should be noted that while production in the interviewed firms has dropped by around 40 percent during the last five years, employment has decreased by only about 25 percent, which indicates inadequate restructuring efforts. The same pattern was found in a study by Nilsson and Shvidenko (1998).

In the following two diagrams changes in employment and production for 123 interviewed firms are related to an estimate of productivity change (production volume in tons or cubic meters related to the number of employees in 1998 and 1993).[12] In this way the diagrams indicate restructuring efforts manifested in changes in the competitive position of the firms during the last five-year period.

As shown in Diagram 1, a number of firms have been able to maintain or increase their productivity since 1993 (those above 1 on the vertical axis). However, only seven have simultaneously increased their employment. Around 30 firms expose a market behavior similar to that of a typical western forest enterprise, i.e., they decrease employment and increase productivity. From Diagram 1 it could also be concluded that the vast majority of the companies find themselves in the very difficult position with stagnating or decreasing productivity and decreasing employment. Fourteen firms have even increased their employment despite decreasing productivity. Indeed, this should be interpreted as a very strong verification of the virtual economy thesis.

[12] All *leskhozy* as well as all firms younger than five years are omitted in this comparison. A *leskhoz* should be considered as a public authority rather than an enterprise operating in the emerging Russian market economy.

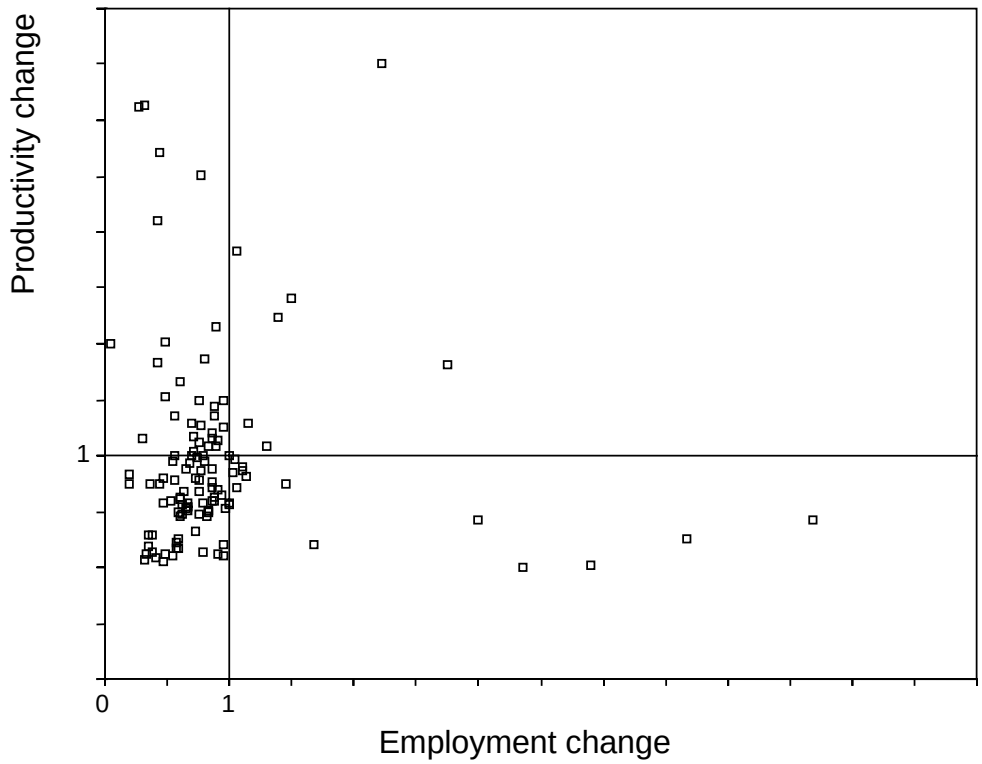

Diagram 1. Employment change related to productivity change in 123 Russian forest enterprises 1993–1998.

In Diagram 2, productivity changes are related to the changes in production volumes. Productivity decreases are obviously heavily dependent on the large reductions in production that have taken place during recent years in most Russian forest enterprises. The simple linear regression applied fits well to observed changes (Rsq 0.67) among the firms with decreasing production (i.e., those below 1.0 on the horizontal axis in Diagram 2). Thus, the possibility to reduce employment at the same rate as production decreases seems to have been limited in most companies. As shown in the diagram only a few firms have been able to increase productivity along with a decreasing production volume. In fact, our calculations show that a decrease in production is accompanied by an equal proportional reduction in productivity (elasticity, ß = 1.02).

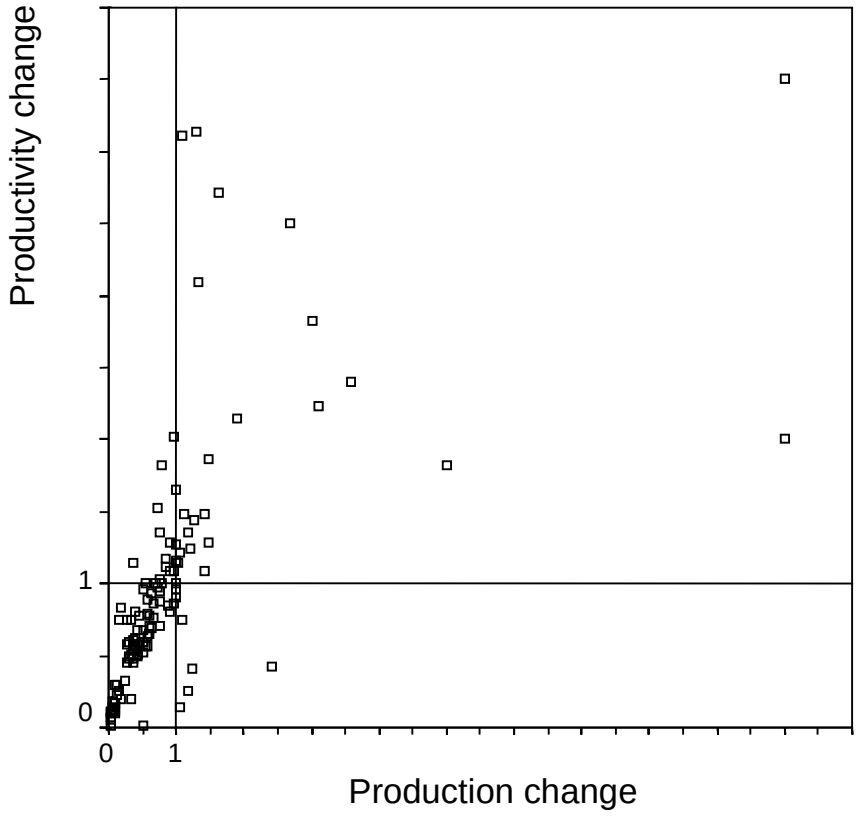

Diagram 2. Production change related to productivity change in 123 Russian forest enterprises 1993–1998.

Diagrams 1 and 2 show that the forest sector decline might be even more severe than previous analyses have indicated (cf. Backman, 1998). Only few companies in our data set seem to have started any restructuring and transition process in a market oriented direction. This conclusion is further supported by Diagram 3. As can be noticed state/publicly owned firms behave differently compared with other types of enterprises. For example, when production decreases in state owned firms productivity decreases with almost the same proportion (0.98). This can be compared with new private firms where the productivity change is much lower (0.53). Thus, it can be concluded that state owned firms are much less adaptive than new private firms. Old publicly owned, but privatized, enterprises seem to have the same types of problem. Even if the production volume shrinks they do not adjust their work force accordingly, something that inevitably affects productivity.

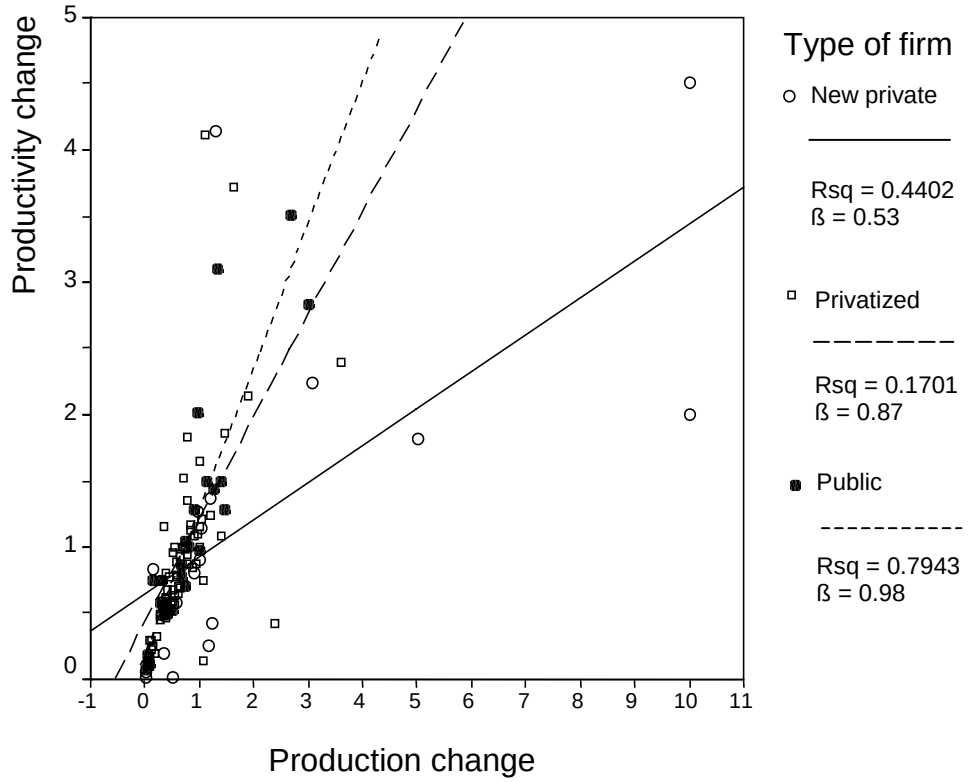

Diagram 3. Production change related to productivity change among different types of Russian forest enterprises 1993–1998. N=123.

One consequence of the Gaddy and Ickes theory of the virtual economy is that we cannot, in fact, be sure that a firm showing a positive production rate is in any market sense successful. Higher production rates might also reflect an increase in production of "soft goods" exclusively traded in the virtual "quasi-market". Thus, we need other ways to analyze the behavior of the firms that capture both investments in "relational" and "tangible" capital. This is the topic for the next section.

Forest Firms in the Virtual Economy

In order to capture the Russian forest firms' location in the "restructuring space," depicted in Figure 1, we have to find indicators that capture whether a firm operates in the relational sphere or if it is oriented towards reducing its distance to the market. To capture this, an empirical specification of the Gaddy/Ickes concept "social relation" and "involvement in the virtual economy" versus "transition firms", i.e., firms that are trying to reduce, or that are actually reducing, their distance to the market, was made in the following way. The degree of "relational capital orientation" versus "distance to market reduction" was estimated by two indices that theoretically might vary from one to ten. In the social-relational capital dimension we find firms that obviously do not make efforts to transform to the market or try to act on monetary and market terms. Such a company will get one "point" every time its behavior fits the following criteria:

- Use of barter in buying arrangements.
- Use of barter in selling arrangements.
- Negotiates but does nothing more to enforce broken buying agreements.
- Negotiates but does nothing more to enforce broken selling agreements.
- Has multiple social responsibilities.
- Says that lack of privileges is the most binding restriction for operating the firm.
- Calls for privileges for the company in question concerning important forest policy changes.
- Wants to become public again after being privatized or calls for "state coordination," i.e., a state command economy to be reintroduced in the forest sector.
- Increasing employment while decreasing productivity.
- Increasing production while decreasing productivity.

As a contrast, a company is regarded as a "market distance reducer" if it:

- Invests in equipment, buildings or education of the workforce.
- Has bank relations on the buying side.
- Has bank relations on the selling side.
- Is not involved in barter on the buying side.
- Is not involved in barter on the selling side.
- Uses arbitration courts to enforce broken buying and/or selling contracts.
- Regards workforce discipline and lack of entrepreneurial tradition and/or business ethics as important obstacles for operating the firm.
- Identifies poor workforce skill as an important binding restriction for the firm.
- Calls for efficient business legislation enforcement as a necessary change in policy in the forest sector.
- Operates with increasing productivity.

It should be noted that these indices are deliberately constructed by variables that both reflect actual behavior and attitudes. We believe that this is necessary in order to be able to capture the character of the problem. The outcome of this calculation is illustrated in Figure 2.

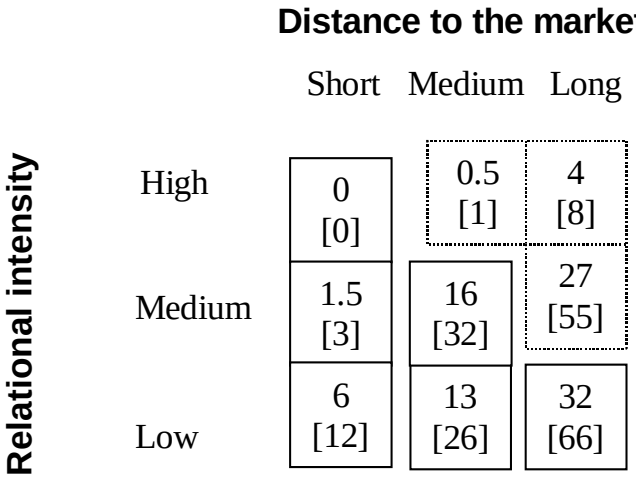

Figure 2. Distribution of Russian forest firms according to their distance to the market and their investment in relational capital. Percent (N = 203).

It should be evident that the Russian forest firms line up fairly well along the two dimensions that is believed to capture market behavior (distance) and some kind of aptitude for avoiding restructuring and transition to the market (relational intensity). Six percent, or twelve enterprises, clearly display a kind of market behavior, i.e., they have a low value on the distance index meaning a relatively short distance to travel towards becoming competitive on the market while, simultaneously, their investments in relational capital is fairly low.[13] It can also be seen that more than 60 percent of the firms have a long distance to travel towards the market while 4 percent seem to compensate the long distance with higher relational intensity. We regard the firms located in the down/right square in Figure 2 (32%) as unviable and those in the upper right group as typical virtual economy enterprises. For the middle group the situation is unclear.

When analyzing these groups (indicated by the four blocks in Figure 2) it should be noticed that there are some, but rather few, attributes that *significantly* affect the likelihood for market oriented behavior (cf. Appendix 2, bold figures). Thus, we find that the overall likelihood for a forest company to act as a transition firm is fairly low, 7.4 percent.[14] However, if the enterprise is an exporter the likelihood increases (7.4 + 13.1 = 20.5%). The most problematic situation for a forest firm is probably when it has not succeeded to traverse towards the market and when its relational capital is poor, 32.5 percent of the firms have this problem. However, the likelihood that we find very big companies in this predicament of having poor relations is fairly low, (32.5 – 11.1 = 21.4 %) while this situation is more common among the smallest firms. Likewise, the likelihood of finding larger enterprises in the virtual economy group is significantly higher (31.5 + 9.1 = 40.6) than for smaller ones (31.5 – 10.1 = 21.4). The explanation is, of course, that larger enterprises have better access to non-market solutions.

[13] As predicted the vast majority of the Swedish firms (75%) is to be found in this square of the matrix. We regard this as a rough validity test of the indices.

[14] Note that this says nothing about the success or profitability of the firms.

One might suspect that the firms in a weak position in the virtual economy and with a long distance to market competitiveness, i.e., in the “low-long square” of Figure 2, in general represent firms in a catastrophic situation. This would, for example, be indicated by an exceptionally large and rapid production decline and, as a matter of fact, there are some indications of this. A statistical check reveals that during the last 5-year period about 45 percent of the 179 firms located in the four squares down to the right in the matrix, have experienced a larger reduction in produced volumes than the average. Among firms with a short distance to the market seven out of fifteen (45%) have maintained or increased their production, while only two have reduced their production more than the average firm.

Depending on where firms are located in the matrix, Figure 2, it can be expected that their managers have different perceptions of problems and that they suggest different remedies for their solution. This is discussed in the next section.

Voices from the Margin

As we have seen transition firms constitute a marginal group which shows attributes and acts more in line with our image of firms in developed market economies. Given that this is the most strategic group for developing a market economy it is particularly important to find out how the leaders of these enterprises comprehend the current situation.

Diagram 4 shows the answers to one of the questions in our survey from the seven percent transition firms compared with all the rest. The question was: “If it would be possible to change anything related to the Russian forest sector, what would you change?” Transition firms clearly emphasize policy changes related to business legislation, better business ethics, work discipline, etc., while firms that do not belong to this group call for state intervention and coordination and give higher priority to problems associated with technology, finance and investments.

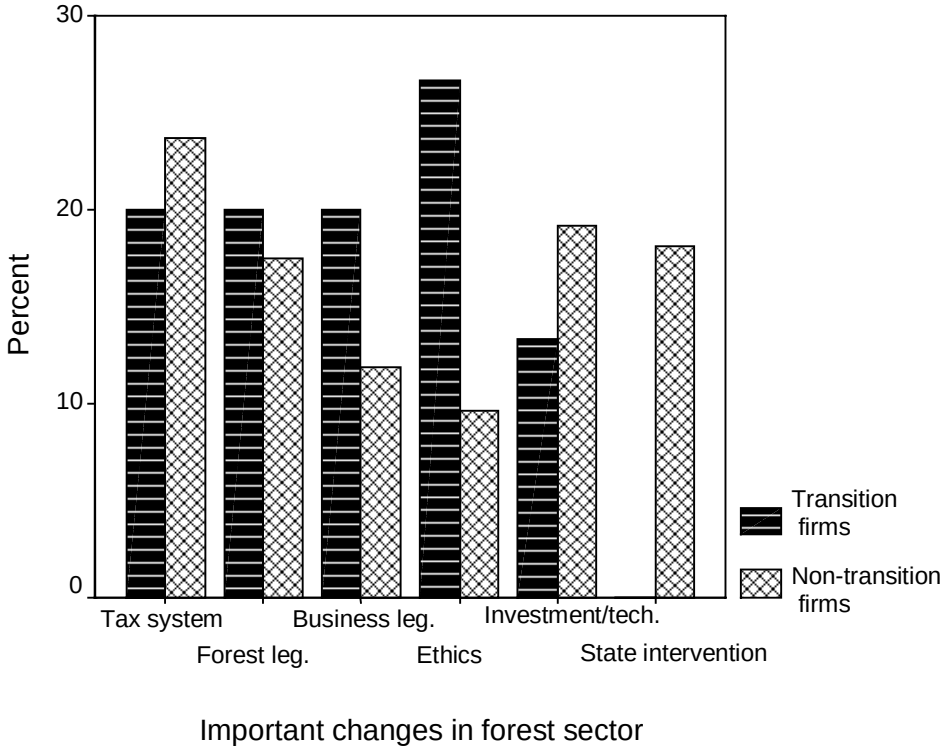

Diagram 4. "If it would be possible to change anything related to the Russian forest sector, what would you change?"

The 15 enterprises that we have classified as transition firms, i.e., those trying to, or actually reducing market distance, emphasize the unpredictable and often contradictory business legislation as basic problems. An efficient mechanism for the executions of the decisions made by arbitration courts is also demanded as an important policy change needed to improve business in the forest sector. These enterprises also identify high transaction costs, due to inefficiency of the banking and communication systems, as big problems that must be solved. The badly skilled workforce and the traditions still remaining from socialism among public officials in the forest sector, are also recognized as severe problems.

Transition firms more often call for privatization of forestlands as well as more open systems for leasing parcels of the forest fund. Different suggestions aiming at facilitating long-term agreements and long-term planning in different areas, such as, taxation policy and especially rules related to value added tax, problems related to inflation, fire protection and improvement of the forest resource in the long-term perspective, are also demanded. In Box 1 we have collected typical statements from the interviews with representatives of the transition firms in our sample.

Box 1. Opinions among managers of market oriented forest firms.

Are there rules or regulations that apply to your enterprise which you regard as an obstacle for your activities?

Existing tax policy ■ Tax legislation• VAT ■ Stabilization of federal and regional tax policy ■ Delays and non-returned VAT for exports ■ Absence of Tax code ■ Drunkenness of workers, theft ■ No fire protection ■ Leasing of parcels of forest fund is not done openly ■ The economic legislation is incomplete, especially in the field of economic relations between business partners ■ Delays with bank payments to suppliers and bank transfers of revenues from sales.

Are there other problems which you regard as obstacles for a successful business?

Machinery/technology ■ Equipment/supply/maintenance ■ Personnel/skill/competence ■ Waste utilization.

What is the single most binding "restriction" on the activity of your enterprise?

Absence of Tax Code of the RF, therefore impossible to make long-term business plans ■ High taxes ■ Existing tax system ■ High tax burden ■ Tax burden is too high for successful development of firm ■ Lack of specialized machinery, lack of finances for running forestry ■ Inflation is unpredictable ■ The absence of qualified and skilled personnel ■ Lack of working capital ■ The enterprise has to get payments for its products before delivery.

Generally speaking, do you find the formal legislation regulating Russian forest enterprises adequate and efficient?

Contradictory laws, edicts and resolutions ■ The Forest Code does not guarantee the maintenance of leasing for long periods of time, that is why we are not interested in forest resource improvement ■ There is no lawful mechanism of execution of the arbitration court decisions ■ Customs, tax and banking legislation does not correspond to the interest of the firm ■ VAT-taxes not after the sales of products, but just after delivery ■ Make the forest sector, including leskhozy, private, but organize the state regulation of it, the same system as in Finland and Sweden.

If it would be possible to change anything related to the Russian forest sector, what would you change?

Forestry should be managed by people who did not have experience in this work in the times of socialism ■ Transfer forests to private property.

Other comments of relevance?

The markets must stabilize ■ There is a growing impact of criminal elements on the business ■ Imperfection of postal services and high prices create problems in sending correspondence, parcels, etc., abroad.

The Regional Dimension

In order to investigate if an obvious regional dimension of the persistence of a "virtual economy" exists, the two indices above, "relational intensity" and "distance to market", have been added. Thus, the higher value a firm gets on this new "virtual economy index" the farther away from market or transition behavior it is and/or the more the firm is oriented towards non-market, social relation building, activities. The following box-plot, Diagram 5, illustrates how the companies in each region are distributed according to this summarized index, as well as the position of 50 percent of them (the length of the single box) and the median firm (vertical line in the box). Asterisks and circles indicate outliers and extremes among the firms.

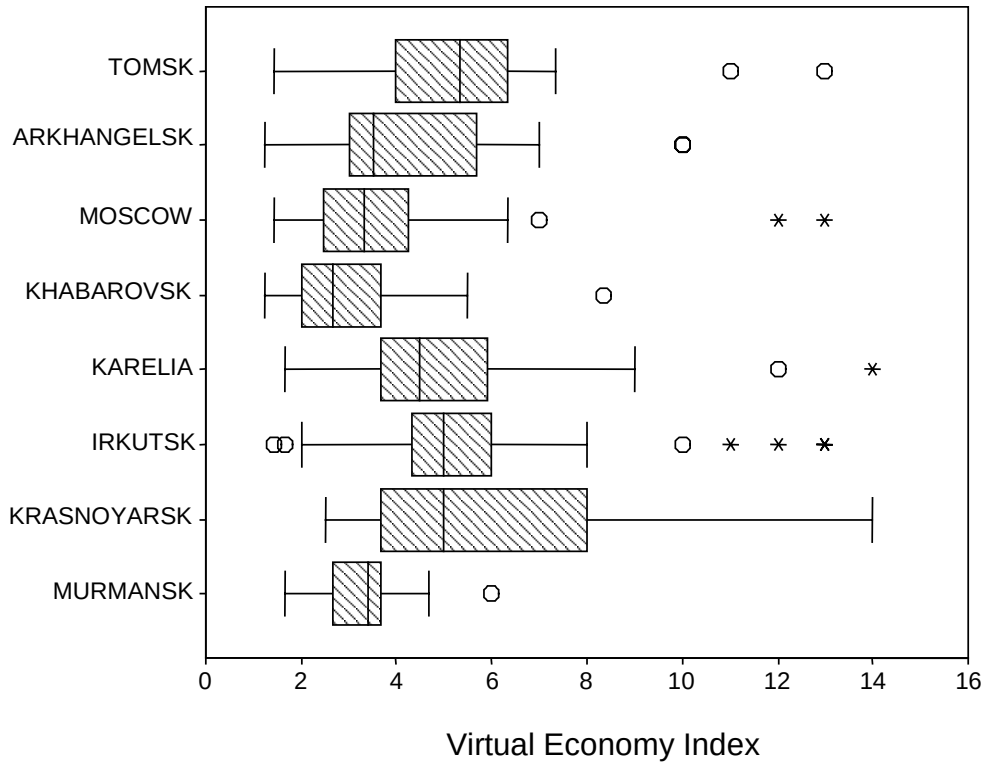

Diagram 5. Distribution of Russian forest firms by region and by their relative involvement in the virtual economy.

From Diagram 5 we can conclude that there are hardly any clear-cut regional differences. However, transition, or market reducing efforts, are slightly more prevalent in Khabarovsk, Moscow, Murmansk and Arkhangelsk. The opposite seems to be the case for companies in Krasnoyarsk and Irkutsk. In a statistical check (a linear regression with company size, regions and branches as independent variables) only the latter two regions (as dummies) reached statistical significance at the one-percent level. In Krasnoyarsk and Irkutsk there are about two points higher values on the combined index. However, all in all, regional differences are small or almost non-existent, while the differences between the companies within each region are considerable. In summary, our investigation gives no support for the existence of significant regional differences. When it comes to the forest sector, the sweeping changes in the Russian economy, or, if one prefers, the inheritance from Soviet times, have not separated out any successful region that has clearly managed to move closer to an efficient market behavior.

Making an Aquarium of the Soup?

The result of our investigation among Russian forest firms clearly gives support for North's statement about the persistence of "informal constraints embodied in customs, traditions, and codes of conduct" (North, 1990:6). Despite deliberate efforts to change the rules of the game, such as allowing free pricing, privatization of firms, etc., the logic of the old Soviet system still decides much of enterprises' behavior. Thus, the old logic still serves as a *dominant institutional setup* deciding the degrees of freedom for the players. For example, the extensive barter trade would not be possible without relatively well established patterns of contacts involving actors from the highest political, administrative hierarchies, banks, etc., down to the single manager of a forest firm.

Our study also supports the Gaddy and Ickes theory of the virtual economy. *First*, it has, in fact, been possible to arrange the firms along the two major dimensions stipulated by the theory, "distance to the market" and "relational capital". It should be emphasized, however, that our indices capture how firms actually behave as well as managers' comprehension of, and opinions about, the current situation. We believe that using such a combination of quantitative and qualitative indicators is essential for understanding Russia's inability to develop a market economy. *Second*, it has also been demonstrated that firms in our sample behave somewhat in accordance with what is assumed by the theory. For example, large publicly owned companies are more deeply rooted in the virtual economy than smaller ones and newly established firms, larger firms call for state coordination, and so forth.

Thirdly, the application and test of the virtual economy thesis has also made it possible to sort out what a transition firm typically looks like. Thus, a typical transition firm is an enterprise that is *heavily exporting and has leaders who call for better business manners, ethics, competence and skills*. It might be surprising that no other variable than export significantly seems to have any explanatory power. For example, we find no difference between regions — it does not matter whether the firm is engaged in harvesting, processing, or sawmilling — nor does it seem to play any decisive role whether enterprises are joint ventures or not. A typical virtual economy firm, on the other hand, can be characterized in the following way: it is *large, low-exporting and has managers who call for state coordination*.

As the answers regarding modes of payments, violation of rules, etc., show, our investigation gives further support for our notion that an "institutional deadlock" is a general characteristic for all regions in our investigation. With the terminology of game theory Russia seems to have reached some sort of *negative equilibrium*. As Gaddy and Ickes (1999b) have indicated the virtual economy may not be an unlucky detour on the road towards an efficient market economy. It may be an entirely new system that is now being entrenched in the Russian society. It should not be forgotten that the virtual economy is quite beneficial for a number of people who might unfortunately be exactly the ones who are expected to change the system, managers of firms, politicians, bureaucrats, and other decision makers. Thus, the way out of this system is probably very problematic. It requires a number of things:

- That the payoff is better for producing tangible goods than to engage in the "soft goods" trade.
- That those who take the first step towards market behavior will not be un-proportionally punished.
- That law and order is established.
- That the current pattern of performing "business" is not further entrenched, something that will have the effect that newer generations of business people will "imitate" current behavior (Gaddy and Ickes, 1999b).
- That changes towards market behavior is supported by the people, thus, that people believe that changes will make life better.

Can the current situation in the Russian forest sector be deliberately changed? There is an old saying stating that "it is possible to make fish soup out of an aquarium but it is not possible to make an aquarium from fish soup". The reason is simple, creating living systems — aquariums as well as market economies — require vital units that can serve as basic building blocks. However, such vital units are to a large extent lacking in contemporary Russia. For example, there is no tradition of privately owned commodity producing companies, a powerful middle class is still basically missing, and political preferences among people still reflect and support attitudes associated with the old Soviet regime. If people believe, or in fact experience, that a major prerequisite for a large processing firm to continue its operation is that it continues to receive privileges, it is likely that they will also support such policies. Currently, we seem to have a situation where the most mobilized parts of the population are those who are the most supportive of state intervention, typically those to the left of the political scale, i.e., mainly supporters of various communist parties.[15]

The other side of the coin is the apparent lack of *trust* in the Russian society, something that is also indicated in our investigation.[16] If, as some of our respondents say, most actors assume that the others will cheat we have a classical case of Prisoners Dilemma, the collective outcome is inferior to that which would have been achieved through cooperation. This attitude also has the peculiar consequence that, even though people (workers, engineers, etc.) are aware of the fact that decision-makers (managers, politicians, and bureaucrats) might acquire resources in an inappropriate way, they have poor incentives to change the situation. "Those who presently are in charge have already milked the cow, a new one will only start all over again, so why change?"

Axelrod (1984) has demonstrated that small "worlds" of cooperation might spread even in a world of "cheaters". — Never start by defecting, cooperate when your partner cooperates, defect when he does! This is the most successful strategy for the evolution

[15] By comparing the turnout in the 1995 State Duma election and support for communist/left wing parties one might get a rough estimate of this relation. Such a calculation indicates that a higher participation rate is positively correlated with more support for the communists and other left wing parties (0.45). For "Our Home is Russia", president Yeltsin's party, the corresponding figure –0.19 and for the ultra right wing party "Liberal Democratic Party of Russia" –0.03. This tendency is further strengthened by the relative success for the communist parties in the 1999 State Duma election.

[16] In this context some authors want to emphasize the anti-legalistic heritage from the East Roman empire compared to the early establishment of law and order through the Catholic church in Western Europe (cf. Berman, 1983).

of cooperation. Thus, the traverse towards a market economy in Russia will benefit from the creation of groups of firms that "cooperate" in the market sense of the word, groups of firms that have learned that their partners do not start their interaction by cheating, that good manners will be rewarded accordingly. Consequently, the policy advice is to support the establishment of such groups of firms.[17]

Building institutions takes time and market institutions are not built from above. However, political authorities might provide an institutional framework that enables a market economy to be developed (Eliasson *et al.*, 1994; Silk and Silk, 1996; Stiglitz, 1999). The authorities should ensure that those who are among the first to act in "proper" ways do not have to pay an unproportional share of the burden by being, for example, extensively taxed. Consequently, the most important task is to reduce the payoff from investing in relational capital. A thorough taxation reform could significantly contribute to this. Since Gazprom, and a few other large state monopolies, act like some kind of engines for providing resources that is consumed in the metabolism of the Russian virtual economy stopping this infusion would have decisive effects. As Gaddy and Ickes (1998b) have emphasized only making credit restrictions harder will not solve the problem, such policies might even drive firms deeper into the virtual economy and will probably affect those firms that should not be affected. Hence, more efforts should be made in order to support the creation of new private firms and joint ventures. But, given that undemocratic solutions are ranged out, all sweeping changes of the political system, including reformation of bureaucracies, the legal system, and so forth, can only be made with the support of the people (Rose *et al.*, 1998).

What Should be Done?

The question of what should be done to change the current situation, as described above, is intricate. As indicated, people do not act in a vacuum, i.e., their actions are embedded in an institutional context. Kiser and Ostrom (1982) have elaborated the idea of three worlds of action. Every institutional arrangement, they argue, is shaped by three layers of rules, *constitutional rules*, *collective choice rules* and *operational rules*.[18] With reference to the Russian forest sector, constitutional rules specify what kind of ownership forests may have and, indirectly, who is eligible to share the benefit of their use. Constitutional rules also specify the division of labor between federal and regional authorities. Collective choice rules regulate how decisions are made concerning the forests in order, for instance, to decide leasing terms, levels of harvesting, or the technological input. Operational rules, finally, regulate the daily activities, i.e., the intensity of harvesting, methods of regeneration, modes of transportation, etc.

The three layers of rules form a hierarchy indicating that rules on a higher level decide the degrees of freedom for those on a lower level. "Constitutional decisions establish institutional arrangements and their enforcement for collective choice. Collective

[17] Hendely, 1999 gives interesting examples of the different ways of operating in the Russian economy. She also provides evidence of the existence of firms functioning somewhat in accordance with market principles, e.g., not been entangled in the barter trade, etc.

[18] For an illustration see Tang (1992) and Ostrom (1992).

decisions, in turn, establish institutional arrangements and their enforcement for individual action. [...] Constitutional choices precede and constrain collective choices" (Kiser and Ostrom, 1982:209–210).

In this perspective a constitution can be defined as a system of rules specifying the terms and conditions of governance, while governance itself "includes the setting of rules, the application of rules, and the enforcement and adjudication of rules" (Feeny, 1988:172, Carlsson, 2000b). Thus, the forest firms in our investigation are subjected to the logic of this hierarchy. Consequently, different problems must be solved at different levels.

The constitutional level: On this level constitutional rules can be enacted and changed. In Russia, the first thing that has to be done is to define what issues and domains the federal level is supposed to handle. Thus, the division of labor between federal agencies and the subjects of the federation, oblasts, etc., should be clear and settled. For example, the dual subordination that is inherited from the Soviet era should be abolished — today the regional forest committees are subordinated both to the Federal Forest Service (*Rosleskhoz*), as the central authority, and to the executive authority of the oblasts, etc. Generally, all ambiguities and contradictions in the federal constitution, which has been identified by many experts, should be sorted out. When it comes to the forest sector, this applies to property rights as well as collisions between the wording in the constitution, the Federal Forest Code, and a number of other legal acts, e.g., those concerning environmental protection. One obvious decision is to permit private ownership to forest land, something that is allowed in the constitution but not in the Forest Code. Another alternative would be to transfer forest ownership to the Oblasts, etc. Whatever decisions might be taken, all constitutional issues that are unsettled create problems on lower levels of government and society.

It should be emphasized that this focus on constitutional issues does not neglect the fact that a number of political problems, e.g., the role of the parliament versus the president as well as many macroeconomic questions, must be solved in order to establish a solid foundation for a vital forest sector. But, once again, if constitutional issues are undefined, or in a flux, there is nothing to build on.

Collective choice level: The notion of collective choice rules refers to the fact that all collective decisions are dependent on rules that stipulate how such decisions should be made, i.e., a framework for collective action. Economic history tells us that once a constitutional order is established, subsequent levels and their players can develop their own rules. This has proven to be a basic prerequisite for the evolution of markets. Thus, the collective actors in the forest sector must define their mutual relations. For example, this means that tax authorities should act independently and that tax revenue, or more typically tax arrears, should not be used as "trading goods" in local virtual economies. Another example is the regional units of the Federal Forest Service, the decisions of which should be dictated by professional concerns rather than by regional political matters.

One feature that has confused this necessary division of labor is the creation of quasi non-governmental organizations, such as the regional "Unions of Forest Industrialists," etc. These unions are deliberately composed of local politicians, bureaucrats, industrial leaders, trade union representatives, etc., with the official aim to provide political and administrative "coordination" of the regional forest sector.

In other reports we have characterized the Russian forest sector as trapped in an institutional deadlock (Carlsson and Olsson, 1998b:52 ff.). Another way of describing the situation is to say that the virtual economy in fact provides a coherent political, administrative system with its own logic. In such a system, tax authorities and other public agencies do not act independently, nor do industries, trading organizations, central actors in the transport sector, etc. The following list — which could indeed be made longer — indicates what must be done on the collective choice level in order to open up the institutional deadlock and, thus make the forest sector better:

- Federal and regional policy programs that are in line with the principles of market economy should be worked out. For example, this means that they should not rely on the idea of political and administrative coordination of business activities.
- A thorough taxation reform should be enacted. In general, and not only when it comes to the volume of taxation rules, the whole system of fees, etc., should be diminished, should be more transparent and, as a consequence, more easy to enforce.
- Politicians and bureaucrats should withdraw from direct involvement in single enterprises. For example, regional bureaucrats should not as a rule take over and run firms that are found to be unviable.
- All democratic means to create law and order should be utilized.
- By virtue of their credit practices banks and other credit institutes, should encourage entrepreneurship, export, and joint ventures with foreign companies.
- Forest enterprises should create their own independent branch organizations, the aims of which are to draft and settle binding agreements concerning rules of conduct, standards, etc.
- Infusion of “soft money” to the forest sector from “prosperous” state monopolies should be stopped. This also requires that the worst “economic zombies”, i.e., value destructors, are shut down.
- The bankruptcy system as well as the arbitration courts must be made more efficient.
- Education and training of people for new tasks and technologies must be developed, democratic citizenship should be encouraged.

Operational choice level: The operational choice level is the arena of the individual actor, typically the firm and its staff. However, decisions on this level are enabled or hindered by higher levels of rules. A typical operational decision is how to utilize the internal resources of the firm. From our analysis it is obvious that the Russian forest companies face a number of intertwined problems, which are all connected to the lack of, or the embryonically developed, market institutions. This is manifested in a concentrated way in the widespread and deeply rooted lack of trust that characterizes the relations between business partners (cf. Fell, 1999).

The forest industry is composed of a chain of actors, from the forests to the end users, who have to interact and transact with one another. If, as in Russia, transaction costs, due to weaknesses in business legislation, enforcement and unclear definition of property rights, are extremely high, sometimes prohibitive, there are good arguments for

a backward vertical integration of the firms (cf. Figure 3). “In-house monitoring” might be able to compensate for the lack of efficient market institutions. Coordination in anorganized form within the firms is sometimes more efficient, i.e., cost saving, than a market solution (Coase, 1937). For example, in the Nordic countries a high degree of integration, both backward toward the forest resource, and forward towards the end users, has characterized the industry since the late 19th century. Subcontracting also exists. The extent of subcontracting has varied from time to time depending on technological and institutional changes in the industry. For example, today almost all harvesting is arranged by subcontracting with the involvement of both very large *and* very small firms. The same goes for a large part of the transport work.

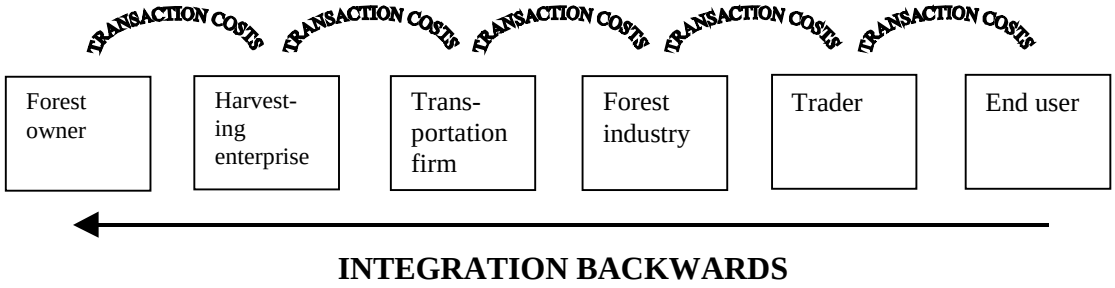

Figure 3. Integration in the forest-to-market chain.

In Russia, the present situation of unclear property rights, *ad hoc* rules, and irrational transport pricing — in short the high transaction costs — has resulted in a sharp production decline in the forest sector. An integration “backwards” along the chain illustrated in Figure 3 might therefore be a rational decision. In this way, for example, the managers of processing plants may gain a better control of the transactions and, as a consequence, reduce the total costs. It must be emphasized, however, that this “solution” is triggered by an absence of viable markets for forest products. Under other economic circumstances, such an integration may even increase both transaction and production costs.

It is, however, important to emphasize that such a coordination and integration process introducing a “visible hand” (Chandler, 1977) in the sector, must be the result of different companies’ own decisions concerning mergers, etc. Such solutions are not possible to arrange efficiently by the intervention from the old political structure within the forest sector (Joskow and Schmalensee, 1997).

Finally, it should be emphasized that the three worlds of action, as described above, constitutes a totality within which both the “visible hand” of the state — and other public authorities — and the “invisible hand” of the market operate. These two hands might, and sometimes must, be coordinated, but, in principle, they should be able to move independently, all for the purpose of making Russian democracy and capitalism work.

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Appendix 1

Dependent variable: investment.
Explanatory variables: joint venture, type of business, size, region, ownership, export, age of firm.

Table A1-1: Coefficients for variable joint venture.

Investment	Average	Joint venture	
		Yes	No
Yes	36.2	**19.7**	**-2.7**
No	63.8	**-19.7**	**2.7**

Table A1-2: Coefficients for variable active.

Investment	Average	Active					
		Forest management	Harvest	Sawm/proc	Pulp/p	Consultant/ trading	Harv/sawm
Yes	36.2	13.7	-0.6	6.3	1.7	-9.6	-8.8
No	63.8	-13.7	0.6	-6.3	-1.7	9.6	8.8

Table A1-3: Coefficients for variable size.

Investment	Average	Size		
		Small	Medium	Large
Yes	36.2	-1.6	-4.8	6.6
No	63.8	1.6	4.8	-6.6

Table A1-4: Coefficients for variable region

Invest-ment	Average	Region							
		Tomsk	Arkhang	Moscow	Khabar	Karelia	Irkutsk	Krasnoy	Murmansk
Yes	36.2	**23.3**	**-21.6**	-7.6	-9.9	-0.5	9.4	3.3	6.6
No	63.8	**-23.3**	**21.6**	7.6	9.9	0.5	-9.4	-3.3	-6.6

Table A1-5: Coefficients for variable owner.

Investment	Average	Owner			
		Public	Private	Employees	Pub/priv
Yes	36.2	-10.3	0.7	10.0	7.0
No	63.8	10.3	-0.7	-10.0	-7.0

Table A1-6: Coefficients for variable export.

Investment	Average	Export		
		No export	<40%	>40%
Yes	36.2	-5.2	10.0	9.9
No	63.8	**5.2**	-10.0	-9.9

Table A1-7: Coefficients for variable age of firm.

Investment	Average	Established year		
		–1947	1948–88	1989–
Yes	36.2	0.6	-3.8	2.9
No	63.8	-0.6	3.8	-2.9

Appendix 2

Dependent variable: GADICK-index, type of firm.
Explanatory variables: size, background, joint venture, export.

Table A2-1: Coefficients for variable backgr.

Attributes	Average	Ownership		
		Public	Old private	New private
Transition	7.4	-2.2	-1.8	3.3
Virtual	31.5	7.5	-4.6	2.1
Unclear	28.6	0.8	-1.7	1.7
Unviable	32.5	-6.1	8.1	-7.2

Table A2-2: Coefficients for variable joint venture.

Attributes	Average	Joint ventures	
		No	Yes
Transition	7.4	-0.0	0.2
Virtual	31.5	0.3	-2.4
Unclear	28.6	0.9	-6.2
Unviable	32.5	-1.2	8.3

Table A2-3: Coefficients for variable export.

Attributes	Average	Export		
		No export	<40%	>40%
Transition	7.4	**-4.2**	-7.1	**13.1**
Virtual	31.5	1.9	**22.1**	**-13.6**
Unclear	28.6	-0.4	**-10.5**	5.4
Unviable	32.5	2.8	-4.5	-4.8

Table A2-4: Coefficients for variable size.

Attributes	Average	Employees		
		–55	56–342	343–
Transition	7.4	-1.4	1.2	0.3
Virtual	31.5	**-10.1**	0.5	**9.1**
Unclear	28.6	1.9	-4.0	1.6
Unviable	32.5	9.6	2.3	**-11.1**

Table A2-5: Coefficients for variable attributes.

Important changes	Average	Attributes			
		Transition	Virtual	Unclear	Unviable
Tax system	21.7	-1.7	-2.9	-4.4	7.1
Forest legislation	11.8	1.5	-5.6	5.4	0.3
Business legislation	11.3	8.7	-2.0	4.2	-3.8
Ethic	10.3	**16.3**	-4.1	1.7	-1.3
Invest. techn.	15.3	-1.9	5.0	-3.2	-1.6
State coordination	15.3	-15.3	**12.9**	-1.5	**-7.7**
No answer	14.3	-7.6	-3.3	-2.2	**6.9**