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“R&D Contracts in the Soviet Union”

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## **Contracts in the USSR Economy**

Economic contracts (*khoyastvennye dogovory*) have long played a role in the management of business relations among Soviet enterprises and organizations. State agencies frequently use contracts in defining the details of economic obligations placed on them by the central planning authorities. The typical types of economic contracts involve the immediate sale or purchase of goods (*kuplya-prodazha*), arrangements for the delivery of future production (*postavka*), and the performance of services (*podryad*).<sup>1</sup>

Economic contracts for research and development work have existed since the First Five-Year Plan. However, early R&D contracts were relatively uncommon, marginally important and functioned more as a means for adjusting state budget allocations than as financial incentives for scientific organizations.<sup>2</sup> Following World War II the Soviet Communist Party devoted considerably more attention to programs for developing and using new technologies. Part of this increased attention led to a series of measures that promoted economic contracts for research and development as instruments for obtaining more industrially useful technologies from scientific and engineering organizations.

This paper examines the evolution of research and development contracting in the post war Soviet Union. In particular, the paper analyzes the legal and economic discussions that accompanied numerous changes in the rules for R&D contracts in light of Soviet goals for improving research, development and innovation performance of the economy.

### **The Rise of R&D Contracting**

#### 1. A First Step: The Model Contract for Experimental-Design Work

In the mid-1950s, Soviet national leaders concluded that past economic policies were insufficient for achieving proper rates of technical innovation, and they began searching for special mechanisms for securing technical progress.<sup>3</sup> Great importance was attached to increasing the scientific and technological interaction among ministries and to applying the talents of the scientists and engineers of the educational establishment to industrial objectives.<sup>4</sup>

Many ministries and central agencies, recognizing that their enterprises frequently need quick access to the technical expertise of their central design facilities or to the production line experience of other related enterprises, had established internal regulations for model design and development contracts.<sup>5</sup> Innovations, however, frequently showed little respect for ministerial boundaries and considerable difficulties still existed when enterprises needed to enlist the services of research or design organizations subordinated to other ministries. These problems were exacerbated by separate – and, perhaps, contradictory – ministerial decrees. Consequently economic policy makers began to standardize R&D contracting practices on a national level.

In mid-1955, addressing the problems of inter-ministerial cooperation in technical innovation and prodding those agencies that had neglected to establish internal

regulations for their own organizations, a national model contract for experimental-design (*opytno-konstruktorsiy*) work was promulgated.<sup>6</sup> The absence of any standard contract in an area where traditional economic contracting practices often proved inapplicable had likely discouraged broader participation of design and development organizations in significant innovation.<sup>7</sup> This model contract standardized important considerations – e.g., definition of and recourse for non-fulfillment, establishment of performance schedules, identification of responsible parties, regulation of cost estimates, etc. “ for the contracting parties and probably removed many of the uncertainties that had plagued experimental-design contracting.<sup>8</sup>

The creation of a model experimental-design contract signaled the start of the use of contracts as part of the state-wide efforts to promote enterprise innovation. The model experimental-design contract of 1955 was followed several years later by a vigorous expansion of national legislation for general research and development contracting.

## 2. Expanding Coverage:

### a. Contracts for research and development (1961)

Party leaders, in reforming industrial innovation, decided to shift the financing of R&D away from the state budget and toward independent accounting or self-financing (*khozraschet*). Economic officials viewed state budget financing as the cause of a number of the problems encountered in moving new technologies out of the state’s laboratories and into production. For example, the central administrative personnel who managed the research projects funded from the state budget frequently neglected to consult carefully with the potential using enterprises. The shift from budgetary allocations to self-financing brought the creators and users of new technologies closer together, for enterprises now contracted their R&D work directly with research facilities.<sup>9</sup> Financing from budgetary allocations also made R&D facilities financially independent of their customers, i.e., the enterprise using the new technical developments. This independence seriously undermined the R&D facilities’ concern about quality or costs. Self-financing R&D facilities were, however, expected to finance operating expenses out of the revenues earned through contracts. These contracts, therefore, brought R&D facilities directly into formal contact with their customers and became instruments for controlling both quality and costs.

In 1961 the Council of Ministers issued a series of decrees and model contracts for both research and development work, thus strengthening the decision to make R&D facilities into self-financing organizations.<sup>10</sup> In establishing contracts for R&D, Soviet legislators confronted some thorny problems. First, traditional Soviet contracting practices proved of limited use, for many of them were simply geared to specifying the details of centrally planned deliveries. Economic contracts for planned deliveries differ significantly from the contracts for R&D projects, for unlike the arrangements for the delivery of a standard industrial product, the final results of contracted research are often unpredictable and difficult to describe accurately. Consequently, Soviet legislators had to develop a model contract that established an equitable sharing of the risks of failure. Second, the quality

and stage of completing of research work is often difficult to ascertain, and guidelines for adjudicating these issues had to be created. Third, the material incentives for both parties had to be established in such a way as to promote the eagerness of institutes to engage in important R&D projects and to create a willingness of enterprises to use the results of contracted work.

Soviet legislators evidently considered the timidity of R&D facilities to be the greatest danger in expanding the use of contracts, for in 1961 legislation carefully attempted to encourage risk taking by research and development organizations. For example, a sponsoring enterprise was still required to pay an R&D facility for any unsuccessful research and development work. In the words of one Soviet jurist, the 1961 legislation made “a presumption of unconditional goodwill on the part of the contractor.”<sup>11</sup> Furthermore, the sanctions against low quality work performed by an R&D facility were considered toothless.<sup>12</sup> Finally, a sponsoring enterprise’s payments to an R&D facility were not affected by the economic value of the research results, or by the length of time required to implement the research work into production.<sup>13</sup>

In the West contracting usually involves a considerable amount of negotiation. The actual degree of negotiation possible during the conclusion of Soviet R&D contracts – especially when the research formed part of the annual plans for both -- is unclear. An important element of a party’s bargaining power in many negotiations can be the right not to conclude a contract. Prior to the shift to self-financing, most R&D related contracts were planned and seemed obligatory for both parties. The refusal of one party to conclude a contract was already considered a violation of the other party’s rights and could be submitted to state arbitration.<sup>14</sup> After the shift to self-financing, the planned nature of R&D contracts seems to have changed somewhat, for contracted R&D needed to be included in the plans of only one of the parties.<sup>15</sup> Whether the party without the planned requirements could refuse to enter a contract with impunity is not clear.

Negotiations seemed to center most on the financial arrangements. While R&D facilities felt pressure to cover their costs, bankruptcy was probably never a concern, for cost overruns could likely be covered by budget allocations. The financial concerns of the R&D facilities centered largely on their desire to obtain the bonuses that resulted from operating at a profit and to acquire new equipment.<sup>16</sup> The model contract of 1961 closely regulated the financial terms for the R&D contracts, effectively guaranteeing profits to the R&D facilities and generally placing them in a good position to obtain favorable financial terms.<sup>17</sup>

Although the model contract of 1961 sought to place the R&D institute in a favorable financial bargaining position, it did little to undermine the real bargaining position of the enterprises. R&D contracts were largely concluded for small R&D projects, i.e., tasks that were unlikely to endanger fulfillment of their production plans. Thus, enterprises preserved their bargaining position by remaining relatively independent of the results of the contracted R&D. Bargaining in R&D contracts likely became the search for modest results that enable both parties to satisfy their respective success indicators.

## b. Reform of R&D in the higher educational establishments

Soviet higher educational establishments (*VUZy*) employ almost one-third of total Soviet scientific workers. During the early postwar period many Soviet policy makers considered the *VUZy* to be too divorced from solving major economic problems and enacted legislation to redirect the *VUZy* scientific work more towards industry. One important legislative change allowed ministries and other national agencies to establish branch laboratories in the *VUZy*.<sup>18</sup>

Economic contracts were a major tool in redirecting the scientific and engineering focus of the *VUZy* and were prominently mentioned in early legislation. A 1957 internal order regulated economic contracting.<sup>19</sup> Subsequently, a 1962 decree on scientific research work in higher education was passed, with the 1961 model contract for R&D work appended to it.<sup>20</sup> R&D contracts were made quite attractive to *VUZy*, providing them with sources of new equipment, capital investment funds, and even recreational facilities.

According to one thorough cataloguing of *VUZy* contract research during the 1960s, the early Soviet legislative efforts brought results. “Increases in the amount of contract work done by *VUZy* started around 1957. Between 1957 and 1960, the total increased three times, and between 1960 and 1965 it increased two and a half times. Since 1965 the acceleration was markedly less – 20 percent between 1965 and 1967.”<sup>21</sup>

## 3. An Innovative Proposal: Socialist Licenses

Against a background of major economic reform and constant calls by Communist Party officials for more significant technical innovation in industry, a relatively novel idea for R&D contracts surfaced – a proposal to establish a *socialist license*. The legislation for R&D contracts was targeted primarily at creating new technologies and implicitly assumed that valuable results would be used. Further, R&D contracts were usually concluded between two parties and did not address the task of disseminating the new technologies to other interested, outside parties. In fact, under Soviet law any outside parties – if state organizations – had the right to free access to any technology developed by other state organizations in the Soviet Union. Soviet officials implicitly assumed that state organizations would automatically avail themselves of newly developed technologies.

The diffusion of new technology did not, in fact, occur automatically and the Soviet press began to publicize suggestions for promoting the more efficient spread of domestic technologies. One such suggestion, the proposal for a system of domestic licenses, was made by a senior official at the State Committee for Inventions and Discoveries.<sup>22</sup> He proposed *socialist licenses* that would give state organizations the exclusive rights to the technologies they develop, including the right to sell them to other organizations within the Soviet Union. This official claimed that Soviet legislation had put those facilities creating world level technologies on an equal footing with those facilities that remained technologically backward. He implied that the backward facilities were parasitic. “Is it

just that the collectives working creatively and collectives that simply use the results of someone else's work should have equal rights?" he asked.

The original suggestion for a socialist license was cautious and opposed giving the licensor unlimited rights to establish prices. It suggested instead that the payment period for royalties be limited to five years and the amount be limited to 10-15 percent of the savings created by the new technologies. Further, it proposed that both civil and criminal sanctions be imposed on officials responsible for violating the organization's exclusive rights.

An official at the Riga Electric Building Factory strongly supported the creation of socialist licensing and joined the public discussion with a detailed account of his factory's experience in developing and selling an important new technology (the economic savings exceeded one million rubles per year).<sup>23</sup> His factory developed plastic collectors for direct current electric machines. The research and development costs for the collectors totaled over 300,000 rubles. Outside contracts with the Latvian Institute of Mechanics and Polymers, the Kuybyshev Aviation Institute and the Riga Polytechnical Institute cost 52,000 rubles. The factory's own special design bureau spent 216,000 rubles over a ten year period on salaries for 15 designers, while the factory spent over 32,000 rubles building specialized equipment.

In selling its new technology, REZ could use the 1961 model contract only if new research and development work was necessary for adapting the technology to the specific conditions of the user. Thus, when REZ contracted to transfer its new technology, it was unable to charge more than 7,000 rubles, even though some of the users saved more than 200,000 rubles per year. Since the original research and development was already completed, it could be included into the price of the contract. REZ's contract for selling the new technology could only charge for the wage costs of preparing the documentation, travel expenses to the new site, overhead and planned profits for the transfer. The REZ official, summing up his dissatisfaction with the financial terms, wrote: "We consider that our profit was much lower than what our factory justly deserved as the creator of an invention and as the pioneer of its assimilation."<sup>24</sup>

The REZ official proposed that innovating organizations be allowed to draft contracts that charge a client a percentage of the savings generated by the innovation. The income from these contracts – rewards for risk taking – would support employee bonuses and fund new R&D projects. Such a system, according to this official, would go far in addressing the present problems of diffusing new technologies throughout Soviet industry.

The proposal for a socialist license evoked considerable opposition. One prominent jurist flatly declared it "incompatible with the basic principles of socialist economics."<sup>25</sup> He objected first to what he envisioned as a struggle among enterprises to grab those inventions belonging to individuals, presumably making their owners wealthy.<sup>26</sup> Secondly, he believed that socialist licensing contradicted planning and would lead to financial disarray as funds travelled from branch to branch with no central guidance.

The discussion about a socialist license occurred at the same time that economic officials were analyzing the results of the push for greater R&D contracting. Although one Soviet jurist carefully mentioned that a form of socialist licensing existed in the GDR, Poland and Romania, he concluded, “the introduction of licensing relations among Soviet organizations was presently premature.”<sup>27</sup> He suggested that Soviet organizations needed more experience in compensating each other for domestic transfers of technology and that a traditional economic contract for such transfers would be a more cautious approach.

#### 4. Revising the Legislation on Contracts

After almost a decade of using R&D contracts as a means to improve industrial innovation, Soviet legislators issued new regulations that addressed problems caused by the past legislation, made adjustments for the reappearance of industrial ministries and extended the scope of contracts to cover the transfer the use of new technologies among organizations.

The model contract of 1961 had emphasized the creation of new technologies and implicitly assumed that the results of the contracted research would be used. However, a 1968 Central Committee decree, “On Raising the Efficiency of the Work of Scientific Organizations and Accelerating the Use of the Achievements of Science and Technology in the National Economy,” preceded the new legislation on R&D contracts and stated prominently “that the shortcomings retarding the use of new technologies had to be eliminated” to achieve the Party’s goals.<sup>28</sup>

Evidently the sponsors of R&D contracts did not sufficiently use the resulting technologies. One jurist described the situation under the model contract of 1961 as follows: “Almost no enterprises carry the responsibility for the use of the work they order, and the scientific institutes carry none of the actual results from implementation.”<sup>29</sup> New regulations prominently promoted the use of the technologies from contracted research. For example, the new model contract for R&D required that the sponsor state where and how the new technology was to be used.<sup>30</sup> Clients could also make the obligation to use the resulting technology a condition of the contract itself.<sup>31</sup> More importantly, Soviet legislators followed up their revisions of the model contract for R&D with a separate model contract for the transfer of technologies.<sup>32</sup>

At the same time the contracting R&D facilities received more legal tools to force the use of their new technologies, they also lost some of the advantages they had enjoyed over their sponsors in the previous model contracts. R&D facilities now became responsible for the quality and timeliness of their work. Technical indicators could be put into the contract and outside experts could judge whether the resulting work met the agreed-upon indicators. Furthermore, if a sponsor deemed it fruitless to continue the R&D work, it could terminate the contract and only pay actual expenses up to that moment. Finally, material sanctions could be applied to R&D facilities that failed to perform the contracted work.

In 1965 Khrushchev's economic regions (*sovnarkhozy*) were disbanded and the ministerial branch system of organizing the economy was reintroduced. The new legislation on contracts carefully distinguished between R&D that was conducted entirely within a ministry from R&D that crossed ministerial boundaries. The former was subjected to internal ministry orders (*vnutriministerskiye zakazy*) and the latter, to contracts. Further, point 4 of the 1969 model contract clearly stated that industrial ministries would determine the details of their own self-financed research work. R&D contracting was technically applicable only for projects that crossed ministerial boundaries for projects outside of the national economic plan (point 6). Thus, the reestablishment of industrial ministries left the national campaign for greater use of R&D contracts concentrated primarily on the Academy of Sciences and *VUZy* research facilities, for their greater involvement in solving national economic problems automatically caused them to deal with other ministries.

The revised regulations for R&D contracting did not establish a socialist license. However, the new model R&D contract addressed some of the problems raised by the proponents of socialist licensing and allowed for small profits (1.5 to 6 percent of estimated savings). The contract for the transfer of scientific-technical achievements rejected making any additional payments to the developer of technology stating flatly that (point 7): "The cost of the work for the creation of the transferred scientific-technical development is not subject to compensation." Both of the new contracts were more generous to individuals and established sources for considerable bonuses for those involved in creating and disseminating new technologies. The refusal to implement a socialist license likely rests in its perceived threat to centrally planned priorities. Significant licensing royalties, if used to create material reserves for research organizations, could redirect resources away from priority technologies and simply channel them toward successful entrepreneurs.

### **The Use of R&D Contracts**

#### 1. The Ministry of Higher and Specialized Secondary Education

The campaign to make *VUZy* R&D programs an integral part of the Soviet industrial R&D effort, aided by the use of R&D contracting, appears to have succeeded. The number of branch and specialized (*problemnye*) laboratories grew rapidly during the 1970s, from 900 to 1270. If the relative proportions between the branch and specialized laboratories remained constant, there would now be over 700 branch laboratories in the *VUZy*. Since the work at these branch laboratories is conducted on the basis of economic contracts, the rapid growth in the number of branch laboratories seemingly indicates a broad acceptance of R&D contracting by many industrial ministries.<sup>33</sup> Furthermore, R&D contracts now comprise a significant share of total expenditures on scientific research at the *VUZy*. One Soviet writer stated that about 80 percent of all *VUZy* R&D in 1976 was conducted on the basis of economic contracts.<sup>34</sup> The Gubkin Institute for the Petrochemical and Gas Industry reported that 7 million rubles of the financing for its

scientific research came from economic contracts, while only 302,000 rubles (about 4 percent) came from the state budget.<sup>35</sup>

Economic contracting has taken many *VUZy* far beyond their traditional role as educational establishments. In a sense, economic contracting has brought production to science and made many of the *VUZy* into seeming extensions of the Soviet industrial R&D effort. The Khar'kov Aviation Institute is one of the more successful *VUZ* contractors and, perhaps, illustrates the “industrialization” of the *VUZy*. The institute’s Aircraft Production Department specialized in the explosive working of metals and has obtained a “significant amount” of money from 18 contracts. (The Ministries of Ferrous Metallurgy, Heavy, Energy and Transport Machine Building and Ship Building were mentioned as sponsors.) Furthermore, the Khar'kov Aviation Institute’s technical successes led the Ministry of Ferrous Metallurgy to establish a one-million ruble laboratory complex there. In explaining the reason for the institute’s success at obtaining such generous funding, one of the institute’s professors stated, “The *VUZ* is a nice ‘neutral territory’ for permitting the adjustment of relations between different ministries that are interested in solving inter-branch problems.”<sup>36</sup>

The initial legislation that brought *VUZy* scientific research closer to production clearly implied that this effort would involve both civilian and defense-industrial ministries.<sup>37</sup> Since Soviet publications rarely discuss the detailed activities of the defense industrial ministries, it is difficult to establish the extent to which the defense-industrial ministries have participated in economic contracting with the *VUZy*. One Western study showed that about one quarter of the unclassified *VUZy* inventions used by outside organizations were used by defense-industrial ministries.<sup>38</sup> If these used inventions are in any way indicative of R&D contracting, then the “industrialization” of the higher educational establishments has likely benefitted both the civilian and defense industrial research efforts.

## 2. The Academies of Science

The campaign to use R&D contracts also touched institutes of the Academie of Sciences system. Although the USSR Academy has a generally recognized mandate to conduct fundamental research, it has participated in economic contracts. By the mid-1970s contract research “accounted for 12 percent of overall resources of the USSR Academy (excluding capital construction).”<sup>39</sup> A number of the USSR Academy’s institutes have their own special design bureaus and are, therefore, well positioned to help industry solve technical problems. The A.V. Shubnikov Institute of Crystallography, for example, did important contract work for the Ministry of the Chemical Industry – developing laser elements – and the Ministry of Electronics – developing film materials.<sup>40</sup>

Republic Academy institutes have traditionally conducted more applied scientific research than have the USSR Academy’s institutes. Consequently, the Republic Academies participate more actively in contract research. By 1975 economic contracts accounted for almost 40 percent of the Ukrainian Academy’s expenditures on R&D and almost 20 percent of the Siberian Division’s expenditures.<sup>41</sup> The Republic Academies

also have specialized and branch laboratories, bringing the research institutes into direct contact with industrial enterprises.<sup>42</sup>

The Paton Institute for Electro-Welding is, perhaps, one of the Academy's greatest users of economic contracts and a major supplier of new technology to Soviet industry (see table 1). Although subordinate to the Ukrainian Academy of Sciences, the Paton Institute resembles in many ways a major industrial research institute. It has more than 7,000 employees, a lead research institute, a special design bureau, experimental test facilities and two experimental factories.

**Table 1**  
**List of Soviet Facilities Receiving Paton Institute Technologies**

<b>Facility</b>	<b>Location</b>
Siberian Electro-Thermal PO	Novosibirsk
Izhorsk Factory	Leningrad
Power Machine Building Factory	Belgorod
Turbine Factory	Khark'kov
Power Mechanics Factory	Zaporozh'ye
Dorogobych Drill Bit Factory	L'vov
Oil Gas Geology PO	Poltava
Oil Machinery PO	Volgograd
Dnepro Speciality Steel Factory	Zaporozh'ye
All Union Soyuz Specialty Steel PO	Moscow
Iron Alloy Factory	Nikopol'sk
Metallurgical Factory Azov Steel	Zhdanov
Metallurgical Factory	Zlatoust'
V.V. Kuybyshev Pipe Casting Factory	Makeyev
Pipe-Rolling Factory	Chelyabinsk
Titanium-Magnesium Kombinat	Zaporozh'ye
Kuybyshev Diesel Locomotive Factory	Moscow Region
Heavy Machinery PO	Elektrostal'
Heavy Machinery PO	Zhdanov
V.I. Lenin Heave Machine Building PO	Sverdlovsk Region
Automobile Factory	Bryansk
Experimental Mechanics Factory	Kiyev
Lenin Machine Building PO	Petrozavodsk
Ordzhonokidze Machine Building Factory	Podol'sk
Red Giant PO	Moscow
Vatra PO	Ternopol'
Babushina Factory	Dnepropetrovsk
Kakhovsk Factory for Electro-Welding Equipment	Kherson
Heavy Electro-Welding Equipment Factory	Pskov

Source: Soviet press PO=Production Association

Press accounts also reported facilities at two defense-industrial ministries, Radio Industry and Aviation, as having received technologies from the Paton Institute.

While the above list of facilities is certainly not exhaustive, it illustrates the wide ranging, inter-branch role that the Paton Institute occupies and is likely indicative of the goals of the Party's campaign for bringing the Academy's research closer to industrial needs.

### 3. Successes and Failures

Economic contracting seems to have increased the ties of many of the *VUZy* and Academy of Sciences research institutes to the overall Soviet industrial research effort. Further, the use of contracts with ministries for above plan work seems to have added a degree of flexibility to the R&D programs of the industrial ministries. The incentives for contracts – new equipment, larger staffing, broader research possibilities, and political contacts – differ from the general motivation of Western entrepreneurs, but are, perhaps no less successful. Thus, the introduction of greater R&D contracting bears the marks of an administrative success.

R&D contracting has not, however, overcome a number of problems endemic to the Soviet economy. First, many Soviet writers assert that most economic contracts are related to petty, insignificant research themes.<sup>43</sup> For example, one writer observed that only 2 percent of the inventions created by the Academy and *VUZy* facilities resulted in economic savings greater than 100,000 rubles.<sup>44</sup> Another notes that the uncertainties in dealing with outside organizations work against contracting for anything of major importance to the enterprise.<sup>45</sup> Second, the actual industrial implementation of and broader dissemination of contracted R&D is fraught with many familiar roadblocks to innovation in the Soviet economy. The Soviet press has published little on the model contract for the transfer of R&D work, and it has likely proven a weak motivator.<sup>46</sup> Third, calculation of estimated or actual economic effectiveness form the heart of R&D contracts, determining both the contracts' profitability and the incentives. Yet, these calculations have always been a source of controversy, and it is doubtful if they can be accurately made in most cases.<sup>47</sup> Fourth, the formation of branch laboratories and the ability of some research departments to exist on outside funding have caused some internal organizational problems. Some heads of *VUZy* have felt their authority diluted, and some organizations have seen their subordinate design bureaus overly occupied with the work of others.<sup>48</sup> Fifth, the majority of R&D contracts are limited to one year, a period considered by many Soviet scientists and engineers to be too short for serious, long-term research and to be a cause of many premature cancellations.<sup>49</sup> Finally, a large amount of contracting, especially the above plan work, is viewed by some specialists to be poorly coordinated and a source of much duplication.

Thus, R&D contracts, while significantly improving organizational interrelations, failed to solve many of the systemic problems that thwart industrial innovation in the Soviet Union.

## End Notes

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- <sup>1</sup> Ya. A. Kunik (ed.), *Sovetskoye grazhdanskoye pravo*, Moscow: "Vysshaya shkola," 1974, pp. 161-319.
- <sup>2</sup> Louvan Nolting, unpublished manuscript on "Soviet Research, Development and Innovation," (1984), pp.29-30. See also *Vysshaya shkola*, Moscow: Sovetskaya nauka, 1957, pp. 229-230.
- <sup>3</sup> Ronald Amann and Julian Cooper (ed.), *Industrial Innovation in the Soviet Union*, New Haven: Yale University Press, 1982, pp. 493-494.
- <sup>4</sup> Approximately 40 percent of Soviet scientific workers are employed by the Academy of Sciences and the Ministry for Higher and Specialized Education. See Table 32 in Louvan E. Nolting and Murray Feshbach, *Statistics on Research and Development Employment in the U.S.S.R.*, Series P-95, No. 76, U.S. Department of Commerce, Bureau of the Census, June 1981.
- <sup>5</sup> M.P. Ring, *Dogovory po nauchno-issledovatel'skiy i konstruktorskiye raboty*, Moscow: Yuridicheskaya literatura, 1967, pp. 40-41. Several of the Soviet defense-industrial ministries (Ship building and the Radio Industry) and one of the quasi-civilian ministries (Heavy and Transport Machine Building were evidently leaders in the implementation of rules for design contracting. A.S. Pribluda, "Dogovor po opytno-konstruktorskiye raboty." *Sovetskoye gosudarstvo i pravo*, 1958, No. 1, p. 26.
- <sup>6</sup> "Tipovoy dogovor po vypolneniye opytno-konstruktorskiye raboty," see Pribluda, *op. cit.*, 26.
- <sup>7</sup> Science and technology related contracts have differed considerably from ordinary types of economic contracts concluded in the Soviet Union. A.Yu. Kukrus, "Dogovory o provedenii nachno-issledovatel'skikh rabot v vuzakh," *Sovetskoye gosudarstvo i pravo*, No. 10, 1975, p. 65.
- <sup>8</sup> Pribluda, *op. cit.*, 27-32.
- <sup>9</sup> See point 1 of "O perevode otraslevykh nauchno-issledovatel'skikh i konstruktorskikh organizatsii na khozyaystvennyy raschet," Postanovleniye Soveta Ministrov SSSR of 1 April 1961, No. 282. In M.Ya. Chernyak (ed.), *Zakonodatel'stvo o kapital'nom stroitel'stve*, *Vypusk I*, Moscow: Yuridicheskaya Literatura, 1970, pp. 472-477.
- <sup>10</sup> "Polozheniye o poryadke zaklyucheniya dogovorov na provedeniye nauchno-issledovatel'skikh i konstruktorskikh rabot nauchno-issledovatel'skimi i konstruktorskimi organizatsiyami, sostoyashchimi na khozraschete," of 7 September 1961; "Tipovoy dogovor na vypolneniye nauchno-issledovatel'skikh rabot," of 7 September 1961; and "Tipovoy dogovor na vypolneniye konstruktorskikh rabot," of 7 September 1961.
- <sup>11</sup> V.S. Venetskiy, "Dogovory o sozdanii i ispol'zovanii novykh tekhnicheskikh resheniy," *Voprosy izobretatel'stva*, 1970, No. 12, p. 62
- <sup>12</sup> *ibid.*, p. 63.
- <sup>13</sup> R. Amann, M.J. Berry, and R.W. Davies, "Science and Industry in the USSR," *Science Policy in the USSR*, Paris: OECD, 1969, p. 468.
- <sup>14</sup> Pribluda, *op. cit.*, p. 26.
- <sup>15</sup> Ring, *op. cit.*, pp. 48-49.
- <sup>16</sup> The acquisition of new equipment was evidently a prime consideration for many clients. See example of Khar'kov Aviation Institute on page 13.

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<sup>17</sup> The financial position of R&D facilities created by the model contract of 1961 was considered so favorable as to lead one Soviet legal specialist to conclude: “Legal writings are completely justified in emphasizing these laws [the 1961 decree and the model contract] contradict the principles of self-financing, - don’t help the struggle for lowering the costs of R&D work, and don’t provide economic incentives for filing the plan.” *Ibid.*, p. 158.

<sup>18</sup> Point 4 of “O merakh ulushcheniya nauchno-issledovatel’skoy raboty v vysshikh uchebnykh zavedeniyakh,” Prikaz Ministra vysshego obrazovaniya SSSR of 24 April 1956, No. 357, in *Vyssshaya shkola, op. cit.*, p. 216. The branch and problem laboratories subsequently received model status from Minvuz in 1965.

<sup>19</sup> “Instruktsiya o poryadke vypolneniya i oplaty khozdogovornykh nauchno-issledovatel’skikh rabot v vysshikh uchebnykh zavedeniyakh Ministerstva vysshego obrazovaniya SSSR,” 12 October 1957.

<sup>20</sup> “Polozheniye o nauchno-issledovatel’skoy rabote v vysshikh uchebnykh zavedeniyakh,” Ratified by an order of the Ministry for Higher and Secondary Specialized Education on 9 July 1962. For a list of other relevant decrees see N.S. Barabasheva, *Pravovoy status vuzov v SSSR*, Moscow: Izdatel’stvo Moskovskogo Universiteta, 1979, pp. 110-111 and Chernyak, *op. cit.*, pp. 479-481.

<sup>21</sup> Amann, Berry and Davies, *op. cit.*, p. 367.

<sup>22</sup> I.L. Mitakov, “Voprosy stimulirovaniya razrabotki i vnedreniya izobreteniy,” *Voprosy izobretatel’stva*, 1967, No. 6, pp. 9-11.

<sup>23</sup> D.I. Dumesh, “Dogovor- put’ dlya shirokogo vnedreniya izobreteniy,” *Voprosy izobretatel’stva*, 1969, No. 5, pp. 39-42.

<sup>24</sup> *Ibid.*, p. 41.

<sup>25</sup> V.A. Dozortsev, *Pravovoy rezhim avtorskogo svidetel’stva v usloviyakh novoy sistemy planirovaniya i ekonomicheskogo stimulirovaniya*, Moscow: TsNIIPI, 1969 quoted in V.P. Rassokhin, “O dogovore vozmezdnoy peredachi tekhnicheskogo opyta,” *Voprosy izobretatel’stva*, 1970, No. 9, p.11.

<sup>26</sup> V.P. Rassokhin commented wryly on this prediction: “A situation whereby enterprises would fight for the right to be first to implement an invention appears to be a hard to achieve situation about which only inventors and the government employees responsible for technical progress can dream.” *Ibid.*, p. 13.

<sup>27</sup> *Ibid.*, p. 14.

<sup>28</sup> “O meropriyatiyakh po povysheniyu effektivnosti raboty nauchnykh organizatsiy i uskoreniyu ispol’zovaniya v narodnom khozyaystve dostizheniy nauki i tekhniki,” *Postanovleniye TsK KPSS i Soveta Ministrov SSSR* of 24 September 1968.

<sup>29</sup> S.D. Voloshko, *Dogovor na peredachu nauchno-tekhnicheskikh dostizheniy*, Khar’kov: Izdatel’stvo “Vishcha shkola,” 1978, p. 9.

<sup>30</sup> Point 6 of Tipovoye polozheniye “O poryadke zaklyucheniya khozyaystvennykh dogovorov i vydachi vnutriministerstvennykh zakazov na provedeniye nauchno-issledovatel’skikh, opytно-konstruktorskikh i tekhnologicheskikh rabot,” *Postanovleniye GKNT* of 5 August 1969 with attached “Tipovoy dogovor na provedeniye nauchno-issledovatel’skikh, opytно-konstruktorskikh i tekhnologicheskikh rabot.”

<sup>31</sup> Venetskiy, *op. cit.*, p. 63.

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<sup>32</sup> “Tipovoy dogovor na peredachu predpriyatiyami i organizatsiyami svoikh nauchno-tekhnicheskikh dostizheniy drugim predpriyatiyam i organizatsiyam i na okazaniye im pomoshchi v ispol’zovanii zaimstvovannogo opyta,” Postanovleniye GKNT of 31 December 1971.

<sup>33</sup> M.I. Piskotin, V.A. Rassudovskiy and M.P. Ring (ed.), *Organizatsionnopravovye voprosy rukovodstva naukoy v SSSR*, Moscow: Izdatel’stvo “Nauka,” 1973, p. 319 and *Voprosy ekonomiki*, 1981, No. 11, p.138.

<sup>34</sup> “Vazhneyshaya zadacha vysshey shkoly,” *Vestnik Vysshey shkoly*, 1976, No. 4 in Barabasheva, *op. cit.*, p. 128.

<sup>35</sup> V.N. Vinogradov, “VUZ i proizvodstvo-tesnyy kontakt, *Voprosy izobretatel’stva*, 1973, No. 10, p. 45.

<sup>36</sup> V.G. Kononenko, “Razrabotka i ispol’zovaniye izobreteniy v usloviyakh VUZa,” *Voprosy izobretatel’stva*, 1969, No. 3, p. 43.

<sup>37</sup> Point 8 of “O merakh ulushcheniya nauchno-issledovatel’skoy raboty v vysshikh uchebnykh zavedeniyakh” 24 April 1956 stated that before industrial equipment related to defense could be given to VUZy, agreement from the Ministry of Defense had to be obtained.

<sup>38</sup> John A. Martens and John P. Young, “Soviet implementation of Domestic Inventions: First Results,” in *Soviet Economy in a Time of Change, Volume 1*, Joint Economic Committee, Congress of the United States, October 10, 1979, p. 488.

<sup>39</sup> Thane Gustafson, *Selling the Russians the Rope? Soviet Technology Policy and U.S. Export Controls*, The Rand Corporation, R-2649-ARPA, April 1981, p. 65.

<sup>40</sup> B.K. Vaynshteyn, V.A. Kuznetsov, and I.N. Tsigler, “Fundamental’naya nauka-proizvodstvu,” *Voprosy izobretatel’stva*, 1984, No. 3, pp. 13-14.

<sup>41</sup> V.I. Kushlin, *Uskoreniye vendreniya nauchnykh dostizheniy v proizvodstvo*, Moscow: Ekonomika, 1976, p.138 in Gustafson, *op. cit.*, pp. 61 and 65.

<sup>42</sup> B. Paton, “Plodotvornoye vzaymodeystviye,” *Kommunist*, 1981, No. 2, p. 31.

<sup>43</sup> Barabasheva, *op. cit.*, pp. 110 and 122 and V.P. Rassokhin, “Pravovoy mekhanizm yedinoy politiki razvitiya nauki i tekhniki, *Sovetskoye gosudarstvo i pravo*, 1980, No. 4, p. 94.

<sup>44</sup> L.Ye. Komarov, “Sovershenstvovaniye izobretatel’skoy raboty v akademicheskikh nauchnykh uchrezhdeniyakh i vuzakh,” *Voprosy izobretatel’stva*, 1982, No. 12, p. 4.

<sup>45</sup> Dumesh, *op. cit.*, p. 39.

<sup>46</sup> The Institute of Economics of the Ukrainian Academy of Sciences surveyed 300 scientific organizations on work implemented and discovered that about 80 percent was used at only one or two enterprises and 0.6 was used at more than five enterprises. Ya. Akhundov, M. Krasnokutskiy and Sh. Nuradinov, “Spetsilizirovat’ vnedreniye technicheskogo progressa,” *Khozyaystvo i pravo*, 1979, No. 1, p. 56.

<sup>47</sup> In the early 1930s there was an investigation of 984 calculations made for economic effectiveness. More than 300 of them were “Phrases that only stated bluntly the savings” and more than 600 were done “unsystematically.” Only 36 calculations were done thoroughly. Savitskiy, “Raschety effektivnosti,” *Izobretatel’*, 1933, No. 11, pp. 37-38. Between 1957 and 1967 calculations for economic savings were made for only 52 to 58 percent of all inventions and rationalization proposals implemented. Ye. G. Kiriyenko,

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Nekotorye problemy ekonomiki izobretatel'stva," *Ekonomika izobretatel'stva: Materialy nauchnoy konferentsii/ 4-6 Marta 1968*, Kiyev: Znaniye, 1968, p. 71.

<sup>48</sup> Barabasheva, op. cit., pp. 120-121 and G.A. Nesvetaylov and L.N. Rutskiy, "Kurs na vnedreniy nauchnykh razrabotok," *Voprosy izobretatel'stva*, 1983, No. 2, p. 50.

<sup>49</sup> A.Yu. Kukrus, "Dogovory o provedenii nauchno-tekhnicheskikh rabot v vuzakh," *Sovetskoye gosudarstvo i pravo*, 1975, No. 10, p. 70.