

# *Quality, experience, and monopoly: the Soviet market for weapons under Stalin*<sup>1</sup>

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## SUMMARY

Monopoly is a particular problem in markets where experience goods are traded, since the consumer cannot respond to bad experiences by switching repeat purchases to another supplier. New evidence shows how the defence ministry as buyer in the Soviet market for military goods responded to this problem by investing in an evaluation of quality prior to purchase, by showing reluctance to buy, and by exploiting the available non-market means to influence the defence industry as supplier. The effectiveness of these stratagems was limited by the defence industry's counteractions and because the buyer had no choice but to come to a compromise with the supplier.

When it is costly to evaluate the qualities of a good, the consumer faces a significant problem in deciding whether or not to purchase it. Nelson introduced a distinction between 'search' goods, for example food and clothing, and 'experience' goods, for example domestic appliances and mechanical equipment.<sup>2</sup> The difference lies in the relative cost to the consumer of evaluating a good before purchase, through search, relative to the costs of doing so afterwards, from experience. When sampling is destructive, or when the conditions of use cannot easily be replicated before purchase, the cost of search is raised relative to that of experience and we become more likely to rely on evaluation after purchase.

In this article we investigate the market for weapons and military equipment; these would appear to fit the class of experience goods quite well. For many military consumables, for example ammunition and explosives, sampling is destructive. The firing range does not easily replicate combat conditions for the testing of equipment. The 'experience' aspect of military goods is underpinned by many anecdotes about equipment on which the

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<sup>2</sup> Nelson, 'Information and consumer behavior'.

government was happy to spend taxpayers' money that broke down afterwards when subjected to practical use.<sup>3</sup> In the case of armaments, it would certainly appear that prior search has often failed to establish quality before purchase.

A result of this is that, where weapons are traded before use, they must eventually undergo two tests. The first is the market test: do the weapons create producer and consumer surpluses sufficient for both buyer and seller to be willing to participate in an exchange *ex ante* and then to remain satisfied with its terms *ex post*? The second is the battle test: when combined with the rest of the military apparatus, do the weapons beat the enemy and win the war? The two tests are conceptually distinct, although practically related. By the close of the Second World War, Soviet weapons had won a justifiably high reputation for rugged serviceability and firepower. Eventually, they passed the battle test. This does not mean that they always performed as designers and producers promised and generals expected. The features that made a Soviet tank superior to its German adversary on the battlefield were not necessarily those that featured in the market test. The subject of the present article is the market test, not the battle test: what made the Red Army willing to pay, and did the Army get what it thought it had paid for?

The western literature on experience goods typically assumes a buyer's market. Where the consumer is sovereign, experience is valuable and has a pay-off in helping to decide on repeat purchases: the consumer's best response to a bad experience is to switch brand or supplier. In this article, however, we consider the case of the Soviet economy where the market belonged to the seller: supply was monopolized, the consumer could not switch suppliers, and this reduced the value of experience.

Monopolization was a source of immense advantage to the Soviet seller. It was associated with the softening of financial constraints on production establishments and a state of permanent shortage, in which the consumer had no choice but to accept the goods that the seller offered, regardless of quality or assortment.<sup>4</sup> Without free entry and exit there was no automatic punishment for supplying shoddy goods. The initial transition to the monopolistic command system brought a rapid deterioration in product quality that was eventually halted and reversed only with great difficulty.<sup>5</sup>

Although the Soviet economy was generally unlike western market economies, markets for military equipment have specific features that tend to be similar everywhere. In all countries, agents on both sides of the market place are powerful and well connected. On one side, a senior government minister

<sup>3</sup> For a catalogue of equipment failings on British army exercises in Oman in 2001, see National Audit Office, *Ministry of Defence exercise*.

<sup>4</sup> Kornai, *Economics of shortage*, vol. 1, pp. 101–2.

<sup>5</sup> Davies, *Soviet economy in turmoil*, pp. 88–9, 313–14, and 384–5; Davies, *Crisis and progress*, pp. 108, 394–5, 404, and 484.

manages a monopsony. On the other side are large-scale producers with claims on government funding that carry additional weight because these concerns are too important as producers and employers to be allowed to fail. Nonetheless, defence markets are not *uniformly* the same, even among market economies; in fact, national arrangements of the military market have varied widely in the degree of competition, public accountability, rent seeking, and ‘softness’ of budget constraints.<sup>6</sup>

The Soviet economy, with ownership and allocation monopolized under a single-party state, lay at one extreme of a spectrum of institutional possibilities.<sup>7</sup> Its market for military goods shows several unique and fascinating features; despite being exceptionally monopolized it supplied an army that won the Second World War and terrified the west for the next half century. Thus it is fully worthy of detailed study.

What working arrangements are likely to emerge to protect the buyer under conditions of generalized monopoly? We offer three propositions. First, the monopolization of supply reduced the value of experience to the consumer, who could not act upon it in repeat purchases, relative to the value of search; as a result we would expect Soviet consumers to have been more willing to invest in evaluation before purchase, however costly this might be. We would also expect them to have been less willing to buy the goods they were offered in the process of evaluation for the sake of experience.

This may seem paradoxical since there is much evidence of the opposite kind of behaviour, i.e. of consumers in Soviet-type economies generally being willing to buy whatever they were offered, a phenomenon that Kornai described as ‘forced substitution’.<sup>8</sup> Kornai’s point is that in a seller’s market there is a pay-off to hoarding that does not exist in a buyer’s market. Our point does not contradict this. It is that, in a seller’s market, experience is less valuable since the buyer can respond to a bad experience only by not making a repeat purchase at all. Therefore, we expect to see more care and greater reluctance in purchasing things that would qualify as experience goods in a buyer’s market than for things that are search goods everywhere.

<sup>6</sup> Eloranta, ‘Demand for external security’; Eloranta, J., ‘Rent seeking and collusion in the military allocation decisions of Finland, Sweden, and the UK, 1920–1938’ (University of Warwick, Department of Economics, Working Paper, 2004).

<sup>7</sup> The continuity along this spectrum is conceptualized by Djankov et al., ‘New comparative economics’. In the case of the Soviet economy the reader may question whether the ‘market for weapons’ is an appropriate terminology. Was it a buyer’s market, a seller’s market, or not a real market at all, but just an administrative device that the dictator used to control the implementation of his directives? We discuss this fascinating subject elsewhere (Harrison, ‘Soviet quasi-market’; M. Harrison and A. M. Markevich, ‘Hierarchies and markets: the institutional setting of the Soviet defense industry, 1929 to 1953’ (University of Warwick, Department of Economics, PERSA Working Paper no. 39, 2005: Available at: <http://www.warwick.ac.uk/go/persa>), concluding that, while technically a ‘quasi-market’, the institutions within which Soviet military goods were traded had significant features of a real market. In the present case we will illustrate this by showing a tendency to equilibrium (see section VII and the app.).

<sup>8</sup> Kornai, *Economics of shortage*, vol. 1, pp. 36–8.

Our second proposition is that, since buyers' preferences could not be enforced by competition, we would expect to see the Soviet consumer using other means, including legal enforcement, administrative regulation, and enforcement through private or informal relationships. Since the buyer could not punish one supplier by changing to another, we would think it natural to find the buyer seeking to reward the supplier by offering favours and good will in return for higher quality. We would expect to see active consumer lobbies looking to the state to enact quality standards and enforce them through moral pressure, regulatory agencies, incentives to improve quality, penalties for sub-standard work, and so on.

We would also expect counteraction by the producer interest. On one hand, we would expect the weakness of civil society in the Soviet Union and the initial advantage of the seller's market to aid the producer. On the other hand, the defence ministry was not an ordinary consumer; it was the most powerful buyer in the Soviet economy. The defence sector was of high priority for the Soviet leadership. The quality of military goods bore directly on the country's defensive capability; a ship that sank or a weapon that misfired would cost soldiers' lives, and prejudice morale and security. This raised the importance of product quality in the defence industry above that in civilian industries, and added force to the attempts to overcome the adverse consequences of the seller's market in the defence sector.

Our third proposition concerns the potential for integrating the defence industry with the military. When one firm supplies experience goods to another as inputs and it is cheaper to exchange information within a firm than across a market, a tendency to vertical integration may result.<sup>9</sup> This case for integration extends the argument that firms exist to enforce effort when independent agents cannot commit not to shirk.<sup>10</sup> Since weapons are an input to the production of military power, we could expect a tendency to vertical integration that would have brought the defence industry under the direct control of the military.

The historical record shows that military interests did seek vertical integration with the defence industry, but Stalin opposed it and quickly ruled it out. In 1927 army commanders Tukhachevskii, chief of the general staff, and Unshlikht, a member of the Revolutionary Military Council, proposed giving the Red Army powers over appointments to the defence industry, plans and reports of defence producers, and plans for capital investment in the industry.<sup>11</sup> The proposals were rejected.<sup>12</sup> Tukhachevskii's subsequent resignation as chief of staff was most likely prompted by the failure of his ambition to control the defence industry.<sup>13</sup> As for Stalin's motivations,

<sup>9</sup> Crocker, 'Vertical integration'.

<sup>10</sup> Alchian and Demsetz, 'Production'; Perry, 'Vertical integration', pp. 210–11; in the case of the Soviet defence industry 'shirking' took the form of supplying substandard goods.

<sup>11</sup> Tukhachevskii: Samuelson, *Plans*, pp. 42–7; Unshlikht: A. K. Sokolov, 'Before Stalinism'.

<sup>12</sup> Harrison and Simonov, 'Voepriemka', p. 230.

<sup>13</sup> Samuelson, *Plans*, pp. 55–9

divide-and-rule was a basic mechanism on which he built his power, and this included keeping soldiers and industrialists at odds.<sup>14</sup>

With vertical integration beyond reach, the Soviet purchaser in the military market place was limited to the other responses available in practice. Our first two propositions defined these as a greater willingness to evaluate before purchase combined with greater reluctance to buy, and the enforcement of quality by non-market means. We investigate them using the formerly secret documents of the supplier, the Soviet ministries for military industry; the purchaser, the defence ministry; and the relevant regulatory agencies. This documentation covers two decades, from the late 1920s to the late 1940s. Our main focus is on the 'military agents' of the Soviet defence ministry who were responsible for the day-to-day acquisition of weapons and equipment from industry.

The military agents have been described in previous studies that were based on official publications and the testimony of émigrés formerly employed in defence-related branches of industry and science.<sup>15</sup> Access to a few central memoranda and decisions enabled Harrison and Simonov to offer a significantly more sceptical perspective on these arrangements than was previously available.<sup>16</sup> Ours is the first account based on detailed primary documentation of the process of Soviet military procurement. In terms of the methodology of social science, the evidence is qualitative and is of two kinds: for the most part we accumulate examples that illustrate the argument; occasionally we draw conclusions from silences in the data. The reader will find that the balance of our evidence is heavily critical of the quality of Soviet weapons; this arises inevitably from its selection to reflect the experience of the market test, not the test of battle.

The article is organized as follows. Sections I and II describe the institutions for quality control in Soviet industry, including those found only in the defence industry, such as the military agents. In sections III and IV we analyse the military agents' control of quality and deadlines. Sections V and VI review the counter-actions of industry. Section VII suggests that the

<sup>14</sup> Harrison, 'Soviet industry'. It is true that Stalin and his deputies imposed further discipline by organizing tournaments of 'socialist emulation' in which producers were obliged to compete against each other on administrative criteria. Rivalry of this kind, often taking the form of races to fulfil plan indicators, has been called 'yardstick' competition by Shleifer, 'Yardstick competition'. In the Soviet economy socialist emulation was practised in the defence industry as in the civilian sector; Rogachevskaia, *Sotsialisticheskaia sorevnovanie*, gives many examples. Another potential yardstick was the level of military technology abroad, such as the performance characteristics of the latest foreign tanks and aircraft. But yardstick competition emphatically did not remove the monopoly power of Soviet military producers; it did not endow the army with the power to select its suppliers and to reject one in favour of another. It is true that aviation engineers competed for the adoption of rival designs in a more thoroughgoing way, described by Harrison, 'Political economy' and 'Soviet quasi-market' and Holloway, 'Innovation'. But the logic of the command system did not allow competition among large-scale industrial producers to work like this, and ministers and planners saw no purpose in creating rival suppliers for reasons other than strategic insurance.

<sup>15</sup> Agursky, M., 'The Research Institute of Machine Building Technology' (Hebrew University of Jerusalem, Soviet Institution Series no. 8, 1976); Agursky and Adomeit, 'Soviet military industrial complex'; Alexander, *Decision making*; Almquist, *Red Forge*; Holloway, 'Innovation'.

<sup>16</sup> Harrison and Simonov, 'Voenpriemka'.

market tended to equilibrium, adjusted by variations in quality. Section VIII concludes.

For brevity we write ‘the army’ and ‘industry’ to stand for the players on either side of the military market place; the *army* as purchaser comprised the ministry of defence, including the Red Army and Navy command and supply staffs; *industry* comprised the supply ministry for heavy industry from 1931 until the defence industry was hived off in December 1936 and further subdivided in January 1939, into several ministries with specialized production responsibilities for aircraft, armament, and so on. Soviet ministries were called ‘people’s commissariats’ until they were renamed ministries in 1946; we call them ministries throughout. Soviet defence factories were designated by number, for secrecy, and name of the fund-holding ministry. In place of ‘factory no. 24 of the people’s commissariat (ministry) of the aircraft industry’ we write ‘aircraft factory no. 24’.

## I

The problem of quality in Soviet industry arose because factory managers faced strong incentives to seek a quiet life for themselves and their employees by fulfilling the plan for least effort.<sup>17</sup> The authorities assigned plans in roubles of gross output, subject to fixed plan prices and quality specifications [*tekhnicheskie usloviia*]. Quality, however, was costly to the producer. As we now know, virtually everything in the Soviet command system that appeared fixed was negotiable in practice, including plans and prices. Once plans and prices had been written down, however, the main scope for the factory to economize on effort lay in finding ways to reduce quality that were hard to detect at the point of sale. Where they succeeded, quality became a critical issue for the purchaser.

Legal mechanisms did exist for the Soviet purchaser to bring pressure to bear upon a poor-quality supplier. Under Soviet legislation of 1929, strengthened in December 1933 and July 1940, factory managers became criminally liable for negligence in relation to product quality. The problem lay not in the law but in its enforcement; in 1939, for example, the decree of December 1933 was already a dead letter.<sup>18</sup> The purchaser could also claim a refund and seek damages through the civil arbitration courts. The expected gain to the purchaser was limited, however, by two factors: the procedure was time-consuming, and, by damaging the monopoly supplier’s good will, it threatened further adverse consequences for the purchaser in the future.

Another factor affecting the quality issue in the Soviet defence market was the failure of industrial self-regulation. The basic regulator of product quality in every Soviet factory was its department for ‘technical control’

<sup>17</sup> Berliner, *Factory and manager*; Granick, *Management*.

<sup>18</sup> Solomon, *Soviet criminal justice*, pp. 144–7.



(OTK). The factory OTK was obligated to regulate quality by testing or sampling the product. Formally, the factory could deliver only goods that its OTK had approved. This mechanism failed in the sense that those who themselves worked in it regarded it as defective, while those who presided over it lacked the will to change it. This does not mean that self-regulation was completely ineffective; if it was, it would be hard to understand why it was retained. But it did not achieve the intended effects.

The main problem was that the OTK came under the control of the seller, not the buyer, and could not regulate independently. Defence enterprise managers were more interested in the gross value of output than in its quality. In 1934 for example, the same managers of aircraft factory no. 24 who had just been reprimanded for poor-quality work by a 'comrades' court' and issued with an administrative penalty were rewarded three days later with bonuses for fulfilling the 1933 plan.<sup>19</sup>

To fulfil the plan, factory managers either put pressure on the OTK to approve substandard goods or by-passed it altogether. A fairly typical audit of an electrical factory in 1943 revealed chaotic procedures for quality control, concluding that 'the OTK has no influence . . . there is no account of substandard goods . . . no one is accountable for substandard goods'.<sup>20</sup> Even where procedures were outwardly intact, the reality was that the OTK was under the director's thumb. At a postwar armament factory:

The chief technician and chief designer generally pass substandard goods for the sake of quantitative plan fulfilment, and also for personal motives, to avoid bad relations with the director. The chief engineer and director generally resolve 99 per cent of disputes on the side of production regardless of quality, based on the recommendations of [the chief technician and designer]. The result is a little odd: the chief of OTK labels the output as substandard, but the director issues an instruction not to scrap it and not to cut back on acceptance. As the chief of OTK, subordinate to the factory director, I am obligated to carry out the director's instruction.<sup>21</sup>

Attempts by OTK employees to resist management priorities were doomed. Before the war, the OTK chief at an armament factory refused to approve defective goods without the director's written instruction. The director gave way, but sacked the OTK chief two months later.<sup>22</sup> In another case, an OTK chief tried to cable the ministry complaining about management pressure; the director stopped the cable on the grounds that the OTK

<sup>19</sup> Hoover/RGANI: 'Archives of the Former Soviet State and Communist Party' from the Russian State Archive of Recent History (Moscow) at the Hoover Institution on War, Revolution, and Peace (Stanford, CA) (hereafter Hoover/RGANI), 6/1/91, f. 12 (17 March 1934). Russian archival documents are numbered according to a standard system; the foregoing refers to documents of the Russian State Archive of Recent History Russian (RGANI) on microfilm at the Hoover Institution, ministerial collection (*fond*) no. 6, inventory (*opis*) no. 1, file (*delo*) no. 91, folio (*list*) 12.

<sup>20</sup> Hoover/RGANI, 6/2/55, ff. 13ob, 24 (4 August 1943).

<sup>21</sup> RGAE: Russian State Economic Archive (Moscow) (hereafter RGAE), 8157/1/4105, f. 147 (Pavlov, 21 October 1947).

<sup>22</sup> RGAE, 8157/1/4105, f. 213 (Mandich, 21 October 1947).

chief did not have the right to communicate with the ministry independently, only through him.<sup>23</sup>

OTK staff regarded their dependence on the director as a main reason for their ineffectiveness. At a meeting of OTK chiefs held in the ministry of armament on 21 October 1947, opinion was unanimous: 'It would be ideal to take the OTK staff away from the director's influence'.<sup>24</sup> One option was for the OTK to report directly to the minister. It is true that ministers responsible for the supply of military goods were not indifferent to quality and engaged in periodic inspirational campaigns to enforce it, usually accompanied by fearsome threats. In practice, however, the ministry had its own plan to fulfil; conscientious adherence to quality standards could threaten not only the incomes of workers and managers but also the authority and prestige of the minister. The result was that the ministerial commitment to quality lost credibility and could not be enforced.

Before the event the minister was always for *quality*, but after the event, when quality was already decided, *quantity* became the important thing. Thus a ministry official explained a plan shortfall for 1940 at the Red Etna factory as follows:

The OTK started rejecting everything just to be on the safe side and letting nothing through . . . Instead of the breakthrough that the collective could have mobilized there was just whinging and playing safe . . . I had to comb through the warehouse and label the goods that were serviceable. Now we've replaced the OTK chief and we've taken on someone from the Gor'kii factory, they say he's a sensible, capable worker.<sup>25</sup>

Reorganization could not alter this basic situation.

In short, self-regulation did not solve the problem of quality. The seller was primarily interested in fulfilling the plan for finished output. Once this plan was fixed, the seller lost interest in quality and typically gained from lowering it. The purchaser was the only agent with a private interest in enforcing quality standards. The means to a solution lay in the purchaser's deployment of permanent representatives to the supplier's factories. Below, we analyse this operation.

## II

To exert influence over suppliers in the Soviet seller's market, many purchasers paid informal agents [*tolkachi*] to live with the supplier.<sup>26</sup> Such agents had no legal status and the authorities saw them as a nuisance. Their existence violated the principles of the command system, although the same system would have had difficulty operating without them.

<sup>23</sup> RGAE, 8157/1/4105, f. 150 (Pavlov, 21 October 1947).

<sup>24</sup> RGAE, 8157/1/4105, f. 102 (Zvonarev, 21 October 1947).

<sup>25</sup> Hoover/RGANI, 6/2/34, f. 21 (4 February 1941).

<sup>26</sup> Berliner, *Factory and manager*.



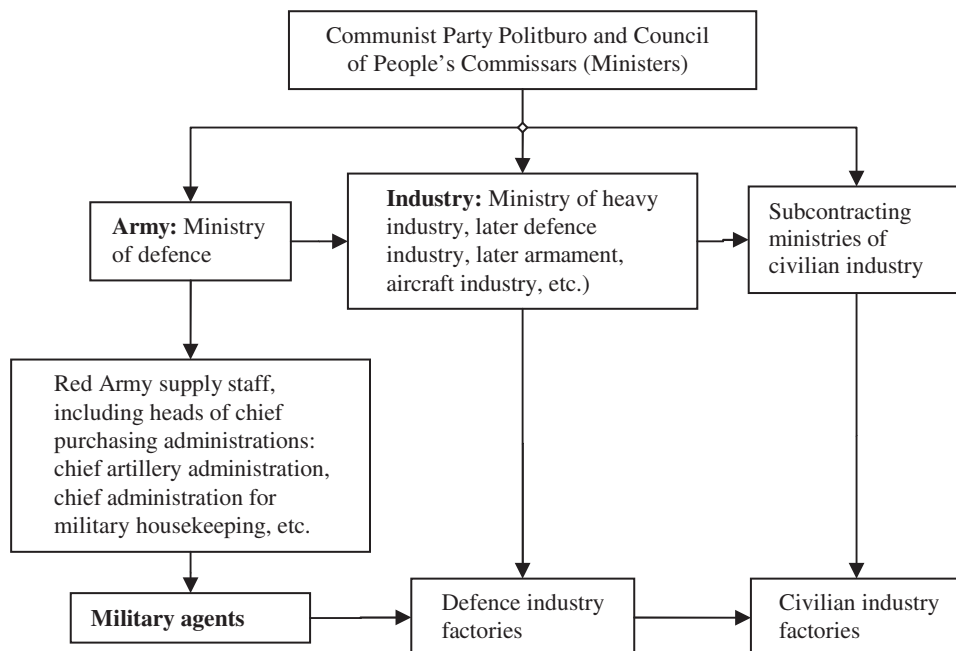


Figure 1. *Principals and agents in the military market place*

Despite their dislike for purchasing agents in general, the authorities permitted the army to appoint special military agents [*voennye predstaviteli, voenpredy*] to regulate procurement from industry: in other words, the military agent was a *tolkach* with legal status. Harrison and Simonov have described how this arrangement emerged from the prerevolutionary procurement system.<sup>27</sup> As the mixed economy of NEP gave way to the command system, the army had to confront the adverse consequences of the seller's market. In 1930, a radical reform created the military agents so as to 'move rapidly to a breakthrough in the work of industrial enterprises in fulfilling military equipment orders'.<sup>28</sup> The 1930 statute also defined the rights and obligations of industry and the army in relation to product quality.<sup>29</sup> These were left largely unchanged in subsequent versions enacted in 1933/34 and 1939.<sup>30</sup> Figure 1 illustrates the structure of agency that resulted.

The statute of 1939 charged the military agents in industry with 'observance of the process of manufacture of military products . . . the technical

<sup>27</sup> Harrison and Simonov, 'Voenpriemka'.

<sup>28</sup> Russian State Military Archive, Moscow RGVA (hereafter RGVA), 33991/1/65, f. 7–8 (1930).

<sup>29</sup> Harrison and Simonov, 'Voenpriemka', p. 229.

<sup>30</sup> State Archive of the Russian Federation, Moscow (hereafter GARF), 8418/8/175, ff. 10–14 (decree of the Council of Labour and Defence, 28 November 1933; decree of the ministries of defence and heavy industry, 4 August 1934); 8418/23/314, ff. 1–5 (decree of the Defence Committee, 15 July 1939).

acceptance of finished items, and monitoring the enterprises' mobilisation readiness'.<sup>31</sup> Their responsibilities included checking that production adhered to technological standards and that enterprises fulfilled their plans; they were obliged 'to report to the Red Army chief of armament through the chief of the appropriate equipment [purchasing] administration' concerning all shortfalls in suppliers' fulfilment of military equipment orders: the use of substandard materials, shortages of raw materials and semi-manufactures for the enterprise, departures from approved processes and blueprints, poor work by the factory OTK, missed deadlines for military orders, and so on.<sup>32</sup> To fulfil these obligations, the military agents were endowed with rights of free access to the entire factory site at any time, day or night, and to all documentation relating to technology, production, and mobilization. The management was obliged to support the military agents with necessary accommodation and equipment. Faced with substandard products the military agents could halt acquisition and, if necessary, production; but they were prohibited from doing so if the purpose was to exert pressure on the management. Managers had no right to interfere directly in the work of the military agents, but could appeal over their heads to higher authority. To protect their independence from management, the military agents were paid only by the defence ministry and were prohibited from accepting rewards or benefits from the side of industry.

During the 1930s the numbers of military agents appear to have risen dramatically, and their qualifications also improved. Within the defence ministry, separate chief administrations for artillery, the air force, chemical weapons, and so forth, dealt with the purchase of specialized equipment (see figure 1). Each maintained its own military agents at suppliers. Two factors swelled their numbers. First, the agents themselves were serving officers, but the defence ministry also engaged civilian employees to support them. Second, an enterprise that supplied more than one purchasing administration of the defence ministry had to accommodate agents from each of them, and this also added to numbers. At 16 factories in Iaroslavl' in 1943, for example, a total of 144 agents worked on military acceptance, including 19 senior command staff, 30 middle-ranking officers, and 89 hired employees. Some factories accommodated agents of up to five separate army and navy purchasing administrations.<sup>33</sup>

The growth of numbers employed as military agents is hard to judge because we lack global figures for the early period. At the beginning of 1930, one of the Red Army's purchasing administrations, that for military house-keeping, accounted for just 263 local procurement agents.<sup>34</sup> Numbers appear to have grown rapidly thereafter; by 1938 the total of military agents

<sup>31</sup> GARF, 8418/23/314, f. 2 (15 July 1939).

<sup>32</sup> RGVA, 33991/1/65, f. 11 (March 1930).

<sup>33</sup> Hoover/RGANI, 6/2/49, f. 8 (7 July 1943).

<sup>34</sup> RGVA, 47/5/207, f. 1 (1930).

and their employees had reached 2,000–3,000, and 20,281 by 1940.<sup>35</sup> This growth probably reflected supply and demand. On the demand side, the economy, and especially its defence sector, was expanding with exceptional rapidity.<sup>36</sup> At first, demand outstripped supply; at the beginning of the decade skilled engineers were so scarce that recruiting standards had to be lowered to fill vacancies for military agents.<sup>37</sup> In 1933 the government admitted that ‘the defence ministry acceptance staff do not measure up to their job descriptions’.<sup>38</sup> Frequent military complaints about the shortage of agents and the amount of overtime they had to work, leading to poor control of quality and deadlines, persisted through the mid-1930s.<sup>39</sup>

Two factors eventually overcame this shortage. One was the expansion of Soviet higher education, which greatly augmented the supply of professionally qualified personnel. The other is that more privileged terms of employment were established to make up requirements by recruiting skilled civilian personnel.<sup>40</sup> In 1938 military agents’ pay was raised up to and subsequently beyond the level of OTK staff; as numbers increased, their workload was also cut back.<sup>41</sup>

The turnaround in relative pay and conditions sometimes evoked resentment from the side of OTK employees. According to one speaker at the meeting held in the ministry of armament in October 1947, for example: ‘... a leading military employee [responsible] for a single product gets 1,400 to 1,500 rubles [monthly]. An OTK deputy [chief] for metallurgy in charge of 17 workshops gets 1,350 rubles and an OTK head of workshop gets 900 rubles. This pay gap ensures they get people with more skills, higher discipline, and better training since these are all associated with high pay’.<sup>42</sup> Another gave the average monthly pay of OTK staff at his factory as 400 roubles including bonuses, while hired employees of the military agents got 600 roubles and the officers up to 2,000 roubles.<sup>43</sup> A third compared wages in the OTK unfavourably not only with the earnings of the military agents but also with production workers’ pay. The basic pay for OTK workers equalled that of production workers, but the latter could expect large piece-rate bonuses, whereas OTK staff got nothing for additional effort.<sup>44</sup>

OTK workers also complained about the military agents’ easy life. ‘Our team from the chief artillery administration comprised a lieutenant-colonel, a captain, and three hired staff. They needed 40 minutes to take ‘decisions’

<sup>35</sup> 1938: a document dated 16 April of that year (GARF, 8418/22/508, f. 6), gives the number of locally hired employees of military and naval agents as 1,695; the serving officers can hardly have exceeded this number. 1940: Harrison and Simonov, ‘Voenpriemka’, p. 229.

<sup>36</sup> Davies and Harrison. ‘Soviet military-economic effort’.

<sup>37</sup> RGVA, 33991/1/65, f. 1 (27 February 1930).

<sup>38</sup> GARF, 8418/8/175, ff. 10–12 (28 November 1933).

<sup>39</sup> GARF, 8418/22/508, f. 8 (29 May 1938).

<sup>40</sup> GARF, 8418/8/175, f. 3 (4 August 1934).

<sup>41</sup> GARF, 8418/22/508, f. 1 (5 June 1938).

<sup>42</sup> RGAE, 8157/1/4105, f. 102 (Zvonarev, 21 October 1947).

<sup>43</sup> RGAE, 8157/1/4105, f. 140 (Dovzhenko, 21 October 1947).

<sup>44</sup> RGAE, 8157/1/4105, f. 110, 112 (Koloskov, 21 October 1947).

and the rest of the time they could catch flies, sing songs, and undertake staff development'.<sup>45</sup> This was not an urban myth; the army considered it normal that 'the workload of military product acceptance on military agents and their staff does not exceed 50 per cent'.<sup>46</sup>

The army saw the maintenance of this apparatus as a price worth paying for improved quality. Even in wartime, when career officers were needed for the front, the defence ministry refused to cut numbers of military agents by merging its specialized purchasing administrations into one.<sup>47</sup> There were at least three wartime proposals to do this, one in 1941 and two in 1943; the ministry rejected them all on the grounds that 'Creating a unified apparatus for regulation and acceptance of military production, independent of the chief administrations, would lead to a loss of accountability in regulating the production of armament and munitions, and to a reduction in their quality'.<sup>48</sup> This readiness to trade frontline strength for logistical muscle in wartime demonstrates clearly the high value that the army itself set on its procurement organization.

### III

In the introduction we suggested that under Soviet conditions the buyer of experience goods would show a greater willingness to evaluate before purchase combined with a greater reluctance to buy, and would also engage in the enforcement of quality by non-market means. In this section we analyse how the army's agents worked to enforce quality on industry. We illustrate how the antagonism between army and industry came to focus on the role of the military agent. We find that the military agents did what economic theory suggests: they engaged in systematic evaluation of the product before purchase; they acted as a deliberate brake on the acquisition process and so enacted the army's reluctance to buy at any price. However, they did not do so with complete success.

Officially, the army and industry had common interests; disputes arose only because of 'misunderstanding', which could be overcome through procedures to identify and manage disagreements, such as joint meetings.<sup>49</sup> In reality, however, 'mutual relations of the factories with ministry of defence and [navy] representatives are unbearable'.<sup>50</sup> Underlying this lay a basic conflict of interest between the army and industry.

<sup>45</sup> RGAE, 8157/1/4105, f. 203 (Dul'chevskii, 21 October 1947).

<sup>46</sup> Hoover/RGANI, 6/2/49, f. 8 (7 July 1943).

<sup>47</sup> Hoover/RGANI, 6/2/49, f. 8–10 (7 July 1943).

<sup>48</sup> Hoover/RGANI, 6/2/49, f. 9 (7 July 1943).

<sup>49</sup> 'Common interests': RGVA, 47/9/83, f. 102 (Budnevich, 1928); RGAE, 8183/1/146, f. 81 (Kudak, 13 April 1937). 'Mutual misunderstanding' to be overcome through 'joint meetings': RGAE, 7515/1/403, f. 180 (Kulik to M. Kaganovich, 7 February 1938). Advocating 'joint meetings' ten years previously: RGVA, 47/9/83, f. 96 (Dybenko, 1928).

<sup>50</sup> RGAE, 8183/1/146, f. 80 (Kudak, 13 April 1937).

The mutual attitudes of managers and military agents can be illustrated from both sides. A defence industry manager spoke up for industry in 1928: 'Less regulation. It is our misfortune that they regulate us so much'.<sup>51</sup> Nearly a decade later, a shipyard worker told party activists: 'the handover of vessels must be simplified. We are losing a lot of time doing unnecessary trials'. A military agent replied for the army: the previous speaker 'said that the trials are implemented in too much detail. But I say that detailed trials are essential . . . We have to eliminate all defects from the key items through exhaustive trials'.<sup>52</sup> Another military agent put it bluntly: 'Don't argue with us, just do what we say because we're not making it up'.<sup>53</sup>

Those who spoke for industry typically accused military agents of incompetence and lack of realism. 'There are good acceptance agents but there are also agents who don't understand the things they are supposed to accept. How can someone be a good acceptance agent if they tell him to deal with soap today, hay tomorrow, and belts the day after?'.<sup>54</sup> 'If the [naval agency] is staffed with weak employees then they will set requirements wrongly. Often a ship isn't handed over because there is more squabbling going on than work'.<sup>55</sup> In a development predicted by Holloway, they considered the agents to be useful only to exert pressure on their own subcontractors.<sup>56</sup> The agents themselves realized that industry regarded them with contempt, as 'blunderers who . . . give us nothing useful', or 'formalists who . . . shove spokes in our wheels', and so on.<sup>57</sup>

This hostility arose because the military officers acted as the Army's loyal agents. The chief instrument at their disposal for enforcing quality, and perhaps the only one that was effective, was their right to refuse to accept goods that were not up to standard. By rejecting the goods that industry offered they threatened the ability of industry to show compliance with supply plans and contracts.

This was a powerful threat, although not as potent as might appear at first sight. In theory plan and contract violations could carry direct administrative and legal penalties. In practice, however, military agents rarely looked to higher authority to impose punishments for low quality, and when they did they were typically unsuccessful. In 1933, for example, a military agent tried to use the party committee of aircraft factory no. 24 to bring to account those responsible for 'malicious toleration of defective parts', but

<sup>51</sup> RGVA, 47/9/83, f. 30 (Penin, 1928).

<sup>52</sup> RGAE, 8183/1/146, ff. 53-53ob (shipyard worker Serdiuk versus naval agent Aliakrinskii, 13 April 1937).

<sup>53</sup> RGAE, 8183/1/146, f. 39 (Blagoveshchenskii, 13 April 1937).

<sup>54</sup> RGVA, 47/9/83, f. 23 (Bobrov, 1928).

<sup>55</sup> RGAE, 8183/1/146, f. 48 (Serdiuk, 13 April 1937).

<sup>56</sup> Holloway, 'Innovation', p. 325. For example, defence industry minister Kaganovich wrote to the chief of the Red Army artillery administration, Kulik, asking him to tighten up the work of military agents at engineering factories that were supplying defective shell casings to defence factory no. 12 (RGAE, 7515/1/404, f. 247, 20 June 1938).

<sup>57</sup> RGAE, 8183/1/146, f. 80 and 39 (13 April 1937: 'Blunderers', Kudak; 'formalists', Blagoveshchenskii).

without success.<sup>58</sup> We have found only one case, that of naval armament factory no. 347, where a military agent took the managers to court on criminal charges of supplying substandard goods; the court cast doubt on the accusations and the file was returned for further enquiries. A review by KPK, the ruling party's 'control' or audit commission, found that the judicial route was inappropriate and substituted dismissal for the criminal charges.<sup>59</sup>

Financial penalties mattered more. When plans failed workers, managers, and ministerial officials lost bonuses; contract failures deprived the enterprise and ministry of revenue. Although it did not have the same significance as in a market economy, money did matter. Just as importantly, plan and contract violation attracted complaints and was a signal for investigation. For those to whom a quiet life mattered more than money, to underfulfil a plan or agreement usually led to unpleasantness and disruption. Other classic investigations confirm how important it was for industry to avoid this by fulfilling the plan.<sup>60</sup>

The frequency with which industry failed to fulfil the army's contracts is one measure of the military agents' activism. At armament factories nos. 74 and 286 in 1946/7, for example, the share of output that the military agents rejected rose above 40 per cent.<sup>61</sup> Military agents could reject the entire monthly output of a given factory, for example that of defence industry factory no. 205 for March 1938 'in view of the totally unsatisfactory installation of electric plugs in all articles supplied'.<sup>62</sup>

Enquiries into the failure of defence orders by KPK, the party audit commission, often laid the fault at the military agents' door. One of the most important regulatory agencies in the Soviet Union, KPK was established in 1934 to watch over the fulfilment of party and state directives, and the discipline, honesty, and reliability of the party membership. According to KPK documents, in January and February 1934 the Tula gun factory produced 3,000 carbines and 106 ShKAS machine guns, but only 800 rifles were accepted for the defence ministry, and no machine guns at all. The 3,000 carbines 'were presented for acceptance 23,000 times, i.e. almost 8 times per carbine on average'.<sup>63</sup> KPK auditors concluded that 'discord between management and representatives of military acceptance on the score of product quality' lay behind persistent plan breakdowns.<sup>64</sup> In 1944 the KPK official for the Khabarovsk region reported that 'vexatious litigation', with the managers on one side and the OTK and military agents on the other, had taken hold of aircraft factory no. 126 on the issue of parts and components that did not conform to the blueprints. 'These

<sup>58</sup> Hoover/RGANI, 6/1/91, f. 10 (17 March 1934).

<sup>59</sup> Hoover/RGANI, 6/6/1616, f. 128 (13 May 1941).

<sup>60</sup> Berliner, *Factory and manager*.

<sup>61</sup> RGAE, 8157/1/4105, f. 213 (Mandich, 21 October 1947).

<sup>62</sup> RGAE, 7515/1/404, f. 158 (Savchenko to M. Kaganovich, 1938).

<sup>63</sup> Hoover/RGANI, 6/1/22, f. 34 (7 March 1934); emphasis in the original omitted.

<sup>64</sup> Hoover/RGANI, 6/1/22, f. 36 (7 March 1934).



disputes (“thwarts” as the producers call them) sometimes drag on for weeks . . . while business stands still’. In the first quarter of 1940 rejected goods amounted to 375,000 roubles.<sup>65</sup>

The military agents’ screening could outdo OTK control by an order of magnitude. Among the aircraft that the OTK factory no. 126 passed in 1940, the military agent found up to 80 defects.<sup>66</sup> In the first nine months of 1940, of 6.6 million shell cases produced at munitions factory no. 184 the OTK scrapped 2.74 per cent; after that, the military agent scrapped a further 10.5 per cent.<sup>67</sup>

Not all military agents refused to compromise on quality issues or demanded unconditional adherence to agreed standards; in 1937, for example, naval officers warned against the common practice of accepting vessels without the necessary technical documentation.<sup>68</sup> KPK factory audits of the period report other failures of a similar type. At a naval armament factory the military agent was reported to have accepted substandard mines.<sup>69</sup> At aircraft factory no. 39 in 1939, it was said, ‘[the] senior military agent . . . and regional military engineer . . . have impermissibly weakened control over the quality of accepted goods, established the practice of accepting unfinished aircraft subject to written factory guarantees, and left aircraft armament unchecked’. Aircraft with unserviceable machine guns and bombers with engines that suffered overcooling when cruising in level flight were accepted and put into service. Iron replaced chrome-molybdenum for rivets with the silent consent of the military acceptance officers, and so forth. Significantly, Efimov, the chief of the air-force purchasing administration, was accused of colluding with these malpractices: ‘not only did [he] not take measures to restore order but [he] even suppressed criticism of the defects, describing the communists who raised the criticisms as “cry-babies” and threatening them with dismissal’.<sup>70</sup> Efimov was one of the top supply officials in the defence ministry; if this was his attitude, the case of factory no. 39 cannot have been unique.

In the years of rapid prewar expansion equipment supplied to military units often turned out to be unfit for service although the military agents had previously passed them as acceptable. In March 1938, for example, the air force complained to defence industry minister Mikhail Kaganovich about numerous defects in I-16 fighters and UTI-4 trainers, and requested that the factories themselves despatch special repair brigades to military units.<sup>71</sup>

Military agents’ standards appear to have slipped markedly with the outbreak of war. Table 1 gives an indication of wartime trends in quality at

<sup>65</sup> Hoover/RGANI, 6/2/27, f. 108–9 (29 July 1940).

<sup>66</sup> Hoover/RGANI, 6/2/27, f. 108 (29 July 1940).

<sup>67</sup> Hoover/RGANI, 6/2/34, f. 158–59 (27 December 1940).

<sup>68</sup> RGAE, 8183/1/146, f. 38 (Blagoveshchenskii, 11–13 April 1937).

<sup>69</sup> Hoover/RGANI, 6/6/1616, f. 127 (13 May 1941).

<sup>70</sup> Hoover/RGANI, 6/2/17, f. 47 (KPK bureau decree, 3 December 1939).

<sup>71</sup> RGAE, 7515/1/404, f. 4–6 (29 March 1938).

Table 1. *The quality of tanks: factory no. 183, 1942–45*

	1942	1943	1944	1945
Tanks free of defects, percentage of total accepted by the military agent	7	14	29.4	49
Defects, average per tank accepted	3.6	2.4	1.7	0.8
Output scrapped, percentage of gross value produced	...	2.22	2.08	1.49
Tanks subject to re-testing by the military agent, percentage of total accepted	36	13.8	4.8	4.5

Source: Russian State Economic Archive, Moscow, (RGAE), 8798/4/17, ff. 231–232 ('History of tank factory no. 183', manuscript).

tank factory no. 183; in every year of the war the majority of tanks taken into military service were registered with one or more defects at the point of acceptance, and in 1942 only 7 per cent were reported free of defects. The high rate of defects at this early stage of the war was attributed to the fact that factory no. 183 was newly assembled out of plants evacuated from Khar'kov, Bezhitsa, Moscow, Mariupol', and Stalingrad. The frequency of defects fell back again, however, as output expanded and experience accumulated.

The situation was no better elsewhere. For example, of the T-34 tanks that factory no. 174 presented to the military agent in August 1943, only 4.5 per cent were free of defects and more than half had three defects or more. From April to August 1943, roughly one-tenth of vehicles were in such a bad state that they were returned to the factory for remedial work before re-testing.<sup>72</sup> The same happened to more than 20 per cent of tanks supplied by the Kirov factory in Cheliabinsk.<sup>73</sup> Subject to repeated testing, however, military agents eventually accepted virtually all tanks produced; across the industry, in July 1943, tanks accepted ran at 99 per cent of those supplied.<sup>74</sup>

In practice only completely unserviceable goods were rejected; most equipment was taken for the army following re-testing, defects and all. The result was a steady flow of complaints by military units. In April and May 1943, the army made 77 complaints to industry about cracks in tank bodies.<sup>75</sup> A recent study of the tank industry by Arsenii Ermolov provides further detail. During the war 12 per cent of all tank losses were ascribed to technical faults; this proportion was higher in 1942 and 1943. In the summer of 1942 the military agent at tank factory no. 183 found that every tenth new vehicle sent to the front was being reported as needing repair. In his view this understated the true position: only one-quarter of actual defects were being reported; military units were either tolerating the

<sup>72</sup> RGAE, 8752a/4/293, ff. 180, 182 (11 August 1943).

<sup>73</sup> RGAE, 8752a/4/293, f. 188 182 (11 August 1943).

<sup>74</sup> RGAE, 8752/4/293, f. 66 (11 August 1943).

<sup>75</sup> RGAE, 8752/4/293, f. 114 (11 August 1943).

remainder or fixing them at their own expense. A senior officer responsible for armoured equipment recalled that 'in one particular engagement on the Stalingrad front, when our tank numbers were evenly matched with the Germans, only one quarter of our tanks actually took part—say, 100 out of 400 tanks'.<sup>76</sup>

The standards that military agents applied to armament were probably more stringent than those for personal kit and transport stores. While the gap is inherently difficult to measure, KPK documents give the impression that military agents allowed more defects in soldiers' clothing and footwear, and that their superiors in the central supply staff of the defence ministry agreed with this. A KPK audit of 1937 found that 'the army is supplied with footwear made out of leather of completely unsatisfactory quality'. 'Neither the ministry for light industry and its plant managers, nor the Red Army administration for supply of troops is giving the necessary attention to the quality of military footwear'. '[Each] military agent in the localities has to service four to six or more production establishments and cannot systematically check up on the footwear plants'. At some factories up to half the footwear that the military agents had accepted was substandard. 'The [supply administration] has systematically tolerated a lowering of requirements in the footwear supplied, with regard to both soles and materials'. In this case the mutual rights and responsibilities of buyer, seller, and military agents were undefined, since the draft regulations had been under consideration by the ministry for light industry for two years.<sup>77</sup> The situation persisted for three *more* years; in 1940 a KPK report found that 'defence ministry acceptance agents in factories and plants [of the light and textile industries] are tolerating substandard items on a massive scale'.<sup>78</sup>

#### IV

On quality matters military agents could take a relatively hard line. On other issues, for example the quantitative fulfilment of orders, they were usually more ready to compromise. This asymmetry has a simple explanation: the agents' first duty to the army was to ensure quality. On one hand, the army entrusted them not to permit the fulfilment of orders in quantity at the expense of quality. On the other hand, industry often sought leeway from the military agents on quantity as the price for maintaining quality.

Concealment of delays in the acquisition process arose frequently. The KPK archive contains many cases of reports falsified by both civilian and defence enterprises. The usual form was to exaggerate output over the

<sup>76</sup> Ermolov, A., 'Narodnyi komissariat tankovoi promyshlennosti SSSR v gody Velikoi Otechestvennoi voyny. Struktura i deiatel'nost'. 1941–1945 gg.' (Moscow State University, Candidate of Historical Sciences Dissertation, 2004).

<sup>77</sup> Hoover/RGANI, 6/1/72, f. 77, 82–84 (10 June 1937).

<sup>78</sup> Hoover/RGANI, 6/2/250, f. 41–42 (14 May 1940).

accounting period by including *pripiski*, goods that did not exist yet but would be produced in the next period. *Pripiski* allowed the enterprise to claim fulfilment of the plan and entitlement to a bonus by ‘borrowing’ future output.

The practice of *pripiski* involved criminal violations that a single enterprise could not undertake in isolation; ministerial superiors had to know about it and the customer had to collude with it. Despite the risks, however, the power of suppliers in the civilian seller’s market was often enough to win the cooperation of both superiors and purchasers.<sup>79</sup>

*Pripiski* were widespread in the Soviet defence industry.<sup>80</sup> A KPK report of 1946 for example, claimed that a tank factory director ‘is systematically engaging in the *pripiska* of goods that have not finished production’ and that his chief administration, although aware of this, ‘has not only not prevented but has even rewarded it’.<sup>81</sup> Similarly, the KPK found that in 1944 the relevant administration of the armament ministry told a factory director ‘to report inflated information to the ministry’.<sup>82</sup> In September 1944 the KPK acknowledged that *pripiski* were widespread: in 1943 and 1944 an armament factory had ‘continually reported falsely inflated information about the fulfilment of the factory’s programme, typically using from 5 to 20 days of the following month to complete production’; an aircraft factory had reported ‘incorrectly inflated information about plan fulfilment’ in 1943 and for the months of January, February, and March 1944; the managers of a tank factory ‘have also been deceiving the government and ministries by reporting false information on the fulfilment of the production programme’.<sup>83</sup> There were even *pripiski* in a vehicle repair factory of the defence ministry itself; the ministry’s vehicles administration, while ‘aware of all the factory’s shortfalls and lack of management, took no measures to overcome them’.<sup>84</sup>

Widespread *pripiski* indicate that industry was systematically ignoring delivery deadlines: goods were being delivered to the army a month or more late. The military agents could not possibly have been unaware of this. Alexander predicted that military agents would be found to collude with *pripiski* for the sake of maintaining the producer’s good will; in contrast

<sup>79</sup> Berliner, *Factory and manager*.

<sup>80</sup> Devons, *Planning in practice*, pp. 138–42, noted similar practices in the British aircraft industry in wartime, where monthly and weekly output was planned by the elastic category of the number of aircraft delivered and ‘AFT’ (awaiting flight test). According to the late Sir Austin Robinson, wartime head of the UK Ministry of Production programmes division, high officials in the ministry of aircraft production were willing to include AFT aircraft in totals ‘even when they were far from finished. (There were some cases when they lacked wings!)’ (letter to Harrison received 21 March 1989). In the Soviet case, while *pripiski* transferred output to one period from the next, they did not accumulate through time and could not, therefore, significantly inflate the accuracy of annual totals as B. V. Sokolov, ‘O sootnoshenii poter’, suggested.

<sup>81</sup> Hoover/RGANI, 6/2/98, ff. 81, 85 (2 August 1946).

<sup>82</sup> Hoover/RGANI, 6/2/67, f. 11 (1944).

<sup>83</sup> Hoover/RGANI, 6/6/1583, f. 10–13 (15 July 1944).

<sup>84</sup> Hoover/RGANI, 6/6/1583, f. 31 (26 October 1948).

Agursky and Adomeit thought this unlikely.<sup>85</sup> In fact Alexander was right: military agents virtually never took action to enforce deadlines. Of all the cases of *pripiski* that the KPK uncovered, only two were reported by military agents. In September 1941 a military engineer reported an unacceptable delay in an order for gas protection equipment placed with the ministry of general engineering.<sup>86</sup> Intervention by the KPK secured a new deadline for the order, but no penalty for the delay. In 1943 a military agent and his senior technician reported on 'deception and irregularities' at an electrical factory; this led to a special audit commission that confirmed the various violations.<sup>87</sup>

KPK auditors themselves uncovered other *pripiski*. When they did so, they found that the military agents had colluded tacitly or openly in the deception. In 1944, for example, the military agent had joined the director of an armament factory in signing a cable reporting 101.5 per cent fulfilment of the April programme when both knew this to be false, since it took part of the May programme into account. Higher officials representing both industry and army had approved the *pripiska* by 30 April.<sup>88</sup> They justified this on the basis of precedent; the defence official noted that he had approved similar arrangements in other cases 'to avoid a breakdown of the plan and provision for the needs of the troops'.<sup>89</sup>

It was the same in the tank factories. In 1942 the KPK officer for Sverdlovsk district found evidence of large-scale *pripiski* for September, October, and November at the Uralmash factory, not just 'with the ministry's knowledge' but 'on the instruction' of the minister and deputy minister, most of which the military agent went along with.<sup>90</sup>

To conclude, deadlines for the supply of armaments seem to have caused little anxiety to military agents; even their superiors were ready to approve delays to some extent. They did have to *look* as if they supported firm deadlines. This led them to collude with enterprise managers in falsifying reports of plan fulfilment.

## V

The archives have shown that military agents were typically loyal to the army in relation to industry. They screened goods before deciding whether to accept them, and displayed reluctance to accept goods that fell below expected standards. As we have seen, this was not to the liking of factory managers in the localities or their ministerial superiors at the centre. The

<sup>85</sup> Alexander, *Decision-making*, p. 59; Agursky, M. and Adomeit, H., 'The Soviet military industrial complex and its internal mechanism' (Queen's University, Centre for International Relations, National Security Series no. 1/78, 1978), p. 23.

<sup>86</sup> Hoover/RGANI, 6/6/47, f. 18 (29 September 1941).

<sup>87</sup> Hoover/RGANI, 6/2/55, f. 1-2 (KPK bureau decree, 28 October 1943).

<sup>88</sup> Hoover/RGANI, 6/2/63, ff. 159-60 (5 June 1944).

<sup>89</sup> Hoover/RGANI, 6/2/63, f. 21 (8 July 1944).

<sup>90</sup> RGAE, 8752/4/108, f. 151-51 ob (7 December 1942).

reason is that the military agents' actions reduced their chances of successful plan fulfilment.

Civilians used various strategies to address problems that they encountered in everyday life. Zvi Gitelman asked Soviet emigrants to Israel in the 1970s: 'If you had a problem in the USSR that demanded an administrative solution, what would be the most effective way of dealing with it?'.<sup>91</sup> Of 114 respondents who answered, 11 said they would write to the newspaper, 45 said they would turn to the local soviet, party committee, or town council, and 58 reported 'other', which turned out on further enquiry to mean the use of 'pull, connections, and bribery'.

In principle the same strategies were available to industry in the face of the Army's demands. Below we consider the possible uses of formal protests and the exploitation of informal relationships, and corruption, to influence the behaviour of the military agents.

Managers could make official complaints about military agents' refusal to accept goods on grounds of poor quality. For example, article 5 of the model agreement between the defence and armament ministries for 1940 stated that in the event of 'disputes between the purchaser's military agent and the supplier regarding fulfilment of this agreement in relation to the quality of goods supplied' the supplier had five days to lodge a written objection, and the dispute would then go to a joint meeting of representatives from both parties.<sup>92</sup>

If resolution was not achieved at this level, the enterprise could pursue its complaint through a wide range of state and party channels up to and including the press; written appeals to higher authority were a general feature of life in a society with underdeveloped legal enforcement, and citizens in all walks of life used them to seek truth and justice.<sup>93</sup> In the case of industry, such complaints typically emphasized that military agents were rejecting perfectly good items so as to play safe, and were hindering the fulfilment of defence orders as a result.

In April 1938, for example, a workshop chief from aircraft factory no. 153 wrote to secret police chief Ezhov accusing military agent Mikhailov of sabotage by deliberately scrapping serviceable products. Mikhailov was alleged to have said: 'I'll bring the factory to a halt so as to make it learn to work exactly according to the blueprints and with the new equipment that the factory lacks'.<sup>94</sup> The informant went on to claim that factory no. 21 had been supplying similar items, although of lower quality, without objection by the military agent. By this means the factory provoked an investigation into Mikhailov's actions. The defence industry ministry's interest lay in scapegoating the military agent for the factory's poor work; the

<sup>91</sup> Cited by Grossman, 'Notes', p. 841.

<sup>92</sup> RGAE, 8157/1/134, f. 44-7 (1940).

<sup>93</sup> A. K. Sokolov, *Golos*; A.K. Sokolov, ed., *Obshchestvo*; Livshin and Orlov, eds., *Pis'ma, 1917-1927*; Livshin, Orlov, and Khlevniuk, eds., *Pis'ma, 1928-1939*.

<sup>94</sup> RGAE, 7515/1/404, f. 104-11 (20 April 1938).



minister held an internal inquiry that confirmed the charges against him, threw in his personal links with arrested 'enemies of the people', and proposed a special commission to investigate further.<sup>95</sup>

The archives do not reveal how this story ended. According to some accounts, setting up a 'fact finding commission' was a common stratagem by which ministerial officials tried to suppress criticism.<sup>96</sup> In fact, the documents suggest that such inquiries sometimes sided with the military agent. At the 1947 meeting of OTK chiefs the following story was told. In 1946 the director of factory no. 188 had complained to 'someone at the business administration of the council of ministers' about military agents 'scrapping his factory's totally serviceable goods and he was being forced to destroy them and incinerate these items'. A lengthy review by representatives of the state control ministry, the chief artillery administration, and the armament ministry concluded, however, that 'all the scrapped production was substandard and the commission confirmed that it was all to be destroyed and on no account to be used by the Army'.<sup>97</sup>

Another way of influencing the military agent was by means of informal pressure. The institutional basis of this pressure was the goodwill that the buyer needed to build up with the supplier in the seller's market in order to go home with anything at all in the shopping bag, but it was usually exercised through personal contact. In the military market place the army's supply officers each had their own purchasing plans to fulfil, and as a result industry's officials could and did make demands on them.

The industry ministers frequently requested army officials to accept one item or another as an exception to the rule. On 15 March 1938, for example, defence industry minister Kaganovich asked defence minister Voroshilov to accept 200 unfinished aircraft.<sup>98</sup> In 1945 the armament ministry requested the artillery administration to instruct the military agent of armament factory no. 8 to accept systems lubricated with uncertified gun oil as a special case.<sup>99</sup> In a further case the armament ministry asked the artillery administration to accept items fitted with lubricators that diverged from the agreed specification.<sup>100</sup>

Mutual relations between industry and the army were such that the former could even ask the latter to write off a loss. In 1943, for example, the financial accounting chief of the ministry for the tank industry wrote to the deputy minister to substantiate a case for appealing to the defence ministry to lift penalties on tank factories for not meeting supply deadlines:

<sup>95</sup> RGAE, 7515/1/404, ff. 102–3 and 101 (10 May 1938).

<sup>96</sup> Respondents cited by Gregory, *Restructuring*, p. 67.

<sup>97</sup> RGAE, 8157/1/4105, f. 239 (Gavrikov, 21 October 1947). For a story in a similar spirit before the war, see RGAE, 8183/1/146, f. 39–39ob (Blagoveshchenskii, 11–13 April 1937).

<sup>98</sup> RGAE, 7515/1/403, f. 166–7 (15 March 1938).

<sup>99</sup> RGAE, 8157/1/1010, f. 89 (26 November 1945).

<sup>100</sup> RGAE, 8157/1/1010, f. 217 (20 December 1945).

Among the causes of production shortfalls are power cuts and fuel shortages. Moreover, periodic amendments to factory programmes also affect the fulfilment of the supply plan for the Army. On formal grounds the Red Army armoured forces have every right to impose penalties on our enterprises. However, since the fines and forfeits imposed amount to substantial sums and basically show up as enterprise losses, I request you to confer personally with deputy commander of the Red Army armoured forces lieutenant general Korobkov not to claim fines and forfeits from our factories in the first half of 1943 for non-fulfilment of agreements.<sup>101</sup>

When informal pressure was successful in influencing the army's supply staff in favour of compromise, the result was often to shift the focus of conflict away from the interface between industry and army to inside the army, between its combat and supply staff. Defects that the military supply staff believed they had to accept were not always tolerable in the eyes of the combat troops. When this happened the perennial conflict over quality between the army and industry opened up a conflict within the army itself, between combat officers and supply officers whose interests diverged. The combat staff were most closely interested in the quality of weapons. The supply officers, on the other hand, shared responsibility for the quantity of weapons procured, and this led them to be more inclined to compromise with managers in the defence industry and accept goods with defects. In 1930, for example, a few months after the reform of the military acceptance system, deputy defence minister and president of the revolutionary military council Ubovich alleged that the military acceptance staff were covering for the poor work of industry. He wrote to his heads of administration: 'I note that your administrations have recently ceased to provide reports on the quality of goods . . . I propose that as a rule [you should] report to me on this once a month . . .'.<sup>102</sup>

If experience showed that the defects were serious, and it turned out that the military agents had tolerated them, the combat officers turned on the supply officers. In a case that we have already mentioned, the military agent at aircraft factory no. 39 was alleged to have accepted substandard goods, and his superior officer, chief of the air force purchasing administration Efimov, was accused of colluding with him. At this point the military agent had no alternative but to fight to the finish; even after military units began to report aircraft accidents, he maintained that these were 'unverified rumours'.<sup>103</sup>

When the army would not concede on quality, there was usually something else on which its agents were willing to trade. The way in which the military agents were sucked into collusion with *pripiski* is evidence of how such informal relationships developed at lower levels. Alternatively, the military agents had to work harder to improve the factory's supply. When

<sup>101</sup> RGAE, 8752/1/193, f. 30 (5 August 1943).

<sup>102</sup> RGVA, 33991/1/65, f. 27 (22 July 1930).

<sup>103</sup> Hoover/RGANI, 6/2/17, f. 52 (1939).

managers complained to the military agent, a common factor was the demand for better supply: if the state wanted higher quality, it had to give higher priority to supply. 'If there are no raw materials, and it doesn't violate the production plan, then we'll take them out of the mobilization stocks so industry will make them up again over a few months'.<sup>104</sup>

The army tried to limit its vulnerability to informal pressure by making hard-line declarations. For example, in the armament ministry collegium on 15 January 1939 an artillery officer remarked: 'The head of the artillery administration has asked me to tell you not to appeal further to us about lost output that has to be scrapped because of [violations of] the technological process. He will not discuss this further with factory representatives'.<sup>105</sup> These seem unlikely to have had much effect.

## VI

The last strategy available to managers was to seek to buy the military agents off. The archival evidence on bribery is not consistent. It appears from an OGPU (security police) report of August 1933 that defence suppliers were commonly setting aside special funds for incentive payments to military agents.<sup>106</sup> Three times, in 1934, 1938, and 1939, the defence ministry issued prohibitions on side payments by enterprises to military agents, which also indicates that the practice existed.<sup>107</sup> But our search for specific cases of corruption and the punishment of military agents for accepting bribes has yielded little. The files of the agencies of state or party control contain many examples of illegal payments to factory managers and local party leaders, but are almost completely silent on factory payments to military agents.<sup>108</sup>

Only one case has come to light. In 1936 the military agent for factory no. 70 reported that the director, Davydov, had offered him a bribe to accept substandard armaments. The factory had been assigned an urgent delivery of aerial munitions for Spain; the director asked for standards to be lowered and offered cash in exchange. An investigation by the military and naval group of KPK confirmed the facts, and disclosed that Davydov had also tried to bribe other agents.<sup>109</sup> Prime minister Molotov and heavy industry minister Ordzhonikidze became personally involved, which suggests that the

<sup>104</sup> RGVA, 47/9/83, f. 20 (Budnevich, 1928).

<sup>105</sup> RGAE, 8157/1/124, f. 107 (Anisimov, 15 January 1939).

<sup>106</sup> Cited by Harrison and Simonov, 'Voenpriemka', p. 240.

<sup>107</sup> *Ibid.*, pp. 240–1.

<sup>108</sup> State control: GARF, *fond* 7511 (commission of state control) and 8300 (ministry of state control). Party control: Hoover/RGANI, *fond* 6. Perhaps the relevant files have not been declassified. Many files of the ministry of state control relating to the defence industry remain secret. The defence ministry has not yet transferred the records of the military prosecutor and courts martial for the 1930s and since to RGVA. Lastly, the files of the NKVD (interior ministry) economic administration, the responsibilities of which included the defence industry, are missing from the NKVD archive.

<sup>109</sup> GARF, 8418/11/283, ff. 4–8 (N. Kuibyshev to Stalin, Ezhov, Molotov, Ordzhonikidze, and Voroshilov, 29 November 1936).

case was exceptional. Davydov was expelled from the party, dismissed, and handed over to the courts. The hard evidence turned out to be circumstantial rather than direct, suggesting that corruption could be difficult to prove.<sup>110</sup>

Through their informal connections managers were also able to offer non-monetary considerations to military agents, who depended on their client factories for residential and office housing and consumer supplies. The OGPU report of 1933 and the KPK investigation of 1936 both provide illustration.<sup>111</sup> Again it may have been difficult in practice to distinguish corruptly motivated provisions from those that were 'normally' privileged.

The rarity of prosecuted corruption in the archives could mean several things. Perhaps corruption among military agents was tolerated. The history of military agents' involvement in *pripiski* suggests that Red Army supply chiefs tended to cover for the violations of military agents in the localities. It is possible that, while declaring war on corruption in its decrees, the defence ministry did not wage it in practice.

Another possibility is that military agents were not easily corrupted. By the late 1930s the army was deliberately paying its agents well and allowing them to enjoy a relaxed working schedule. Perhaps they valued pay and leisure more than any bribe that industry could offer. Thus, the reason that we have not found evidence of corruption could be that military agents were not corrupt. If they sometimes accepted substandard goods it was not for venal reasons, but because their loyalty to the army and responsibility for its supply induced them to compromise with industry. Lastly, it may transpire that evidence of widespread corruption exists in files that are still classified.

## VII

Military agents were virtually never penalized for accepting shoddy goods, even if loss of life resulted, as in aviation accidents. The statute on technical acceptance of artillery goods, for example, did not consider the acceptance of substandard items as a possibility, and so did not lay down penalties for it.<sup>112</sup>

However, the main reason that military agents did not always stick rigorously to defence ministry guidelines on substandard equipment was that, out of loyalty to the army, they could not reject everything that industry offered them. One of the OTK chiefs at the armament ministry meeting held in October 1947 let the truth slip: 'I don't agree that we cannot come to terms with the military acceptance staff . . . They are state officials the

<sup>110</sup> GARF, 8418/11/283, f. 2 (minister of heavy industry decree no. 1917, 3 December 1936).

<sup>111</sup> GARF, 8418/8/175, ff. 34–40 (1 August 1933); GARF, 8418/11/283, ff. 4–8 (29 November 1936).

<sup>112</sup> RGVA, 47/5/207, ff. 28–33 (28 June 1927).

same [as us] and *they are responsible for equipment orders* to the same extent [as us]'.<sup>113</sup> The same logic also led their chiefs on the supply staff to collude with them and not punish them for lowering standards.

If agents demanded inflexible adherence to standards, they laid themselves open to criticism for excessive zeal or caution. For example, a KPK factory report of 1940 condemned the OTK and military agent at aircraft factory no. 126 for 'a tendency to over-insurance'.<sup>114</sup> Surveying the work of military agents in 1943, the KPK demanded that 'the military agent should in most cases rule on the acceptability of one or another deviation [from standards] so as not to delay products for the front'.<sup>115</sup> Thus, while military agents may have tried not to accept goods that were clearly unserviceable, there was pressure on them to tolerate some level of defects.

It would be wrong to conclude that the military agents were ineffective. Certainly they achieved more results than the factory OTK; they turned goods back more frequently, and this led to a higher rate of remedial repairs than in the civilian sector. Gregory has noted the relatively low fulfilment of Soviet defence industry plans and contracts despite their high priority.<sup>116</sup> The activism of military agents may help explain this. It may be asked why, through repeated exchanges, industry and the army did not learn each others' preferences and resources so as to converge on a mutually beneficial equilibrium in which the army obtained goods of the quality it required and industry was able to fulfil its plans without the need for costly rejections and plan failures. We interpret this as the outcome of a game in which the army offered mutually advantageous contracts for industry to supply goods of given price, quantity, and quality; once price and quantity had been fixed, however, industry was unable to commit its own agents not to shirk on quality. As a result, industry was continually tempted to fulfil contracts with low quality outcomes at the expense of the army.

Why was the equilibrium rate of rejection of defence products not zero? We think of rejected goods as representing a costly but valuable investment by both sides. It hurt industry to see its goods rejected because this made its own position more difficult, both financially and in terms of plan fulfilment. Industry was willing to take a certain level of rejection, however, to make its difficulties in meeting quality standards credible to the army. A high rejection rate *forced the army to lower its expectations and standards*. At the same time, it hurt the army to reject the goods it was offered, because this made it harder for the army to achieve its strategic goals. The army was willing to reject goods up to a point, however, to make its own quality standards credible to industry. Thus a high rejection rate *forced industry to lift its performance*. In the upshot, quality outcomes

<sup>113</sup> RGAE, 8157/1/4105, f. 136 (Dovichenko, 21 October 1947); emphasis added.

<sup>114</sup> Hoover/RGANI, 6/2/27, f. 109 (29 June 1940).

<sup>115</sup> Hoover/RGANI, 6/2/49, f. 9 (7 July 1943).

<sup>116</sup> Gregory, 'Soviet defence puzzles'.

and rejection rates were determined simultaneously, and a positive rate of rejection served the interests of both parties (for formalization, see the appendix).

## VIII

Military market places display obvious inefficiencies under most institutional arrangements, but that of the Soviet Union was characterized by monopoly and a seller's market to an unusual degree. Monopoly presents a particular problem where experience goods are traded, since the consumer cannot respond to bad experience by switching repeat purchases to another supplier.

In introducing the case of the Soviet market for weapons and military equipment, we offered three predictions. First, we expected that the buyer, the Soviet defence ministry, would show willingness to invest in costly evaluation before purchase, and would also display reluctance to buy despite the seller's market. Second, we expected that the buyer would enlist legal, administrative, and informal means of enforcing product quality; we also anticipated that this would be met with counteraction by the producer interest. Third, we would have expected attempts by the buyer to solve these problems through vertical integration, by merging with or taking over the producer, but for the fact that Stalin explicitly ruled this out from the beginning of his regime.

The evidence of the Soviet market for weapons has shown that our expectations were correct. The buyer, the defence ministry, created a single mechanism with both market and non-market functions. The military agents' market function was to evaluate goods before purchase and give effect to the buyer's reluctance to buy. Their non-market function was to exert pressure on the seller so as to enforce product quality.

We have explored the limits on the effectiveness of these stratagems. Of some importance were the counteractions of the seller, which included covert and overt resistance and informal pressure, but not corruption as far as we have been able to discover. More importantly, the military agents were compelled to compromise with the seller by the logic of their own position.

The military agents' chief weapon was to refuse to buy goods that they evaluated as of poor quality; this imposed certain costs on the seller. In general, however, being responsible for procuring the equipment that the armed forces needed to carry out their national mission, agents could not use this weapon without limit; they could not buy nothing for long. Under such circumstances compromise was inevitable. The outcomes, including persistent low-quality output and its rejection up to a point, reflected an equilibrium that was in the common interest of both buyer and seller.



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## APPENDIX

In each period industry offers the army one unit of goods of average quality  $q$ . The army desires both quality and quantity, but has only one instrument to influence them: it can reject a percentage  $r$  of the output that is offered. This reduces the quantity available in the present but, taking into account the response of industry, raises average quality in the next period. Thus, rejecting industry's goods is costly to the army but brings a future benefit.

The army follows a boundedly rational decision rule: it rejects the goods that industry offers in a proportion  $0 < \beta < 1$  to the gap between their average quality and the quality level  $\hat{q}$  that the army expects, so its rejection rate in period  $t$  is  $r_t = \beta \cdot (\hat{q}_t - q_t)$ . We call  $\hat{q}$  the army's quality filter. The army resets the filter in each period on the basis of the achieved quality level of the previous period plus a constant increment  $\gamma > 0$  so that  $\hat{q}_t = q_{t-1} + \gamma$ ; in short, by planning 'from the achieved level' the army subjects industry to a quality ratchet.<sup>117</sup>

The presence of  $q_{t-1}$  in the quality filter and the condition  $\beta < 1$  are conditions of a seller's market. When  $\beta < 1$  the buyer accepts some goods that fall below expectations for the sake of goodwill, to win the seller's loyalty. The influence of  $q_{t-1}$  on  $\hat{q}$  lets the seller manage the buyer's expectations.

Substituting the determinants of the army's quality filter into its rejection decision and defining  $\Delta q_t = q_t - q_{t-1}$  yields the filter-setting (FS) curve:

$$r_t = \beta \cdot (\gamma - \Delta q_t) \quad (1)$$

from which it follows that when quality is steady so is the rejection rate at  $r^* = \beta \cdot \gamma$ . This suggests a restriction, however: it is necessary that  $\beta \cdot \gamma < 1$  since the army cannot reject more goods than are offered in the steady state.

Industry would freely set the quality of output at  $\bar{q} < \hat{q}$ . To achieve  $\hat{q}$  it must incur an effort cost. Failing this, the army will reject some of its goods and a third party, the dictator, will impose a penalty. When sanctioned for low quality in one period, industry lifts quality above  $\bar{q}$  in proportion  $\alpha > 0$  to the previous period's rejection rate, so  $q_t = \bar{q} + \alpha \cdot r_{t-1}$ . Subtracting  $q_{t-1}$  from both sides gives the quality-setting (QS) curve:

<sup>117</sup> Planning from the achieved level: Birman, 'From the achieved level'. Ratcheting: Keren, 'Ministry'; Weitzman, 'Ratchet principle'.

$$\Delta q_t = \alpha \cdot r_{t-1} (q_{t-1} - \bar{q}) \tag{2}$$

The interaction between the QS and FS curves is iterative. Given the inverse relationship of  $\Delta q_t$  and  $q_{t-1}$  in the QS curve, the solution converges on a steady state in which  $q^* = \bar{q} + \alpha \cdot \beta \cdot \gamma$  subject to a further restriction on parameter values: for the sake of stability it is necessary that  $\alpha \cdot \beta < 1/2$ .

Figure A1 illustrates how quality outcomes and rejection rates are simultaneously determined and can converge on a steady state. The left-hand panel illustrates the short run. The horizontal axis is defined by the quality increment  $\Delta q_t$ , rather than the quality level, because industry sets the quality increment in response to the previous period's rejections; the army sets its rejection rate in response to the current period's quality increment. As long as the short-run equilibrium is away from the vertical axis the quality level is changing, however; each positive quality increment takes industry further away from  $\bar{q}$  and increases its resistance to further quality change. Consequently, the QS curve is drawn over time towards the intersection of the FS curve with the vertical axis, where the quality increment is zero and the quality level has achieved a steady state; this is shown in the right hand panel.

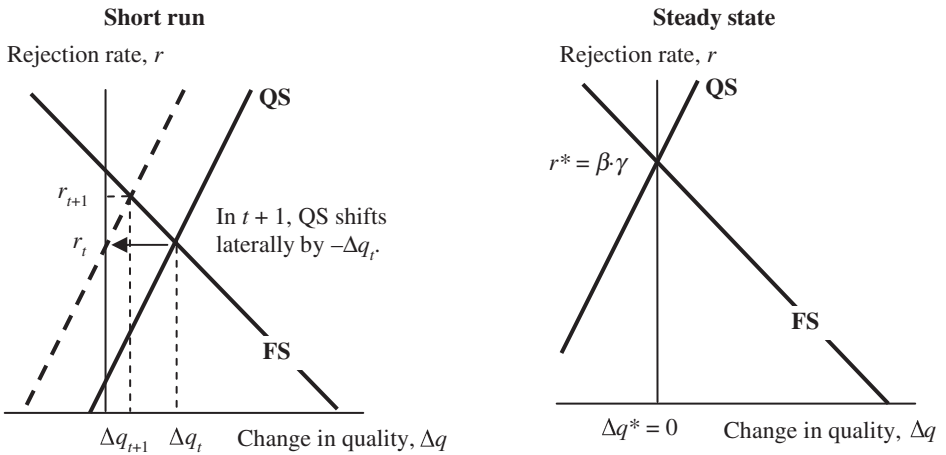


Figure A1. *Rejection rates and quality outcomes*

Taking into account the history of the army's rejection decisions, industry has set the QS curve to intersect the army's FS curve at  $r_t, \Delta q_t$ . Since  $\Delta q_t > 0$ , the rise in quality takes industry further away from  $\bar{q}$ . In the next period,  $t + 1$ , the QS curve will shift left by  $\Delta q_t$ , and the equilibrium moves to  $r_{t+1}, \Delta q_{t+1}$ . Quality will rise further, but at a falling rate, while the rejection rate will climb. With moderate restrictions on parameter values the process will converge on the steady state  $\beta \cdot \gamma, 0$ , shown in the right-hand panel.

This framework illustrates the scope and limits of the army's influence on quality. One feature is that in equilibrium both players will accept a positive rejection rate. The army rejects some of the goods offered in order to maintain industry's focus on quality. Industry supplies goods of a quality that invites some rejection in order to manage the army's expectations.

The army can influence quality. Its expectations matter: by ratcheting more stiffly (raising  $\gamma$ ) the army can force improvement. The army's will to punish low quality also matters: it can force improvement by increasing penalization (raising  $\beta$ ). The cost of either is a higher rate of rejection in the steady state.

Because of the restrictions on parameter values already mentioned above, the army cannot raise  $\beta$  or  $\gamma$  without limit. First,  $\beta \cdot \gamma$  must not exceed one since the army cannot reject more goods than are offered. Second, if the army lets  $\alpha \cdot \beta$  rise above one half the interaction of the players will become over-responsive and result in instability. These restrictions limit the army's power to force quality improvement.

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