

SECURITY AND WESTERN STUDY OF THE SOVIET MILITARY SECTOR

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ABSTRACT

In the previous paper (Kontorovich, 2009) I documented the near-absence of the military sector from the publications by the Western academics studying the Soviet economy. The present paper considers whether the neglect of this sector was caused by Soviet secrecy on military matters. I investigate if the scholars at the time mentioned secrecy as a barrier to research and displayed interest in the writings that purported to overcome secrecy. I also review various sources of information on the military sector available at the time. The evidence suggests that secrecy was not the binding constraint on Western researchers.

1 The secrecy hypothesis

Western academic study of the Soviet economy, called here Sovietology, was founded in the late 1940s to help counter the national security challenge posed by the USSR. The military sector of the Soviet economy, which made this challenge possible, was unprecedentedly large, ranked higher in importance and performed better than any other sector, and was organizationally distinct from the rest of industry. Western security concerns aside, the military sector was interesting in its own right and important for understanding the workings of the Soviet economy. Yet despite all that, it received scant attention from the new discipline, as I demonstrated in an earlier paper surveying books and journal articles published in 1948-1991 (Kontorovich, 2009).

Former Sovietologists, when shown this finding, explain it by the official secrecy which shrouded the military sector. There was just no information to support any writing on the subject, and so the scholars occupied themselves with other topics. This explanation is called here “the secrecy hypothesis”. If it is true, it means that the experts are completely dependent on the information supplied by the government of the country studied, and the government is able to hide massive economic facts (e.g., a virtual war economy during peacetime) from the rest of the world for almost half a century, even under the conditions of partial openness of the post-1956 Soviet Union. This should not inspire confidence in the national security uses of social science. And if the secrecy hypothesis is rejected, then we need to look of other factors responsible for keeping the military sector off the pages of Western economic writings.

This paper starts by briefly describing Soviet information regime and its motivation, as well as its application to the coverage of the economy and specifically of the military sector. I then offer two types of tests of the secrecy hypothesis. Indirect tests consider whether Sovietolo-

gists pointed to secrecy as a constraint on their knowledge; used indirect ways to try to pierce the veil of secrecy; and showed interest when their colleagues claimed to have learned something about the military sector despite secrecy. The direct simply catalogs some of the significant things that could be known about the Soviet economy's military sector at the time. Both types of tests point toward the rejection of the secrecy hypothesis.

2 The shape of the secrecy constraint

2.1 *Secrecy in Soviet society*

Secrecy surrounding the military sector was a part of the general Soviet information control regime. It posed problems of similar kind, if not degree, to the Western researchers of the USSR across disciplines and subjects of study. Outside observers were primarily concerned with Soviet restrictions on the publication of information of the kind which was routinely available in other countries. Yet this was but one aspect of an elaborate system which also regulated insiders' access to the information already in government possession (e. g., through security clearances) and restricted the acquisition of new information (e.g., by defining permissible topics for social science research) (Shlapentokh, 2001, pp. 57-59).

While national security considerations and propaganda abroad played a role in motivating the secrecy regime, the main reasons for it were domestic.² This can be seen from the fact that many of the secrets were of no interest for foreigners, such as the goings on in the local party and government organs. Other secrets were widely known abroad. These included world events that were kept from the Soviet public, as well as the blacked out pages of Soviet history, such as

² Herman (1963, pp. 6-7, 11); Hutchings (1987, p. 264); Holloway (1982, pp. 340-341).

some of the details of intra-party struggle in the 1920s. Much information was kept away even from top Soviet officials. The members of Politburo, secretaries and heads of departments of the Central Committee were denied access even to basic military and military-industrial information.³ Top diplomats discussing arms control treaties with US representatives were kept in the dark about assets their side possessed (Dobrynin, 1996, pp. 492-3). In one instance, at those talks, the head of the Soviet delegation asked Americans not to present their estimates of the Soviet missile deployment in front of the civilian members of his delegation (Graham, 2002, p. 55).

The main function of secrecy was to shield the officials on all levels from public scrutiny. From the early years of the Soviet regime, the decision making processes in the party and government were at the top of the list of secrets (Pavlova, 1993, pp. 71, 130-1). (This made the work of Western political scientists difficult, but did not have the silencing effect that secrecy surrounding the military sector is alleged to have, as I show in 3.2.) Since the party aspired to direct an extremely broad range of social processes, practically any information could be seen as casting its activity in the wrong light. Hence the extremely broad list of items unfit for publication, including such seemingly innocent ones as the news of natural disasters and industrial and transportation accidents, and the names of spouses of political figures.⁴

2.2 Secrecy of economic information: civilian and military economy

The extent of secrecy concerning the economy changed over the course of the regime's life. The initial informational openness was gradually rolled back starting in 1927 (Herman,

³ Gorbachev (1995, pp. 318-9, 334); Medvedev (1998, p. 96).

⁴ Hutchings (1987) has a detailed discussion of the things kept secret at various times.

1963, pp. 5-8). A virtual blackout on economic statistics set in after 1939, when no statistical yearbooks were published, and the data on economic performance appearing in the press were meager. While the publication of economics books and journals continued, practically the only numbers they contained were those of the pages, as the joke went.⁵

The publication of statistical yearbooks resumed in 1956, and after a few slim volumes they regained heft they had in about 1936.⁶ Researchers and journalists again occasionally cited useful data in print. This greater degree of openness prevailed, with some variations, until the final years of the USSR and also coincided with most of Sovietology's lifespan. Still, the publications in this period omitted a wealth of data which were collected by Soviet statistics and were routinely published in the other countries.

For example, numbers for money supply, gold and hard currency reserves, balance of payments, and anything concerning non-ferrous metals sector never appeared in print.⁷ Information on the government revenues and outlays, national financial flows, earnings by industry and occupation, pensions, employment breakdown by sector of industry, input-output tables, foreign trade and finance were revealed with significant omissions. Economists using the published fragments of information were unable to restore the full statistical picture – the state budget, the national income accounts, distribution of personal incomes - without massive additional guesswork. From time to time, previously available data would stop being published, e. g., input-output tables, wholesale price indices, and much data on imports and exports in the early 1980s. Documentation of published statistics was often inadequate, making their definition and cover-

⁵ Hutchings (1987, pp. 138-9); Kaser (1972, pp. 47-50).

⁶ Herman (1963, p. 9); Kaser (1972, pp. 56-60).

⁷ See Nove (1986, pp. 363-6) and Hutchings (1987, pp. 77-90 and elsewhere) for a more detailed discussion.

age unclear.

The increase in the availability of economic information since the mid-1950s did not involve the military industry. The very existence of this sector was very rarely mentioned in print. Some of the military industry ministries bore euphemistic names - Ministry of Intermediate Machinebuilding for making things nuclear, Ministry of General Machinebuilding for missiles – and even these names were mentioned in print extremely rarely, such as when a new cabinet was being announced at the Supreme Soviet.⁸ The Military Industrial Commission and the defense department of the State Planning Committee, the coordinating organs of the industry, were never mentioned in published sources.⁹ Regular newspaper reporting on the activity of enterprises, when read in large quantities, presented a rich and consistent picture of the types of problems arising at the micro level of the civilian economy, but no such reporting appeared on the nine military industry ministries.

No data on the sector's performance appeared in the statistical yearbooks or in any other published sources. The only number on the military economy which was regularly published was labeled, without explanation, "defense expenditures of the state budget" (e.g., Goskomstat, 1988, p. 588).¹⁰ Data on the production of civilian goods in the military industry, such as ships, aircraft, and electronics, were kept secret. Much of the secrecy in reporting on the civilian economy, as described above, was likely motivated by the concerns for shielding the military industry information. Non-ferrous metals industry data were kept under wraps because its main cus-

⁸ Korol (1965, p. 356-7) noted that the jurisdiction of the Ministry of General Machinebuilding is not clear and then combined five different Soviet sources to suggest that it may be in charge of rocket technology.

⁹ "Little is known of this body, except that it is called the Military-Industrial Commission." Holloway, 1982, p. 298.

¹⁰ A number for "national income used for defense", published for a few years in the 1970s, was identical to the state budget defense allocation (Nove, 1987, pp. 177-8).

tomers were the military ministries. Breakdown of employment by sector of industry, disaggregated data on machinery production, elements of the state budget, national income accounting, foreign trade, and input-output tables were withheld, in all likelihood, so as to thwart the attempts to indirectly estimate military sector magnitudes.¹¹

For comparison, consider the data available in a national economy statistical yearbook for a civilian sector of industry, such as ferrous metals or construction materials. Just leafing through a randomly chosen edition (TsSU, 1981), one can find several dozen numbers for a particular year, including the output of main types of products of the sector in physical terms; rate of growth of total output in value terms; number of enterprises; sector's share in the total industrial output; rates of growth of labor productivity, fixed assets and working capital, and fixed assets alone; percentage shares of structures, equipment, and other elements in the fixed assets; rate of change of capital/labor ratio; share of fixed assets in all assets; share of fixed assets commissioned in the last ten years in the total fixed assets; commissioning and decommissioning of fixed assets by type, as share of the total; cost structure; number of pieces of automated and other advanced equipment installed; structure of investment; volume of construction in progress. Some of these data would be reported consistently enough to provide time series spanning several decades. Even more data on a civilian sector could be dug up in economic and technical publications, and in specialized statistical publications. If instead of a sector of industry one looked at a sector of the economy (e. g., agriculture or transportation), data availability would be even greater. Data reported for civilian sectors, while meager by international standards, presented a veritable feast of information compared to the military industry.

¹¹ Hutchings (1987, p. 58). Herman (1963, p. 11) notes that these are exactly the data that open societies withhold in wartime.

2.3 *The world famous output of the top secret sector*

If statistical yearbooks and economic affairs reporting in the newspapers, the standard sources for the Sovietologists, were the only sources of information on the military sector, the secrecy hypothesis would be unassailable. However, the barrenness of these sources was only part of the story. The products of the military sector were widely publicized by the same authorities who prohibited mentioning in print the names of the factories that made them. Twice a year at military parades in Moscow, foreign military attaches saw samples of military equipment driving or flying by. Space launches were officially announced, as were nuclear and ballistic missile tests. Navy ships made officially arranged calls at foreign ports. Soviet rulers bragged about the quantity and the capabilities of their weapons in their published speeches and interviews.

Consider some of the revelations of the first post-war decade, when Soviet secretiveness was at all time high. The first jet-propelled military planes were exhibited at an air show in August, 1946 and discussed in *Pravda*. In 1947, the Soviet government officially announced “breaking the secret of the atomic bomb”, and in 1949 announced its first nuclear test. In 1951, Stalin discussed the past and future nuclear tests in an interview to *Pravda*. An official announcement followed the test of the multi-stage intercontinental ballistic missile in 1957 and a concurrent series of nuclear and thermonuclear tests. ICBMs were carted through Moscow dur-

ing the Nov. 7, 1957 parade.¹² Information supplied in these ways (among others) quickly made it to the front pages of Western newspapers (Table 3).

This seemingly contradictory treatment of the military sector was due to the fact that much of the utility of military hardware derives not from its battlefield use, but from the impression it makes on the adversary before the battle. Withholding all information about military production would have sacrificed this effect. Absolute secrecy in the Soviet Union was reserved for the phenomena the very existence of which was officially denied, like riots, strikes, and official privileges. Soviet rulers were far from denying the existence of their arsenal.

Nor would a general statement unsupported by detailed information, of the kind issued concerning other areas of secrecy, suffice here. Thus, the state budget was said not to be in the deficit (Garbuzov, 1984, p. 168), though much of the data necessary to verify this claim were not published. The deliberations within the party organs were kept secret, but these were routinely said to exhibit monolithic unity.¹³ Similar general statements were being made about ample provision for defense and high capability of the weapons, but their credibility, and hence the effect on the adversary, was uncertain. The claim about the state budget being in the black was false, at least towards the end of the Soviet era, though generally taken at face value in the West.¹⁴ The claim about unity within the party leadership generally was not believed in the West, even for the periods for which it was correct (Khlevniuk, 1996, pp. 6-8). For the adversary to be definitely overawed by the Soviet military might, he had to see the main products of the secret sector with some specificity (Hutchings, 1987, pp. 72-4, 197).

¹² Babakov (1987, pp. 40, 45-6, 94-5). Also, it was revealed “during the air parade of May 1, 1954 that the Soviet Union was building giant intercontinental jet bombers” (Schwartz, 1954, p. 125).

¹³ Except in the cases of a coup or a coup attempt, as in 1953, 1957, and 1964.

¹⁴ Birman (1980, pp. 95-97); Hanson (2003, p. 188).

There were also domestic reasons for not keeping the military sector entirely under wraps. Defense industry relied on cooperation from the rest of the economy. Its success depended on the privileged treatment – the priority – given to military tasks at every stage of planning and the actual running of production and supply by those in the civilian sectors. One way this priority was communicated and reinforced was through the restatement of the unique importance of military economic tasks in rulers' speeches, official documents, planning manuals and textbooks. The practice of giving the military sector the prime cut of every resource also became widely known to a large number of people enacting the priority in their daily activities.

Statistical yearbooks, economics journals, and newspaper business reporting, while supplying varying and generally inadequate amounts of information on most civilian sectors, were practically silent on the workings of the defense industry. However, the products of this industry, advanced weapons systems, were publicized in other venues. The importance of the sector was reiterated countless times by some of the most authoritative Soviet sources. This was a more open treatment than that afforded civil disturbances, official privilege, and political decision making. Military sector secrecy was not absolute, or the most severe compared to the other areas of Soviet life. We will now see how the discipline of Sovietology dealt with this unbalanced information diet.

3 Indirect tests of the secrecy hypothesis

If Sovietologists were interested in studying the military sector, but were prevented from doing so by secrecy, we should be able to observe how they bumped against the constraint. There should be recorded complaints about secrecy and discussions of the gaps in knowledge produced by it. Researchers should be making repeated attempts to overcome secrecy surround-

ing the military sector by roundabout means. The work of those who claim to have found anything new about the military sector should attract attention and perhaps emulation in the profession. Here we consider evidence for each of these three patterns of behavior in turn.

3.1 Concern about secrecy and the recognition of gaps in knowledge

Sovietology was born in the late 1940s, when the availability of data on the economy was at its lowest (see 2.2).¹⁵ At that time, complaints about secrecy standing in the way of understanding the Soviet economy (and not just its military sector) were not uncommon. In his preface to the first major book published by the new discipline, Bergson (1953, p. iii) wrote of “the enormous difficulties posed for this discipline by the information policy of the Soviet government, especially the extreme secrecy”, and asked the readers to bear it in mind when examining the often tentative contributions that leave many gaps. The need to overcome secrecy and the ability to do so were viewed as defining characteristics of the new discipline at its inception. “Even more important was to learn how to combine statistical data so as to obtain information which never was intended to be divulged by the compilers and publishers of Soviet statistics.” (Gerschenkron, 1968, p. 528). “The necessity of creating its own data has left a definite stamp on the character of this branch of economics. Because the data were otherwise not readily available, or where available, not reliable, or at least had to be checked, the economist has had to dig up the basic figures and to combine them into assimilable and digestible aggregates.” (Grossman, 1959, p. 36).

However, the general concern with secrecy would soon be abated. In the late 1950s, some of the new discipline’s founders published surveys of the field to mark its tenth anniversary.

¹⁵ For an account of the discipline’s emergence, see Kontorovich (2009, section 3).

Their overall assessment was upbeat, with no more talk of tentativeness of conclusions and gaps in knowledge: “the facts are now known, the concepts forged”; “... at the mere level of quantitative factology we are well informed about the Soviet and indeed most European communist countries; certainly better than about underdeveloped countries.” (Wiles, 1961, p. 87, and 1964, p. 71)¹⁶ Grossman (1959, pp. 41-43) in his survey mentioned secrecy once as an obstacle to research into labor compensation, but suggested that a non-quantitative study still could be done. Lack of data on the defense industry output was mentioned as a barrier for accurate measurement of economic aggregates, but not as a problem in its own right.¹⁷

As is common in this genre, the papers identified the areas where knowledge remained deficient and more work was required. Among the latter, they listed steel, coal, and petroleum industries, construction technology, obsolescence, collective farm management, finance, foreign trade, labor, and wages.¹⁸ Even water transportation was named as “a big enough activity to justify treatment of itself alone” (Campbell, 1961, p. 140).¹⁹ The defense industry was not deemed worthy of such a treatment.

Many of the leading Sovietologists participated in the collective volume (Trembl and Hart, 1972) aimed at the “assessment of availability, reliability, and credibility of Soviet economic statistics” (ibid., p. v). In the introduction to the book, Hunter (1972, p. 5) mentioned “defense-related producing sectors” as one of three “vast areas of relative silence”, and suggested, in one sentence, that this hurts the Soviets themselves by preventing them from analyzing policy trade-

¹⁶ But see Grossman (1959, p. 49): “we still know little about what makes the Soviet economy and its components tick ...”.

¹⁷ Wiles (1964, p. 71); Grossman (1959, p. 38).

¹⁸ Campbell (1961, p. 140); Gerschenkron (1968, p. 532).

¹⁹ At the time (in 1960), internal waterways carried 5.2% of freight shipped by common carrier in the USSR, and the share of merchant marine was 1.9% (Goskomstat, 1988, p. 306).

offs. This was followed by an extended argument about the Soviet economy's need for better statistics on agriculture, consumption, and services. There was no comment on what, if anything, "silence" on military production did to the Western understanding of the economy's tradeoffs.

A 1973 questionnaire asked American economists studying the USSR about the desired allocation of research effort across 51 topics. For each topic, the number of responses saying it deserves less attention was subtracted from the number of those saying more work is needed, and topics were ranked according to this difference. Defense economics ranked 32nd, sharing this place with the history of economic thought (Barry and Millar, 1975). Later surveys of the field (Clarke, 1983; Millar, 1980) focused exclusively on achievements and did not name any areas where knowledge was still deficient. There was also no longer any need to deal with Soviet secrecy. If the earlier generations of Sovietologists had "to comb through large masses of publications for individual numbers, for descriptions of institutions, and for hints about problems and conflicts", in the 1970s, one could rely either on the Soviet official or the CIA sources for the data. Researchers no longer had to devote time to data collection and did not see it as being of intrinsic scholarly interest (Millar, 1980, pp. 324-5).

In the introduction to his textbook on the Soviet economy, Millar (1981, p. xv) proclaimed that "we have developed the basis for a full and reliable description and analysis of the Soviet economic system." The only issues worth mentioning on which there was still little information were the World War II period and its immediate aftermath, and "how political decisions are taken and get translated into economic directives." In general, however, enough was

known “visualize the over-all pattern and much of its detailed complexity.’ (idem., p. xvi)²⁰

A more direct approach to documenting the degree of concern for secrecy is to look for the words “secrecy” and “secret” in the books’ indexes. Table 1 presents a result of such an exercise for 143 books on the main aspects of the Soviet economy. The terms are present in the indexes of only 11 books, including 2 out of 43 textbooks.²¹ Secrecy does not make it into the indexes of most books on the national income accounting, the genre created in large part to overcome Soviet secrecy. It is not mentioned in the books on planning, though the specifics of plan construction have always remained secret, and much of the Sovietologists’ effort went into deciphering what each plan meant to accomplish. It does not appear in the indexes of books on Gorbachev’s reforms, though the latter had the relaxation of secrecy (*glasnost*) as their major plank.

These numbers may also reflect the tendency in the later decades to speak euphemistically about “areas of relative silence” (as Hunter, cited above) or “data availability” (Nove, 1986, p. 363), rather than secrecy. However, this reluctance to call a spade a spade itself testifies to the relative lack of concern with secrecy as a barrier to research on important subjects. The neglect of Soviet secrecy and its effects was not specific to economic literature. Hutchings (1987, p. 6) searched for the word “secrecy” in the indexes of books about the USSR from different disciplines, and then followed up on the entries he found to see if there is a substantive discussion of it

²⁰ Hutchings (1987, p. 1) was in a minority of one when he stated: “What we do not know about the Soviet Union because information is withheld is potentially, and in the most literal sense, of vital importance. As far as possible, it must be taken into account in any evaluation or study of the USSR. It is truly remarkable how many people, some of whom ought to know better, or do know better, take no notice of the fact that the great bulk of our information about the Soviet Union has been passed through a filter which is designed and inserted by the Soviet Union itself.”

²¹ The books are the same ones I checked for military references in Kontorovich (2009), where their selection is explained. Entries for “commercial secrecy” and “secret police” were not counted.

in the text.²² He found no discussion of secrecy in the general histories, and no extended discussion in other fields. The two most extensive treatments of the subject that he found were in books written by journalists, not social scientists.

Writings on the Soviet economy after the brief initial period (late 1940s-early 1950s) generally were not concerned with secrecy, and did not acknowledge any important gaps in knowledge due to it. This rules against the hypothesis that the Sovietologists were frustrated by secrecy in their quest to learn more about the military sector. The non-recognition of secrecy and the issues it raised by much of the social science literature also presents a puzzle in its own right.

3.2 The example of Kremlinology and the use of roundabout means to overcome secrecy

Secrecy surrounding a subject does not necessarily result in the absence of publications about it; the effect may well be the opposite. Withholding information itself supplies a motive to find out what is being hidden: “Given that such enormous trouble, in so many dimensions and at such expense, is taken to preserve secrecy, what is kept secret must be considered to be of great importance.” (Hutchings, 1987, p. 264) In the case of the Soviet military sector, while information on its workings was being hidden, its output was shown off around the world (see 2.3), practically teasing the experts to find out more about its origins.²³ A dearth of information need not prevent publications about a subject deemed interesting and important. It may actually lead to an excess of publications, as authors use fragmentary, secondary, and otherwise deficient evidence in support of hypotheses some of which would have been rejected with higher quality

²² Hutchings (1987) does not say how the books were selected and how many were covered.

²³ See Hutchings (1987, pp. 28-9) on the importance of keeping a secret inconspicuous in order to safeguard it.

information.

Western study of the top-level Soviet politics provides an example of massive published output in the face of unavailability of primary data. In a tightly centralized system, all important and a great many unimportant national decisions were being made at the Politburo level (Khlevniuk, 1996, p. 3). The operation of that body was, therefore, key to explaining the country's policies. Yet the internal workings of the ruling circle - procedures for arriving at decisions, positions of particular personalities, their alliances, or even the scope of the agenda – were among the jealously guarded secrets. This was true even with respect to a relatively distant past. A historian writing about the sources available for the study of Politburo in the 1930s during the late Soviet period speaks of “absolutely closed ... archives and, to put it mildly, tight-lipped politicians”; “falsified official documents, unpersuasive memoirs, and cleaned-up archives” (Khlevniuk, 1996, pp. 4, 259). Even a Sovietological triumphalist like Millar (1981, p. xvi) conceded that “how political decisions are taken” remained an important unanswered question. As with the military sector, what was visible was a part of the Politburo's output, published policy documents and official speeches.

Yet this did not prevent a voluminous scholarly literature on the politics of the Soviet ruling circle from arising. Commensurate with its importance in the system, political scientists directed the lion's share of their attention to the “question of leadership. Much effort was expended on scrutinizing Politburo politics and second-guessing the moves of the general secretary” (Rutland, 1993, p. 118).²⁴ Absent direct evidence, scholars analyzed in detail the short official biographies of Politburo members and their published speeches, or retreated into pure

²⁴ On centrality of “high politics” for the field of Soviet political studies, see also Unger (1998, p. 19).

theorizing (Rutland, 1993, p. 115).²⁵ These efforts did not necessarily produce valid results; indeed, the sources quoted here are highly critical of the fruits of this research. But this makes my point even stronger: when a subject is considered important and interesting, the lack of reliable information about it is not necessarily a barrier for research publications. Evidence of any sort will be used to produce studies on the burning topic.

There was an approach to the study of the military sector analogous to Kremlinology: the estimation of secret economic magnitudes as residuals. The reasoning was that though, for example, (true) military spending or military industry production data were not reported, they were included in the total government expenditures or total output of machinebuilding. Subtracting from these totals all the explicitly identified civilian components yielded the residual that had to include the sought after military magnitude. For such exercises to be feasible, one needed data on the reasonably complete list of civilian components, a condition more or less satisfied since the early 1960s, when Soviet statistical yearbooks regained their heft (see 2.2). Also, the way in which data were reported made this simple-sounding calculation of the residual impossible without a large number of additional assumptions about bookkeeping conventions, statisticians' stratagems, and missing magnitudes. Much as the analysts tried to ground these assumptions in what was known or seemed plausible about the Soviet economy, they still came up with widely varying approaches.²⁶ These, in turn, led to divergent estimates.

One could expect a proliferation of residual studies in the 1960s-1980s, as researchers explored the consequences of different assumptions for the important and hotly contested question

²⁵ When dealing with high politics of the 1930s, they used sources such as hints in Khrushchev's 1956 speech and Nikolaevsky's purported conversation with Bukharin (Khlevnyuk, 1996, pp. 258-9).

²⁶ Witness the positions of the contributors to Jacobsen (1987).

of the size of the military sector. I found only four such studies published in books and journals: Lee (1977), Jacobsen (1987), and Steinberg (1990) on military spending, and Kontorovich (1988) on new product prototypes. Three of them came out towards the very end of the Soviet rule.²⁷ The main practitioners of this approach were “free lancers” (William Lee, D. Steinberg), rather than established academic Sovietologists.

3.3 Paying attention to those who claim to have learned about the military sector

One would expect the researchers frustrated by secrecy to be alert to any breakthroughs in the informational blockade. Publications purporting to have things to say on the important yet obscure subject would be noticed, receive careful scrutiny, and their results, if found valid, will be cited, and methods imitated by other researchers. To see if this has been the case, I turn to the few scholars who did write on the military sector early on, and trace the reaction to their work, as reflected in the book reviews.

Krylov (1979) was the first textbook in a quarter of a century to include a chapter on the military sector.²⁸ Much of that chapter was devoted to mobilization planning, i.e., shaping civilian production so as to make it convertible for wartime needs. This unique aspect of the Soviet military economy, unlike the size of military expenditures or characteristics of defense industry, was very rarely mentioned in Western economic writings. No reviewer commented on either the presence of the chapter or its content.²⁹ Gay (1980, p. 507) complained about some chapters, such as “Militarization of the Economy” being very short, as if he had seen chapters of any

²⁷ Kushnirsky (1993) and Steinberg (1992) appeared after the fall, illustrating the belated peak of interest in the topic. Appendix to Konotorovich (2009) explains why I counted only books and journal articles.

²⁸ Schwartz (1954) was the previous one.

²⁹ This includes Birman (1980), Thornton (1980), and an anonymous review in *Choice*, Nov. 1979, p. 1214.

length on this topic in a textbook before.

One of the first works on science and technology to include a discussion of the military sector was Sutton's three volume "monumental study" (Ofer, 1984, p. 138). It used the US Department of State and Western company sources to document, sector by sector, transfer of technology to the USSR, and concluded that the Soviet economy was incapable of generating innovation, and instead relied on the West for practically all civilian advances. Sutton's secondary thesis was that since the Soviet economy was focused on the buildup of defense industries, Western technology ended up strengthening the declared adversary's military. Sutton (1968) had a chapter on the technology transfers as a result of the Soviet-German military cooperation, and Sutton (1971) had chapters on aircraft and on tanks, guns, and explosives. Sutton (1973) had chapters on atomic energy and on space and aircraft technology, as well as an extended argument about dual use technologies such as automotive and marine transport, a discussion of the relation between the industrial base and the military industry, and a section on the innovativeness of the weapons industry compared to the rest of the economy (Sutton, 1973, pp. 361-2).

A series of generally positive reviews did not make any note of the discussion of the secret sectors, or indeed of the whole military economy part of Sutton's argument.³⁰ A more critical review only complained that the book defines strategic goods too broadly, to include engines for merchant marine ships and automobiles (Grayson, 1975).³¹ Freeman (1972) berated Sutton (1971) for neglecting various concerns of those who study worldwide technology transfer, and in turn dismissed the concerns animating the study: "In general Sutton's approach is extremely

³⁰ Campbell (1972), Trembl (1972), and Dohan (1970 and 1972).

³¹ The commander of the Soviet Navy sided with Sutton on the strategic value of merchant marine (Gorshkov, 1979, pp. 47-73).

parochial and very much in the cold-war tradition of the fifties.”

The first volume on R&D and technology by establishment Sovietologists to pay significant attention to the military sector was Amann et al. (1977). It included, among the studies of the relative technological level of a number of industry sectors, an 80-pp. chapter on military technology by David Holloway (a political scientist), with detailed case studies of tanks and ICBMs, and a shorter chapter on space technology. Several reviews called these chapters interesting or very interesting and related their argument in a sentence or two, without further comment.³²

The follow-up volume (Amann and Cooper, 1982) contained a 90-pp. chapter (Holloway, 1982) with a remarkably detailed general account of the military industry. It covered the creation of the sector in the late 1920s and 1930s, and its place in the process of industrialization (pp. 279-282), the organs making decisions on military economic matters (pp. 296-303), and the structure and peculiarities of the industry itself (pp. 303-314). It also dealt specifically with innovation-related topics, such as the technological policy in the sector and the use of imported technology (pp. 283-287), R&D establishments and their relations with production plants (pp. 314-340), and the magnitude of military R&D outlays (the appendix). There was also a 40-pp. chapter (again, by Holloway) with a case study of innovation in tanks and ICBMs.

Each one of the eight reviews which I read noticed the military chapters, but no one expressed surprise at the author’s ability to learn that much about a secret sector, or discussed his sources of information. Two reviews (both by economists) started their retelling of the military chapters with the words “Not surprisingly ...” (Schroeder, 1983, p. 46) and “Western observers

³² Bailes (1970); Campbell (1979); McKay (1979); Solo (1978); “The gap in technology”, *The Economist* February 18, 1978.

have long noted ...” (Hunter, 1983, p. 1027).³³

Holloway (1983) contained a section on industrialization and military power (pp. 4-10), a chapter titled “The Defence Economy” (pp. 109-130), and another one on “Military Technology” (pp. 131-155). The 16 reviews of the book which I located were published in political science, international relations, history, and Russian studies journals, and even in the *Washington Post*. Not a single one appeared in an economics journal or was written by an economist.

Book reviewers took chapters on the Soviet military economy for granted. The fact that a chapter would be the first on the topic in a textbook or a book on technology was not noted. There was no surprise at and admiration for the ingenuity of the authors who had surmounted the hurdle of secrecy, and no discussion of the sources of information on the military sector used. Some reviewers commented that the material conforms to the common knowledge on the subject.

4 Direct test of the secrecy hypothesis

In this section, I survey some of the sources of information about the military sector which were available at the time. Such information, having originated in the USSR, reached Sovietologists through three channels: Soviet publications, direct physical observations, and eye-witness testimony. Party and government documents, speeches of the rulers, economics, history, and military books and articles, and memoirs all belonged to the sources that Sovietologists could be expected to consult and interpret. Direct observation of a weapon, whether intended by

³³ The other six reviews referred to here are Beissinger (1984), Erickson (1983), Hutchings (1984), Ofer (1984), Parrott (1983), and Rabkin (1984).

the Soviets, as discussed in 2.3, or unintended, as with spying, was a different matter. An economist would not know what to make of the sighting of a particular missile on the Red Square or a plane off the coast of Kamchatka. This sort of information would have to be processed by a Western military analyst to be useable by a social scientist. Accordingly, this information is reviewed here under the heading of “Western publications”. Finally, we survey the accounts of Soviet émigrés and Western journalists and engineers who were posted in the country.

4.1 Soviet publications

In the next three sections, I document the profusion of military references in the Soviet sources on three important topics - industrialization, the role of heavy industry, and objectives of planning - and briefly contrast it with their treatment in Sovietological literature. In section 4.1.4, I invert the approach and follow the references of a few Western publications concerned with the military sector to show what they were able to find in the Soviet sources.

4.1.1 Industrialization: motives and nature

Industrialization was a foundational event which, together with the introduction of central planning and collectivization of agriculture in the late 1920s and early 1930s gave the Soviet economy the shape it retained till the very end.³⁴ The military reasons for industrialization were announced from the outset and were frequently repeated by the most authoritative sources.

The XV party congress in 1927 adopted a resolution “On the directives for compiling the five-year economic plan”. The very first directive it contained was this: “Taking into account

³⁴ Millar (1981, p. 21); Gregory and Stuart (1986, p. 71); Ofer (1987, p. 1770).

the possible military attack on the proletarian state it is necessary in the five year plan to pay maximum attention to the fastest possible development of those sectors of the economy and of industry which play the main role in supplying defense and in the economic stability of the country in wartime. Not only planning and economic organs, but, most importantly, the whole party must pay unflinching attention to the issues of defense in connection with compiling the five year plan.” (Voronetskaia, 1969, pp. 42). All other directives for the future plan – on the tradeoff between consumption and investment, growth rate, foreign economic relations, agriculture vs industry, intra-industry proportions – followed after the call for concentration on defense.

At the outset of the first five year plan, Stalin (1928, pp. 247-253) cited three reasons for accelerated development of industry. The first was the need to complement the most advanced social system with the most advanced technology so as to achieve the final victory of socialism in the country. The second reason was that “It is impossible to stay independent without the sufficient industrial base for defense. It is impossible to create such an industrial base without the most advanced industrial technology.” He then made an analogy between his policies and those of Peter the Great, who “feverishly constructed plants and factories to supply the army and strengthen the defense” (ibid., p. 248).³⁵ At another instance, Stalin (1931, pp. 38-39) gave a colorful justification of the high growth rates by the need to prevent the repetition of Russian history, in which it was weak and always beaten by its neighbors.

In his speech on the results of the first five year plan Stalin (1933, pp. 172-173) named six main tasks of the plan: 1. reequip the country with modern technology; 2. turn it into a powerful

³⁵ The third reason was the need to provide agriculture with modern equipment to effect its technological transformation.

industrial country standing on its own and independent of the whims of world capitalism; 3. increase the share of socialist institutions in the economy; 4. create an industry capable of re-equipping all sectors of the economy; 5. collectivize agriculture; 6. create all the necessary technical and economic conditions for the maximal increase in defense capability. Tasks one and four repeat each other, and refer to means rather than final objectives (modern technology for what?). Tasks three and five concern the complete absorption of the economy by the state, which, as far as industry was concerned, was not too problematic at the time. Tasks two and six are closely related (as will be shown in the next section), and point out the final use of all the new technology, that for strategic and military purposes.

He then named the four accomplishments of the plan in industry: the extinction of capitalist economic institutions; turning an agrarian country into an industrial one; reaching 93.7% of the five-year target for industrial production in four years; and turning a weak and militarily unprepared country into one capable of mass production of all the modern weapons (Stalin, 1933, pp. 179-181).³⁶ In discussing the need for the break neck rate of change during the first five year plan, Stalin briefly mentioned the need for a new technological base, but spoke mainly of mortal danger to the country, the threat of military intervention, and the need to overcome military weakness (ibid., pp. 183-4).

The official party history (*Istoriia*, 1938, p. 264) described Stalin's argumentation as early as the XIV party congress in 1925 as "Industrialization made possible the maintenance of the country's economic independence, strengthened its defense capacity, and created the necessary conditions for the victory of socialism in the USSR." Yet I found no reference to defense capac-

³⁶ The failure to complete the plan in four years was ascribed to the downtime caused by the conversion of some plants to military production due to the international situation.

ity in the published text of the speech (Stalin, 1925a).³⁷

These strong pronouncements are all the more remarkable for being made at the same time as the Soviet rulers tried hard to project a peaceful image of their country by hiding the true amount of defense spending (Davies, 1993).³⁸

With some notable exceptions, Western textbooks on the Soviet economy sought the genesis of industrialization in the teachings of Marx and Lenin, Soviet economics writings of the 1920s on primitive socialist accumulation, and the intra-party struggle. Military motivation was not mentioned (Millar, 1981, pp. 21-33; Dyker, 1985, Ch. 1) or was mentioned in passing (Gregory and Stuart, 1986, pp. 68-105; Campbell, 1966, Ch. 2). Most of the leading histories of industrialization in the 1960s and 1970s - Erlich (1960), Jasny (1961), Dobb (1966), Nove (1969) - deemphasized or even denied military motivation for industrialization before 1934 (Wein, 2005). This cannot be explained by secrecy.

4.1.2 Heavy industry: Preobrazhensky vs Stalin

The Soviet Union was credited with inventing a strategy for accelerating growth by boosting capital formation, allowing a poor country to catch up with the rich ones (Easterly, 2001, p. 32). The key element of this strategy was priority given to the development of heavy industry, which characterized Soviet policy from the industrialization and into the 1980s.³⁹ For several decades, a number of developing countries tried to use this formula to spur their growth (Montias, 1961, pp. 58-61).

Stalin and the official documents routinely explained the stress on the heavy industry by

³⁷ For more statements on the military motivation for industrialization see 4.3 below.

³⁸ Davies (1993) contains a fascinating history of how the information of the military side of industrialization was being released in the 1920s-1970s, and how it was assimilated by Western economists.

³⁹ Wilber (1969, p. 76), Ofer (1987, p. 1807), Kornai (1992, p. 171)

the need to preserve the country's economic independence from capitalist economies.⁴⁰ Depending on the context and the exact phrasing, some such pronouncements could be interpreted as aiming to isolate the USSR from the vagaries of business cycle, or to inoculate it against boycotts and other politically motivated trade disruptions, or to prevent it from turning into a "raw material appendage" of capitalist economies. However, on many important occasions the priority of heavy industry was explained by the need to create the industrial base for the military industry, and the country's economic independence was cast in strategic terms.

The XV party congress resolution "On the directives for compiling the five year economic plan" demanded that the first priority be given to production of means of production, so as to satisfy the demand of all the sectors of the economy from the domestic sources. "The sectors of the heavy industry that should grow the fastest are those that in the shortest time increase economic and military might of the USSR, guarantee development in case of an economic blockade, weaken our dependence on the capitalist world" (Voronetskaia, 1969, p. 285). The resolution of the XVI party conference "On the five year economic plan" stated: "Based on the general idea of the country's industrialization, strengthening its defense, and freeing it from the dependence on capitalist countries, industrial investment is directed primarily into the sectors making means of production ..." (*Institut*, 1954, p. 570).

Stalin (1933, pp. 182-3) in his speech on the results of the first five year plan gave four reasons for favoring heavy industry at the expense of consumer goods production. Absence of heavy industry would have left the country disarmed in the face of technically advanced capitalist world; it would have deprived agriculture of equipment, and hence the country of food sup-

⁴⁰ Stalin, 1925a, pp. 298-9; 1925b, pp. 354-6; 1926, pp. 120-1.

plies; it would have left capitalist elements intact, hence “unbelievably increasing the chances of capitalist restoration”; it would have deprived the country of means of defense, making it the victim of external enemies. The overall result would have been a bloody, unequal war to the death with the better armed enemies.

Stalin Feb. 9, 1946 speech on the military motivation of heavy industry.

Economics textbooks repeated Stalin’s arguments. Sorokin (1946, 18): “The first task of socialist planning is to secure independence of our economy from its capitalist surrounding. Realizing this task is directly connected with the strengthening of defense capability”. “... the party developed heavy industry, so as to secure economic independence of the USSR.” “Only the development of heavy industry made the creation of the modern military industry possible ...” Ioffe (1948, p. 5): “the need to possess powerful armed forces ... requires strong and highly developed industry and, first of all, heavy industry with its heart, machinebuilding. Only the industry with huge production capacity, and, first of all, formidable stock of machine tools, developed metallurgy, chemical industry and fuel and power generation sectors, is capable of not just profusely equipping the army with modern weapons, but also of providing continuous and ever increasing flow of supplies in the time of war.”

An introduction to a Soviet collection of documents on industrialization stated that “The threat of imperialist aggression demanded the accelerated development of machinebuilding in general, and especially the defense industry” (Khlusov, 1971, p. 5) A planning manual named the development of heavy industry by all means (*vsemernoe*) as the first task of industrial plans, because this sector forms the foundation of economic growth, technical level of the whole economy, and strengthening of the country’s military might (Gosplan, 1974, p. 52).

Most Sovietological writings did not mention Stalin’s military explanation for the stress on

heavy industry. Some saw development of heavy industry (or creation of a production apparatus, or output of steel and electricity, which we take to mean the same thing) as an objective in its own right, not as a means to some other end.⁴¹

Others saw the stress on heavy industry as a means to generate rapid growth (Kershaw, 1961, pp. 8-9). They pointed to the writings of a Soviet growth theorist of the 1920s Preobrazhenskii as evidence that heavy industry was given priority so as to accelerate economic growth. “It is not difficult in this context to understand why Stalin laid such stress on heavy industry. High rates of growth of national income were viewed partly as an end in themselves, partly - certainly by Preobrazhenskii – as a means of ensuring a rapid increase in employment.” (Dyker, 1985, p. 3). “The most remarkable feature of the 1930s was the extent to which the pro-heavy-industry bias asserted itself (as Preobrazhenskii said it should).” (Gregory and Stuart, 1986, p. 93). “The concentration of investment in [producer-goods industries]... is the key to rapid growth in Marxist and Soviet growth models.” (Ofer, 1987, p. 1807). Moravcik (1965), in his “doctrinal history” of the priority of heavy industry found the idea in Marx and Preobrazhenskii, dismissed Lenin’s contribution (alleged by a Soviet source), but did not mention Stalin. More recent growth theories were mobilized, as well, to explain this peculiarity of the Soviet growth strategy. Wilber (1969, pp. 76-86) argued that the allocation of a very large share of investment to heavy industry was a “historical example of unbalanced growth strategy advocated by economists such as Hirschman.” Little did Stalin know.

4.1.3 Objectives of central planning⁴²

⁴¹ Goldman (1968, p. 63), Millar (1981, pp. 31, 122), Hare (1991, p. 21), Bernard (1966, p. 96), Hirsch (1961, p. 26), Hunter (1964, pp. 4, 14). This is discussed at greater length in Kontorovich and Wein (2009).

⁴² The discussion below is drawn from Section 4 of Kontorovich and Wein (2009).

Central planning, the defining characteristic of the Soviet economy, is a specifically goal-oriented activity.⁴³ The ability to steer the economy in pursuit of society-wide objectives has been one of the arguments made in favor of planning by its advocates. The most authoritative Soviet sources – constitutions, speeches of party leaders, party platforms, planning manuals, and textbooks - discussed the objectives of planning in general, as well as those of particular plans. They usually named military might as one of the two main objectives of planning, alongside with consumer welfare.

The 1936 Constitution of the USSR defined the goals of planning as “increasing national wealth, continuous rise in the material and cultural wellbeing of the working people, strengthening independence and defense capability of the USSR” (Konstitutsiia, 1960, p. 6). The Directives of the 24th congress of the CPSU postulated high rates of growth so as to secure increases in living standards and strengthen economic and military might as the objectives (*Materialy*, 1972, p. 129). Brezhnev (1981, p. 3) summarized the achievements of the 10th five-year plan as increase in the national wealth and production, scientific and technological potential, strengthening of defense capability, and increase in welfare and cultural level of the people. Ryzhkov (1986, p. 6) formulated the main goal of the 12th five-year plan (1986-90) as increasing the growth rate and efficiency of the economy as a base for improving popular welfare, while maintaining necessary military might.

The manual on methods of compiling five-year national plans opened with the proclamation that plans should aim at high rates of growth so as to secure increases in living standards and strengthen economic and military might (Gosplan, 1969, p. 3). The next edition of the man-

⁴³ Spulber (1964, p. 7); Lindblom (1975, p. 23); Rutland (1985, p. 103).

ual, Gosplan (1974), mentioned defense in the line six of the first of its 800 pages, as one of the goals of planning, alongside with growth and consumer wellbeing, and again on the first page of the part dealing with industrial planning.

An early planning textbook formulated the leading task of national economic planning as “Securing self-sufficiency and independence of the socialist motherland, strengthening its military might” (Sorokin, 1946, p. 18). Later textbooks on national economic planning routinely listed strengthening the military might as one of the goals of planning.⁴⁴ A planning textbook that undertook to carefully formulate the relationship among objectives by ranking them into a hierarchical “tree” (Berry, 1973, pp. 32-4) named the satisfaction of the material needs of consumers and strengthening defense capability as the main national goals of equal importance, their relative weight changing depending on the situation.

When the Soviet rulers declared consumption as their objective, this was consistent with the image of themselves that they wanted to project, as evidenced by every conceivable source. Declaring the military might objective was extraordinary in the context of planning textbooks and manuals, given the virtual blackout in the post-war Soviet economic sources on anything related to military economic matters. Apparently the message was important enough to justify breaking the taboo. And there is nothing comparable about the military might as an economic objective in western college economics textbooks, or in the economic pronouncements of western leaders.⁴⁵

The majority view in Sovietological literature maintained that central planners were striv-

⁴⁴ Kurskii (1954, p. 14), Koval’ (1973, p. 20), Kolodnyi and Stepanov (1975, p. 18), Tsapkin and Pereslegin (1967, p. 15), Tsapkin (1972, p. 18).

⁴⁵ See Higgs (1994, p. 283) on the absence of the Cold War from the American economic history books.

ing for growth for the sake of growth. Kontorovich and Wein (2009) document this position and also show that such an objective would be irrational unless one assumes highly unusual preferences on the part of the Soviet rulers. Only a minority of writers recognized the military objectives of planning, despite the fact the fact that the Soviet rulers themselves announced these frequently and unequivocally. More generally, military considerations were not even mentioned in most Sovietological books on planning. Soviet books had no indexes, but I counted that the word “defense” occurs on 17 pages in Berry (1973), as the objective of developing military might is reiterated. For comparison, nine out of twelve Western books on planning have no defense related entries in their indexes, while the remaining three have one, two, and seven references (Table 2).

4.1.4 What an interested Sovietologist found in the Soviet publications

Holloway (1982), discussed in 3.3 above, gave a remarkably detailed description of the military sector. Much of it derived from the Soviet sources. I summarize the text referenced to these sources, and provide abbreviated bibliographic references, intended only to give the idea of the range of useful publications and their dates. Many sources are cited several times on different topics, but I only note them once.

The main goal of the five year plan was strengthening the armed forces. The first five-year plan was accompanied by a plan for the development of the armed forces. In 1929, the Politbureau called for an even faster drive to re-equip the army. In 1931, the goal was set to achieve numerical superiority over the probable enemies. Voroshilov, speech at the XV party congress, 1927; *Istoriia vtoroi mirovoi voiny*, 1973; *KPSS o vooruzhennykh silakh*, 1969.

Development of defense industry required an industrial base. This included metallurgy, fuel, machine tool, electrical and chemical industries. Special shops were set up in most of the

new civilian machinebuilding plants to smooth the way for arms production. Of thirty agricultural machinery plants converted to ammunition production at the outset of the war, twenty one lacked necessary equipment. Tukhachevskii, *Sovetskaia entsyklopedia*, 1928; Kravchenko, *Sovetskaia ekonomika ...*, 1970; Vannikov, *Voprosy Istorii*, 1969; *Istoriia Velikoi otechestvennoi voiny*, 1961.

Weapons design and production in the 1930s was hobbled by shortage of metals and fuels. Design of both production facilities and weapons had to take into account the low level of skills. Defense industry received preferential treatment in the supply of manpower and materials. Various data on military production in 1941-1944. Large increases in productivity. Emelianov, *Novyi mir*, 1967. Tukhachevskii quoted by Popov, 1972. Various sources already listed.

Main principles of military-economic policy and their relation to society's economic potential in Soviet thinking. Striving for both quantity and quality in Soviet military policy. Soviet thinking about the military research-production cycle. R&D expenditures as a growing share of total lifecycle weapon cost. Soviet thinking on the role of science in weapons development. *Marksizm-Leninizm o voine*, 1968; *Voprosy strategii*, 1965; Cherednichenko, *Kommunist Vooruzhennykh Sil*, 1968; Daniluk, *Economic accounting in a defense plant* (in Polish), 1974; Lomov, *Nauchno-tekhnichestkii progress*, 1973; Bondarenko, *Sovremennaiia nauka*, 1976; Bondarenko, *Kommunist Vooruzhennykh Sil*, 1971.

A page worth of information on the structure of central policy making bodies in military research and production in the 1930s and during the war.⁴⁶ Zhukov, *Memoirs*, 1969; Meretskov,

⁴⁶ This and other lengthy discussions are also using Western sources.

Memoirs, 1971; *KPSS o vooruzhennykh silakh*, 1969; *Sovetskaia Voennaia Entsiklopedia*, 1976, 1977; *50 let vooruzhennykh sil*, 1968.

A more tentative two pages long story of the post-war evolution of the central bodies. Petrov, *Stroitel'stvo politorganov*, 1968; *Bol'shaia Sovetskaia Entsiklopedia*, 1957; Petrov, *Partiinoe stroitel'stvo*, 1964; Soviet Constitution, 1977, Epishev, *Krasnaia Zvezda*, 1977, *Voennyi Vestnik*, 1977, *Lenin i vooruzhennye sily*, 1967; *Pravda*, 1981.

A three pages long discussion of the planning of military industry and top level policy setting. Sokolovskii, *Voennaia strategiia*, 1968; *Istoriia KPSS*, 1970; Zakharov, *Voенно-istoricheskii zhurnal*, 1971; Sokolov, *Voенно-ekonomicheskie voprosy ...*, 1968; *Pravda*, 1974; Kuzmin, *Na strazhe mirnogo truda ...* 1941.

The structure of the defense industry, four pages. Anfilov, *Bessmertnyi podvig*, 1971; *Sovetskii tyl v Velikoi otechestvennoi ...* 1974; Lokshin, *Promyshlennost' SSSR*, 1964; *Ekonomicheskaiia zhizn' SSSR*, 1967; Iakovlev, *Tsel' zhizni*, 1974; *Sbornik zakonov SSSR*, 1961; *Materialy XXIV siezda*, 1971; Starik, Paramonov, and Bugakov, *Ekonomika, organizatsiia i planirovanie*, 1976; Tolubko, *Tekhnika i vooruzhenie*, 1974.

Priority of military industry, three pages. Stukolov, *Ekonomika elektronnoi promyshlennosti*, 1976; Ol'shevits and Orlov, *Organizatsiia, planirovanie i ekonomika*, 1963.

R&D establishments, 13 pp. Skugarev, *Morskoi sbornik*, 1967; Mostovenko, *Tanki*, 1958; Grabin, *Oktiabr'*, 1973; Zakharov, *Voенно-istoricheskii zhurnal*, 1971; Levshin, *Akademiia nauk SSSR*, 1966; Komkov, *Akademiia nauk SSSR*, 1974; Golovin, *I. V. Kurchatov*, 1973; Radunskaiia, *Aksel' Berg*, 1971; Brenev, *Izvestiia vuzov SSSR*, 1968; *Entsiklopedia kibernetiki*, 1974; Avramchuk and Bartenev, *Morskoi Sbornik*, 1969; Biriuzov in Tikhachevskii, *Izbrannye proizvedeniia*, 1964; Khoroshilov, *Eto nachinalos' tak*, 1970; Bazurin, *Aviatsiia i kosmonavtika*,

1966; Iakovlev, *Stalingradskaia epopeia*, 1968; *Pravda*, 1972; *Boevoi put' sovetskogo flota*, 1974; Iakubovskii, *Boevoe sodruzhestvo*, 1975; Grechko, *Vooruzhennye sily*, 1975; Barakov, *Tekhnika i vooruzhenie*, 1975; Pyshnov, *Voennaia mysl'*, 1963.

Various issues in military R&D. Lobanov, *Iz proshlogo radiolokatsii*, 1969; *XXI siezd*, 1962; Berg, *Nedelia*, 1963; Tikhomirov, *Organizatsiia i planirovanie proizvodstva*, 1972; As-tashenkov, *Plamia i vzryv*, 1978; *Plenum TsK KPSS*, 1962; Tsvylev, *Voprosy ekonomiki*, 1971.

Military research-production cycle. Tsirlin, *Kommunist vooruzhennykh sil*, 1966; Bon-darenko, *Kommunist vooruzhennykh sil*, 1971; Krupchenko, *Voенno-istoricheskii zhurnal*, 1966; Chutko, *Znamia*, 1973; Grechko, *Voенno-istoricheskii zhurnal*, 1966; *Krasnaia Zvezda*, 1965.

This long list by no means exhausted everything available in the Soviet publications on the military sector. Some of the Western sources used by Holloway were themselves based on Soviet publications, such as the remarkable Cooper (1976). Such information was highly dispersed in the flow of printed matter, and one can see alert authors finding different pieces of it. For example, Krylov (1978) refers to Sokolov's book also cited by Holloway for a statement on mobilization planning, and to the journal *Planovoe Khoziaistvo* from 1966 for the rate of growth of defense industry during the second five year plan.⁴⁷ Sutton (1973, p. 191) referred to Lagovskii, 1961 on how design unification for machine parts and assemblies makes conversion from civilian to military production easier. The top priority given to military production in supply was stated in two issues of the journal *Material'no-Tekhnicheskoe Snabzhenie* in 1967-68 (Ericson, 1979, p. 33).

The wave of publications on the Soviet military sector after 1991 greatly benefited from

⁴⁷ This was the rate cited by Kaganovich at the 18th congress and overlooked by the early Western compilers of the Soviet national income accounts (Davis, 1993, p. 578).

the partial opening of archives (Ellman, 2008, 104-6). Remarkably, even here, the old open Soviet sources are used with great profit. Gaddy (1995): Lagovskii.

4.2 *Western publications*

4.3 *Disgraced rulers, emigres, and Western journalists and engineers*

4.3.1 **Military sector before the war**

Trotsky (1937, p. 10) agreed with Stalin's description of the objectives and achievements of industrialization (see 4.1.1), saying that its most important successes were in the war industries. Planning means "a continual mobilization of industry in the hands of the government, and make it possible to focus on the interests of defense even in building and equipping new factories." (ibid., p. 156).

The Moscow correspondent of the *Christian Science Monitor* during the first five year plan period noted the military value of many industrialization projects.⁴⁸ The new factories built in West Siberia and the Urals "possess definite potential war utility" and would be secure from the hostile air raids (Chamberlin, 1935, p. 48). Experience of World War I showed "with what ease steel plants [like that in Magnitogorsk] may be utilized for the manufacture of shells and munitions", while Cheliabinsk tractor plant "on short notice could be set to making tanks". He reported a Soviet engineer at a Sverdlovsk machinebuilding plant boasting of producing "everything that Krupp ever made, for war as well as for peace", and a foreign expert explaining that a fertilizer plant at Berezniki becomes a producer of explosives in time of war. Industrial projects

⁴⁸ This reference was suggested by Davies (1993).

in the Ukraine will provide the Soviet Union with “a new, powerful, industrial-military base” (pp. 53-55). In conclusion, “With all its shortcomings and failures in other fields, the first five-year plan unmistakably and considerably increased the military preparedness of the Soviet Union.” (p. 199).

Specifics of the military sector - top priority accorded military orders, military industry’s heightened requirements for input quality, special system of quality control for output, ample supplies - were conveyed by the interviewees of the Harvard Project, mentioned in passing and not pursued further by Berliner (1957, pp. 127, 151-2, 204).

4.3.2 Military sector after the war

Khrushchev (1974).

Soviet interview project.

Balzer (1989) is based on émigré information, coming out ten years after the end of the emigration wave. Katsenelinboigen (1978) gave a detailed description of mobilization planning. What he was saying was little different from the much later revelations of Iaremenko (1990).

4.4 Soviet military sector on the front page of the *New York Times*

We searched the *New York Times* from 1946-1991 for the front page headlines containing words “Soviet” (or “Russian”) and one of the following: arms; weapons; missiles; rockets; tanks; nuclear.⁴⁹ The results, summarized in Table 3, pertain only to the most visible coverage of the military sector in the paper, and exclude articles on the topic which appeared on all the other pages, as well as articles on the subject without our keywords in their headlines. We found

⁴⁹ Articles focusing on Sputnik and space exploration were not counted.

a total of 40 articles from 1950 to 1987, that is, on average one front page headline concerning military industry per year. The coverage was more frequent in the 1960s (14 articles) and 1970s (12).

Most articles listed in Table 3 contained reports about testing or deployment of new, more capable models of hardware, followed by a discussion of similar American weapons and the meaning of the news for the balance between the two sides. Occasionally, a sophisticated discussion of the Soviet military sector would appear, such as Middleton (1980) or this piece by Baldwin (1967):

“The Russian challenge affects all factors of military power: industrial-economic power; maritime power; aero-space power; all types of weapons from assault rifles to multimegaton bombs. ... Experts agree that Russia is the world’s second military power – first in some aspects and making a determined effort to achieve superiority in all. ... The Soviet economy has major weaknesses, not the least agriculture. Its computer, chemical, electronic, automotive and transportation industries and its mass production techniques – all of basic military importance – appear behind those of the United States. But the Soviet Union has a tremendous capability for the production of arms of all types.”

A reader of the news in the West could not remain ignorant of the fact that there was a sector of the Soviet economy that was turning out weapons numerous and sophisticated enough to rival anything in the world. No other single sector of the Soviet economy received comparable media coverage, or was said to have world-class achievements.

5 Conclusion

The discipline studying the Soviet economy was created in the West so as to help in deal-

ing with the Soviet strategic challenge. Yet in its publications it paid scant attention to the very sector that made this challenge possible. It has been plausibly suggested that Western scholars' efforts were frustrated by the secrecy enveloping the parts of the economy working for the military.

However, I found no signs of this frustration. The reviews of the field did not complain about the lack of information preventing the study of an important sector, and, as time went by, acknowledged hardly any gaps in the understanding of the economy. Secrecy itself was very rarely mentioned, much less considered a serious problem for researchers. Unlike in the study of top level Soviet politics, lack of information did not stimulate the use of roundabout ways to learn about the sector (until the final years of the USSR). The reviews of the relatively rare publications on the military sector did not exhibit any interest in how the author managed to pierce the veil of secrecy.

While some aspects of the military sector were kept secret, others were broadly advertised. The output of the sector – weapons - was shown to foreigners at parades, shows, fleet visits, and in the course of normal use. The importance of military might as the objective of planning was emphatically and repeatedly stated in the official pronouncements and planning textbooks. The military motivation of industrialization, and of the key element of growth strategy, priority of heavy industry, was eloquently expressed in Stalin speeches and quoted or retold in the textbooks. In the 1960s and 1970s, there appeared a substantive literature - memoirs of industrialization and the war, books on the history of the war, military economy, economics and organization of aircraft and electronics industry, and other subjects – with mass of information on the military sector.

Individuals with first-hand experience in the military sector abounded among the post-

World War II displaced persons, in the Jewish emigration of the 1970s, and among various escapees from the USSR and the East European countries. Newspapers.

Secrecy did make some types of research into the military sector, e.g., estimation of its production function, or other data-intensive exercises, impossible. However, the bulk of publications on the Soviet economy were descriptive in nature (Ellman, 2009, p. 5).

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Table 1. Secrecy and military terms in books on the Soviet/socialist economy, by category

Category of books	Books with index:			
	Total	w/o military entries	average no. entries per book	With “secrecy” or “secret”
Textbooks and readers	41	6	7.1	2
Planning	12	9	0.8	0
Enterprise management	8	5	3.0	1
Growth	9	3	10.4	0
NIPA, statistics	8	1	28.1	1
General Soviet/socialist	25	7	6.0	3
Gorbachev, collapse	15	2	11.7	0
Economic history	14	2		0
R&D, innovation	11	0		4
TOTAL	143	35		11

Source: Tables A1-A9,

<http://www.haverford.edu/economics/Faculty/Kontorovich/TabWAK.pdf>

Table 2. Books on Soviet/socialist planning

Author, year, edition	Chapter on military sector	Chapters on other sectors	Index entries, number and % of total pp.
Grossman, 1960	No	Agriculture, transport	No index
Hirsch, 1961	No	Investment	2/220; 0.9
Bergson, 1964	No	Agriculture, C ¹ , Investment	0/382; 0.0
Degras, 1964	No	Banking	No index
Bernard, 1966	No	Investment	0/300; 0.0
Hardt, 1967	No	No	0/266; 0.0
Zauberman, 1967	No	Foreign trade	0/302; 0.0
Ellman, 1971	No	Wholesale trade	No index
Ellman, 1973	No	No	0/190; 0.0
Marczewski, 1974	No	Agricult., for. trade, services	No index
Zauberman, 1976	No	Investment	No index
Cave, 1980	No	Supply	0/198; 0.0
Kushnirsky, 1982	No	No	7/163; 4.3
Rutland, 1985	No	Healthcare	1/267; 0.4
Ellman, 1989	No	Agriculture, for. trade	0/330; 0.0
Bennett, 1989	No	Investment, for. trade	0/271; 0.0
Eatwell, et al., 1990	No	Agric., for. trade	No index
Hare, 1991	No	Investment	0/137; 0.0

Notes: ¹ Consumption.

Table 3. Soviet military hardware in the front page headlines of the *New York Times*, 1946-1991

Date	Weapons	Source	Substance
Oct. 4, 1950	Tanks, planes	American in E. Germany	New models
Feb. 22, 1951	Tanks, artillery	Unspecified	Arming East Germany
May 2, 1954	Jet aircraft, artillery	May day parade	New models
Dec. 10, 1955	Missile, nuclear test	Soviet announcement & unspecified	New models
Feb. 6, 1956	Missiles	US	New models
May 26, 1956	Bomber	US	New models
Nov. 12, 1956	Various	British	Arming Arab countries
July 7, 1957	Various	US Army	Military balance
Feb. 2, 1958	Missiles, planes, nuclear	Western	Military balance
Dec. 11, 1958	Missiles	Khrushchev interview	New models
Dec. 18, 1958	Bomber	Jane's Aircraft	New models
Dec. 8, 1961	Nuclear	US	New models
July 18, 1964	Missile	US	New models
Nov. 8, 1964	Missiles	Nov. 7 parade	New models
Nov. 8, 1965	Missiles	Nov. 7 parade	New models
Dec. 8, 1966	Missile defense	US	New construction
Feb. 5, 1967	Missile defense	US	Military balance
Oct. 30, 1967	Various	US	Military balance

Feb. 19, 1968	Missiles	US	Growing number, new models
Dec. 11, 1968	Defense spending	Supreme Soviet proceedings	Increase in budget allocation
Feb. 21, 1969	Missile defense	US	New models
June 9, 1969	Missiles	US	New models
Oct. 28, 1969	Missiles, planes, etc.	US	Growing number, new models
Dec. 17, 1969	Defense spending	Supreme Soviet proceedings	Increase in budget allocation
April 28, 1970	Missiles, ABM	US	Military balance
Sep. 5, 1971	Bomber	US	New model
Oct. 11, 1971	Missile silos,subs	US	New construction
Aug. 18, 1973	Missile	US	New model
Oct. 8, 1973	Tanks, aircraft	British	Growing number in Europe
Jan. 15, 1975	Missiles	US	New models deployment
June 21, 1975	Missile	US	Growing deployment
Dec. 26, 1976	Cruise missiles, etc.	US	Military balance
Feb. 2, 1979	Cruise missile	US	New model
Apr. 24, 1979	Missile	US	New deployment
Sep. 21, 1980	Various	US	Military balance
Dec. 7, 1980	Various	US	Military balance
Dec. 8, 1980	Arms technology	US	Military balance
Sept. 27, 1981	Various	US	Military balance
Apr. 15, 1982	Missile	US	Accuracy
July 12, 1987	Tanks	US	New armor