Chapter II

CIA's Analysis of the Soviet Economy

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Fifty years ago Max Millikan, the first director of CIA's Office of Research and Reports (ORR), set a course for the Agency's economic analysis of the Soviet Union; one that proved to be remarkably prescient over the next 40 years—*The Role of ORR in Economic Intelligence* (August 1951). He wrote that foreign economic intelligence serves at least five purposes:

- To help estimate the magnitude of present and future military threats by assessing the economic resources available to a potential enemy—now and in the future.
- To estimate the character and location of possible military threats—how potential enemies have invested their resources.
- To assist in divining the intentions of potential enemies in the conviction that how they act in the economic sphere is likely to reveal intentions.
- To help policymakers decide what can be done to reduce possible or probable military threats by impairing an enemy's capabilities.
- To assist in establishing and projecting relative strengths of East and West.

Clearly, at first there was a laser-like focus on potential enemies. At that time and throughout the Cold War, these potential enemies were the USSR and other Soviet Bloc countries. Approximately two-thirds of ORR's economic and geographic analysts were assigned to the Soviet target; most of the remaining one-third covered Eastern Europe and the Asian communist countries. Before long, however, CIA's economic analysis was extended to cover much of the rest of the world. Developments in the international arena in the 1960s and 1970s such as the spike in raw-material prices, the Vietnam War, the oil crisis, and unsettled monetary markets siphoned off analysts from work on Soviet Bloc countries. A number of economic analysts also were transferred to military analysis as CIA expanded its role in this area, first as a Military Research Area within ORR and then in a newly formed Office of Strategic Research (OSR).

As a consequence, the resources devoted to economic analysis of the Soviet Union shrank appreciably. For example, whereas eight or nine analysts followed Soviet Bloc chemical industries in the 1950s, two had that responsibility in the 1980s. Overall, the

number of analysts assigned to Soviet economic topics declined sharply between 1953 and 1991. Nonetheless, for those analysts on the Soviet economic account, Millikan's broad set of objectives still guided their work. This paper reviews CIA's analysis of the Soviet economy as it relates to these objectives.

We need to begin with a reminder of how obsessed the Intelligence Community and policymakers were in the 1950s with the prospect that the Soviet Union would overtake the United States in terms of national output and military production. As Millikan put it:

> Patient and thorough examination and analysis of the mass of detailed information available to us as to the present status and prospects of the Soviet economy...is ORR's main job. It may well be the most important research job there is in the country today.

Further, a distinguished Princeton historian and CIA consultant, Joseph Strayer, declared that "Some of the most valuable intelligence papers ever written [are] those projecting the future economic growth of the USSR."

Building a Framework for Analysis

To assess Soviet economic potential, ORR first had to develop its own economic measures. Soviet macroeconomic statistics were too few and too flawed. Beginning in the 1950s and periodically thereafter, CIA constructed national accounts for the Soviet Union. This entailed a laborious search for bits of the puzzle in Soviet statistical handbooks, economic journals, and newspapers. The path had been pioneered by Professor Abram Bergson and his colleagues at Columbia, Harvard, and the RAND Corporation.

The national accounts provided estimates of Soviet gross national product (GNP) by sector of origin and end use. As explained by a 1958 ORR publication, *Soviet National Accounts for 1955*, they served "several specific requirements of the Intelligence Community." Deflated by appropriate price indexes, national accounts series measure the growth of the Soviet economy. End-use and sector-of-origin breakdowns of GNP yield information on the structure of the economy and economic policy directions. Elements of the national accounts such as the urban wage bill, agricultural incomes, household consumption, and capital formation are of significant intelligence interest. Finally, national accounts, with the help of appropriate purchasing power (ruble/dollar) ratios, provide the basis for international comparisons of levels of GNP and its major components.

After a mostly abortive attempt to measure real growth in Soviet GNP by estimating price indexes in order to deflate GNP by end use in current prices, CIA turned to estimates of the real growth of GNP as the sum of the estimates of the real growth of the various

sectors of origin—industry, agriculture, transportation and communications, etc. Two of the papers in the collection for this conference—*Trends in Industrial Production in the USSR, 1955-63* (December 1964) and *Trends in Output, Inputs, and Factor Productivity in Soviet Agriculture* (May 1966)—describe the estimating procedures and report some significant results. The report on industrial production found that the average annual growth in Soviet industrial output had decelerated from 8.6 percent in 1956-59 to 6.7 percent in 1960-63. Soviet official claims were about two percentage points higher. The paper on agricultural output, inputs, and productivity explained why independent estimates of farm output were necessary and, like the paper on industrial production, reported a substantial drop in the growth of agricultural production. The paper's agricultural statistics showed that between 1950 and 1965 production had increased by 70 percent, but that two-thirds of the increase had occurred in 1954-1958, the five years following Stalin's death. Per capita output in 1965 was less than in 1958.

Since the industrial and agricultural sectors drove the Soviet economy, CIA's measures carried over to GNP. The deceleration in GNP growth reported by CIA did a great deal to ease concerns that the USSR would soon overtake the United States, as Soviet party leader Nikita Khrushchev had boasted it would at the twenty-second Congress of the Communist Party of the Soviet Union (CPSU) in 1961. When the CIA reported that the increase in Soviet GNP in 1963 was only 2.5 percent, President Lyndon Johnson dispatched a delegation to brief the findings in West European capitals. The Agency also held a formal press conference after the news had appeared in the *New York Times*. The press, however, seemed more interested in CIA's motives in going public than in the decline in Soviet economic fortunes (see Fig. 1, the Herblock cartoon).

Figure 1. Herblock cartoon.

Over the years, CIA's estimates of GNP growth were refined to take advantage of new information released by the Soviet Union and to adjust the

measures for divergencies between Soviet established prices and the costs of the resources used in producing a given product. Successive publication of portions of Soviet input-output tables allowed Duke University Professor Vladimir Treml and his colleagues to compile partial reconstructions of the 1959, 1966, 1972, 1976, and 1982 tables. These tables proved a great help in improving the sector weights for CIA's measures of GNP growth and the adjustments designed to convert GNP in established prices to GNP at factor cost.

Measures of the productivity with which resources were used in the Soviet Union were essential in assessing the USSR's economic potential. The focus here was on discovering the sources of economic growth rather than measuring its extent. In the 1950s, CIA papers on labor productivity wrestled with the problem of matching output with inputs of labor. They concluded that half of the increase in industrial production in 1951-55 could be attributed to a rise in labor productivity.

CIA's productivity analysis took a major step forward in 1954 in *Long-Run Soviet Economic Growth.* At a time when production-function analysis was in its infancy in the West, the paper developed measures of combined factor productivity—the efficiency with which labor, capital stock, and land were used—for the Soviet Union. Especially noteworthy was the paper's treatment of labor quality, economies of scale, and the possibility of diminishing returns to increases in the Soviet capital stock. Factor-productivity analysis became the backbone of CIA's analysis of Soviet economic trends. Thus, *Trends in Factor Productivity in Soviet Industry, 1951-63* (November 1964) found that more than half of the growth in industrial output from 1950 to 1963 was due to the "employment of additional labor and capital" and the remainder to an increase in factor productivity—output per unit of labor and capital combined. From 1961 to 1963, however, the rate of growth of factor productivity fell to about 2 percent per year compared with nearly 5 percent per year from 1954 to 1960. The paper's analysis suggested that the decline was not a short-run phenomenon "but is also, in part, a trend that is likely to persist over the near future." Estimates of factor-productivity growth in the several branches of industry showed substantial variations but broadly similar trends. The paper put forward several possible causes of the slowdown in factor-productivity growth: the immediate postwar recovery as a nonrecurring event; the rapid increase in defense spending and its claim on scarce science and engineering resources; the effect of declining rates of growth in investment on the average age of capital stock; and a lessoning of the pressures on Soviet managers to maintain output that prevailed during the reduction in the work week from 1956 to 1959.

CIA's *Trends in Factor* Productivity paper concluded that because the USSR could not continue to increase inputs to industry at past rates, the slowdown in industrial growth could not be halted unless the efficiency with which resources were used could be

improved. The prospects for raising factor-productivity growth through administrative measures or partial economic reforms were central to subsequent macroeconomic analyses of the Soviet economy. The paper on agriculture cited above reached a similar conclusion—that factor-productivity growth in agriculture had slowed abruptly in the early 1960s and that future growth in farm output depended on a reversal of this trend.

A 1970 CIA paper offered an even more pessimistic view of the Soviet economic future. The Cobb-Douglas production functions used in earlier reports had a particular form: a given percentage increase in labor or capital resulted in a specified constant increase in output. Thus a one percent increase in labor might increase output by 0.75 percent and a 1-percent increase in capital might increase output by 0.25 percent. The paper, *Investment and Growth in the USSR* (March 1970), investigated a different production function, one in which the returns to capital declined as the ratio of capital to labor increased. This 1970 paper concluded that this type of function, when fitted statistically to Soviet postwar experience, indicated that returns to new investment were "strongly diminishing." Thus a change in leadership priorities favoring a higher rate of capital formation would "not insure even a continuation of present rates of economic growth." In any event, controversy in CIA and in the academic community over the appropriate form of a production function for the Soviet economy and Soviet industry proved inconclusive. CIA's production function analysis continued to be based on the more familiar and simpler Cobb-Douglas form.

Industry Studies

While CIA's resources allocated to macroeconomic analysis of the Soviet Union were considerable, they were decidedly less than those devoted to specific sectors of the economy. As an indication, the CIA publications declassified and released to the National Archives by spring 2001 include 215 on civil industry, 152 on agriculture, 219 on transportation and communications, and 155 on energy. Many of these responded to requests from other government agencies. The Department of the Interior wanted information on Soviet mineral production, the Maritime Administration required periodic reports on the status of lend-lease ships in Soviet hands and occasional reports on Soviet ports and port regulations, US delegations to the Soviet Union meeting with their Soviet counterparts asked for briefings and background information on specific industries, and the list goes on.

CIA's analysis of individual industries, agriculture, energy, and transportation and communications assessed the strengths, weaknesses, and prospects of these sectors in detail and on a continuing basis. These studies generally had a special focus on the technological level of the given industry. They supported not only intelligence objectives but, as contributions to publications of the Joint Economic Committee of Congress, contributed to

the general pool of knowledge on the Soviet economy. Some examples of the depth of the research are a 315-page study of the coal-mining equipment industry (May 1953) and a 410-page paper on iron and steel plants in Ukraine (August 1954).

In addition to shedding light on areas of ignorance regarding Soviet industry, ORR's research program in the 1950s sought to uncover vulnerabilities that might slow Soviet economic growth. Thus, a paper on the Soviet tire industry reported a persistent deficit in the availability of tires, inferior tire quality, and a technologically backward industry. But it concluded that the USSR could produce modern tire-making equipment, probably by copying equipment readily available in the West. On the other hand, an industry given a higher priority—the electro-technical industry—was increasing production rapidly, in general had the personnel and materials it needed, and was supplied with relatively modern equipment (mainly of Soviet design). This sector could supply all the electronic and telecommunications equipment necessary to meet current needs, as well as support a general war in the future. A series of papers on other branches of industry recorded similar results in the sense that no important vulnerabilities were uncovered.

After the 1950s, ORR's research became more narrowly focused on a relatively few industries: the iron and steel industry was followed closely and in great detail. A 1957 paper covered the organization of the industry, planning and control, production of steel and raw materials used in steel production, trade, technology, costs, prices, investment, employment and wages, distribution and consumption, and the usual "capabilities, vulnerabilities, and intentions." Although Soviet steel production had far surpassed US production in the 1970s, Soviet requirements increased even faster: steel shortages constrained fulfillment of the 1971-75 national economic plan. Production of precious metals also was covered carefully with the help of the full range of intelligence sources. The Soviets reported almost nothing in this area, and demand for information on production and reserves of gold (especially from Washington policymakers) was high throughout the Cold War.

When a given industry was essential to a major Soviet planning initiative, ORR's research program reacted accordingly. For example, when Khrushchev and later Soviet party boss Leonid Brezhnev put forward their ambitious farm programs, they called for huge increases in the production of mineral fertilizer. A 1954 CIA report, *The Mineral Fertilizer Industry in the USSR* (April 1954), took stock of the industry's position—the investment required and the lack of supporting infrastructure—and concluded that the production goals could not be met in the time frame specified. Then a 1962 paper, *The Soviet Fertilizer Industry: Great Plans, Little Progress* (March 1962), reported that producers were indeed falling behind the plan's goals because of insufficient investment and the "unhappy lot" shared by other branches of the chemical industry—defective equipment, shortages of equipment, and tardy receipt of more modern technical designs.

The growth of Soviet industrial production slowed markedly after 1975. To uncover the reasons for the slump, CIA's Office of Soviet Analysis (SOVA) commissioned several papers looking at steel, nonfuel minerals and metals, machine tools, fertilizers, cement, and the timber industry. A 1983 paper *The Slowdown in Soviet Industry, 1976-82* (June 1983) considered the findings of these publications and concluded that several key factors were at work as well as many lesser ones. First, the paper noted the planners' decision to cut the rates of growth planned for new fixed investment and output—a "planned temporary retreat turned into a rout." Second, three critical constraints on industrial production had emerged: growing shortages of raw materials; slower growth in energy supplies (especially coal and electric power); and developing bottlenecks in rail transport. Third, industrial performance suffered from the continuing priority given to the military, changes in the rules by which industrial managers operated, growing difficulties in planning, and foreign trade rigidities.

The analysis concluded that these factors would be at work throughout the 1980s, exacerbated by a "greatly reduced availability of labor, accelerated pressure on industry to economize on all inputs simultaneously," and overly complex incentive schemes. While Soviet party leader Yuri Andropov's discipline campaign could have some short-run impact on productivity, it would not last. Major systemic reforms, although not on the agenda, could provide a solution down the road. But the road would be long. Reforms, even if introduced, "would be unlikely to boost industrial growth and productivity for many years."

The CIA's coverage of Soviet agriculture featured periodic reports on crop prospects and analysis of successive attempts to boost farm production. In the early 1950s, the desperate condition of agriculture throughout the Soviet Bloc led CIA to undertake its own forecasts and estimates of crop production. As in industry, independent indexes of agricultural production had to be compiled to overcome devious official statistical practice. Several attempts were made to develop statistical relations between crop yields and weather, the earliest in 1952—*Weather-Crop Yield Correlations as Applied to Crop Yield Estimates for the European USSR* (May 1952). When the USSR began to import grain following poor harvests, the search for a predictive model intensified. By the 1970s, a well-funded effort to employ meteorological data, agronomic expertise, and satellite images to monitor the progress of the grain crop was in place. In a particularly provocative paper, *Soviet Climate Change: Implications for Grain Production* (May 1985), a few Office of Global Issues analysts suggested that a general improvement in climate since the 1960s, rather than improved agro-technology, had accounted for most of the rise in Soviet grain yields. They then projected what yields might be if the gradual increase in precipitation levels came to a halt while average temperatures continued to climb because of the greenhouse effect. The "most likely" estimate was that grain production would average about 60 million tons below target from 1986 to 1990. On balance, the models tracked actual yields fairly well. The problem was that the range of error around the point

predictions was still large enough to make estimates of import requirements uncertain in most years. The principal contribution of the crop-monitoring reports was to signal large changes in Soviet grain production and therefore possible Soviet purchases in the world market.

In following Soviet agricultural progress, CIA's analysis first centered on the post-Stalin program to increase livestock production as part of a more consumer-oriented policy thrust, and the "New Lands" program, which was intended to provide the feed base for the livestock program. A 199-page report in 1957 (*The New Lands Program in the USSR*) reviewed developments in the new lands. The work already accomplished was striking—in less than two years, the area introduced to cultivation had exceeded total wheat acreage in the United States by 25 percent. The initial yields were high, but after comparing the soil and growing conditions with the Canadian spring wheat belt and looking at sixteen years of yields grown in similar Soviet regions, the paper concluded that yields would average little more than half of the yields implied in official statements. The program, according to the paper, displayed the major strengths and weaknesses of the Soviet system. It could marshal resources quickly, but it appeared to have been "developed without a sound preliminary analysis" of how best to proceed and without a realistic estimate of the production levels that could be achieved.

According to CIA's analysis, Khrushchev's initiatives often made the agricultural situation worse. Organizational changes giving party officials a greater role in agricultural administration were counterproductive. His decision to plow up grassland and fallow land to plant corn, sugar beets, peas, and beans seemed wrong headed, especially in the case of corn. Even if some short-run gains might materialize, in the longer-run soil moisture and nutrient levels would decline, as reported in *Recent Developments in Soviet Agriculture* (November 1962).

Economic Projections

To give a quantitative dimension to the future economic potential of the Soviet Union, CIA tried various approaches over the years. An early paper titled *Long-Run Soviet Economic Growth,* published in December 1954, experimented with projections based on past trends in labor productivity for agricultural and nonagricultural production separately. The projection of choice, however, was based on projections of labor, capital stock, and land (for agriculture) together with the efficiency of factor inputs: a slight increase for both agriculture and the rest of the economy based on past trends. The "final projection" had GNP increasing by 4.2 percent or 5.2 percent per year from 1953 to 1975. The higher rate of GNP growth was associated with a slower rate of growth of consumption and therefore a higher rate of growth for investment. For what it's worth, the CIA estimate of GNP growth during this period was 5.1 percent per year according to a 1982 report.

A leading example of production-function-based projections was published as an unclassified paper, *Soviet Economic Problems and Prospects,* in July 1977. It considered the policy choices available to the Soviets in dealing with the labor force, productivity, and energy constraints discussed above. Because many of the solutions were interrelated (e.g., importing oil would reduce purchases of Western machinery and equipment), the paper attempted to sort through the combination of policies that showed the most promise. The result was a set of **policy-conditioned** forecasts. In the best case, GNP might grow at 4 percent per year through 1980, then at 3 to 3.5 percent per year from 1981 to 1985. Still, chances were good that growth would be slower.

In the late 1970s, CIA began to build a large-scale, macroeconomic model of the Soviet economy. *Sovsim: A Model of the Soviet Economy,* produced in February 1979, reported on a fifteen-sector model that used production functions for the projection of output in individual sectors but imposed the inter-industry ties found in Soviet input-output tables as constraints on potential growth. It was able, therefore, to deal with a wider range of policy scenarios than the much more aggregative framework employed in the 1977 *Soviet Economic Problems and Prospects.* In the 1979 model, a baseline scenario assumed that Soviet economic policy would remain frozen in its pre-1977 pattern. Then it examined a series of options that the Politboro might adopt to improve the Soviet economic future. The model's baseline projection of growth in GNP was 2.5 percent per year from 1981 to 1985. The "what if" analysis of various policy scenarios and differences in underlying conditions—oil production, Western demand for Soviet exports, and the like—showed little difference from the baseline projections. Seemingly, the Politboro could not "stave off a reduction in rates of economic growth by simply exercising the traditional policy levers under its control."

CIA's analysis of the prospects for Soviet oil production provoked a good deal of controversy. An unclassified paper in 1977 predicted a decline in production and a potential shift for the USSR from a net export to a net import position. CIA's position had shifted abruptly. A paper prepared for the Joint Economic Committee (JEC) *Outlook for Soviet Energy* (June 1976) had noted that the USSR was the only major industrial nation self-sufficient in energy and was likely to remain so, although future growth in the Soviet energy supply depended on the development of resources in a hostile Siberian environment. It predicted that oil production in 1980 would reach 590 million metric tons compared with the plan of 620 to 640 million metric tons (mmt). Nine months later, another Office of Economic Research (OER) paper *The Impending Soviet Oil Crisis* (March 1977) declared that "the Soviet oil industry is in trouble," and that oil production would peak as early as 1978 and "certainly" no later than the early 1980s at a level of 550 to 600 mmt per year. The 1997 paper continued, "maximum levels are not likely to be maintained for long, however, and the decline, when it comes, will be sharp." Two basic problems confronted

the industry: first, acceptable reserve-to-production ratios could not be maintained unless a massive new field was found and, second, existing wells were experiencing severe water encroachment.

Oil production, however, climbed to 603 mmt in 1980 and 616 mmt in 1983. It then fell to 595 mmt in 1985 before rebounding to 624 mmt in 1987 and 1988. As it turned out, CIA was right about the fundamental problems that eventually brought about a fall in production. However, CIA's estimate of oil reserves was low—even though it was derived from open Soviet literature, which was not prone to understate Soviet potential—and CIA did not take sufficient account of Soviet willingness to shift resources to Siberian development in the middle of a five-year plan.

In a 1982 paper, the baseline projection for GNP growth in the 1980s had dropped to less than 2 percent per year. Moreover, the projections assumed that defense spending would increase at 4.5 percent per year, pushing growth in consumption and investment down to the lowest levels in the postwar years. In fact, per capita consumption would fall after 1985. CIA presented the model and a series of conditional forecasts *USSR: Economic Projections Through 1990–A New Look* (February 1984), at a meeting with academics in February 1984. The new forecasts took into account a more optimistic assessment of the Soviet energy situation contained in a 1983 CIA paper, the recently revised (lower) estimates of the growth of defense spending, and the probable effects of Andropov's accession to power. Nevertheless, the projection of GNP growth was only marginally better—roughly 2 percent per year. Again, the differences from the baseline projection resulting from a range of policy choices were small

No model—and certainly not the CIA's as it had evolved in the 1980s—could reflect all the complexities and possibilities in the Soviet economy. But beginning in the 1950s and continuing into the 1980s, CIA's model-assisted predictions of medium- and long-term growth were remarkably accurate—at least as compared with CIA's estimates of real GNP growth. More complex models had the principal virtue of forcing analysts to consider the trade-offs involved in policy decisions. Ultimately, however, their use highlighted the fundamental problem underlying declining rates of Soviet economic growth—the erosion in the efficiency with which labor and capital were employed. As the 1984 paper reported, "our results suggest that, without a fundamental reform of the economic system or a combination of very favorable circumstances bringing back pre-1975 productivity relationships, the Soviets probably can do little to alter the economic growth trend through 1990 as is indicated in our baseline."

Analysis of Intentions

CIA's analysis of Soviet intentions in the economic sphere centered on plans and policies and how those plans and policies would work out. Of the hundreds of Agency publications reporting on economic plans and plan fulfillment, this author can discuss only some that were representative of Agency thinking at particular points during the Cold War. Having invested heavily in measures of the growth and distribution of GNP, Agency economic analysts then had the responsibility of identifying and assessing how changing economic conditions in the Soviet Union had affected or would affect resource allocation and/or stimulate economic reforms.

After Joseph Stalin's death, Washington policymakers wondered whether Soviet Premier Georgi Malenkov's announced economic policy really meant that improving the lot of the consumer had taken priority over industrial development. CIA concluded that Soviet leaders were serious. In particular, the growth of defense spending would be "drastically reduced in 1953-55," *The Implications of the New Soviet Economic Policy* (December 1953). In fact, CIA estimates showed a fall in defense expenditures during this period. The increment to consumption, according to the paper, could not come at the expense of investment because consumption goals could not be met without additional investment in consumer-goods industries. Before long, Khrushchev had deposed Malenkov and the emphasis had switched to agriculture instead of industrial consumer goods. But defense spending continued to decline with the demobilization of millions of Soviet servicemen.

In November 1958, Khrushchev presented theses on the 1959 to 1965 economic plan to the Central Committee of the Communist Party. He boasted of past economic progress and said that in the coming period—the period of large-scale building of a communist society—the main tasks would be "creation of the material-technical basis of communism; the further strengthening of the economic and defensive might of the USSR; and simultaneously, the fuller satisfaction of the growing material and spiritual requirements of the Soviet people," *Khrushchev's Theses on the Seven-Year Soviet Economic Plan, 1959-65.* In other words, all the major claimants of GNP—investment, defense, and the consumer—would be winners. Indeed, Khrushchev asserted that by 1970, or even earlier, the Soviet Union would lead the world in both absolute and per capita output, providing its population with the highest living standards in the world. CIA's paper dissected the plan as outlined by Khrushchev and pronounced it both infeasible and inconsistent with hopes of overtaking the United States, even if plan goals were met. The major plan features on the production side were a pronounced shift in the energy balance to oil and gas at the expense of coal, and a much larger share of investment assigned to chemicals. Still, Allen Dulles, in JEC testimony, maintained that the seven-year goals could be met with certain exceptions,

notably the agricultural targets. For US policymakers, Dulles's message was that meeting the goals of the seven-year plan was such a high priority for the Soviet leaders that they wanted a period of coexistence. In any event, the 1959-65 goals were badly under-fulfilled.

A little more than three years after the Dulles testimony, a major CIA paper, *Trends in the Soviet Economy* (February 1963), recognized the falloff in the rates of growth in industry and agriculture. In particular, agriculture had been hit by a series of poor or indifferent harvests. As a result of an acceleration in defense spending, resources were over-committed and the consumer suffered. In 1962, meat prices were raised by 30 percent, scheduled reductions in personal income taxes were deferred to restrain consumer demand, and housing construction was cut. The paper questioned whether the Soviet leadership would countenance an "inclusive military buildup" for very long, given the "fundamental" long-term Soviet policy of overtaking the United States economically. Furthermore, consumers were becoming more insistent on having "better quality food, decent housing, and more consumer durables." Finally, Soviet leaders were increasingly aware that the arms and space races were hurting economic growth much more in the USSR than in the United States. Nonetheless, as it did so many times in the future, CIA said that economic considerations would not move Soviet leaders to scale back defense programs.

Soviet policy did change markedly following a near disastrous wheat harvest in 1963. Apparently deciding that they could not permit the population to take the full brunt of the shortfall, the Soviet leadership ordered the purchase of 11 million tons of wheat and flour. From that point forward, CIA focused considerable effort on improving forecasts of the Soviet grain crop and the potential for Soviet imports of grain and meat. A 1964 Agency review, *Soviet Economic Problems in Mid-1964* (April 1964), noted that even before the harvest failure, Khrushchev had begun a review and revision of the 1959 to 1965 plan with emphasis on "chemicalization" of the economy in support of agriculture and industry. After the harvest, planned support for agriculture was increased. Meanwhile, the continuing slowdown in economic growth aggravated the competition for resources needed for industrial modernization, defense-space programs, and improvement of the population's diet and housing. A new Politboro, however, seemed to be marking time; no new decisions to change the allocation of resources were evident.

Beginning in the 1950s and continuing until the Soviet Union dissolved, other CIA assessments responded to requests of US policymakers. These were designed to judge Soviet interest in arms control. For example, a 1957 paper given to Harold Stassen, President Dwight Eisenhower's special assistant on arms control, *Estimated Effect on the Soviet Economy of the Level of Disarmament Implied by Recent Soviet Proposals (*May 1957), found that 2.5 million men could be released from military service and that alternative scenarios for procurement cuts could result in reductions of 11 and 42 percent, compared with the procurement implied in current national estimates. The resources freed

up "could cause a significant impact on non-military production." A memorandum for the Arms Control and Disarmament Agency's (ACDA) Archibald Alexander, *Economic Consequences of Reduction in Soviet Military Expenditures Under ACDA Planning Assumption* (August 1966), reported that realization of ACDA's scenario would reduce Soviet military spending by 13 percent between 1965 and 1970. The overall effect on economic growth was relatively small, but the benefits for the consumer were larger. As in almost all of the papers of this kind, the findings stressed that at the margin the pressures on the economy would be reduced markedly.

CIA's estimates of Soviet defense spending were used extensively in the 1950s and 1960s to test the plausibility of projections of Soviet military programs in National Intelligence Estimates (NIEs). An ORR contribution to an NIE on Sino-Soviet military air defense programs held that the NIE's production and deployment numbers for fighter aircraft and missiles were unrealistically high; their production would reduce the rate of growth of heavy industry and require the Soviet Bloc's electronic equipment industries to be "expanded to a far greater extent than is currently estimated." Fred Kaplan, in his book *The Wizards of Armageddon*, describes the Pentagon's use of CIA's dollar estimates of the cost of Soviet defense programs, during Pentagon deliberations over a damage-limiting strategy to employ against Soviet strategic forces. The Agency estimates indicated that all US combinations of civil defense, ABM systems, and anti-bomber defense systems were losing propositions. As Kaplan put it, the studies showed that for each extra dollar that the Soviets added to the attack forces, the United States would have to spend $3 to protect 70 percent of its industry, $2 to save 60 percent...and the same $1 to defend a mere 40 percent.

Until the end of the Cold War, the Department of Defense continued to be an eager customer for CIA estimates of the dollar equivalent of Soviet military programs. In 1977, Secretary of Defense Harold Brown, in a memorandum to the Director of Central Intelligence (DCI), declared that the reports and analysis being produced on military economics were "the basis of the comparative economic analysis employed by Defense." He added, "The dollar estimates provide the best, single aggregated measure of US and Soviet defense efforts." (CIA's defense spending estimates are discussed in detail in a book sponsored by the Center for the Study of Intelligence titled *Soviet Defense Spending: A History of CIA Estimates, 1950-1990*, written by Noel Firth and James Noren and published by the Texas A & M University Press in 1999.)

The rapid growth in Soviet military programs as reflected in CIA estimates of defense spending in constant prices led to questions in policymaking circles as to whether it would or could continue. DCI Richard Helms told Congress in January 1968 that the Soviet Union had introduced substantial changes in resource allocation favoring defense and, to a lesser extent, consumption, while slighting investment in both industry and agriculture.

Furthermore, he said, Soviet-announced plans suggested that these policies would be in place for the time being. "Ultimately, however, the cutback in investment is bound to affect economic growth adversely," he concluded, adding that this was a development that some Soviet leaders recognized. How to "allocate the USSR's limited resources seems to be a hot issue in the Kremlin at the moment." Nonetheless, as the DCI said in his 1971 Congressional briefing, problems in the economy would not force the Soviet leadership to forgo specific military or foreign initiatives because the Soviet economy is "now large enough so that even low rates of growth mean a very substantial increase in output."

In May 1976, CIA published the findings of a major reassessment of Soviet ruble defense spending in classified and unclassified papers. Intended as interim reports on the impact on the ruble estimates of "an unusually large body of new information," the papers reported:

- Soviet defense spending (as the USSR might define it) had increased from 40-50 billion rubles in 1970 to 55-60 billion rubles in 1975, measured in constant 1970 prices. (A year earlier the comparable figures were 29 billion rubles for 1970 and 34 billion rubles for 1975.)

- Over the same period, the rate of growth of defense spending in 1970 prices was now thought to be 4 to 5 percent per year instead of the 3 percent per year reported in previous estimates.

- Since 1970, defense requirements had been absorbing 11-13 percent of GNP (instead of less than 8 percent) depending on whether defense was defined narrowly (US definition) or broadly (Soviet definition).

At the same time, the papers emphasized that because about 90 percent of the increase in ruble estimates resulted from "changes in our understanding of ruble prices and costs" rather than "discovery of larger programs," the revision did not affect CIA's appraisal of the size or capabilities of Soviet military forces or change appreciably the estimated dollar cost of reproducing Soviet defense programs. The real significance of the revision was that the Soviets were devoting more resources to defense than had been thought earlier.

The consternation sparked by the revision reverberated in the administration and in Congress. Appearing before a CIA advisory panel of outside experts chaired by Ivan Selin—hereafter referred to as the Selin panel—David Chu, Assistant Secretary of Defense for Programs Analysis and Evaluation, spoke of the increasing distrust of the spending estimates, "particularly its relationship to Soviet GNP." Also in testimony before the panel, James Locher, a staff member of the Senate Armed Services Committee, highlighted the problem caused by major shifts in the estimates ("as in 1976") in his summary of criticisms of CIA's estimates by senators on his committee. Unfortunately, confidence in the defense estimates waned just as advances in technical collection had markedly improved CIA's

estimates of the size and composition of Soviet forces, military construction, and the physical and technical characteristics of Soviet weapons systems. Almost all Soviet weapons had been re-costed, research on Soviet maintenance practices had raised the spending estimates, and a study of military manpower had raised estimates of military manning substantially.

Agency publications did identify a fundamental shift in Soviet intentions in the early 1970s when General Secretary Brezhnev announced that the USSR hoped for a "new epoch" in relations with the West. CIA explained the new policy as follows: "Faced with slower economic growth and a commitment to meet rising consumer expectations and having experimented unsuccessfully with economic reform, Moscow has turned to the West to help relieve its economic problems" (*Implications of the Present Soviet Economic Problems*, February 1973). Brezhnev's program to supply more meat to the population had created a demand for grain that could not be satisfied from domestic production, and the USSR had decided to buy large quantities of machinery and equipment from the West to raise the productivity of fixed capital. The ensuing détente spawned a great many CIA appraisals of the economic benefits to the USSR from expanded commercial relations with the West and how US firms might be affected.

In the 1977 paper cited earlier, (*Soviet Economic Problems and Prospects*) and later distributed by the JEC, CIA adjusted its stance with respect to Soviet intentions in the defense area. Citing the various causes of the slowdown in the economy, the 1977 paper argued that "long-standing problems are likely to intensify" and be aggravated by a sharp decline in the growth of the working-age population and a "looming oil shortage." Analysis of a series of possible leadership attempts to deal with the situation suggested that a "marked reduction" in economic growth was "almost inevitable," perhaps sparking sharp debate in Moscow over future levels and patterns of military spending. The paper expected the rise in defense spending to continue to increase for the present time "at something like recent annual rates of 4 to 5 percent because of programs in train." Mentioning that with slower economic growth, ways to reduce the growth in defense spending could be increasingly attractive for "some elements" of the Politburo.

CIA's analysis of Soviet intentions regarding defense missed the boat in the late 1970s. Whereas a second look at its estimates in 1982 found that outlays for military procurement had leveled off since 1975 and the growth in total defense spending had slowed significantly in real terms, the Agency's assessments in the intervening period continued to maintain that defense spending would rise at the historic rate of 4-5 percent per year. A massive interoffice study taking advantage of more than 40 individual research projects surveyed the evolution of Soviet forces during the Brezhnev era, looked at the ongoing research and development programs, considered Soviet military requirements, and concluded that military spending would have to rise through the 1980s to support all of the

ongoing activities. Moreover, "current evidence" suggested that they intended to do just that , *The Development of Soviet Military Power: Trends Since 1965 and Prospects for the 1980s* (April 1981). A year later, another review reported continued growth in defense spending with the expectation that it would continue at its historical rate through at least 1985, or at even higher rates in view of "what the Soviets may perceive as an accelerating arms competition with the West."

Then in 1983, CIA announced that its estimates of Soviet defense spending had changed: first in a paper comparing Soviet and US expenditures in dollars, then in *Soviet Defense Spending: Recent Trends and Future Prospects,* issued in July 1983. Instead of rapid growth in procurement, the papers said a "procurement plateau" had existed since 1976 and that growth in overall defense spending had also slowed substantially, largely because of the flat procurement. The new estimates were issued only after careful internal review within CIA's Office of Strategic Resources of the physical estimates underlying the spending estimates. They encountered a great deal of resistance in the upper levels of CIA and in the Department of Defense, coming as they did when President Ronald Reagan's US defense buildup was gathering momentum. The possible reasons advanced in the estimates for the procurement plateau were eclectic: technical delays in production, bottlenecks in transportation and in the supply of energy and raw materials, and perhaps a policy decision to reduce defense spending. A subsequent draft paper suggested that the most plausible interpretation was that the slower growth was built into the 1976-80 economic plan and into at least the first few years of the 1986-90 plan. The draft never saw the light of day.

CIA addressed the implications of a slowdown settling into stagnation in a major paper in 1984, *Policy Implications of the Slowdown in Soviet Economic Growth* (July 1984). Analyzing a range of policy alternatives, it suggested that the USSR would try to salvage its military programs while striving for at least some growth in living standards and spending on new plants and equipment. The Soviet policy response would also likely include heightened propaganda to convince the population of the need to tighten belts in the face of the growing military threat from the United States, while redoubling efforts to divide the West over trade policies. To increase hard-currency earnings, Moscow would attempt to expand its commercial relations with the Middle East and its arms sales to the Third World. Despite a GNP growth rate of 2 percent or less, the paper went on to predict that "We believe that the chances are low" that, by 1990, the economic slowdown will lead to "widespread popular unrest, pave the way for significant liberalization or a militarization of the regime," or "bring to power a leadership with significantly different foreign policy aims." In most respects, the paper's predictions were off the mark.

It is instructive to review what CIA's defense spending and GNP estimates, as they matured in the late 1980s, suggest about the relation between defense and the civilian economy in the postwar USSR. The first things to look at are the estimates of Soviet

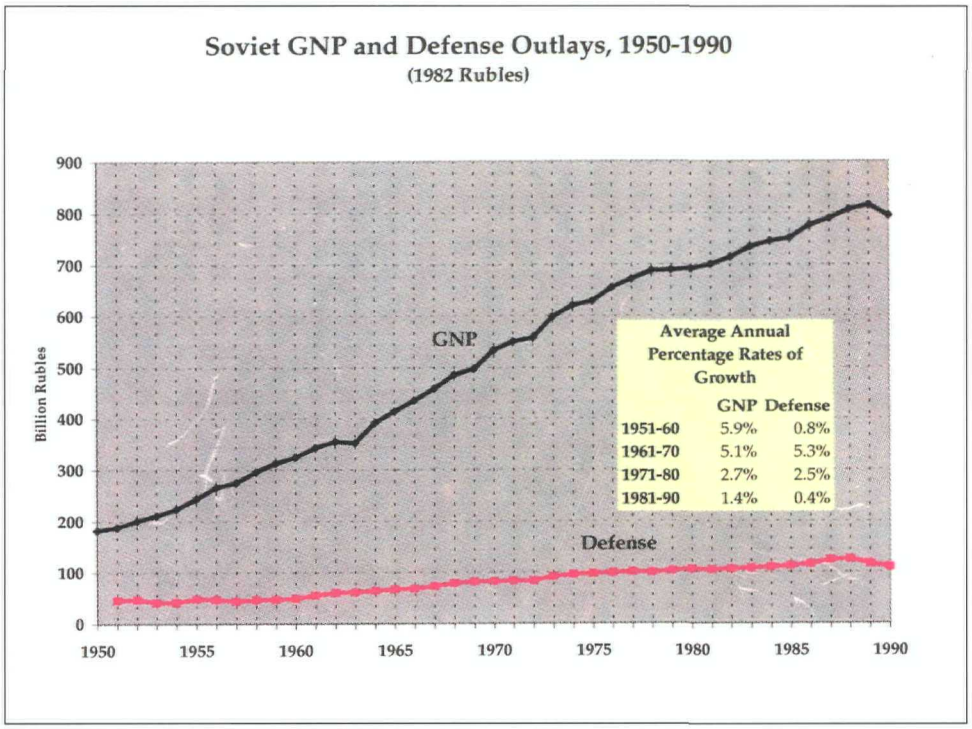


Figure 2.

defense spending and GNP in 1982 rubles (Fig. 2). If prices of an earlier year are used, the rates of growth of both defense spending and GNP would be marginally higher and the ratio of defense spending to GNP a bit lower, but the overall picture would be much the same. In constant 1982 prices, the share of defense in GNP declined from 24 percent in 1951 to 14 percent in 1959. It then varied within the range of 14 to 16 percent between 1960 and 1990. The calculation provoked a good deal of controversy over the years, as it was taken to represent the burden of defense on the Soviet economy.

One can also isolate different stages in the growth of Soviet defense spending and relate them to developments in the economy generally. CIA's estimates set out in considerable detail the changes in the composition of GNP or defense spending. This detail permitted analysis of changes in the USSR's economic policy—the third of Max Millikan's objectives for US foreign economic intelligence. The average annual rates of growth shown for defense in Figure 2 certainly do not reflect the monotonic, monotonos, rapid growth that was, and perhaps still is, the prevailing public perception. Meanwhile, the continuous decline in the rate of growth of GNP suggests the underlying forces that led Soviet leaders to constrain defense spending and finally caused General Secretary Mikhail Gorbachev to introduce his ill-fated reforms and cut military outlays.

Tracking Changes

The immediate explanation of the changes in the growth of defense spending are complicated, but a few of the prime movers can be identified. In the 1950s, Khrushchev's manpower demobilization was the major factor. In the 1960s, defense spending grew rapidly, propelled by growth in procurement of missiles, ships and submarines, space vehicles, and aircraft as well as by the post-Khrushchev buildup in general purpose forces. Thereafter, the growth of defense subsided as procurement increased less rapidly from 1970 to 1974 and leveled off from 1975 to 1984. Outlays for operations and maintenance and research and development continued to rise, although at a slower pace than formerly. After Gorbachev came to power, there was a three-year acceleration in defense spending marked by a spurt in outlays for aircraft and missiles, then a sharp decline in defense procurement, spurred by a downturn in outlays for aircraft, land arms, and space-related equipment.

At a minimum, the trends described in Soviet defense spending suggest some questions for historical research on Soviet military policy during the Cold War. For example:

- Were the slower growth in real defense spending after 1975 and the plateau in procurement the result of conscious policy decisions? If so, what were the underlying reasons?
- What role did the US defense buildup beginning in the late 1970s play in the spurt in Soviet defense spending in 1985-87?

CIA's economic analysis of Gorbachev's economic program traced its evolution from reliance on the human factor to dependence on industrial modernization, and finally, to a recognition that basic reforms were necessary. A 1987 paper, *Gorbachev: Steering the USSR Into the 1990s* (July 1987), reviewed the adjustments the Soviet leadership would have to make in the economic plan to cope with emerging shortfalls and to correct imbalances. Judging the reforms introduced thus far as a "set of partial measures," it assessed the guidelines for additional reforms approved by the Central Committee of the CPSU in June 1987. With the industrial modernization program failing, Gorbachev would have to decide whether still more investments were needed and defense programs should be cut back. But time was growing short. "Developments during the past years have increased the chances that he [Gorbachev] will act boldly to sustain the momentum of his program" by seeking arms control agreements and pushing through more radical political and economic reforms. The paper concluded with some thoughts on the consequences of failure:

> Gorbachev has already asked the military and the population to curb their appetites in return for more later. If his programs do not work out, other leaders could appeal to these constituencies. The risks in a more radical

> reform and a rewrite of the social contract are that confusion, economic disruption, and worker discontent will give potential opponents a platform on which to stand. Gorbachev's position could also be undermined by the loosening of censorship over the written and spoken word and the promotion of limited democracy. If it suspects that this process is getting out of control, the party could well execute an abrupt about-face, discarding Gorbachev along the way.

From the beginning of Gorbachev's rule to the end, CIA tracked *perestroyka's* policies and assessed the results. A 1985 paper, *Gorbachev's Economic Agenda: Promises, Potentials, and Pitfalls* (September 1985), set out his program in a skeptical vein. The abortive attempt to modernize the machine-building sector while leaning on it to produce more civilian goods was described in *The Soviet Machine-Building Complex:* Perestroyka's *Sputtering Engine* (April 1988). Loosened controls over the economy led to financial imbalances and inflation, *USSR: Sharply Higher Deficits Threaten* Perestroyska (September 1988). By 1989, the economy was nearly out of control, *Soviet Industry in 1989: Falling into Disarray* (March 1990); and *The Soviet Economy Stumbles Badly in 1989* (May 1990).

Was the economic slide of the 1980s inevitable? Was it preordained by the systemic flaws of the Soviet economy? In CIA's view, the demise of the system—although perhaps inevitable at some point—was brought forward in time by a particularly unfavorable constellation of developments.[1] Gorbachev's plans were dogged by bad luck in several respects. The downturn in world energy prices after 1985, the Chernobyl disaster in 1986, and the Armenian earthquake in 1988 did substantial damage to the economy in addition to inflicting a terrible loss of life. The weather from 1984 to 1987 also was uncommonly poor for agriculture in the USSR. Using regression analysis to estimate weather-related harvest losses, Robert Kellogg found that the Soviet Union sustained 30 billion rubles of farm losses from worse-than-average weather in the 1984 to 1987 period, or 6 percent of reported production, *Modeling Soviet Agriculture: Isolating the Effects of Weather* (August 1988).

More important, in many respects *perestroyka's* policies were ill-conceived and Gorbachev's partial economic reforms contributed to the collapse of the traditional system. The initial emphasis on investment—to the neglect of the population's desire for higher living standards—was a costly mistake. To make matters worse, by launching his anti-alcohol campaign, Gorbachev simultaneously dealt a blow to production of a major

[1] This section is extracted from James Noren and Lauri Kurtzweg, "The Soviet Economy Unravels, 1985-91," in *The Former Soviet Union in Transition,* Vol. 1, Study Papers Submitted to the Joint Economic Committee, Congress of the United States (Washington DC: US Government Printing Office, 1993).

consumer good and cut state budget revenues sharply. The population, which had always experienced shortages of particular goods and services, found the shortages becoming more general as income growth outstripped the supply of consumer goods.

To explain the popular discontent that flourished in the 1980s, however, one also has to take into account the much greater freedom of expression in printed and spoken dialogue and even in demonstrations and strikes. *Glasnost* served as a powerful amplifier for the dissatisfaction that lay under the surface before Gorbachev. *Perestroyka's* failures in improving living standards and reforming the economy could not be endured silently as previous campaigns had been. The gulf separating promise and performance now was discussed openly, with fairly obvious consequences for perceptions of well-being.

The sudden shift in resource priorities in mid-plan added to the confusion and disruption in the economy. Because enterprises were not equipped to change gears so suddenly, production dropped, especially in the machine-building sector. While the lost production of military hardware was not serious, the methods employed in restructuring the economy set back reform and hurt key industries. The reorientation of the economy toward the consumer was carried out in campaign fashion, by issuing state orders and strengthening central planning. In the hurry to limit state-financed investment, the crucial energy sector was short changed. Within a year or two the effect on production, domestic supplies, and export earnings became evident.

When Gorbachev decided to pursue economic reform, moreover, its implementation proved to be partial and contradictory. Central control over the economy was lost, and market forces were slow to emerge. Just as economic reforms began to force enterprises out of their accustomed reliance on central plans and orders, the loss of control of the state budget and the disruptions caused by ethnic unrest and republic rivalries wreaked havoc with the traditional distribution system. In addition, reform coupled with the rapid demoralization of the party removed one of the traditional elements of economic administration.

The breakup of the Soviet multinational empire proved to be the final blow to economic activity in the former Soviet economic space. Beginning with ethnic conflicts on the periphery, the desire for autonomy spread to almost all republics. Moscow's belated attempts to reduce the budget deficit, which probably achieved some success in 1990, were overwhelmed by republican refusal to support the union budget in 1991. By the end of that year, no monetary or fiscal control worthy of the name remained, and the rate of open inflation accelerated. Republican, and even local governments struggled to protect their citizens by limiting exports of food and scarce industrial supplies. The ruble lost its value as a medium of exchange, and factories and workers alike resorted increasingly to barter to sustain commerce. The economic linkages built up in the postwar years were substantially

destroyed in a relatively short time. Perhaps only the powerful inertia of the system and the long-standing personal and business relationships that surmounted republican and regional boundaries prevented the economic collapse that many observers predicted or reported.

Organization and Management

The Princeton conference collection of CIA documents on the Soviet Union includes a great many papers assessing earlier Soviet attempts to improve economic organization and management. CIA's skepticism about the worth of the successive "reforms" mounted as experience with them accumulated.

From the perspective of the post-Soviet years, a 1956 paper on the Soviet industrial enterprise, *Management of the Soviet Industrial Enterprise* (November 1956), seems an outlier. It found elements of flexibility in plan implementation that indeed were present throughout the Soviet period, while offering a thorough explanation of how the system of industrial management operated. Surprisingly, however, the paper declared that the "strong points of the Soviet system of centralized control over enterprises appear to be of greater significance than its weaknesses."

When Khrushchev pushed through his 1957 industrial reorganization plan, creating more than 100 regional economic councils in order to relax the Moscow ministries' grip on local decision-making for industrial and construction enterprises, CIA appraisals were decidedly negative. At the beginning of the reform, a CIA paper, *The Political and Economic Effects of the 1957 Industrial Reorganization* (October 1958), held that the reorganization promised no significant devolution of economic decision-making and that its effect on industrial growth would be small. In particular, the reform had not changed the focus of decision-making regarding the allocation of resources.

Three years later, another paper reviewed developments under the territorial system of economic organization and planning—*Developments in the Organization and Planning of Soviet Industry* (August 1961). It pointed out a persistent problem confronting Soviet planners as they alternated between ministerial and regional-based managerial principles: neither system was able to "encompass simultaneously and with equal effectiveness both departmental and regional considerations." After inspecting Soviet claims made for the 1957 industrial reorganization, the paper said the advertised achievements were for the most part either unsubstantiated, or not due to the reorganization, and that local managers had not much more freedom of maneuver than under ministerial subordination.

The story was much the same in agriculture. A 1963 paper reviewed the many administrative changes in farm management—*Vacillations in the Organization of Soviet Agriculture* (August 1963). It could find no noticeable improvement in efficiency whether

the turn was toward greater centralized control or more decentralized control. At the same time, the influence of the party apparat seemed to be expanding. Other measures, such as increasing incentives and devolving decisions to the farm level, would be of more help and the paper noted that greater price-based incentives had boosted production between 1953 and 1958.

In the evolution of economic reforms, Premier Alexei Kosygin's 1965 program was the next big step. It gave somewhat greater authority to the enterprises and revised the measures by which enterprise performance was judged, with more emphasis on profits and return on capital. The reform also called for a revision in wholesale prices and allowed enterprises to accumulate cash for employee bonuses and investment. An early assessment of the program, *The Soviet Economic System in Transition (*May 1966), argued that the proposals were too "timid" and that their results could be "forecast in advance"—small positive and negative effects. In short, the "new system cannot operate as long as the old one remains on the job in full strength." However, the paper did stress the distance Soviet economic thought had traveled since Stalin's time. Elements not included in the Marxist theory of value—charges for the use of land and capital, the role of demand in price formation, and the "pivotal role of profits"—could be discussed openly. The paper concluded that evolutionary reform would not work in the Soviet Union and that "If growth rates continue to decelerate the pressure for further reform will build up again."

The titles of two papers expressed CIA's evaluation of Soviet economic reforms as they had solidified by the late 1970s: *Organization and Management in the Soviet Economy: The Ceaseless Search for Panaceas* (December 1977); and *Soviet Economic "Reform" Decrees: More Steps on the Treadmill* (May 1982). The 1977 paper systematically reviewed developments in organization and management from 1965 to 1977. It found that the Kosygin reform had eroded and that its beneficial effects "have been minimal at best." Reforms in research and development had foundered on managerial resistance to innovation and new technology, and the revision of enterprise success indicators had confronted managers with conflicting pressures. In any case, unrealistic prices sent the wrong signals. While seeing little prospect for more radical reforms in the near future, the 1977 paper suggested a reform involving market arrangements might be tried later on. It would have to abolish directive plans for enterprises, replace rationing of most producer goods with wholesale markets, set most prices free, and introduce profit-based incentives. All of these elements were featured in Gorbachev's 1987 economic reform. The "Treadmill" paper discussed and dismissed a July 1979 decree and its July 1981 amendments designed to improve planning, reform industrial wholesale prices, encourage enterprises to economize on material inputs, expand enterprise self- financing, and restrain the proliferation of investment projects. It concluded:

> The changes in working arrangements do not constitute a genuine reform

> of the economic system. Rather they reinforce the traditional features that have wasted resources on a grand scale. Because planning is now more centralized, rigid, and detailed than ever before, the producing unit is more fettered. Producer goods are more tightly rationed; administratively set, average cost-based prices are retained, and Byzantine incentive systems tie rewards and punishments to meeting plan targets expressed in physical units. The modifications of the past two and a half years are no panacea for the Soviet economy. Rather, they move the system away from the decentralization, flexibility, and introduction of market elements, which most Western (and some Soviet) critics believe are needed.

Intensified research on the defense planning process provided the basis for two 1988 papers and summarized our knowledge in a highly secret area—*USSR Forecasting and Planning Weapons Acquisition* (January 1988); *Preparing the Soviet Five-Year Defense Plan: Process, Participants, and Milestones* (October 1988). The papers' findings are too rich to summarize, but they underline how tightly defense planning was tied to national economic plans and how plans for weapons acquisition were guided by information and intelligence on Western plans for weapons acquisition.

Foreign Economic Policy

By the mid-1950s, interest in Washington concerning Soviet intentions and capabilities in the foreign economic arena had triggered a very substantial research and reporting program in CIA—one that continued until the last days of the Soviet Union. By the late 1950s, concern over the Soviet "economic offensive" in the Third World was extremely high in Washington. In perhaps the best CIA discussion of the topic *External Impact of Soviet Economic Power* (October 1962), the author noted that by the mid-1950s the USSR had achieved basic economic independence and was ready to shift to an active and aggressive international economic policy. Soviet foreign trade with the West climbed, and in 1962, 45 percent of that trade was with the less-developed countries (LDCs). As an important part of Soviet determination to extend the USSR's influence into new regions, the trade and aid programs in LDCs were intertwined with propaganda, subversion, and political support to favored local leaders. As of 1961, the USSR had established positions of influence in the economies of Egypt, India, Afghanistan, Indonesia, and Cuba. In the communist world, Moscow employed its trade weapon to punish China by suddenly calling its technicians home and by easing the conditions of its trade with Eastern Europe in the wake of the 1956 uprisings there.

Hundreds of CIA research papers, memoranda, and short responses to questions from Washington departments or agencies described the status of Soviet economic and military aid programs. Periodic reports related what was known about the programs, country-by-

country and project-by-project. Other papers covered the training of foreign nationals in the USSR, the presence of Soviet economic and military technical experts in LDCs, and the USSR's attempts to penetrate and manipulate foreign labor organizations.

In the mid-1960s, a midstream assessment of the Soviet aid program was made—*Soviet Foreign Aid to the Less Developed Countries: Retrospect and Prospect* (February 1966). The LDCs' demand for Soviet aid flowed in part from their proclivity to fashion overly ambitious development plans they could not finance themselves. The USSR offered aid in the hope of nurturing future leaders who would be sympathetic to the Soviet Union. Striking a balance, the paper noted that the USSR had established a presence in the LDCs consisting of men, equipment, and ideas and had made progress in displacing Western powers, in part through Soviet support for the nationalization of Western properties. On the other hand, there had been some notable failures. LDCs often grumbled at the slow implementation of aid agreements. Soviet failure to assume responsibility for individual projects frequently had meant they were done badly, with the blame attached to the Soviets. Moreover, a decline in Western influence did not necessarily lead to an increase in Soviet influence, as evidenced by the fall from power of a succession of Soviet-supported strongmen.

A May 1976 CIA study, *Organization of Foreign Military and Economic Aid,* found that a hierarchical institutional structure forced resolution of all important aid issues to the top. Nevertheless, the aid programs were run by experienced bureaucrats who could wield considerable influence over less informed policymakers. But their recommendations were subject to the conflicting goals and rivalries of the numerous institutions involved in administering the programs. Finally, the Soviet leadership tended to favor military over economic aid, believing that it promised to have a bigger political payoff.

In 1985, a CIA contract study, *USSR-LDC Trade: An Economic and Quantitative Analysis* (February 1985), investigated Soviet-LDC trade in-depth with the help of some laboriously constructed statistics previously unavailable. This study suggests that "some common perceptions of the nature and importance of the trade are mistaken." First, Soviet exports of nonmilitary goods to LDCs had increased slowly since the early 1970s, while the terms of trade with the developing countries had deteriorated. Second, the Soviet Union had not proved to be a substantial market for LDC manufactures. Third, the prices paid by the USSR for imports of raw materials from the LDCs were no more stable than the prices paid by Western market economies. All in all, few LDCs except those in the Soviet political sphere of influence depended heavily on trade with the USSR, and economic interdependence between the USSR and the LDCs probably had grown more slowly than perceived by many in the West and claimed by the Soviets.

Reducing Military Threats

The contributions of CIA's economic analysts to Max Millikan's fourth purpose of foreign economic analysis consisted of support for trade controls, assessments of the effectiveness of other trade restrictions, and evaluations of the impact of technology transfer on Soviet economic and military strength.

In the 1950s, ORR published dozens of encyclopedic industry studies intended to shed light on areas of Western ignorance and to identify possible sources of vulnerability to Western embargoes and other trade controls. By the mid-1950s, however, a contribution to a briefing for President Eisenhower reported that while controls had some "retarding effect" on Bloc economies, the internal supply position for many of the commodities on control lists had "improved markedly." Thereafter, CIA support for export controls centered on the gradually shorter list of strategic commodities. For example, a memorandum for the Department of Commerce's Director of Export Control, *USSR and Eastern Europe: Semiconductors* (April 1973), stated that solid-state technology was quite backward in the USSR, and provided a list of inferior equipment for which the Soviets were trying to find foreign substitutes.

As early as 1962, ORR was commenting on Soviet capacity to produce large-diameter pipe in connection with a possible embargo. And in a memorandum for the Commerce Department's Advisory Committee on Export Policy, OER advised in May 1970 that Soviet persistence in trying to buy Gleason gear-cutting machines was understandable given the state of technology in the USSR's automotive industry. Gleason tools were "crucial" to modernizing Soviet truck production, and an increase in production of all-wheel-drive vehicles—best suited for army tactical operations— was part of the plan for every plant wanting Gleason gear cutters. In contributions like these and in technical support to the advisory committees concerned with specific areas of export control, CIA analysts reported on the state of Soviet technology and on the availability of equipment in countries not participating in export controls.

Sanctions and Trade Restrictions

When Khrushchev began his chemicalization campaign, the USSR requested larger Western credits and longer repayment terms. ORR reported that the credits would prevent the diversion of resources from other high-priority programs and, using various assumptions, ran a number of scenarios before concluding that the Soviet Union could repay the credits if it were able to increase its exports to the West by 5 percent per year. In the 1980s, the question of the effectiveness of credit restrictions was central to policy discussions. Two National Intelligence Council (NIC) memorandums were issued in 1982, *The Soviet Bloc Hard Currency Problem and the Impact of Western Credit Restrictions*

(March 1982); and *The Soviet Bloc Financial Problem as a Source of Western Influences* (April 1982). The first reported that the financial bind facing the USSR and Eastern Europe provided an "unusual opportunity to use economic measures to influence Moscow's behavior." Even limiting new credits to recent levels—the most that Western Europe and Japan might agree to—"would significantly constrain Soviet policy choices." Curiously, the second NIC memorandum stressed the difficulty of gaining international cooperation in limiting credits, reported that a possible agreement on capping the volume of new credits would have little effect on Soviet import capacity, and it down played the influence that even stronger restrictions would have on Soviet defense or foreign policies.

The subsiding of official interest in credit restrictions was partly due to briefings CIA's SOVA gave to high-level departmental representatives—*USSR: The Role of Western Credits* (January 1982). Using a financial model, SOVA stipulated various levels of credit drawings to see what Soviet import capacity would be. To the dismay of those who supported pushing Western Europe and Japan to clamp down on new credits to the Soviet Union, the briefing pointed out that, after 1985, differences in debt service among the scenarios began to offset differences in volume of new credit drawings. Thus, Soviet import capacity was much the same over a range of assumed new credit drawings.

Over the years, CIA was consistently bearish with respect to the effectiveness of Western embargoes on exports to the Soviet Union and the Soviet Bloc. Two reasons for skepticism were usually advanced: the difficulty of getting other countries to join in an embargo, and the ability of the Bloc to adjust internally to an embargo. A 1961 paper, *Estimated Impact of Western Economic Sanctions Against the Sino-Soviet Bloc* (July 1961), is illustrative. It pointed out that a unilateral US embargo would be ineffective because the volume of US-Soviet trade was so small. Enlisting NATO and Japan, would, under generous assumptions, deny about $4 billion of Western goods, but the effect would be mainly in the first six months. Thereafter the Bloc could turn to alternative suppliers. In 1980, the United States restricted exports of grain to the Soviet Union following Soviet intervention in Afghanistan and secured the agreement of other major grain exporters not to replace the US grain. A paper from OER tried "to clarify" the embargo's impact—*USSR: Adjusting to the Grain Embargo* (February 1981). It reported that the embargo reduced Soviet imports by 6 million tons in the year ending September 1980, but its impact "was substantially lessened by the fact that other exporters sold more grain to the USSR than was contemplated when the embargo was announced." Moreover, the Soviets were able to replace some of the lost imports by drawing down domestic stocks.

The US attempt to interfere with the construction of the Siberia-to-Europe gas pipeline ran into similar constraints. Western Europe welcomed the gas and refused to deny compressors and large-diameter pipe for the pipeline. For its part the USSR, for technical reasons and through internal adjustments, was capable of doing without US compressors.

A paper jointly produced by SOVA and the Office of European Analysis, *Outlook for the Siberia-to-Western Europe Natural Gas Pipeline* (August 1982) summarized the results of intense investigation, some of which responded to DCI William Casey's questions. The paper stated, "We believe that the USSR will succeed in meeting its gas delivery commitments to Western Europe through the 1980s" by relying on excess capacity in existing pipelines, the contributions of West European and Soviet equipment, and the fact that the USSR could push through about two-thirds of the gas using only about one-third of the compressor power ultimately intended for the pipeline. Moreover, Western Europe was "deeply angry" over the US decision to try to control compressors manufactured in Western Europe under US license. These findings were briefed extensively to Washington policymakers and supported by US industry experts in February and March 1982. Nonetheless, on 18 June 1982, President Ronald Reagan extended the pipeline sanctions to prevent foreign subsidiaries and licensees of US companies from supplying equipment for the pipeline.

Monitoring Technology Transfer

Washington officials had an enormous appetite for assessments of the role of technology transfer in Soviet economic and military development. Usually CIA's response was (a) virtually all Soviet technology was relatively backward, creating a demand for more advanced Western technology; (b) the contribution of this technology was likely to be concentrated in small areas because the acquisitions Moscow could buy or steal constituted only a small share of total investment; and (c) systemic constraints on the assimilation and diffusion of new Western (or Soviet) technology further limited its impact. Still, CIA papers found a great many instances where the Soviet Union copied or adapted Western designs, a form of technology transfer not subject to measurement or easily denied.

After Western controls on the export of machinery and equipment were relaxed in the 1950s, the flow of technology to the USSR increased. The burst of Soviet buying of chemical installations attracted particular interest—*Acquisition of Chemical Equipment and Technology by the Soviet Bloc From the Free World, 1957 Through Mid-1963* (April 1964). Soviet Bloc purchases of 234 installations worth $1.3 billion "clearly" would make a major contribution to Bloc chemical industries, although there would be problems in getting them on line, the paper noted. Two papers on agricultural technology, *Soviet Efforts to Introduce US agro-technology* (November 1975), and *Agricultural Machinery Technology in the USSR and Eastern Europe* (May 1976), pointed to the difficulty the Soviets were having in assimilating Western agro-technology and maintained that even successful adaptations of Western designs resulted in poor quality products because of shortcomings in planning and incentives.

In the documents supporting the Princeton conference, there are a great many comprehensive surveys of the role of technology transfer in Soviet economic development. A few of the more prominent examples are *The Technological Gap: The USSR vs. the US and Western Europe* (June 1969); *Transfer of Technology from the United States to the USSR: Problems and Prospects* (December 1973); *Significance of Soviet Acquisition of Western Technology* (June 1975); *Soviet Economic Dependence on the West* (June 1975); and *Soviet Microelectronics: Impact of Western Technology Acquisitions* (December 1986). In broad terms, the papers argued that the technological gap was large and probably widening even though the USSR had borrowed extensively from the West. The Soviet system of planning and management retarded the assimilation and diffusion of new technology, and the volume of imports was too small relative to total investment to have a substantial effect in macroeconomic terms.

When attention turned to specific sectors, the findings were different. In just one of many examples, Soviet oil and gas development benefited considerably from imports from the West—*The Role of Western Equipment in Soviet Oil and Gas Development* (September 1984). The Soviet focus on acquisition of technology for more militarily-significant sectors stimulated a large body of research. In addition, CIA aggressively sought to alert Western countries to the scope and successes of legal and illegal Soviet acquisition of technology for the defense industry. An unclassified paper, *Soviet Acquisition of Western Technology* (April 1982), received wide dissemination abroad. One of the more startling examples was the microelectronics industry where, according to a 1986 paper—*Soviet Microelectronics: Impact of Western Technology Acquisitions* (December 1986), Western equipment had "radically advanced the quality and quantity" of production. The USSR now lagged in advanced integrated circuit development by eight to nine years; without Western assistance it might have been 18 to 19 years. "Successful, and in most cases illicit, "acquisition had filled critical military electronic requirements. As an illustration of how important Western technology could be to a small industry, the report estimated that the Western equipment on hand would provide about one-third of the "critical equipment for all production areas."

Assessing Relative Strengths of East and West

Max Millikan's fifth objective of foreign economic intelligence perhaps attracted more interest and provoked more controversy than any other facet of CIA's economic analysis of the Soviet Union. In the 1950s, many worried that the balance of relative strengths of East and West—or at least the USSR and the United States—was going to tip in favor of the East. CIA research produced estimates of the dollar value of Soviet GNP and each of its components—consumption, investment, defense, and government administration.

The procedure for determining the estimates, with some exceptions, was to start with CIA's estimates of the ruble values of the components of Soviet GNP and convert these values to dollars. This was done by applying appropriate dollar-ruble ratios to express what it would cost in dollars to buy a ruble's worth of goods and/or services in a particular segment of Soviet GNP. Then the components of US GNP were converted to ruble values by applying ruble-dollar ratios expressing what it would cost in rubles to buy a dollar's worth of goods and/or services in a particular segment of US GNP. The result of this exercise was a set of comparisons of US and Soviet GNP expressed alternatively in dollars and in rubles. When presented in a publication, a single-valued comparison was usually reported—the geometric mean of the dollar and ruble comparisons.

The research required to derive the appropriate conversion ratios was enormous and has been described in large part in a series of unclassified publications. Some representative examples are *Ruble-Dollar Ratios for Prices of Machine Tools, Metal-Forming Machinery, Textile Machinery, and Abrasive Products* (October 1956); *1955 Ruble-Dollar Ratios for Construction in the USSR and the US* (August 1964); *A Comparison of Consumption in the USSR and the US* (January 1964); *USSR and the United States: Price Ratios for Machinery, 1967 Rubles-1972 Dollars,* Volumes I and II (September 1980); and *Consumption in the USSR: An International Comparison* (August 1981). In deriving the ruble-dollar conversion ratios the Agency consulted extensively with US firms—even to the extent of buying Soviet goods and having them appraised by US manufacturers of similar products.

The Comparisons

One of the first CIA publications dealing with US-Soviet comparisons estimated physical output per worker in the branches of industry and transportation where data permitted such comparisons—*Comparative Levels of Labor Productivity in the US and the USSR, 1951* (December 1954). It found that labor productivity in the USSR varied from 15 percent (spinning of cotton textiles) to 73 percent (blast furnaces) of the US level. The paper attributed the differences in productivity to differences in natural conditions in mining sectors and to differences in technology and investment in other sectors. Systemic differences, so prominent in later comparisons of productivity, were not mentioned.

Research in the mid-1950s under the guidance of Morris Bornstein led to a comparison of GNP and its components in the United States and the USSR in 1955. Many of the ruble-dollar ratios employed in the comparisons paper, *A Comparison of Soviet and United States*

National Product, submitted to the Joint Economic Committee, Congress of the United States, 1959, were drawn from RAND Corporation studies. The results are expressed as Soviet percentage of US:

	Comparisons in 1955 Rubles	Comparisons in 1955 Dollars	Geometric Average
Consumption	20.8	39.0	28.5
Investment	48.8	68.3	57.7
Defense	75.3	94.3	84.3
Administration	152.5	152.1	152.3
GNP	26.8	53.4	37.8

Most CIA comparison papers presented both ruble and dollar comparisons as well as the geometric mean comparisons, but the comparison most generally quoted was the geometric mean of the ruble and dollar comparisons. This "short cut" is commonly used in international comparisons but obscures some important information. Thus, the dollar comparison can be interpreted as giving a rough appreciation of the relative ability of the USSR and United States to produce the Soviet mix of goods and services. Conversely, the ruble comparison can be interpreted as approximating the relative ability of the two countries to produce the US mix of goods and services. Given their respective resource endowments and production history, it would be expected that the Soviet Union would look better in a dollar comparison (the relative ability to produce the Soviet mix) than in a ruble comparison (the relative ability to produce the US mix).

In subsequent years, as new estimates of the ruble value of Soviet GNP and ruble-dollar ratios were developed and assimilated, the geometric mean comparisons showed the USSR in varying positions. A 1966 ORR paper, *US and USSR: Comparisons of Size and Use of Gross National Product, 1955-64 (*March 1966), said that the main reason for the lower USSR/US comparisons was a series of adjustments made to ruble/dollar ratios to take account of the lower quality of Soviet durable goods and the lower productivity of Soviet workers in health and education. Later, however, a CIA comparison published in a congressional JEC compendium in 1979, *US and USSR: Comparisons of GNP,* presented new comparisons "based on [new] US-Soviet purchasing-power-parity ratios covering consumption, machinery, construction, and defense." The ratios drew on a much wider sample of goods and services and a United Nations comparison of national products, which helped in sample selection and product specification. According to the CIA comparison,

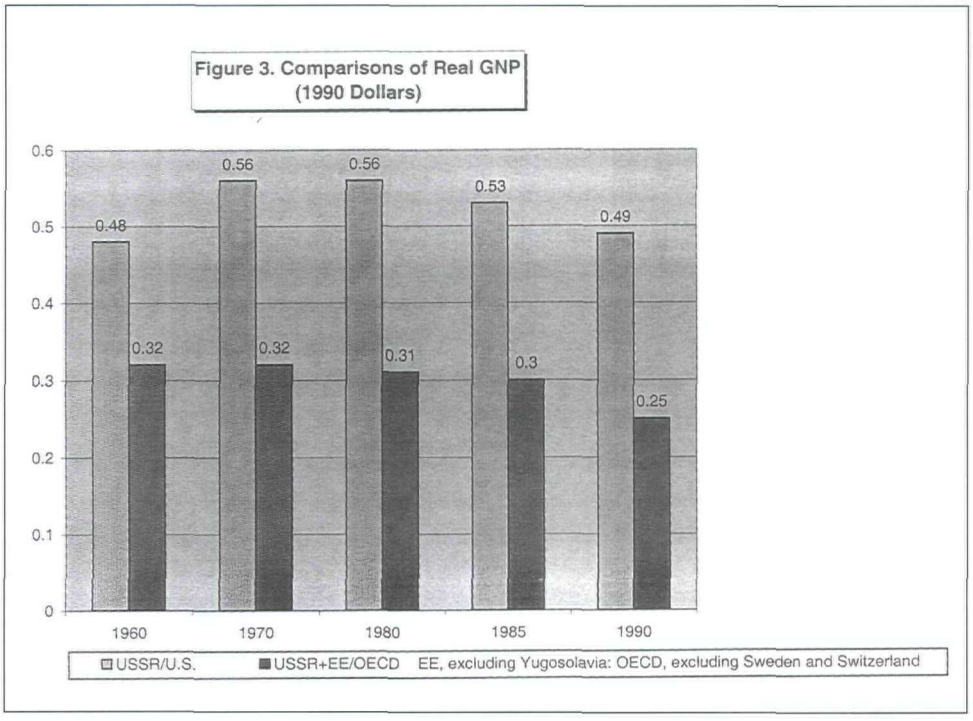
Soviet GNP in 1976 was 60 percent of US GNP (geometric mean), per capita consumption 37 percent of US per capita consumption, and outlays for defense and space 136 percent of the US level.

In 1981, the JEC published a CIA paper that revised downward the estimates of the dollar value of Soviet consumption—*Consumption in the USSR: An International Comparison* (August 1981). It found that, since 1960, Japanese living standards "caught up with, and raced ahead of the USSR's, while France, West Germany, and Italy extended their leads." The study put Soviet per capita consumption at 34 percent of the US level in 1976, but its major contribution was a wide-ranging discussion of international differences in the structure of consumption and a thorough exposition of the methodology underlying the estimates.

The next general comparison of GNPs appeared in 1984—*A Comparison of Soviet and US Gross National Products, 1960-83* (August 1984). This paper reported Soviet GNP as 49 percent of US GNP in 1960 and 55 percent in 1983. Soviet per capita consumption in 1983 was one-third of the US level. As in previous comparison papers, the authors declared that these numbers "trace the upper bound of ratios of Soviet to US GNP." And, as in previous studies, the ratios for machinery and equipment were not adjusted for quality differences beyond those reflected in the original product matches, and the consumption ratios did not take into account the advantage the American consumer has in terms of convenience, variety, and availability. Moreover, the ratios for consumer services were probably too low because they could not adjust adequately for the higher qualifications of American workers in health and education.

Employing the Agency's basic ruble-dollar ratios and estimates of Soviet GNP growth, the last comparison paper, *The Soviet Economy in a Global Perspective* (March 1989), tried to put Gorbachev's concerns about the Soviet economy in context by comparing it to a wide range of other economies. CIA purchasing-power-parity estimates for the Soviet Union were linked to those of the UN's International Comparison Project. The CIA paper reported that the Soviet economy was in many respects like that of a developing rather than a developed country—more like Mexico or Brazil. In terms of the share of agricultural output in GNP, the USSR resembled Turkey and the Philippines. The paper also tested CIA's comparisons using a model relating GNP statistically to a collection of physical indicators. The physical indicator approach produced a value for Soviet GNP in 1980 of $5,360 per capita while the purchasing-power-parity method equivalent was $5,600.

For the general public, CIA's annual unclassified publication *Handbook of Economic Statistics* provided a window on CIA estimates of the East-West balance and the relative size both of US and Soviet GNP. The 1991 edition showed the comparisons depicted in 1990 dollars (see figure 3). The USSR-US ratio peaks around 1970, levels off in the 1970s,



and falls steadily in the 1980s. If Eastern Europe (excluding Yugoslavia) is added to the Soviet potential and compared with the Organization for Economic Cooperation and Development (OECD) countries (excluding Sweden and Switzerland), the USSR and its allies had only about 30 percent of the GNP of the OECD nations in the 25 years from 1960 to 1985. As for the Soviet Union overtaking the United States, these handbooks showed an absolute gap between them, widening steadily in the 1960s and more rapidly in the 1970s.

Interest in CIA's estimates of Soviet defense outlays within the US government and in Congress centered on the dollar comparisons. Unfortunately, the records necessary to put the defense comparisons on a single-dollar price base are no longer available. Figures 4A and 4B show the comparison of the dollar cost of Soviet and US defense programs in 1951-64 expressed in 1972 dollar prices and in 1965-89 in 1988 dollar prices. According to these comparisons, the cost of US defense programs exceeded the dollar equivalent of Soviet programs by about 13 percent in the earlier period, while the dollar cost of Soviet military programs in 1965-1989 was slightly greater than US spending.

These comparisons are dollar comparisons, not the geometric mean of comparisons in ruble and dollar prices that underlie the GNP comparisons. Critics have rightly noted that a comparison in dollars shows the USSR to a greater advantage than a comparison in rubles. For example, a comparison of Soviet and US defense and space programs in the 1970s showed the Soviet programs 36 percent larger in dollar prices and 29 percent larger in ruble

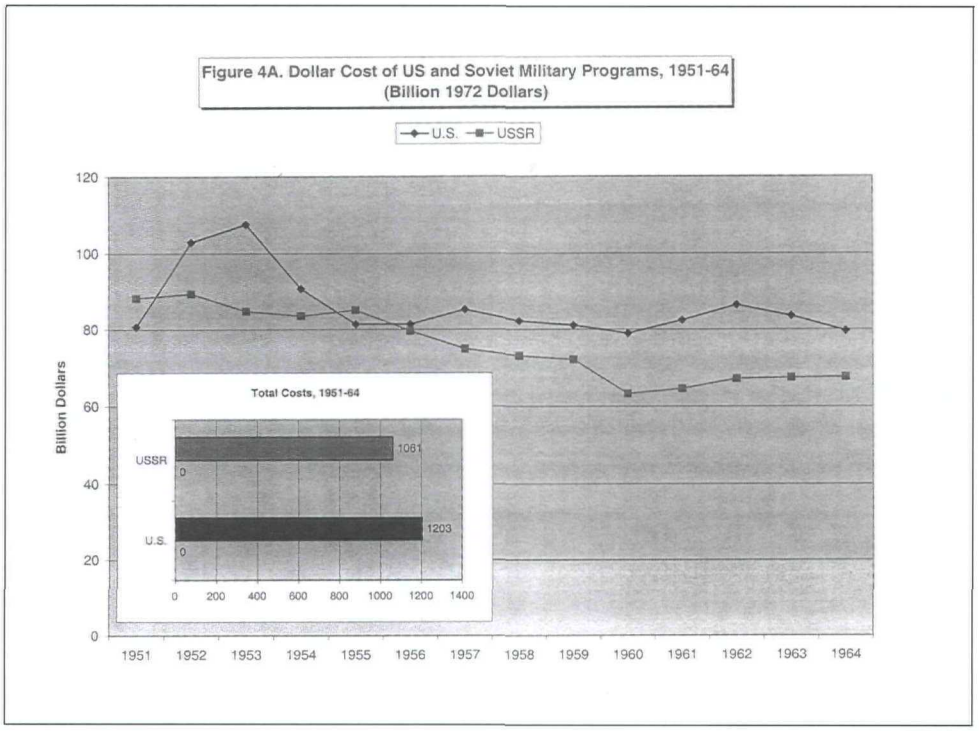


Figure 4A. Dollar Cost of US and Soviet Military Programs, 1951-64
(Billion 1972 Dollars)
U.S.
USSR
Billion Dollars
120
100
80
60
40
20
0
1951
1952
1953
1954
1955
1956
1957
1958
1959
1960
1961
1962
1963
1964
Total Costs, 1951-64
USSR
1061
0
U.S.
1203
0
0
200
400
600
800
1000
1200
1400

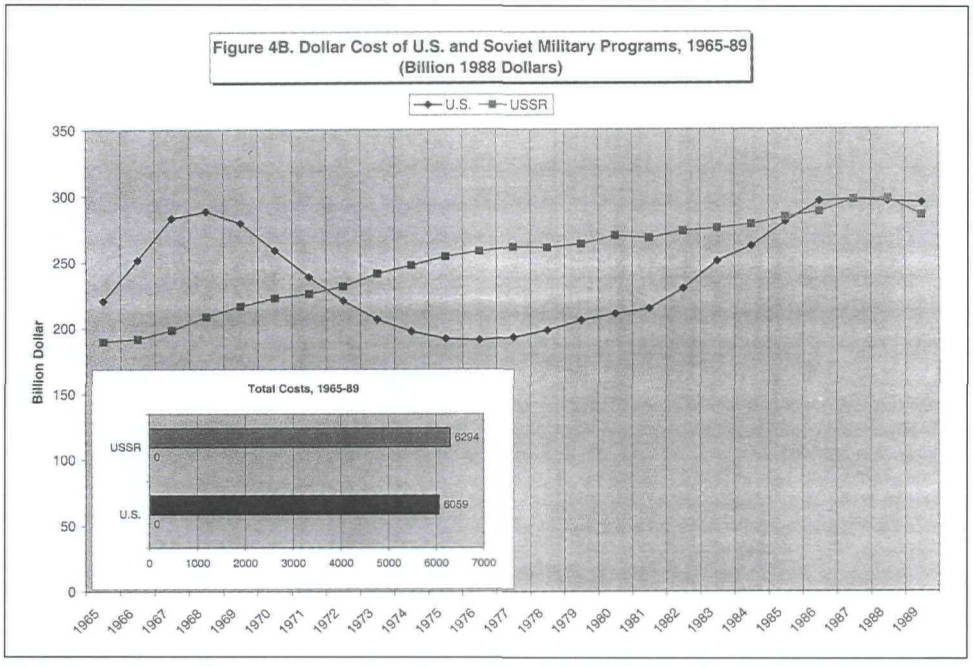


Figure 4B. Dollar Cost of U.S. and Soviet Military Programs, 1965-89
(Billion 1988 Dollars)
U.S.
USSR
Billion Dollar
350
300
250
200
150
100
50
0
1965
1966
1967
1968
1969
1970
1971
1972
1973
1974
1975
1976
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
Total Costs, 1965-89
USSR
6294
0
U.S.
6059
0
0
1000
2000
3000
4000
5000
6000
7000

prices. A proper ruble comparison required Soviet prices for American defense procurements, but Soviet estimates of these prices were not available. Further research widened the gap between comparisons in dollar and ruble prices. The most recent calculations of ruble comparison based on indirect calculations, suggests that over the period 1973 to 1987 Soviet defense activities exceeded the US equivalents by 21 percent in the dollar comparisons and by 7 percent in the ruble comparisons.

In the 1980s, some variants of these comparisons were constructed—one to take in a broader definition of national security outlays and another to construct a NATO-Warsaw Pact comparison. The comparison, expanded to include the so-called "cost of empire," civil defense, and the like, pushed up Soviet spending relative to US outlays by a couple of percentage points in the 1980s, but the NATO-Warsaw Pact comparisons showed the dollar-equivalent cost of NATO defense programs to be 15 percent larger than Warsaw Pact programs over the period 1976 to 1986.

Perhaps the most visible contribution of the defense spending estimates was to the debates over US defense budgets. The US-Soviet comparisons figured heavily in the presentations that successive presidential administrations made to Congress and the country. For example, Secretary of Defense James Schlesinger at the beginning of his 1975 annual report said that "The Soviets now devote more resources than the United States in most of the significant categories of defense" and showed a chart comparing US and Soviet defense spending. He emphasized even more strongly the adverse trends embodied in the spending estimates by telling the armed services committees, "If they continue to grow at 5 percent or 7 percent per annum, and we continue to shrink, then it is plain that sooner or later the divergence will become so great that we will be in very substantial trouble." Under Democratic administrations, the pitch was much the same. William Kaufman, a consultant to the Department of Defense (DOD) through most of the 1970s, said that, beginning in 1973 and 1974, he "turned very strongly to the CIA estimates as a basis for indicating why the US defense budget ought to be increased."

Thus, the US-Soviet defense comparisons were featured in DOD congressional testimony, defense posture statements, and in the DOD publication *Soviet Military Power.* The comparisons, however, lost their popularity when the dollar-equivalent cost of Soviet defense programs began to fall below the cost of US programs in the 1980s. Robert Gates, as Deputy Director for Intelligence and later as Deputy Director of Central Intelligence, had long been skeptical of the dollar estimates and tried to abolish them in the early 1980s; pressure from consumers in the Pentagon and Congress, however, forced a resumption of the dollar costing. When Soviet military spending moved downward in the late 1980s, consumer demand for the dollar estimates weakened, and Agency managers decided the time was right to drop them.

The estimates of the ruble and dollar costs of Soviet defense programs were controversial, but they were the only ones that reflected the Intelligence Community's best estimates of the physical quantities underlying these programs. Moreover, the trends displayed by the latest CIA estimates seem consistent with recent interpretations of Soviet policy shifts and fit quite well with post-1985 statements by Soviet leaders regarding the defense burden and the production of military hardware. Finally, in the absence of CIA's estimates, the field would have been left to alternative calculations that had Soviet real defense spending increasing at double-digit rates. Had such calculations been believed, the US national debt might have been appreciably higher than it was because of the pressure that would have been exerted to raise US defense spending to match what the USSR was thought to be spending.

The Agency's inquiries into the relative strengths of the Soviet Union and the United States proceeded down a number of other paths as well. For example, in the 1960s, papers dealt with population, manpower, and professional manpower—*Comparison of US and Soviet Population and Manpower* (November 1960); and *A Comparison of US and Soviet Professional Manpower* (May 1963). The demand for comparisons of the US and Soviet space programs never wavered. A 1966 paper estimated US civil and military funding for space programs at $7 billion in FY 1964 and FY 1965 while the estimate for the USSR was in excess of $5 billion in FY 1965. It was a tricky exercise since the requirements for the USSR had to be reconstructed from both identified and inferred components. *Comparison of US and Soviet Procurement of Major Weapons Systems* (November 1975), provided annual figures for 1953-74. Perhaps the best treatment of a particular sector appeared in 1989—*A Comparison of the US and Soviet Industrial Bases* (May 1989). It described the many quantitative, qualitative, and structural differences between Soviet and US industry.

How Good Were the Dollar Comparisons?

The dollar comparisons of US and Soviet GNP have been criticized—correctly—for not taking sufficient account of quality differences in the product matches that formed the basis for the ruble-dollar ratios used in converting Soviet GNP to dollars and US GNP to rubles. Certainly CIA struggled with the problem over the years as it introduced some fairly arbitrary adjustments to the ratios while warning readers that the comparisons were at the "upper bound" of reality. In my view, a combination of realistic adjustments would not take a Soviet-US GNP ratio of 50 percent below 40 percent. That such a change would have changed perceptions of the relative strengths of East and West seems doubtful. (Any adjustments should also include an allowance for the "second economy" activity not fully reflected in CIA's estimates of Soviet GNP.)

What the comparisons measured is not obvious. CIA argued that they were more valid as measures of real income than of production potential, although they fell short of the theoretical requirements for a real income measure (see *US and the USSR: Comparisons of GNP* [1979], pp. 388-89). Fundamentally, the comparisons provided an indication of the relative volume of goods and services produced in the two countries and to a lesser extent, a sense of relative production potentials and real incomes. If one were to be more demanding regarding these requirements, however, the structure of international comparisons built up over the years (e.g., in the *UN International Comparison Project*) would collapse and with it much of the statistical analyses of the sources of economic growth based on these comparisons. For the Soviet Union, just as for much economic analysis, the requirements for theoretical purity conflicted with the demand for policy relevant analysis. CIA's economists attempted to provide relevant analysis while recognizing the limitations inherent in Soviet statistical reporting.

The Analysis in Perspective

Over the years, CIA's analysis of the Soviet economy fulfilled, I believe, all of Max Millikan's objectives for economic intelligence. In the process, CIA learned a great deal about the Soviet economy and aspects of Soviet military forces not discovered earlier. It shared most of these findings with the public and academia in hundreds of unclassified papers and dozens of contributions to Joint Economic compendia.

CIA's support for US policymakers expanded as its research base grew and other agencies came to know the capabilities of the analysts following the Soviet Union. Most of their work responded to requests from a wide range of consumers; the examples cited in this paper can only suggest the diversity and extent of these contributions. In terms of Millikan's first objective, CIA did, over the decades, measure and forecast the erosion in the USSR's economic vitality, calming the fears of "overtaking" arguments so prevalent in the 1950s. The estimates of the cost of Soviet defense programs helped to shape US policy in various ways. To repeat a view expressed above, Noel Firth and I opined in our book that, in the absence of the defense-spending estimates, "the prevailing view of Soviet military programs would have been more alarmist and US defense spending during the Cold War would have been much higher." In its support for policymakers, CIA had the advantage of not having to defend a particular policy. It tried to offer impartial assessments without worrying about the sour receptions they sometimes received.

Much of the controversy over CIA's economic analysis has centered on the accuracy of the GNP and defense measures. This is unfortunate to the extent that it overshadows the large volume and vast range of the Agency's economic work as suggested by the records released to the National Archives. I would say that CIA's measures relied on the best evidence available and were compiled according to standard national accounting practice.

They were reviewed by a series of external panels that generally gave the ruble measures high marks. The dollar comparisons elicited greater skepticism, but there were no credible alternatives. Therefore, CIA's ruble and dollar estimates are still the estimates of choice for scholars researching the economic history of the Soviet Union or investigating the sources of international differences in production and productivity.

Many lessons have been learned during the years of studying the Soviet economy, but I will cite two major ones. They are (1) the need to be willing to take new evidence aboard without delay and entertain an unconventional view of the world, and (2) the difficulty of interdisciplinary analysis. These played a part, for example, in CIA's delayed call on the slowdown in Soviet military spending in the late 1970s, the exaggeration of the Soviet oil crisis, and the reluctance to believe that conditions in the economy would lead to dramatic changes in the way the Soviet Union was governed.

Discussant Comments

A panel chaired by **Dr. Laurie Kurtzweg**, from the Office of Russian and European Analysis in CIA's Directorate of Intelligence, discussed James Noren's paper and provided additional views on CIA's analysis of the Soviet economy. The panelists were Dr. Abraham Becker, Senior Economist Emeritus at RAND; Dr. James Millar, Professor of Economics and International Affairs at George Washington University; and Dr. Charles Wolf, Senior Economic Advisor at RAND.

Abraham Becker attempted to explain the "extraordinary explosion of hostile reaction" to CIA's economic analysis that took place in the late 1980s and early 1990s. He cited several reasons for it. One reason, according to Becker, was the highly complex nature of the economic issues that were debated, such as the international economic comparisons done by CIA and the Agency's use of dollar and ruble estimates of Soviet defense spending. These issues were, according to Becker, difficult for policymakers to understand. Further complicating the analysis were the significant differences between the US and Soviet economic and political structures, Soviet secrecy and disinformation efforts, and Marxian concepts that found their way into Soviet economic issues and statistics. Becker implied that a lack of understanding of some of the economic concepts used by CIA contributed to considerable skepticism about the Agency's analysis.

Becker also maintained there was confusion over the use of CIA's GNP estimates of the size and growth of the Soviet economy as a measure of welfare in the USSR. In his view, economic practitioners understand that GNP statistics are not a measure of a nation's welfare. Still, according to Becker, CIA was accused of passing off its GNP series as welfare indicators.

A third reason cited by Becker was what he labeled the "disastrous impact" of the changes in Soviet military expenditures announced by CIA in the mid-1970s and again in the early 1980s, and the release of the controversial oil estimate in 1977. The public, according to Becker, interpreted these events as multiple, serious intelligence failures and the politicizing of intelligence estimates.

A fourth factor undermining CIA's economic analysis was, according to Becker, the contradictory message given to policymaking authorities, particularly during the later Reagan years. He cited, in particular, former DCI William Casey's effort to provide policymakers with his view of the Soviet Union. Unfortunately, that view sometimes varied significantly from what CIA's analysts were saying. Becker pointed out that Casey and his assistant, Herbert Meyer, who Becker claims misunderstood what CIA was saying about the rate of economic growth in the USSR, did a lot of maneuvering behind the scenes, effectively undermining the CIA's message.

The fifth factor, according to Becker, was a dilemma the Kremlin faced that made the forecasting of economic events in the Soviet Union difficult, if not impossible. The Soviets desperately needed to reform the Soviet economy but realized that implementing meaningful reform measures could lead to political upheaval and chaos. How to implement meaningful reform without bringing down the system was a difficult problem even for a more enlightened leader such as Gorbachev. In Becker's view, there was no way to predict when and if someone would come along who would be able and willing to implement significant reform.

Finally, Becker asserted that US analysts erred in failing to adequately take into account what Soviet émigrés were saying about the state of the Soviet economy. According to Becker, this unfortunate occurrence resulted from the development of a "climate of mistrust between émigrés and the US Sovietological establishment."

James Millar, who served as the chairman of a committee formed in the late 1980s at the request of the House Permanent Select Committee on Intelligence to evaluate CIA's record in measuring Soviet economic performance, gave the Agency high marks for its economic assessments. Millar said the committee concluded, in general, that the work of the Office of Soviet Analysis, and its predecessors in the CIA, has been "professional and appropriately reasonable and cautious." Most reports through 1988 on the course of Soviet GNP and on general economic development were found to be "accurate, illuminating, and timely." Finally, Millar opined that the committee concluded that the CIA "did in fact provide the kind of information that policymakers needed to make reasonable judgments about policy with respect to the Soviet Union."

According to Millar, however, the committee was critical of the Agency's estimates of Soviet defense expenditures and its estimates of the defense burden as being based on slender data sources and on questionable methodologies. Moreover, it found CIA's dollar estimates of Soviet GNP and defense spending misleading, and it criticized the Agency for publishing geometric mean averages of its dollar and rubles GNP and defense estimates that were without meaning.

The next commentator, **Charles Wolf**, used three criteria to assign numerical grades to CIA's work on the Soviet economy:

Grading Criteria	**Grade**
Scholarship and Academic Quality	Strong B
Validity and Accuracy	Strong C
Effect on Policy	A-

Under his first category, "Scholarship and Academic Quality," Wolf praised the Agency's work in constructing national income accounts as equal to the very high standard set by Simon Kuznets and the National Bureau of Economic Research (NBER) in compiling accounts for the US economy. In fact, Wolf opined that it was a standard that was met under circumstances that were more difficult than those faced by the NBER because of the secretive nature of the Soviet Union and the "peculiarities" of Soviet published economic data. According to Wolf:

> The industry studies, including defense industries, agriculture, energy, foreign aid, and international comparisons, I think, provided major insights into the structure of the Soviet economy, into the input/output relations in the system, and so forth, and conformed to the average for the National Bureau.

At the same time, however, Wolf was critical of the Agency for, in his view, being too optimistic about the viability of the Soviet planned economy—what he termed "within the box thinking," based on the work of economists Oskar Lange and Abba Lerner who believed in the perfectibility of market socialism. Rather, he opined that Agency analysts should have done more "outside the box thinking" based on the work of economists Frederic Hayak, Ludwig Von Mises, and Milton Friedman who felt that socialist economies were unworkable and doomed to collapse under their own weight. As an example, Wolf cited the failure to take into account the poor quality of manufactured goods in the USSR.

In other words, according to Wolf, CIA should have looked deeper and in different ways "at the corrosive effect of the Soviet political system on human capital, that is on morale, on entrepreneurship, on innovativeness, the work ethic, and so forth."

In his category of "Validity and Accuracy," which he graded as little better than average, Wolf concluded that CIA overestimated the size of Soviet GNP—that is, in his view, it was no more than 30 percent of US GNP compared with the geometric mean estimate of around 50 percent that the Agency claimed. Analysts persistently overestimated the Soviet economy's growth rate by "at least a couple of percentage points," and underestimated the military burden. The latter, according to Wolf, was closer to 25 percent than the 11 to 15 percent range posited by CIA.

Finally, Wolf addressed the effects of the Agency's analysis on the Administration's policies. Wolf disagreed strongly with Senator Moynihan's publicly stated view that the United States overspent on defense during the Cold War period because of the Agency's overblown analyses. Wolf, in effect, characterized such thinking as wrong headed. Rather, he opined, "The Soviets, if faced with the choice of using it or losing it, might well have used it had we [the United States] not prepared with medium-range ballistic missiles (MRBMs) and the prospect of the Strategic Defense Initiative (SDI) and Star Wars."