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INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

SOME ASPECTS OF SOVIET ECONOMIC GROWTH

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Introduction

The object of the following note is to present a brief summary of some recent literature on the subject of Soviet economic growth. In particular, an attempt is made to find out what the literature says in answer to the following three questions:

1. What has been the rate of growth of industrial production and national income according to Soviet official data? How do these rates compare with independent estimates made by Western scholars?

2. What has the "rapid" rate of growth, suggested by Soviet indices, implied in terms of improvements in the standard of living?

3. What would be the impact on aggregate growth, if Soviet planners decided to shift the pattern of investment in favour of consumer goods production?

The following note is not designed to arrive at any independent conclusions. Rather, it should be looked upon as a starting point for a more thorough and detailed investigation, if that should become necessary at any time.

A brief bibliography is attached to the text.

A. Industrial Growth in U.S.S.R. - Soviet Estimates

1. According to the official index, industrial production increased as follows during the Soviet era:

<table>
<thead>
<tr>
<th>Period</th>
<th>Compound Growth Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1913-55</td>
<td>8.2</td>
</tr>
<tr>
<td>1928-55</td>
<td>11.9</td>
</tr>
<tr>
<td>1928-37</td>
<td>18.1</td>
</tr>
<tr>
<td>1948-55</td>
<td>15.3</td>
</tr>
<tr>
<td>1955-56</td>
<td>11.0</td>
</tr>
<tr>
<td>1956-57</td>
<td>10.0</td>
</tr>
<tr>
<td>1959-65 (planned)</td>
<td>8.6</td>
</tr>
</tbody>
</table>

2. The chief defect of the official index was its system of weights. The physical output of various commodities was weighted by 1926-27 prices. New commodities which did not exist in the base year and new models of old commodities were valued at prices based on high initial production costs. And since it was precisely these new items (producer goods) which recorded the largest physical increases, a considerable upward bias was introduced in the over-all index.*

*The weight base of the index was shifted to 1952 prices in 1950 and to 1955 prices later on. However, nothing was done to recalculate the indices for earlier years. The old series was mechanically linked to the new one.
3. Another source of upward bias was introduced by the rapid replacement of household production of consumer goods by factory output, during the period of observation. This was the result of urbanization and deliberate policy measures encouraging the production of commodities requiring greater processing (candy instead of sugar). "The great apparent enlargement in the output of consumer's goods...must clearly have been caused almost exclusively by processing formerly not considered as well as by the additional processing of the same goods" (Jasny - see bibliography 6).

4. The Soviet index is a 'gross value' index, i.e., individual commodities are weighted by their full price rather than by value added. This procedure involves a great deal of double counting and the absolute volume of industrial production in any one year is an inflated figure. Furthermore, this procedure tends to exaggerate the rate of growth in a period, such as the 1950's, when the vertical integration of industry decreased significantly.

5. Western indices are based on the uniform pricing of commodities irrespective of their geographical origin. In contrast, the Soviets have recently started to include transport costs in the prices with which commodities are weighted. This practice tends to boost the index in a period, such as the 1950's, when the locational pattern is being shifted towards the remote underdeveloped regions of the country.

B. Industrial Growth in U.S.S.R. - Western Estimates

1. The rates of growth of industrial production shown by the official index can be compared with at least five western estimates, tabulated below. It should be noted that all of them by necessity use Soviet official data regarding individual commodity production. Their novelty consists in adopting different weighting systems. The table arranges the western estimates according to the implied degree of exaggeration in the official Soviet series.

<table>
<thead>
<tr>
<th>Period</th>
<th>Official</th>
<th>Seton</th>
<th>Hodgman</th>
<th>Clark</th>
<th>Jasny</th>
<th>Nutter</th>
</tr>
</thead>
<tbody>
<tr>
<td>1928-37</td>
<td>18.1</td>
<td>16.0-16.7</td>
<td>15.7</td>
<td>13.4</td>
<td>12.4</td>
<td>8.3-11.2</td>
</tr>
<tr>
<td>1928-40</td>
<td>16.2</td>
<td>13.5</td>
<td>12.9</td>
<td>10.8</td>
<td>10.8</td>
<td>6.8-8.9</td>
</tr>
<tr>
<td>1948-55</td>
<td>15.3</td>
<td>12.0-13.0</td>
<td>11.8^a/</td>
<td>n.a.</td>
<td>n.a.</td>
<td>7.7-11.7^b/</td>
</tr>
<tr>
<td>1928-55</td>
<td>11.9</td>
<td>9.3-9.8</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
<td>5.4-7.4</td>
</tr>
<tr>
<td>1913-55</td>
<td>8.2^a</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
<td>3.3-4.7</td>
</tr>
</tbody>
</table>


C. Growth of National Income in U.S.S.R.

1. According to the official index, national income increased as follows during the Soviet era:
Period Compound Growth Rate

1913 - 55 7.0
1928 - 37 16.2
1940 - 55 7.0
1950 - 55 11.0
1955 - 56 12.0
1956 - 57 (planned) 8.0
1959 - 65 (planned) 7.2-7.5

2. The Soviet concept of N.I. included the following items: (i) agricultural output; (ii) industrial output; (iii) construction; (iv) freight transport services; (v) retail trade, including communal restaurants; (vi) some branches of communications. The following items are excluded: (i) salaries of Government employees, including defense personnel; (ii) passenger transportation; (iii) independent physicians, teachers, artists, barbers, laundymen and others performing personal services unrelated to production; (iv) domestic.

3. On the basis of Gosplan data, Soviet estimates of N.N.P. for 1928 should be raised by about 9% in order to make them comparable with the more comprehensive western concept of N.N.P. Furthermore, there is some reason to believe that the service items excluded from the Soviet concept of N.N.P. increase faster than aggregate N.N.P. Accordingly, Naum Jasny raises the converting percentage from 9% in 1928 to 10% in 1937, 11% in 1940 and 12% in 1948, to allow for the greater expenditure on the pay and upkeep of the Armed Forces and of wages of the personnel engaged in performing personal services.

4. Like the official index number of industrial production, the Soviet estimates of N.N.P. are subject to considerable upward bias, and for many of the same reasons. An additional source of exaggeration arises from the method of valuing food output. Whereas food consumed on the farm is valued at average wholesale prices, urban consumption is valued at retail prices which are much higher. With the rapid urbanization of the economy, the share of food consumed in the city increases and makes for a partially spurious rise in the value of agricultural production. But even if we are able to eliminate the more glaring of these defects we still have to resolve a serious problem of weighting. "The more growth there is to measure, the greater the structural shifts in the economy, the sharper the displacements in value relationships, and therefore the more pronounced the difference between using a weighting system pertaining to the beginning of the period under consideration, and one pertaining to the end of the period". (Grossman - see bibliography 2(i).

5. The following western estimates of Soviet income growth during the prewar period of rapid and intensive industrialization are illustrative of the weighting problem:
Nature of Estimate                                      | Compound Rate of Growth
---                                                       | 1928 - 37
Jasny (using 1926-27 prices as weights)                | 8% - 9%
Grossman (using 1937 factor cost as weights)          | 5%
Clark (using "international units")                   | 4.5%
Clark (using British prices of 1934 as weights)        | 5.5%
Wyler (using 1940 dollars as weights)                  | 5.6%
Soviet official estimate                                | 16.2%

6. It has been argued that one way to get around the weighting problem is to take the geometric mean of the Laspeyres and Paasche indices. Accordingly, the Soviet growth rate during 1928-37 falls between 6.5% and 7.0% per annum (using Jasny's estimate in 1926-27 prices and Grossman's estimate in 1937 prices).

7. Some unpublished calculations by Nove and Wiles suggest that the postwar (1948-53) rate of income expansion has been as high as or higher than the growth rate during 1928-37. This is so in spite of some retardation in the rate of industrial expansion. The effect of this retardation is offset by the fact that the industrial sector now accounts for a much higher share of national income. Whereas in 1928 industrial production was 28% of national income, now it is about 40%.

8. Official target rates of growth of industrial production and national income for the new Seven Year Plan (1959-65) suggest significant retardation compared to 1928-37 and the post reconstruction period. Western commentators have been expecting this deceleration for some time. They argue that the Soviet economy faces a severe labor shortage resulting from war casualties and an unusually low baby crop during the war and immediate postwar years. Although the total population will grow at a rate of 1.7% per annum, the ratio of workers to dependents will fall. Jasny estimates that the yearly net addition to the labor force will fall from 2.1 million in 1956 to 0.3 million in 1959 and 1960. In addition, the new plan promises a reduction in man hours worked per week.

D. Standard of Living in U.S.S.R.

1. On a per capita basis, personal consumption in U.S.S.R. is between 11% and 20% of per capita consumption in U.S.A. in 1955.

2. Available data regarding average real wages and salary earnings of Soviet urban workers for the period 1928-55 suggests that the improvement in living standards, if any, was of a marginal character. These calculations show that 1955 average real wages after taxes (and including the imputed value of education and health services) were in a range between 84% and 122% of 1928 real wages.

3. The following table summarizes data on per capita availability of consumer goods in U.S.S.R. in 1928 and 1955. In a number of cases, the availability in 1928 is underestimated (see A-3 above).
E. Soviet resource allocation and the pattern of investment

1. On the basis of earlier work done by Messrs. Bergson and Heymann, a study for the Joint Economic Committee has arrived at the following estimates regarding Soviet resource allocation:

<table>
<thead>
<tr>
<th>Year</th>
<th>Consumption</th>
<th>Gross Investment</th>
<th>Defense</th>
</tr>
</thead>
<tbody>
<tr>
<td>1928</td>
<td>72</td>
<td>23</td>
<td>3</td>
</tr>
<tr>
<td>1937</td>
<td>66</td>
<td>23</td>
<td>9</td>
</tr>
<tr>
<td>1940</td>
<td>64½</td>
<td>17</td>
<td>18</td>
</tr>
<tr>
<td>1944</td>
<td>49</td>
<td>13</td>
<td>36</td>
</tr>
<tr>
<td>1948</td>
<td>57</td>
<td>26</td>
<td>16</td>
</tr>
<tr>
<td>1950</td>
<td>59</td>
<td>23</td>
<td>15</td>
</tr>
<tr>
<td>1955</td>
<td>57</td>
<td>27</td>
<td>14</td>
</tr>
</tbody>
</table>

2. The diversion of resources to the military during 1928-37 and the Second World War was very largely at the expense of consumption. However, the defense mobilization during 1937-40 and the Korean crisis (not shown in the table) impinged on the investment sector.
3. Available data regarding the Soviet pattern of investment is summarized below:

(percentage of total investment)

<table>
<thead>
<tr>
<th>Sector</th>
<th>1928/29-32</th>
<th>1933-37</th>
<th>Postwar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industry</td>
<td>41</td>
<td>37</td>
<td>50</td>
</tr>
<tr>
<td>Agriculture</td>
<td>19</td>
<td>19</td>
<td>16</td>
</tr>
<tr>
<td>Transport</td>
<td>17</td>
<td>16</td>
<td>10</td>
</tr>
<tr>
<td>Housing</td>
<td>9</td>
<td>9</td>
<td>15</td>
</tr>
<tr>
<td>Other</td>
<td>14</td>
<td>19</td>
<td>9</td>
</tr>
</tbody>
</table>

4. It has been a central tenet of Soviet planning to give priority to the development of the producer goods sector (in Soviet terminology this sector is identical with heavy industry, i.e. minerals, fuel, energy, metals, engineering products, building materials and chemicals). According to a calculation of the Economic Commission of Europe, almost nine-tenths of gross fixed industrial investment during 1929-55 went into the producer goods sector. The share of producer goods in gross industrial production increased from 40% in 1928 to 71% in 1955 (Soviet official data).

5. In justifying the priority assigned to the development of heavy industry, Soviet theoreticians implicitly assume the framework of a closed economy. The argument typically takes the following forms:
   (i) the main avenue of increasing the efficiency of a backward economy is to make production mechanical and thus to increase over-all capital intensity. If imports are ruled out, this necessarily implies that a high premium will be placed on the expansion of the domestic capital goods industry, (ii) large-scale mechanized factory industry makes it easier to achieve and sustain a high rate of savings than small and decentralized units of handicraft production, (iii) a diversified base of producer goods industry is essential for defense and (iv) a well developed capital goods industry is necessary for the Soviet goal of assisting industrialization abroad - both within the Sino-Soviet camp and in the uncommitted nations.

6. The emphasis to be placed on heavy industry is a matter which has excited considerable controversy amidst Soviet planners. Some have argued that the strictly economic arguments for assigning priority to heavy industry are valid only in the early phases of industrialization when it is desired to raise the rate of growth of the over-all economy. Once this necessary momentum has been gained and the output of producer goods is sufficient to satisfy replacement needs and the requirements of new machines to expand capacity at a particular rate, it is no longer necessary to place relative emphasis on heavy industry. Assuming constant capital-output ratios, the new equilibrium growth rate can be sustained without a further relative expansion in the size of the producer goods sector. In fact, some evidence can be cited to show that in the early years of the Third Five Year Plan, this school of opinion had the upper hand. In 1937, whereas the output of producer goods industry increased by 8.5%, consumer goods increased by 15.2%. But this shift in policy was short-lived and the necessity of rearmament reintroduced the emphasis on heavy industry. A similar shift
towards consumer goods industry occurred during the 1950's after the economy had recovered its sizeable war losses. But the fall of Malenkov heralded another reversal and heavy industry re-established its primacy in Soviet developmental strategy. The new Seven Year Plan (1959-65) affirms this policy by fixing a target rate of 9.3% per annum for the output of producer goods compared to a growth rate of 7.3% per annum for consumer goods.

7. Barring sizeable disarmament, it does not seem likely that the Soviet pattern of investment will shift in favor of consumer goods, in the near future. Nevertheless, it may be interesting to speculate on the likely effects of such a shift on the over-all rate of growth of Soviet national income, assuming that the aggregate rate of investment is maintained at the existing level.

8. It can be plausibly argued that a diversion of investment in favor of light industry, i.e. textiles, footwear and food processing may exercise a favorable influence on income growth, at least for a time. This possibility arises from the fact that whereas the technological gap between Soviet and U.S. heavy industry has narrowed down considerably, it remains wide with respect to manufactured consumer goods. Consequently, future increases in the productivity of Soviet heavy industry will be less rapid than in the past. They will depend more on improvements in labor skills and managerial capacity as well as new innovations than on emulating and adapting existing American technology. In contrast, there remains a backlog of techniques which could be adopted in Soviet consumer goods industries. Calculations made by Galenson show that Soviet labor productivity in cloth manufacturing is only 23% of the U.S. level. In the shoe industry, productivity declined at the rate of 1.4% per annum during 1928-37 and has not improved perceptibly since then. In the sugar industry, postwar productivity is certainly less than one-quarter the U.S. level. In short, it would seem that the marginal productivity of Soviet investments is likely to be higher in the light industry sector than in the heavy industry sector for some time to come.

9. The expansion of light consumer manufacturing industry requires a simultaneous expansion of agricultural raw materials such as cotton and wool. These needs can be met either by increases in domestic agricultural production or by imports. It has been argued that over the last 30 years the Soviet Union has experienced a sharp shift in its comparative cost advantage vis-a-vis the rest of the world. The costs of fabrication (particularly in the producer goods sector) have fallen substantially relative to the costs of primary production. Consequently, it would be more profitable for the Soviets to import agricultural raw materials (and pay for them by exports of capital goods) rather than to produce them at home. However, there is no indication that the Soviets contemplate such a move. The present trade and credit program is not designed to realize these gains. (See Berliner - bibliography 15). If the Soviets insist on maintaining the autarkic character of their economy and supply conditions in agriculture are unfavorable (as some authorities claim), the potential productivity gains in light industry may be offset by diminishing returns in agriculture. Expansion of the domestic supply of raw materials is likely to prove a capital intensive operation involving reclamation of virgin lands, irrigation works, etc.
10. The composition of Soviet investment may be shifted in favor of urban housing in order to relieve the acute shortage (see D-3 above). This shortage is the result of a deliberate policy. The allocation of funds to housing has been grossly inadequate to cope with the demands of rapid urbanization. Housing investments absorbed nearly 30% of total U.S. investments during 1880-90 compared to 9% of total Soviet investments during 1928-37. This neglect of social overhead capital probably discouraged the inflow of rural labor into the cities. The rate of growth of the urban population dropped from about 6% per annum during the 1930's to about 2.5% per annum during 1939-56. The Soviets have already increased the share of housing investment (see E-3 above) in order to widen this bottleneck. They may be compelled to increase it further in order to stimulate the movement towards urbanization.* This diversion of resources to housing implies a temporary slowing down of the rate of growth of productive capacity. The capital-output ratio in housing is much higher than in other sectors of the economy.

* 57% of the population is classified as rural in Soviet official data for 1956.
BIBLIOGRAPHY


