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APPENDIX F

Official Soviet Data on Industrial Production

THE basic Soviet accounts of aggregate industrial production are kept in the form of gross value of industrial production, in both current and "constant" rubles. The comprehensive accounts have not been published for any year, and the few figures that have been made public refer to the interwar period. The data shown here (Tables F-1 and F-3) have generally been reconstructed from the few available figures, some derived indirectly, and published index numbers (Table F-2) or other relationships.

The nature of the Soviet production accounts has been carefully described elsewhere[1] and cannot be given satisfactorily in brief compass. The few notes written here are intended merely to highlight some of the considerations needed to interpret the assembled data.

Major Categories of Gross Production

Following Marxian doctrine, industrial products are broken down into two primary categories: Group "A" and Group "B," sometimes referred to rather inaccurately as "producer goods" and "consumer goods." The former represent goods—and some services—used to produce other goods; the latter, goods used to produce services in households and other "nonproductive" sectors of the economy (as education, health services, government). This formal dichotomy leaves room for trouble in deciding where specific items should be entered, and we know from the Soviet literature on the subject that a number of arbitrary decisions are made. In the absence of detailed published accounts, we are left in the dark, however, on how some of the more important issues are resolved.

For example, where are military products recorded? In principle, they would seem to belong in Group "B," but they could hardly have been recorded there as late as 1945 since they undoubtedly exceeded "B" goods in gross value that year (see Table F-1). As we shall discuss further below, some important changes were apparently made in the production accounts at the time of the shift from "1926/27" prices to "1952" prices, and the change in the gross value for machine building, taken together with the data on "tools of labor" (*orudiia truda*), suggests

[1] See, e.g., an excellent article by Alec Nove (*538*). See also our discussion of official production indexes in Chapter 5 and the references given there.

TABLE

SELECTED OFFICIAL DATA ON VALUE OF GROSS PRODUCTION[a]

	"1926/27" Prices							
	1913	1928	1932	1937	1940	1945	1946	1950A
1. All industry	16.4	21.6	43.7	96.2	139.3	128.0	106.9	241.7
2 Group "A"	5.5	8.5	23.3	55.6	85.3	95.8	70.4	175.0
3. Group "B"	10.9	13.1	20.4	40.6	54.0	32.2	36.5	66.7
4. Large-scale industry	11.1	16.9	39.0	90.5	130.0	120.4	98.5	229.0
5. Small-scale industry	(5.3)	(4.7)	(4.6)	(5.7)	(9.3)	(7.6)	(8.1)	(12.7)
6. Machine building and metalworking	1.3	2.4	9.7	27.5	48.4	62.4		104.0
7. Machine building		1.4	7.4	22.7	40.3	52.8		94.3
8. Metal products		0.8	(1.7)	(2.6)	(8.1)	(9.6)		(9.7)
9. Repair shops		0.2	0.6	2.2				
Group "A"								
10. Tools of labor[c]								
11. Materials[d]								
12. Category I								
13. Category II								
14. Military products[e]				8.5	24.6	(44.6)	(6.8)	(17)

Figures in parentheses are residuals or indirect estimates.

Sums and detail may not agree because of rounding.

[a] Excludes turnover taxes, except those levied on industrial materials consumed within industry. See Table F-3 and text.

[b] Prices of January 1, 1952, and July 1, 1955, with important exceptions. See text.

[c] *Orudiia truda.* This seems to be machinery and equipment plus repair shops minus

F-1

IN SOVIET INDUSTRY, BENCHMARK YEARS (billion rubles)

"1952" Prices[b]			"1955" Prices[b]			
1950B	1953	1955A	1955B	1956	1957	1958
(451)	(655)	(834)	(766)	(847)	(932)	(1,030)
(310)	(453)	(589)	(540)	(600)	(664)	(740)
(141)	(202)	(248)	(226)	(247)	(268)	(290)
(192)	(302)	(417)	(384)	(436)	(494)	(562)
(73)	(123)	(177)	(163)	(190)	(221)	(253)
(107)	(179)	(223)	(205)	(246)	(273)	(309)
(12)		(17)	(16)			
(81)	(131)	(183)	(167)	(198)	(232)	(266)
(229)	(322)	(406)	(373)	(402)	(432)	(474)
(149)	(213)	(271)	(248)	(264)	(286)	(311)
(81)	(109)	(135)	(124)	(138)	(146)	(163)
(16)	(39)	(44)	(42)			

consumer durables. If this interpretation is correct, the latter would be about 4 billion rubles for 1950 and about 12 billion for 1955, in "1952" and "1955" prices, respectively.

[d] *Predmety truda.*

[e] Estimated earmarked expenditures on military products, excluding such things as atomic energy. Over 1950–1955, estimates are probably too high in view of recent information (see annex to technical note 3, Appendix A).

NOTES TO TABLE F-1

Line 1

1913–1950A: Value in 1933 (45,955 million rubles as given in *241*, 7–11, and *362*, 1935, No. 7, 41–49) extrapolated by index (see Table F-2 and, for 1933, *180*, 32).

1955A, B: Gross production less turnover taxes (800 billion current rubles from Table F-3) corrected by price index. We assume that half the volume of production occurred before July 1, 1955, when the "1955" prices became effective. Since "1955" prices were apparently 0.92 of "1952" prices when properly weighted (*580*, 1956, 1-4), gross industrial production may be estimated as follows (billion rubles):

	Current Prices	"1952" Prices	"1955" Prices
First half, 1955	417	417	383
Second half, 1955	383	417	383
Total	800	834	766

1950B, 1953: 1955A extrapolated by index (see Table F-2).

1956–1958: 1955B extrapolated by index (see Table F-2). The figure for 1958 checks roughly with the statement by Khrushchev, *364*, 1/28/59 (*451*, XI, 3, 6) that an increase in gross industrial production by 1% in 1959 would amount to more than 11 billion rubles.

Lines 2 and 3

1913–1940, 1946, 1950B–1955: Line 1 times percentages in *180*, 13.

1945, 1950A: 1932 extrapolated by index in *180*, 33. See text for reason in case of 1950A.

1956–1958: Line 1 times percentages in *141*, 147.

Line 4

1928–1950A: 1932 extrapolated by index (see Table F-2). 1932 derived from 1933 value (42,261 million rubles as given in *241*, 7–11) and 1933 as per cent of 1932 (105% as given in *180*, 33).

Line 5

1928–1950A: Residual, all industry (line 1) minus large-scale industry (line 4).

Line 6

1913–1932, 1940–1950A: 1937 extrapolated by index (see Table F-2).

1937: *490*, 86.

1955A, B: Machine building and metalworking are stated (*34*, 35) to account for about 50% of gross industrial production in 1954–55. This figure is explicitly identified as an estimate. The same source gives the share for 1940 as 31%, which is less than our implied estimate of 35% or the figure of 36.3% given by Voznesensky (*292*, 45). It may be that repair shops are excluded in the Soviet estimate.

1950B, 1953: 1955A extrapolated by index (see Table F-2).

1956–1958: 1955B extrapolated by index (see Table F-2).

Line 7

1928: 1928/29 in current prices from Table C-2. This year is used because current data for it are consistent with the implied official 1928 figure for machine building and metalworking in "1926/27" prices. The alternative would have been to

estimate a current value for 1928 and translate it into "1926/27" prices. Both adjustments would have been largely arbitrary.

1932: Large-scale value multiplied by ratio of total to large-scale in 1933. For basic data, see *467*, 340, series excluding repair shops.

1937: Large-scale value (*467*, 340) plus estimated small-scale value. The latter (565 million rubles) is taken to be 10.0 per cent of total value of small-scale industry, the percentage for 1933. For 1933 data on small-scale sectors, see *467* and *362*, 1935, No. 7, 41–49.

1940: Machine building and metalworking times 0.833, interpolated ratio between 1937 and 1941 Plan. For 1941 Plan data, see *490*, 181.

1945–1950A: 1940 extrapolated by index (see Table F-2).

1950B, 1953: 1955A extrapolated by index (see Table F-2).

1955A: Taken as same ratio to line 6 as for 1955B.

1955B–1957: 1958 extrapolated by index (see Table F-2).

1958: Based on line 1 and statement (*410*, 1959, No. 8, 11) that machine building accounted for 25% of gross industrial production.

Line 8

1928: 1928/29 from Table C-2. See line 7, same year.

1932 and 1937: Residual, line 6 minus lines 7 and 9.

1940–1950A, 1953, 1956–1958: Residual, combined with repair shops, line 6 minus line 7.

1950B, 1955; Combined residual (line 6 minus line 7) for metal products and repair shops distributed on the basis of the following indexes of gross production (*180*, 203):

	1955 as Per Cent of 1950
Metal products	209
Repair shops	141

Line 9

1928–1937: *467*, 340. Difference between series including and excluding repair shops.

1940–1958: See line 8.

Line 10–13

1950B–1957: Group "A" (line 2) broken down by percentage distribution (*180*, 13; *141*, 148; and *141a*, 149).

Line 14

1937: Table A-9, note to 1937.

1940: Estimated value in current rubles (31.0 billion from Table A-9) divided by 1.26 (see same table, note to 1937).

1945–1950A: Estimated value in current rubles, assumed to be the same as "1926/27." From Table A-9, col. 2.

1950B, 1953, 1955A: Estimated value in current rubles (Table A-9) deflated by price index for basic industrial materials (estimate A, Table A-10).

1955B: From Table A-9, col. 2.

TABLE F-2

SELECTED OFFICIAL INDEXES OF GROSS PRODUCTION IN SOVIET INDUSTRY, BENCHMARK YEARS

	1913	1928	1932	1937	1940	1945	1946	1950	1953	1955	1956	1957	1958
						INDEX (1928 = 100)							
1. All industry	76	100	202	446	646	593	495	1,119	1,626	2,069	2,288	2,517	2,776
2. Group "A"	65	100	273	652	1,000	1,122	824	2,049	2,992	3,895	4,335	4,812	5,361
3. Group "B"	83	100	156	311	415	246	279	510	736	899	982	1,063	1,149
4. Large-scale industry	66	100	232	537	771	714	584	1,355	2,004	2,576			
5. Small-scale industry	(113)	(100)	(98)	(121)	(198)	(162)	(172)	(270)					
6. Machine building and metalworking	56	100	399	1,128	1,982	2,553		4,252	6,699	9,235	10,505	11,892	13,533
7. Machine building		(100)	(529)	(1,621)	(2,879)	3,771		6,737	11,401	16,439	19,174	22,312	25,503
8,9. Metal products and repair shops		(100)	(230)	(480)	(810)	(960)		(970)	(1,500)	(1,960)	(2,010)	(2,230)	(2,524)
						INDEX (1950 = 100)							
Group "A"	3.2	4.9	13	32	49	55	40	100	146	190	212	235	263
10. Tools of labor								100	(160)	227	(270)	306	354
11. Materials								100	(140)	177	(190)	211	231
12. Category I								100	(150)	183	(200)	219	242
13. Category II								100	(130)	167	(190)	197	213
14. Military products				(50)	(210)	(265)	(40)	100	(244)	(275)			
Group "B"	16	19	31	61	81	48	55	100	144	176	193	209	225
15. Light industry	14	21	31	54	89			100	143	178	190	200	216
16. Food industry	22	22	35	67	103			100	138	160	175	192	203

Note: In some cases, published indexes with differing base years have been linked together. Figures in parentheses have been derived from estimates of gross production (see Table F-1), and not from official indexes. For notes on coverage, see Table F-1.

NOTES TO TABLE F-2

Line 1

1913:	*180*, 9.
1928–1955:	*180*, 32.
1956–1957:	*141*, 60. Index with 1913 = 100.
1958:	*141a*, 141. Index with 1913 = 100.

Lines 2 and 3

1913:	*180*, 9.
1928–1955:	*180*, 32.
1956–1957:	*141*, 60. Index with 1913 = 100.
1958:	*141a*, 141. Index with 1913 = 100.

Line 4

1913–1955:	*180*, 31.

Line 5

1913–1950B:	Derived from gross production estimates in Table F-1.

Line 6

1913:	*180*, 203.
1928–1950, 1955:	*180*, 10.
1953, 1956–1957:	*141*, 52 f, 229. Index with 1913 = 100.
1958:	*141a*, 146. Index with 1940 = 100.

Line 7

1928–1940:	Derived from gross production estimates in Table F-1.
1945–1955:	*180*, 203. Index with 1940 = 100.
1956–1957:	*141*, 135. Index with 1940 = 100.
1958:	*141a*, 146. Index with 1940 = 100.

Line 8 and 9

1928–1958:	Derived from gross production estimates in Table F-1.

Line 10–13

1950, 1955:	*180*, 13.
1953, 1956:	Derived from gross production estimates in Table F-1.
1957:	*141*, 148.
1958:	*141a*, 149.

Line 14

1937–1955:	Derived from gross production estimates in Table F-1.

Lines 15 and 16

1913–1937:	*180*, 319, 367. Index with 1955 as per cent of these years.
1940–1957:	*141*, 139 f. Index with 1940 = 100.
1958:	*141a*, 146. Index with 1940 = 100.

TABLE F-3

ESTIMATED SOVIET INDUSTRIAL PRODUCTION ACCOUNT, 1955
(billion current rubles)

1.	Gross production	1,040
2.	Turnover taxes	242
3.	Profits (incl. subsidized losses)	72
4.	"Commercial" outlays and misc. charges	27
5.	Production outlays	700
6.	Cost of materials consumed	530
7.	Raw and basic materials	420
8.	Auxiliary materials	38
9.	Fuel	31
10.	Power	13
11.	Amortization	24
12.	Employee compensation (incl. social insurance deductions)	150
13.	Unallocated outlays	22
14.	Net production	500
15.	Turnover taxes	242
16.	Profits (incl. subsidized losses)	72
17.	Net "commercial" outlays and misc. charges	21
18.	Employee compensation (incl. social insurance deductions)	150
19.	Net unallocated outlays	17

General Note: Sums and detail may not be consistent because of rounding. The concepts of gross and net production are intended to be those on a "commercial cost" basis outlined by Nove in *538*. We are also indebted to Nove for bringing important source materials to our attention, as indicated below.

Line 1: Net production (line 14) divided by its share in gross production (given as 0.48 by Notkin in *410*, 1956, No. 9, 6). From the context it seems clear that Notkin refers to magnitudes in "realized" prices, i.e., including turnover taxes. He also seems to refer to current prices, since he gives national income as 50% of aggregate social product, a fraction identified elsewhere (*363*, 1957, No. 8, 76) as applying to current prices. Gross production as derived here is not entirely consistent with the statement (*364*, 5/31/57) that Ukrainian gross production (preliminarily estimated as 177 billion in *365*, 1/19/56) was "almost a fifth" of Soviet gross production. These sources were brought to our attention by Nove.

Line 2: *141a*, 799. We assume all turnover taxes are assigned to industry in official Soviet national income accounts. Note that some of these taxes are double-counted to an unknown extent in lines 4, 6–11, and 13, since turnover taxes are levied on some of the intermediate products consumed within industry.

Line 3: Sum of net profits of state enterprises and industrial cooperatives (*141a*, 799) plus estimate of 5 billion rubles for subsidized losses. The latter seems consistent with estimates of subsidized losses in *491*, 143.

Lines 4–13: Mutually determined on the basis of the following relations. Production outlays (P) plus "commercial" outlays (C) are equal to gross production minus the sum of turnover taxes and profits. Employee compensation (E) plus "commercial" and unallocated outlays (U), both net of materials consumed, are equal to net

that military products may have been transferred at that time to Group "B."

Recent statistical sources have published a percentage breakdown of Group "A" goods into tools of labor and materials of labor (*predmety truda*), the latter being further broken down into materials used in making "A" goods (materials of category I) and "B" goods (materials of category II). The classification "tools of labor" apparently covers machinery and equipment (including repairs carried out in repair shops) except consumer durables. Most military equipment may also be excluded, as noted below. This interpretation is supported by the movement of the Group "B" official production index relative to the official indexes for the light and food industries.

Another major category for which data on gross production can be reconstructed is "machine building and metalworking." This category overlaps all the others discussed to this point. Its three main subdivisions are machine building, metal products, and repair shops. Machine building apparently includes machinery and equipment of all kinds—hence both "A" and "B" goods—except that, as we have noted, military

Notes to Table F–2 (continued)

production minus the sum of turnover taxes and profits (*538*, 265 f). For unallocated outlays, materials consumed are taken in Soviet statistics as 24% of the outlays (*538*); we assume the same percentage holds for "commercial" outlays. The percentage distribution of production outlays is given (*180*, 29) for cost of materials (M) and its components, employee compensation, and unallocated outlays. Hence we have the following equations whose solution is given in the body of the table:

$$P + C = 725 \text{ billion rubles}$$
$$E + 0.76\,(C + U) = 185 \text{ billion rubles}$$
$$M = 0.757\,P$$
$$E = 0.212\,P$$
$$U = 0.031\,P$$

It should be noted that all items involving materials (lines 4, 6–11, and 13) include such turnover taxes as were levied on those materials, with an unknown extent of doublecounting.

Line 14: Estimated national income (928 billion rubles) times 0.54, the fraction accounted for by industry (*363*, 1957, No. 8, 76 f). National income is Nove's estimate of 1,100 billion rubles for 1957 (based on seemingly firm evidence summarized in *538a*) extrapolated to 1955 by the official index (*141*, 95). Since the latter is in terms of "constant" prices, this calculation is subject to undeterminable error.

Lines 15, 16, and 18: Lines 2–4 and 12.

Lines 17 and 19: 76% of lines 4 and 13.

equipment may have been removed at the time of the shift from "1926/27" to "1952" prices and placed with metal products. Metal products also fall into both "A" and "B" categories, and they include intermediate materials as well as final products. Finally, repair shops are apparently those specialized establishments that repair and rebuild machinery and equipment of various kinds; the value of their activity seems to be counted entirely within the "A" category.

For some years, statistics can also be broken down for large- and small-scale industry. This classification is explained in some detail in Chapter 7, and it seems better to refer to that discussion than to attempt a brief and inadequate summary.

Role of Turnover Taxes

A special problem in interpreting Soviet data on the value of industrial output is created by the treatment of turnover taxes, which have their primary incidence on "B" goods. According to established Soviet doctrine, turnover taxes—including those levied on agricultural products —represent the product of all industry that is transferred to the state, being collected for financial convenience from certain industries. In national product accounts, turnover taxes are therefore included in the product attributed to industry. A case in point is the total gross production shown in line 1 of Table F-3, which also includes an undeterminable amount of double counting of turnover taxes to the extent that they are levied on intermediate products consumed within industry. That is to say, some of the turnover taxes (line 2 of Table F-3) attributed to the gross production of industry are already included, perhaps several times, in the gross production "net" of turnover taxes (line 1 minus line 2) to the extent that they appear in the prices of intermediate products consumed within industry.

In internal industrial accounts, gross production is recorded "net" of turnover taxes, in the sense just explained. That is, output of each good is evaluated at its price net of the turnover tax levied on it, so that turnover taxes are included only to the extent that they are levied on materials consumed within industry. For example, the gross value of shoes does not include the turnover tax on shoes, but it does include any turnover tax on the leather used in making shoes—and on things used in making leather, and so on. The gross production of industry used in these accounts would be the sum of lines 3–5 in Table F-3. The accounts reconstructed in Table F-1 and F-2 were presumably calculated in this way, except that they are expressed in "constant" prices.

Net Production

The net production of industry, though calculated by Soviet statisticians as part of national income, has not been published since the mid-thirties, and it cannot be derived from the accounts thus far discussed. Using indirect procedures, we have estimated net production, as defined in Soviet national income accounts, for 1955 in current rubles (Table F-3). The Soviet concept of net production differs somewhat from the U.S. concept of value added in that the former is net of amortization charges, but these charges are generally small, much smaller than depreciation calculated under U.S. accounting practices. A more important difference arises from the inclusion of turnover taxes in the Soviet concept. While it is true that business taxes are also included in U.S. value added, they are relatively so much smaller that they are not at all comparable.

The comparability of Soviet net production with U.S. value added is perhaps best examined by considering the share of employee compensation in each. For 1955, employee compensation accounted for 55 per cent of value added in U.S. manufacturing; if income of unincorporated enterprises is added to employee compensation, the fraction is 56 per cent.[2] We see from Table F-3 that employee compensation accounted for only 30 per cent of Soviet net industrial production in the same year if turnover taxes are included, but for 58 per cent if they are excluded. For Soviet net production including turnover taxes to be comparable with U.S. value added in coverage, the share of production attributable to capital would have to be half again as large in the Soviet Union as it is in the United States, which seems unlikely. It would therefore seem that value added as measured in the United States is approximately equivalent to Soviet net production excluding turnover taxes, or at least a very large part of them.[3]

Industrial Production Account for 1955 in Current Rubles

The production account in Table F-3 is erected, by means of various internal relations revealed here and there in the Soviet literature, on independent estimates of net production, profits, and turnover taxes.

[2] *649*, 1958, 493, 774.

[3] In a recent article, Academician S. G. Strumilin presents some estimates of net production for industry in "1926/27" prices (see *256a*, 233–242). Among other things, it is interesting to note that he considers employee compensation to be 57 per cent of net production, a fraction he treats as constant over the Plan period, and net production in 1955 to be 30.6 per cent of gross production. If gross and net production are both taken as excluding turnover taxes, the corresponding fractions derived from Table F-3 are 58 and 32.3 per cent.

Thus, net production is derived as a percentage of national income; gross production is derived as a percentage of net production; and the items within gross production (except, of course, profits and turnover taxes) are mutually derived from a set of relations explained in that table.

If the production account has been properly reconstructed (there is room for error), our interpretation of the Soviet treatment of turnover taxes outlined above seems to be confirmed. Note that net production is estimated at about 500 billion rubles, and that the gross production of about 1,040 billion rubles is derived from net production. Similarly, cost of materials is derived from gross production minus turnover taxes and profits. Both net and gross production are known to include turnover taxes, but it is not entirely clear from Soviet sources to what extent those taxes are included. This seems to become clear from the reconstructed production account. If we subtract from net production the total amount of turnover taxes paid to the government, we are left with 258 billion rubles. Similarly, if we subtract the same amount from gross production, we derive the cost of materials as 536 billion rubles. Gross production then consists of the following items (billion rubles):

Net production excluding turnover taxes	258
Cost of materials consumed in "commercial" and production outlays	536
Turnover taxes	242
Total (rounded)	1,040

The three items are consistent with each other, and this would not be the case if only a fraction of turnover taxes were considered as included in net and gross production: the total derived here would come out larger than the independently derived 1,040 billion rubles, because cost of materials would be larger.

It is very difficult to check the accuracy of the reconstructed account in any other way, since, to our knowledge, none of the components has been independently published. A partial check is provided by various indirect estimates of employee compensation, usually in the form of average annual or hourly earnings, made by Soviet and Western economists; but they extend over a wide range, often apply to the wrong year, and usually cover a broader sector of the economy than industry alone. In other words, they do not seem to be inherently more reliable than the estimate that we have reconstructed. It is nevertheless important to see how they compare with ours.

On the Soviet side, Academician Strumlin has estimated that average hourly earnings, apparently in industry only, were 4 rubles an hour around 1955.[4] This implies aggregate employee compensation of 160 to 170 billion rubles (see our estimate of annual hours worked in Table A-23), or 10 to 20 billion more than our estimate. On the Western side, a figure somewhat lower than this is implied by Janet Chapman's estimate that 1952 average annual earnings of workers and employees were 8,050 rubles in the nonagricultural sector and 7,800 rubles in the economy as a whole,[5] if we assume that the average had not changed significantly by 1955 and that it applied to the 17.4 million wage and salary earners, with the 2 to 3 million other workers—members of producer cooperatives and collective farms—earning substantially less (for employment data, see Table C-1). An even lower figure for aggregate employee compensation, perhaps about equal to ours, is implied by the BLS estimate that average annual earnings of all workers and employees was about 7,200 rubles in 1953.[6] Finally, a figure below ours is implied by Solomon Schwarz's estimate of 5,200 to 5,400 rubles for average annual earnings of all workers and employees in 1951.[7] It therefore seems that our estimate of employee compensation is bracketed by those made by prominent scholars in the field of Soviet labor.

Data in "Constant" Prices

Since the characteristics of Soviet gross production in "constant" prices are discussed in Chapter 5, we shall confine ourselves here to a few comments on some of the apparent revisions made in the series on two occasions, when the system of price weights was changed. Through 1950 the series was expressed in so-called "1926/27" prices. For the succeeding two years, it was temporarily extended by a link based on current prices, a revised link being calculated later when 1952 prices were adopted as the unit of measure. The data continued to be expressed in "1952" prices through 1955, when a new link was established using "1955" prices. The latter have continued in effect up to the present.

From internal evidence it is seen that Soviet production accounts were substantially revised in connection with the shift from "1926/27" to "1952" prices, though the exact nature of the revision can only be surmised. We note, first of all, that for 1950 the percentage breakdown of gross production into "A" and "B" goods is different in the two sets of

[4] In *367*, 11/4/54, as cited in *529a*, 361.
[5] *441*, 144.
[6] *529a*, 361.
[7] *555a*, 253.

prices. This may be seen by comparing published index numbers for "A" and "B" goods based on "1926/27" prices with the published percentage breakdown of gross production into the two categories.[8] For benchmark years within the period 1913–1946, the two sets of data are consistent; that is, the same values of gross production are derived for "A" and "B" goods either by extrapolating base figures by the indexes or by multiplying total gross production by the given percentages. For 1950, two different sets of figures are derived as follows (billion "1926/27" rubles):

	From Indexes	*From Percentage Breakdown*
Group "A"	175.0	166.3
Group "B"	66.7	75.4
Total	241.7	241.7

Since the figures derived from indexes based on "1926/27" prices sum to the known total for gross industrial production in "1926/27" prices, we may infer that the percentage breakdown implied by those figures (72.4 and 27.6 per cent) refers to values in "1926/27" prices, while the published percentage breakdown underlying the figures in the second column above (68.8 and 31.2 per cent) refers to values in "1952" prices.

The question next arises whether this revision reflects merely changes in relative prices—a raising of "B" prices relative to "A" prices—or a reclassification of goods as well. There is some internal evidence to suggest that the latter may have been the case, if the reconstruction of accounts in Table F-1 is essentially correct. Note that, according to those reconstructed data, the gross production of machine building in 1950 was reduced from 94 to 73 billion rubles, or by 21 billion rubles, while the gross production of metal products and repair shops was raised from 10 to about 120 billion rubles, or by 110 billion rubles. Although there is good reason to believe that the gross value of machinery and equipment in "1926/27" rubles was not less than the gross value in either current or "1952" rubles, it seems unlikely that the former actually exceeded the latter by 29 per cent, as would be implied if the entire adjustment were in prices alone.

A possible and plausible explanation is that conventional military products formerly classified under machine building were transferred to metal products and that the prices of machinery and equipment were not

[8] *180*, 9–13, 31–33; *141*, 60, 137.

changed. Our estimate of 1950 expenditures on conventional military products in current rubles, about the same as "1926/27" rubles, is 17 billion rubles, which differs insignificantly from the calculated 21 billion rubles by which machine building was reduced in view of probable estimating errors and of double counting in the latter item. If this explanation seems reasonable, one may also infer that military products were simultaneously shifted from "A" to "B" goods, because the values for machine building and tools of labor are consistent in "1952" prices (see Table F-1), and also because the official index for "B" goods shows a sharper rise over most years after 1950 than either of the indexes for the component light and food industries, a condition that does not apply to the prewar period (see Table F-2). Following these suppositions, we could reconstruct the 1950 accounts in "1926/27" prices to make them approximately comparable in coverage with those in "1952" prices. This is done in the following table (billion rubles for 1950):

	"1926/27" Prices	*"1952" Prices*
Group "A"	154	310
Tools of labor	81	81
Materials	73	229
Group "B"	88	141
Machine building	73	73
Metal products and repair shops	31	119

We may now compare the price changes for 1950 implied by these revised accounts with those implied by the accounts as given in Table F-1:

	Value in "1952" Prices as % of Value in "1926/27" Prices	
	Accounts in Table F-1	Revised Accounts
Group "A"	177	201
Tools of labor	71	100
Materials	376	314
Group "B"	211	160
Machine building	71	100
Metal products and repair shops	1,227	384

For the first column, we have taken the implied price change for machine building as applying to tools of labor as well, and from this we have

derived a value in "1926/27" rubles for both the latter and materials (114 and 61 billion rubles, respectively). The pattern of price changes seems to be more plausible and consistent in the second column than in the first. It seems particularly odd and inconsistent to find the price level for metal products and repair shops shown as multiplying twelve times, while the price level for machine building—a related classification—is shown as declining and that for materials—another related classification—as multiplying less than four times. We conclude that some reclassification of products, such as supposed for the second column, took place in connection with the shift from "1926/27" to "1952" prices.

In passing, we should note one important difficulty in comparing data for machine building and metalworking with data for military products. The former refer to gross value and hence include double counting of products to the extent that enterprises classified within that category specialize in particular stages for fabrication. The latter refer to expenditures on end products only and hence exclude double counting. We may presume that industrial specialization has increased over the years so that there has been an upward trend in double counting. The figures as given therefore understate the relative importance of military production more for 1955 than for 1950 or earlier years. It may even be that some of the increase in gross production of metal products that accompanied the shift from "1926/27" to "1952" prices is attributable to a reorganization of statistical recording of output leading to more double counting.

We should also note that atomic energy is probably included in the category of machine building, since it is administratively organized under a special Ministry for Medium Machine Building. Inclusion of atomic energy, together with growing specialization, could help to explain the fact that gross production in machine building shows a much sharper percentage rise between 1950 and 1955 than can be accounted for by civilian machinery (see the indexes in Table A-8).

By contrast, the change-over from "1952" to "1955" prices seems to have involved few adjustments. For one thing, there was no change in the relative prices of "A" and "B" goods. This is shown by the fact that the published percentage breakdowns for 1955 and later years coincide with the ones derived from production indexes. We therefore infer that values for "A" and "B" goods were multiplied by the same factor (0.92) in shifting from "1952" to "1955" prices.[9]

[9] Two sources (*580*, 1956, 1–4; and *423*, 56 f) suggest that prices fell more relatively for "A" than for "B" goods. If this was so, as it well may have been, Soviet statistical authorities apparently did not adjust the accounts for 1955 accordingly.

Early Data on Machinery

The data for large-scale production of machine building in the late 1920's, as published in the interwar period, apparently included metal products as well as machinery and equipment, as may be seen by comparing those data[10] with figures taken from our Table C-2 (million rubles):

	Machine Building		
	Interwar Sources, "1926/27" Prices	Table C-2, Current Prices	Machine Building and Metal Products, Table C-2, Current Prices
1926/27		925	1,369
1927	1,226		
1927/28		917	1,431
1928	1,545		
1928/29		1,352	1,936
1929	2,117		

Since wholesale industrial prices fell gradually and slightly during the years in question,[11] the figures in the first column seem to refer to the same products as those in the third. The apparent inclusion of metal products in the early official figures may explain why no index for machine building is given in postwar statistical sources for years before 1940.

Annex: Data Published in 1960

The Soviet statistical handbook published in 1960[12] contains some important information on industry that, because of its late appearance, could not be carefully analyzed and integrated into this study, though minor revisions were made where possible and appropriate. We present here, with a brief commentary, some additional data bearing most directly on the estimates of gross and net industrial production given in the main body of this appendix.

For the first time in postwar years, a percentage breakdown has been given for gross social product and national income, both according to their Soviet definitions. These breakdowns may be combined with other information in a recent speech by Khrushchev to reproduce estimated

[10] *467*, 340, series excluding repair shops.
[11] See *498*, 784.
[12] *141a*.

absolute magnitudes for 1959 in "1958" rubles (see Table F-4). The resulting estimates for gross and net industrial production are derived essentially independently of each other, enabling us to construct a

TABLE F-4

OFFICIAL DATA ON SOVIET GROSS SOCIAL PRODUCT AND NATIONAL INCOME, 1959

	Per Cent		*Billion "1958" Rubles*	
	Gross Social Product	National Income	Gross Social Product	National Income
Total	100.0	100.0	2,430	1,330
Industry	61.3	52.7	1,490	700
Agriculture	17.5	20.9	425	280
Construction	10.5	10.2	255	135
Transportation and communication	4.1	4.8	100	60
Others	6.6	11.4	160	90

GENERAL NOTE: The percentage distributions are given in *141a*, 78. The fact that the accounts are in "1958" rubles is indicated in *141a*, 829. The items for gross social product in rubles are derived from gross industrial production (including turnover taxes) and the percentage distribution; the items for national income in rubles, from total national income and the percentage distribution. Gross industrial production was said by Khrushchev in his speech of May 5, 1960, to the Supreme Soviet (*451*, XII, 18, p. 11) to be "already approaching 1,500 billion rubles." National income is derived from the following information in the same source: (a) the increase in 1959 was 8 per cent or 100 billion rubles (p.11); and (b) national income planned for 1960 is about 1,450 billion rubles, an increase of 9 per cent (p. 5). We have interpreted the following statements in the same source as applying to gross industrial production *net* of turnover taxes: (a) "a rise in labor productivity of just 1 per cent in the current year [1960] would yield the country's industry as a whole additional output of almost 13,000,000,000 rubles" (p. 11); and (b) the increase in 1959 was more than 11 per cent instead of the planned 7.7 per cent, or 50 billion rubles more than planned (p. 5).

seemingly more reliable production account for 1959 (see Table F-5) than for 1955. On the basis of those two accounts, one can compare percentage increases in official figures for gross and net industrial production.

In current prices ("1958" prices for 1959), gross production excluding turnover taxes rose by 48 per cent over 1955–1959 (Tables F-3 and F-5). This is about the same as the growth of 49 per cent shown by the official index in "1955" prices,[13] which provides some ground for confidence in this part of the reconstructed accounts. Net production excluding turnover taxes rose by 51 per cent, or somewhat more. (Net production

[13] *141a*, 141, 145.

including turnover taxes rose by 40 per cent, or substantially less.) However, there was a significant shift in the structure of net production over this period, the percentage share rising for profits and falling for

TABLE F-5
ESTIMATED SOVIET INDUSTRIAL PRODUCTION ACCOUNT, 1959
(billion current rubles)

1.	Gross production	1,490[a]
2.	Turnover taxes	311
3.	Profits (incl. subsidized losses)	130
4.	"Commercial" outlays and misc. charges	60
5.	Production outlays	990
6.	Cost of materials consumed	770
7.	Raw and basic materials	630
8.	Auxiliary materials	48
9.	Fuel	36
10.	Power	17
11.	Amortization	35
12.	Employee compensation (including social insurance deductions)	190
13.	Unallocated outlays	32
14.	Net production	700[a]
15.	Turnover taxes	311
16.	Profits (incl. subsidized losses)	130
17.	Net "commercial" outlays and misc. charges	46
18.	Employee compensation (including social insurance deductions)	190
19.	Net unallocated outlays	24

[a] "1958" rubles.

GENERAL NOTE: See general note to Table F-3.

Line 1: From Table F-4.

Line 2: *141a*, 799.

Line 3: Sum of net profits of state enterprises and producer cooperatives (*141a*), plus estimate of 5 billion rubles for subsidized losses.

Lines 4–13: See Table F-3, same lines. Percentage distribution of productive outlays from *141a*, 161. The following equations are solved simultaneously:

$$P + C = 1{,}049 \text{ billion rubles}$$
$$E + 0.76\,(C + U) = 259 \text{ billion rubles}$$
$$M = 0.775\,P$$
$$E = 0.193\,P$$
$$U = 0.032\,P$$

Line 14: From Table F-4.

Lines 15, 16, and 18: Lines 2–4 and 12.

Lines 17 and 19: 76% of lines 4 and 13.

turnover taxes and employee compensation. Such a change could have been effected solely for fiscal convenience—for example, to facilitate a switch from turnover to profits taxes—and may have no relation to economic factors. Employee compensation accounted for 58 per cent of net production (excluding turnover taxes) in 1955 but for only 49

per cent in 1959. Put another way, employee compensation rose by only 27 per cent while net production (excluding turnover taxes) rose by 51 per cent. Under such circumstances, it is hardly possible to know what is a proper measure of net production. Incidentally, the figure of 190 billion rubles for employee compensation in 1959, if more or less accurate, suggests that the figure of 150 billion rubles for 1955 is not seriously in error.

The latest statistical handbook also publishes the results of the large-scale revaluation of capital in the Soviet economy at replacement cost as of January 1, 1960.[14] We may note here that the replacement cost of industrial capital (including inventory but excluding land, depreciated assets, and fiduciary assets) comes to about 600 billion rubles.[15] Unfortunately, this figure cannot be directly compared with estimates of capital in U.S. industry[16] because of important differences in the definition of capital.

[14] *141a*, 65 ff.
[15] *141a*, 67, 75.
[16] See, e.g., *614a*.