

This PDF is a selection from an out-of-print volume from the National Bureau of Economic Research

Volume Title: Studies in Income and Wealth

Volume Author/Editor: Conference on Research in Income and Wealth.

Volume Publisher: UMI

Volume ISBN: 0-870-14163-5

Volume URL: <http://www.nber.org/books/unkn46-2>

Publication Date: 1946

Chapter Title: PART EIGHT Methods of Estimating National Income in Soviet Russia

Chapter Author: Paul Studenski

Chapter URL: <http://www.nber.org/chapters/c5699>

Chapter pages in book: (p. 195 - 234)

PART VIII

Methods of Estimating
National Income in Soviet Russia

PAUL STUDENSKI
New York University

Acknowledgment is due Julius Wyler, Jacob Marschak, S. M. Schwartz, and Alexander Baykov for their helpful criticisms and suggestions.

1 HISTORY OF ESTIMATES

The first systematic inquiry into the national income of Russia, in 1906, was made by the well-known Russian statistician, S. N. Prokopovitch, and was for 1900.¹ In 1918 he published a second and more elaborate estimate covering the national income of 1913.² For both, he used the net output method. In the middle '20's, official estimates began to appear in connection with state economic planning and control and were published annually until the outbreak of World War II.³

Meanwhile Prokopovitch, who had left Russia, and several other Russian economists now living abroad, published a series of estimates purporting to correct certain biases alleged to be in the official Soviet figures.⁴ Some of these estimates were adjusted to British prices to make them more comparable with the national income estimates of England. A more comprehensive re-valuation of Russia's national income in British prices for 1913, 1928, 1934, and 1937 was published by Colin Clark in 1939.⁵

This paper is concerned solely with the official estimates, which are fully explained in the recent publications of the Economic Institute of the Russian Academy of Sciences, men-

¹ *Opyt Ispichislenia Narodnogo Dokhoda (Trudy Volno Economiticheskogo Obshchestva, 1906)*, II, 20-35 (in Russian). In 1860 the noted English economist, statistician, and jurist, Leone Levi, in an article, On the Distribution and Productiveness of Taxes and Prospective Amelioration of Revenue (*Journal of the Royal Statistical Society*, 1860, p. 40), estimated Russia's national income to be £400 million, or £6 (40 rubles) per capita. He did not explain how he arrived at this figure.

² *Opyt Ispichislenia Narodnogo Dokhoda po 50 Gubernyam Evropeyskoy Rossii* (Moscow, 1918) (in Russian).

³ The official estimates have appeared in various publications of the Gosplan (State Planning Commission) and its special section, the TZUNHU (Central Accounting Administration of the National Economy), such as *Kontrolnyia Tzifry* and *Socialisticheskoye Stroyitelstvo*. The 1928-29 volume of *Kontrolnyia Tzifry* contains especially comprehensive statements on methodology and national income estimates in detail. Of the special works on the subject, all in Russian, and using official figures, the most important are: Litoshenko, *Narodny Dokhod, U.S.S.R.* (Narkomfin, Moscow, 1925); S. G. Strumilin, *Narodny Dokhod, U.S.S.R.* (Moscow, 1929); V. Katz, *Narodny Dokhod, U.S.S.R.* (Moscow, 1932); D. I. Chernomordik *et al.*, *Narodny Dokhod, U.S.S.R.* (Academia Nauk, Institut Ekonomiki, Moscow, 1939); M. B. Kolganoff *et al.*, *Narodny Dokhod, U.S.S.R.* (Academia Nauk, Institut Ekonomiki, Moscow, 1940).

⁴ Bulletins of the Economic Cabinet of Professor S. N. Prokopovitch, published from 1928 to 1938 in Prague; also publications of the Bureau of Russian Economic Research, Birmingham University; of special value among the latter is Prokopovitch's Memorandum 3, The National Income of U.S.S.R., (Nov. 1931).

⁵ *A Critique of Russian Statistics* (Macmillan, London, 1939).

tioned in note 3.⁶ Since 1933 only broad totals have been given out. For international political and military reasons, the Soviet authorities clamped down severely on the publication of any statistics on domestic economic operations. National income totals continued to be published annually, but without any allocation by either economic activity or recipient group (Table I).

TABLE I
National Income, Total and Per Capita, USSR, 1913-1940

	POPULATION (000) ^a	MILLIONS OF RUBLES ^b (1926-27 PRICES)	INDEX (1929: 100)	RUBLES PER CAPITA (1926-27 PRICES)
1913	140,000	21,000	73	150
1917		16,800	58	
1920	131,000	10,500	36	80
1921		9,400	33	
1924-25	143,400	16,800	58	117
1926	146,000	21,700	75	149
1927	148,570	23,000	80	155
1928	151,389	25,000	87	165
1929	153,846	28,900	100	188
1930	155,810	35,000	121	225
1931	157,397	40,900	142	260
1932	158,131	45,500	157	288
1933	158,662	48,500	168	306
1934	159,603	55,800	193	350
1935	160,660	66,500	230	414
1936	162,330	86,000 ^c	298 ^c	530
1937	165,124	96,300	333	583
1938	168,387	105,000	363	623
1939	170,467	115,000	398	675
1940		125,500	434	

^a All population figures are as of the middle of the year. Those for 1913 and 1920 are from *Statistisches Handbuch der Weltwirtschaft*, Statistisches Reichsamt, 1936, p. 251. The censuses of December 1926 and January 1939 reported a population of 147,028 million and 170,467 million, respectively (see League of Nations, *Statistical Year Book, 1932-33*, p. 21, *ibid.*, 1940-41, p. 16). The population for 1926 was roughly estimated on the basis of the census data; those for 1927-38 are derived from estimates prepared by Frank Lorimer for his forthcoming book, *The Population of the Soviet Union: History and Prospects*.

^b M. B. Kolganoff, *op. cit.*, p. 53. The figure for the national income for 1939 is arbitrarily fixed as the middle between the reported 1938 and 1940 figures. The figure for 1940 is from the report of N. Vosnesensky, Chairman of Gosplan, Economic Plan for 1941 (18th Congress of the Communist Party, Feb., 1941).

^c The reason for the great jump in the figure from 1935 to 1936 is not clear. It may have been due to some unexplainable change in the method of computation of the 1936 national income.

For selected years some fragmentary figures, percentages of an unknown total, were published for various branches of economic

⁶ Published under the names of their editors, Professors Chernomordik and Kolganoff.

activity (see Table 2). Moreover, all the estimates for the 1930's were in 1926-27 prices, and their relation to current prices was not explained. Neither the price indexes themselves nor the methods of their computation and application have been made public. Hence the proportions of current governmental revenue, expenditures, debt, etc., which are usually in current prices, to national income cannot be determined. This paucity of statistics, in the Soviet national income literature of 1933-40 contrasts sharply with the richness of its conceptual and methodological explanations. Some day, undoubtedly, this gap will be corrected by the publication of allocations by economic activity and recipient group and by the resumption of the publication of detailed statistics.

TABLE 2
National Income, by Branches of Economic Activity
(percentages of total in current prices)

	1913	1925-26	1929	1937
Agriculture	48.0	41.4	35.1	25.7
Industry (incl. lumber & fishing)	34.9	35.6	41.7	53.1
Construction	4.1	5.4	6.1	5.8
Transportation	4.3	3.5	6.7	3.0
Trade & communal restaurants	8.1	13.7	10.0	9.5
Misc. (communications, etc.)	0.6	0.4	0.4	2.9
Total national income	100.0	100.0	100.0	100.0

Kolganoff, *op. cit.*, pp. 63, 65, and 77.

2 CONCEPT OF NATIONAL INCOME

The Soviet concept of national income, founded on Karl Marx' ideas, is associated with the net output method of estimation. National income is commonly defined as "that part of the social product, evaluated in monetary terms, which is newly created each year by the labor of the society and becomes available annually for consumption and accumulation",⁷ but the product is deemed to include physical goods alone, i.e., material product. Governmental and personal services as well as services of dwellings are not considered parts of the social product or national income; they are not 'primary' or 'original' income created but merely the result of its distribution. Soviet estimators use the term 'production' in the sense of so-called 'material production' alone. In practice, however, 'material production' is not as restricted as its meaning would suggest. A wide array of *services*

⁷ Chernomordik, *op. cit.*, pp. 3 and 11.

are included so far as they are connected with the production of goods and are accounted for in their costs.

The distinction between original or primary, and 'derivative' income (i.e., between distribution associated with, and not associated with, material production) is taken by Marx from Adam Smith,⁸ with only a few modifications. In the course of a critique of Adam Smith's theory of value, Marx states it as follows: "All members of society not directly engaged in reproduction, with or without labor, can obtain their share of the annual product of commodities—in other words, their articles of consumption—primarily only out of the hands of those classes who are the first to handle the product, that is to say, productive laborers, industrial capitalists, and real estate owners. To that extent their revenues are substantially derived from wages (of the productive laborers), profit and ground rent, and appear as indirect derivations, when compared to these primary sources of revenue. But, on the other hand, the recipients of these revenues, thus indirectly derived, draw them by grace of their social functions, for instance that of a king, priest, professor, prostitute, soldier, etc. and they may regard these functions as the primary sources of their revenues."⁹ This is the only place where Marx seems to make this distinction.

In Marx' terminology, only marketable commodities are deemed to comprise economic production or reproduction. Marx distinguishes between gross product and gross income. Gross annual product, he says, consists of two parts: one serving to replace the value of the "constant capital" consumed in production, the other providing revenue to society in the form of wages, profits (including interest), and rent. This revenue is available for consumption and accumulation. Gross income is the residue left after subtracting capital replacement from gross product. "Viewing the income of the whole society, the national income consists of wages plus profit plus rent, that is, of the gross income."¹⁰ This, apparently, is the only place where Marx uses the term 'national income'.

Gross product and gross income, according to Marx, are created entirely by labor. Profit (including interest) and rent are

⁸ *Wealth of Nations*, Book II, Ch. 111.

⁹ *Capital* (C. H. Kerr & Co., Chicago, 1909), II, 429.

¹⁰ *Ibid*, III, 979.

mere surplus value created by labor. In a capitalist society, however, reflecting the capitalists' point of view, the term 'net income' is used to denote profit (including interest) and rent only.

Commercial activity, whether combined with the production of commodities or carried on by a separate trading organization, according to Marx, creates no value and, therefore, no surplus value. The function of buying and selling commodities merely helps to realize the value produced in industry. However, the income of the commercial capitalist is derived from the *surplus* value created in production, through the equalization of profit rates throughout all industries. It thus appears to be primary income, inasmuch as industrial profit is correspondingly reduced thereby. It is not clear whether Marx considers commercial labor income primary or secondary. Although not contributing to the creation of the use value of a product "it is immediately productive for the capitalists", is often paid by a share in their profits, and forms part of the selling or exchange value of the commodities.¹¹ Soviet economists, at least in recent years, have considered commercial labor as contributing to use value, and, hence, as producing primary income.

Since governmental services are not marketable, Marx did not consider them a part of production. Moreover, together with Engels, he considered the state a purely repressive agent having no function except to keep the exploited classes down.¹² Even in a socialist society the state is nothing but a repressive agent—operating, however, against the bourgeoisie; while in a completely communist society, "the state will wither away".¹³ Unless this philosophy is so amended in Soviet Russia that the state appears as a positive social and economic agent, its activities must continue to be treated as unproductive and not included in estimating national income.

Based as it is on the Marxian approach, the Soviet concept of national income is much narrower than that of other countries. It embraces only the net value of agricultural and industrial output, and construction, and the services of freight transportation,

¹¹ *Ibid.*, III, 330-56.

¹² For pertinent quotations from Marxist literature, see S. H. M. Chang, *The Marxian Theory of the State* (Philadelphia, 1931), Ch. III.

¹³ V. I. Lenin, *State and Revolution* (Lawrence and Wishart, London, 1933), Ch. V.

trade, and, apparently, some branches of communication. These services are included on the ground that without them material production could not be carried on. If goods are to be made, materials and equipment must be moved to places of production; the producing enterprises must be able to communicate with one another; and the goods can have no value unless delivered to their ultimate consumers. Trading organizations as well as transportation and communication agencies are the means. National income does not include the value of the services of (a) government as measured in most other countries by the salaries of government employees, and in some also by interest on the public debt, (b) passenger transportation, (c) independent physicians, dentists, teachers, artists, barbers, laundrymen, and other workers performing personal services, (d) domestics.

The net value of product, or national income, includes mainly wages and other forms of income paid workers and members of cooperatives engaged in material production; social security and housing contributions, and costs of various facilities furnished producers, such as clinics, nurseries, meals, as well as technical instruction and training; net interest, insurance; profits (supplying new capital as well as means to promote the welfare of producers); taxes paid by enterprises, most of which are treated as the collective profit of the community.

All the foregoing payments and earnings constitute the chief shares of primary income into which it is originally distributed. The sums paid out by the government to its employees and to bondholders, or by persons engaged in material production to persons rendering various personal services are treated, on the contrary, as *derivatives* in that they are components of the redistribution of the primary income. The nature of these various elements is discussed further in Sections 12-15.

a *Treatment of Government Income*

The inclusion of the taxes on enterprises from which government employees are paid must not be interpreted to mean that indirectly the value of *all* such services themselves are included in national income. They are included because entering the prices of national product, as they do, they are the means of transferring a portion of it to the government. Their inclusion may take

account of the services rendered by government to production, but not of those rendered by it directly to consumers.

In capitalist economies, the full net value of the product of the private sector, including the portion transferred to governmental personnel, is similarly accounted for, in the main, by the incomes paid out to producers, or accrued for their benefit; for the taxes through whose payment claim is transferred to the governmental personnel on a portion of that product are abstracted, largely, from these incomes themselves. Incomes are, in part, so determined by market forces as to take such taxes into account. The capacity of the producers, in the aggregate, to buy back their own output is reduced by the amount of direct and indirect taxes imposed on their incomes. Taxes levied on business, as distinguished from those levied on consumer incomes, are included as separate items in the national income of only a very few countries, namely, in Colin Clark's estimates for England, in Matolcsy's and Varga's estimates for Hungary, and also in estimates for Sweden and, in part, those for Germany.¹⁴

In the Soviet economy, on the other hand, salaries, wages, and other monetary payments to producers are, by and large, ordinarily net of state levies,¹⁵ and are so fixed that producers can buy back merely a portion of their aggregate output. Taxes (and, in part, the planned profits) make its price so high that a portion is kept out of their reach and its transfer to the government rendered possible.

In capitalist economies also, transfers through taxes of at least a portion of the commercially produced output from its producers to the government personnel are included in national income estimates. But in addition, the value of the services rendered in return by the governmental personnel to these producers is included. In other words, in the treatment of government, exactly the same procedure is followed as in any division of economic activity where both the net value of the output of all the other divisions going to the support of its producers and the

¹⁴ For the full titles of these books see Part I, notes 1 and 13, and Part VII, note 21. In countries for which only rough estimates of national income according to the net output method could be made, indirect taxes were not deducted from the gross value of output because their amount was not known; not for any theoretical reason.

¹⁵ More recently, however, especially during World War II, salaries and wages became subject to much stiffer personal income and other direct taxes.

net value of the output given in return are included in national income. Under the Soviet concept of production and national income, the gap in the income of the producers in the commercial sector left by the transfer of goods to the governmental personnel is left unfilled. The accounting for the taxes, while taking care of the value of the material goods being transferred through them to that personnel, does not take care of the value of the services taking the place of these goods. These services are not recognized as having 'value'. The transfer is treated as being more in the nature of a gift than of an exchange of values. To fill the gap and make the estimate complete, it would be necessary, in addition to accounting for taxes, to account for the value of governmental services, i.e., for the compensation paid employees rendering them and for the interest on government obligations. But in that case, the Soviet estimates would be even more complete than those of most capitalist countries. To place them on a comparable basis, therefore, it would be necessary, furthermore, to eliminate from the aggregate of included taxes a proportion corresponding to the missing business cost taxes in the estimates of other countries.

b *Treatment of Social Insurance Contributions, etc.*

Similarly, the inclusion of contributions to social insurance and housing funds and to the maintenance of factory clinics, schools, nurseries, and other social and cultural facilities does not mean that the services of the physicians, nurses, teachers, and other persons paid from the funds or furnishing the facilities are completely accounted for in national income. At best, only the portion that is directly connected with productive processes (e.g., accidents and illnesses suffered while at work) is so accounted for. The accounting for the portion not connected with productive processes on a basis comparable with other countries' estimates would require the inclusion also of the compensation paid out of the funds to the persons rendering such services, so that these services would be treated as additional incomes of the employees.

c *Reconciliation with Estimates for Other Countries*

The exclusion of these various items from Soviet national income is, according to the Soviet economists, responsible for an aggre-

gate underestimate of 25-30 percent. However, the data they present in support of their contention are far from convincing. They are well aware of the differences between their methods and those of estimators in other countries. But they hold that the other figures are overestimates. Consequently, instead of raising their own figures by including the missing items, they lower the estimates for other countries by deducting the value of governmental and other services. For some countries, the reductions amount to more than 30 percent.¹⁶ Inasmuch as services play a much bigger role in the economic structures of the United States and Germany, which are industrially further advanced, than in Soviet Russia, their exclusion distorts the national income figures of the former much more than those of the latter, thereby throwing the comparison out of gear in the opposite direction. This type of adjustment is incorrect for the further reason that, as indicated above, the services rendered directly by government to production are accounted for in the Soviet estimates by the inclusion of business taxes.

d *Conceptual Differences*

Some economists in Soviet Russia, notably Professor Strumilin, have departed somewhat from the orthodox Marxian concept and have taken the position that governmental, personal, and other services are just as 'productive' as so-called 'material production' and should be included in national income on an equal footing.¹⁷

¹⁶ The Kolganoff study reduces the 1929 estimate for the United States from \$81.0 to \$55.9 billion and the 1928 estimate for Germany from 75.4 to 55.5 billion Reichsmarks to adjust them to the USSR national income (*op. cit.*, pp. 67-71 and 80-1).

¹⁷ Strumilin maintains that "it is incorrect in estimating national income to consider only the net value of the output created by the economic enterprises of the nation. The computation should embrace the incomes of the entire population. The latter is comprised, however, not only of the net value of the material production, but also of the services furnished without charge to the citizens by the socialist State and the social organizations. Doctors, teachers, and other workers not participating directly in the material production receive a part of the social product created thereby and furnish in exchange for it the results of their own labor in the form of services. The reproduction of the material product implies also the reproduction of services. In our socialist practice, the teaching trades are already being treated in all the accounting of the economic enterprises on an equal footing with such auxiliary trades as those of workers engaged in factory power houses, research laboratories, repair shops, etc." (Quoted by Chernomordik, *op. cit.*, pp. 75-6, from *Problemy Planirovaniya*, Moscow, 1932, p. 397).

Professor Chernomordik and his associates, though not going quite so far, argue in favor of including the services of passenger transportation in national production and in national income.¹⁸ Marx, they say, never intended to exclude all services from material production. He intended to exclude only services of a strictly personal nature, such as exist between a master and a domestic servant, which are not subject to the rules of capitalist production. To them, the distinction between a physical good and a service is not economically significant. The only important distinction is between production organized under the prevailing rules of the society and flowing through its channels and that not so organized and carried on. The former is a part of national production and national income; the latter is not. Since passenger transportation utilizes the institutions of a society, be it capitalist or socialist, it must be treated as a part of national product.

The Chernomordik study maintains that neither theoretical nor practical considerations justify excluding the services of so useful an undertaking as the Moscow subway, for example. At least one-half of passenger transportation serves the needs of production directly, in that the passengers are traveling to or from work or on specific business assignments. The other half, though serving consumption, is just as productive as consumer goods. Passenger service in 1935 engaged 600,000 workers, or one-fifth of the 3 million workers then engaged in the transportation industry as a whole. As the value of their services must have amounted to at least 2 billion rubles at current prices, its exclusion would undervalue national income almost 1 percent.

Whether this broader concept of national production and national income expounded by these several authors will in time gain ascendancy in Soviet economics it is impossible to say.

3 STATISTICAL SOURCES

The official estimates were prepared by the *Gosplan*, and, in more recent years, by the TZUNHU. The data with which gross and net values of output can be computed are quite complete for industry, transportation, and trade, where administrative organization and financial control are highly centralized. They are somewhat less adequate for agriculture and construction, where

¹⁸ *Op. cit.*, pp. 198 and 203.

controls and hence records are far less centralized. The data for the socialized sector of the economy are from the annual reports of the state trusts and farms and cooperatives and from the consolidated reports prepared by the TZUNHU itself. The data necessary to compute the net value of output of the non-socialized sector, i.e., of independent artisans and farmers, were obtained during the 1930's from industrial, agricultural, and other censuses, income tax statistics, and sample studies. Accounting and production records are so comprehensive and so highly centralized under the Soviet system of socialized ownership and central control of economic enterprises that national income can be estimated more easily than in capitalist economies.

4 DIVISION BY ECONOMIC ACTIVITY

Material production has six branches: (1) agriculture, (2) industry, (3) construction, (4) transportation, (5) trade, (6) miscellaneous. As in the statistics of other countries, the line between agriculture and industry is flexible. Owing to the progressive industrialization and specialization of production, certain types of economic activity formerly classified under agriculture, such as making butter and cheese, spinning yarn, milling grain, lumbering, and preparing fuel wood, are classified in the more recent production statistics and national income estimates under industry. Slaughtering and the obtaining of meat, hides, feathers, bristles, and similar commodities are classified under agriculture. There is a growing opinion, however, that these types too should be included under industry. Mining, fishing, and hunting are included under industry.

The line between industry and construction is similarly not always distinct. When, as in the case of the installation of machinery in a factory, the construction is done by an enterprise with its own labor, it is classified under industrial production. When, on the other hand, it is performed by an outside organization specializing in construction work, it is classified under construction. Theoretically, repairs, whether done by special repair shops or by the regular employees of the enterprise itself, are classified under industrial production, while replacements of equipment are classified under construction. In practice, however, work called 'repairs' is often so comprehensive as to

amount to capital replacements. The Chernomordik study advocates crediting such repairs to the construction industry.

5 TWO BASIC METHODS OF ESTIMATING NET VALUE

The net value of output is estimated for each branch of the economy either by calculating gross, then deducting certain cost items representing duplications, or by aggregating directly the various components.

The first method is used chiefly for agriculture, the construction industry, transportation, and trade. Gross value is computed in one of three ways: (1) by adding reported receipts from sales, (2) by adding all the recorded pertinent items of expense, profits, and tax payments, or (3) by multiplying the reported number of units of physical output by their prices. Since prices are fixed by central authority, they vary less and are more easily ascertained than in economies where prices are determined by market forces. However, the fact that they vary in some branches of the economy (chiefly agriculture) according to the type of purchaser somewhat complicates the use of price data.

The deductions from gross value necessary to avoid duplications in computing net value are mainly expenses for raw materials and other commodities and services purchased from other enterprises; auxiliary supplies and materials; purchased fuel and electric energy; repairs (done outside); and amortization of plant and equipment.

The second method, direct aggregation of items of outlay or revenue, is used for all large scale industries, inasmuch as they account for their revenues, expenditures, profits, and tax payments in detail (see Sec. 2).

We now review the peculiar problems that have arisen in estimating the net output of each branch of economic activity.

6 INCOME FROM AGRICULTURE

Net agricultural output in the socialized sector of the economy is estimated on the basis of the annual reports of the *sovhoz* (state farms) and *kolhoz* (collective farms) and of the tractor organizations, as already stated, by first computing gross value, then deducting certain costs.

a *Gross Value*

Since agricultural output was subject to several price systems, computation was difficult. The prices of products agricultural enterprises were obliged to sell the state were exceedingly low. Sales to consumer cooperatives and to the People's Commissariat for the Procurement of Agricultural Products, with the single exception of grain, were at slightly higher prices, while those by the *kolhoz* in the open market were at so-called free prices, which were much higher. Finally, products resold by the state to individual consumers as well as to cooperatives and other organizations, being subject to the turnover tax, were the highest priced. In computing the value of agricultural output, it was necessary, therefore, for the estimators to determine for each commodity what portion was sold to whom. As the resulting valuations give a distorted picture of the relative importance of each category of enterprise, the Chernomordik study proposed that the value of each product be computed at a single weighted price, irrespective by whom produced or where delivered.

The main division of agricultural output is between plant and animal production. The various classifications of plant production followed or proposed at different times need not be discussed here.¹⁹

Animal production includes the raw products of living animals, such as milk, eggs, honey, wax, and wool; meat, hides, feathers, bristles, and other animal products; the livestock and fowl sold for breeding, slaughtering, and other purposes; the breeding of fish and wild animals.

The inclusion of slaughtering and the sale of animals for slaughter under animal production has been criticized in recent Soviet statistical works as yielding highly misleading figures; for the volume of slaughtering done in any year bears no necessary relation to the natural reproduction of the animals. An increase in slaughtering at the expense of the accumulation of livestock or fowl would really mean an increase in capital consumption, not in production. For example, the great increase in slaughtering 1929-33 (for political reasons), constituted a wanton de-

¹⁹ The Chernomordik study recommends a ninefold division: (1) grain, (2) technical cultures (cotton, flax, sugar cane, tobacco, etc.), (3) feed cultures (hay, etc.), (4) potatoes, (5) vegetables, (6) fruits and berries, (7) citrus fruits, (8) tea, (9) decorative and protective plants (flowers, trees, etc.).

TABLE 3
Turnover of Livestock
(percentages of total at beginning of year)

	NO. AT BEGINNING OF YEAR	NATURAL REPRODUCTION	NATURAL DEATH	SLAUGHTER	NO. AT END OF YEAR
C A T T L E					
1927-28	100.0	42.7	9.0	30.0	103.7
1928-29	100.0	40.6	8.9	36.3	95.1
1929-30	100.0	37.5	8.7	50.6	78.2
1930-31	100.0	43.0	9.8	41.9	91.3
1931-32	100.0	39.0	10.2	44.0	84.8
1932-33	100.0	44.7	9.5	40.8	94.4
1933-34	100.0	47.0	8.4	28.1	110.5
1934-35	100.0	45.8	7.5	22.2	116.1
1935-36	100.0	44.2	6.5	22.9	114.8
S H E E P A N D G O A T S					
1927-28	100.0	52.2	13.1	34.1	105.0
1933-34	100.0	51.2	12.3	35.5	103.4
1934-35	100.0	60.0	10.0	32.4	117.6
1935-36	100.0	62.0	9.5	32.4	120.1
P I G S					
1927-28	100.0	169.2	46.4	110.8	112.0
1933-34	100.0	173.6	35.0	94.0	144.6
1935-36	100.0	180.0	38.0	107.2	134.8

Chernomordik, *op. cit.*, p. 104.

struction of capital, not an increase in production (Table 3). On the other hand, the decrease in slaughtering during the succeeding several years meant that livestock was being built up, not that animal production decreased.

Recent statistical works have advocated, therefore, a reclassification of animal production to include only the breeding of livestock and fowl (i.e., the replacement of slaughtered or deceased animals and the addition to and improvement of the stock of the living); the production of milk, eggs, wool, and other products of living animals. Such a classification, it was believed, would afford a better basis for measuring changes in annual animal production and for distinguishing between capital replacements and income in the sphere of production.²⁰

Agricultural production is classified further according to type of ownership into production on *sovhoz* and on *kolhoz*; domestic production by *kolhoz* members; home gardening by urban employees and workers; production by independent farmers.

²⁰ Among other countries using, in their national income estimates, slaughtering statistics without adjustment for an increase in the stock of the living is Poland. On the other hand, India uses slaughtering statistics adjusted for accruals of living stock, while Switzerland and Sweden use accruals alone.

The gross value of agricultural production was computed as total finished production plus any increase, or minus any decrease, in unfinished production (the value of the plowing, fertilizing, sowing, and other work done for the next year's crop). Total unfinished production as well as increases or decreases in it from year to year in many branches of Soviet agriculture are quite substantial. Some Soviet economists maintain that the inclusion of this variable item is inadvisable, inasmuch as it introduces a speculative element into national income estimates and tends sometimes to exaggerate, sometimes to understate actual production.²¹

The production expenses deducted from gross value to obtain net value cover such items as seed, feed, depreciation (or amortization), chemical fertilizers, insecticides, fuel, lubrication, and other industrial products, repairs, etc., and other production expenses. The Chernomordik study, however, maintains that this classification fails to distinguish adequately between various items of agricultural expense.²² In its stead the following more elaborate grouping was suggested: depreciation on buildings, machines, and livestock; current repairs; fuel and lubrication; seed; feed; fertilizer; insecticides; miscellaneous expenses. These cost items were estimated as follows:

Depreciation. Depreciation on buildings, machinery, and livestock, usually based on the estimated life of the property, is computed at a fixed percentage of the original investment.²³ On the ground that the gross underestimation of the lives of machines tended to carelessness in their use, failure to repair them properly, and made people scrap them prematurely, the Chernomordik study advocated lower amortization rates. It maintained that in a socialist economy there could be no such thing as obsolescence, and that for this reason too the life of machinery should be estimated more liberally. Instead of being

²¹ For a statement of the arguments on both sides of the issue, see Chernomordik, *op. cit.*, pp. 55-8 and 108-20.

²² *Ibid.*, p. 129.

²³ The annual depreciation on plows and other cultivating machines as well as on wheat threshers was computed at 10 percent of their original cost, that on harvesting machinery at 12 percent, and that on combines at 14 percent. The Chernomordik study pointed out (p. 125) that these depreciation charges no longer corresponded to the actualities, inasmuch as substantial changes had occurred in the machines and their uses. Lower depreciation charges were urged.

scrapped, machinery of old design is transferred to less developed sectors of the economy. Before 1930 it was customary to estimate the life of a tractor at approximately five years and accordingly to compute its annual depreciation at 18-20 percent of its original cost. Beginning with that year, however, its life was estimated in terms of hours of actual use instead of years of potential use. The life of a tractor operating on chains was fixed at 12,000 hours of actual utilization; of one operating on wheels, at 8,000. Differences in the intensity of the utilization of different kinds of tractors or even of the same tractors by different farms were thus recognized.

During the 1930's the TZUNHU computed depreciation on livestock only for animals employed in farm work, such as horses and oxen. This, in the opinion of Chernomordik and his associates, was an error. The breeder is capital. They believed that the cost of acquiring and reproducing breeders necessary to maintain the existing level should likewise be taken care of through depreciation reserves.²⁴

Repairs. Repairs on agricultural tractors included so-called capital repairs, i.e., actual replacement of worn-out parts, as well as current repairs proper. On other agricultural machinery, however, since 1938, current repairs alone have been classified as such, as allowance for capital repairs led to neglect of ordinary repairs and a tendency to replace old parts with new on the slightest pretext, with a consequent waste of capital funds.

Fuel and lubricants. Outlays for fuel and lubricants were computed from the annual reports of the *sovhoz* and *kolhoz* to their central administrative organizations and from other reports.

Seed. Outlays for seed were computed for the *sovhoz* and *kolhoz* from their annual records. For independent farmers they were estimated 10 percent higher so as to take account of the less efficient methods of seeding by hand.

Feed. Outlays for feed, larger than for any other agricultural materials, were also calculated fairly accurately for the *sovhoz* and *kolhoz*, but for other farms, could be estimated only on the basis of sample investigations.

Fertilizers. The cost of fertilizers is usually included among

²⁴ *Ibid.*, p. 126.

current expenses and deducted from gross value of output. According to the Chernomordik study, however, such a procedure understates the value of agricultural production. A substantial part of this outlay is said to represent capital investment, inasmuch as many chemical fertilizers tend to improve the fertility of the soil permanently. Such capital investment increases from year to year, thereby raising the efficiency of agricultural production continually. Any such outlay should, therefore, be treated as a part of net value, not as a deductible expense. The only proper deduction would be for the annual depreciation on the fertilizer.

The *kolhoz* contributions in kind for the maintenance of the agricultural tractor stations servicing them, included in the net value of agricultural product as a whole, cover only part of the maintenance costs; the other part is covered by state subsidies.

b *Net Value*

The net value of agricultural output remaining after these several deductions is comprised of labor compensation, social security and other contributions to the welfare of producers, wage payments to *kolhoz* members, payments to tractor stations, profits, interest, taxes, reserves against crop failures, and other items more fully described in Section 14.

7 INCOME FROM LARGE SCALE INDUSTRY

Before 1937 the official practice was to confine the concept of material production in industry to work performed in the factory, and to include in both gross and net value only items pertinent to such production. During that year the concept of material production was broadened and the method of computing both gross and net value modified to cover also cost, profits, and tax payments connected with the commercial activity of the industrial trust carried on outside the factory—accounting, planning, financing, storing, selling, delivery, research, and several other such functions. The category 'business costs' was substituted for the narrower 'factory costs'.

In accordance with the practice followed in most countries, Soviet estimates of both the gross and net value of industrial output take account not only of the finished output of the year

but also of the increases or decreases in the unfinished. Total unfinished production is quite substantial in many branches of the Soviet economy. For example, in 1935, for all the large scale industries combined, it represented 4.8 percent of total output; in the metal products industries, as much as 17.7 percent.²⁵ The changes in the amount of such unfinished production from year to year, however, seem to have been relatively small. It is admitted that Marx in his discussion of national income referred to finished production alone, and his neglect of unfinished is explained on the ground that he was concerned with discovering the basic laws of capitalist and socialist production, not with the methodology of computing their net value, or national income.

In the accompanying tabulation the gross value of industrial

ITEMS OF GROSS VALUE THAT ARE:

A PART OF NET VALUE	NOT A PART OF NET VALUE
Salaries & wages, basic & supplementary	Raw materials
Contributions to social security, workers' welfare, dissemination of technical information, and training of new workers	Supplies & equipment
Interest on loans	Purchased fuel
Insurance	Purchased electric light & power
Municipal taxes & other charges	Purchased transportation & delivery services
Profits	Travel, postage, telegraph, telephone, fines, breakage, losses, etc.
General turnover tax	Depreciation

output is divided into the items that form a part of net value and those that do not. Most of the items represent production costs. Among them, raw materials make up 52.5 percent in all industries combined; supplies, fuel, electric power, 10.1 percent; amortization, 2.6 percent; labor costs (including social security and welfare contributions), 27.6 percent; and miscellaneous items, 7.2 percent. The highest ratio of raw materials to total expense is in the food industries, the lowest in the electric power industry; conversely, the highest ratio of labor costs is in oil extraction, the lowest in the fats, soap, and perfumery industries.

²⁵ Chernomordik, *op. cit.*, p. 56. Up to 1937 it was customary to include in gross value all unfinished production. This is said to have tended to undermine the effectiveness of the state's production programs, for the industries were inclined to accumulate large inventories of idle raw materials and to leave much of their production in an unfinished state. As the supply of goods to other productive enterprises and consumers was thereby being retarded, the government issued a regulation that all production programs should be made in terms of finished output.

The ratio of amortization to total expense is highest in the electric power industry; lowest in the food and in the fats, soap, and perfumery industries (Table 4).

In calculating most of the items comprising net value, no special methodological problems are involved. Some controversy exists, however, over the treatment of payroll contributions for the maintenance of factory clinics, factory schools, clubs, etc. Professor Strumilin holds that only the part that is spent for labor on these facilities should be included in the net value of the product of the given industry. The part spent for materials, he says, is accounted for in the net value of the product of other industries.²⁶ The authors of the Chernomordik study, on the other hand, hold that the present practice of covering the full amount is correct, inasmuch as the entire cost of maintaining these facilities is borne by the given industry itself. The inclusion of the full amount in computing net value is held essential irrespective which concept of production is used in estimating national income—the concept of material production alone or that of combined 'material' and 'immaterial' production.²⁷

Interest costs are computed from the interest enterprises pay on loans from the Gosbank, after the interest they receive on their deposits has been deducted. Regarded as a contribution the socially owned capital makes to production, interest costs are of considerable importance in consumer goods industries, especially the food industries, whose purchases of raw materials during certain seasons are so large that they cannot be financed entirely from operating capital. Insurance costs are only for insurance taken out by cooperatives and handicraft industries and artisans. The properties and operations of state enterprises are not insured. Their losses from fire or other contingencies are taken care of in the state budget.

In estimating the net value of the output of producer goods industries, state subsidies are not deducted, for they are considered a redistribution of profits earned by industry as a whole and paid into the budget, the producer goods industries getting back the profits they would have earned had they been per-

²⁶ Quoted by Chernomordik, *op. cit.*, from *Problemy Planirovania*, pp. 397, 398.

²⁷ Chernomordik, *op. cit.*, p. 75.

TABLE 4
Production Expenses in Industry, 1935
(percentages of total)

	TOTAL	AMORTI- ZATION	RAW MATERIALS & BASIC GOODS	AUXILIARY SUPPLIES & MATERIALS	FUEL	ELECTRIC POWER	LABOR COMPENSATION	PAYROLL CONTRI- BUTIONS	MISC.
All industries combined	100.0	2.61	52.47	5.55	3.28	1.29	21.41	4.12	7.21
Producer goods	100.0	3.93	34.23	6.54	4.57	1.80	30.03	5.18	10.73
Consumer goods	100.0	1.07	73.77	4.38	1.77	0.70	11.34	2.89	3.10
Electric power	100.0	16.06	0.36	5.48	32.99	0.00	21.28	5.32	15.93
Oil extraction	100.0	8.68	1.06	11.26	1.84	2.77	49.53	6.60	12.77
Mining	100.0	5.89	2.17	15.71	1.23	3.98	47.99	6.25	11.17
Chemical mining	100.0	6.27	1.00	13.46	7.63	2.36	38.28	9.04	16.68
Mineral extraction	100.0	3.43	3.71	9.35	3.68	1.13	47.24	7.89	18.07
Other mineral extraction	100.0	3.88	22.74	7.62	3.30	3.58	35.94	8.80	10.33
Lumbering	100.0	2.02	18.80	7.77	1.69	0.08	41.03	4.35	18.94
Oil refining	100.0	5.10	58.58	4.08	3.68	1.37	11.18	2.21	12.26
Chemical	100.0	3.68	54.46	6.04	3.23	2.00	16.60	1.70	8.16
Glass & pottery	100.0	4.28	12.79	8.99	13.43	2.70	35.75	9.17	9.60
Steel & iron	100.0	5.02	24.43	8.92	14.07	2.05	29.94	4.52	7.72
Copper & other metallurgy	100.0	4.96	40.30	7.31	4.90	4.79	24.36	3.88	6.96
Machinery	100.0	2.93	33.41	5.58	2.38	2.12	35.39	6.23	9.18
Rubber & asbestos	100.0	1.66	65.00	3.38	1.88	1.23	16.32	1.46	4.41
Wood products	100.0	2.01	43.90	5.29	1.34	0.76	27.75	2.97	10.47
Paper	100.0	5.26	33.22	8.74	11.58	3.22	21.37	5.51	9.30
Printing	100.0	2.61	23.74	6.36	1.31	2.22	40.18	11.69	8.15
Textile	100.0	1.16	74.28	3.46	1.40	0.96	12.29	3.01	2.29
Garment	100.0	0.27	76.28	1.19	0.25	0.40	14.87	3.45	2.34
Leather & fur goods & shoes	100.0	1.00	55.78	14.95	1.56	0.84	16.01	4.59	4.06
Fats, soap, & perfumery	100.0	0.78	77.77	8.04	1.35	0.69	6.32	1.95	2.55
Food	100.0	0.96	80.11	3.45	1.92	0.34	7.36	1.89	3.33
Other manufacturing	100.0	1.10	61.60	4.88	0.79	0.87	18.72	5.19	5.35
Misc.	100.0	11.49	22.52	4.61	0.66	8.87	29.06	6.60	13.36

Chernomordik, *op. cit.*, p. 63.

mitted to charge full normal prices to the consumer goods industries.

8 INCOME FROM SMALL SCALE HANDICRAFT AND DOMESTIC INDUSTRY

The gross and net value of the output of small scale industrial undertakings could not be calculated as precisely as those of large scale, because their operations are reported in less detail. The estimates had to be based on the gross value as given in the biennial industrial censuses, and on ratios of net to gross value computed from an analysis of the operations of the corresponding large scale industries. The censuses covered practically the entire socialized sector of the economy, namely: all industrial establishments having electric or other power-driven motors or employing three or more persons; all workshops of an industrial character, whether independent or subsidiary, maintained in conjunction with agriculture, construction, transportation, or trading enterprises or educational institutions, irrespective of the number of persons employed, including blacksmith shops, carpentry shops, etc.; all subsidiary workshops of the *kolhoz* and *sovhoz* engaged in the primary processing of agricultural goods, such as mills, creameries, churneries, and bakeries. Only establishments performing personal services, such as barber shops, private laundries, and private restaurants, as well as independent workers and artisans were not covered.

The net value of *artisans'* output was estimated from their income tax payments. Their income, considered to be equivalent to the net value of their product, was adjusted to take care of exempt incomes (those below 500 rubles, at one time, 800 rubles at another).

The net value of the domestic industrial output of *kolhoz* members and independent farmers—fuel wood, peat, building materials, mushrooms, wine, fish, and miscellaneous handicrafts—was estimated on the basis of sample studies of family budgets and production.

9 INCOME FROM CONSTRUCTION

a Effect of the Reorganization of the Construction Industry

Before 1936 no separate construction industry existed in Soviet

Russia. Each industrial organization constructed its own plant, organizing and training a labor force and acquiring materials and equipment. Upon completing the project, it transferred some employees to regular production work and laid off others, and disposed of the equipment in various ways. In short, the entire carefully built up organization and technical equipment was dispersed instead of being used on another similar undertaking elsewhere—obviously a wasteful and inefficient procedure.

In 1936 a far-reaching reform was instituted, looking to the organization of a permanent construction industry, more or less centrally directed and provided with permanent equipment and labor force. It was charged with the responsibility of doing the construction work for all state enterprises and industrial and trade cooperatives, but not for the *kolhoz* and artisans' cooperatives, or independent farmers. The organization of the construction industry was further improved in 1939 by bringing all construction agencies under the direction of the People's Commissariat of Construction.

The computation of the net value of annual construction was thereby greatly simplified. Most estimates were based upon the annual accounting and statistical reports of the construction industry and of the *kolhoz*. The only estimates that still continued to be rough, based as they were on fragmentary data, were those covering the construction activities of independent farmers and artisans' cooperatives, which, in aggregate value, were relatively small.

Construction included construction proper, the erection of industrial, agricultural, residential, public, cultural, commercial, and other buildings, as well as other structures, such as roads, railroad tracks, blast furnaces, oil pipelines, telephone lines, water supplies, and dams; installation of machinery and other permanent fixtures; grading, landscaping, and other land improvements.

b *Construction for State Agencies (including the Sovhoz),
and Industrial and Trade Cooperatives*

The gross value of construction was calculated in one of two ways, depending on whether the work was performed for an-

other enterprise or for one's own. If the former, it was calculated at the contract price, which included, besides the actual costs of construction, a predetermined profit and the turnover tax. If the latter, it was computed simply by aggregating all the costs involved. In both, the costs of the machinery and other fixtures installed in finished structures, as well as the increase or decrease in the year's unfinished structures, were included. The gross value of road construction included also the imputed value of the labor rendered without pay by *kolhoz* members and independent farmers (a minimum of 6 days a year) and of the services of the horses, tractors, and other equipment lent by them to the government without charge (Table 5).

TABLE 5

Components of Construction Costs, 1933-1936
Actual Cost to the Construction Agency or to the
Undertaking doing its own Construction
(exclusive of profits and of the costs of equipment installed in buildings)

	1933	1934	1935	1936
		(PERCENTAGES)		
Labor (basic & supplementary pay)	24.68	26.18	24.95	23.45
Materials, total	46.77	46.41	49.13	52.50
Basic costs	35.72	34.74	35.22	40.09
Transportation & storage	8.14	8.90	10.45	10.08
Auxiliary supplies & implements	1.35	1.49	1.23	1.10
Fuel, steam, gas, electricity	1.56	1.28	2.23	1.23
Depreciation & rent for use of equipment	2.47	2.63	1.64	1.55
Limited or conditional outlays	22.67	22.05	22.27	19.17
Administrative overhead	11.82	9.96	9.42	8.11
Contributions to social security & workers' welfare & training	8.49	9.58	8.78	6.96
Expenses for municipal services to workers				
Other outlays	2.36	2.51	4.07	4.10
Other expenditures	3.41	2.73	2.01	3.33
Total	100.0	100.0	100.0	100.0

Chernomordik, *op. cit.*, p. 168.

The net value of construction is the residual left after deducting the costs of raw materials and auxiliary supplies such as fuel and electric power (including the costs of their transportation or transmission), costs of machinery and fixtures involved in the installations, depreciation and repairs on the equipment of the construction agency, as well as the costs of the scaffolding. As in the case of industry generally, the net value is comprised of the

basic and supplementary pay; contributions to social security, housing fund, workers' welfare (medical aid, etc.), outlays for technical instruction, and for training of new workers; and, in the case of work done under contract, profit (capital accumulation); and the turnover tax.

The accretion to the capital of the construction agencies performing work under contract was computed either by deducting from the contract prices the expenses or by adding the value of economies realized in executing the financial plan and the profits from the execution of specific construction projects.

The process followed in calculating the net value of construction may be exemplified by the accompanying schedule. How-

TYPES OF CONSTRUCTION	COST OF THE WORK TO THE ORDERING AGENCY	DEDUCTIONS FOR:		NET VALUE
		COSTS OF MATERIALS (BASIC & AUXILIARY), FIXTURES, ETC.	DEPRE- CIATION (AMORTI- ZATION)	
Construction proper				
Installation				
Improvement & irrigation of land				
Landscaping				
Machinery, fixtures, etc.				
Geological & other surveys, & other planning work				

ever, the net output of only a portion of total construction work, aggregating in the late 1930's some 5-6 billion rubles, could be calculated from actual accounting records. For the rest of the construction work done for or by state agencies, net value was calculated by applying to its gross value the estimated average ratio of net to gross value, or conversely, the estimated average ratios of specific expenses to gross value, derived from the accounting records in the first instance. The total was therefore inevitably somewhat rough. The Chernomordik study urged the adoption of more refined calculations using different ratios for different types of construction. It called attention also to the inaccuracies arising because in construction done under contract the ratios were based on figures including profit, while in other construction they were based on figures embodying no profit.

c Construction by the Kolhoz

The net value of construction carried on by the *kolhoz* and their

members, the various cooperative organizations, independent farmers, and workers and employees in cities was calculated similarly. Certain peculiarities in the organization of this type of construction, however, created special problems. First of all, the *kolhoz* annual reports gave data for only certain items of construction costs. From these figures it was impossible to arrive at either the gross or net value of their construction. For example, information was given on the monetary outlays for materials and labor, but not on the value of home produced materials.

Under these circumstances, the net value had to be based on several somewhat doubtful assumptions. Gross value was the sum of the reported monetary outlays for construction and the imputed value of the labor of *kolhoz* members. Costs of material, deductible from gross value, were calculated by applying to gross value the ratios common in the construction of the *sovhoz* and other state agricultural agencies.

One weakness of this method was that the imputed value of the labor contributed by *kolhoz* members to their common construction work was based on their shares of the *kolhoz's* earnings during the year of the construction. As a result, the value of the construction itself depended on the *kolhoz's* current earnings, whereas in reality it is an independent item. This weakness was corrected during the late 1930's by calculating the labor contributions of *kolhoz* members to construction in terms of the wage rates paid construction workers on the *sovhoz*.

d *Construction by Individuals for their Own Use*

It was even more difficult to estimate the net value of the construction performed by *kolhoz* members and urban workmen and employees for their own use. As data were not collected by any single agency, they were exceedingly fragmentary. The state insurance organization had some data on the value of agricultural buildings, but reliable estimates of the volume and value of new construction could not be made; for at least a part of the changes in the annual reported aggregate value of buildings was due to changes in the valuation of existing buildings. Sample studies by the TZUNHU afforded some basis for a rough estimate of the volume and value of urban construction by individuals for their own use. The costs deductible from gross values were

roughly estimated by the TZUNHU in 1934 at the following ratios to gross value: for construction by *kolhoz* members, 59.7 percent; for construction by farmers, 56 percent; and for that by urban workmen and employees, 55 percent.

10 INCOME FROM TRANSPORTATION

Most of the means of transportation in Soviet Russia are organized in large state-owned enterprises under various commissariats—railroad, waterway, and the like—and comprise the transportation industry of the country. In addition, each industrial, trade, or agricultural enterprise maintains transportation services to move its own goods and workers from shop to shop within its own walls, or from its sources of supply to its plant, or to its stores or customers outside. These transportation services are classified under agricultural, industrial, or other production, not as an activity of the transportation industry as such. The latter includes only services performed by the specialized agencies for pay. In the opinion of Professor Chernomordik and his associates, such a basis of distinction is appropriate to a capitalist, but not to a socialist economy.²⁸ The function of transportation is to move goods from enterprise to enterprise or from enterprise to consumer. Any such moving of goods, even if done in the enterprise's own vehicles, should be classified under transportation. Only the moving of goods within the confines of an enterprise (e.g., from the warehouse to the shop, or from one floor of a plant to another) need not be so classified.

The value of the services of passenger transportation, as already noted, is omitted from national income on the ground that it is not a part of material production (see Sec. 2).

Transportation is classified into railway, waterway, automobile (truck and bus), airplane, street railway, and horse wagon. Transportation of oil or gas by pipeline and the transmission of electric energy are credited to other industrial categories.

a *Gross Value*

The gross value of transportation services was calculated largely from the gross earnings of the transportation industries. Included were fines imposed on shippers for violations of railroad rules (aggregating in 1935 more than 200 million rubles at current

²⁸ *Ibid.*, p. 186.

prices). Fines imposed for holding up empty railroad cars in expectation of their ultimate loading (aggregating one-half of total receipts from fines) represented, according to Chernomordik, a charge for a productive service, corresponding to a charge to shippers for the rent of railroad cars. It was doubted, however, that other fines could be considered to represent a receipt from a productive service.

b *Net Value*

Net value is the residual left after deducting from gross value expenses for fuel and other materials and supplies, costs of repairs, and depreciation (amortization). Difficulties were involved in computing only the last two items.

Repairs. Under the official practice in vogue during the 1930's, only the cost of the materials used in connection with repairs done by the transportation agency itself was deducted from gross earnings. The cost of the labor was included in the net value of transportation services. On the other hand, the entire expense of repairs done outside in special repair shops, including that for labor, was deducted. In the opinion of Professor Chernomordik, this would have been correct had the labor been accounted for in the net value of the output of the repair shops. Somehow, the outlay for such labor was not considered a part of material production during the '30's. Consequently, national income was understated by several hundred million rubles.²⁹

Depreciation (amortization). One difficulty encountered in estimating the amortization of railroad plant and equipment was the familiar one of differentiating between capital replacements, repairs, and additions to capital. Theoretically, amortization covers the wholesale replacement of worn-out parts, as when rails are replaced along substantial sections of the track or locomotives are completely renovated or replaced. On the other hand, repairs are supposed to cover only replacements of minor worn-out or missing parts, such as a single rail or tie, or the readjustment of machinery parts that no longer fit well together. Theoretically, additions to capital include new structures or replacements of old by larger and better new structures, as when a light rail is replaced by a heavy, or a small locomotive by a more power-

²⁹ *Ibid.*, p. 221.

ful. In practice, however, these outlays overlap to such an extent that it is impossible often to tell to which of the three categories a given outlay belongs.

A technical conference held in the late 1930's by the TZUNHU decided that more than half of the sums spent in nearly all categories of railroad outlays for materials belonged under capital replacement, i.e., amortization. The only exceptions were outlays for fuel, where replacement represented only 17 percent of the expenditure, and outlays for lighting materials, grease, twine, bags, canvas, books, and paper, where no capital replacement was involved. In twenty types of outlay for material, capital replacement represented 75-95 percent, and in eleven, 50 percent. By using the reported figures of the proportion of capital replacement in each type of railroad outlay, total railroad expenditures for capital replacements year by year could be approximated.

The rate of depreciation varied so greatly that the adoption of any uniform amortization rate for the capital as a whole was scarcely possible. It is estimated, for example, that the railroad bed has a life of some 200 years; depreciation would amount to no more than 0.5 percent. Tunnels, according to some authors, have a life of 100 years; stone bridges, 75 years; steel frames, 50 years; rails, 25 years; sleepers, 10 years; brick buildings, 75 years; and frame buildings, 30 years. Other authors give these structures shorter lives, suggesting rates of annual depreciation of 1.8 percent for stone bridges, 2.2 percent for stone buildings, and 5.1 percent for frame buildings. Even for the same type of capital structure, the rate of depreciation varied with the care different managements gave it. For example, certain improvements introduced during the 1930's into the methods of repairing and maintaining locomotives were found to have greatly lengthened their lives.

During the 1920's depreciation on railroads was commonly fixed at only 1 percent of the capital; accordingly, allocations for replacements were limited to this amount. Since, consequently, rails, sleepers, and superstructures during some of these years were not generally replaced, the railroad properties deteriorated considerably. During the 1930's allowances for amortization were more liberal. In 1936 they amounted for motor trucks to

2 percent of gross earnings, for railroads to 9 percent, for waterway transportation to an even higher ratio. Outlays for automobile tires were charged entirely to depreciation, the life of the tires being fixed at 7,000 miles for those used on gravel roads and 36,000 for those used on cement roads. The annual rate of depreciation on motor vehicles was fixed at 15 percent.

Soviet statisticians contended, however, that since railroad outlays for replacements during the 1930's contained substantial net additions to capital, because superior materials and equipment had been used, the valuation of transportation services was somewhat too low.

11 INCOME FROM TRADE

Soviet estimators emphasize the dynamic role of trade in the economy. By facilitating exchanges among the enterprises themselves and between them and consumers, trade is said to intensify production, accelerate capital accumulation, and tie the agricultural and industrial sectors more closely.

The net value of the services of trade is the residual left after deducting certain items of business expense from the realized value of the 'mark-up' or 'gross profit' of the trading agencies, reported annually. The deductions cover the costs of the trading commissariats for central administration, presumably on the ground that it constitutes a government activity, as well as for materials and services purchased from other enterprises, and depreciation. The values of the trading activities of the state and cooperative organizations are computed separately.

State organizations carried on about three times as much trade during the 1930's as the cooperatives (see Table 6).

12 DISTRIBUTION OF NATIONAL INCOME

In Soviet economics, five shares or types of primary income are distinguished:

- 1) the income of the state, comprised in the main of the profits of its enterprises and of taxes and other social levies on economic undertakings generally
- 2) compensation of employees of state-owned and cooperative undertakings

TABLE 6
Net Value of the Services of Trade, 1936

	MILLIONS OF RUBLES (CURRENT PRICES)			% OF TOTAL		
	TOTAL	STATE	COOPERA-	TOTAL	STATE	COOPERA-
			TIVE			TIVE
Income from mark-up (on sales aggregating 80 billion rubles for the state trading organizations & 36 billion rubles for the cooperatives)	15,831	11,980	3,851	100.0	100.0	100.0
<i>Deductions</i>						
Expenses for operation of trucks & wagons; rent; repairs; office supplies; amortization; loss, theft, & spoilage of goods, packing; advertising, display, trade conferences, etc.	3,552	2,841	711	22.5	23.7	18.2
Payments to other industries for services rendered (transportation costs; travel; postage, telegraph & telephone; municipal charges for water, light, heat, etc.; protection of property, etc.)	2,271	1,697	574	14.4	14.0	14.7
Net value of trade services	10,008	7,442	2,566	63.1	62.3	67.1
Chernomordik, <i>op. cit.</i> , p. 270.						

- 3) profits and collective funds of the *kolhoz* and of the artisans' and consumer (trade) cooperatives
- 4) wages of *kolhoz* members and artisans' cooperatives
- 5) incomes of independent farmers and artisans

The first and third shares represent the collective income of citizens; the other three, the private income of the citizens participating in production. The latter, except the parts taken away by taxation and other deductions, are available for private spending and saving.

These shares are produced by five types of enterprises: (1) state-owned (agricultural, industrial, construction, transportation, and trading); (2) *kolhoz*; (3) trade cooperatives; (4) artisans' cooperatives; (5) independent farmers and artisans.

13 INCOME DISTRIBUTED BY STATE-OWNED ENTERPRISES

The income distributed by state-owned enterprises constitutes the greater part of national income, inasmuch as the state owns practically all industrial construction, transportation, and financial enterprises, the greater portion of trading organizations, and some very substantial farms. It is much broader in scope than

income distributed by state enterprises in capitalist economies. One part goes to the state, the other to labor. The former consists mainly of profits of the enterprises; net interest of state banks; turnover and certain other taxes; payroll contributions to social security and other welfare funds.

Profits of state-owned enterprises serve a double objective: to provide new investment capital for the expansion of production and funds for workers' welfare. They are intended also to promote within the enterprises proper business accounting and economic operation. One part remains in the enterprise and is either re-invested or spent on workers' welfare; the other is transmitted to the state which distributes it in the form of budgetary subsidies among industries operating at a loss or earning only small profits. These deductions, in addition to producing revenue for the state and providing means for the equalization of capital resources of enterprises, help the state to enforce its controls over the enterprises and the use of their funds. The profits are usually planned in advance as a specific percentage addition to business costs, the ratio varying from industry to industry depending upon the character of the industry or enterprise, its cost structure, and the price policy of the government. A high ratio does not always mean a high rate of profit, or a low ratio a low rate; for in an industry employing little or no or only inexpensive raw material, the ratio, all other conditions being the same, would necessarily be higher than in one using much and/or expensive raw material.

The general tendency of the Soviet economic authorities, quite consistently, was as far as possible to fix prices high enough to cover costs and yield sufficient profits to cover the industry's capital requirements and substantially improve the workers' welfare. However, for several industries prices could not be raised to such a level even during the 1930's, not to speak of the '20's. Consequently, these industries, especially producer goods, were still far from self-supporting; e.g., the lumber industry had a deficit of 10.6 percent in 1937; the cement industry, 7.3 percent; the aluminum and the building supply industries, varying deficits. Most consumer goods industries, on the contrary, had surpluses.

Interest represents the value of the services of finance (the

services of personnel, profits, etc., and is computed as the difference between interest earned and interest paid.

The *turnover tax* is the state's principal fiscal source as well as an important price regulator and instrument of economic control generally. Ordinarily, it finances almost 80 percent of the national budget (77.4 percent in 1935, 78.4 in 1937), is paid by all state and cooperative enterprises that sell their own products, and is levied at only one stage. It is used first, to ensure a supply of new capital to the various sectors of the national economy; second, to provide for the costs of general administration, national defense, education, and other social and cultural needs. Through it the state divides the total social product, or national income, into a portion to be used collectively for investment and capital accumulation purposes as well as to maintain various social and other purposes designated in the state budget and economic plan; and a portion to be distributed among the producers as their private incomes to be spent on consumption or saved. According to Soviet writers, the turnover tax represents the state's profit from socialist production to be used for the collective benefit of the community.³⁰

The tax functions as an instrument of over-all control over production and the use of funds by enterprises. It is also a regulator or corrective of prices, helping to keep supply and demand in line.³¹ The rate ordinarily varies from 1 percent of the final price (of which it is a part) of some products to more than 90 percent of others. Its rapid growth, and wider application after the tax reform of 1930 is evident in the accompanying figures.

Before 1930 state-owned industries as well as other types of

³⁰ According to the Chernomordik study (pp. 87-88) "From an economic point of view the turnover tax and the socialist profit are identical in nature. Both are produced by collective socialized labor. Both constitute the portion of the national income that is accumulated for investment and other social needs . . . Profits increase not only with output but also with labor efficiency and lower costs. The purpose of allowing enterprises to retain a portion is to afford an additional stimulus to efficiency and cost reduction. Though only a portion of profit is paid into the national budget, the entire proceeds of the turnover tax are made available to it. The withdrawal of a portion of the 'accumulatable' income in the form of the turnover tax ensures the fulfillment of the revenue estimates of the budget, and, hence, also of its expenditure, and of the entire economic program of the nation. The tax is also an instrument of supplementary financial control over the entire system of production and distribution."

³¹ For a fuller description of this tax see Alexander Baykov, *Development of the Soviet Economic System* (Cambridge University Press, 1945), Ch. XIX.

	Receipts from the Turnover Tax (millions of rubles)						
	1931	1932	1933	1934	1935	1936	1937
Total receipts	11,672	20,514	27,060	37,596	52,167	65,762	76,795
Receipts from industry	9,349	15,445	19,751	21,969	29,194	39,249	46,819
% receipts from industry are of total	80.1	75.3	73.0	58.4	56.0	59.7	61.0

Chernomordik, *op. cit.*, p. 85.

undertakings (not to speak of individuals) were subject to the *income tax*. After the tax reform of that year, state enterprises were exempt and subject to the turnover tax.

The income tax, as a business or production tax, is still imposed on cooperative organizations, handicraft industries, and individual enterprises (see Sec. 14). The *land rent* tax is levied at specific rates per square meter of land, depending on the classification of the community as well as how the land is used. Communities are classified by such factors as size, social and occupational characteristics of the population, degree of development of industry and commerce, location with reference to transportation, administrative importance, and other factors determining the rentability of the land. This tax must be distinguished from the rents charged by local authorities for the exploitation of peat lands and for the collection of fuel wood in municipally controlled forests. The tax on *buildings* is laid at a fixed percentage of the cost of buildings or their insurance valuation. The rates are somewhat higher for industrial than for residential buildings. They vary also with the type of industrial (or residential) occupant. The *fishing levy*, applied to the socialized fishing agencies, is based on the catch or number of aquatic animals killed.

The *basic pay* of employees of state-owned enterprises consists of compensation, at prescribed rates, for regular and overtime work, as well as of bonuses for especially hazardous, strenuous, or unhealthful work, long service, possession of certain qualifications, the performance of certain civic duties; bonuses for the fulfillment by the entire enterprise of a designated production program, the reduction of waste, breakage, and other defects in production, and the prolongation of the life of the machinery; and premiums for efficiency and extra pay to experienced workers for instructing apprentices.

Supplementary pay of employees of state-owned enterprises is not based directly on their jobs. It is for time-off granted minors for school attendance, rest, and recreation, time lost by mothers in nursing their babies, and time taken by shop leaders and other workers to attend to party activities or civic duties; also vacation pay, allowances for lodgings, reimbursement for municipal taxes and other charges to workers not living in factory houses, street car or railway commutation, and costs of various services and goods furnished workers gratis, such as meals in factory restaurants or laundering the workers' personal effects. The latter services or goods are distinguished from those furnished them for use in the course of their duties, such as working clothes or aprons, soap, towels, foods neutralizing the effects of industrial poisoning, duty laundry, which are treated as ordinary expenses of production deductible from the gross value. In 1935 the supplementary pay in money or in kind averaged approximately 10 percent of the basic pay.

The *payroll contributions* by state-owned enterprises for the collective benefit of the workers in addition to their individual compensations are either in cash or in kind and consist chiefly of contributions to the centralized state social security fund or to the industry-wide housing fund; support of the enterprise's own welfare institutions. The social security contributions are fixed at varying percentages of the payroll, depending upon the character of the industry or trade. For example, for artists they were fixed in 1936 at 3.7 percent; for certain categories of chemical workers they were as high as 10.7 percent.

Most of the contributions by enterprises to their own welfare activities were consolidated in 1936 into the 'Director's Fund', fixed at 4 percent of the authorized or planned profit and at 50 percent of any excess profit. At least one-half of the income from the fund was to be expended each year on housing for workers. The rest could be spent, under the authority of the Director, for cultural or other needs of the workers, such as clinics, clubs, libraries, cafeterias, and laundries, as well as to improve operation and reward special efficiency. Before 1936 each enterprise provided for the maintenance of its own factory schools, nurseries, and kindergartens by a special contribution of one-quarter of 1 percent of its payroll. It provided also for the

dissemination of its own technical information among workers and training specialists as well as rank and file workers by means of special contributions fixed as a certain percentage of its payroll. During that year, however, the responsibility for financing schools and nurseries and some of the costs of technical training were transferred to the state budget. In 1935 all these contributions to social security and workers' welfare funds and workers' training together averaged for all industries combined approximately 20 percent of the basic and supplementary pay (see Table 4).

14 INCOME DISTRIBUTED BY OTHER ENTERPRISES

The income produced by the *kolhoz* is distributed in the form of payments to state tractor stations, largely in kind; a 10-15 percent reserve of seeds and feed against crop failures; additions to the capital fund, amounting usually to 10-20 percent of the money income and used to acquire agricultural machinery, building materials, and other means of production; administrative expenses, limited as a rule to 2 percent of the total income; fund for cultural purposes such as to acquire radios and train leaders; relief fund for the benefit of disabled workers, the aged and sick, and soldiers' dependents, and to maintain nursery schools and care for orphans (likewise to a large extent in kind); wage payments to *kolhoz* members based on the number of days of labor performed; the agricultural income tax levied on gross monetary income of the *kolhoz*. The latter tax is levied to enforce control over the financial operations of the *kolhoz* as much as to raise revenue.

In addition, *kolhoz* members receive income from their own farms and household occupations.

The income produced by the *artisans' cooperatives*, unlike that produced by the *kolhoz*, is distributed mainly in cash. The major part is divided into wages of cooperative members, fixed on a piece rate basis and in accordance with the grade of work done, and profits. The latter are divided, in turn, into income tax payments to the state, additions to the capital fund, amounting usually to 30 percent, and the sums allocated to the improvement of the housing and living conditions of the members, as well as

to any other purposes approved by the general assembly of the cooperative.

The income produced by *trade cooperatives* is distributed in the form of wages and profits—from which the income tax is paid.

The income produced by *independent farmers and artisans*, a small item, is very simple in structure.

15 REDISTRIBUTION OF NATIONAL INCOME

'Primary' incomes, after having been distributed among producers, are redistributed as various types of 'derivative' income to citizens not participating in production. The redistribution is effected, as the Kolganoff study puts it, through the channels of government finance, the sale of personal services in the market, and the activities of voluntary social organizations.³²

Channels of government finance. A substantial part of the so-called primary income is redistributed through the levy of graduated income taxes and cultural and housing levies on individuals (*kult-zhil-sbor*), the issue of government loans, and the payment by the government of the compensation and maintenance of its civilian and military personnels, stipends to students, pensions, social security benefits, interest on government loans, prizes in government lotteries, insurance benefits, and interest on deposits in state banks.

Sale of personal services. As already noted, personal service (literary, artistic, medical, domestic, etc.) plays a relatively minor role in the Soviet economy. Consequently, it has not yet given rise to a large derivative income.

Activities of voluntary social organizations. These include those of the Communist Party, trade unions, and workers' clubs. Income is redistributed to their paid workers and members on the one hand, through dues, and on the other, through payments of compensation and benefits.

Despite their importance, derivative incomes are only vaguely sketched in Soviet literature.

³² *Op. cit.*, p. 103.

16 RECONCILIATION OF DISTRIBUTION AND REDISTRIBUTION

If one were to add all the primary and derivative individual incomes as well as the collective income, the aggregate would exceed the computed national income. The excess would be due to the double-counting of the derivative incomes—once as such and once as part of the primary incomes.³³

So far, the relation between the redistribution and distribution of national income has not been demonstrated statistically. The last published statistics on the distribution of national income were for the early 1930's (see Table 7). In none of the studies quoted is there a statistical table of the redistribution for any year.

³³ *Ibid.*, p. 105.

TABLE 7

National Income by Recipient Groups prior to Complete Socialization, 1928-1931

	MILLIONS OF RUBLES (CURRENT PRICES)					PERCENTAGES OF TOTAL						
	1928	1929	1930	1931	1928	1929	1930	1931	1928	1929	1930	1931
Nonagricultural	11,934	13,486	16,604	19,487	39.9	42.2	40.3	38.6				
Factory workers & employees	8,563	10,285	13,094	15,752	28.6	32.2	31.8	31.2				
Factory workers	4,406	5,325	7,113	8,848	14.7	16.7	17.3	17.5				
Employees	3,467	4,122	5,067	5,819	11.6	12.9	12.3	11.5				
Others	690	838	914	1,085	2.3	2.6	2.2	2.1				
Artisans & handicraftsmen	1,807	1,916	2,192	2,590	6.0	6.0	5.3	5.1				
In cooperatives	562	771	1,113	1,669	1.9	2.4	2.7	3.3				
Not in cooperatives	1,245	1,145	1,079	921	4.2	3.6	2.6	1.8				
Entrepreneurs	1,102	794	792	588	3.7	2.5	1.9	1.2				
Industrial	150	89	79	52	0.5	0.3	0.2	0.1				
Small merchants	652	489	555	406	2.2	1.5	1.3	0.8				
Other	300	216	158	130	1.0	0.7	0.4	0.3				
All others	462	491	526	557	1.5	1.5	1.3	1.1				
Agricultural	15,502.	14,999	19,594	22,183	51.8	47.0	47.6	43.9				
Workers	536	625	844	1,307	1.8	2.0	2.1	2.6				
In socialized sector	242	343	657	1,195	0.8	1.1	1.6	2.4				
In non-socialized sector	294	282	187	112	1.0	0.9	0.5	0.2				
Kolhoz members	260	614	4,921	10,432	0.9	1.9	12.0	20.7				
Independent producers	13,306	12,460	13,329	10,154	44.5	39.0	32.4	20.1				
Kulaks (larger proprietors)	1,400	1,300	500	290	4.7	4.1	1.2	0.6				
Profits of socialized sector	2,462	3,454	4,967	8,823	8.2	10.8	12.1	17.5				
Total national income	29,898	31,939	41,165	50,493	100.0	100.0	100.0	100.0				

Compiled from V. Katz, *National Income of U.S.S.R. and its Distribution* (in Russian) (Moscow, 1932), p. 99.