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THE DISTRIBUTION OF EARNINGS AND INCOMES IN THE SOVIET UNION*

By ALASTAIR MCAULEY

I

IN this article I am concerned with inter-personal variations in earnings and income. The material presented is primarily statistical in character; that is, the intention has been to describe the extent of differentials rather than to explain it or to consider its economic and political implications. This emphasis has been dictated by the availability of material (or the lack of it). At present there are no official Soviet statistics on the distribution of earnings and income, indeed there are no published figures on average incomes in the USSR, and it was only in the mid-sixties that the authorities resumed publication of data on average earnings. It is true, however, that since 1960 a number of monographs and papers on distribution have appeared in the USSR (and they have been an invaluable source of information), but they do not contain explicit figures; they are restricted to indirect statistics and graphs. Also, in the West, Wiles and Markowski have published estimates of the distribution of earnings and income—but their figures refer only to 1966.[1] Hence the most important thing is to collect and collate available information, and that is the aim of this article. In Section II I describe the sources of data on distribution available to Soviet economists and statisticians and attempt to assess their reliability. Section III contains a reconstruction of the distribution of earnings, while Sections IV–VI deal with the distribution of income for different social groups.

II. *Statistics on the Distribution of Earnings and Income in the USSR*

The Soviet government does not publish statistics on the distribution of earnings or income, but such information is collected and is available

* This article forms part of a wider study of income and inequality in the Soviet Union in the postwar period.

[1] P. Wiles and S. Markowski, 'Income Distribution under Communism and Capitalism', *Soviet Studies*, vol. XXII, nos. 3, 4 (January, April 1971). See also P. Wiles, *Distribution of Income: East and West* (Amsterdam, 1974).

to Soviet statisticians and economists working in the field—or at least to those employed in government research establishments. There are four different sources of information on the distribution of earnings, two of which also provide data on the distribution of income. In this section I propose to outline each of them in turn, indicating how the data are collected and the sorts of biases they are likely to contain.

A knowledge of the sources of data is useful for two purposes—even if the actual statistics are not published. Often it can aid in the interpretation of particular figures and assertions. This is important since Soviet statisticians and economists are rather casual about questions of definition. It is frequently unclear what is and what is not included in the definition of earnings and income or which particular socio-economic groups are included or excluded from distributions and comparisons. A knowledge of the probable source of the statistics used can sometimes resolve these questions. It can also throw light on the question of the availability of information. It is all too frequently assumed that the Soviet government has at its disposal virtually unlimited information about the Soviet economy and Soviet society. The failure to publish particular statistics is taken as evidence of obsessive secrecy about economic information, that the Soviet authorities have something to hide. But in a pre-computer society the amount of statistical information that can be handled is strictly limited. Frequently, the absence of published statistics reflects no more than the failure to collect them in the first place. This is particularly true in the field of personal welfare and the standard of living. Below we suggest that there are adequate statistics on the distribution of earnings in the state sector for only nine postwar years. Data on the distribution of income are even more limited; figures are available for only three postwar years.

Family Budget Surveys

The most extensive source of information on the distribution of earnings and incomes is the family budget survey. Continuous budget data collection started in the USSR in 1929, but a number of sample surveys had been conducted in the twenties. The collection of data is carried out under the auspices of TsSU (Central Statistical Administration). The procedures were substantially revised in 1951, and there were further modifications during the sixties.[2] During the fifties information was collected on the incomes and expenditures of some 50,000 families; later the sample size was expanded to 62,000, approximately 0·1% of the total number of families in the USSR.[3] But weaknesses in

[2] A detailed history of family budget studies in the USSR is given in I. Ya. Matyukha, *Statistika byudzhetov naseleniya* (M., 1967).

[3] *Id.*, *Statistika zhiznennogo urovnya naseleniya* (M., 1973), p. 72.

sample selection procedures and data analysis have undermined the value of this material and meant that it has been little used in the study of income distribution.

The basic principle used in the selection of samples is that of the industrial affiliation of the wage earner. Enterprises are classified into industries and ordered by employment. First, a representative sample of enterprises is chosen, designed to reflect the industrial mix of the economy as a whole; from selected enterprises a random sample of individuals is chosen by mechanical means.[4] There are a number of weaknesses with this procedure. First, not all industries are included; until recently the sample of enterprises was confined to industry proper (which on Soviet definition includes mining and quarrying). The result was that the families of those covered by the survey constituted only about a third of all wage-earners.[5] It was only in the sixties that the sample was increased to include those employed in construction and transport; those who work in distribution and other services are still very largely excluded. In rural areas the sample consists primarily of kolkhozniki. State farm workers are grossly under-represented, and those whom the Russians call the rural intelligentsia are wholly excluded, although, again, there have been some changes in the later sixties.

The use of the so-called industrial principle in sample selection results in a number of biases. The sample is geographically unrepresentative; it is claimed, for example, that there are very few households from Kazakhstan.[6] More generally, the procedure excludes pure pensioner and pure student households; it also excludes those households where all are employed in trade and services. All of these might plausibly be expected to be among the worst-off in the USSR. Also, since probability of selection depends, in part, upon the number of workers in the family, one-worker families will be under-represented. It is claimed that the distribution of earnings derived from budget data is biased upwards and that this bias is substantial.[7] Similar criticisms could also, presumably, be levelled at distributions of income derived from this source. Nevertheless, until 1972 it has been the only source of information about the distribution of incomes among kolkhoznik families.[8] Also, it is suggested that since the budget survey returns aggregate the earnings of all members of kolkhoz households it is impossible to produce a distribution of earnings for kolkhozniki, for the country as a whole for any year before 1972.[9]

[4] A. I. Levin, *Sotsial'no-ekonomicheskie problemy razvitiya sprosa naseleniya v SSSR* (M., 1969), pp. 150–6. [5] *Ibid.* [6] *Ibid.*
[7] N. M. Rimashevskaya, *Ekonomicheskii analiz dokhodov rabochikh i sluzhashchikh* (M., 1965). [8] Matyukha, *Statistika zhiznennogo urovnya naseleniya*, p. 72.
[9] G. S. Sarkisyan, *Uroven', tempy i proportsii rosta real'nykh dokhodov pri sotsializme* (M., 1972), p. 194.

Until very recently, 1969-72, the analysis of family budget data was carried out manually. As a result, households were classified into income groups at local level and only the total numbers in each category forwarded to TsSU in Moscow. Urban households were classified into 11 categories by per capita money income, while kolkhozniki were grouped into 12 classes by per capita total income. It is only since 1970 that both groups have been classified by the same principle. The use of these procedures has meant that the central authorities have had at their disposal very little information about the distribution of particular categories of receipts. Between 1969 and 1972 the analysis of this data has been transferred to computer; this has increased the amount of material available to TsSU and the planners.[10]

For those families included, information is collected on both income and expenditures. For survey purposes income is defined to include earnings in cash and kind, pensions, stipends, and money receipts from the government, and other sources, and also the value of output from private agricultural activity. For budget survey purposes, apparently, privately produced agricultural products together with those received in return for labour services are valued at state retail prices.[11]

All these problems make family budget survey data of questionable value in the determination of income and earnings distribution.

Income Distribution Surveys

Although large quantities of information on family incomes and expenditures in the USSR are collected each month through the family budget survey, Soviet statisticians and economists have found it virtually impossible to use this information to derive accurate estimates of the distribution of personal or money income. For this reason the basic source of information on income distribution is data drawn from a series of special sample surveys undertaken by TsSU. Such surveys were held in 1958, 1967, and 1972. In consequence, it is only for these years that adequate distribution statistics exist.

Only the 1958 survey has been described in detail, but there is reason to believe that the other two have been similar in methodological approach and basic objectives.[12] It has been stated that the aim of the 1958 survey was to collect representative data on incomes, housing conditions, and family composition, and also to investigate the possibility of generalizing family budget survey results to the population as a whole.[13] There is no evidence to suggest that it was successful in this

[10] Matyukha, *Statistika zhiznennogo urovnya naseleniya*, p. 137.

[11] The sources are ambiguous on this point, but see Matyukha, *Statistika zhiznennogo urovnya naseleniya*, p. 78.

[12] See *ibid.*, p. 74.

[13] See M. L. Zhutkovskaya, 'Edinovremennoe vyborochnoe obsledovanie sostava semei, dokhodov i zhilishchnykh uslovii rabochikh i sluzhashchikh nesel'sko-

second aim. The 1958 and 1967 surveys were restricted to the non-agricultural population of the USSR, but in 1972 the survey was extended to include kolkhozniki. It also, presumably, included state farm employees and their families, although sources are silent on this point.[14]

In 1958, 240,000 families were surveyed, in 1967 the sample size was increased to 250,000, and in 1972 it was 310,000 or approximately 0·4% of the population of families.[15] In both 1958 and 1967 the sample of families was selected on the basis of the industrial principle.[16] A similar procedure was presumably used in 1972. Only the approach used in 1958 has been described in detail. It is thought that the methods used in other years have been similar in most respects to those known from 1958, when the approach was essentially the same as that used in the selection of families for inclusion in the family budget survey, except that all non-agricultural branches of the economy were included and more attention was paid to obtaining a geographically representative sample. In consequence, the information obtained is likely to suffer from many of the same biases.

In 1958, selected enterprises were asked to prepare lists of all employees who had worked the full month of April. (At this stage apprentices were excluded.) A random sample was selected mechanically from these lists and individuals were visited in their homes between 10 and 18 October. They were asked to provide information about family composition, housing conditions, and income. All members of the families of selected employees were asked to supply information on earnings and other sources of income; but information from individuals absent at the time of the enumerators' visits was provided by other family members.

For survey purposes income was defined on an accruals basis; information was related to the month of September. (There is some suggestion, however, that those who did not work the full month of September were asked to supply figures relating to the last complete month worked.[17]) Income was defined to include money earnings, pensions, stipends, and other receipts from the government, and monetary receipts from other sources. Subsidies (*dotatsiya*) for keeping children in day nurseries or kindergartens, for sending children to pioneer camps or for visits to sanatoria and rest-houses were excluded. Finally, income in kind, with the exception of free accommodation associated with

khozyaistvennykh otraslei narodnogo khozyaistva', in *Vyborochnoe nablyudenie v statistike SSSR* (M., 1966), p. 96.

[14] V. E. Komarov and U. G. Chernyavsky, *Dokhody i potreblenie naseleniya SSSR* (M., 1971), p. 205. [15] Matyukha, *Statistika zhiznennogo urovnya naseleniya*, p. 74.

[16] This description is taken from Zhutkovskaya, *op. cit.*, pp. 96ff.

[17] *Ibid.*, p. 104.

employment, was excluded.[18] Family income was defined to be the sum of the incomes of the members, and per capita income to be family income divided by the number of members in the family. In Soviet practice a family is defined as a group of individuals who share common housekeeping arrangements, whether or not they are related by blood or marriage.

The two sources examined so far are the only ones to give information on the distribution of personal and money income. Personal income distribution statistics, where they are quoted or referred to in Soviet sources for years before 1972, must be based on the family budget data, the limitations of which we have seen. Money income distribution statistics for years other than 1958, 1967, and 1972 will also have been derived from the same source. Further, they will exclude kolkhozniki. References to the distribution of money incomes in 1958, 1967, and 1972 will probably be based on data drawn from the specific sample surveys. All these income distribution statistics exclude pure pensioner and pure student households and, because of the way in which samples were selected, under-represent single-worker households. For that reason, if for no other, they are likely to exhibit upward bias. These points should be borne in mind when discussing particular distributions or statistics derived from them.

Earnings Censuses

The basic source of information on the distribution of earnings have been the periodic censuses (*otchety*) carried out by TsSU. Although similar enquiries were held before the Second World War they were stopped at some time in the thirites and resumed only in 1956. Since then they have been held every two or three years. There were almost certainly censuses in 1956, 1959, 1961, 1964, and 1966; probably they were also held in 1957, 1968, 1970, and 1972.[19] This gives a maximum of nine earnings distributions from the postwar period. Figures relating

[18] *Ibid.*, p. 108. I. Ya. Matyukha gives a copy of the survey questionnaire in which there is no specific mention of free accommodation so this should be treated with caution. See 'Iz opyta primeneniya vyborochnogo metoda pri izuchenii zhiznennogo urovnya naseleniya', *Vestnik statistiki*, 1960, no. 9, pp. 14–26.

[19] Each year in the first list is given at least twice in the following sources: *Balansy dokhodov i potrebleniya* (M., 1969), p. 92; A. V. Krushevsky, 'Nekotorye metody prognozirovaniya ryada ekonomicheskikh pokazatelei', *Ekonomika Sovetskoi Ukrainy*, 1967, no. 5, p. 87; Matyukha, *Statistika zhiznennogo urovnya naseleniya*, p. 77; Rimashevskaya, *op. cit.*, p. 46. Krushevsky also mentions 1957, and Shvyrkov and Aidina print a histogram relating to that year in 'Model' raspredeleniya naseleniya po dokhodu' in *Opyt primeneniya matematicheskikh metodov i EVM v ekonomiko-matematicheskom modelirovanii potrebleniya* (M., 1968), p. 234. Matyukha also refers to 1972. No explicit mention of 1968 and 1970 has been found, but N. E. Rabkina and N. M. Rimashevskaya give a graph relating to the first year in *Osnovy differentsiatsii zarabotnoi platy i dokhodov naseleniya* (M., 1972), p. 194, and Sarkisyan, *op. cit.*, pp. 132–3, gives statistics relating to the second.

to other years will probably have been derived from family budget data or the income survey, and should be treated with caution. This applies in particular to 1946, which serves as a base year for many Soviet comparisons in the postwar period.[20]

For census purposes, all enterprises, organizations and institutions (excluding kolkhozy, of course) are required to provide information on numbers employed, total wages paid out, and to give distributions of employees both by basic wages or salaries (*tarifnye stavki ili dolzhnostnye oklady*), and also by gross earnings (*nachislennaya zarabotnaya plata*). The figures cover all those who have worked a full month (usually March or April), and earnings include wages, salaries, all incentive payments from the wages fund and other sources. The reimbursement of expenses and loans from enterprises are excluded.[21]

This brief statement of census methodology leaves a number of questions unanswered. It says nothing about multiple job holders or part-time workers (presumably excluded), nor does it say how income in kind is dealt with. But it does give a general outline of the nature and scope of the material from which Soviet earnings distributions are constructed. They relate to full-time state employees only. This means that kolkhozniki are excluded and also members of artisans' cooperatives before they were absorbed in 1960. On the other hand, apprentices are almost certainly included, as are junior service personnel and enterprise security staff.[22] Earnings cover all forms of monetary receipts for labour services, are defined on an accruals basis, and relate to a single month in the relevant year.

Earnings Surveys

In at least two years the earnings census has been combined with a sample survey designed to investigate the structure of earnings for particular groups of state employees in more detail. Such surveys were held in 1956 and 1959; they may also have been held after 1966 but no such reference has been discovered. There was also a survey in 1963—a year in which no *otchet* was held.[23] These surveys cover the earnings of all employed at enterprises selected. (Apprentices and others are explicitly mentioned.) For the years on which we have information, they have been restricted to enterprises in industry and construction,

[20] But see below for a possible alternative source of information in 1963.
[21] Rabkina and Rimashevskaya, *op. cit.*, p. 47.
[22] These groups are not specifically mentioned as being included—but there is other evidence to suggest that they are. See below.
[23] See P. I. Labok, 'Vyborochnoe obsledovanie zarabotnoi platy rabochikh, ITR i sluzhashchikh v promyshlennosti i stroitel'stve', in *Vyborochnoe nablyudenie v statistike SSSR* (see footnote 13 above), pp. 270–80. See also Rabkina and Rimashevskaya, *op. cit.*, p. 47.

and their primary purpose has been to investigate changes in the structure of earnings, the relative importance of basic wages, various bonuses and plus-rates. The results have been used both in the organization of the wages reform and in monitoring its impact. Apart from this very little more is known of these surveys.

The four sources listed provide the only information available to Soviet economists, statisticians and policy-makers about the distribution of earnings and incomes in the USSR as a whole. No doubt individual academics and organizations have undertaken small-scale surveys designed to reveal information on the distribution of incomes and earnings for particular groups and localities.[24] But these are surely subject to considerable margins of error. In addition to these sources on the distribution of earnings and incomes, TsSU has published annual figures on average earnings since the mid sixties. These figures relate to state employees and to earnings in particular economic sectors. There are also some figures on earnings of workers, ITR (Engineering and Technical Personnel), and clerical staff in particular industries. These figures are apparently derived from accounting data collected in the course of monitoring plan-fulfilment.[25] They do not permit the construction of earnings distributions. Nor, so far as I am aware, has any use been made of income tax data in the USSR, although this is the source used by the British authorities to construct estimates of the distribution of income in the United Kingdom.

So far we have described the sources of information on earnings and incomes available to Soviet economists and statisticians. Only figures relating to average earnings in particular sectors and for state employees as a whole are published by the Soviet authorities. However, enough information is given in Soviet monographs to permit most of the available distributions to be reconstructed with reasonable accuracy, although information on the distribution of incomes among kolkhozniki is particularly scarce. The published material is largely graphical: a number of Soviet books and articles contain histograms or polygons that represent the distribution of earnings or incomes for specific groups in particular years. The diagrams are often badly printed and all numerical information is usually removed from the axes; there is no indication of the scale employed nor, often, of the location of the mean or other parameters. But some indirect information is usually given about these parameters in the text (or in other texts). These two sorts of information usually suffice to permit the original distributions to be reconstructed. This is the source of all distributions given in this

[24] See, for example, those described by M. Matthews in *Class and Society in Soviet Russia* (London, 1972), pp. 85–86.

[25] See the definitions given in *Narodnoe khozyaistvo SSSR v 1969 g.*, p. 825.

study. The techniques employed in making these reconstructions were first used by Wiles and Markowski to obtain an earnings distribution for 1966.[26] They involve careful measurement of the histograms, or more usually polygons, and certain plausible assumptions about the way in which original diagrams were constructed. In particular, it is assumed that income classes or earnings classes are divisible by five.

There is one final feature of the sources of statistical information on the distribution of earnings and incomes that merits comment. So far, we have commented only on the paucity of data on the distribution of earnings, and particularly income, available to the Soviet authorities. It must also be pointed out that very much more information is available now than in, say, 1955. Earnings censuses were restarted in 1956; income surveys were held in 1958, 1967 and 1972; earnings surveys were held in 1956, 1959 and 1963 and possibly in other years; the family budget survey was overhauled and extended in the sixties. All of these activities involved the expenditure of resources, and surely would not have been undertaken unless the political authorities were interested in the information they might provide. They should therefore be taken as evidence of a kindling (or re-kindling) of interest in questions of distribution and inequality at some time in the middle fifties.

On a rather different level, in 1959–60 changes were made in planning procedures which increased the emphasis attached to welfare considerations. After 1959, the so-called 'Balance of Money Incomes and Expenditures of the Population'—the device by which equilibrium in the consumer goods market is maintained—was calculated on a republican basis; previously, it had been compiled only for the USSR as a whole.[27] This would have had the effect of making explicit inter-republican differences in per capita incomes and expenditures even if this was not the primary purpose of the innovation. Also, in 1960 a separate section dealing with indicators of material welfare (*material'noe blagosostoyanie naroda*) was introduced into the national plan. Previously, such indicators had been scattered through the rest of the document.[28] This change also suggests that questions of welfare were accorded higher priority in planning after 1960.

These changes in planning practice and extensions to the range of economic statistics collected are more convincing indications of a change in policy on the part of the Soviet authorities than public pronouncements of the state's concern for popular living standards, which have formed part of the Communist Party's political rhetoric since 1917, if not earlier. They tend to confirm the claim that one of the objectives of the wage reform, launched in 1956, was a reduction in earnings dif-

[26] See Wiles and Markowski, *op. cit.*
[27] *Balansy dokhodov i potrebleniya naseleniya*, p. 122.
[28] *Ibid.*, p. 70.

ferentials,[29] and that the so-called earnings revolution since that date has in part been motivated by a desire to reduce the inequality of earnings and incomes.

III. *The Distribution of Earnings, 1956–70*

Table 1 gives my reconstruction of the Soviet earnings distribution for seven of the nine years in which I believe wage censuses were held. I have been unable to locate sufficient information to permit reconstructions of the distributions in 1970 or 1972. A detailed description of the sources and methods used in the reconstruction is given in the Appendix.

The first question to be answered is: how accurate are the distributions given in Table 1? The underlying material on which the figures are based has been drawn from two separate Soviet sources, probably using slightly different assumptions. As a result, there are inconsistencies between the different years. These are most apparent between 1959 and 1961 and probably greatest in the tails. In Table 3 we compare certain statistics given in the Soviet literature with their analogues computed from the data in Table 1. This suggests that the distributions for 1961, 1966 and 1968 are more accurate than those for other years.

There is one feature of the distributions given in Table 1 that merits a special comment. Average per capita earnings in 1956, calculated from the distributions, are shown as 69.60 rubles per month: in 1957 the figure is 73.90 rubles per month. The corresponding figures from TsSU's annual series on average earnings are 73.40 and 76.20 rubles per month respectively. On this point, however, both the relevant sources are reasonably unambiguous: Shvyrkov states that between 1956 and 1964 average earnings increased by 29·3% (and by 6·2% between 1956 and 1957). The corresponding figures calculated from the TsSU series are 22·75% and 3·8%. It is difficult to believe that Shvyrkov's figures are the result of a printing mistake. Consequently, Shvyrkov's distributions either yield lower average earnings in 1956 or higher earnings in 1964 than TsSU s. Since the rates of growth for 1959–61 and 1961–64 are more or less identical I prefer the first alternative. This decision receives indirect confirmation from Rabkina and Rimashevskaya. They give an equation that describes average earnings as a function of time. They claim that the maximum error between predicted and actual earnings is 2.9 rubles. Substituting for 1956 in this equation yields a value for average earnings of 69.58 rubles.[30]

It is difficult to conceive of an explanation for an error of 3.8 rubles

[29] A. P. Volkov, 'Trud, zarabotnaya plata i narodnoe blagosostoyanie v SSSR', in A. P. Volkov (ed.), *Trud i zarabotnaya plata v SSSR* (M., 1968), p. 23.
[30] Rabkina and Rimashevskaya, *op. cit.*, p. 250.

(approximately 5%) in average earnings computed by the two methods used by TsSU, especially since it does not apply in later years. The most plausible explanation is either that the 1956–57 wage censuses included a substantial group of low-paid workers who were excluded from the calculation of TsSU's annual series—a group that has subsequently been either excluded or included in both sets of calculations; or that the 1956–57 earnings censuses excluded a category of earnings which was included in TsSU's annual calculations and which has been either included or excluded from both sets of calculations since 1959. In the former case, apprentices seem the most likely group, although it is unlikely that the accounting data on which the annual series is based record the earnings of apprentices separately. In the latter case, some form of income in kind, probably paid to employees on state farms, seems most logical. It is a moot point whether this category of income was included in the census definition or excluded from the annual series after 1959. On the argument that Soviet statisticians would tend to make earnings as large as possible: probably the former.

The figures in Tables 1 and 2 provide more information about the extent and nature of the 'earnings revolution in the 12 years after Khrushchev's secret speech. They allow certain conclusions to be drawn about the impact of the wages reform of 1956–65 and the progressive increases in the minimum wage. They show that over the period average earnings increased by almost 60%, approximately 4% per annum. The Soviet government does not publish a cost-of-living index but one calculated by Bronson and Severin shows an increase of only 0·5% over the 12-year period. Thus the increase in real wages was virtually identical to the measured increase in nominal wages.[31]

At the same time the degree of inequality, as measured by the decile ratio, declined by some 38–45%. This was achieved by a substantial increase in the earnings of the low-paid, accompanied by a restriction in the growth of earnings among the highly-paid: the first decile grew by 144% over the period, the ninth by only 38%. In ruble terms, the increases received over the ten years were very similar at all levels of income. In 1956 the inter-quartile range was 54.55 rubles, 12 years later it was 55.94 rubles; the inter-decile range increased only from 99.10 rubles to 110.20 rubles. Looked at in this way, differentials can be said to have remained more or less constant in ruble terms while the whole distribution has shifted bodily to the right. Thus, the consequence of the wage reform and the earnings revolution has been to give everyone more or less the same increment in money wages. It is this policy that has produced the marked fall in the degree of inequality.

[31] D. Bronson and B. Severin, 'Soviet Consumer Welfare: The Brezhnev Era', *Soviet Economic Prospects for the Seventies* (Washington, D.C., 1973), p. 393.

TABLE 1

DISTRIBUTION OF STATE EMPLOYEES BY GROSS EARNINGS: USSR, 1956–68 (%)

Earnings (rubles per month)	*1956*	*1957*	*1959*	*1961*	*1964*	*1966*	*1968*
–25	9·66	8·20	4·40	6·74	2·15	2·18	3·04
25–30	6·02	6·05					
30–35	5·04	5·55	7·97	9·47	5·27		
35–40	5·18	4·79	4·82				
40–50	11·49	10·09	11·95	11·37	6·25	7·09	
50–60	10·50	9·58	11·32	9·89	9·91	11·33	5·43
60–70	9·52	9·08	9·23	10·53	10·54	11·88	8·31
70–80	7·84	8·07	8·39	9·68	11·08	10·42	10·22
80–90	7·28	7·31	7·75	8·42	10·37	9·58	11·18
90–100	6·72	6·56	7·13	7·37	9·29	8·48	10·54
100–120	9·24	9·59	10·28	10·53	13·59	13·33	17·57
120–140	5·32	6·11	7·12	5·89	9·38	8·73	12·46
140–160	3·08	3·84	4·61	3·37	5·71	5·82	8·30
160–200	2·52	4·12	3·98	2·53	5·00	6·79	7·36
200–	0·56	0·67	1·05	4·21	1·43	4·36	5·49

Sources: 1956–59, 1964: V. V. Shvyrkov and L. K. Aidina, 'Model' raspredeleniya naseleniya po dokhodu', in *Opyt primeneniya matematicheskikh metodov i EVM v ekonomiko-matematicheskom modelirovanii potrebleniya* (M., 1968), p. 234; 1961, 1966–68: N. E. Rabkina and N. M. Rimashevskaya, *Osnovy differentsiatsii zarabotnoi platy i dokhodov naseleniya* (M., 1972).

TABLE 2

SOVIET EARNINGS DISTRIBUTIONS: MEASURES OF LOCATION AND DISPERSION

	1956	*1957*	*1959*	*1961*	*1964*	*1966*	*1968*
Mean (rubles)	69·6	73·9	79·2	83·2	91·0	98·9	110·9
Median (rubles)	62·2	66·3	70·4	72·1	84·0	87·4	101·3
As % of median:							
1st Decile	40·68	39·97	47·58	46·32	53·57	57·89	61·01
1st Quartile	62·86	60·94	66·05	66·16	73·10	72·88	77·00
3rd Quartile	150·64	150·23	147·73	142·72	136·78	139·13	132·28
9th Decile	200·0	202·11	201·14	195·01	177·14	190·85	169·79
Decile Ratio	4·9	5·1	4·2	4·2	3·3	3·3	2·8
Average Earnings (rubles)	73·4	76·2	79·0	83·4	90·1	99·2	112·7

Source: Last row from *Trud v SSSR* (M., 1968), p. 137.

The increases in earnings recorded in Table 1 did not occur smoothly over the period. The most important factor in achieving the reduction in inequality has been the periodic increases in the minimum wage. In 1957 the minimum wage was set at 27–35 rubles per month, depending on location and occupation. Between 1957 and 1965 the whole wages system was reformed, and at the end of the period the minimum was raised to 40–45 rubles. In 1968 it was raised to 60 rubles per month. The impact of these changes is clear in Table 1. One further feature of the figures in Table 1 deserves comment. The Soviet minimum wage is

TABLE 3

SOVIET EARNINGS DISTRIBUTIONS: FURTHER PROPERTIES

	Soviet Estimates		*From Table 1*	
	d_9/d_1	$\bar{x}/d_1$	d_9/d_1	$\bar{x}/d_1$
1956	4·4		4·9	2·6
1957			5·1	2·8
1959			4·2	2·4
1961		2·5	4·2	2·5
1964	3·7	2·4	3·3	2·0
1966	3·2		3·3	2·0
1968	2·7		2·8	1·8
1970	3·2	1·8		

Source: Cols. 1 and 2: G. S. Sarkisyan, *Uroven', tempy i proportsii rosta real'nykh dokhodov pri sotsializme* (M., 1972), pp. 124, 126, 132-3.

defined as 'the limit below which the remuneration of an employee who conscientiously fulfils his obligations cannot fall'.[32] Throughout the period this so-called lower limit coincided approximately with the first decile of the earnings distribution. Since the earnings censuses refer only to those who have worked a full month, this may be taken to imply that apprentices (to whom the minimum wage laws do not apply) are included.

The distributions in Table 1 relate to the period 1956–68; although it is not possible to give complete figures, one can say something about the changes that occurred between 1968 and 1970. According to TsSU figures, average earnings increased to 122 rubles per month, a rise of 10%. This increase was accompanied by some increase in differentials. From the figures in Table 3 it follows that the first decile was 68.16 rubles while the ninth had increased to 218.10 rubles, that is, by 26·8%. In 1970 the Soviet authorities started a programme to raise the minimum wage to 70 rubles per month, so the empirical relationship mentioned above continues to hold. But the policy of reducing relative differentials has been partially reversed by allowing larger ruble increases to those at the top of the scale. By 1975, when the new minimum wage provisions have been universally introduced it is intended that the degree of inequality in earnings that existed in 1970 will have been reduced—but not to the levels of 1968. The planned value of the decile ratio in 1975 is 2·9.[33]

Even if the planned changes in average earnings during the 1970–75 five-year plan are not achieved, the wages revolution that has occurred in the USSR is still remarkable. But if average earnings reach their target of 150–160 rubles per month in 1975, then in approximately 20

[32] R. S. Livshits, *Zarabotnaya plata v SSSR: pravovye voprosy* (M., 1972), pp. 228–30.
[33] Sarkisyan, *op. cit.*, p. 132.

years they will have increased by 224%. Over the same period the minimum wage will have risen between two and two-and-a-half fold, and the degree of inequality (as measured by the decile ratio) will have fallen by 34%. The change since 1946 is even more remarkable—although not too much reliance can be placed upon the statistics of the 1946 distribution and in that year the economy had not recovered from the effects of the war; still, the statistics suggest that there will have been a 60% reduction in inequality in the postwar period. This is no mean achievement and one that I doubt could have occurred in the absence of the centralized setting of wages.

IV. *The Distribution of Incomes in 1958 and 1967*

Using techniques similar to those employed on earnings, it has proved possible to reconstruct the distribution of income in the USSR in 1958 and 1967. The reconstructions are given in Table 4 and statistics of location and dispersion calculated from them are given in Table 5.

TABLE 4

DISTRIBUTION OF THE NON-AGRICULTURAL POPULATION BY PER CAPITA INCOME: USSR, 1958 AND 1967 (%)

Income (rubles per month)	*1958*[a] *Individuals*	*1967* *Individuals*	*Families*
−20	12·92	—	—
20–25	8·76	2·75	1·75
25–30	10·42	4·375	3·5
30–35	10·11	5·7	5·0
35–40	9·2	6·875	5·75
40–45	9·16	8·5	7·5
45–50	9·0	9·5	9·0
50–60	8·33	19·5	19·0
60–70	7·87	15·0	15·5
70–90	14·19	15·0	17·5
90–110		5·0	7·5
110–130		3·0	4·5
130–		4·75	3·5

[a] It is impossible to give more detail about frequencies in the tails of this distribution as it has been estimated indirectly.

Sources: 1958: N. M. Rimashevskaya, *Ekonomicheskii analiz dokhodov rabochikh i sluzhashchikh* (M., 1965); 1967: Rabkina and Rimashevskaya, *op. cit.*, Figs. 8 & 9, p. 120.

For 1958 we have been able to obtain figures on the distribution of individuals only by per capita income; for 1967 we give both the distribution of families and family members by family per capita income. At the risk of repeating myself, it is important to emphasize what the figures in Tables 4 and 5 represent. They give distributions of non-agricultural families (and family members) by per capita money income. Although it is difficult to be precise, the 1958 figures therefore cover

TABLE 5

SOVIET INCOMES DISTRIBUTIONS: MEASURES OF LOCATION AND DISPERSION

	1958	1967	
	Individuals	*Individuals*	*Families*
Mean (rubles)	48·4	62·6	65·7
Median (rubles)	39·2	56·3	59·2
As % of median			
1st Decile	46·66	57·73	58·70
1st Quartile	68·11	76·55	77·36
3rd Quartile	140·31	130·90	133·61
9th Decile	190·56	179·40	176·86
Decile Ratio	4·1	3·1	3·0

about 56% of the Soviet population, while those in 1967 refer to approximately 63%.

The form in which data on the distribution of income are presented will, in part, depend on the uses to which they are put. Soviet interest is primarily centred on disparities in living standards, and this has influenced the character of the distributions derived. Soviet statisticians define the family as a group of individuals (usually related by blood or marriage) sharing a common budget. The family is taken to be the basic consumption unit, and the Soviet view is that all members of a given family will enjoy the same standard of living. This is conventionally measured by the family's per capita income. This is usually calculated as total family income divided by the number of persons in the family. The Soviet literature contains some discussion of adult-equivalent scales and their determination, but I know of no empirical work on the distribution of income in which family members are given different weights depending upon their age or sex. In the distributions given below, the very old and the very young have the same weight as adult members in the determination of per capita family income.

It is difficult to determine how reliable the figures given in Table 5 are. The only other published distribution, that by Wiles for 1966, gives a median per capita income of 53.20 rubles per month and a decile ratio of 3·6. This corresponds fairly closely with a median income of 56.28 rubles per month in 1967 derived from Table 4, but there is a significant difference in the degree of dispersion. The distributions are broadly similar; the figures for the two years are also plausible; more than that one cannot say.

If we accept the figures of Table 4, we see that between 1958 and 1967 average per capita income increased by some 29·3%. This is somewhat less than the increase in average earnings. Using the annual series published by TsSU, earnings increased by 32·4% over the same period but, of course, these figures include the earnings of state farm workers

whose relative position improved over the decade while they are excluded from the income data.

Over the same period, the degree of inequality, as measured by the decile ratio, declined by about 24%. This is a reflection of the relatively more rapid rate of increase of per capita incomes in the bottom tail of the distribution. As the inter-quartile range remained virtually unchanged in ruble terms over the period it appears that the bulk of Soviet citizens enjoyed broadly similar increases in living standards. Since the increase in the ninth decile, in ruble terms, was greater than that of lower deciles it seems that the best-off enjoyed the largest absolute increase in real income.

In spite of the fact that per capita incomes increased at a rate of 2·9% per annum over the period 1958–67, the figures in Table 4 show how badly off substantial numbers of Soviet families remain and, *a fortiori*, how low living standards were in 1958. In 1974 the Soviet authorities introduced an income supplement for needy families (*maloobespechenym semyam*) and thus implicitly defined a poverty level for Soviet conditions. In view of the very low rates of price inflation in the preceding decade and a half, that level can serve as an approximate indicator of poverty for 1967 and even 1958. Under the provisions of the 1974 regulation, families with a per capita income of less than 50 rubles per month receive 12 rubles per child per month until the child reaches its eighth birthday. For purposes of calculating income, earnings, pensions, stipends and other financial receipts are included as is, apparently, the value of output from the family's private plot.[34] Thus we can take 50 rubles per month as a rough indication of the 'poverty level' in 1967. At that date, according to the figures in Table 4, 32·5% of families and 37·7% of individuals were below the poverty line. Since these figures exclude state farm workers where incomes tend to be lower and families larger than the average, the true proportions of workers and their families in poverty probably exceeds 40%.

V. *The Distribution of Kolkhoznik Incomes in 1965 and 1968*

As was pointed out in Section II, the only source of information on the incomes of kolkhoznik families available to Soviet statisticians before 1972 was the family budget survey. For budget survey purposes, income is defined to include not only receipts from the state, the collective farm and from sales of output of the private plot but also that part of home-produced output that is consumed within the family. Thus it follows that data on the distribution of kolkhoznik families by income will not be strictly comparable with the figures given in the preceding

[34] For a fuller description see H. Vogel, 'Social Security and Medicare', in *Economic Aspects of Life in the USSR* (Brussels, 1975), pp. 207–33 and especially p. 214.

section. In fact, I have only been able to find two distributions relating to kolkhozniki for 1965 and 1968. These are discussed below.

Reconstructions are given in Table 6, and associated measures of location and dispersion in Table 7. They were obtained with the same techniques as other distributions in this article. It is difficult to establish how accurate the figures in Table 6 are because nothing similar exists in the literature, nor are there all that many indirect statistics with which to compare our results. Some check on the location of the distributions is given by the following arguments. In my study of the structure of incomes in the USSR,[35] using national income data for the most part, I obtain a figure of 46.95 rubles for the average monthly per capita income of kolkhozniki in 1965. This includes an allowance for the value of benefits received from the state health service and state education. When these are excluded average per capita income is reduced to 43.83 rubles per month. These figures are clearly of the same order of magnitude as those for 1965 given in Table 6. The discrepancy may in part be assigned to sample bias.

TABLE 6

DISTRIBUTION OF KOLKHOZNIKI AND THEIR FAMILIES BY PER CAPITA TOTAL INCOME: USSR, 1965 AND 1968

1965		*1968*	
Income (rubles per month)	%	*Income (rubles per month)*	%
10–15	1·17	15–20	2·83
15–20	4·17	20–25	5·22
20–25	7·83	25–30	7·83
25–30	10·17	30–35	9·13
30–35	11·17	35–40	10·00
35–40	11·50	40–45	10·43
40–50	19·33	45–55	17·83
50–60	13·33	55–70	18·91
60–75	12·00	70–90	12·61
75–100	6·67	90–110	3·91
100–125	1·67	110–130	0·87
125–	0·83	130–	0·43

Source: Rabkina and Rimashevskaya, *op. cit.*, pp. 122–3.

To check on the 1968 figure we may use the fact that in 1969 the average per capita income of kolkhozniki was 69% of that of state employees.[36] If the median earnings of state employees bore the same relationship to the mean in 1969 as in 1968, the figures in Table 2 imply a median of 106.7 rubles per month in 1969. Further, if median per capita income for state sector families bore the same relationship to median earnings in 1969 as in 1967, we may use the coefficient given

[35] A. McAuley, *Personal Income in the USSR 1960–1970* (mimeo), University of Essex, 1975.

[36] Sarkisyan, *op. cit.*, p. 189.

TABLE 7

KOLKHOZNIK INCOME DISTRIBUTIONS: MEASURES OF LOCATION AND DISPERSION

	1965	*1968*
Mean (rubles)	46·4	51·4
Median (rubles)	42·1	47·6
As % of the median		
1st Decile	54·63	55·04
1st Quartile	72·92	73·53
3rd Quartile	135·87	135·08
9th Decile	176·25	173·32
Decile Ratio	3·23	3·15

by Rabkina and Rimashevskaya to infer a median per capita income of 65.51 rubles per month.[37] Again relying on the constancy of median-mean relationships we derive an estimate of average per capita income in the state sector in 1969 of 72.84 rubles per month. This implies a per capita income of 50.26 rubles per month for kolkhozniki. Since the original comparison must have been based exclusively on family budget data or on national income data as there was no income survey in 1969, and, in view of the numerous possible sources of error in the calculation, this figure is remarkably close to the 51.36 rubles per month given in Table 7. We may conclude, then, that the distributions of Table 6 are located in approximately the right position, showing a tendency to overstate average incomes if anything.

The only information on the dispersion of incomes that I have been able to discover relates to the Latvian SSR. For that republic the decile ratio of kolkhoznik incomes is reported as 3·01 in 1965 and 3·10 in 1968. Latvia is small and relatively affluent and, *a priori*, I would expect the distribution for the USSR as a whole to show a greater dispersion. These figures tend to confirm the dispersion recorded in Table 6 or to imply that it has been understated. One disturbing feature of the figures given by Berzkaln is that they record a continuous increase in the decile ratio of kolkhoznik incomes over the period 1965–70. From Table 7 the trend for the USSR as a whole is in the other direction. But in view of the policies pursued towards the kolkhoz sector in this period I believe that a reduction in the degree of dispersion is inherently more plausible.[38]

On the basis of the figures in Table 7 the average per capita income of kolkhoznik families in 1965 was 46.38 rubles per month. By this date, kolkhozniki had received very significant increases in rates of pay since 1953; also, in 1965 a start was made in extending to kolkhozniki

[37] Rabkina and Rimashevskaya, *op. cit.*, p. 215.

[38] O. Ya. Berzkaln, 'O differentsiatsii rabochikh, sluzhashchikh i kolkhoznikov Latviiskoi SSR po urovnyu dokhoda i potrebleniya', in *Statistika i elektronno-vychislitel'naya tekhnika v ekonomike*, vyp. IV (M., 1971), pp. 64–79.

benefits from the Soviet welfare state. Average per capita income in the early sixties was probably significantly less than in 1965. Between 1965 and 1968 average income increased by 10·7% (a rate of 3·45% per annum). In 1968 it was 82·1% of the per capita income of the families of state employees in 1967. This is substantially more than the 69% recorded in 1969. The relative deterioration in the position of kolkhozniki at the end of the sixties was most probably a consequence of the raising of the minimum wage to 60 rubles per month in 1968. The further increase in minimum wages scheduled for 1970–75 will probably result in state employees maintaining their relatively advantageous position.

As measured by the decile ratio, the degree of inequality among kolkhozniki in 1968 was only marginally greater than that of state employees in 1967. Since the state employees category here excludes sovkhozniki, there was probably little to choose between the two in actual fact. The three-year period 1965–68 is too short to draw any meaningful conclusions about the way in which inequality has changed over time.

Although average earnings have been rising quite rapidly and, although kolkhoznik incomes are not markedly more unequally distributed than in the rest of the economy, kolkhozniki and their families are still badly off. In 1968 more than 54% of kolkhozniki lived in families with per capita incomes of less than 50 rubles per month, our notional poverty level. In 1965 the proportion was as high as 64%. In the mid-sixties, then between one-half and two-thirds of collective farmers and their families were still living in poverty.

VI. *The Distribution of Income in the USSR*

The discussion of the previous sections suggests that even Soviet specialists do not have at their disposal adequate materials to permit them to construct distributions of income applicable to the Soviet population as a whole for years before 1972. The income surveys of 1958 and 1967 refer to the non-agricultural population. The earnings censuses refer to state employees, but exclude kolkhozniki. Family budget data provide information on the collective farm sector, but sovkhozniki and other categories are under-represented or excluded. Also, the different sources of information use different definitions of income. The income surveys refer to money income for the month of September; the earnings censuses refer to gross earnings for the month of March; family budget data refer to money income for state employees, to total personal income for collective farmers but averaged over the whole year.

It is, however, possible to integrate the distributions given in the preceding sections to provide an estimate of the distribution of income for the USSR as a whole. Given the inconsistencies in the data and the undoubted errors that have crept in in the course of reconstruction, the resulting distribution should be interpreted with caution. But it should give a better idea of the extent of disparities in living standards in the USSR in the late sixties than anything that has been available hitherto.

There are two issues to be resolved before the distributions given in Tables 4 and 6 can be integrated: first, the period to which it should refer has to be determined and, second, some allowance has to be made for state farm employees. The most appropriate initial distributions refer to 1967 for the non-agricultural population and 1968 for the collective farm sector. Unfortunately, we do not know how incomes changed between 1967 and 1968, yet ideally one of the two distributions should be shifted. According to TsSU, average earnings in the state sector grew by 7·6% between the two years, but this is scarcely a sufficient basis on which to determine the shift in the 1967 distribution. Consequently, no allowance has been made for this factor. In what follows we integrate the 1967 and 1968 distributions and assume that they refer to 1967/68. The effect of this will be to reduce both mean income and the degree of dispersion.

State farm workers and their families are excluded from the distribution in Table 4; they are also excluded from Table 6. Yet, in 1968 this group accounted for approximately 15% of the Soviet population. Further, average earnings in state agriculture, while higher than in the collective farm sector, were lower than in the rest of the state sector. To exclude this group would tend to bias the results upwards. To investigate the extent of this bias two distributions have been estimated. In the first, it was assumed that state farm sector incomes were distributed in the same way as incomes in the rest of the state sector. In the other, it was assumed that state farm incomes were distributed in the same way as those in the collective farm sector. These are given in Table 8; the relevant statistics on location and dispersion are given in Table 9.

It should also be pointed out that the 'income' referred to in Tables 8 and 9 is something of a bastard concept. For state sector employees it is per capita money income while for the collective farm sector total personal income per capita is implied. Since a significant proportion of the income of the collective farm family is still derived from private agricultural production, that is, accrues in the form of subsistence consumption, the use of total income is to be preferred.

In 1967/68, then, bearing in mind the caution with which the figures should be interpreted, average per capita income in the USSR was

TABLE 8

DISTRIBUTION OF INCOME: USSR, 1967/68 (%)

Income (rubles per month)	1	2
–20	0·63	1·10
20–25	3·30	3·68
25–30	5·14	5·68
30–35	6·46	6·99
35–40	7·57	8·05
40–45	8·93	9·23
45–50	9·37	9·28
50–60	18·54	17·88
60–70	14·47	14·10
70–90	14·47	14·10
90–110	4·76	4·59
110–130	2·52	2·20
130–	3·79	3·12

Notes: The distribution in col. 1 reflects the assumption that the incomes of sovkhozniki were distributed in the same way as other state employees, that in col. 2 that they were distributed like those of kolkhozniki. Both are derived as weighted averages of distributions in Tables 4 and 6. Population shares are used as weights: col. 1—0·2227: 0·7773; col. 2—0·3774: 0·6225. The share of state farmers in the population was calculated as the product of average annual employment in 1968 and the average size of rural families in 1959.

TABLE 9

DISTRIBUTION OF INCOMES 1967/68: MEASURES OF LOCATION AND DISPERSION

	1	2
Mean (rubles)	60·1	58·4
Median (rubles)	54·6	53·4
As % of the median		
1st Decile	56·23	55·43
1st Quartile	75·27	73·78
3rd Quartile	129·67	129·78
9th Decile	173·44	168·35
Decile Ratio	3·08	3·04

between 58 and 60 rubles per month. The degree of inequality, as measured by the decile ratio, lay between 3·04 and 3·08. The proportion of individuals living in families with a per capita income of less than 50 rubles per month (the implied poverty line) was between 41·40% and 43·98%.

The results of this exercise show that in the late sixties over two-fifths of the Soviet population were still living in poverty. But they also show that the degree of inequality, at least as measured by the decile ratio, was substantially less than had previously been conjectured. The decile ratios given in Table 9 are some 15% less than that conjectured by Wiles. On this measure the USSR is shown to possess approximately the same degree of inequality as other countries in Eastern Europe for which Wiles gives figures (with the exception of Bulgaria). It is substantially more equal than the United Kingdom (with a decile ratio of 3·4 in 1969) or the United States and Italy.[39]

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[39] See Wiles, *op. cit.*, p. 48.

APPENDIX

The Reconstruction of Soviet Earnings and Income Distributions

The problem is to reconstruct numerical estimates of the relevant distributions from the materials to be found in published Soviet sources—a variety of indirect statistics and a series of graphs from which all numerical information has been removed. The version of the Wiles-Markowski technique employed in this article rests on the following assumptions:

a) the graphs have been constructed from underlying histograms by joining the mid-points of their columns;

b) in constructing the diagrams and reducing them for printing the metric scale was used;

c) possibly the true mode rather than the mid-point of the modal column was used;

d) the histogram columns have bases that are integral multiples of five rubles.

The reconstruction of any particular distribution involves the following steps:

i) careful measurement of the original graph to locate the points of inflection in the distribution polygon;

ii) determination of the number and probable width of the underlying histogram columns; at this stage assumptions b) and c) are used to account for minor inaccuracies due to bad printing;

iii) measurement of the height of points of inflection above the abscissa to determine the height of histogram columns;

iv) calculations of the total area (in square millimetres) of the histogram;

v) calculation of the mean of the histogram with reference to the start of its first column;

vi) approximate identification of the calculated mean with the ruble mean determined from other sources;

vii) determination of dispersion and location from assumption d) and indirect statistics.

Details of the calculations involved in particular reconstructions are given in Table A-1.

TABLE A—1

EARNINGS DISTRIBUTIONS

1956–59, 1964—*Source:* Shvyrkov and Aidina, *op. cit.*, pp. 233–4. Shvyrkov gives the relevant histograms; reconstruction involves the determination of scale location.

	1956	*1957*	*1959*	*1964*
Scale (= 5 rubles)	3 mm.	3 mm.	2 mm.	2 mm.
Histogram Origin	10 r.	10 r.	15 r.	20 r.
Number of Columns	14	15	14	17
Upper Limit	220 r.	220 r.	225 r.	230 r.

The implied ruble intervals are

1956: 15, 3×5, 6×15, 3×20, 30; 1957: 15, 3×5, 7×15, 3×20, 15;
1959: 15, 3×5, 10, 5×15, 2×20, 25, 30; 1964: 15, 5×5, 6×10, 15, 20, 25, 30, 25.

An indication of the adequacy of these reconstructions is given by comparing the values of parameters of log-normal curves fitted to the reconstructions with those given by Shvyrkov. Parameters were estimated by the quantile method.[40] Quantiles were estimated on the assumption that observations were evenly distributed within their intervals (see Table A-2).

TABLE A-2

	Shvyrkov				*Fitted*			
	1956	*1957*	*1959*	*1964*	*1956*	*1957*	*1959*	*1964*
m	4·076	4·147	4·215	4·366	4·110	4·158	4·241	4·433
s	0·58	0·56	0·54	0·52	0·64	0·61	0·59	0·47

TABLE A-3

1961, 1966–68—*Sources:* Rabkina and Rimashevskaya, *op. cit.*, pp. 138, 194. Only the polygons are given so that for these the histograms had to be reconstructed.

	1961	*1966*	*1968*
Scale (= 10 r.)	5 mm.	4 mm.	3 mm.
Histogram Origin	20 r.	30 r.	40 r.
Number of Columns[a]	13(11)	11(9)	13
Upper Limit	300 r.	260 r.	280 r.

[a] Figures in parentheses indicate the number of identified points of inflection. The others include additional columns to make the scale fit in accordance with assumption d).

The implied ruble intervals are
1961: 8×10, 3×20, 40, 100; 1966: 10, 20, 4×10, 3×20, 40, 60;
1968: 7×10, 2×20, 10, 40, 30, 50.

For comparison, Rabkina and Rimashevskaya give the following equations describing mean and decile ratios as functions of time.[41]

$$\text{Log } K(t) = \exp(0{\cdot}6742 - 0{\cdot}0242t)$$
$$\bar{x}(t) = \exp(3{\cdot}829 + 0{\cdot}0376t)$$

where K(t) equals the decile ratio in year t, and t = 0 in 1945. Substituting in these equations gives values to be compared with those derived from the reconstructed distributions shown in Table A-4.

TABLE A-4

	Rabkina			*Fitted*		
	1961	*1966*	*1968*	*1961*	*1966*	*1968*
$\bar{x}$	83·96	101·40	109·27	83·2	98·7	110·9
K	3·66	3·16	2·98	4·2	3·4	2·8

The location of the distributions was determined by the earnings distributions already derived and the relationships between deciles given by Rabkina and Rimashevskaya.[42]

[40] J. Aitchison and J. A. C. Brown, *The Log-Normal Distribution* (Cambridge, 1957), pp. 40–42.
[41] Rabkina and Rimashevskaya, *op. cit.*, p. 250.
[42] *Ibid.*, p. 215.

TABLE A–5

INCOME DISTRIBUTIONS: STATE SECTOR

Sources: Rimashevskaya, *op. cit.*, p. 61, Rabkina and Rimashevskaya, *op. cit.*, p. 120. The 1958 distribution is derived from a diagram representing 'earnings' in that year. It has been converted to 'incomes' using the set of decile ratio coefficients for that year given *ibid.*, p. 215. The basic characteristics of the three reconstructions are:

	1958 Earnings	*1967 Individuals*	*1967 Families*
Scale (= 5 r.)	2 mm.	3 mm.	3 mm.
Histogram Origin	20 r.	20 r.	20 r.
Number of Columns	9	12(11)	12(11)
Upper Limit	260 r.	170 r.	170 r.

The implied ruble intervals are
1958 (earnings): 4×10, 2×20, 40, 2×60;
1967 (both distributions): 6×5, 2×10, 3×20, 40.

TABLE A–6

INCOME DISTRIBUTIONS KOLKHOZ SECTOR

Source: Rabkina and Rimashevskaya, *op. cit.*, pp. 122–3. The basic characteristics of the reconstructions are:

	1965	*1968*
Scale (= 5 r.)	3 mm.	3 mm.
Histogram Origin	10 r.	15 r.
Number of Columns	12	12
Upper Limit	150 r.	150 r.

The implied ruble intervals are
1965: 6×5, 2×10, 15, 3×25;
1968: 6×5, 10, 15, 4×20.

The location of these distributions on the ruble scale rests upon plausibility. Histogram column widths in millimetres are reasonably well-established as is the scale of 3mm: 5 rubles. But in 1965, for example, given the national income calculations referred to in the text, these are consistent with a mean income of either 46.4 rubles or 41.4 rubles per month. The former figure has been chosen because a ruble scale containing intervals such as 75–100 rubles is inherently more plausible than one utilizing 70–95, etc. The choice in 1968 is determined partly by the calculation given in the text and partly by the choice for 1965.