The economic transformation of the Soviet Union, 1913–1945

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2 The crooked mirror of Soviet economic statistics

S. G. Wheatcroft and R. W. Davies

Statistics have very seldom been collected for purely historical analysis. They have normally been collected to assist in such functions as administration, planning, and levying taxes. Historians by the very nature of their subject are forced to use other people’s statistics. They cannot redesign the surveys and questionnaires that were used in the past, they cannot measure things that were not measured or affect the timing and location of those surveys, censuses, investigations and registrations that were carried out. They have to make the best use of what statistical data and accounts are available to them. Before they begin using these data, however, they should attempt to discover how the data were collected and calculated, and by whom these operations were carried out. They should attempt to see whether there are any reasons for doubting the reliability of these data. Where doubts do arise as to their reliability, they should attempt to make an assessment of the possible scale of the inaccuracy. It is extremely dangerous to accept figures on trust without understanding their origin and history.

These homilies apply to the study of the economic and social development of any country at any time. They are even more important in the case of Soviet history. It is true that Western historians working on the economic and social history of the USSR have the advantage of dealing with a country that had a well-developed central statistical agency and was gathering and publishing data on all sorts of social phenomena. This was unique for such a large and underdeveloped country. On the other hand, they have the disadvantage that political and ideological bias has distorted published Soviet government statistics to an exceptional extent. In the crucial period of Soviet development in the 1930s and 1940s the authorities selected for publication those statistics which would portray their activities in a favourable light. At the height of the Stalin period very few specific figures were published. In a number of important cases the authorities deliberately distorted the statistical record in order to conceal disasters and repressions.

Fortunately a great deal of information is available which enables us to examine actual statistical procedures and the contemporary debates among statisticians over these procedures. Many blanks in the record have been filled in since the death of Stalin by the release of previously unpublished data, and in the past few years a vast range of formerly secret archives has been made available to Western as well as Russian historians. The economic history of the Soviet Union can now be based on reasonably full and reasonably reliable data.

In this chapter we introduce the reader to the chequered history of Russian and Soviet statistics; and to the many Western studies which have sought to clarify and assess Soviet economic and social data.

(A) A brief history of Russian and Soviet statistics

A Statistical Department was established as early as 1811 by Alexander I, subordinate to the Ministry for Police. By 1857 this had been transformed into the Central Statistical Committee (Tsentral’nyi Statisticheskii Komitet – TsSK) attached to the Ministry for Internal Affairs. TsSK, and its associated provincial statistical committees, steadily expanded until the Bolshevik revolution of October 1917 brought them to an abrupt end. Among the most important achievements of TsSK was the preparation of national series on the harvest, using data on sown area and yield sampled from the millions of peasant households. It also collected population data, culminating in the first full population census in 1897.

From the end of the 1860s the new units of local government, elected on a restricted franchise – the zemstvo – also began to establish their own statistical agencies. In their studies of peasant economy, including the budgets of peasant households, they were world pioneers. In 1916, the zemstvo statisticians were allowed to organise the first all-Russian agricultural census.¹

Pre-revolutionary government departments also established their own statistical departments. Thus by the end of the 1890s the Ministry of Finance and the Ministry of Trade and Industry systematically collected data on industrial production and employment, which formed the basis for first-class studies of the factory industry of the Russian Empire published in the 1920s.²

Pre-revolutionary statistics were by no means free of bitter controversy. The zemstvo were extremely hostile to the TsSK, which they regarded as a puppet of the tsarist government. Statistical reliability was not the prerogative of either camp. As we shall see in chapter 6, we have come to the conclusion that the grain harvest data of TsSK, much criticised for underestimating production, were reasonably reliable. On the other hand, we accept the view that its population data in the years following the 1897 population census were greatly overestimated.

After the October 1917 revolution, the new Bolshevik government under
Lenin sought to combine the traditions and activities of the TsSK and the zemstvo in a unified hierarchy of statistical agencies. Lenin’s own very serious attempts to study the pre-revolutionary economy convinced him of the importance of statistics for both analysis and policy-making. On 23 July 1918, the Central Statistical Administration (Tsentral’noe statisticheskoe upravlenie – TsSU) was established, and it has continued to exist, together with its local agencies, under various names and variations until the present day. Its first director was P. I. Popov, a prominent zemstvo statistician; it was Popov who organised the 1916 agricultural census.

Ministerial statistical departments also continued to exist. While in principle and to some extent in practice they coordinated their activities with TsSU, they always retained a considerable degree of autonomy. Perhaps the most important was the Central Statistical Department (Tsentral’nyi Otdel Statistiki – TsOS) of the Supreme Council of National Economy (Vesenkhoh or VSNKh), in practice responsible for industrial statistics.

With the restoration and expansion of the economy after the end of the Civil War, the 1920s was the decade in which statistics flourished, and a huge amount and variety of statistical data were published. Outstanding publications included the balance of the national economy for the economic year 1923/24; the population census of 1926 (the first since 1897), the final results of which appeared in 56 volumes; and the 1929 census of small-scale industry. A more detailed account of Soviet statistical publications in the 1920s and 1930s will be found in Wheatcroft’s chapter in S. Fitzpatrick and L. Viola (eds.), A Researcher’s Guide to Sources on Soviet Social History in the 1930s (1990), pp. 155-73.

In the 1920s the Soviet leaders insisted on the importance of objective statistical data. Even Stalin piously proclaimed in 1924:

no work of construction, no state work, no planning work is conceivable without correct records (ucheta). And records are unthinkable without statistics … In a bourgeois state a statistician has a certain minimum of professional honour. He is unable to lie. He may be of any political persuasion or outlook, but in relation to facts and figures, even if he is abused, he will not state an untruth. We should have more of such bourgeois statisticians.

But during the course of the 1920s statistics in practice became increasingly subject to political control.

At the outset of the New Economic Policy, when Lenin presented harvest data to the X Party Congress, he used the incorrect results of the 1920 agricultural census to claim that the harvest was low, and hence to justify a radical shift in policy towards a more flexible arrangement with the peasants. Popov, the head of TsSU, and Tsyrurupa, the People’s Commissar for Food, confirmed the accuracy of these low harvest figures. The radical shift in policy proposed by Lenin was undoubtedly necessary; but it is equally certain that the harvest figures for 1920 were underestimated, as TsSU itself later admitted. It is not clear how far Lenin deliberately presented figures which he knew were unreliable. But this incident was probably a major factor in lowering the credibility of the statisticians in the eyes of senior party officials such as Stalin. When Stalin later practised far greater statistical deceit, he could easily persuade himself that he was following a Leninist precedent.

A further dramatic incident followed in the autumn of 1925. TsSU had prepared figures showing, probably accurately, that a high proportion of grain surpluses came from peasant households with larger sown areas. These figures were used by a leading Bolshevik Lev Kamenev, in opposition to a party majority which included Stalin and Rykov, to argue that economic polarisation among the peasantry was increasing.

To investigate this incident the party set up a special commission which found against TsSU; and simultaneously TsSU proposals to increase expenditure on the collection of state statistics were rejected. In January 1926 Popov resigned, and he was replaced a month later by V. V. Osinski, a quite prominent party member. Osinski’s remit was to reorganise TsSU, and to cooperate more closely with Gosplan, the State Planning Commission. At this time, the period of recovery from war and civil war was coming to an end, and great attention was being devoted to state planning. With the twin aims of increasing the usefulness of statistics for planning purposes, and of increasing the influence of Gosplan over TsSU, Gromov, a Gosplan official, was appointed a member of the collegium of TsSU and placed in charge of the planning of statistics.

These developments did not mean the immediate collapse of statistical independence or objectivity. Osinski had worked in a provincial statistical office before the First World War, and had a justified reputation in the party for his independent spirit. In general he defended the interests and objectivity of the statisticians. But two years after his appointment he was removed from office. This was apparently because he was not prepared to accept the optimistic assessment of the 1927 harvest which formed part of Stalin’s justification for the strong measures adopted to obtain grain from the peasants. Osinski was replaced by V. P. Milyutin, a prominent, colourless and amenable party member. In the period between the spring of 1928 and the summer of 1929 the dispute between Stalin and the Bukharinist ‘Right Wing’ was not finally resolved in Stalin’s favour. For the moment statisticians were still able to put forward data which conflicted with the official conception of reality. But during 1928 and 1929 open discussion of economic matters was more and more restricted.

Among the statisticians matters came to a head in the course of the
The crooked mirror of Soviet economic statistics

This revival of more objective state statistics did not survive the next few years. In December 1932, a Politburo resolution prepared by Stalin, Molotov and Kaganovich criticised TsUNKhU for ‘very crude political mistakes’, due to the ‘presence on the central staff of a bourgeois tendency concealed under the banner of “objective” statistics’. The alleged mistakes included the underestimation of both the grain yield for 1932 and the industrial results of the five year plan. Osinski received an official reproof, and his first deputy was dismissed, together with the eminent statistician Nemchinov. The status of TsUNKhU was reduced; henceforth it was not ‘attached’ to Gosplan but formed a subordinate part of it. Kraval’, a strong supporter of Stalin, was appointed as Osinski’s first deputy.

In the next few months the control of the Politburo over statistics was further strengthened. In June 1933 Stalin and Molotov sent a telegram to the Odessa regional authorities claiming that ‘reliable data’ showed that the Odessa Grain Trust had deliberately underestimated their harvest. This extraordinary intervention by the highest authorities resulted in widespread upward revision of the harvest estimates. Osinski was finally forced to back down on his more objective evaluations of agricultural production. Two years later, in August 1935, Osinski was dismissed and replaced by Kraval.

Even by 1935 professional statistics was not dead. In 1937, a further crisis occurred when the preliminary results of the 1937 population census, the first since 1926, showed that the population of the USSR was at least eight million less than had been officially anticipated (see chapter 4). The results of the census were suppressed, and Kraval was accused of wrecking, and arrested. TsUNKhU, like all other government departments, was engulfed in the ‘Great Purge’ of 1937-8.

Behind the scenes, however, a great deal of statistical material continued to be prepared and circulated within a narrow circle. An industrial census was carried out in 1938, and this was followed by a successful population census in 1939. Many of the older professional statisticians continued to work within TsUNKhU, including P. I. Popov, who had resigned from its leadership in January 1926.

In spite of this activity of statisticians behind the scenes, which continued throughout the Stalin period, very little statistical material was published in the USSR from 1937 until 1956, three years after Stalin’s death. And in the later years of the Stalin period the figures which were published were often distorted or falsified. The Soviet economy was presented to the Soviet people and to the West in a crooked mirror. Some of these statistical practices continued until well after the launching of perestroika in 1985.
(B) Distortions

The Soviet authorities pursued several different and often contradictory objectives in developing their elaborate arrangements for collecting statistics at a local, departmental and national level. They sought to know the truth about the economic situation in the country, particularly in relation to successes and failures in pursuing their key priorities. But they also sought to reward achievements and penalize failure with the aid of their knowledge of the quantitative results achieved by individual economic units, and by whole sectors of the economy. This gave strong incentives to participants in the system at every level to exaggerate their reported results; and the central authorities were not always able to correct this deficiency adequately. Moreover, the central authorities and the competing interests within the party, and within the state apparatus, were all willing to distort statistics in their own interests.

The authorities also used their statistics to publicize the achievements of the Soviet system to the world. Published statistics therefore suffered a further distortion as compared with internal statistics for official use: Soviet successes were exaggerated, and failures minimized or simply omitted from the published record. The published record was further complicated by the Soviet passion for secrecy. What constituted a state secret was far more broadly defined in Soviet practice than in the practice of other Great Powers. The relative unimportance of commercial secrecy in the Soviet Union mitigated this defect, but only to a relatively minor extent.

At worst, Soviet published statistics were deliberately falsified. We shall see in the course of this book that the published harvest data were falsified throughout the Stalin period from 1933 onwards. It is evident that the Soviet authorities, including Stalin, were tainted in their own distortions, and to some extent even deceived themselves about the size of the harvest. (See chapter 6.) Demographic data were also deliberately falsified; thus the size of the Soviet population was exaggerated in the published results of the 1939 population census. The official figure for deaths in the Second World War announced by Stalin was greatly underestimated, presumably with the intention of concealing Soviet weakness from the capitalist world. (See chapter 4.)

Apart from such cases of deliberate falsification, the authorities always adopted those statistical series which gave the most favourable presentation of the rate of growth. No unambiguously objective estimate of rates of growth is possible. The composition of output and relative prices of different kinds of output differ considerably over time, particularly in a fast-growing economy. The choice of base year when estimating index numbers can therefore make a considerable difference to the result. (For a more detailed discussion of index numbers, see Box.)

Index number problems

When the structure of prices and outputs is changing, it becomes impossible to measure changes in real output and the price level unambiguously.

Consider an index of the current, nominal value of GNP in 1937 expressed as a percentage of 1928 (we call 1928 the base year, and 1937 the current year; Pe is the set of prices, and Qe the set of quantities produced, in year e):

Nominal GNP index = \( \frac{\Sigma P_{37}Q_{37}}{\Sigma P_{28}Q_{28}} \)

To find the change in real GNP in 1937 (the current year), compared with 1928 (the base year), this index must be divided by a price index. The price index can be weighted by the structure of output either in the base year (a Laspeyres index) or in the current year (a Paasche index). In conformity with the Gerschenkron effect, we expect the Laspeyres index to grow more rapidly, because the prices of food and consumer products grew rapidly over the period, and in 1928 agriculture and light industry had the largest weight in the structure of output. The Paasche price index will grow more slowly, because machinery prices were relatively stable, and the weight of machinery in the structure of output in 1937 was relatively large.

Real GNP, measured by the nominal value of output, deflated by the Laspeyres price index, will therefore appear to grow more slowly. In fact, it will form a Paasche index of volume, weighted in this case by the current (1937) structure of output, as the following expression shows:

\[
\left( \frac{\Sigma P_{37}Q_{37}}{\Sigma P_{28}Q_{28}} \right) / \left( \frac{\Sigma P_{28}Q_{37}}{\Sigma P_{28}Q_{28}} \right)
\]

Conversely, the nominal value of GNP, deflated by the Paasche price index, gives a Laspeyres index of real output:

\[
\left( \frac{\Sigma P_{37}Q_{37}}{\Sigma P_{37}Q_{37}} \right) / \left( \frac{\Sigma P_{37}Q_{37}}{\Sigma P_{37}Q_{37}} \right)
\]

More generally, the value of output

= Paasche price index \times Laspeyres volume index

= Laspeyres price index \times Paasche volume index.

This index-number effect is particularly important in the case of Soviet industrial production in the 1920s and 1930s. The Soviet series are calculated in terms of the initial-year prices of the economic year 1926/27. But the rate of growth of Soviet industrial production is much greater when it is
measured in initial-year prices rather than prices of a later year (1937 or later). In the 1920s, machinery costs and prices were relatively high, because most machinery was produced on a small scale. At the same time food prices were relatively depressed. By 1937, the concentration of resources on the capital goods industries in general, and on the machine-building industry in particular, had led to a sharp fall in costs and prices relative to those of other products, especially industrial consumer goods and agricultural products. But the output of machinery and capital goods grew much more rapidly than the rest of the economy. This resulted in the 'Gerschenkron' effect, named after the American–Russian economist who first observed it. When Soviet goods and services are valued at 1926/27 prices, the growth of total output is dominated by high-priced machinery, and the rate of growth is exceptionally rapid. If 1937 prices are used, total output is dominated by consumer goods and agricultural products, which grew much more slowly. (See Box for further discussion of the Gerschenkron effect.)

These real changes in output and costs have a similar effect on price indexes. A price index weighted by the structure of output in the 1920s, when the economy was dominated by agriculture and light industry, shows much sharper increases in the period up to 1937, when prices on consumer markets spiralled upwards. Price indexes weighted by the structure of output in later years are correspondingly more influenced by machinery prices, and rise more slowly.

The 'Gerschenkron effect' is also found in other countries at a similar stage of development, such as the United States in 1899–1939. It is particularly marked in the Soviet Union because the pace of change was so precipitate. There is no methodological reason to prefer index numbers in initial-year prices ('Laspeyres' indices) to index numbers in end-year prices ('Paasche' indices): both provide 'true' if substantially different rates of growth. But the Soviet exclusive preference for the Laspeyres index, and the extreme difference in the two indices due to the rapid transformation in the Soviet machine-building Industry, certainly resulted in a one-sided presentation of Soviet economic success.

Such distortions and ambiguities have greatly complicated the task of Western economic historians in our efforts to assess the Soviet economic effort. But as long as the reliability of different kinds of data published in different periods can be graded, and the methods used to distort and exaggerate can be identified, Western students of the Soviet economy have been able to take steps to check and correct the exaggerations. And our knowledge has been considerably extended by the publication, from 1956 onwards, of previously secret statistical data for the Stalin period, and the more recent availability of formerly secret publications and of statistical archives.

(C) Re-evaluations

Soviet official statistics were challenged as early as the 1930s by émigré economists and well-informed journalists; the exaggerated post-1932 harvest figures were particularly strongly criticised. Aggregate statistics for the growth of industrial production and national income were also widely discounted. In 1939 Colin Clark, a Western statistician, attempted to estimate the order of magnitude of Soviet growth by evaluating a small group of commodities in United States' prices. He concluded that official index numbers for overall growth were greatly exaggerated.

After the Second World War Soviet statistics were analysed carefully and systematically by a large number of Western scholars. The pioneer was the demographer Frank Lorimer, whose book The Population of the Soviet Union, published by the League of Nations in 1946, was primarily based on the 1926 and 1939 population censuses (only a few tables from the 1939 census had been published). We shall frequently refer to this brilliant study in our subsequent discussion.
Soviet military achievements during the Second World War appeared to

demonstrate that the Soviet economy was much stronger than previously

believed. With the growing tension between the Soviet Union and the West,

an assessment of Soviet economic power became a major preoccupation.
The pioneer was the émigré economist Naum Jasny, who, working on

his own, attempted in a series of volumes published between 1949 and 1962 to

estimate the growth of industry, agriculture and national income. His most

important books, still relevant today, are: *The Socialized Agriculture of the

USSR* (1949); and *Soviet Industrialization, 1928-52* (1961). His general

quantitative results are conveniently summarised, and compared with those


made many errors, both in arithmetic and in methodology, but — perhaps

because of his wide-ranging knowledge of the Soviet economy — his esti-

mates did not differ widely from those reached by large teams of American

researchers.

The most important Western work on Soviet statistics was undertaken in

1946-55 by a United States team headed by Professor Abram Bergson,
developing work undertaken by the Office of Strategic Services during the

war, and financed by the United States' Air Force. They prepared a series of

major sectoral studies which enabled Bergson to compute solidly-based

national income statistics in fixed and current prices for the years 1928,

1937, 1940, 1950 and 1955. National income was primarily estimated in

terms of end use, and the most important sectoral studies concerned con-

sumption and investment. The statistics of consumption were primarily

based on the work of Janet Chapman, published as: *Real Wages in Soviet

Russia since 1928* (1963). Retail trade data in current prices were deflated

by the use of retail price indices based on a large body of data on individual

prices. The investment series in real terms combined separate series for
capital equipment and construction, also published in large monographs:

R. Moorsteen, *Prices and Production of Machinery in the Soviet Union,


Stock, 1928-1962* (1966). The Moorsteen and Powell study also includes an

annual series for Soviet national income (gross national product) by sector

of origin; the authors compare this with capital and labour statistics to

evaluate changing economic efficiency. The conclusions of Bergson and his

team, with some international comparisons, are summarised in: A. Bergson,

*The Real National Income of Soviet Russia since 1928* (1961), and in

a collection of essays: A. Bergson and S. Kuznets (eds.), *Economic Trends in

the Soviet Union* (1963).

The rival studies by Jasny and Bergson were the subject of much acid

dispute at the time. Jasny believed that Bergson's team overestimated
Soviet achievements and underestimated Soviet failures. Bergson originally

merely undertook a series of studies of separate years in current prices,

believing that available price data would not make possible a comparison in
terms of constant prices. It was only after Jasny demonstrated that abundant
price data were available, and published his own rough results in 1951-2,
that Bergson embarked on his comparison of different years in constant
prices, which was not published until 1961. Jasny claimed that his
announcement that he had found several previously unused volumes of
detailed price data for capital goods and industrial materials in the Library
of Congress led the agitated American authorities to send a despatch rider
round to Jasny's home to collect them.

In their turn, Bergson and his colleagues were irritated by the inaccuracies

and wild guesses with which Jasny's work is peppered. A supporter of

Bergson published an article critical of Jasny entitled 'Arithmancy, Theo-

mancy and the Soviet Economy'.26 Bergson pointed out, for example, that

although Jasny's calculations for 1928-1937 are stated to be weighted by
1926/27 initial-year prices (a 'Laspyres index'), in fact he inadvertently
used the current prices for each year.27 Jasny's estimated growth rate was
therefore remarkably close to Bergson's when the latter used prices of 1937.
In this unintended way, the two results actually confirmed each other, and
served to cast doubt on Colin Clark's estimates, which were lower still. The
average annual rate of growth of Gross National Product between 1928 and
1937 in the different estimates is as follows (in per cent):

<p>| | | | |</p>
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<tbody>
<tr>
<td>Clark</td>
<td>3.2</td>
<td>Jasny</td>
<td>5.3</td>
</tr>
<tr>
<td>Bergson (1928 prices)</td>
<td>11.9</td>
<td>Bergson (1937 prices)</td>
<td>5.5</td>
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The difference between Bergson's two estimates is of course a result of the
Gershenzon effect.

While we should acknowledge Jasny's outstanding work as a pioneer, it is
the volumes of Bergson and his colleagues which must be on the desks of
researchers in Soviet economic history, as their careful accuracy make it
possible to use the detailed figures they cite from Soviet sources with
confidence.

In the 1960s and 1970s individual scholars made further contributions to
our knowledge of the quantitative aspects of Russian and Soviet develop-
ment: Crisp and Gregory on the pre-revolutionary economy; Hodgman and
Nutter on industrial production; Eason, Redding and Nimitz on employ-
ment; Hunter on transport; Gardner Clark on steel. The French economic
historian Eugène Zaleski has carefully compared quantitative plan indica-
tors with performance for the whole Stalin period. Their work will be dis-
cussed in the appropriate chapters below, and is listed in the Bibliography.
More recently, several of the authors of the present volume have undertaken further work on Soviet statistics. If the earlier studies were primarily concerned with assessing the growth of Soviet power, the main thrust of our studies, like Zaleski's, has been to relate the statistical data to policy changes and the operation of the Soviet system. Gatrell has examined heavy industry before and during the First World War, with special reference to armaments production. Wheatcroft has investigated agricultural production, building up a new index by combining revised indexes for individual product groups. He has also undertaken a great deal of work on population, including the controversial questions of the number of persons incarcerated in camps, and the number of excess deaths in this grim period of two world wars, civil war and Stalinist repression; he was the first Western scholar to use the previously secret files of the 1939 population census. Lewis has estimated the size of Research and Development employment and expenditure during the industrialisation period. Cooper, Davies and Harrison have recalculated military production and military expenditure during the 1930s and the Second World War, showing that military expenditure was much more substantial in the early 1930s than was previously believed, and that military production during the Second World War was previously underestimated. We shall present our findings in the appropriate chapters, and compare them with those of other scholars.

In recent years, a fresh debate has broken out. Russian economists, critical of their past, have launched a series of attacks not only on Soviet official statistics, but also on Western estimates. They claim that Western economists, including the CIA, have given far too much credence to Soviet published statistics. The main thrust of their criticisms has been directed at Western estimates for the 1970s and 1980s. But the statistics of the 1930s and 1940s have also been re-examined.

The most detailed criticism of Western work appears in the ongoing publications of G. I. Khainin. Khainin claims that national income increased by only 3.2 per cent a year between 1928 and 1941 (50 per cent total growth). This is less than two-thirds of Bergson's estimated rate of increase, 5.0 per cent a year for 1928-40 at 1937 prices (79 per cent total growth). Unfortunately Khainin does not supply enough data to enable an independent assessment of his estimates. He does not differ substantially from his Western colleagues in case of three of the four major production sectors — industry, agriculture and railway transport. Khainin estimates the rate of growth of industrial production at 10.9 per cent in 1928-41 (so 1941 is 384, with 1928 = 100). This may be compared with Moorsteen and Powell's 10.1 per cent in 1928-40 at 1937 prices (1940 is 318, with 1928 = 100). For agriculture and railway transport, Khainin uses official figures. He rejects Powell's estimate of the rate of growth of construction as too high. 

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construction amounted to a mere 5 per cent of GNP in 1937, so cannot have made a substantial difference to the outcome. The only possible explanation is that Khainin has given a higher weight than Bergson and Moorsteen/Powell to agriculture, which had a lower rate of growth than the other main sectors of the economy.

A further recent study by three Russian demographers, Andreev, Darskii and Khan'kova, who worked in the TsSU research institute, concerns the much-disputed estimates of excess deaths during the upheaval of collectivisation, famine and repression in 1928-37. Their estimates of excess deaths are discussed in chapter 4. They are considerably higher than Lorimer's estimates, or than those published in the West more recently by Wheatcroft and Maksudov. The main disagreement is about the number of infant deaths in the famine.

The Russian historians Zemskov and Dugin have used data in newly-opened archives to calculate the number of people imprisoned and sent to labour settlements and camps in 1928-40, and the total number in camps and in settlements in each year. Their estimates are lower than Wheatcroft's, and far lower than those by Robert Conquest and others.

In our discussion below we return in more detail to the recent work of Khainin, Zemskov and others. But many of these controversial issues — if they can be settled at all — must await the laborious processing of the archival data.

Further reading
