The economic transformation of the Soviet Union, 1913–1945

Edited by
R. W. Davies
Mark Harrison
S. G. Wheatcroft
Published by the Press Syndicate of the University of Cambridge
The Pitt Building, Trumpington Street, Cambridge CB2 1RP
40 West 20th Street, New York, NY 10011-4211, USA
10 Stamford Road, Oakleigh, Melbourne 3166, Australia

© Cambridge University Press 1994

First published 1994

Printed in Great Britain at the University Press, Cambridge

A catalogue record for this book is available from the British Library

Library of Congress cataloguing-in-publication data
P. cm.
Includes bibliographical references and index.
ISBN 0 521 45152 3 – ISBN 0 521 45770 X (pbk.)
5. Russia – Economic policy.
I. Davies, R. W. (Robert William), 1925–. II. Harrison, Mark, 1949–
III. Wheatcroft, S. G.
HC335.T7362 1993
330.9470842–dc20 93-25112 CIP
ISBN 0 521 45152 3 hardback
ISBN 0 521 45770 X paperback

Contents

List of figures page x
List of maps xi
List of tables xii
Notes on contributors xv
Preface xvii
Acknowledgements xxiii
Major events in Russian and Soviet economic development xxiv

1 Changing economic systems: an overview
R. W. Davies
(A) The Tsarist economy 1
(B) War Communism 5
(C) The New Economic Policy 8
(D) The Stalinist administrative economy 13

2 The crooked mirror of Soviet economic statistics
S. G. Wheatcroft and R. W. Davies
(A) A brief history of Russian and Soviet statistics 25
(B) Distortions 30
(C) Re-evaluations 33

3 National income
Mark Harrison
(A) The growth of total output 41
(B) The level of development 45
(C) Investment and consumption 48
(D) The development model: a summary 53

4 Population
S. G. Wheatcroft and R. W. Davies
(A) The eve of the First World War 58
(B) World war and civil war, 1914–1922 60
(C) The mid-1920s 64
(D) Years of tumult and disaster, 1929–1939 67
(E) The Second World War, 1939–1945 77
5 Employment and industrial labour
   J. D. Barber and R. W. Davies 81
   I Employment
   (A) Eve of war 82
   (B) From Tsarism to NEP 82
   (C) The impact of industrialisation 83
   II Industrial labour 85
   (A) Eve of war 92
   (B) In transition, 1914–1927 92
   (C) 1928–1941 94
   (D) The plan era, 1929–1941 95
   (E) The foreign sector in Soviet development 214

6 Agriculture
   S. G. Wheatcroft and R. W. Davies 106
   (A) Before the First World War 107
   (B) War and reconstruction, 1914–1927 110
   (C) The transformation of agriculture, 1928–1941: production 113
   (D) Factors influencing production, 1928–1941 117
   (E) Labour productivity, 1928–1941 129

7 Industry
   R. W. Davies 131
   (A) The eve of the First World War 132
   (B) From Tsarism to NEP 135
   (C) During NEP, 1921–1928 135
   (D) Industry under central planning, 1929–1941 136

8 Transport
   J. N. Westwood 158
   (A) The government and the railways 159
   (B) Railway traffic 161
   (C) Railway investment 168
   (D) Labour 173
   (E) Rivers 177
   (F) Roads 179
   (G) In retrospect 181

9 Technology and the transformation of the Soviet economy
   Robert Lewis 182
   (A) Under Tsarism 182
   (B) Technological change, 1917–1928 183
   (C) Technology and the industrialisation debate 184
   (D) Technical change, 1928–1940 186
   (E) Closing the technological gap? 190
   (F) Technology and Soviet economic growth 192

10 Foreign economic relations
    Robert Lewis 198
    (A) Under Tsarism 198
    (B) War, revolution and civil war 200
    (C) The NEP years 202

11 The First World War and War Communism, 1914–1920
    Peter Gatrell 216
    (A) The work force 216
    (B) Investment 221
    (C) Agricultural production and food supply 226
    (D) Industrial production 232

12 The Second World War
    Mark Harrison 238
    (A) Production 239
    (B) Foreign economic relations 250
    (C) Capital 252
    (D) Labour 256
    (E) Food 261
    (F) Two world wars in economic comparison 265

Tables 268
Glossary 324
Notes 330
Bibliography 358
Index 374
Probably, the Stalinist concept of the economic development process was seriously oversimplified. The high per capita GNPs of the western capitalist economies were based on more than heavy industrialisation. There, investment in human capital, rising living standards for a widening labour aristocracy, and the spread of new technologies for communications and information, all complemented the rising productive capacities of established industries, and gave the market economies a resilience which Soviet leaders of the Stalin generation failed to foresee. As a result, despite the Soviet great leap forward of 1928–37, which coincided with the destabilisation and breakup of the international market economy, the USSR did not win the expected decisive victory in the economic race with the capitalist powers. This makes the Soviet victory in the Second World War, perhaps, still more remarkable.

Further reading


4 Population

S. G. Wheatcroft and R. W. Davies

The tumultuous and agonising transformation of the Russian Empire and the Soviet Union in the first half of this century brought about dramatic changes in the size and structure of the population.

On the one hand, broadly in common with other industrialising countries – at first in Europe and then elsewhere – there was a long-term improvement in prosperity, living conditions and health provision affecting a large number of the population. In the mid-nineteenth century, birth rates and death rates were extremely high. But from the 1880s onwards both the death rate (CDR – crude death rate) and the birth rate (CBR – crude birth rate) in the Russian Empire as a whole steadily declined. This decline continued with interruptions through all the upheavals of the next eighty years, and by the 1960s the Soviet Union was already a society with the low birth rate and the low death rate characteristic of most industrialised countries. Simultaneously, the proportion of the population living in the towns greatly increased, from a mere 12–15 per cent in the 1890s to 33 per cent on the eve of the Second World War and over fifty per cent by the 1960s.

Our three decades were dominated, however, by three unprecedented demographic convulsions which distorted and disguised the long-term trends. In each case a large number of people died from violence, famine or epidemics; in the discussion which follows we shall refer to these premature deaths as ‘excess deaths’. In addition, during each demographic crisis the birth rate temporarily fell substantially. We shall refer to the total of excess deaths plus the loss of population due to the fall in the birth rate as ‘the population deficit’.

In the account which follows, we begin by summarising the main trends for the whole period, and then consider developments chronologically in more detail.

*The first demographic convulsion*, in 1914–1922, was the result of the First World War and the succeeding civil war, epidemics and famine. Excess deaths amounted to about sixteen million – soldiers and civilians who were killed, or who died prematurely. Simultaneously, the birth rate temporarily declined, and as a result the number of children born in this period was ten
million less than normal. At the beginning of 1923, the population was 4–6 million smaller than in 1914, and some 28 million smaller than it would have been if pre-war death and birth trends had continued.

The second demographic convulsion, in the 1930s, resulted from the famine and repressions which accompanied the industrialisation drive and the collectivisation of agriculture. Estimates of the number of excess deaths vary widely, particularly because there is no agreement on the number of births which took place between the population censuses of 1926 and 1939. On present evidence, some ten million excess deaths occurred between these dates, most of them during the 1933 famine. But if the birth rate remained at a 'normal' level in 1933, as some Soviet demographers have argued, and infant mortality rose to an unprecedented level in that year, the number of excess deaths during the famine would have been several million greater. In the 1930s as a whole, in contrast to the crises brought about by world war and civil war, the population continued to increase (except during the famine year 1933). The population rose by about twenty million during the twelve inter-censal years 1927–38. The total population deficit in this period, including both excess deaths and children not born owing to the temporary decline in the birth rate, may have amounted to some twenty million. And infant mortality almost ceased its long-term decline, so that in 1938 it was only 12 per cent lower than in 1926.

The third demographic crisis, in 1941–5, was primarily a consequence of the German invasion during the Second World War, and was by far the most profound. The number of excess deaths among soldiers and civilians between the German invasion of June 1941 and the end of 1945 amounted to some 25 million, and in addition some ten–fifteen million children were not born owing to the fall in the birth rate, so the total population deficit in these 4 1/2 years amounted to 35–40 millions. In consequence, between mid-1941 and the end of 1945 the population declined by as much as 25 million; it did not recover to the mid-1941 level until 1955, ten years after the end of the war.

In the post-war period the long-term trends almost immediately resumed. By 1950 the birth rate was substantially lower than on the eve of the Second World War, and the crude death rate had almost halved; as part of this decline infant mortality had fallen to less than half the 1938 9 level.

(A) The eve of the First World War
The only full population census before 1914 was held on 28 January 1897. It revealed that the population of the Russian Empire (excluding Finland and the Kingdom of Poland) amounted to 127.8 million, about 106.1 million of which were located within the pre-1939 frontiers of the USSR.1 In the absence of a later pre-war census, the population on the eve of the First World War has to be estimated primarily by using data from the registration of births and deaths for the years 1897–1914. Before the revolution annual estimates of the population were made both by the Central Statistical Committee (TsSK) and the Chief Medical Inspectorate of the Ministry of Internal Affairs. In the 1920s these figures were corrected by Soviet statisticians working in the Central Statistical Administration (TsSU) and in the State Planning Commission (Gosplan); they demonstrated that the TsSK had overestimated the annual growth of the population and in consequence had overestimated the total population in 1914 by 5 or 6 per cent.2

Throughout the period between 1897 and 1914 the population had continued to increase rapidly, by 2.5–3 million per year; even on the lower estimates the total population of the Russian Empire in 1914 exceeded that of 1897 by over 30 per cent, with no increase in territory. Against this background of an expanding population, all authorities agreed that the CDR and CBR had both declined steadily since the 1880s. However, the CDR and in particular infant mortality remained very high by the standards of Western Europe. Even in 1914 infant mortality amounted to 273 (that is, of every one thousand children born, 273 died before the age of one). This figure was much closer to the rate in India at the same time than to those prevailing in Western Europe or even Japan.3 It was close to the estimated 255 for Western Europe at the beginning of the nineteenth Century.4

The best estimate available of the population on the pre-1939 territory of the USSR is 139.9 million in mid-1913 and 141 million on 1 January 1914; the equivalent figure for the Russian Empire on 1 January 1914 is 167.5 million.5

This was a population in movement, undergoing a quite rapid change in its structure. Throughout the nineteenth Century the urban population increased more rapidly than the population as a whole, and the increase accelerated in the second half of the century. Between 1897 and 1914 urban population rose from 15.0 to 17.5 per cent of the total population, using the definition of 'urban' in the 1926 census (using the 1897 definition, it increased from 12.4 to 14.6 per cent).6 The degree of urbanisation was of course substantially lower in Siberia and Central Asia than in most of the European provinces of the Russian Empire. It was substantially higher in the main industrial regions: the St Petersburg region, the central industrial region round Moscow, and the mining areas of the Urals and Ukraine. But it rose above 30 per cent in only half-a-dozen of the fifty provinces of the European Russian Empire.

The CDR and CBR of the towns and urban settlements on average were
both lower than in the countryside. But this did not indicate that living conditions were healthier. As is normally the case in industrialising countries, the proportion of adult males of working age was substantially higher in the towns, and the proportion of women, children and older males was lower. This was primarily because young men tended, to a greater extent than women, to move from countryside to town in search of better opportunities; and then to return to the countryside in middle age. The lower CDR and CBR in the towns is entirely explained by this age and sex structure. Age-specific mortality data indicate that, age for age, mortality was lower in the countryside than in the overcrowded unhygienic towns, where elementary sewage facilities and clean water were a rarity.7

The decades before the First World War were also a period of large-scale migration. Between 1897 and 1914, an estimated 3,407,000 people migrated from European Russia (USSR pre-1939 frontiers) to Siberia and Central Asia, continuing the trend of previous decades and centuries. By 1914, Russians constituted 85 per cent of the Siberian population, and 19 per cent of the more recently-colonised Kazakhstan and Central Asia. The pre-war decades also saw a greatly accelerated emigration abroad, mainly to the United States and Canada; emigration in 1897–1914 was estimated at 875000 persons over the whole period. The total migration from European Russia in this period, 4,282,000 persons, amounted to 14.7 per cent of the natural increase of the population.8

(B) World War and Civil War, 1914–1922

In the years of world war and civil war the population of the former Russian Empire suffered disturbance and destruction on a huge scale. ‘During the years 1915–1923’, wrote Lorimer, ‘the Russian people underwent the most cataclysmic changes since the Mongol invasion in the early thirteenth century’. Immense population losses accompanied or followed the uprooting or temporary displacement of the population.

(i) Population displacement, 1914–22

The first wave of population displacement occurred during the First World War, between July 1914 and the autumn of 1917. A huge Tsarist army was mobilised; by the end of 1917 this had involved in all some 15.7 million people. Of these, 13.7 million saw active service, and before the end of 1917 the vast majority of these had been captured, killed or wounded, or had suffered from some disease. The best available estimate is as follows (million):10

<table>
<thead>
<tr>
<th>Population</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Killed or died in action</td>
<td>0.7</td>
</tr>
<tr>
<td>(including those dying from wounds)</td>
<td>5.1*</td>
</tr>
<tr>
<td>Wounded (2.7) or sick (2.4)</td>
<td></td>
</tr>
<tr>
<td>Prisoners of war or missing</td>
<td>5.1+</td>
</tr>
<tr>
<td>Deserted (0.47) or demobilised (0.58)</td>
<td>1.0</td>
</tr>
<tr>
<td>Other (1.8)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>13.7</td>
</tr>
</tbody>
</table>

* Of these, 1.1 subsequently died of wounds or sickness; 3.2 million returned to active service.  
+0.18 million died in captivity. Of the remainder, 4.13 million were estimated to have lived on Soviet pre-1939 territory.

In the course of the battles on the Eastern front, in addition to the large number of Russian prisoners of war captured by Germany and the other Central Powers, there was also a substantial inflow of enemy prisoners of war captured by the Tsarist army. Refugees fled to the interior of Russia in large numbers from areas occupied by the enemy; others fled to Russia from pogroms and brutal attacks taking place on enemy territory (notably the Armenians fleeing across the Southern front from the Turkish massacres).

According to Volkov, at the end of 1917, immediately after the Bolshevik revolution of October/November, the total population still unsettled at that time amounted to 17.5 million persons, 12.4 per cent of the total population. This included the military (7.8 million), and refugees and foreign prisoners of war (together amounting to 9.7 million). The total of 17.5 million included 6.3 million displaced persons who were now living in the towns – 24.6 per cent of the urban population. This was the explosive mixture that had its dramatic outcome in the social unrest of the revolution and its aftermath.

The second wave of population displacement in 1917–20, following the October revolution, was equally dramatic. It consisted of several different sub-waves. First, the remainder of the Tsarist army was rapidly demobilised; and in its place by the summer of 1918 the Red Army and numerous anti-Bolshevik armies had already been brought into being. The civil war armies were smaller than the Tsarist army. The Red Army increased to a maximum of 3.5 million people in September 1920; the peak size of the White Armies in May 1919 has been estimated at just over one million.12

Secondly, the bitter civil war in which these rival armies fought to and fro across the vast territory of the former Empire was accompanied by flows and counter-flows of refugees. Reliable estimates of the number of refugees involved in this second wave have not been made; there were certainly many millions.

Thirdly, many people left the towns in 1918–20, particularly the large Northern towns. The pattern of movement out of the towns was compli-
ated, and imperfectly recorded. The population of Moscow and Petrograd taken together fell dramatically from 4.30 million at the beginning of 1917 to a mere 1.86 million in July 1920, and the population of some larger towns like Kiev and Odessa also declined substantially. But the decline was less dramatic for the urban population as a whole than for the largest towns; the number of people living in small urban settlements apparently even remained constant.

Fourthly, with Bolshevik victory many defeated White officers and soldiers and many members of the old wealthy classes fled abroad, as did many professional people. The number emigrating has usually been estimated at approximately two million, though some estimates place it as high as 3.5 million.

The third wave of population displacement took place in 1921–2, with the flight of refugees from the famine in the Volga region, the North Caucasus and Ukraine, following the drought and harvest failure of 1921. This was possibly the largest of all movements of refugees; it certainly involved the most suffering. Millions of refugees set off in different directions. Initially peasants set off from the Volga heading West to Ukraine, where they wrongly believed food to be plentiful. Others moved from west to east heading towards Tashkent; yet others moved to the north.

(ii) Population losses, 1914–22

These successive population upheavals of 1914–22 involved human privation, suffering and misery on an enormous scale. The number of people who died prematurely in these years can only be roughly estimated.

We shall first consider the years of the First World War, 1914–7. The number of soldiers who were killed, or died of wounds or disease, is known only approximately. Estimates vary from 1.6 to 2 million, and this excludes many soldiers who were sent back from the front wounded or sick but still alive, and whose lives were shortened. Some increase in deaths among the civilian population no doubt also occurred in 1914–7, though in those towns away from the front for which data are available the CDR did not increase substantially.

During the civil war of 1918–20, the vast majority of deaths resulted from disease. Estimates of the number of soldiers who died in 1918–20 are in the range 0.8–1.2 million; the lower estimate seems more probable. This was a small fraction of the total number of deaths. During the years of the world war, food shortages, overcrowding and insanitary conditions among refugees undoubtedly weakened resistance to disease, and from the summer of 1918 a series of epidemics spread rapidly, reaching a peak in 1920. In European Russia alone deaths from typhus, typhoid, dysentery and cholera amounted to two million in 1918–20, the majority from typhus, as compared with 257,000 in the previous three years.

After the end of the civil war, the famine of 1921–2 resulted in large numbers of deaths from hunger in the Volga regions and Ukraine, and in an accompanying increase in deaths from infectious disease among people suffering from severe malnutrition. Epidemics also spread in areas outside the famine regions, so that in Petrograd, for example, the CDR in December 1921 was twice as high as in December 1920. In European Russia 858,000 people died in 1921–2 from the four diseases referred to above, nearly five times the normal number. These were also the years in which a devastating influenza epidemic swept through Europe. Total premature deaths from famine and disease may have amounted to over five million.

Surveying the whole period between the outbreak of the First World War in 1914 and the population census of December 1926 Lorimer estimates that the total population deficit arising from the war and civil war amounted to 28 million, subdivided as follows:

<table>
<thead>
<tr>
<th>Category</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Military deaths</td>
<td>2</td>
</tr>
<tr>
<td>Civilian deaths</td>
<td>14</td>
</tr>
<tr>
<td>Emigration</td>
<td>2</td>
</tr>
<tr>
<td>Birth deficit</td>
<td>10</td>
</tr>
</tbody>
</table>

The total figure of 28 million was obtained by comparing the actual population at the time of the population census of December 1926 (this was recorded as 147 million) with the hypothetical population in December 1926 estimated by extrapolating from the rate of natural increase of population in 1897–1914 (this worked out at 175 million). We have already discussed military deaths and emigration, for which Lorimer’s figures are fairly conservative. Lorimer estimated the birth deficit on the basis of the age cohorts of the 1926 census; he concluded that the number of children not born through the decline in the birth rate was a maximum of ten million. The figure of 14 million civilian deaths was obtained as a residual. Checking it against the 1926 census, Lorimer came to the conclusion that it included 3 million premature deaths of children born since 1912 and 11 million premature deaths of men and women already born by that year.

Lorimer’s figure for the number of military deaths should be increased to about 3 million to include military deaths during the civil war. If the higher figure for emigration (3.5 million) were also accepted, the number of civilian losses would fall to 11.5 million.

Alternative estimates have been made by Soviet historians comparing the pre-war population not with the population at the time of the December 1926 census but with the population at the lowest point, immediately following the famine of 1921–2. In his study undertaken in the 1920s Volkov
concluded that there was an absolute decline in the population of 6.3 million between January 1914 and January 1923. In more recent estimates the equivalent decline is given as 7.3 million by Danilov and 9.6 million by Polyakov. These figures imply a population deficit, including the deficit from the decline in CBR, of 30 million or more between the two dates.\textsuperscript{21}

The annual estimates of total population show clearly that the population deficit was concentrated into the years after 1917. In spite of the military losses, the total population continued to increase in 1914 and 1915, though much more slowly than in the pre-war years. The increase in population between the beginning of 1914 and the beginning of 1917, as estimated by our different authors, ranges from 2.6 to 4.7 million. This may be compared with the normal pre-war increase over three years of about 7.5 million (2.5 million a year).\textsuperscript{22}

In the ensuing six years 1917–22 the population fell sharply; the different estimates range from 9 to 14.3 million. According to Danilov, excess deaths from famine and disease amounted to eight million persons in 1918–20.\textsuperscript{23} This implies that a further six million people may have died prematurely in 1921 and 1922 from famine and disease.

The fairly large differences between the various estimates arise from the gaps and uncertainties in the statistics at this time of demographic catastrophe, when birth and death registrations were inadequately kept. The total population deficit is extremely sensitive to variations in the assumed 'normal' birth and death rates; and it is even more difficult to assess how far the deficit of young children in the years after the demographic catastrophe is due to a drop in the birth rate, and how far to the deaths of babies whose birth had not been registered. We shall see that these problems cause us great difficulty when we turn to the demographic crisis of the 1930s.

\textbf{(C) The mid-1920s}

The country soon emerged from the crisis. By 1924 the pre-war pattern of population growth had been approximately restored. In each of the two years before the population census of 17 December 1926 (1925 and 1926) the net increase in the population was well over three million, a larger annual increase than before the war.

The size of this increase was not the result of an increase in the birth rate as compared with the immediate pre-war years. In 1923–6, the birth rate did increase rapidly from the low level of 1922. Nevertheless, in the mid-1920s it was probably somewhat lower than on the eve of the war. This was partly because the age at which women married was higher than before the war: in European Russia/USSR the percentage of women who were under twenty when they married was 55 per cent in 1910 but only 34 per cent in 1927.\textsuperscript{24} A further factor in the probable slight decline in the birth rate was the incidence of abortion, which had been legalised after the revolution.\textsuperscript{25}

In contrast the death rate had fallen substantially. The decline in CDR may have affected a wide range of age-groups; but it was primarily due to a decline in infant mortality from 273 in 1913 to 174 in 1926.\textsuperscript{26} This decline was part of a general European trend: in Germany and Austria infant mortality declined by over 40 per cent in the same period. But the improvement in the USSR was remarkable in view of the turmoil in the intervening years.\textsuperscript{27} It was this fall in CDR which accounted for the rapid annual increase in population just before the 1926 census.

As a result of the expansion of population in 1924–5, the population census of 17 December 1926 recorded a total population higher than that on the same territory on 1 January 1914. Some authorities have suggested that there was some undercounting in the 1926 census: the official figure was 147.0 million. A recent Soviet estimate, by Andreev, Darski and Khar'kova (referred to henceforth as ADK) raises this figure to 148.5 to allow for underrecording of children under three years of age (see Figure 3 and Table 6).\textsuperscript{28} Estimates of the pre-war population vary between 139.7 and 142.4 million (see p. 335 note 5 below), so the increase between 1 January 1914 and the end of 1926 is within the limits 3.2 and 6.1 per cent.

The urban population also somewhat exceeded the pre-war level in absolute terms, and thus remained almost exactly the same proportion of the total population; it amounted to 26.3 million at the time of the 1926 census (17.7–17.9 per cent of total population) against 24.9 million in 1914 (17.5–17.8 per cent) (the same list of towns has been used in each case).\textsuperscript{29}

Although the population had recovered to its pre-war level, the consequences of the upheavals of war and civil war continued to be felt. The extent of the recovery varied considerably between different regions. Broadly speaking, the areas in which recovery was slowest were those in which civil war and famine had caused the greatest harm to agriculture and agricultural capital. The population was still 5 per cent below its pre-war level in the Central Producer Region, and in this region the urban population had also failed to recover to the pre-war level. But in the Eastern Producer Region and the Southern Consumer Region, which were least affected by civil war and famine, the population was as much as 10 per cent larger than in 1914.

As a result of the ravages of war and famine, the structure of the population in December 1926 was far from the pre-war norm. There was a large deficit in the age group 5–9 (children born in 1917–21), reflecting the lower fertility and higher infant mortality during those years. There was also a quite substantial deficit in the age group 10–14, born in 1912–6; this group includes the years of very low birth rate 1915–6. Among adults, the
most striking feature is the consistently lower number of males than females in every age group, reflecting military losses and the greater susceptibility of males to infectious disease. 31 In 1926 the total number of females in the population exceeded the total number of males by 4.9 million, as compared with less than one million in 1914.

The absolute level of the CBR and CDR in the first post-census year 1927 are extremely controversial. They are important not only as an indication of the demographic situation in the last full year of the New Economic Policy, but also because they form the starting point for all estimates of the fate of the population during the tumultuous years of the 1930s. The only reliable data available on the size and structure of the population are for the census years 1926, 1937 and 1939. What happened in the intervening years has to be estimated, and an important element in any estimate is the estimated CBR and CDR. If the normal CBR was high and the normal CDR was low in the intervening years, then the number of excess deaths from the famine and from violence against the population would be larger; if normal CBR was low and normal CDR was high, then the number of excess deaths would be smaller.

Here are three substantially different estimates for 1927 (per thousand population; NRR (net reproduction rate) = CBR - CDR):

<table>
<thead>
<tr>
<th></th>
<th>CBR</th>
<th>CDR</th>
<th>NRR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registration data*</td>
<td>43.7</td>
<td>21.0</td>
<td>22.7</td>
</tr>
<tr>
<td>Lorimer estimate^b</td>
<td>45.0</td>
<td>26.0</td>
<td>19.0</td>
</tr>
<tr>
<td>ADK estimate^c</td>
<td>46.3</td>
<td>26.5</td>
<td>19.7</td>
</tr>
</tbody>
</table>

* CBR as given by Ulanis (1977), 11-12; CDR estimated from this figure and registration data for net increase in population in 1927 (3,339,000) (RGAE, 105/1/10, 15-7). Note that Stalin, spe. 1928 [1929], 76-9, gives CBR and CDR for European USSR at 45.0 and 20.8 (i.e. NRR was 22.2).
^ Lorimer (1946), 134; he discusses how he obtained these figures on pp. 113-133 (see our text).
^ ADK (1990a), 41. The authors state that these figures were derived 'on the basis of the age and sex structure of the population in each year', but give no further details. On p. 43 they give an alternative NRR for 1927 of 17.25; and in their estimates on p. 41 they appear in practice to use an NRR of 10.96.

On the birth rate, Lorimer believes that the registration data for the European USSR were 'reasonably complete'. He then assumes that the demographic characteristics of the remaining area were similar to those of the Ural and Vyatka regions, where the CBR was higher than elsewhere in European Russia. 31

Lorimer's upward revision of the CDR was more substantial. He argues that there are several reasons for supposing that the CDR based on the registration data is too low. The most important of these for the European USSR was the abnormal structure of tables for the European USSR showing the expectation of life at various ages (life tables). In these life tables for 1927 mortality rates rise only slowly in moving from early adult years to later years, especially in the case of females. Lorimer attributes this abnormality to the incomplete registration of deaths among the higher age groups. For that part of the Soviet Union where deaths were not registered, Lorimer follows the procedure he used for the CBR, and assumes a higher CDR comparable to that in the Vyatka and Ural regions (where it was 50 per cent higher than in the rest of the European USSR). This gives him 'a hypothetical death rate' for the whole USSR of 26.0. 32

Maksudov rejects Lorimer's proposal to increase the CDR for the European USSR on the grounds that burials took place in a small number of cemeteries, which were firmly under state control; moreover, the local statistical bureaus were able to check death registrations against medical records of deaths. While Maksudov accepts that the CDR for the European USSR should be increased when estimating CDR for the USSR as a whole, he argues that Lorimer's increase was too large. 33

Unfortunately the recent article by ADK (1990a) does not explain clearly how their estimates were derived; for 1927 (unlike later years) they are close to Lorimer's. The Lorimer and ADK estimates result in estimates of the net increase of population in 1927 which are substantially different from the earlier estimates based on the registration data. According to Lorimer, the net increase in the population in 1927 was 2,869,000; 34 according to ADK, it was 2,965,000; 35 but according to the earlier estimates based on the registration data it was as much as 3,339,000. 36 The discrepancy persists for the following two years 1928 and 1929. While Lorimer estimates that the population on 1 January 1930 was about 155.5 million, the registration data gave a figure of 157.4 - 157.7 million; the prevalence of this higher and possibly exaggerated figure played a significant role in the bitter disputes about the size of the population in 1937. 37

(D) Years of tumult and disaster, 1929–1939

The years of forced-march industrialisation were also years of a social upheaval far greater than had occurred elsewhere in peace-time Europe in the modern era.

The disruption of the lives of the peasant population which accompanied industrialisation has a certain analogy with the enclosure movement in Britain. But it was an upheaval compressed into a few years instead of decades or centuries. In the simultaneous 'elimination of the kulaks as a class', something like the treatment of the Scottish highlanders was
extended to a minority of peasants in every village in the whole USSR, while simultaneously most peasants were required to change drastically their methods of earning their living. The Soviet peasantry was at one and the same moment hurled into a much more mechanised agriculture and into a social system analogous with serfdom.

Perhaps five or six million peasants, over one million of the 25 million peasant households, were direct victims of dekulakisation in the years 1930-3. They were subdivided approximately as follows (million persons):

1. Exiled outside their own region: 2.1
2. Exiled within their own region: 2 - 2.5
3. ‘Dekulakised themselves’: 1 - 1.25

The first group, an estimated 2,142,719 peasants, were exiled from their villages to other regions, usually in remote parts of the country, where they became "special settlers (spetsposelentsy)" in work camps or settlements under the control of the OGPU (later NKVD). The second group includes peasants removed from their lands to the outskirts of their village or to elsewhere in their district or region. The precise number is not known. According to Danilov, the number exiled within their own region in 1930-1 alone amounted to 400,000 or 450,000 families, 2-2.5 million persons. Some of those exiled within their own region were subsequently exiled to remote regions; they are apparently included within the total of 2.1 million above.

A third group, comprising a further 200,000 to 250,000 households, 1 - 1.25 million persons, ‘dekulakised themselves (samorashkulachites)’ by leaving their land and cottages and fleeing to the towns or other regions.

The former kulaks did not simply remain where they were. Several hundred thousand died: according to the official records, 241,355 died in exile in 1932-3 alone. These figures exclude an unknown number of peasants who died in the often appalling conditions in which they were transported from their villages to exile; they also exclude those who were executed. According to the official records, even larger numbers escaped from exile: in 1932-3 alone 330,677 escaped and were not recaptured (it seems quite possible, however, that some of those recorded as escaping in fact died or were killed in the course of attempting to escape).

Collectivisation and the forced requisitioning of agricultural products which accompanied it also had frightful consequences for many peasants who were not classified as kulaks. In Kazakhstan, the attempt to settle nomad farmers in collective farms led to the death of most of their animals, the main source of food in this region. A large number of Kazakhs died of starvation in 1931-3, and others fled abroad. In 1933, a devastating famine affected most of Ukraine, and large areas of the Volga regions and the North Caucasus; several million peasants died.

Population

Against this sombre background in the countryside the towns expanded extremely rapidly, largely because millions of peasants moved to the towns in search of a better life. Even in 1928, before collectivisation, as many as 6,477,000 peasants were recorded as moving temporarily to the towns and urban settlements, and 1,062,000 as settling permanently. In the 1930s the numbers greatly increased:

### Migration (in thousands)

<table>
<thead>
<tr>
<th>Year</th>
<th>to town</th>
<th>away from town</th>
<th>settlement in town</th>
</tr>
</thead>
<tbody>
<tr>
<td>1928</td>
<td>6,477</td>
<td>5,415</td>
<td>1,062</td>
</tr>
<tr>
<td>1929</td>
<td>6,958</td>
<td>5,566</td>
<td>1,392</td>
</tr>
<tr>
<td>1930</td>
<td>9,534</td>
<td>6,901</td>
<td>2,633</td>
</tr>
<tr>
<td>1931</td>
<td>10,810</td>
<td>6,710</td>
<td>4,100</td>
</tr>
<tr>
<td>1932</td>
<td>10,605</td>
<td>7,886</td>
<td>2,719</td>
</tr>
<tr>
<td>1933</td>
<td>7,416</td>
<td>6,644</td>
<td>772</td>
</tr>
<tr>
<td>1934</td>
<td>11,856</td>
<td>9,404</td>
<td>2,452</td>
</tr>
<tr>
<td>1935</td>
<td>13,732</td>
<td>11,176</td>
<td>2,556</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>17,686</td>
</tr>
</tbody>
</table>

The annual migration figures suffer from double-counting, and show a substantially larger settlement in the towns than in fact occurred. But the proportions between years are no doubt approximately correct; they show that settlement was concentrated into the three years 1930-2. In the course of 1933 internal passports or identity cards were introduced for the urban population in order to control movement into the towns; but the movement into the towns resumed in 1934. More reliable figures covering the whole inter-censal period between 1926 and 1939 show that the urban population increased from 26.3 to 56.1 million persons. Of this increase of 29.8 million, 5.5 million were due to natural growth, 5.8 million to the reclassification of former rural areas as urban areas; the remainder, 18.5 million or 62 per cent of the total increase, were peasants and other rural inhabitants who migrated to the towns.

There were other subsidiary movements of the population. Particularly in the early 1930s, labour turnover was extremely high. Workers, particularly those who had recently ceased to be peasants, roamed from factory to factory and building site to building site in search of better food, accommodation and working conditions.

It was not only kulaks who suffered exile and imprisonment. In the first half of the 1930s smaller numbers of former private traders, ‘bourgeois specialists’ accused of sabotage, and others, were arrested or exiled. In 1933, members of the families of former nobles, merchants and other classes were
exiled from the major towns. Then in 1936–8 in the ‘Great Purge’ members of the party and professional elite were arrested in large numbers; many of them were executed. The ‘Great Purge’ did not merely affect the professional classes. For example, an NKVD order of 30 July 1937, following a Politiburo decision of 2 July, instructed local NKVDs to execute and exile ‘former kulaks, active anti-Soviet elements and criminals’; execution and exiling were to begin on 5 August and to be completed within four months of that date. The numbers allocated ‘for guidance’ to regions in the RSFSR, Ukraine and Kazakhstan totalled 72950 persons to be executed and 186500 to be sentenced to confinement in camps or prisons for 8–10 years.44

At the time of the population censuses of 1937 and 1939 the total number of prisoners and exiles managed by the NKVD was comprised as follows (thousands).45

<table>
<thead>
<tr>
<th>Location</th>
<th>1937</th>
<th>1939</th>
</tr>
</thead>
<tbody>
<tr>
<td>Camps</td>
<td>821</td>
<td>1317</td>
</tr>
<tr>
<td>Colonies</td>
<td>375</td>
<td>355</td>
</tr>
<tr>
<td>Prisons</td>
<td>545</td>
<td>351</td>
</tr>
<tr>
<td>Labour settlements</td>
<td>917</td>
<td>939</td>
</tr>
<tr>
<td>Total</td>
<td>2658</td>
<td>2962</td>
</tr>
</tbody>
</table>

Persons with sentences less than three years were sent to colonies; persons with sentences of three years or more were allocated to ‘corrective-labour camps’ (earlier known as ‘concentration camps’). ‘Special settlers (spetsperešalentsy)’ were exiles compelled to live in fenced-in settlements and undertake work on the instructions of the NKVD; the spetsperešalentsy were known as ‘labour settlers (trudperešalentsy)’ between 1934 and 1944, and as spetsperešalentsy from 1944 onwards. In the early 1930s the spetsperešalentsy were mainly exiled ‘kulaks’. From 1934, camps, colonies, settlements and prisons were all subordinate to the Chief Administration for Camps (GULAG) of the NKVD. These figures do not include persons sent into exile without confinement in a camp or settlement (known as styal'nye).46 Nor do they include an unknown but large number of former prisoners and exiles of various kinds who had been freed from their places of confinement but were excluded by a note in their internal passport from living in certain cities. No statistical information has yet been published about this important category of people whose movement was restricted, or about other styal'nye. Police and free personnel working in places of confinement are not included in these figures; they probably amounted to 143000 persons in 1937 and 189000 in 1939.47 They also exclude NKVD personnel themselves, amounting to an additional 271000 in 1937 and 366000 in 1939.48

While we now have fairly precise figures about the number of people incarcerated in prisons, camps and colonies in the 1930s, our knowledge about the number of normal or excess deaths during the demographic catastrophe of the 1930s, and about when these deaths occurred, remains extremely uncertain. Before perestroika, Western scholars sought to estimate excess deaths with the small amount of data then available; the most important and careful analysis was undertaken by Lorimer in 1946. In 1990, the results of the 1937 census were published in some detail, and much more information has become available about the 1939 census. In addition, national and regional data on birth and death registrations have been made accessible to Western as well as Soviet historians. In consequence our estimates are now much better informed, but a very wide margin of error remains.

The results of the three censuses provide the starting point for analysis (see Figure 3 and Table 6). As we have seen, the figure for the 1926 census is relatively uncontroversial, varying between 145.5 and 148.5 million.

The population revealed by the preliminary returns of the 1937 census was far smaller than the political leaders or the statisticians anticipated. Gosplan had predicted in the late 1920s that the population would continue to increase at the high rate which it had estimated for 1927, and would reach 180.7 million by 1937. Even as late as 1936, a few months before the census, the official estimate of the population at the beginning of 1933 was as high as 165.7 million.49 But the actual census figure four years later at the beginning of 1937 was only 162 millions, at least eight million less than the 1933 figure implied. In March 1937 the TsUNKhU official Kurman proposed to increase this figure by one million to allow for undercounting, and then his superiors in TsUNKhU claimed that undercounting amounted to as much as 6.5 million, so that the population was not 162 but 168.5 million.50 This
proposal, made in a desperate effort to reconcile the census data with the previous estimates, had no serious foundation. The census was cancelled and leading statistical officials, including both the head of TsSU and Kurman himself, were arrested. With the publication of the census results over half a century later in 1990, ADK, on the basis of a comparison of the age and sex cohorts of the 1937 and 1939 censuses, have proposed a small increase by 0.7 million, raising the total to 162.7 million.

In the case of the 1939 census, western writers have long suggested that the official figure, variously given as 170.1 and 170.5 millions, should be reduced. Recent data from the archives have revealed that the figure was deliberately exaggerated. The total number of people recorded in the census was in fact 167.3 million, comprising a basic return of the civilian population amounting to 159.1 million, plus 2.3 million for the population in distant regions, 2.1 million recorded by the military and a 'special contingent' of 3.7 million recorded by the NKVD. The Soviet authorities more or less arbitrarily increased the total figure to 2.82 million: 1.14 million to allow for persons temporarily away from home and not recorded elsewhere, and a further 1 per cent (1.68 million) to allow for undercounts. This brought the total to 170.1 million. Both these increases were obviously far too great; ADK suggest a total increase of 1.6 million to 168.9 million, to allow for undercounting. Other authorities believe this increase is too large, and accept the raw figure, 167.3 million. The higher figure is consistent with the treatment of the previous censuses by ADK: they increased the 1926 census by 1.5 million and the 1937 census by 0.7 million.

On the basis of the data of the 1926 and 1939 censuses, serious estimates of the number of excess deaths between 1926 and 1939 have ranged from 5.5 million to 14 million. The American demographers Anderson and Silver have shown that alternative assumptions about the 'normal' level of fertility and mortality can produce a total population deficit as compared with normal expectations ranging from zero to 24 millions, including a deficit among those already born at the time of the 1926 census ranging from 0.5–5.5 million. The lowest figure assumes low normal fertility and high normal mortality, while the highest figure assumes high normal fertility and low normal mortality. If the entire population deficit was due to mortality higher than normal, the figure for population deficit would be equal to the number of excess deaths; for those already born in 1926, the population deficit is of course in any case identical with the number of excess deaths.

The earliest attempt to measure population deficit and excess deaths in the inter-censal years 1927–1938 was made by Lorimer in 1946. He presented two estimates (see Box). The first gave the total deficit in the inter-censal years as 5.5 million, the second, obtained from life-tables, gave a deficit of 4.8 million for those already born at the time of the 1926 census.
Many years later, Maksudov, on the basis of somewhat similar calculations, reached a substantially higher figure, or rather range of figures, for excess deaths, a total of 9.8 million ± 3 million, of which 5.7 million were already born in December 1926 (see Box on p. 73).

When Lorimer and Maksudov prepared their estimates, the results of the 1937 census were not available. Lorimer’s rough guess that the population at the beginning of 1937 was 163.4 million (see Table 7) was remarkably accurate; it exceeds the census figure by at most one million. Lorimer correctly supposed that excess deaths were concentrated into the period 1930–5, though he wrongly placed the peak in 1932 instead of 1933. He was also unaware that the published figure for the 1939 census was exaggerated by 1.6–3.2 million. The total deficit between 1926 and 1939, using Lorimer’s own methods, therefore amounted to his estimated 5.5 million, but to 7.1–8.7 million. Maksudov’s estimate of total excess deaths should similarly be moved to the upper margin of error. Maksudov stated in 1991 that the disclosure that the population was only 162 million at the beginning of 1937 ‘probably allows one to speak of losses [i.e. excess deaths] of 11.5 million persons with a margin of error of + 3 millions and – 1.5 millions’.38

The births and deaths registration data for 1927–37 also became available (in part) in 1989–90, and together with the results of the 1937 census they modify Lorimer’s conclusion that the total deficit was 5.5 million in at least two ways (see Box on pp. 75–6). First, the registration data show that the number of excess deaths in 1932–3 was considerably greater than Lorimer supposed, amounting to 3.4 million excess registered deaths, as compared with Lorimer’s 1,135,000 in his peak year 1932.

Secondly, these registration data did not incorporate the total number of deaths. When the results of the 1937 census were first obtained, Kurman prepared a memorandum which showed that the 1937 population was some eight million smaller than the figure obtained from births and deaths registrations. The Kurman gap has been widely discussed. On present evidence, it includes some five million excess deaths; together with the registered excess deaths in 1932–3, the total number of excess deaths in 1927–1936 may amount to as many as 8.5 million.

In 1990 a further estimate of births and deaths in 1927–36 was made by the Soviet statisticians Andreev, Darskii and Khar’kova (referred to here as ADK). They assumed that the birth rate in 1933 was substantially higher than the numbers registered, and concluded that excess deaths, registered and unregistered in 1932–3 alone, were as high as eight million. The discrepancy between this figure and the number of famine deaths estimated by Wheatcroft (1990, p. 358) – four to five million – is due to

---

### Excess deaths between 1926 and 1937 censuses

December 1926–January 1937

1. The births and deaths registration data show excess deaths in 1932–3 amounting to at least 0.24 million in 1932 and 3.12 million in 1933, 3.36 million in all (taking 1930 as a normal year)

<table>
<thead>
<tr>
<th>(registered deaths in 1930)</th>
<th>3.101</th>
</tr>
</thead>
<tbody>
<tr>
<td>1931</td>
<td>3.144</td>
</tr>
<tr>
<td>1932</td>
<td>3.344</td>
</tr>
<tr>
<td>1933</td>
<td>6.217</td>
</tr>
</tbody>
</table>

derived from CDR for 1930–3, given in RGAE, 1562/20/42, 76).

2. In addition, the ‘Kurman gap’ reveals 8 million unregistered deaths between December 1926 and January 1937 (see Table 8).

According to the two censuses, the population increased by 15 million.

According to the registration data (total births minus total deaths), as adjusted for territory, it increased by as much as 23 million.

Kurman explained the gap as follows:

1. Emigration: 2.0
2. Over-estimate of 1926 population: 1.5
3. Under-estimate of 1937 population: 1.0
4. Unregistered deaths in 1933: 1.0
5. Unregistered deaths in NKVD system: 1.0–1.5
6. Deaths not registered by ZAGS in other years: 1.0–1.5

Total: 8.0

His first three items can almost certainly be discounted; some emigration occurred, but it was much less than 2 million. The bulk of his 8-million gap must therefore be attributed to items 4–6.

**Tsaplin suggests:**

- Unregistered deaths from famine: 1.0
- Unregistered deaths in NKVD system: 2.8
- Estimate of Kazakh deaths during collectivisation (see chapter 4, note 41): 1.3

Total: 5.1
If these figures are correct, 2.9 million ‘normal deaths’ remained unregistered over the whole period 1927–36. This would increase the CDR in each year by about 2 per 1,000 above the registered deaths. The total number of excess deaths in 1927–36 would amount to

3.4 million registered in 1932–3 and

5.1 million unregistered

8.5 million in 1927–36

(3) Andreev, Darshii and Khar’kova (ADK) (see Table 7, Columns 4, 6, 9 and 13). ADK argue that the number of births during the famine was much greater than the number registered. Kurman allowed for under-registration by increasing the number of births by 1.7 million above the total registered for the whole period 1927–36. But ADK assume that there were 5½ million more births than in the registration data presented by Kurman, so that deaths were not eight million but about 12½ million higher than the number of registered deaths.

In particular, they argue that the CBR declined only slightly in 1933. According to the registration data, it fell from 31.9 to 25.3 per thousand. According to ADK, it fell only from 35.9 to 34.7. Using the age-cohorts in the 1926 and 1927 censuses, they therefore estimate a much larger number of famine deaths than are suggested by Tsaplin or others. Taking their estimate for 1929 as a ‘normal’ number of deaths, excess deaths in 1932–3 amounted to 7,966,000 of which 7,312,000 occurred in 1933 alone (estimated from data in Table 7).

unregistered deaths, as is Tsaplin’s estimate that unregistered deaths in places of confinement in 1937–8, including executions, may have amounted to 1.3 million.62

In summary, the total number of excess deaths in 1927–38 may have amounted to some 10 million persons, 8.5 million in 1927–36, and about 1½ million in 1937–8. On all estimates, most of the deaths took place during the 1933 famine. The estimate of 10 million would be substantially increased if the number of babies born in 1933 was as high as ADK suggest.

Apart from their tragic results in the deaths of large numbers of the population, the repressive policies and social upheaval also postponed the long-term trend towards the improvement of the health and expectation of life of the Soviet population. Substantial resources were invested in the health services in the 1930s, particularly by increasing the number of doctors, nurses and others working in the health services. But these increases hardly kept pace with the deteriorating conditions resulting from forced industrialisation. While the CDR declined between 1927 and 1939, the child mortality rate remained high. Infant mortality (deaths between 0 and 1 year of age) declined only slightly from 174 to 161 per thousand.63 (See Table 9.)

(E) The Second World War, 1939–1945

The Soviet Union was not invaded until 22 June 1941, but the outbreak of the European war in September 1939 provided the opportunity to annex territories from Eastern Poland and Romania, and the three Baltic republics; these territories had almost all formed part of the Tsarist Empire in 1917. The exact population of these areas is not known, but is estimated at 20.3 millions at the beginning of 1939, bringing the total population to 188.8 millions (168.5 + 20.3), using the ADK figure for the 1939 census. On this basis it was estimated that the total population in mid-1941 amounted to 196.7 millions.64

The upheaval of 1941–5 involved far greater destruction of human lives and greater movements of population than the previous two demographic catastrophes. Millions of Soviet soldiers were killed or died in captivity. Most of the European USSR was occupied by Nazi Germany and its allies, and millions of civilians were transferred to work in Germany and German-controlled Europe. Millions more were evacuated or fled to the interior in face of the advancing German armies. With the liberation of occupied territory by the Soviet army, many civilians returned to their homes; a far smaller number departed westwards with the German armies. The Soviet government itself, from 1940 onwards, deported to the interior millions of
civilians from national minorities, first from the newly-annexed areas in the West, and then from Soviet pre-1939 territory. All these vast movements of population took place in insanitary conditions, and with inadequate nourishment of the victims.

The number of excess wartime deaths due to military action, malnutrition, disease and repression was concealed while Stalin was alive, presumably in the hope of concealing Soviet weakness as a result of the war. Stalin admitted a mere 7 million war deaths. When the Soviet population was officially reported as amounting to only 200.2 million in April 1956, this figure was 20 million less than some Western observers had anticipated. Khrushchev in 1961 stated that military and civilian deaths amounted to 'more than 20 million persons'.

In recent years, more reliable attempts have been made to estimate war-time deaths. The most careful is by ADK. On the basis of registration data and the results of the 1959 census they conclude that the total population at the end of 1945 was only 170.5 millions, 26 million less than at the time of the German invasion.

From this starting point the authors estimate separately the number of deaths among the population already born in 22 June 1941, and the number of deaths among children born after that date. Of the total population at the end of 1945, 159.5 millions were already born before 22 June 1941, so that the number of deaths in 4½ years was 37.2 millions (196.7-159.5). If the CDR had remained at the level of 1940, only 11.9 million people already alive in June 1941 would have died in this period; the number of excess deaths was therefore 25.3 millions (37.2-11.9).

The number of children born in the 4½ years is estimated by ADK at 15.7-16.4 millions, of which 4.6 million died by the end of 1945. If the death rate for these children had remained at the level of 1940, only 3.3 million would have died, so excess deaths among children amounted to 1.3 million. Hence the total number of excess deaths in 1941–5 amounted to 26.6 millions (25.3+1.3). This included 19 million males and only 7 million females; the number of females in the population at the end of the war exceeded the number of men by some 20 million, as compared with 7.2 million in 1939 and 5 million in 1926. This figure does not make any allowance for net emigration from the USSR, which must be deducted from the total number of excess deaths. The population deficit, including children not born as a result of the decline in the birth rate, may be estimated at nearly 40 million.

Other estimates of excess deaths are even higher. V. I. Kozlov claims that the population amounted to only 167 million at the end of 1945, as compared with an expected population, given normal CBR and CDR, of between 212 and 215 millions. The total population deficit was therefore 45–8 million. About ten million of this total was due to the decline in birth rate, so the number of excess deaths was 35–8 million. Kozlov even advocates increasing this figure to 40 million on the grounds that the size of the population in 1940 was underestimated. Kozlov's estimates are much cruder than those by ADK.

Our knowledge of the breakdown of the 26 million excess deaths estimated by ADK is extremely limited. An army commission was established to estimate military losses, and early in 1990 M. A. Moiseev, then head of the General Staff, announced that the total number 'killed and missing, plus prisoners who did not return, plus those military who died from wounds, illness and accident' amounted to 8,688,400; an unknown number of these were prisoners and missing persons who did not return to the USSR. Several Soviet commentators have suggested that this figure is too low, and that in reaching it the military were influenced by their wish not to admit that far more Soviet than German soldiers were killed. V. I. Kozlov claims, or guesses, that there were as many as 15–20 million military losses, including 11–13 million in the army. Volkogonov suggests an intermediate figure of 10 million. The deaths among prisoners of war have been estimated at at least 3.3 million. If the Moiseev estimate were true, the number of military fatalities in combat and in the rear would be only 5 million.

All sources agree that the number of excess deaths among civilians must have amounted to 15 million or more. How this figure is made up is not known. Deaths among certain specific groups were very high: over 2% million Jews were murdered by the exterminators of Nazi Germany and its allies; 0.8 million civilians died in the siege of Leningrad. According to one estimate, total deaths of civilians from territory occupied by the enemy amounted to 11 million, of which 5 million died in captivity. In the Soviet rear, many deaths occurred among prisoners of the NKVD. According to NKVD statistics 622000 died in labour camps alone in 1941–5, at least 400000 in excess of the normal death rate. A substantial number of the various nationalities deported in 1940–5 died en route or while in exile; the total number deported amounted to over 3 million, including 1.1 million Soviet Germans, 1.2 million from Western Ukraine and Western Belarus, and some 0.6 million from the Caucasus. But the overwhelming majority of civilian deaths, over 10 million of the total of 15 million, must have occurred from illness, malnourishment and ill-treatment on occupied territory and in captivity in German-occupied Europe, and in the harsh conditions of the Soviet civilian rear, where food was in extremely short supply and sickness was rife.
Further reading


5 Employment and industrial labour

J. D. Barber and R. W. Davies*

The 1917 revolution destroyed the economic power of the landowners, the industrial capitalists and the large merchants. But at the end of the first decade after the revolution the occupational structure of the population as a whole was little changed from before the First World War. Over 80 per cent of the population were engaged in agriculture both in 1914 and in 1926. Among the 20 per cent outside the agricultural sector, the main changes were a precipitate decline in the number of domestic servants, the reduction in the size of the armed forces by 50 per cent, and a substantial growth in unemployment.

Between the two population censuses of 1926 and 1939, an occupational revolution took place. The number of persons working in the agricultural sector declined considerably, while the number engaged in all kinds of non-agricultural activities more than trebled. This included a trebling of the number employed in the education and health services as well as in industry. Educational levels rose sharply. The number of schoolchildren increased by over 150 per cent, so that by the end of the 1930s two-thirds of all children were attending school for seven years. The number of graduates increased from less than a quarter of a million in 1928 to nearly a million by the eve of the Second World War, though they still amounted to only just under one per cent of the labour force.

The core of the process of industrialisation was the expansion in the number of industrial workers, particularly those employed in the capital goods industries. Millions of new workers poured into factories and building sites from the countryside, and simultaneously the number of women employed in industry and related occupations greatly increased. The account which follows first outlines the general changes in employment, and then looks more closely at the expansion of the industrial labour force, and at its working and living conditions.

* Section I and Sections II (A) and (B) were primarily written by Davies, Section II (C) by Barber.
## Table 6. Population recorded by censuses, 1926, 1937 and 1939 (millions)

<table>
<thead>
<tr>
<th></th>
<th>17 December 1926</th>
<th>6 January 1937</th>
<th>17 January 1939</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Official(1)</td>
<td>Adjusted(2)</td>
<td>Official(3)</td>
</tr>
<tr>
<td>Males</td>
<td>71.0</td>
<td>71.0</td>
<td>77.7</td>
</tr>
<tr>
<td>Females</td>
<td>76.0</td>
<td>76.0</td>
<td>86.3</td>
</tr>
<tr>
<td>Total</td>
<td>147.0</td>
<td>147.0</td>
<td>164.0</td>
</tr>
</tbody>
</table>

**Sources:**
1. Lothian (1940), 231.
Table 7. Annual population increase, 1927–39: alternative estimates

<table>
<thead>
<tr>
<th></th>
<th>Population on 1 January (million)</th>
<th>Births during year (thousands)</th>
<th>Deaths during year (thousands)</th>
<th>Net increase in population (thousands)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>From registration data</td>
<td>Lesterine initial</td>
<td>Lesterine adjusted</td>
<td>ADK initial</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>1927</td>
<td>147.1</td>
<td>147.1</td>
<td>147.1</td>
<td>148.7</td>
</tr>
<tr>
<td>1928</td>
<td>150.4</td>
<td>150.0</td>
<td>150.0</td>
<td>151.6</td>
</tr>
<tr>
<td>1929</td>
<td>154.2</td>
<td>153.0</td>
<td>153.0</td>
<td>154.7</td>
</tr>
<tr>
<td>1930</td>
<td>157.4</td>
<td>155.5</td>
<td>155.5</td>
<td>157.4</td>
</tr>
<tr>
<td>1931</td>
<td>160.6</td>
<td>157.8</td>
<td>157.8</td>
<td>159.8</td>
</tr>
<tr>
<td>1932</td>
<td>163.3</td>
<td>159.0</td>
<td>159.0</td>
<td>161.0</td>
</tr>
<tr>
<td>1933</td>
<td>164.9</td>
<td>161.8</td>
<td>161.8</td>
<td>162.9</td>
</tr>
<tr>
<td>1934</td>
<td>165.7</td>
<td>163.8</td>
<td>163.8</td>
<td>165.8</td>
</tr>
<tr>
<td>1935</td>
<td>164.8</td>
<td>[165.0]</td>
<td>160.0</td>
<td>158.2</td>
</tr>
<tr>
<td>1936</td>
<td>167.1</td>
<td>[166.6]</td>
<td>161.3</td>
<td>160.1</td>
</tr>
<tr>
<td>1937</td>
<td>168.3</td>
<td>[168.9]</td>
<td>163.4</td>
<td>162.5</td>
</tr>
</tbody>
</table>

**Notes:**
Discrepancy between his initial estimates and actual population in January 1939 was assessed by Lesterine to amount to 5,322,000 persons. As the population at the time of the 1939 census was in fact smaller, the discrepancy must have been smaller than stated. Lesterine’s assumption, the actual discrepancy was between 5.5 and 8.5 million persons, and a discrepancy remained after Lesterine’s adjustments (0.2–3.0 million persons). We have shown these figures, and the corresponding figures for 1927, in Columns 2 and 3. Population is assumed to have increased by 0.2 million between January 1 and the date of the census, 17 January 1939. A further adjustment would be needed to Lesterine’s discrepancy of 5.5 million, if the population at the time of the December Census was not 147.0 but 148.5 million.

Figures in square brackets are interpolated by the authors.

**Sources:**
- Column 1 and 10: from contemporaneous report of P. I. Popov (RGAE, 105/1/10, 22).
- Column 2, 5, 7 and 8: Lesterine (1946), 134.
- Column 3: Lesterine (1946), 125.
- Column 4, 6, 9, 13: ADK (1990a), 41.
- Column 8: derived from Lesterine’s revised data for population cited in Column 3 and given in more detail in Lesterine (1946), 135.
- Column 11: derived from Lesterine’s initial data in Columns 6 and 9.
- Column 12: derived from Lesterine’s adjusted data for population (Lesterine (1946), 125).
Table 8. Births and deaths in the period 1927–1936 (inclusive) (millions)

<table>
<thead>
<tr>
<th></th>
<th>Raw registration data</th>
<th>Kuznetsov: advanced registration data</th>
<th>ADK: Estimated population changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Births</td>
<td>47.5</td>
<td>(55.5)</td>
<td>61.0</td>
</tr>
<tr>
<td>Deaths</td>
<td>28.5</td>
<td>32.5*</td>
<td>46.9</td>
</tr>
<tr>
<td>Net apparent increase</td>
<td>19.0</td>
<td>33</td>
<td>14.1</td>
</tr>
<tr>
<td>Net actual increase</td>
<td>15.0</td>
<td>15</td>
<td>13.8</td>
</tr>
<tr>
<td>'Gap'</td>
<td>(4.0)</td>
<td>8*</td>
<td>0.2*</td>
</tr>
</tbody>
</table>

Notes:
* Covers only part of all Soviet territory; in 1934 it was estimated to include territory incorporating 90.7 per cent of the population, and 95.7 per cent of the population on that territory - i.e. 80.6 per cent of the whole population.
* According to ADK (1990a), 36, 34.5 million deaths were registered.
* For Kuznetsov's exploration of this gap, see lines on p. 75.
* ADK assume this small gap to be migration, which they give as 0.2 million as a minimum.

Sources:
1 See ADK (1990a), 36.
2 See. in. 6, 1990, 23-4 reprints the Kuznetsov memorandum, dated 14 March 1937.

Table 9. Birth rates and death rates, 1913–1950

<table>
<thead>
<tr>
<th></th>
<th>Crude birth rate (per 1000 population)</th>
<th>Crude death rate (per 1000 population)</th>
<th>Net reproduction rate (per 1000 population)</th>
<th>Infant mortality rate (per 1000 population)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1913</td>
<td>47.0</td>
<td>30.2</td>
<td>16.8</td>
<td>271</td>
</tr>
<tr>
<td>1920 (Official)</td>
<td>44.0</td>
<td>26.3</td>
<td>23.7</td>
<td>174</td>
</tr>
<tr>
<td>1927 (registration)</td>
<td>43.7</td>
<td>21.0</td>
<td>22.7</td>
<td>-</td>
</tr>
<tr>
<td>1927 (Luchter)</td>
<td>45.0</td>
<td>26.0</td>
<td>19.0</td>
<td>-</td>
</tr>
<tr>
<td>1927 (ADK)</td>
<td>46.5</td>
<td>26.5</td>
<td>19.0</td>
<td>182</td>
</tr>
<tr>
<td>1938 (Official)</td>
<td>37.5</td>
<td>17.5</td>
<td>20.0</td>
<td>161</td>
</tr>
<tr>
<td>1938 (ADK)</td>
<td>39.0</td>
<td>20.0</td>
<td>18.2</td>
<td>174</td>
</tr>
<tr>
<td>1950 (Official)</td>
<td>36.7</td>
<td>9.7</td>
<td>17.0</td>
<td>81</td>
</tr>
</tbody>
</table>

Sources:
1 Nar. 66, 1933 (1937), 30.
2 See text table, p. 66, note n.
3 Luchter (1946), 134.
4 ADK (1990a), 41, 43.

Table 10. Agricultural and non-agricultural occupations, 1926 and 1939 (millions of persons)

<table>
<thead>
<tr>
<th></th>
<th>1926</th>
<th>1939</th>
<th>1939</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Raw data</td>
<td>Revised data</td>
<td>Raw data</td>
</tr>
<tr>
<td>Agricultural</td>
<td>71.7</td>
<td>61.6</td>
<td>48.2</td>
</tr>
<tr>
<td>Industry, building and transport</td>
<td>8.5</td>
<td>6.3</td>
<td>23.6</td>
</tr>
<tr>
<td>Other non-agricultural</td>
<td>5.3</td>
<td>5.3</td>
<td>12.3</td>
</tr>
<tr>
<td>Total</td>
<td>85.3</td>
<td>73.2</td>
<td>87.1</td>
</tr>
<tr>
<td>Pensioners, unemployed, etc.</td>
<td>2.9</td>
<td>2.9</td>
<td>5.0</td>
</tr>
<tr>
<td>Total gainfully occupied</td>
<td>88.2</td>
<td>76.1</td>
<td>92.1</td>
</tr>
</tbody>
</table>

Note:
1 Raw data for agriculture included family members engaged in agriculture: 11.5 million children aged 10–15 and 6.2 million men and women over nominal retirement age of 65 for women and 60 for men. The 1939 census includes only children over 15 and men and women under retirement age. For comparability with 1939, in col. 2 we have removed the 0.2 million men and women and (ordinarily) one-third of the children aged 10–5 (we have assumed that a smaller proportion of children of that age was available for agricultural work in 1939 owing to increased school attendance). See also Wheatcroft, Davies and Cooper (1986), 273.

'Other non-agricultural' includes trade and credit; social and cultural administration; five professions; casual labour, domestic servants, etc.; and armed services (see table 11). Pensioners, unemployed, etc. includes unemployed; pensioners; readmits on general patients, children and invalids; prisoners; relicts, beggars, etc. and not indicated or incomplete (see table 11).

1 Figures obtained as follows (million): Agriculture, etc. 40.29: employed in agriculture 7.96: family members engaged in personal economy (families of manual and white-collar workers, collective farmers). Industry, etc. 48.16: Total. 14.94: employed in industry (including artisans). 0.32: family members engaged in personal economy (families of cooperative and non-cooperative artisans). 1.68: in timber industry (men tree-growers). 3.23: building. 3.46: transport and communications. 23.51: Total. Other non-agricultural: includes trade and credit; social and cultural administration; and 'not distributed by branch of economy' (see table 11).