

ECONOMIC GROWTH IN POSTWAR RUSSIA: ESTIMATING GDP

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Abstract

Making use of new sources which have become available since the collapse of the Soviet Union, I develop a new approach to estimating Russian economic growth for the period 1961 through 1995 by using the official output and employment data provided by Goskomstat RF and CIS Komstat, and find that official figures greatly exaggerated growth during 1961–1990. Second, I make a comparison of official and other estimates of real growth rates of Russian GDP for 1991 through 1995. Using systematically revised estimates to compensate for under-reporting, and keying on the utilization of electricity, I find that official statistics greatly overestimate production declines for 1991–95.

I. Introduction

Since the collapse of the Soviet Union, we have come to recognize the importance of quantitative historical research on the republics of the former Soviet Union (FSU), including Russia. The breakup of the Soviet Union brought about a marked drop in output in all the transition economies of the FSU. The measured drop in industrial output was much larger than that during the Great Depression of the 1930's. However, the collapse of the totalitarian Soviet system is making it possible to have access to much statistical data which was once hidden. Further, the transition to a market economy is bringing a striking change to the statistical systems of all the FSU republics, namely the shift from the traditional System of Material Products (MPS) to the market-oriented System of National Accounts (SNA).

Making effective use of the changed statistical environment, this paper presents the author's own estimates of economic growth in postwar Russia. First, this paper provides an estimate of real growth rates of GDP in Russia for 1961–1995 by using the official output and employment data given by Goskomstat RF (State Statistical Committee of the Russian Federation) and CIS Komstat (Interstate Statistical Committee of the CIS). Second, it presents an alternative estimate of real growth rates of GDP in Russia for 1991–1995 through replacing the official industrial output indexes with the author's estimate of industrial production. This preliminary, but pioneering, research on the Russian GDP is intended to contribute to developing further the Asian Historical Statistics Project [see Odaka (1996)].

II. Methodology and Data for Base-Line Estimate

The procedure employed by the present author to derive the base-line estimate of postwar growth in Russia can be summarized as follows:

1. The republican 1990 GDP by sectoral (industrial) origin, in current prices, was selected as the reference base data. Here let $Y_i(t)^{(k)}$ be the i -th sector's GDP in the country k at the t -th period. $Y_i(1990)^{(k)}$ is given by the official data shown in *Russian Statistical Yearbook 1995*. Given $Y_i(1990)^{(k)}$, we proceeded to derive $Y_i(t)^{(k)}$, $t=1960, 1962, \dots, 1989, 1991, \dots, 1995$ with $t=1990$ as the reference year by using independently-estimated sectoral real growth rates, $g_i(t)^{(k)}$, namely

$$Y_i(t-1)^{(k)} = Y_i(t)^{(k)} / (g_i(t)^{(k)} + 1), \quad t=1990, 1989, \dots, 1961. \quad (1.1)$$

$$Y_i(t)^{(k)} = (g_i(t)^{(k)} + 1) Y_i(t-1)^{(k)}, \quad t=1991, 1992, \dots, 1995. \quad (1.1')$$

2. The global national income produced in terms of the 1960 reference base, $Y(t)^{(k)}$, and its growth rate, $G(t)^{(k)}$ in the country k at the t -th period, were computed as

$$Y(t)^{(k)} = \sum_i Y_i(t)^{(k)},$$

and

$$G(t)^{(k)} = (Y(t)^{(k)} - Y(t-1)^{(k)}) / Y(t-1)^{(k)}, \quad t=1961, 1962, \dots, 1990. \quad (1.2)$$

As can easily be seen, this equation is equivalent to

$$G(t)^{(k)} = 1 / [\sum_i \omega_i(t)^{(k)} / (g_i(t)^{(k)} + 1)] - 1, \quad (1.3)$$

where $\omega_i(t)^{(k)} = Y_i(t)^{(k)} / \sum_i Y_i(t)^{(k)}$ denotes sectoral weights in the t -th period national income of the country k .

3. The crucial step in computing the global growth rate of each country at each period is to estimate sectoral real growth rates, $g_i(t)^{(k)}$, which were calculated directly by employing the following official data:

For $i = 1$ (industry): republican volume indexes of industrial production [Table 1];

For $i = 2$ (agriculture and forestry): republican gross agricultural output indexes in 1983 constant prices [Table 1];

For $i = 3$ (construction): republican volume indexes of construction and assembling works [Table 2];

For $i = 4$ (transportation): republican average indexes of freight and passenger transportation [Table 3];

For $i = 5$ (distribution): republican volume indexes of retail turnover [Table 4];

For $i = 6$ (other services): republican employment data for 'other'.

TABLE 1. GROWTH OF INDUSTRIAL AND AGRICULTURAL OUTPUTS IN RUSSIA

	Industry annual growth rates (%)	Agriculture annual growth rates (%)	Industry indexes (1960=100)	Agriculture indexes (1960=100)	Industry indexes (1990=100)	Agriculture indexes (1990=100)
1950	...	...	35.3	...	7.0	...
1951	15.7	...	40.8	...	8.1	...
1952	10.8	...	45.3	...	9.0	...
1953	11.1	...	50.3	...	10.0	...
1954	13.0	...	56.8	...	11.3	...
1955	11.6	...	63.4	...	12.6	...
1956	9.6	...	69.5	...	13.8	...
1957	9.0	...	75.8	...	15.1	...
1958	9.3	...	82.8	...	16.5	...
1959	10.9	...	91.8	...	18.3	...
1960	8.9	...	100.0	100.0	19.9	60.5
1961	8.1	2.5	108.1	102.5	21.5	62.0
1962	9.0	3.5	117.8	106.1	23.5	64.2
1963	8.0	-10.1	127.3	95.4	25.4	57.7
1964	6.0	14.1	134.9	108.9	26.9	65.8
1965	7.3	-0.1	144.7	108.8	28.8	65.8
1966	8.4	8.9	156.9	118.5	31.3	71.6
1967	9.9	3.7	172.4	122.9	34.4	74.3
1968	8.1	5.3	186.4	129.4	37.1	78.2
1969	6.9	-7.0	199.3	120.4	39.7	72.7
1970	8.0	12.3	215.2	135.2	42.9	81.7
1971	7.6	-1.2	231.6	133.6	46.1	80.7
1972	6.4	-8.7	246.4	122.0	49.1	73.7
1973	7.3	22.1	264.4	149.0	52.7	90.0
1974	7.8	-4.7	285.0	142.1	56.8	85.7
1975	7.3	-5.0	305.8	134.9	60.9	81.5
1976	4.7	1.9	320.2	137.5	63.8	83.0
1977	5.3	6.2	337.1	145.9	67.2	88.1
1978	4.6	2.6	352.6	149.7	70.3	90.4
1979	2.9	-5.7	362.9	141.1	72.3	85.3
1980	3.2	-0.8	374.5	140.0	74.6	84.6
1981	3.0	-4.2	385.7	134.2	76.9	81.0
1982	2.7	9.8	396.1	147.3	78.9	89.0
1983	3.8	7.3	411.2	157.9	81.9	95.5
1984	3.8	-2.2	426.8	154.4	85.0	93.4
1985	3.4	0.4	441.3	155.1	87.9	93.8
1986	4.5	6.7	461.2	165.5	91.9	100.0
1987	3.5	-1.2	477.3	163.5	95.1	98.8
1988	3.8	3.2	495.4	168.8	98.7	102.0
1989	1.4	1.7	502.4	171.7	100.1	103.7
1990	-0.1	-3.6	501.9	165.5	100.0	100.0
1991	-8.0	-4.5	461.7	158.0	92.0	95.5
1992	-18.0	-9.0	378.6	143.2	75.4	86.9
1993	-14.1	-4.0	325.2	136.9	64.8	83.4
1994	-20.9	-12.0	257.3	120.4	51.3	73.4
1995	-3.3	-8.0	248.8	110.8	49.6	67.5

Sources: Goskomstat RF and CIS Komstat.

Notes: The figures for industry are based on real (physical) output volume indexes, and those for agriculture are in 1983 prices.

TABLE 2. GROWTH OF CONSTRUCTION AND ASSEMBLING WORKS IN RUSSIA

	growth rates (%)	indexes (1960=100)	indexes (1990=100)
1947	3.0	18.9	6.3
1948	20.0	22.7	7.6
1949	15.0	26.1	8.7
1950	15.0	30.0	10.1
1951	21.0	36.3	12.2
1952	13.0	41.0	13.7
1953	4.0	42.6	14.3
1954	18.0	50.3	16.9
1955	10.0	55.3	18.6
1956	13.0	62.5	21.0
1957	11.0	69.4	23.3
1958	17.0	81.2	27.2
1959	13.0	91.7	30.8
1960	9.0	100.0	33.5
1961	-0.6	99.4	33.3
1962	2.0	101.4	34.0
1963	2.0	103.4	34.7
1964	5.0	108.6	36.4
1965	8.0	117.3	39.3
1966	6.0	124.3	41.7
1967	8.0	134.3	45.0
1968	8.0	145.0	48.6
1969	2.0	147.9	49.6
1970	11.0	164.2	55.1
1971	10.0	180.6	60.6
1972	7.0	193.2	64.8
1973	3.0	199.0	66.7
1974	6.0	211.0	70.7
1975	7.0	225.7	75.7
1976	2.0	230.2	77.2
1977	2.0	234.8	78.8
1978	2.0	239.5	80.3
1979	-0.5	238.3	79.9
1980	0.7	240.0	80.5
1981	2.0	244.8	82.1
1982	2.0	249.7	83.7
1983	3.0	257.2	86.3
1984	1.0	259.8	87.1
1985	2.0	265.0	88.9
1986	8.0	286.2	96.0
1987	6.0	303.3	101.7
1988	6.0	321.5	107.8
1989	0.8	324.1	108.7
1990	-8.0	298.2	100.0
1991	-15.0	253.5	85.0
1992	-37.0	159.7	53.6
1993	-12.0	140.5	47.1
1994	-7.0	130.7	43.8
1995	-7.0	121.5	40.8

Sources: Goskomstat RF and CIS Komstat.

TABLE 3. VOLUME INDEXES OF
TRANSPORTATION

	freight (1990=100)	passenger (1990=100)	average (1990=100)
1960	22.6	27.7	23.7
1961	23.9	29.2	25.0
1962	25.2	30.7	26.4
1963	26.7	32.3	27.9
1964	28.2	34.0	29.5
1965	29.8	35.8	31.1
1966	32.3	38.7	33.7
1967	34.9	41.9	36.4
1968	37.8	45.3	39.4
1969	40.9	49.0	42.6
1970	44.3	53.0	46.1
1971	47.3	56.7	49.3
1972	50.5	60.7	52.7
1973	53.9	65.0	56.3
1974	57.6	69.5	60.1
1975	61.5	74.4	64.2
1976	63.9	75.1	66.3
1977	66.5	75.9	68.5
1978	69.2	76.6	70.8
1979	71.9	77.4	73.1
1980	74.8	78.2	75.5
1981	79.1	80.1	79.3
1982	83.7	82.1	83.3
1983	88.5	84.1	87.6
1984	93.6	86.2	92.0
1985	99.0	88.4	96.7
1986	99.2	90.6	97.4
1987	99.4	92.9	98.0
1988	99.6	95.2	98.7
1989	99.8	97.6	99.3
1990	100.0	100.0	100.0
1991	92.6	95.0	93.2
1992	79.8	86.1	81.1
1993	70.6	83.6	73.4
1994	60.5	75.4	63.7
1995	59.3	70.1	61.6

Sources: Goskomstat RF and own computation.

TABLE 4. VOLUME INDEXES OF RETAIL
TRADE TURNOVER IN RUSSIA

	growth rates (%)	indexes (1960=100)	indexes (1990=100)
1950	...	35.8	7.7
1951	14.4	40.9	8.8
1952	10.1	45.1	9.7
1953	21.6	54.8	11.8
1954	17.3	64.3	13.8
1955	3.5	66.5	14.3
1956	7.0	71.1	15.3
1957	13.1	80.5	17.3
1958	5.4	84.8	18.3
1959	7.1	90.8	19.6
1960	10.1	100.0	21.5
1961	3.4	103.4	22.3
1962	5.5	109.1	23.5
1963	3.8	113.2	24.4
1964	4.7	118.6	25.5
1965	8.9	129.1	27.8
1966	7.8	139.2	30.0
1967	8.8	151.4	32.6
1968	8.1	163.7	35.3
1969	6.9	175.0	37.7
1970	7.0	187.2	40.3
1971	6.4	199.2	42.9
1972	6.4	212.0	45.7
1973	4.8	222.1	47.9
1974	6.2	235.9	50.8
1975	6.8	252.0	54.3
1976	4.4	263.0	56.7
1977	4.1	273.8	59.0
1978	3.7	284.0	61.2
1979	3.6	294.2	63.4
1980	5.0	308.9	66.5
1981	4.2	321.9	69.3
1982	-0.1	321.5	69.3
1983	2.3	328.9	70.9
1984	3.9	341.8	73.6
1985	1.7	347.6	74.9
1986	1.5	352.8	76.0
1987	0.9	356.0	76.7
1988	7.6	383.0	82.5
1989	8.5	415.6	89.5
1990	11.7	464.2	100.0
1991	-3.2	449.3	96.8
1992	-3.5	433.6	93.4
1993	1.9	441.8	95.2
1994	0.1	442.3	95.3
1995	-7.2	410.4	88.4

Sources: Goskomsta RF and CIS Komstat.

TABLE 5. EMPLOYMENT BY SECTOR IN RUSSIA

(1990=100)

	Total							
		Industry	Construction	Agriculture	Services	Transport and communication	Distribution	Other
1958	72.4	67.8	45.9	194.4	47.7	71.3	51.4	40.4
1959	72.9	69.9	47.6	185.4	49.6	74.1	54.0	41.9
1960	74.7	72.2	49.2	183.1	52.3	77.3	55.3	44.9
1961	75.3	74.8	49.7	172.1	55.0	80.4	58.5	47.3
1962	76.2	77.0	48.7	167.5	57.0	82.3	60.6	49.3
1963	76.7	79.1	49.3	159.9	58.6	83.6	62.2	51.0
1964	78.2	81.5	51.0	156.3	60.9	86.2	65.0	53.1
1965	79.0	83.8	51.2	148.3	63.3	88.0	67.3	55.7
1966	80.0	86.2	52.1	143.6	65.2	89.0	69.6	57.7
1967	81.0	88.9	54.9	135.6	67.2	89.8	72.3	59.8
1968	82.7	90.6	56.0	135.0	69.5	91.3	75.8	62.1
1969	83.9	92.3	58.8	129.5	71.8	93.1	79.3	64.2
1970	84.9	92.7	61.5	127.5	73.7	95.0	81.9	65.9
1971	86.3	93.6	64.9	125.5	75.8	97.5	84.4	67.8
1972	87.6	94.5	68.1	123.5	78.0	99.9	86.9	69.8
1973	89.0	95.2	68.7	123.4	80.3	103.1	89.8	71.8
1974	90.1	96.5	70.5	120.0	82.4	105.8	92.0	73.7
1975	91.3	98.0	72.6	116.6	84.5	108.6	94.2	75.6
1976	92.6	99.9	73.7	114.6	86.4	111.0	96.0	77.3
1977	93.9	101.7	74.9	112.7	88.4	113.3	98.0	79.2
1978	95.3	102.9	76.1	112.7	90.3	116.0	99.6	81.0
1979	96.3	103.8	76.8	111.0	92.2	118.4	101.2	82.9
1980	97.3	104.4	77.7	110.7	93.9	120.2	102.9	84.5
1981	97.8	105.0	77.7	109.0	95.2	122.0	104.1	85.7
1982	98.5	105.6	77.9	109.0	96.3	124.0	104.6	86.8
1983	98.8	105.8	77.5	108.4	96.9	124.5	104.7	87.6
1984	99.1	105.8	77.6	108.0	97.7	124.8	105.2	88.5
1985	99.5	106.0	78.5	106.9	98.6	125.2	105.6	89.6
1986	99.8	106.0	79.5	105.5	99.5	125.0	105.9	91.0
1987	99.8	105.7	81.4	103.7	99.5	120.3	105.6	92.4
1988	99.5	104.9	89.0	101.7	98.1	107.7	103.1	94.2
1989	100.4	102.9	98.4	100.7	99.1	101.1	100.9	98.1
1990	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1991	98.0	98.2	94.1	100.2	98.3	98.2	95.5	99.1
1992	95.7	93.5	87.4	103.7	97.1	96.2	96.4	97.5
1993	94.1	91.2	79.2	104.0	97.1	92.3	108.2	95.4
1994	90.9	81.4	75.3	106.1	97.1	91.4	110.1	95.2
1995	89.1	75.4	72.1	102.5	99.0	90.5	110.4	98.2

Sources: Goskomstt RF and CIS Komstat.

It should be noted that Goskomstat RF, in cooperation with the World Bank, employed a method which is similar to the author's method when it revised the official growth rate estimates for 1991–1994 in October, 1995 [Goskomstat RF and World Bank (1995)].

TABLE 6. BASE-LINE ESTIMATES OF GROWTH OF GDP IN POSTWAR RUSSIA

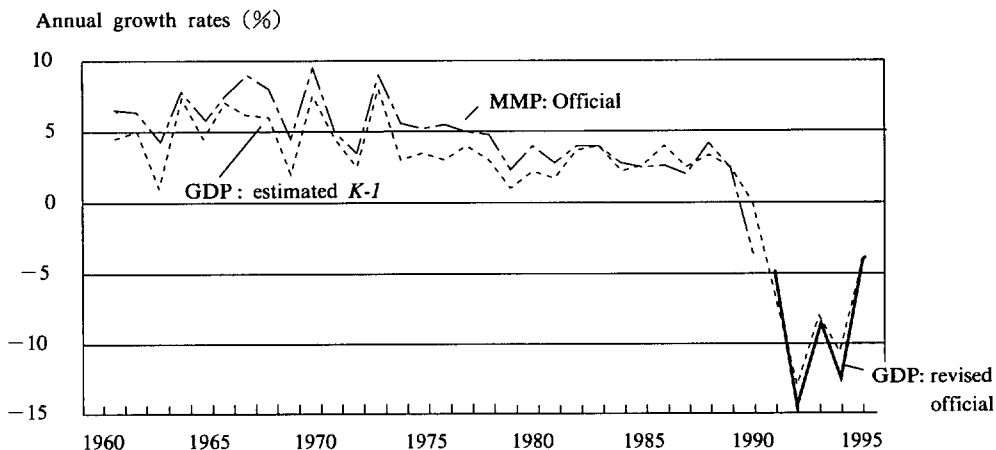
	Estimated GDP (K-1)			Official GDP after revision		Official National Income (NMP)		
	growth rates (%)	1960=100	1990=100	growth rates (%)	1990=100	growth rates (%)	1960=100	1990=100
1960	...	100.0	33.3	...	...	...	100.0	25.0
1961	4.5	104.5	34.8	...	...	6.5	106.5	26.6
1962	5.1	109.8	36.5	...	...	6.5	113.4	28.3
1963	0.6	110.5	36.8	...	...	4.4	118.4	29.6
1964	7.5	118.8	39.5	...	...	8.1	128.0	32.0
1965	4.6	124.2	41.3	...	...	5.8	135.4	33.8
1966	7.0	133.0	44.2	...	...	7.9	146.1	36.5
1967	6.3	141.4	47.0	...	...	9.3	159.7	39.9
1968	6.3	150.3	50.0	...	...	8.5	173.3	43.3
1969	2.1	153.4	51.0	...	...	4.3	180.7	45.1
1970	8.0	165.6	55.1	...	...	9.7	198.3	49.5
1971	4.5	173.0	57.6	...	...	5.2	208.6	52.1
1972	2.2	176.8	58.8	...	...	3.4	215.7	53.9
1973	8.8	192.3	64.0	...	...	9.8	236.8	59.1
1974	3.4	198.9	66.2	...	...	5.8	250.6	62.6
1975	3.5	205.9	68.5	...	...	5.2	263.6	65.8
1976	3.2	212.5	70.7	...	...	5.6	278.3	69.5
1977	4.3	221.6	73.7	...	...	5.0	292.3	73.0
1978	3.3	228.9	76.1	...	...	4.9	306.6	76.5
1979	0.8	230.7	76.8	...	...	2.0	312.7	78.1
1980	2.0	235.4	78.3	...	...	4.3	326.2	81.4
1981	1.5	239.1	79.5	...	...	2.9	335.6	83.8
1982	3.6	247.7	82.4	...	...	3.8	348.4	87.0
1983	3.8	257.2	85.6	...	...	3.7	361.3	90.2
1984	2.0	262.4	87.3	...	...	2.8	371.4	92.7
1985	2.4	268.7	89.4	...	...	2.0	378.8	94.6
1986	4.1	279.7	93.1	...	...	2.3	387.5	96.8
1987	2.1	285.6	95.0	...	...	1.4	392.9	98.1
1988	3.4	295.4	98.3	...	...	4.5	410.6	102.5
1989	2.2	301.8	100.4	...	...	1.6	417.2	104.2
1990	-0.4	300.5	100.0	...	100.0	-4.0	400.5	100.0
1991	-6.3	281.5	93.7	-5.0	95.0	-14.3	343.2	85.7
1992	-13.4	243.8	81.1	-14.5	81.2	-22.0	267.7	66.8
1993	-7.8	224.8	74.8	-8.7	74.2	-13.0	232.9	58.2
1994	-11.0	200.2	66.6	-12.6	64.8	-16.0	195.7	48.9
1995	-3.9	192.4	64.0	-4.0	62.2	...	...	...

Sources: Own estimates, Goskomstat RF and CIS Komstat.

III. Base-Line Estimate (K-1)

The estimated base-line growth figures for Russia — hereafter referred to as *K-1* — are shown in Table 6. Figure 1 displays the estimated GDP growth rates for 1961–1995, the republican official growth rates for 1991–1995 and the republican official growth rates of national income (NMP) produced for 1961–1990.

FIGURE 1. ESTIMATED AND OFFICIAL GROWTH RATES OF GDP IN RUSSIA



Cumulative growth of GDP in 1990 is 3 times the 1960 level for Russia while that of NMP is 4 times the 1960 level. Namely, the estimated values of cumulative GDP growth in the Russian economy as well as most of annual growth rates of GDP are much lower than those of the official NMP growth figures.

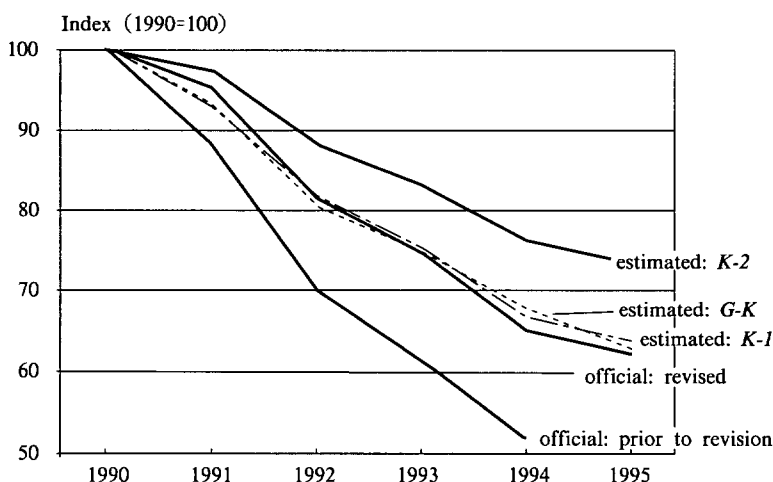
Real GDP increased by 65.6% for 1961–1970, 42.1% for 1971–1980 and 27.6% for 1981–1990. Apparently, the estimated growth figures of postwar Russia in the Soviet era show a marked declining tendency due to overall drops in outputs of industry, agriculture, construction and so on. The major sources of fluctuations in GDP for 1963–1964 and 1972–1973 are marked drops and jumps in agricultural output for the corresponding years.

As stated, the collapse of the Soviet Union brought about remarkable drops in outputs. The *K-I* estimates of annual growth rates and cumulative growth for the years 1991 to 1994 in Russia are very close to the official GDP figures after revision in October, 1995. The estimated growth level in 1994 is 66.6 (1990=100), while the official level is 64.8.

IV. *Alternative Estimates of Growth of GDP for 1991–1995*

The collapse of the Soviet Union led to the breakup of the traditional centralized system of statistics and inspection which, along with vast under-reporting or non-reporting of information by enterprises seeking to evade taxes, brought about marked downward biases in officially measured output, consumption, exports and imports. In order to resolve these biases, Goskomstat, at the beginning of 1994, first revised data on retail sales and paid services for 1992. However, Goskomstat did not then perform a systemic revision of GDP data even though, in general, household consumption of GDP is directly related to retail trade and paid services and constitutes a major part of GDP. Gavrilencov and Koen (1994) — hereafter referred to as *G-K* — presented alternative GDP growth figures for 1991–1994 in November 1994. Their estimates shown in Table 7 and Figure 2 were derived by factoring in a downward bias of output estimates and adjusting consumption figures based on revised data of retail sales, paid services and other factors. They concluded that the Russian GDP dropped not by half as

FIGURE 2. OFFICIAL AND ESTIMATED INDEXES OF GDP GROWTH
IN RUSSIA, 1991-1995 (1990=100)



then officially reported, but by about one third. In October 1995, almost one year after the first G-K estimate on real GDP growth rates appeared, a joint Goskomstat-World Bank team published revised GDP estimates, shown in Table 7 which are close to those given by Gavrilentov and Koen while the joint team's results were mainly derived through the production approach [Goskomstat and The World Bank (1995) and *Russian Statistical Yearbook 1995*].

It should be noted that Goskomstat did not revise the official index of industrial production along with the revision of GDP figures. In recalculating real GDP growth figures, Goskomstat employs growth rates of industrial production which are almost equal to the official growth rates of industrial production (except for the figure for 1991). The department

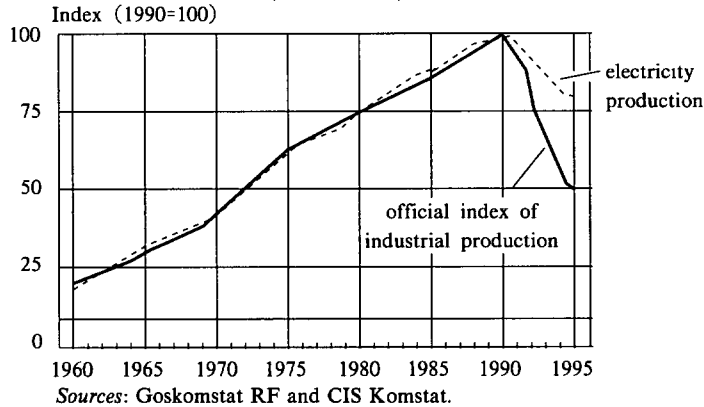
TABLE 7. OFFICIAL AND ESTIMATED FIGURES OF GDP GROWTH FOR 1991-1995

	1991	1992	1993	1994	1995
annual growth rates (%)					
Official data prior to revision	-12.8	-19.2	-12.0	-15.0	...
Official data after revision	-5.0	-14.5	-8.7	-12.6	-4.0
Estimated by Gavrilentov and Koen [G-K]	-6.4	-14.0	-7.5	-9.1	(-6.8)
Estimated by Kuboniwa [K-1]	-6.3	-13.4	-7.8	-11.0	(-3.9)
Estimated by Kuboniwa [K-2]	-3.3	-8.9	-5.6	-8.9	(-2.7)
index (1990=100)					
Official data prior to revision	87.2	70.5	62.0	52.7	...
Official data revised	95.0	81.2	74.2	64.8	62.2
Estimated by Gavrilentov and Koen [G-K]	93.6	80.5	74.5	67.7	(63.1)
Estimated by Kuboniwa [K-1]	93.7	81.1	74.8	66.6	(64.0)
Estimated by Kuboniwa [K-2]	96.7	88.1	83.2	75.8	(73.8)

Sources: Goskomstat RF, *Statistical Year Book 1995*, *Monthly Report*, No.12, 1995, Gavrilentov and Koen (1994, 1995) and Kuboniwa (1996).

Notes: The figures in parentheses are preliminary estimates given by the author, based on the corresponding methods. The figure in G-K for 1995 is Gavrilentov's estimate.

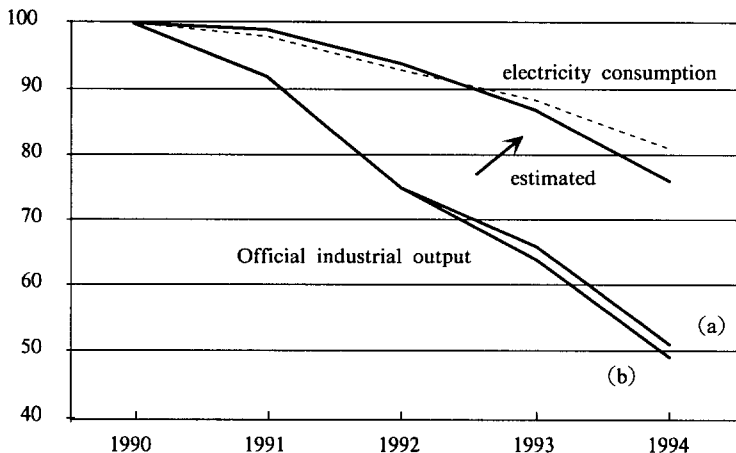
FIGURE 3. OFFICIAL INDEXES OF ELECTRICITY
PRODUCTION AND INDUSTRIAL PRODUCTION
IN RUSSIA (1990=100), 1960-1995



of national accounts of Goskomstat independently recalculated the annual growth rates of industrial production at -6%, -18%, -15% and -21%, respectively, for 1991-1994 while the department of industrial production of Goskomstat provided the revised official estimates of -8%, -18%, -14% and -21% for the same years.

The official industrial production indexes by sector for 1991-1995 indicated that the electricity industry suffered a very slight decrease in production compared to other industrial sectors and to industry as a whole. This is quite strange considering that for several decades, as shown in Figure 3, electricity grew at a rate which closely paralleled that of the whole of industry. In order to solve this problem, which is inherent in the official industrial production indexes, Kuboniwa (1995, 1996) presented alternative estimates of industrial production indexes, the latest version of which is shown in Figure 4.

FIGURE 4. INDUSTRIAL OUTPUT AND ELECTRICITY CONSUMPTION



The previous sections of this paper provide the base-line estimate of GDP growth rates for 1961–1995 by employing the production approach which is similar to but simpler than the Goskomstat and World Bank method. A part of these computation results is again shown as *K-1* in Table 7 where the officially revised industrial production indexes were faithfully used. On the other hand, *K-2* in the table provides an alternative estimate of GDP growth figures where the estimate of industrial output growth figures shown in Figure 4.

As is displayed by Figure 2, the cumulative decline in GDP for 1991–1994 is around 35% in the revised official figures and in estimates *G-K* and *K-1* while the estimate *K-2* based on an upward revision of industrial production shows a 27% drop in GDP for the period. *K-2* is the lowest estimate of decline in Table 7.

It should be noted that the situation for 1995, as was suggested by Gavrilentov (1996), seems to be different from that of 1992–1994. While in 1992–1994 Goskomstat had undervalued the level of production for a number of quite obvious reasons, in 1995 it has perhaps overvalued economic activity in the country. This overstatement is due to the simple production approach, in which the marked reduction in real budgetary expenditures in 1995 was ignored. It should be noted here that Goskomstat currently measures the real growth rate of public consumption by the number of persons employed irrespective of serious delays in paying wages according to the basic principle in SNA 1968/1993. In order to solve this overstatement problem, Goskomstat has to further develop the methodology of national accounts from a simple production approach to the normal double deflation method. This also holds for the author's estimates *K-1* and *K-2* for 1995 in Table 7.

V. Concluding Remarks

In this paper I have adopted a pioneering spirit in attempting to present base-line and alternative estimates of growth of Russian GDP from the production side. Numerous tasks remain to be performed, including estimating growth from the expenditures side, perfecting the complete SNA of Russia, and inquiring into the quality of the official output and employment data. However, it should be noted that further research on estimating national income and GDP statistics in Russia would require much toil and would also be accompanied by higher degrees of uncertainties in estimates.

Finally, it is worth commenting on Russian growth for 1997. The Russian government has prepared two basic scenarios regarding Russia's economic development in 1997. According to the first, optimistic, scenario, GDP growth will equal 0-2%, with inflation rates at 10-13% a year. The principal parameters of the second scenario are a 1-3% decline in GDP and a 21-25% growth in prices. It should be noted that when deciding its monetary policy targets and state budget the government proceeds from the optimistic variant. However, the majority of alternative assessments show that in the coming year the parameters of the second scenario seem more realistic. Besides the usual and traditional political instability the main threats to Russia's economic development in 1997 will be: a) a continuing budget crisis aggravated by weak tax collection capabilities; b) the deteriorating financial position of industrial enterprises; c) declining real household income; d) a growing dependence on imports, strengthening of the real ruble rate and, consequently, a likely deterioration of the foreign trade balance; and e) the volatility of domestic financial markets, particularly the government securities market. If the

government continues to cling to unduly optimistic scenarios and neglects existing dangers, stabilization measures may fail, badly damaging Russia's investment climate in 1997.

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