

Russia's Industrial Growth
In the First Stage of Industrialisation (1880s-1913)

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The inspiration for this work was the long delayed appearance in 1994 of Lev Kafengauz' *The Evolution of Russian Industrial Production (the last third of the nineteenth century to the 1930s)*, which presents an assessment of Russian industrial production from 1887-1927. Kafengauz' book was to have appeared in the 1920s; however, it was published only in 1994. The author worked on the monograph in his prison cell, having little hope for his personal survival, let alone the publication of his book.

Data from his book makes possible a new examination of the rate of growth of Russian industrial production. It makes available supplementary data to which we can compare earlier assessments.

We now have two early Soviet estimates, one by L. B. Kafengauz and the other by N. D. Kondratieff. Thus we have two separate but parallel works by distinguished specialists of one phenomenon in Russia, the growth of industrial output during pre-revolutionary industrialization in Russia from the middle of the 1880s to the beginning of the first world war, both using similar data and methods. These well known scholars—Kafengauz and Kondratieff—however, had different conclusions, which requires special explanation.

We also examine parallel research by two distinguished western scholars. Raymond Goldsmith and Warren Nutter investigated Russian industrial production in separate and independent research in the 1950s for the National Bureau of Economic Research. Nutter's work on the pre-revolutionary period had largely been forgotten because the author was mainly interested in the Soviet epoch and paid little note of his own results for the period before 1913.

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Although Russian industrial production has been used to illustrate an important theory in economic history—the theory of relative backwardness of Alexander Gerschenkron — this established interpretation is founded on a fairly narrow base of 20 products from industrial and mining branches qualifying as industries of Russia. The existence of other views, confirming this one, provides a deceptive security: they all rely in on the same data. The differences between them are due to different techniques used to analyze the data, and they are relatively insignificant. It is therefore understandable that there is principle agreement on the rate of industrial growth in Russia.

Several economic historians evaluated pre-revolutionary Russian industrialization. Alexander Gerschenkron was the first. In 1947, in a western journal, he published an index of Russian industrial production. Gerschenkron's index was based on the index of industrial output for 20 goods for the period 1885 to 1913 that was published in the monthly journal, *Economic Bulletin*, of N. D. Kondratieff's Institute of Conjuncture. Gerschenkron recalculated Kondratieff's index with 1913 weights (Kondratieff used 1900 weights) and used it for his theory about latecomers' "spurts" of industrial growth. It is not surprising that his results, as in a mirror, concur with the conclusion of the Institute of Conjuncture.

Raymond Goldsmith published his index of Russian industrial production in 1962 in the framework of his fundamental work on Russian national income. He used the same 20 series from the Institute of Conjuncture that Gerschenkron had used.

The core of *Evolution* is Kafengauz' work on industrial production in Russia and the Soviet Union from 1887-1927, in which there are almost 300 pages of statistical tables, references and notes.

In *Evolution* Kafengauz looks only at factories surveyed by the industrial census, and he excludes crafts and small manufacturing firms. Kafengauz also, as Kondratieff, includes in his series data for a few mining branches (coal, iron ore, manganese). He calculates aggregated series of three types: gross production in current prices, an index of the physical volume of production, weighted by the structure of the work force and gross production, and series for the number of employed. Kafengauz' index of industrial production was a weighted index of the physical volume of production for 29 goods from processing and mining (we note that Kondratieff used only 20 products). The additional products used by Kafengauz included high technology goods for the end of the nineteenth and early twentieth century—cement, chemical products, and oil refining. Kafengauz indicated that this index of the physical volume of production embraced 66% of the value of output of factories surveyed by the Factory Inspectorate. 34% were left out because the data was lacking indicators of physical output.

As observed above, for this period Kafengauz provides three aggregated figures, the value of production, the number of employees and the physical volume of production. These figures allow new research, especially now that we have better information about price indices for that period. We can now deflate the figures on the value of production by branch.

**Was Russian industrial growth more rapid
than has been thought?**

Comparing the index of industrial production by Kafengauz with the three others, Goldsmith's 1962 index, Kondratieff's 1926 index and Nutter's 1962 index, for 1887 through 1913 results in the following significant divergence (see Table 1, Fig 1). The

index of Kafengauz has the fastest rate of growth (6.65%), the index of Goldsmith the slowest (5.1%), and the indices of Kondratieff (5.6%) and Nutter (5.8%) are in between.

The difference between the maximum (Kafengauz) and the minimum (Goldsmith) is substantial. Estimates by Kafengauz are 30% higher than the widely cited Goldsmith estimates. There is a substantial divergence between all four. On the whole, for the 26 year period the volume of industrial production as estimated by Kafengauz is 50 % greater than by Goldsmith and one third greater than by Kondratieff.

Such a huge difference may suggest that Goldsmith seriously underestimated the rate of industrial growth in that period. Although it also may mean a defect in the underlying data, the topic merits closer analysis.

The faster rate of growth in Kafengauz' series could be the result of three factors, each of which can be studied separately with the available data: differences due to weights, either by value added or number of employees; differences in the series of the physical volume of production; differences in the selection of goods used. This paper evaluates the effect of these factors.

In his *Evolution* Kafengauz introduces a significant amount of information on the value of production of Russian industrial output in current prices. These data may be deflated into constant prices on the basis of the research on price levels, carried out after the appearance of works by Nutter and Goldsmith.

Deflating the value of industrial output for Russia is a complex task, requiring a more detailed study of Russian industrial prices. As our calculations show the deflated series for gross value gives the same rate of growth as the expanded Goldsmith series (more than 6% per annum), which fits within the estimated range of 6-6.65%.

Industrial Growth of Russia by Comparison with Other Countries

In this paper, we draw the conclusion that the rate of growth of Russian industrial production (according to industrial censuses) was underestimated by Goldsmith. The real rate of growth on average was not 5% per annum, as Goldsmith thought, but 6-6.7%. Although the difference of 1% seems small, in actuality it is fairly substantial judging from the perspective of historical statistics.

Let us now look at the characteristics of industry in Russia as a latecomer. We now have enough information about the historical growth of industrial output, the size of the work force and the productivity of labor in the period of industrialization for most countries, so that we can look at Russian industrialization in comparative perspective.

Figure 1 show the effect of increasing the rate of industrial growth from 5 to 6.65%. If we take as our starting point the original estimates of Goldsmith, then in its rate of growth and the growth of productivity of labor in Russia for the last 25 years before World War I is comparable with that of the main rapidly growing industrial countries. In Russia, the increase in the number of workers in industry was more significant than in Germany and Britain, and compared to the growth of numbers of employed persons in the US. If we take the highest estimate by Kafengauz, it appears that Russian industrial growth was much faster than economic growth in the leading industrial countries (for comparisons see Fig. 2).

However this conclusion has evoked a polemic among Russian economic historians in recent years. Thus, Iu. P. Bokarev observes in this connection that “the motives of a number of researchers, who aspire to increase the rate of industrial growth in pre-revolutionary Russia, are entirely clear. It is very flattering to think that had there been no

revolution in 1917, the unusually strong economic growth of Russia would have allowed her in the near future to eliminate economic backwardness”.¹

S. V. Il'in observed not long ago “the enormous backwardness of the Russian empire from the leading countries of the West”. The strong conclusion of the author merits quotation in full:

Earlier, the corresponding figures were introduced in textbooks for middle and higher institutions of learning. Now, understandably, these works are quiet. I note, that in 1913, in Russia, industrial production was 14.5 times less than in the US, 5.9 times less than in Germany and 4.5 times less than in England. On a per capita basis, Russian output lagged behind that of the US by 21.4 times, Germany by 13 times, and England by 14 times. And the slowing rate of industrial growth at the beginning of the last century in such conditions of backwardness was, in my view, a worrisome matter. In the Soviet era, the colossal industrial and cultural gap between our country and countries of the West was on the whole closed, which was a great achievement of our people, and, above all, that part of the people that was organized in the party.²

However, one of the most distinguished Russian economic historians, V. I. Bovykin, who edited the section on industry of Russia for the handbook *Rossia. 1913 god* presents well founded data about the share of Russia, the US, Britain, Germany and France in world industrial production at the end of the nineteenth and beginning of the 20th century. He shows that Russia's share was 3.4% in 1881-1885, 5% in 1896-1900, and 5.3% in 1913.³ His data (see Table 8 in that publication) allow us to correct the meaning of the very indicators that S. V. Il'in uses: Russia in 1913 produced industrial production 6.75 times less than the US, 2.96 times less than Germany and 2.64 times less than Britain. Yes,

¹ Bokarev, Iu. P. “Eshche raz o tempakh rosta promyshlennogo proizvodstva v Rossii v kontse XIX – nachale XX veka”, *Otechestvennaia istoriia* (2006), 1: 140.

² Uk;ubm S, V, “Promyshlennoe razvitie Rossii ot kontsa XIX v. do nachala stalinskogo ‘Velikogo pereloma’, *Konferentsii, diskussii, materialy 2004: Sbornik nauchnykh trudov kafedry istorii Rossii RUDN*, Moscow: Izd-vo RUDN, 2004, p. 135.

³ *Rossia. 1913 g. Statistiko-dokumental'nyi spravocnik*, ed. A. P. Korelin (St Petersburg, 1005), p. 51.

Russia, of course, was visibly more backward than the three leading states. But, as we have seen, this backwardness is half as much as suggested by S. V. Il'in. In another publication of V. I. Bovykin, showing indicators of comparative industrial development of leading world powers, he noted that Russia's relative backwardness by comparison with Britain shrank from 1885-1913 by a third, and with Germany (and the US, which is easily calculated by data from the cited work) by a fourth.⁴

The tradition of understating the estimate of pre-revolutionary Russia's economic potential is not new. V. I. Bovykin attributed it to the 1930s, when there appeared the "notorious thesis of Stalin about semi-colonial dependency of Russia" by which "in all new books indicators of gross industrial production of the country were substantially decreased along with its share in world industrial production. These indicators are still widely used in historical literature. From those times, when characterizing the Russian economy, the accent fell on the technical-economic backwardness of the country and its dependence on foreign capital".⁵ Discussing the "myth about hopeless backwardness of pre-revolutionary Russia, necessitating its path to socialism",⁶ V. I. Bovykin observed that "for our contemporaries, whose historical views were formed under the effect of this myth, it is difficult, understandably, that Russia at the end of the nineteenth and beginning of the twentieth century was one of the most dynamically developing states of the world."⁷

Further examination of the estimates of the rate of growth of Russian industry in the period of first industrialization requires a larger number of series, reflecting the volume of production in different branches.

⁴Bovykin, V. I. *Predislovie k knige: Rossia i mirovoi biznes: dela I sud'by* (Moscow 1996), p. 7.

⁵ Ibid, p 3.

⁶ Ibid, p. 4.

⁷ Ibid.

Table 1.
Alternative Indexes of Russia's Industrial Production

Years	Kafengauz Index	Goldsmith Index	Extended Kafengauz Index	Extended Goldsmith Index
1887	100	100	100	100
1888	110,8	95,3	111,5	101,5
1889	121,4	104,7	122,9	110,7
1890	122,4	112,4	122,5	116,2
1891	131,1	118,4	129,4	120,6
1892	139,7	123,5	138,5	128,5
1893	156,2	140,4	157,4	147,5
1894	167,1	140,4	165,2	147,8
1895	179,3	156,1	176,4	163,1
1896	197,7	161,6	207,3	185,3
1897	216,6	172,5	231,2	204,3
1898	234,3	189,6	251,9	226,5
1899	271,7	211,3	282,3	247
1900	301,5	221,7	303,4	254,4
1901	302,8	228,6	311,4	268,5
1902	301,4	230,2	305,8	267
1903	314,7	236,1	322,3	280,7
1904	339,2	242,8	347	289,5
1905	328	217,7	343	274,4
1906	344,2	247,7	352,2	293,4
1907	375,1	259,2	375,2	303,4
1908	376,9	265	377,5	310,6
1909	388,6	271,6	390,3	321,8
1910	402,3	313,5	412,4	365,4
1911	448,5	331,9	458,2	393,1
1912	448,1	339,7	492,4	407,8
1913	535,4	362,7	551,1	455,9

Fig. 1. Alternative Indexes of Russia's Industrial Production (1887-1913).

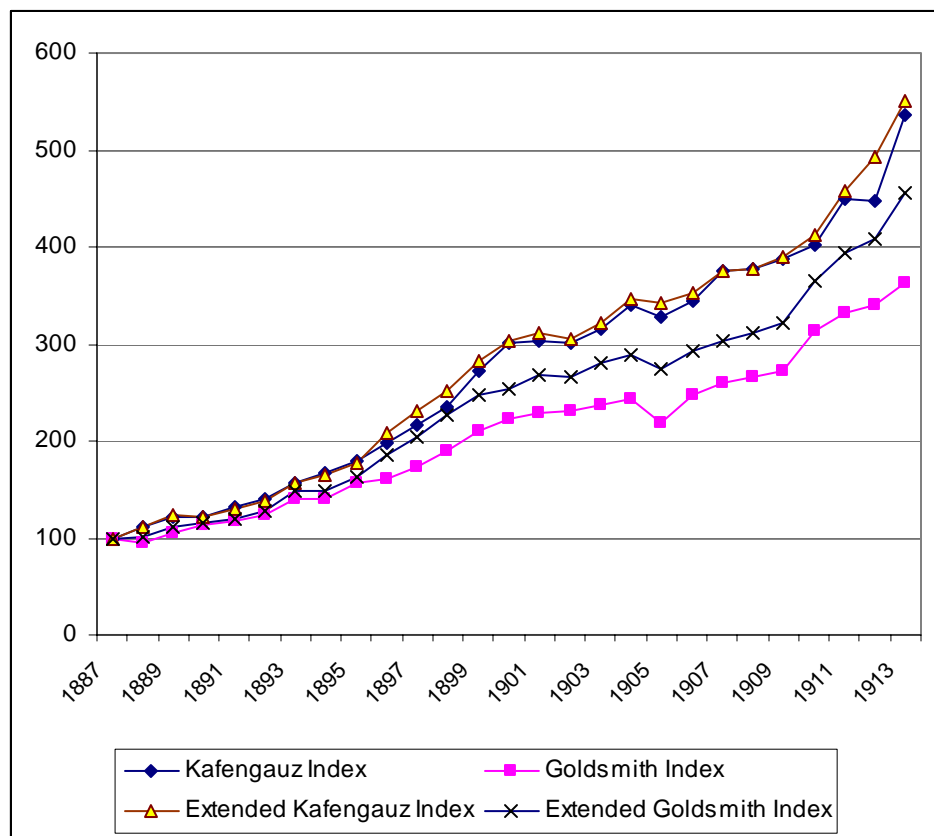


Fig.2. Industrial growth Rates: International Comparisons (1887-1913)