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THE DEVELOPMENT OF THE IRON RELATED INDUSTRIES IN THE SECOND HALF OF THE 19TH CENTURY

—The Significance of the Industries' "Structural change" in the Establishment of Russian Capitalism—

SHŌICHI TOMIOKA

I. INTRODUCTION

According to studies of Russian economic history, Russian capitalism developed remarkably in the second half of the 19th century. This remarkable progress was brought about by the development of the heavy industry, mainly the iron industry and the machine and apparatus manufacturing industry[1].

But in a step further from that general view, you will find that many students' opinions differ. I would like to examine some students and their opinions about the history of the iron industry and the machine and apparatus manufacturing industry.

The first is S. G. Strumilin. His research work covers the development of the Russian iron industry from the 17th century to the middle of the 20th century[2]. He devotes himself to the study of productivity with the growth of the iron industry from 1861 to 1917, in what he calls a capitalistic age. His study is how new iron producing techniques were adopted, steam engines and other machines diffused and labor productivity rose. This process is in connection with the fluctuation in quantity of produced iron and pig iron[3]. And this fluctuation is affected by the periodic crises of the capitalistic world.

Meanwhile, he took little account of the qualitative meaning of quantitative development —the position and character of the iron industry in the whole development of Russian capitalism. You will see that this defect comes from his point of view on "the industrial reformation"[4] in Russia.

He regards "the industrial reformation" as two processes; the shift from manufacture to factory and the transformation of forced labor into free labor. In his opinion this "industrial reformation" was achieved chiefly between 1830 and 1860 in Russia[5]. As a reason he points out that this period's light industry such as the cotton industry advanced these two processes and the industry's productivity rapidly increased[6]. Furthermore, he insists that the advance of "the industrial reformation" affected the iron industry, particularly in techniques[7]. Namely, in the 1850s the iron industry experienced the adoption of steam engines and puddling furnaces and the rise in pro-

ductivity of blast furnaces[9]. But the development of the iron industry was slower than light industry. That was because the forced labor system still occupied a very important position in the iron industry.

In his opinion the 1861's abolition of serfdom meaned that the forced labor system was finally abolished and factories won the superiority to manufactures. Judging from this, the abolition of serfdom cannot be regarded as a premise of the development of the great mechanized industry, but as the last one necessary for its establishment.

It is evident to him that capitalism covered the industry all over after the emancipation of serfs. So his concern is the influence of periodic crises and technical progress in the capitalistic industry.

He takes little account of the role of government, railway construction, foreign capital and, what is more, of the significance of the iron industry in the development of the whole Russian capitalism.

It is V. K. Iatsunsky who criticized Strumilin. He criticizes that Strumilin overestimated the industrial development in 1830 to 1860[10]. According to Iatsunsky, even though the "industrial reformation" began in the 1820s, it was in the 1880s that "the reformation" completed. But he thinks that before the 1860s "the industrial reformation" developed **decisively**[12]. It is suggestive that he should point out active large-scale trade in iron products[13] as well as the development of the mechanized large-scale cotton and sugar industries at this time.

These two students make the same mistake that the great mechanized industry developed "almost spontaneously" before the abolition of serfdom. This mistake results from their attempt to apply the English Industrial Revolution directly to Russia. This sort of attempt has been already criticized partially in both the U. S. S. R.[14] and Japan[15]. After all, when you try to understand the Russian capitalism, you should not take "the industrial reformation" only through the development of the mechanized production at **each** industrial department.

However we can't miss the fact that the great mechanized industry, mainly in the light industrial department, evolved "almost spontaneously", to some extent, in the first half of the 19th century and even in the second half of the century.

It is Haruki Wada who is in contrast both Strumilin and Iatsunsky. He pays attention to "the great reform" including the serf relief "from the top" (by the government). And he attaches importance to the evolvement of the great mechanized industry in the heavy industrial department and to the role of government of the Russian capitalism in the second half of the 19th century.

According to him, it was characteristic of Russian capitalism in its devel-

oping process that railway construction developed heavy industry, with the strong support of the government, relying on imported productive means and capital[16]. This manner of development was kept unchanged all through the latter half of the 19th century.

On the other hand, he points out that Russian capitalism was established in the 1880s. The following are the reasons; ① as a result of the mechanization of the cotton and the sugar industry, self-support of those products was achieved. ② the industry related to railway construction was established, but the inactive railway construction afterwards caused to transfer to the production of other kinds of machines and of iron and steel goods. ③ there were prospects of real development of south Russian heavy industry[17].

His points are very suggestive in a study of the establishment of the Russian capitalism. Unfortunately he doesn't make the best use of his own points. He fails to take account particularly of the first and the second point.

Namely he underestimates the development of the light industry that had no relation to railway construction and government's support[19]. In his opinion the railway related industry played the same role in the 1890's (even after the establishment of capitalism) as it played in the industrial development from the 1860's to the 1870's. He makes no note of the transfer of manufacture of engine, rolling stock and rail to different kinds machines and to iron and steel in the 1880s[18]. He puts stress only the industries that were subject to the government policy of encouragement and were directly related to the railway construction. In my opinion it would be natural to think that the role of government and railway construction changed before and after the 1880's.

The excessive stress on government and railway construction emphasises only the rail production in the South Russian iron and steel industry. As a result, we are to make an impetuous judgement of foreign capital related to Russian capitalism because foreign capital occupied a large percentage of rail production.

Before the October Revolution, there had been a study explaining the development of the iron industry in the second half of the 19th century from the government and rail-way construction aspect. The typical example is a mining engineer, I. Glivits[20]. Many of the statistical data quoted in his study are so precious that are still helpful for studying the Russian iron industry. But his analysis amounts to no more than the developing process of the iron industry, the iron ore mining industry and the coal industry under the support of government and the demand of the railway. He doesn't grasp the importance of the iron industry as a link in the reproductive structure of Russian capitalism.

In this paper, I have no intention to take up the role of foreign capital in the Russian iron and steel industry. But I refer to it a little because it was a very important problem—not only to the iron and steel industry but to the whole of Russian capitalism.

G. D. Bakulev, author of "the South Russian Iron Industry"[21], pays attention to the South iron and steel industry which led the development of Russian capitalism. He insists that the South iron and steel industry's development was dependent on both the railway's demands and foreign capital's rapid inflow. Next he attempts to prove Stalin's theory, "the Half Colonial Subordination". Stalin states as follows; in Russia, pre-World War I, main industrial departments were under the control of foreign capital—especially that of France, Belgium, and England. Besides, a large amount of public loans from foreign countries helped Russian to become a half colony of England and France[22]. Bakuev's opinion presents an example that too much emphasis on government policy and railway construction causes an one-sided understanding of foreign capital related to Russian capitalism[23].

Some European and American students point out that Russia was independent both politically and economically in spite of the introduction of foreign capital. A. Burstein and J. P. Mckay are representatives of those European and American students. Burstein studies the Russian iron and steel industry, following mainly Glivits[24]. McKay investigates the documents preserved in French banks and makes an interesting study of the French and Belgian capital investment to the South Russian mining and metallurgical industry mainly in the middle of the 1880s to the 1890s[25].

Especially McKay points out that foreign enterprises' great contribution to Russian economical growth was their production techniques. But too much emphasis on foreign enterprises' original activities causes one to underestimate the government's role[26]. However, it is understandable that he should recognize the role of private demand except for the National Treasury and the railway, especially the demand for the development of private mechanical production and city construction in national economy. This is similar to Burstein's case. This should be understood in order to grasp the manner of development of various industries related to iron in relation to the Russian capitalistic reproductive structure.

Russian various industries related to iron include iron, machines and apparatus manufacturing, and the other iron processing industry, which all have developed mutually. So far, studies that picked one of them alone underestimates their mutual relation. This is one of the reasons why above mentioned students could not understand the various industries related to iron in relation to the whole Russian capitalism and because of this assessed one-sidely the role of government and railway construction.

In my analysis I will take various industries related to iron as "iron related industries (iron producing and processing industries)", putting them together. Finally let me add that the labor problem and the demands of the military be excluded in this analysis[27].

From the above investigation, let's do some research on iron related industries.

II. THE IMPLANTATION OF THE MODERN IRON RELATED INDUSTRIES — FROM THE 1860s TO THE 1870s —

In Russia, from 1860s to the 1870s, on one hand the implantation of heavy was carried out mainly by the initiative of government, on the other, the mechanization of light industry, which had been proceeding gradually in the first half of the 19th century, developed rapidly. Under these circumstances, the modern[1] iron related industries began to develop with the help of government. This sustained the growth of the railway related industry, engine, rolling stock and rail producing industry.

Because of the defeat in the Crimea War, Russian productivity was proved to be extremely low compared with Western capitalistic countries[2]. It also caused the crisis in the old order. To break the unproductivity, Tsarism enforced "the great reform"[3]. One of the main purposes of its "reform" was to bring up this low productivity. The government's first attempt was to encourage the railway construction by giving it financial support. The second was to upgrade the railway related industry.

The necessary capital was furnished by monetary and financial reforms, "the redemption operation" of the serf relief, and the float of foreign debts. The serf relief produced a large number of wage workers. The customs reform that lowered the tax rates of industrial raw materials and finished goods made it possible to import railway related materials, pig iron and iron necessary for their domestic production[4]. So "the great reform" meant the nation-wide primitive accumulation of capital[5]. "The reform" was not a mere symbol of the final transfer from forced to free labor.

1. *The Railway Construction*

The government announced a railway construction ordinance in 1857 which encouraged railway construction to become the link of "the great reform". The imperial ordinance stimulated the construction of private railways by introducing entrepreneurs, techniques, equipment from foreign countries[6]. This was because government capital was not engough to pay all the financial costs of railway construction and administration[7]. Besides private railways would make the best use of foreign techniques and capital.

A typical example was the Liazan-Kozrov Railway (opened in 1866),

the originater of which was Mr. Dervits, an intimate friend of Finance Minister Leitern's. He succeeded in issuing a bond in the Berlin financial market after winning railway construction concessions[8]. That government guaranteed 5% profit (annually) helped railway construction and administration to make a good start. The railway related materials, rail, engine and rolling stock, were mostly supplied by import from foreign countries like England[9]. The success of Liazan-Kozrov really stimulated other private railway construction. The example of the Liazan-Kozrov railway illustrates that in spite of being in the form of a stock company, a railway company could be formed and managed only after government support[10], which consisted of giving concessions, guaranteeing interest payments and dividends[11], underwriting stocks and bonds, and loaning funds[12]. The investment of foreign capital was not enough.

From the second half of the 1860s to the 1870s, the railway construction made marked progress as shown in the table 11 attached to the finis.

What did the railway construction of that time mean to Russian economy? In considering several factors, neither a military nor a political factor were as influencial an economical one. For instance, most of the railway lines linked the agricultural areas with harbors on the Baltic Sea and the Black Sea. They also connected each industrial area, centering around Moscow[13]. The most remarkable example was the construction of railways for the transportation and the exportation of grain[14]. Almost all the railway construction of these days answered the requests for development of Russian capitalism. In the 1860's to the 1870's economic development was supported by export of grain. This development is also shown by the rapid increase of grain transported in relation to all railway goods 27% in 1810 and up to 42% in 1875[15] with the continuous rise of grain exported there the late 1870s (see table 18).

In this way, Russian farm villages were firmly tied with the world market by railways[16]. You can see that there was a gradual increase in the number of workers and the quantity of industrial products, which were transported by railway. But the railway network was not developed enough to integrate the European area of Russia into one national economy, yet. We have to wait until the 1880s to see that established.

Thus the rapid progress of railway construction brought about a large demand for railway materials which were met mainly by import at first. Then domestic production of railway materials began to develop gradually under a government's implantation policy.

2. *The Implantation of the Railway related Industry*

In 1866, about ten years after the issue of the railway construction

imperial ordinance, another imperial ordinance was issued. The imperial ordinance this time encouraged construction of rail rolling factories. In the same year, the government issued still more imperial ordinances one after another, which were to pay a premium for rail domestic production, to permit National Treasury to order only a domestic manufacturer, and so on. Finally the government issued an imperial ordinance to pay premiums for domestic steam locomotive production. Let me quote a few lines from Finance Minister, Leitern's statement to Emperor which gives the background reasons for the issue of those imperial ordinances.

"To develop the domestic production of rail and some other mining products is one of the vital conditions to prosper financially and economically in future. I will say from an financial point of view, because gradual, but as urgent as possible, development of producing rail, cannon and armor etc. will lighten the heavy load of external debt, which now lower our exchange rate and Russian credit"[17]. This is the reason the government encouraged strongly the implantation and development of the mining and the metallurgical industries, mainly railway related industry.

1) Rail Rolling

It was the New Russia Company established by an Englishman, John Hughes that was the first rail rolling factory in South Russia. The company set up an enterprise in 1869. On that occasion it made a contact with the government to roll 1.5 million poods rail annually, and got a government loan at the amount of 0.5 million rubles for 37 years and took State land free[18].

Outside of South Russian, Putilov company's factory (managed by Russian capital) in St. Petersburg succeeded to increase production of rail rolling from the 1860s to 1870s. This success was from preferential treasury orders and a National Bank loan[19].

Up to 1874, Putilov's factory could change the production of rought iron rail to steel rail. Similarly Briansk Ironworks Company (Russian capital) in the Orel Province began to roll rail in 1874[20], and Demidov's factory of Ural, in 1875.

In 1877, the factory of the Huta-Bankova Steel Company was established in tsarist Poland to produce mainly rail. This company, which was managed by French capital, was a model of the early trials of foreign capital[21].

At the end of the 1870s, eight huge rail rolling factories were operating; in addition to the above mentioned five factories, there were Warsaw Steel Company's factory (German capital), the factory of Alexandrovskii Company at St. Petersburg (French capital), and Belsel' skii's factory in Ural (Russian capital).

The Putilov's and Briansk's factory exceeded any other factories in the annual output of more than 3 million poods[22]. It can be said from this that the central force of a rail rolling was not foreign capital but Russian capital. As to the geographical distribution of rail rolling factories, they were not always gathered mainly in South Russia. They were established here and there, in the North (centering around St. Petersburg), the center (around Moscow), Ural, tsarist Poland and so on. The big difference from the 1890s is the above two points.

They (except a few) produced other steel products and machine apparatus as well as rail. That is one of the reasons the factories could change production from rail to any other manufacturing without difficulties as production of rail decreased little by little.

In the late 1870s, with the establishment of huge factories, rail domestic production increased rapidly and at last it exceeded imports as shown in the table 13. Namely, rail production self-sufficiency had been achieved. Hence, we can see the establishment of the rail rolling industry. As far as this is concerned, government's implantating and development policy seemed to have succeeded. But the import of rail materials like steel and pig iron were increased rapidly[23] at the same time as the establishment of the rail rolling industry (table 1).

2) An Engine and Rolling Stock Manufacture

In this industry as well as the rail rolling industry, the government's implantation and development policy was adopted[24].

In the 1860s, only the factory of Alexandrovskii at St. Petersburg produced engines, while up to the 1870s four factories produced engines. They were Kolomna (in Moscow), Nevskii (in St. Petersburg), Mal'tsev (in the Orel province), and finally Kama-Votkinsk factory (in ural). Both Kolomna's and Nevskii's factory were managed by Russian capital and produced the overwhelming large amount of engines compared with the others[25].

As to wagon manufacture, seven factories produced wagons at the end of the 1870s. Kolomna's and Solmovo's factory (in Nizhni Novgorod) of the seven were a little superior to the others in the amount of production[26].

What can be concluded from the above is that Russian capital occupied a very important position in engine and rolling stock manufacturing industries, too. In addition, they were gathered at either the North or the Central part of European Russia. The above-mentioned characteristics were different from rail and stayed fundamentally the same in the 1890s.

As you see, domestic production of engines and rolling stock increased. Above all the remarkable increase was in the second half of the 1870s (see table 11). Import of engines and the rolling stock decreased with growth

of domestic production (table 12). Consequently domestic production of engines supplied about three forths or four fifths of all the engines consumed, and similar, about five sixths of rolling stock from the end of the 1870s to the early 1880s[27].

From that it can be said engine and rolling stock manufacturing was established along with the establishment of huge factories. The establishing period was at the end of the 1870s, which is the same time as the rail rolling industry. The establishment of the engine and rolling stock manufacturing industry brought about the potential possibility of producing machines and apparatus for several industries. But iron materials and machine tools for engines and rolling stock manufacture largely relied on imports (see tables 1, 9).

By the late 1870s' railway related industry prepared the foundation of the modern Russian iron related industries. In this sense, the government's program seems to have succeeded. But modern iron related industries of this period largely went along with railway demand. The industries were restricted to only a few huge factories. The industries were restricted to only a few huge factories. Besides, they could not exist without the government's strong protective policy and import of productive means. Here was the problem of the modern iron related industries.

In this time, especially from the second half of the 1860s to the latter half of the 1870s, the development of light industry was a remarkable one, too (see table 17). But the modern iron related industries had no direct relationship with the light industry—the relationship pertaining to marketing of iron goods. And it had no close relationship with the Urals' iron industry, which is proved by the fact that some iron goods manufacturing factories in Ural didn't show remarkable increase in the output of pig iron, iron and steel goods from the 1860s to the 1870s (see table 2, 3). In short, at this time in Russia, the close and organic market-like relation between the light and the heavy industries had not been formulated yet. The domestic market could not have developed systematically. This is the reason that the import of productive means was necessary for the capitalistic industry to develop in the country. The export of grain made it possible to import productive means. This is because government had to take the free-trade-like tariff policy, going into a "red-ink" balance of payments.

III. THE IRON RELATED INDUSTRIES' STRUCTUAL CHANGES — IN THE 1880S —

In the 1880s, the iron related industries were forced to change this manner of development. Because the many contradictions in development that the iron related industries had been involved in between the 1860s and

1870s, were recognized. The change was not a tentative one but a fundamental one. It did however adjust the whole structure of the Russian iron related industries.

The reason the iron related industries succeeded in the structual change is that the change responsed to the following two situations. One was the establishment of the great mechanized light industry including the cotton and the suggar refining industry in the 1880s. And also some of the heavy industries began to develop rapidly. The other reason was the rough formation of a railway network and various commerce organizations that enlarged a domestic market. In the 1880s a national economy based on the iron related industries was formulated, which suggests that Russian capitalism was established.

1. *The Changing of Industrial Policies*

There was a certain limit to the iron related industries' development process from the 1860s to the 1870s. This was from the way of the government's industrial development policy. The limit derived from the fact that the iron related industries were dependent on the support of government, railway construction and importing productive methods.

The National Finance showed a loss due to supplying too much capital to railway construction and railway related industries. Also a large quantity of imported pig iron, steel, and machine tools made the balance of payments adverse. Things got even more serious from the end of the 1970s to the beginning of the 1880s when the railway related industry had been fully established[1]. Therefore, government had to change the railway construction policy and the free-trade-like tariff policy.

At that time the government took warning from the fact that the construction policy concerned with private railways didn't complete a national railway network. Because of this they become very worried over the loss of government capital. The government changed its policy, and strengthened the regulations of private railways and nationalized already-made private railways[2]. As a result, constructed railways were shortened a great deal from 1300 kilometers in 1878 to about 300 kilometers in 1879[3], and continued to be shortened all through the 1880s[4] (see table 11). From the railway nationalization policy starting from 1881, the national railroad began from only 60 kilometers in 1880 to about 7700 kilometers in 1890, which was one fourth of all the railways[5].

At the same time, the government began to restrict the number of factories that could accept an rail order as rail demand decreased. This was to develop domestic production of pig iron. In the early 1880s import of pig iron was rapidly increased. At this time there were only three fac-

tories out of all of the huge factories that produced pig iron from the 1860s to the 1870s. They were the New Russian Company's, Demidov's, and Belosel' skii's factory[6]. No factories except the three received government orders of rail. It was the same for an engines. The government stopped issuing National Treasury orders in 1884[7]. The National Treasury orders were no longer important to promote the development of the iron related industries.

It is not until the 1877's adoption of the gold tax policy that the tax policy changed from free to protective trade. The protective tax policy really developed in the 1880s. The government abolished the then duty-free import of pig iron and steel necessary for machine apparatus manufacture. Instead the tax rates of machines as well as other tax rates rose up[8]. But the import tax rates of iron and steel goods were not raised proportionally. The rising ratio of machine apparatus still remained relatively small as compared with the remarkable rise of import taxes of pig iron and steel[9]. Above all, taxes on high-class precision industrial machines and agricultural machinery were not high enough to protect domestic production[10].

This sort of disproportional tax policy came from not only the underdeveloped domestic production of high-class precision machines, but also the position of Russian capitalism in the capitalistic world. Russian capitalism developed by export of agricultural products and import of labor means and capital[11]. Russian exported agricultural products mainly to Germany and England, whose important export products to Russia were machine tolls, textile machines and high-class complicated agricultural machines. Therefore, there was a limit in the government's tax policy to prevent trade with these countries[12]. And in order to export agricultural products smoothly, it was necessary to improve agricultural productivity all the same. The best way to improve agricultural productivity was import of high-class complicated agricultural machines. The landownership characteristics of Russia strengthened such reflections of agricultural interests on the tax policy. In this way, the import tax rate of high-class precision machines was settled comparatively low.

But in spite of disproportional tax rates, the rise of tax rates on iron and steel goods was a great way to reduce imports. Imports of pig iron decreased rapidly in the latter half of the 1880s. Steel products and industrial machines, in the 1880s, and also of agricultural machines, in the latter 1880s. The decreasing tendency was not temporary, but continued up to at least the early 1890s (see tables 1, 8, 10). The protective tax policy played a very important role in protecting and upbringing the domestic iron related industries. Therefore this disproportional tax policy can be regarded as causing the disproportional development of the iron related industries— the corpulence of the iron and steel industry and the weakness of high-class precision ma-

chines industry.

The change in the 1880's railway and tax policy indicates that the government's industrialization policy of that time changes from direct financial support to a protective tax policy along with the introduction of foreign capital. As for the iron related industries, the protectivenss and development policy changed from the railway related industry to the iron and steel industry.

2. *The Change in the Railway related Industry*

The change in the railway policy reduced rapidly the demand of railway materials[13], which led to the reduction of the largely domestic production of railway materials from the first half to the latter half of the 1880s (see table 11).

Meanwhile, five large factories[14] which failed to receive National Treasury order of rails formed a monopolistic organization to maintain rail producing. ("Rail Manufacturers' League" in 1882). The purpose of the organization was to collect rail orders from private railways and divide them among member factories according to a certain ratio[15]. Afterwards in the railway related industry, monopolistic organizations were formulated one after another.

For instance, "The Bridge Manufacturers' Agreement (in 1884 to 1892)", "The Rail Fastening Manufacturers' League (In 1884 to 1892)", and so on. Member factories were restricted to a few large ones including above mentioned five large ones, so some factories affiliated with many organizations[16].

The organizations were legally a cartel, but actually shifting form from a cartel to a syndicate[17]. They were sometimes regarded as a sprout form in considering them in connection with the iron and steel syndicates, "Prodameta" which was established in the 20th century[18]. But it would be much more appropriate to regard them as a contemporary depression countermeasure of the railway related industry. The government encouraged them to form the organizations so they could counter depression, too[19]. They failed to accomplish their purpose sufficiently, and simultaneously with the 1890's boom they mostly dissolved.

The "Rail Manufacturers' League" dissolved in 1887 when the fixed term of agreement passed. This was because two member factories, Briansk Company and Warsaw Steel Company reduced these rail rolling and transfered to the production of pig iron and steel.

Briansk Company, which had already reduced production of rail[20] and instead began to produce "general machines and apparatus", established Aleksandrovsk factory in South Russia for the purpose of self-support of pig iron[21]. The Warsaw Company liquidated rail rolling production in Poland and started to construct a pig iron and steel factory in 1886 in South Russia[22].

This factory was absorbed by a Belgian iron company. (John Cockerill Company) and began to work out as the central factory of the newly established South Russian Dnieper Metallurgical Company in 1889. This Company's establishment gave a model for foreign-capital investment in Russian heavy industry[23].

The attempt to form monopolistic organizations among huge rail rolling factories was in vain, and instead these factories succeeded in transfering the production of rail to pig iron and other steel goods.

Engines and the rolling stock also decreased to manufacture rapidly from the first half to the latter half of the 1880s. The decreasing trend became remarkable especially after 1884 when the government stopped the National Treasury orders of engines. From 1885 to 1890, it was only the Kolomna's factory in Russia that continued to produce engines[24]. Most of the once engine producing factories transfered to "general machines and apparatus"[25] producing factories. For instance, Mal'tsev's factory attempted to produce agricultural machinery[26], and after 1884 Kolomna's factory started to manufacture steamships, locomotives, and agricultural machines[27].

Only the railway-related industry did not increase in production of pig iron, steel products, "general machines and apparatus".

3. *The Iron-related Industries' "Structural Change"*

Russian gross production of pig iron in the late 1880s showed an increase of 1.4 from the early 1880s' (see table 1). The same thing happened not only in the South, but also in the "belated" Ural district (which produced about 60% of all pig iron products. See table 2). In the Ural district the number of small-scale factories was overwhelming large, and the rail production ratio was always small. Contributing to the increasing production of the Ural district was the railway that connected the Ural district with the central part of Russia[28]. Thus Ural iron industry was closely tied into the reproductive structure of Russian capitalism[29]. As compared with decreasing rail production, production of steel products such as steel bar, shape, plate and sheet increased remarkably in the whole of Russia (see tables 4, 5, 6).

Production of steel products increased enough to compensate for decreasing rail production. This was proved by the fact that the 1880s' production rate of iron and steel goods maintained that of the 1870s' (see table 3). The production rate of steel products increased from 62.7% in the early 1880s to 66.8% of all iron and steel goods in the late 1880s. (While that of rail products decreased from 22.3% to 16.1%)

Steel bar production became large-scale in the latter half of the 1880s (see table 7). Thus the situation that held from the 1860s to the 1870s,

i. e. nearly all the large-scale factories were engaged in rail rolling[30], began to break down.

What were these steel products, whose production was so rapidly increasing? Steel bar was necessary for construction of a building and for manufacture of machinery and apparatus, as was plate and sheet, with the exception that latter was also employed in the petroleum industry[31]. Shape was used for construction of buildings and iron structures. Considering the 1880s' establishment of the mechanized large-scale light industry and the beginning of the rapid development of some heavy industry, the foundation of the iron-related industries had changed a great deal in the 1880s.

The transfer from wrought iron to steel went smoothly in the 1880s, and finally the production ratio of wrought iron to steel reached 1 : 1 in the 1890s[32]. Some Southern factories with the newest techniques and equipment began to produce pig iron and steel constantly, owing to the investment of foreign capital.

In short, production of pig iron, iron and steel goods increased on a nation-wide scale in the 1880s. The rail production rate in all iron and steel decreased rapidly, while that of steel products increased. South Russia began to develop as a new iron and steel industrial zone with technical progress[33]. If many industries had not adopted the large-scale mechanization system, the south Russia would not have achieved this development. It would also indicate that iron and steel industry had begun to develope in Russia, closely related to national economy. A typical example was a huge rail rolling factory's transfer to a pig iron and steel products-producing factory. The first element of "a structual change" in the iron-related industries is expressed by a real development of the iron and steel industry.

In machine and apparatus manufacturing, the situation changed much as it had in the iron industry. Increasing production of "general machines and apparatus" was not seen only in the railway related industry. First of all, in the early 1880s, the production trend of all machinery and apparatus, including engine and rolling stock, fell down a little, but later it returned to the high standard of the 1870's, in spite of the rapidly decreasing manufacture of an engine and the rolling stock (see tables 8, 11). It was because the production of "general machinery and apparatus" increased enough to supply the decreasing production of an engine and the rolling stock. It was a large change, considering the high position of an engine and the rolling stock in all machinery and apparatus manufacture from the 1860s to the 1870s.

Then, what is meant by "general machinery and apparatus" here? According to the third edition (1894) of "A Factory Guide-book"[34], they were a boiler, a steam engine, farm machines and implements, industrial machinery (lift, sugar manufacturing apparatus, mill, fermentation & brewing plants).

Above all, all kinds of motors (including a steam engine) increased in production rather remarkably in the 1880s[35], and they were not always inferior to foreign products in quality[36]. What we also notice is the increased production of boilers, farm machines and implements, mining pumps, and pumps for oil industry[37].

Next, lets look at the chronological table of the metal-processing industries (iron related industries excluding the iron and steel industry). According to the third edition of "A Factory Guide-book", a lot of machinery and apparatus-manufacturing factories were established in the 1880s and more than 60% of all the newly established factories were ones producing farm machines and implements, industrial machinery, and boilers. Most of them were comparatively small-scale factories with less than one hundred laborers[38]. Though small-scale, they had either more than 16 laborers or steam engines[39].

The above-mentioned is the result of the increasing production of "general machinery and apparatus" in the 1880s, not only in the large factories which had produced engines and rolling stocks before, but also in many new small-scale factories. Now we can see the formation of "general machinery and apparatus" manufacturing as a second element of the iron-related industries' structual change". But it should be noticed that Russian iron-related industries were too underdeveloped to manufacture machine tools, textile machines, or high-quality complex agricultural machinery[40].

The 1880s' consumption of machines and apparatus was low compared to that of the late 1870s' (see table 8). The output of machinery and apparatus remained at almost the same level all through the 1880s, while import declined. This is partly because engine and rolling stock rapidly decreased in both production and import, and partly because "general machinery and apparatus" increased in production and decreased in import (see tables 1, 9, 11, 12). Speaking of the entire 1880s' period, we must note that domestic products began to take the place of foreign ones, beginning with the simple ones under the government's tax policy. Export of machines and apparatus and also of pig iron and iron and steel goods was so small that we can disregard it.

Concerning the railway related industry established from the end of the 1870s to the beginning of the 1880s, the rail rolling department was absorbed in to iron and steel industry, such as South Russian iron and steel industry, while the engine and rolling stock department was left in the form of an industry. The reason for this is, first of all, that a few huge factories dared to continue to manufacture engines and rolling stock in spite of the promotion of the transfer to "general machinery and apparatus". And in the 1890s, some huge factories were established as ones specializing in engine and rolling stock[41]. The second reason is that they continued to produce

most of the iron materials necessary for manufacture of engine and the rolling stock all through the 1860s and 1870s, and up to the 1890s[42].

It has already been stated that "general machinery and apparatus" manufacturing occupied more than 60% metal processing factories constructed in the 1880s. Nearly 20% of those left turned out casting products, and more than 10% turned out wires. They were mostly small-scale factories with less than one hundred laborers[43].

The 1880s' iron related industries, as shown in table 15, consisted of the iron and steel industry, "general machinery and apparatus" manufacturing, engine and rolling stock manufacturing, secondary products manfacturing, and the casting industry. And the industries consisted of not only a few huge factories but also many comparatively small-scale ones. The iron related industries' development was closely connected to the Russian capitalistic reproductive structure. It was a "structural change" compared with the iron related industries of the 1860–1870s, whose activities were represented mainly by railway materials-manufacturing monopolized by a few priviledged huge factories, relying on only the National Treasury and railway demand.

The protective tax policy made this structural change possible to perform. As stated above, the tax policy was not proportioned. This uneven proportion strained the development of the iron related industries. Namely, the iron and steel industry achieved a more remarkably rapid growth than it had ever had, while the highquality precision machinery industry still remained fragile. The more the iron related industries developed, the larger the strain became. It was after the 1890s that it became obvious.

4. *The Establishment of Russian Capitalism*

The iron related industries were stimulated to transfer their structure by the remarkable development of the mechanized largescale industry.

So far the 1880s has been considered a depressed period[44]. But the Russian economy was not miserable all through the 1880s. In the 1880s there were two prosperous periods (the beginning and the second half of the 1880s) and the conditions of the crops were relatively good through the 1880s except in the year of 1885[45]. Light and some heavy industries also developed rather remarkably.

First of all, lets look at the production trend of main industrial products (see table 17). The increasing trend of cotton products fell a little in the first half of the 1880s, but increased again in the latter half of the 1880s. The coal output increased almost at the same rate as before through the 1880s. Sugar and oil product especially showed a rapid increase, the former in the first half of the 1880s, and the latter, in the second half. As to products related to iron, they were just as stated before. In the 1880s most

of main industrial products increased either at the same rate as before or at a higher rate than before. It is reasonable that the developing rate of the 1880s' Russian industry should be next to the United States in international comparison[46]. The rate, however, was below that of the 1890s.

Increasing production of sugar and oil in the 1880s grow so that the dependency on export of grain could be lessoned. (see table 18). The sugar refining industry and the oil industry grew up to be a noticeable export industry and began to play an important role in Russian capitalism. It was characteristic of Russian capitalism that the sugar refining industries were mostly managed by the aristocratic landlords.

In looking at the number of workers per industrial department, we find a trend similar to that of production (see table 20). The number of workers increased more in the 1880s in the light industrial departments the chemical, and the oil industries. The number of workers in the metal processing industry increased steadily, too.

Speaking of the establishment of new companies in the 1880s, the absolute number was in this period second only to the most prosperous period, the 1890s, although the 1880s' rate of growth was lower than of the 1870s (see Table 19). The industrial departments remarkable for establishing companies were, (except the already-mentioned metal processing industry), the textile, the paper and printing, the foodstuff manufacturing, and the chemical industries.

The cotton industry[47] seems to have completed its mechanization in the 1880s[48]. Even in the sugar industry[49], with its rapidly expanding production, steam power increased three times more than in the textile industry[50]. In the whole industry, the abvance of mechanization was proved by the fact that steam power increased three-fold (from 115 thousand h. p. at the end of the 1870s to 345 thousand h. p. at the beginning of the 1890s)[51]. At the end of the 1880s, Russia ranked as the fourth largest sugar manufacturing country[52].

Based on these developments, what can be said, is that the 1880s is not characteristic of a depressive period. The development was so remarkable that the light industrial department (including cotton and sugar manufacturing) managed to establish a capitalistic mechanized large-scale industry[53]. Similarly, heavy industry (the iron-related industries and the oil industry as well as the coal industry) started real development. In the 1880s, the relative rate of heavy industry to all industry began to increase (see Table 16)[54]. But the absolute number of light industries was still as large as ever.

The growth of demand together with the development of this sort of industrial department made the iron related industries' "structual change" possible. This means that at the same time the iron-related industries, which

supplied main labor means, came to take an important position in the reproductive structure.

In the 1880s, a railway network and a basic commerce organization were provided, which means that the fundamentals necessary to establish united domestic markets had been formed.

In the 1880s, the total distance of constructed railroad was, as stated before, not large, but the railways played an important role. Namely the railway between South[56], Ural or Baku and the center of Russia opened in the 1880s[57]. Together with the railways constructed in the 1860s and the 1870s, these railways formed a principal railway network. See the chart of "the 1890's Russian railway network"[58].

Because of new railway construction, the volume of business in regular market like Nidzegorod, a center of once popular commercial organizations, decreased after the middle of the 1880s. Instead newly established trade centers such as Khar'kov appeared. This is exemplify of the increasing

The 1890s' Russian Railway Network

amount of domestic commodity circulation[59].

It can be said that Russian capitalism was established through the formation of both the reproductive structure (centering around the iron-related industries) and the railway network (as an artery connecting domestic markets). The iron related industries' structural change follows the formation of national economy.

Through the establishment of worldwide capitalism, the development of Russian capitalism was affected. Foreign capital from France, Belgium, and England played a very important role at the beginning of the rapid development of the iron and steel and the oil industries. The investment of foreign capital in heavy industry had started in the 1880s, and up to the 1890s the inflow of foreign capital was remarkably heavy (see tables 21 and 22). The means of production, as a result, were produced sufficiently at home and import of this means, except for high quality precision machines, was no longer necessary as it had been from the 1860s to the 1870s. In order to accumulate domestic capital, the government imported capital and techniques and exported agricultural products, sugar, oil and so on. This is the way Russian capitalism developed. To use a protective tariff was appropriate to this development, which grew more remarkable in the 1890s.

IV. CONCLUSION
—THE PROSPECT FOR THE 1890s—

Russian capitalism began to really develop in the 1890s based on the establishment of the 1880s. The 1890s' boom was an extension of the 1880s.

The change in the government's assistance policy to industry can be clearly in the switch from a direct one (financial aid) to an indirect one (a tariff policy). A new tariff was released in 1891 as a completion of a protective tariff that had been gradually strengthened since the latter 1870s. However, this change in government policy certainly did not reduce the government's role in industrial development. For instance, the government's policy of introducing foreign capital (disclosed later) became widely spread.

Foreign capital investment starting from the 1880s was mainly in heavy industry under Finance Minister Witte's strong promotion (see table 21, 22). It was proved that the way to develop Russian capitalism was by means of export and import; export agricultural products, sugar, and oil and import capital and techniques.

In the 1890s, Russian industry had achieved rapid acceleration in the number of established companies, workers, and in output (see table 17, 19, and 20). Similarly heavy industrialization had made remarkable progress

(see table 16). It was the iron-related industries that led this sort of remarkable development. Pig iron, steel products, and machines and apparatus increased in production, given the rapid development of the Southern iron and steel industry (see table 1, 8). There was one thing different from development of the 1880s'. This was the rapidly increasing manufacture of railway materials owing to the revival of railroad construction (see table 11).

But this was not important enough to change the fundamental structure of the iron-related industries which had undergone "structural change" in the 1880s. The reasons are as follows:

First of all, railway materials manufacturing was restricted to a few privileged factories. The influence of increasing production of railway materials affected only these few factories and was relatively small on the iron-related industries, as a whole.

Secondly, the production of steel products, such as steel bar, shape, plate and sheet, and "general machinery and apparatus" increased steadily along with the substantially increasing production of railway materials (see the table 4, 6, 8, and 10). Noticeably the output of plate and sheet as well as of steel bar had approached that of rail by the end of the 1890s. At the end of the 1890s, transfer of manufacturing from rail to other steel products was very popular in the Southern iron factories[1]. Up to 1900 domestic production of "general machinery and apparatus" exceeded imports: production of steam engines, boilers, sugar refining, milling, brewing machines and apparatus, and agricultural machinery in particular was large (see the table 10)[2].

Thirdly, it should be noted that most of local lines were constructed in the 1890s[4] and the outlines of the railway network centering around European Russia had been constructed in the 1880s[8]. Namely, from the point of view of the domestic market's spread, the influence of railways constructed in the 1890s was not so far reaching as their huge distance.

Thus the iron related industries did not rely mainly on railway demand as they had in the 1860s and the 1870s, but rapidly developed in relation to the development of capitalistic production in both industry and agriculture by means of steel products and "general machinery and apparatus" manufacture. Namely the iron-related industries developed with the intimate connection to the reproductive structure of Russian capitalism. But in the developing process, "strain" had been spreading rapidly. The protective tariff and foreign capital that played a very important role in the 1890s' development of Russian capitalism promoted the rapid growth of, especially, the iron and steel industry. Consequently, overproduction of steel products became a very real problem. This, when accompanied by a gradual increase

of import of high-quality precision machinery whose domestic production was extremely low, became the Achilles' heel of Russian capitalism. There laid the looming economic crisis of the 1900.

THE ATTACHED TABLE 1.

PRODUCTION AND IMPORT OF PIG IRON AND IRON AND STEEL GOODS.

	Pig Iron				Iron and Steel Goods[1]			
	Production (1 million poods)	Import (1 million poods)	Import (1 million ruble)	Total (1 million poods)	Production (1 million poods)	Import (1 million poods)	Import (1 million ruble)	Total (1 million poods)
1861–65	16.9	0.3	0.3	17.2	10.6	1.3	2.1	11.9
66–70	18.7	1.5	1.1	20.2	12.7	11.2	14.2	23.9
71–75	22.5	2.6	1.6	25.1	16.3	15.6	26.9	31.9
76–80	25.0	7.8	4.9	32.8	24.3	16.7	38.4	41.0
81–85	28.7	14.6	9.7	43.3	32.7	6.4	14.5	39.1
86–90	41.5	8.4	5.0	49.9	39.1	4.6	10.6	43.7
91–95	71.7	6.8	4.6	78.5	60.1	8.5	18.5	68.6
96–1900	136.9	5.8	3.3	142.7	97.2	18.2	26.9	115.4
1901–05	165.2	1.2		166.9	138.3	4.5		142.8

Гливиц, И., Железная промышленность России. стат. прил. Спъ., 1911, стр. 7–8, 12–13, 16–17, 39
Покровский, В.И., Съорник сведении по истории и статистике внешней торговли России. Т. 1. Спб., 1902, таблицы стр. 92а, 92б, 92д, 194–195

1) Mainly steel products included wrought iron manufactured goods

THE ATTACHED TABLE 2.

PRODUCTION OF PIG IRON BY AREAS

(1 million poods)	The South	Ural	The Center	The North & The North-west	Tsalist Poland	Total[2]
1861–65	0.1[1]	12.3	2.7	0.2	1.4	16.9
66–70	0.2	13.4	3.4	0.2	1.3	18.7
71–75	0.7	16.1	3.5	0.1	1.8	22.5
76–80	1.3	17.9	3.1	0.2	2.1	25.0
81–85	2.0	20.0	3.5	0.2	2.7	28.7
86–90	7.0	24.2	4.8	0.1	5.1	41.5
91–95	22.6	31.5	7.1	0.2	9.9	71.7
96–1900	64.0	43.2	12.0	1.3	16.1	136.9
1901–05	94.7	42.8	7.3	1.3	18.8	165.2

Гливиц, И., указ. соч., 7–8.

1) An Average Rate of Four Years from 1862 to 1865
2) Included Siberia

THE ATTACHED TABLE 3.

PRODUCTION OF IRON AND STEEL GOODS BY AREAS

(1 million poods)	The South	Ural	The Center[1)]	The North[2)] & The North-west	Tsalist Poland	Total
1861–65		8.3	1.6		0.8	10.6
66–70		8.8	1.6	2.0[4)]	0.6	12.7
71–75	0.6[3)]	10.3	2.1	2.4	1.1	16.3
76–80	1.3	11.7	4.3	4.3	2.6	24.3
81–85	1.9	13.3	5.2	6.4	5.9	32.7
86–90	4.7	16.2	5.4	5.7	7.1	39.1
91–95	15.2	19.3	7.1	8.7	9.7	60.1
96–1900	37.1	24.3	11.4	11.7	14.5	97.2
1901–05	66.4	29.5	15.0	9.9	17.5	138.3

Гливиц, И., указ. соч., стр. 16–17

1) The Area Centering around Moscow

2) The Area around St. Petersburg and along the Baltic Sea

3) An Average Rate of 1973, 1974, and 1975

4) An Average Rate of 1867, 1868, 1869, and 1970

THE ATTACHED TABLE 4.

PRODUCTION OF BAR, SHAPE AND WIRE ROD BY AREA[1)]

(1 million poods)	The South	Ural	The Center	The North & The North-west	Tsalist Poland	Total
1882–85	0.6	6.9	2.5	1.9	2.7	14.5
86–90	1.2	8.0	2.4	2.7	4.2	18.2
91–95	3.6	9.9	4.8	3.7	6.4	28.4
96–1900	12.9	12.7	7.7	7.5	8.7	49.4
1901–05	31.1	12.2	10.0	7.5	12.8	73.5

Гливиц, И., указ. соч., стр. 19

1) Included wrought iron Goods. The Same as in The Attached Table 5 and 6

THE ATTACHED TABLE 5.
PRODUCTION OF RAIL BY AREAS

(1 million poods)	The South	Ural	The Center	The North & The North-west	Tsalist Poland	Total
1882–85	1.1	1.1	0.9	2.3	1.9	7.3
86–90	2.3	1.3	1.3	1.0	0.5[4]	6.3
91–95	8.5	2.2	0.7	2.1	0.5	14.0
96–1900	19.5	3.9	0.1	1.7[2]	1.8	26.8
1901–05	19.2	4.8	0.1[1]	0.06[3]	0.8	24.9

Гливиц, И., указ. соч., стр. 18

1) An Average Rate of 1901, 1902, 1904, and 1905
2) An Average Rate of 1896, 1897, 1898, and 1900
3) An Average Rate of 1901, 1903, 1904, and 1905
4) An Average Rate of 1886, 1887, 1888, and 1889

THE ATTACHED TABLE 6.
PRODUCTION OF PLATE AND SHEET BY AREAS

(1 million poods)	The South	Ural	The Center	The North & The North-west	Tsalist Poland	Total
1882–85		7.3	0.5	0.3	0.4	6.0
86–90		5.8	0.6	0.6	0.9	7.9
91–95	1.0	7.1	0.8	1.2	1.4	11.5
96–1900	5.1	8.9	2.2	1.3	3.3	20.8
1901–05	10.1	13.8	3.4	1.3	2.8	29.7

Гливиц, И., указ. соч., стр. 20

THE ATTACHED TABLE 7.
THE NUMBER OF FACTORIES THAT PRODUCE STEEL BAR

Classification of Factories by Output	1884		1890	
	The Number of Factories	Output (%)	The Number of Factories	Output (%)
Less than 0.1 million poods	11	28.5	11	3.5
From 0.1 to 0.5 million	5	71.5	3	15.1
From 0.5 to 1 million			2	36.6
More than 1 million			1	44.8
Total	16	0.9 (1 million poods)	17	3.7 (1 million poods)

Бовыкин, В.И., Концентрация
производства в тяжелой промышленности
России в комце xix в.
Вестник Московского Унцверситета. №. 1, 1965, стр. 84–85

THE ATTACHED TABLE 8.

PRODUCTION AND IMPORT OF MACHINES AND APPARATUS[4)]

	Production	Import	
	(1 million ruble)	(1 million poods	(1 million ruble)
1861–65	10.8		7.5
66–70	18.2		18.1
71–75	33.5	2.4	29.5
76–80	52.3	6.6	51.1
81–85	47.3	2.5	22.7
86–90	52.4	2.2	18.9
91–95	57.4[1)]	5.0	34.6
96–1900	162.3[2)]	9.4	75.3
1901–05	216.1[3)]	7.8	

Розенфельд, С.Я. и Клименко, К.И.
История машиностроения СССР.
М., 1961, стр. 86
Покровский, В.И., указ. соч.,
стр. 267–268
Гливиц, И., указ., соч., стр. 39
Mendel'son, The Theory and History of Crises (4) Page. 420. 429.

1) An Average Rate of 1891, 1892, and 1893
2) An Average Rate of 1896, 1897, and 1900
3) Numerical Value in 1908
4) Included an engine and the rolling stock

THE ATTACHED TABLE 9.

PRODUCTION AND IMPORT OF INDUSTRIAL MACHINERY AND APPARATUS

	Production		Import	
	(1 million poods)	(1 million ruble)	(1 million poods)	(1 million ruble)
1870			2.5	25.5
75			2.2	31.8
85			1.1	9.8
90		24.3	2.0	18.8
1900	7.5	67.1	7.5	64.2
1908				77.5

Burstein, A., Iron and Steel in Russia 1861–1913
(Unpublished PH. D. thesis, 1963, New School for Social Research) p. 109
Рознфельд, С.Я. и Клименко, К.И., указ. соч., стр. 62, 87

THE ATTACHED TABLE 10.

PRODUCTION AND IMPORT OF AGRICULTURAL MACHINERY AND TOOLS

Year	Production		Import		Year
	(1 million poods)	(1 million ruble)	(1 million poods)	(1 million ruble)	
				1.2	1866–70
1876		2.3		2.0	71–75
79		3.8	0.6	3.2	76–80
83	0.9	5.4	0.9	5.5	81–85
90		5.0	0.4	2.2	86–90
94	1.7	9.0	0.7	3.8	91–95
1900	3.4	12.1	1.3[1)]	7.7[1)]	96–1900
1908	6.7	28.7	3.1	16.2	1901–05

"Lenin Complete Works" in Japanese Translation, Vol. 3, p. 214
Burstein, A., op. cit., p. 95, 101
Розенфельд, С.Я.и, указ. соч., стр. 83
Покровский, В.И., указ. соч., стр. 268
1) An Average Rate of 1896, 1897, 1899, and 1900

THE ATTACHED TABLE 11.

PRODUCTION OF RAILWAY MATERIALS

	The Increased Distance of Railroad (1000 Kilometers)	An Engine	The Rolling Stock (1000 Rolling Stocks)	Rail (1 million poods)
1861–65	0.4		0.2[2)]	
66–70	1.4	23.0[1)]	5.4[3)]	
71–75	1.7	126.2	3.9[4)]	
76–80	0.8	242.4	10.9[5)]	
81–85	0.6	181.4	5.9[6)]	7.3[7)]
86–90	0.9	74.6	2.5	6.3
91–95	1.3	216.2	7.7	14.0
96–1900	3.2	703.6	23.2	26.8
1901–05	1.5	715.4	21.0	24.9

Mendel'sons Above-mentioned Work, p. 453
Гливиц, И., указ. соч., стр. 18
Westwood, J.N., A History of Russian Railways (London, 1964)
Эвентов, Л.Я., Иностранные капиталы в русской промышленности. М., 1931, стр. 56
Burstein, A., op. cit., p. 26
Розенфельд, С.Я.и, указ. соч., стр. 43
1) An Average Rate of 1867, 1869, and 1870
2) Numerical Value in 1865
3) Numerical Value in 1870
4) Numerical Value in 1875
5) Numerical Value in 1878
6) Numerical Value in 1880
7) An Average Rate of 1882, 1883, 1884, and 1885

THE ATTACHED TABLE 12.

IMPORT OF AN ENGINE AND THE ROLLING STOCK

	An Engine		The Rolling Stock[4]
	(1 million poods)	(1 million ruble)	(1 million ruble)
1861–65			0.2
66–70			8.7
71–75			3.9
76–80			2.6
81–85			0.3
86–90	0.007[3]	0.07[3]	0.5
91–95	0.1	1.3	1.9
1901–05	1.1[1] 0.3[2]	10.3[1] 3.0[2]	2.1

Покровский, В,И., указ. соч., стр. 268
таблицы, стр. 141, 196

1) Numerical value in 1896
2) Numerical value in 1897
3) An average rate of 1887, 1888, 1889, and 1890
4) Included a Carriage

THE ATTACHED TABLE 13.

PRODUCTION AND IMPORT OF RAIL

(1 million poods)	Production	Import
1877	2.5	11.4
78	4.4	9.6
79	9.4	4.9
80	12.4	3.4
81	12.7	0.9
82	9.9	0.3

Burstein, A., op. cit., p. 26

THE ATTACHED TABLE 14.

IMPORT OF RAIL

	(1 million poods)	(1 million ruble)
1869	12.7[1]	12.7[1]
1870	13.9[1]	13.9[1]
1871–75	10.6[2]	18.7[2]
76–80	8.1	8.9
81–85	0.3	0.4
86–90	0.06	0.1
91–95	0.6	0.8
96–1900	0.7	0.7

Покровский, В,И., указ. соч., стр. 92а, 92д, 202

1) Only wrought iron rail
2) Steel rail is an average rate of 1873, 1874, and 1875

THE ATTACHED TABLE 15.

STRUCTURE OF IRON RELATED INDUSTRIES

	1890		
	The Number of Factories[2)]	The Number of Workers (1000 people)	Output (1 million ruble)
The Iron & Steel Industry	(241)[1)]	(220.4)	
General Machinery & Tools Manufacturing	282~289	30.1~31.9	28.1~30.1
An Engine & the Rolling Stock Manufacturing	17~24	12.2~13.9	15.2~17.2
Iron & Steel Secondary Products Manufacturing	55	5.0	9.9
Founding (Foundry)	94	3.1	4.9

Указатель Фабрик и Заводов европ. россии
изд. 3, Спб., 1894
Гливип, И., указ. соч.,

1) The numerical value of ( ) includes that of both Tsalist Poland and the Central Asia and the Others are only for Europe Russia
2) The Factories which are recorded in this table are those which equipped with a steam engine or employ more than 16 workers

THE ATTACHED TABLE 16.

THE DEVELOPMENT OF THE HEAVY AND THE LIGHT INDUSTRY

	Heavy Industry		Light Industry		Whole Industry	
	The Number of Workers (%)	Output (%)	The Number of Workers (%)	Output (%)	The Number of Workers (1 million people)	Output (1 million ruble)
1887	40.7	30.1	59.3	69.9	1.0	965
90	43.3	33.4	56.7	66.6	1.1	1128
95	42.4	36.0	57.6	64.0	1.2	1411
1900	49.4	46.5	50.6	53.5	1.6	2253
05	47.4	44.4	52.6	55.6	1.7	2503

Струмилин, С.Г., Оцерки экономической
истории России и СССР. М., 1966,
стр. 444, 449, 451

THE ATTACHED TABLE 17.

PRODUCTION OF MAIN INDUSTRIAL MANUFACTURED GOODS

	Cotton Products		Sugar		Coal		Oil		Pig Iron	Iron & Steel Manufactured Goods	Machinery & Apparatus
	(1 million ruble)	Index	(1 million poods)	Index	(1 million poods)	Index	(1 million poods)	Index	Index	Index	Index
1860	48.0	100	4.0	100	18.3	100			) 100[2]	100	100
65	61.8	129	3.0	75	23.3	127			) 111	120	169
70	96.5	201	6.3	158	42.3	231			) 133	154	310
75	105.4	220	8.1	203	104.0	568	12.5[1]	100	) 148	229	484
80	154.4	322	10.9	273	200.8	1097	25.0	200	) 170	308	438
85	165.7	345	24.0	600	260.6	1424	116.0	928	) 246	369	485
90	208.6	435	23.5	588	367.2	2007	226.0	1808	) 424	567	531
95	350.7	731	32.3	808	555.5	3036	377.0	3016	) 810	917	1503
1900	493.5	1028	48.5	1213	986.3	5390	631.1	5049			

Струмлин, С.Г., указ. соч., стр. 434, 438, 442, 445

Яковлев, А.Ф., Экономические кризисы в Россоии. М., 1955, стр. 171, 278, 91, 138

1) Numerical value in 1877

2) Put mean average rate from 1861 to 1865, 100

See the Attached Table 1

THE ATTACHED TABLE 18.

EXPORT OF MAIN GOODS

The Average Rate of Five Years (1 million ruble)	Total	Oil & Oil Manufactured Goods	Cotton Fabrics	Sugar	Grain
1861–65	226	0.05	4	0.5	60
66–70	317	0.07	3	0.2	105
71–75	471	0.03	1	0.04	180
76–80	527	0.11	1	5	291
81–85	550	7	2	5	309
86–90	631	21	4	18	343
91–95	621	26	7	18	306

Mendel'son's above-mentioned book

Покровский, В.И., указ. соч.

THE ATTACHED TABLE 19.

DISTRIBUTION BY ENTERPRISE CONSTRUCTION YEARS

	Pre-1860	1861–70	1871–80	1881–90	1891–1900	1901–03	Total	
	%	%	%	%	%	%	%	
The Textile Industry	17.3	9.4	15.2	21.6	36.0	0.5	100.0	2572
(The Cotton Industry)	20.7	11.1	13.6	19.5	34.6	0.5	100.0	779
The Paper & Printing Industry	11.6	8.7	17.0	24.0	38.5	0.2	100.0	1022
The Timber Manufactured Industry	4.8	4.8	11.4	18.1	59.9	1.0	100.0	1363
The Metal Processing Industry[1)]	15.0	8.7	16.3	20.9	38.7	0.4	100.0	1680
The Mining Processing Industry	11.8	5.9	13.6	15.5	53.0	0.2	100.0	1446
The Animal Matter Processing Industry	24.9	9.7	15.9	19.8	29.3	0.4	100.0	1171
The Food Producing Industry	7.7	5.9	13.0	23.6	49.2	0.6	100.0	2186
The Chemical Industry	13.4	9.0	13.1	26.7	36.9	0.9	100.0	344
The Others	3.2	—	9.7	16.1	71.0	—	100.0	31
The Industry laid Indirect Tax	23.3	14.6	14.8	21.4	25.2	0.7	100.0	2649
Total	15.1	8.9	14.5	21.0	40.0	0.5	100.0	14464

Рашин, А.Г., Формирование рабочего класса России. М., 1958, стр. 38–39

1) Not Include the Iron Industry

THE ATTACHED TABLE 20.
THE TREND OF THE NUMBER OF WORKERS

(1000 people)	1865	1870	1875	1880	1887	1890	1897	1900
The Textile Industry	239.5	272.4	304.2	334.9	399.2	433.3	642.5	675.6
(The Cotton Industry)	76.3	105.3	149.0	167.0	207.7		316.1	399.9
The Leather Industry	12.3	14.9	14.6	20.7	38.9	39.7	64.4	50.9
The Paper Industry	7.5	8.6	11.3	11.4	19.5	27.4	46.2	72.0
The Chemical Industry	8.6	8.6	10.4	13.7	21.1	27.8	35.3	30.4
The Metal Processing Industry				86.2[1)]	103.3	110.0	214.3	240.9
(The Machinery Manufacturing)	17.8	27.1	41.3	43.9	47.8	49.1	120.3	148.2
The Mining Metallurgical Industry	about 0.2 million	223.4	268.0	283.4	390.9	426.6	544.3	662.2
(The Iron Industry)					222.2		271.2	278.2
(The Coal Industry)					32.8	40.6	65.2	109.2
(The Oil Industry)				1.3[2)]	3.9	5.6	10.8	25.2

Рашин, А.Г., указ. соч., стр. 13, 20, 24-25, 28, 32, 33, 35
Очерки Истории СССР 1861-1904. под. ред. С.С. Дмитриева. М., 1960, стр. 90
Варзар, В.Е., Статистические сведения о фабрик и заводах по производствам необложенным акцизом за 1900г. Спб., 1903,

1) Numerical Value in 1879
2) Numerical Value in 1883

THE ATTACHED TABLE 21.
AN INFLOW OF FOREIGN CAPITAL INTO RUSSIA

(1 million ruble)	The Total Amount	The Investment in a Stock Company	
		Total	The Industry
1860	547[1)]	9.7	
70		26.5	
80	2662[2)]	97.2	48.0
90	3254[3)]	214.7	114.1
1900	4732	911.0	627.9
15	7634[4)]	1939.3	1401.3

Эвентов, Л.Я., указ. соч., стр. 22-23, 25, 28
Мскау, J.P., Pioneers for Profit, Foreign Enterpreneurship and Russian Industrialization 1885-1913 (Chicago, 1970) p. 26
Бовыкин, В.И., К вопросу о роли иностранного капитала в России. Вестник Московского Университета. №. 1, 1964, стр. 69

1) Numerical value in 1861
2) Numerical value in 1881
3) Numerical value in 1893
4) Numerical value in 1914

THE ATTACHED TABLE 22.

INVESTMENT OF FOREIGN CAPITAL IN AN INDUSTRIAL STOCK COMPANY

(1 million ruble)	1880			1890			1900		
	The Total Capital	Foreign Capital	The Ratio of Foreign Capital (%)	The Total Capital	Foreign Capital	The Ratio of Foreign Capital (%)	The Total Capital	Foreign Capital	The Ratio of Foreign Capital (%)
The Mining and Metallurgical Industry	69.1	22.9	41	85.8	55.7	65	392.2	343.8	88
The Metal Processing Industry		5.4		27.8	13.9	50	257.3	125.6	49
The Mineral Processing Industry				6.7	0.2	3	59.1	26.6	45
The Textile Industry	109.0	7.8	7	197.6	26.0	13	373.7	71.4	20
The Others	101.8	11.9	12	125.2	18.3	15	318.2	60.5	19
Total	279.9	48.0	18	443.1	114.1	26	1401.5	627.9	45

Эвентов, Л. Я., указ. соч., стр. 22-23

NOTES

I

1) In this paper, I use "iron industry" to indicate the industry which produces pig iron, cast iron, wrought iron, and steel. When it produces steel mainly, I use "iron and steel industry". Similarly, as the industry of the machine industry, I use "machine and apparatus manufacturing industry", considering of their products of an appliance except machine.
2) Струмилин, С. Г., Черная металлургия в России. М.–Л., 1935.
Струмилин, С. Г., История черной металлургии в СССР. М., 1967.
3) Струмилин, С. Г., Очерки экономиуеской истории России и СССР. М., 1966, стр. 414–458.
4) Strumilin distinguishes the Industrial Revolution in England and the industrial reformation in Russia, but I think their contents differs little substantially.
5) Очерки экономической истории России и СССР. стр. 371.
6) там же, стр. 368, 404 История черной металлуртии в СССР. стр. 322.
7) История черной металлургии в СССР. стр. 322–323, 335, 337.
8) там же, стр. 332.
9) Очерки экономической истории России и СССР. стр. 367.
10) Яцунский, В. К., Промышленный переворот в России. (Печатается по журналу «Вопросы Истории» №. 12, 1952) в кн. В. К. Яцунский, Социально-Экономическая история России XVIII–XIX вв. М., 1973, стр. 119.
11) там же, стр. 134.
12) Яцунский, В. К., Основные этапы генезиса капитализма в России. «История СССР» №. 5, 1958, стр. 82.
13) Яцунский, В. К., География рынка железа в дореформенной России. «Вопросы Географии» сборник 15 (Историческая география), 1960.
14) I will point out only the latest study, Рындэюнский, П. Г., Вопросы истории промышленности в XIX в. «История СССР» №. 5, 1972.
15) Haruki Wada, The Structure of the Modern Russian Society. Rekishigaku Kenkyu: 10, 1961. Tamotsu Matsuoka, The Formation of Capitalism in Russia. Sekai Rekishi. Vol. 19, Iwanami, 1974.
16) Wada, H., The Structure of the Modern Russian Society, p. 12, pp. 16–17. Wada, H., The developing structure of the modern Russian society. Tōdai Social Studies Paper, "Shyakai Kagaku Kenkyu", Vol. 17, No. 2 and 3.
17) Wada, H., The developing structure of the modern Russian society, pp. 140–142.
18) Mr. Shōta Itō thinks this transfer "nothing but, strictly speaking, the depression countermeasure. Though his various studies have deep meanings especially in methodology, I cannot agree at this point. Itō, S., The historical feature in the development of Russian machine industry. Fukushima University, "Rekishi", Vol. 38, 1969, p. 71.
19) Mr. Tatsuro Arima points out a very important aspect that the standpoint to put stress on the international condition and Tzar's government policy to capitalistic development in Russia, which is the main current of Russian history studies in the recent our country is, at the same time, also one

to underestimate the industrial development in the pre-reformational period and the industrial development of capitalistic production. See his "Russian Industrial Development 1800–1860" published by Tōdai Press in 1973, page 3. I think his indication applies to the postreformation as well as the pre-reformation. But he emphasises too much on "the spontaneous development" of Russian industry in the pre-reformation. As to this, I would be very happy if you see my book review on "Journal of Rural Economics", Vol. 48, No. 1.

20) Гливиц. И., Железная промышленностъ России. Спб., 1911.

21) Бакулев, Г. Д., Черная металлургия юга России. М., 1953.

22) История ВКП(б), Краткий курс. стр. 66.

23) The problem of the role of foreign capital in the Russian capitalism included the problem whether Russia was subordinate to foreign capital and the nation to export capital or not, has become an important assignment of Russian history studies since the latter half of the 1920s. Please see the following references for the present.

Тарновский, К. Н., Советская историотрафия российского империализма. М., 1964.

Тарновский, К. Н., Изучение истории империализма в россии. «Очерки истории исторической науки в СССР» т. iv, М., 1966.

"National Monopolism in Russia" by Haruki Wada. "The Studies on Monopoly Capital" edited by Shinzō Kaji, in 1962.

24) Burstein, A., Iron and Steel in Russia, 1861–1913. (Unpublished PH. D. thesis, 1963, New School for Social Research).

25) Mckay, J. P., Pioneers for Profit, Foreign Entrepreneurship and Russian Industrialization 1885–1913. (Chicago and London, 1970)

26) See Olga Crisp's book review against Mckay's work.

27) It is simply because the so-far studies have scarcely dealt with the role of a military industry in the development of Russian iron industry and Russian capitalism. I should like to think about the reason and how the history of the Russian capitalism will change to add the problem of munition to it for another occasion.

II

1) "Modern" means to depend on the mechanized large-scale industry like capitalism.

2) Wada, H., Russian great reformational period. Sekai Rekishi. Iwanami, Vol. 20, 1971, p. 249.

3) "The great reform" is consisted of various kinds of reforms in a wide social and economical field. As to it, see the following references; "The Russian great reformational" and "The Structure of the modern Russian society" by Haruki Wada.

4) As a tax policy in the first half of the 19th century preceding the reform, the extreme import prohibition policy is finally taken under Finance Minister Kanklin, experiencing some changes. As to the changing progress, see the following studies; "The Features of Russian Tax Policy under the serfdom" by Shōta Itō quoted from "Rekishi" of the society for the

study of Historical Science of Fukushima University, Vol. 19 in 1967.

5) The standing point that "the great reform" plays the role to accumulate capital is found very often in the following studies; "The structure of the modern Russian society" by Haruki Wada, page 8. "The Studies on the Agricultural History in Russia" by Shizuma Hinada, after page 170.

6) Wada, H., Russian great reformational period. p. 261.

7) Westwood, J. N., A History of Russian Railways (London 1964) p. 74.

8) Ibid., pp. 70–71.

9) Ляховский, В. М., К вопросу о фцктивных акционерных компаниях в России 1860–1870-х годов (капиталы Рязанско-козловской ж.л.) «Исторические Записки» т. 76, 1965, стр. 277–288.

10) там же, стр. 281.

11) Гиндин, И. Ф., Государственный бачк и экономическая политика царского правительства. М., 1960, стр. 143–153.

12) National funds necessary for financial help was from railway construction funds which was established in 1867.

13) Westwood, J. N., op. cit., pp. 59–61.

14) Ковальченко, И. Д. ц Бовыкин, В. И., статья в кн. «Очерки Истории СССР 1861–1904» под. ред. С. С. Дмитриева. М., 1960, стр. 83.

15) Westwood, J. N., op., cit., p. 78.

16) Эвентов, Л. Я., Иностранные капиталы в русской промышленности. М., 1931, стр. 10.

17) Гливиц, И., указ. соц., стр. 16–17.

18) там же, стр. 18.

19) Wada, H., The developing structure of the modern Russian society p. 167.

20) Burstein, A., op. cit., pp. 257–258.

21) Mckay, J. P., op. cit., p. 41.

22) Бовыкин, В. И., Монополистические обьеднения 80–90 годов XIX в. в России. «Материалы по истории СССР» VI, 1959, стр. 13–14.

23) Burstein, A., op. cit., p. 23.

24) Westwood, J. N., op. cit., p. 93.

25) Розенфельд, Я. С. и Клименко, К. И., История машиностроения СССР. М., 1961, стр. 41.

26) Бовыкин, В. И., Концентрация производства в тяжелой промышленности России в конце XIXв. «Вестник Московскго Университета», №, 1, 1965, стр. 80.

27) Wada, H., The developing structure of the modern Russian society. (1), p. 141.

III

1) Westwood, J. N., op. cit., pp. 68–69.

2) Ibid., pp. 75–77, pp. 81–84.

3) Mendel'soh, "The Theory and the History of a Crisis", p. 422.

4) Annual average distance in the latter half of the 1870s is shown comparatively small in the attached table 11. But it is because 1879's and 1880's decrease was very remarkable. Incidentally, the average of the three years, 1876, 1877, and 1878 is 1.1 (1000 kilometers).

5) Westwood, J. N., op. cit., p. 76.
6) Бовыкин, В. И., Новые сведения о ранных монополиях в России. «Вестник Московского Университета» №. 1, 1956, стр. 182.
7) Westwood, J. N., op. cit., p. 93.
8) Гливиц, И., указ. соч., стр. 58–59.
9) там же, стр. 59.
10) Розенфельд, Я. С. и Клименко, К. И., указ. соч., стр. 51.
Гливиц, И., указ. соч., стр. 60–61.
11) Import goods varies with the times. For instance, a production means was imported widely in the 1860s through the 1870s. Up to the 1880s, import of a labor means such as a highclass precision machine and capital was thought much of. In the 1890s, this tendency —to import capital— became more remarkable. In this aspect, the 1880s is the turning point.
12) As to this problem, see Mr. Shōta Itō's following works; "The commercial confrontation between Germany and Russia, and Russian machine industry", the economical society of Fukushima University "Shyogaku Ronshu", Vol. 39, No. 4, 1971. "The commercial confrontation between Germany and Russia at the end of the 19th century and 1894's Commerce Navigation Treaty", "Seiyōshi Kenkyu", Vol. 1, 1972 and others.
13) According to Burstein's trial calculation, a railway demand ratio in the assumption of iron and steel rolling products was 60 to 85% before and after 1870 and in the first half of the 1880s it fell to 4 through 18%.
14) Five huge factories are Putilov's, Briansk company's, Warsaw steel-casting, Huta-Bankova company's factory, and Aleksandrovsk factory in St. Petersburg.
15) Бовыкин, В. И., Монополистические объединения 80-90-х годов XIXв. в России. стр. 18.
16) Крупина. Т. Д., К вопросу об особенностях монополизации промышленности в России. «Об особенностях империализма в Росссии». М., 1963, стр. 199.
17) Бовыкин, В. И., Новые сведения о ранных монополиях в России. стр. 182.
18) For instance, Bovuikin who takes up "early monopoly" as a real subject of study for the first time, finds a sign of the transfer to the imperialistic stage in such phenomina. But I can't agree at his opinion.
19) Гиндин, И. Ф., Политика царского правительства в отношении промышленных монополии «Об особенностях империализма в России» М., 1963, стр. 100.
20) Бовыкцн, В. И., Концентрация производства в тяжелой промышленности России в конце XIXв. стр. 84.
21) Бовыкии, В. И., Новые сведения о раных моноподиях в России. стр. 182.
22) Wada, H., The developing structure of the modern Russian society (1), p. 139.
23) Mckay, J. P., op. cit., pp. 300–303.
24) Розенфельл, Я. С. и Клименко, К. И., указ. соч., стр. 41.
25) Wada, H., The developing structure of the modern Russian society (1), p. 142.
26) Гиндин, И. Ф., Государственный банк и экономическая политика царского правительства, М., 1960, стр. 237.
27) там же, стр. 222.

28) История СССР 1861–1917. под ред. П.И. Кабанова и Н.Д. Кузнецова. М., 1960, стр. 118.

29) But this opinion is still in the stage of hypothesis. In so far studies, however, only the aspect of the backwardness of Ural iron industry in the latter half of the 19th century has been emphasized. But considering that Ural was still a largest iron manufacturing area in Russia until the latter half of the 1890s, and that the output increased steadily though it was far less than that of the South. It is necessary to locate Ural iron industry into a link of the reproductive structure of the Russian capitalism, and reexamine the role of Ural iron industry.

30) Бовыкин, В. Ч., Концентрация производства в тяжелой промышленности России в конце XIX в., стр. 84–85.

31) Гливиц, И., указ. соч., стр. 48, 89–91.
Burstein, A., op. cit., pp. 256–258.
But those literatures indicate the use of various steel materials only as to the 1890s. Besides, the mechanized large-scale industry in main industrial departments included the oil industry has developed remarkably even under the congestion of railway construction. Import from abroad decreased rapidly. Judging from these, there is no fundamental change of use even in the 1880s.

32) Burstein, A., op. cit., pp. 241–242.

33) I should add to the explanation that in the iron and steel industry of the South Russia, rail production occupies a very large percentage from the beginning of the development in the latter half of the 1880s. But even in the South, the product of steel bar, shape, and an plate and sheet gradually increases, and up to the end of the 1890s which is the prosperous time of both the iron and steel industry and the Russian capitalism, the output of those steel products exceeds that of rail.

34) This is the factory's list which has the explanation of an annual amount of output, the names of owners, the location, the year of construction, the number of workers, equipment, and manufactured goods. The first edition was published in 1882, and the second one, in 1887. Lenin appraised "A Factory Guide-book" with good intentions in his works, "about the problems of a factory statistics in our country" and "The Development of Capitalism in Russia". I should like to consider of the factory statistics including "A Guidebook to a Factory" in another occasion.

35) История СССР. 1861–1917, стр. 117.

36) Розенфельд. Я. С. и Клименко, К. И., указ. соч., стр. 44–45.

37) там же, стр. 45.

38) Указатель Фабрик и Заводов. стр. 372–390.

39) According to Lenin, one of the defects is the ambiguous standard of "a factory" which are described in the factory statistics. ("Lenin Complete Works" in Japanese translation, Vol. 4, page 7 through 14, and 36). In "A Factory Guide-book" the annual output is more than 2000 rubles, which is not always true. So many petty handiwork managements were included. Then, I adopt Lenin's standard of "a factory" —with more than 16 labor-

ers or equipped with a steam engine— and pick up "factories" which satisfies the above-mentioned standard from "A Factory Guide-book".

40) Розенфельд. Я. С. И., Клименко, К. И., указ. соч., стр. 44-46.

41) Wada, H., The develoing structure of the modern Russian Society (2) pp. 167-169.

42) Розенфельд, Я. С. и Клименко, К. И., указ., соч., стр. 40, 43.

43) Указатель Фабрик и Заводов, стр. 360-368, 391-395.

44) Первушин, С. А., Хозяйственная Коньюнктура. М., 1925, стр. 155-165.

45) там же, стр. 190-191.

46) Хромов, П. А.. Экономическое Развитие России. М., 1967, стр. 284.

47) Бовыкин, В. И., Концентрация производства в тяжелой промышленности России в конце XIXв., стр. 71.

48) Wada, H., The developing structure of The modern Russian society (1), pp. 140-141.

49) История СССР 1861-1917. стр. 118.

50) As a reason of rapid increase in output of the sugar industry, they gain much more profits in sugar beet culture than in wheat culture. Besides owing to the improvement of a crop rotation system, sugar beet culture increased very much.
(Россия в конце XIX века. под. ред. в.и. Ковалевского Спб., 1900, стр. 337).

51) История СССР 1861-1917, стр. 115.

52) там же, стр. 118.

53) As to it, see the following literature; "The developing structure of the modern Russian society (1), pp. 140-141.

54) Очерки Истории СССР 1861-1904, под. ред. С. С. Дмитриева. М., 1960, стр. 106.

55) Westwood, J. N., op. cit., p. 100.

56) Шполянский, Д. И., Монополии угольно-металлургичской промышленности юга России в начале XX в., М., 1953, стр. 24-25.

57) История СССР 1861-1917, стр. 118.

58) Оцерки Истории СССР 1861-1904, стр. 107-108.

59) Tugan-Baranovsky, The Russian Factory in the 19th Century, translated from the 3rd Russian edition by Author and Claora S. Levin. 1970, pp. 252-253.

IV

1) Шполянский, Д. И.. указ. соч., стр. 37.

2) Покровский, в.и., Сборник сведении по истории и стаистике внешней торговли. России т. 1, Спб., 1902, стр. 269.
Розенфельд, С. Я. и Клименко, К. И., указ. соч., стр., 83.

3) As is well known, Siberia railway was constructed in the 1890s. I think that so far studies have not proved the role this railway played to the development of the Russian capitalism.

4) Westwood, J. N., op. cit., pp. 61-63.