Russian railway construction and the Urals charcoal iron and steel industry, 1851-1914

By IAN BLANCHARD

It has become an axiom of both Russian and Western scholars that successive railway construction booms in 1856-61, 1867-1874/80, and 1893-1900 exerted, through a demand for rails, ties, and other equipment, a dominant influence on Russian ferrous metal markets. Writing of the boom of 1893-1900, Gerschenkron declared,

the greatest industrial upswing came when from the middle of the ’80s on, the railway building of the state assumed unprecedented proportions and became the main lever of the rapid industrialisation policy.  

His views have been endorsed by other historians, in relation not only to the construction boom of 1893-1900 but also to those of 1856-61, 1867-1874/80 when in free trade conditions demand was largely satisfied, directly or indirectly, by imports. Urals producers played almost no role in satisfying this demand. In examining the reasons behind their lack of participation in the market for rails, both Russian and Western historians have stressed the industry’s technological backwardness and alleged ideological stagnation. The Urals industry is perceived as being incapable of responding to the new demand for rails, and accordingly seen as being displaced in ferrous metal markets. This article examines the role of railway construction in the evolution of Russian ferrous metal markets and explores the part played by the Urals iron and steel industry in that evolution.

At its inception in the 1840s, railway construction was dominated by the building of the Moscow-St Petersbourg line. The demand for track...
materials was largely satisfied by imports of good quality and inexpensive rails from England with small supplementary Russian supplies. Where a higher quality iron was required, for the construction of equipment, locomotives, and rolling stock, supplies were obtained from the Urals iron magnates, the Demidovs. Even at the inception of railway building cost constraints required that a large proportion of rails and equipment were imported. Accordingly when plans began to be laid in 1850 for the construction of a national railway system, the necessity of importing much of the rail and equipment was recognized and the tariff on such materials was abolished. Concerned about the impact of this measure on producers in the Urals, however, the government instituted in 1852 a committee of the State Council, which undertook an investigation into this matter. Its findings, for the years 1852-3, before the Crimean War brought railway construction to a halt, reveal the limited initial impact of imports since the abolition of tariffs in 1850. Urals producers had been forced to cede markets only in the westernmost provinces of the empire. Between 1851 and 1856, 3,246 tonnes of iron and steel (including rails and other equipment) were imported annually. This originated mainly from Finland, whose products passed via Riga to consumers in the Baltic provinces, from Poland, which came to dominate markets in right-bank Ukraine, and from England, which found a place on the St Petersburg market. Otherwise, Russian ferrous metal markets remained the preserve of Urals producers who, by supplying domestic consumers with 138,029 tonnes of iron, maintained a 98 per cent market share.

Between 1856 and 1861 the plans for a national railway network, the implementation of which had been delayed by the Crimean War, got off the ground. With the formation of the Grande Société des Chemins de Fer Russe, the railway system was extended to some 2,232 miles of track in 1861. New lines from Warsaw to St Petersburg (via Grodno, Vilna, and Pskov, with a branch to Riga) and extensions of the St Petersburg-Moscow line to Nizhni Novgorod and Kolomna were built. A new pattern of demand was superimposed upon the old. Demand, particularly for rails, increased enormously. In 1855 the government, mindful of the findings of the 1852 commission, invited Urals producers to tender for contracts to supply rails. Only two factories did so, and even these refused rail contracts in 1860. During the construction boom of 1856-61, the foundations for a basic Russian railway network had been provided

9 Ibid., pp. 320-3.
10 Kolesov and Bem, *Sравнение таможенных тарифов*.
12 Iron rails are not distinguished in the customs records within the general category ‘iron’ until 1869: *Vidi gosudarstvenoi vnesheii torgovli za 1863 (-69) god*. For quantities, see Pokrovskii, ed., *Sbornik*, I, tabs. 9-12, pp. 236-7.
15 Ames, *Russian railroad construction*.
largely by foreign enterprises. Yet, this was only the beginning. Within 14 years (1864-78), five times as much track (11,280 miles) was put in place. The main grain-producing areas of the great estates—the central agricultural region, the Ukraine, and the north west—which in the 1840s and 1850s had been subject to rising land transport costs—were linked to the metropolises and the ports.\(^{17}\) Market integration proceeded apace.\(^{18}\) Trade, and particularly exports, rocketed upwards. For almost a quarter of a century (1856-80), foreigners built a new transport network that transformed the Russian market situation. Their achievement was largely based on the importation of equipment and rails. At the beginning of the boom of 1867-80, most rails continued to be imported. From 1868, however, when rails rolled in Russia received a government subsidy, there was a shift from rail imports to the acquisition by manufacturers of imported pig iron and scrap.\(^{19}\) From 1867 to 1880, an average of 458,152 tonnes of ferrous metal products were imported annually. Yet, only one-third comprised rails, and the proportion of rails fell from 42 per cent at the beginning of the boom to a mere 13 per cent in 1880.\(^{20}\) Nonetheless, whether imported as fabricated rails or in the form of pig and scrap to be processed and rolled into rails by Russian manufacturers these imported wares dominated the Russian market for rails. Similarly, imported locomotives and other railway equipment valued at 5.9 million roubles a year in 1871-5 were the main sources of equipment supply for the Russian railway companies.\(^{21}\)

In relation to railway demand, the iron masters of the Urals and central Russia were marginalized. Between 1867 and 1876 they contributed annually only 540 tonnes of rail, or less than 1 per cent of total supply. Yet, with a total annual average Russian iron output at that time of 330,000 tonnes, they continued to maintain a total market share of 42 per cent and a 73 per cent share in Russian non-railway markets.\(^{22}\) As some 25 years earlier, in free trade conditions, Urals producers ceded ground to imports in non-rail markets mainly in the westernmost provinces of the empire. Such imports there and in the newly ‘invaded’ New Russian provinces of southern Russia had grown considerably from 3,246 tonnes a year in 1851-5 to 122,054 tonnes a year in 1867-80. The market for imported pig and wrought iron, however, remained highly concentrated. It largely serviced the needs of foreign engineering shops that had been established in Russia during the intervening years.\(^{23}\) The share of imported pig and wrought iron in Russian non-rail markets increased dramatically to some 27 per cent. Russian, and in particular Urals, iron production also increased, but more slowly, rising from

\(^{17}\) White, ‘Social saving’; idem, ‘Railway construction’.

\(^{18}\) Mironov, Kholie tsi.

\(^{19}\) As late as 1876 the Putilov works in St Petersburg was the only manufacturer fabricating rails: Gindin, Gosudarstvennyi bank, p. 195.

\(^{20}\) Vidi gosudarstvennoi vneshei torgovli za 1867-9; Obzor’ vneshei torgovli Rossi za 1870-80.

\(^{21}\) Lyashchenko, Istorija, II, pp. 110-11.

\(^{22}\) For output, see Strumilin, ‘Promyshlennye krizisi’, tab. 3, p. 434, tab. 5, p. 438.

\(^{23}\) Ezhegodnik Ministerstvo Finansov, I, pp. 278-9.
138,029 tonnes in 1851 to an average of 330,000 tonnes a year in the years 1867-76 (figure 1). Russian producers still clung to their dominance of non-rail markets, holding a 73 per cent market share. They also distributed their wares in much the same way as they had a quarter of a century earlier (map 1). Between 40 and 50 per cent of the Urals producers’ output of bar and other assorted irons continued to find its way each year to the great Nizhnii Novgorod fair.24 Here it was sold to a small group of three or four major wholesalers.25 These big wholesalers, then as in 1851, distributed the iron to smaller wholesalers who in turn sold the metal on in their home regions. Their main customers were kustari (cottage industries, whose workers were dependent on market purchases of food and utilized imported raw materials) who transformed

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24 Fitzpatrick, Great Russian fair, tab. 2.5, p. 67; Keppen, ed., Materialy.
the bar iron into a wide variety of wares—nails, locks, knives, horse harness, rings, buckles, window bolts, and so on—for the peasant market. Employment in and the output of such *kustari* activity expanded rapidly.\(^{26}\)

Direct sales of the residual 50-60 per cent of output, which took place via the agencies of the great iron magnates in cities across the empire, also increased.\(^{27}\) With the exceptions of the western and southern provinces of the empire, where at Riga, Odessa, and Kiev in 1867-80 they were

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confronted with competition from English and Swedish iron, Russian, and in particular Urals, producers continued to maintain an important position in the rapidly expanding non-rail iron market.

Figure 2. Russian iron prices, 1851-1913


Although successive railway construction booms in 1856-61 and 1867-80 exerted a major influence on Russian ferrous metal markets, it was not a dominant one. Russian and—in particular—Urals iron producers were not displaced but continued to operate within a market which, both functionally and spatially, had split into two discrete sectors since 1856. In supplying the needs of the railway companies, they played almost no role, but they still dominated the non-rail market for ferrous metals. There, importers of Swedish and English iron took over supplying the engineering shops of north-western and southern Russia. These importers made little headway, however, among the *kustari* supplying Russian peasants and townsmen with a wide range of metallurgical wares. Their products were considered by the *kustari* as being of inferior quality and lacking in malleability. This sector, which during the ‘boom years’

28 Ovsiannikov, ‘O torgovle’, p. 64; Munro-Butler-Johnstone, *Trip up the Volga*, pp. 94-5.
comprised 58 per cent of the total Russian ferrous metal market, remained the preserve of the Russian iron masters, who maintained a 73 per cent market share of non-rail demand. Within this sector, moreover, Russian iron masters proved remarkably effective. In spite of low and stable per caput income levels among the peasantry, they were able by a process of continuous technological innovation during the years 1866-78 to reduce the ‘real’ price of Russian iron by half (figure 2) and increase sales from 182,950 tonnes to 329,460 tonnes a year.

II

This situation did not change in 1874-93 when the pace of railway construction slackened and the government embarked on a policy of protectionism in relation to the domestic iron industry. As early as 1868 the government had encouraged the domestic fabrication of rails by paying subsidies to manufacturers who would roll rails made from imported pig iron and scrap. By 1884, as a result of this measure, 14.26 million roubles were spent on premiums paid to five new domestic rail producers—Hughes, Briansk, the Aleksandrovsk and Putilov works in St Petersburg, and the Nizhni Saldinsk plant in the Urals where the Demidovs established Bessemer production of steel rails in 1877. However, these works contributed only 5,164 miles or 34 per cent of the country’s 15,159 miles of steel-rail track and—as until 1886 the Briansk, Putilov, and Aleksandrovsk works processed imported iron—only 1,232 of these 5,164 miles were rails wholly produced in Russia. The effects of subsidizing domestic production of locomotives, rolling stock, and other railway equipment were broadly similar. Between 1868 and 1878 the government spent 70 million roubles. Imports, which had been worth 6.8 million roubles a year in 1869-75, fell to an annual average of 4.22 million roubles in 1876-80. Meanwhile, the value of domestic production expanded from 2.33 million to 6.76 million roubles per year, achieving a 60 per cent market share. The impact of these policies as well as the enhancement in 1877 of tariffs on railway equipment and the restrictions imposed on rail imports was, however, restricted to the new Russian fabricators of railway equipment and rails. As long as they could obtain duty-free imports of raw materials, expanding production in this sector

31 It is hoped to consider more fully this question of technical innovation, undertaken by private and ‘possessional’ works owners but not in state-owned enterprises, in the Urals industry in a later article.
32 See above, p. 109.
34 McKay, ‘Foreign businessmen’; *idem*, ‘Elites’.
36 Girault, ‘Finances internationales’.
38 Gatrell, *Tsarist economy*, p. 150 and n.
39 See sources quoted in nn. 33-6.

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merely resulted in increased imports of cast iron and steel (figure 3). Essentially, manufacturing capacity had been created, imported fabricants replaced by raw materials, and the balance of trade improved accordingly. Yet, whether imported as fabricated rails and railway equipment or in the form of cast iron and steel to be manufactured in Russia, imported wares continued to dominate the Russian market for rails and other railway equipment.

It was only in the aftermath of the Russo-Turkish War of 1879, when the onset of the international cereal market crisis and the resultant deterioration of Russia’s balance of payments situation forced the Russian ministry of finance into an acutely protectionist tariff policy, that this situation changed. Amid a general round of tariff increases, duties imposed on imported pig iron and steel increased rapidly (table 1). The effect was immediate. Combined imports of pig, iron, and steel, which had fallen from a peak of almost 511,046 tonnes in 1880 to 190,781 tonnes in 1886, thereafter collapsed to 73,984 tonnes in 1888.  

With the exception of the Aleksandrovsk and Putilov works in St Petersburg, all of the major manufacturers of rails or railway equipment which had been dependent on such supplies of imported raw materials now turned to southern Russia. Here the completion in 1886 of the Ekaterinslav railway linking Krivoi-Rog with the Donbas, for the first time in Russian metallurgical history, allowed the combination of high-grade ore with bountiful supplies of coking coal. The major manufacturers of rails or

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40 *Obzor vneshnei torgovli Rossii za 1880-(88) god*.
railway equipment were thus in a position to create new smelting capacity
to augment the existing production from Hughes’s Yuzovsk works and
the Pastukov brothers’ tiny Sulinsk plant, which together had produced
annually about 21,224 tonnes of steel in the early 1880s.41 Almost
immediately Briansk undertook to produce its own pig iron domestically,
opening the Alexandrovsk works which blew in its first blast furnace in
1887.42 The Dneprovskii Metallurgical Corporation, a subsidiary of the
Warsaw Steel Company, blew in a further two furnaces in February and
June of the same year.43 Output increased accordingly, reaching 88,525
tonnes in 1888. In the prevailing conditions of stagnant railway construc-
tion, however, total steel production destined for the railways re-attained
the 341,000 tonnes import level of 1880 only in 1893, and even then
only with supplementary supplies amounting to some 47,200 tonnes
provided by Urals producers.44

<table>
<thead>
<tr>
<th>Date</th>
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<tbody>
<tr>
<td>1881</td>
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<td>1882</td>
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<td>1883</td>
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<td>46 38</td>
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<td>1891</td>
<td>52.5 45</td>
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The years 1880 to 1893 had been difficult for those manufacturers
supplying the needs of the railway companies. Low levels of new construc-
tion and intermittent crises in 1881-2 and 1888-91 when orders for rails
and railway equipment reached a particularly low ebb45 took their toll
on the industry. The St Petersburg manufacturers who experienced a
marked rise in their raw material costs were badly hit. The Aleksandrovsk
factory which had been making rails since the 1870s cut back production
in the early 1880s because of the reduction in demand, and in 1887 was
forced to discontinue production of rails completely, switching to other
steel products.46 The Putilov works experienced similar difficulties. Only
a financial restructuring of the enterprise following its bankruptcy in 1890

41 Kubilin, Gornoazovodskaya proizvoditel.
42 Pavlov, Metallurgicheskie zavodi, pp. 44, 153.
43 Ibid., p. 260.
44 Sbornik’ statisticheskikh’ svedenii o gornoazovskoi promishlennosti Rossii v’ 1893.
46 Pavlov, Metallurgicheskie zavodi, p. 153.

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allowed it to continue rail production, though now in an environment of production diversification. 47 Even those who had in 1887 successfully effected the shift to southern Russian pig iron supplies were not immune. The Briansk factory, which had been created in 1873 specifically to make rails, also reduced production in 1881 and was unable to re-attain the output levels of 1880 before 1892 (table 2).

Table 2. Briansk rail production (tonnes), 1878–1891

<table>
<thead>
<tr>
<th>Year</th>
<th>1878</th>
<th>1879</th>
<th>1880</th>
<th>1881</th>
<th>1882</th>
<th>1884-8</th>
<th>1889</th>
<th>1890-1</th>
<th>1891</th>
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<tr>
<td>1878</td>
<td>24,508</td>
<td>37,409</td>
<td>47,770</td>
<td>33,803</td>
<td>23,393</td>
<td>8,197</td>
<td>27,869</td>
<td>37,246</td>
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</tbody>
</table>

Note: a annual average figure
Source: Glivits, Zhelznyaya promyshlennost', tab. 11, p. 18

From 1880 to 1893 in that sector of the Russian ferrous metal market supplying the needs of the railway companies, manufacturers utilizing either imported or domestically produced raw material supplies experienced stagnant output levels. Such was not the case for the iron magnates of the Urals. Production there increased to 561,439 tonnes in 1893, attaining a 52 per cent total market share. Moreover, as the enhancement of tariffs reduced high-price imports of pig, iron, and steel to 84,979 tonnes a year, the Urals producers achieved an 86 per cent share of non-rail markets. During the years 1878-93, some local producers 48 or outsiders to the region 49 experimented briefly with marketing steel rails. Like their counterparts further west, they had got their fingers burnt, but their position was exceptional among Urals producers. By maintaining stable ‘real’ prices for their wares as peasant incomes for the first time began to rise, 50 most found they could sell increasing quantities of bar and other assorted irons through ‘traditional’ channels. As late as 1888 more than half (58 per cent) of Urals iron production was traded at the Nizhni Novgorod fair where the quantities of iron sold had doubled since 1874. 51 From there, the metal was still distributed to the kustari of Tver, Yaroslavl, Nizhnegorod, and Tula, which were then at the height of their fortunes. Before the decade closed, however, it was clear that things were changing. Kustari production declined and Urals producers began sending more of their product directly to consumers across the empire. 52

During the years 1881 to 1893 the pace of railway construction had declined. The products of the new Krivoi Rog-Donbas metallurgical

47 Girault, ‘Finances internationales’; idem, Emprunts russes, p. 279.
49 Vyatkin, Gornozavodskii Ural, pp. 90-1; McKay, Pioneers for profit, pp. 349-53; Girault, Emprunts russes, pp. 287-8.
50 Gregory, ‘Russian agrarian crisis’; idem, ‘Grain marketings’; idem, ‘Russian Living Standards’.
51 Fitzpatrick, Great Russian Fair, tab. 2.5, p. 67.
52 Iarmokhin, Otritsatel’noe znachenie Nizhegorodskoi iarmarki, pp. 10-11.

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complex had replaced ferrous metal imports. Urals producers, however, were unaffected by these changes. Production and sales of Urals iron continued to grow, allowing iron masters to maintain a share of between 44 and 53 per cent of the total Russian ferrous metal market.

III

Only when governments poured seemingly limitless funds into the subsidization of successive booms in railway construction (1893-1900) and then re-armament (1908-14) did this situation change. The amount of track laid during the second Russian railway boom (1893-1900) was ‘unprecedented’. Initially in 1891-5, construction rates were comparable with those of the earlier boom years 1872-6. During the ‘railway mania’ which characterized the closing phase of construction from 1896 to 1900, however, each year saw almost twice as much track—2,065 miles—laid as ever before. Apart from the Trans-Siberian railway for which the minister of finance, Vyshnegradskii, made the first appropriations in 1891, most new track was destined for the construction of a dense feeder network within the fabric of the existing railway system. Once again market conditions were transformed and the pace of integration quickened, but this achievement was now attributable to heavy protection afforded by the 1891 strict no-exemption tariff on iron and steel imports and the placement of uncommonly favourable contracts, largely based on the domestic production of equipment and rails. Through the backward linkages generated by the railways, producers experienced a major industrial boom. Apart from 1 per cent of rail supplies which continued to be imported, provisioning of the railway companies was overwhelmingly the preserve of the southern Russian producers of the Krivoi Rog-Donbas metallurgical complex, although only those companies which could obtain heavily subsidized government contracts prospered. Thus in 1891 the Donets Steel Company, a subsidiary of Huta-Bankova, obtained from the government a contract for 100,000 tonnes of rail and thereby ensured its place in the circle of purveyors of equipment to the railway system. In spite of protracted and ultimately abortive merger discussions between Huta-Bankova and Briansk, which delayed completion of the works until 1895, the rails then produced still found a ready market. During the intervening years, however, others had secured similar lucrative contracts. The Dneprovskii Metallurgical Corporation, a subsidiary of the Warsaw Steel Company, at this time came to supply two-thirds (264,000 tonnes) of the rails required for the contemporary phase of the construction boom. The profit potentialities of this market were enormous and acted as a magnet for capital, both foreign and domestic. During the subsequent years of ‘railway mania’, 1896-1900, with the level of demand for railway

54 Obzor’ vneshei torgovli Rossii za 1891 (-1900) god’.
55 Goldman, ‘Relocation and growth’, p. 32; McKay, Pioneers for profit, pp. 355-60.
equipment rising from 400,000 to 1,042,000 tonnes a year on average.\(^{56}\) There was a rush to create new capacity. Twelve new works were established and production in the southern Russian industry, which had been running at an average annual output of 374,000 tonnes in 1891-5, increased rapidly to 1,054,000 tonnes in 1896-1900.\(^{57}\)

During successive phases of the 1890s railway boom, largely as a result of government expenditure of 3.5-3.6 billion roubles on subsidizing the railway system,\(^{58}\) suppliers experienced a major boom, attaining a 50 per cent share of the total Russian ferrous metal market in 1896-1900. The bulk of the rail output came from factories in southern Russia. Within this region, a small number of enterprises dominated the industry: Hughes’s Yuzovsk works, the South Russian Dnepr Factory, Briansk, the Donets Steel Company, and the Russo-Belgium Metallurgical Company. Similarly, domestic producers supplied some 80 per cent of locomotives and rolling stock during the late 1890s. Three giant engineering works, the Kolomensk, Briansk, and Putilov factories, supplied most Russian-built locomotives.\(^{59}\) Such works dominated the supply of rails and equipment during the boom years, orders for these items absorbing virtually all of the output of the southern Russian industry.

Again, Urals producers played a minor role in this boom. Only two indigenous iron masters were each able, on the basis of particularly favourable state contracts,\(^{60}\) to sell an annual output of 40,000 tonnes of rails during the years 1891-1901. Otherwise, it was ‘foreigners’ who sought to establish rail production in the Urals during that phase of frenzied activity associated with the ‘railway mania’ of 1896-1900. Their efforts met with little success\(^{61}\) and even with the additional output of 30,000 tonnes a year they contributed to the region’s output of railway materials, Urals producers supplied no more than 10 per cent of the total. Yet, as in previous railway booms, the non-rail output of these producers during these years continued to grow, rising from 499,344 tonnes a year in 1893-5 to 645,082 tonnes a year in 1896-1900. Thereby they secured for themselves a total market share of 32 per cent and a share of 56 per cent in Russian non-railway markets. By a process of continual technological innovation and price reductions (figure 2), during the years 1889-97 Urals iron masters were able to sell a growing volume of their wares to an increasingly rich population.\(^{62}\) A high level of inter- and intra-enterprise product specialization\(^{63}\) afforded them a far greater flexibility in satisfying this consumer demand than was enjoyed by their southern Russian counterparts, but this state of affairs had only been

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\(^{56}\) Based on the calculations of Lyashchenko, Istoriya, II, pp. 124-5 and Soloveva, Zhelezodorozhnii transport, pp. 276-7.

\(^{57}\) Kromov, Ekonomicheskoe razvitie.

\(^{58}\) Lyashchenko, Istoriya, II, p. 155.

\(^{59}\) McKay, Pioneers for profit, pp. 355-60; Soloveva, Zhelezodorozhnii transport, pp. 279-82.

\(^{60}\) Verstraete, L’Oural, pp. 101-6, 129-30.

\(^{61}\) Girault, Emprunts russe, pp. 287-8; Verstraete, L’Oural, pp. 106-9; Sbornik statisticheskikh svedeniya po gornoi chast na 1893-1901 gg.

\(^{62}\) Gregory, Russian national income, tabs. 6.2-3, pp. 131, 133-4.

\(^{63}\) Verstraete, L’Oural, pp. 84-176.

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achieved by a fundamental transformation during the intervening years in the distribution system of the industry. Until the late 1890s Urals iron masters continued to dispose of most of their wares at the Nizhnii Novgorod fair. With the building of two new western branches of the Trans-Siberian Railway, Samara-Zlatoust-Cheliabinsk (1896) and Ekaterinburg-Perm-Vyatka (1896-8) together with the Ekaterinburg-Cheliabinsk link-line (1897), however, the situation was transformed. Both northern and southern railway systems bypassed the great fair, but both afforded users direct access to the central and north-western industrial regions. Urals producers, accordingly, now sent more and more of their product directly to these regions.

Here, however, they still found that they had to share the non-rail market with importers who, in spite of the 1891 tariff, continued to supply the engineering shops of north-western and central Russia. Although the tariff impeded this iron and steel trade, it did not halt it. Manufacturers in these regions responded to increased iron and steel prices by restructuring existing enterprises and introducing new ones. Within the prevailing industrial structure, they reduced raw material costs by adding value to their products. In those engineering works whose main market had been the railway companies, there was a process of diversification and product enhancement. This caused manufacturers to eschew the low-grade raw materials of the Ukraine and forge new links with Urals producers and importers for the supply of quality iron and steel, from which they could make high-value precision products. Thus, following its bankruptcy and financial restructuring with French capital, the Putilov works moved away from producing railway equipment in favour of the manufacture of steamship parts and industrial machinery (particularly for the oil industry). These years also saw the establishment of the ‘Motor’ (1896) and ‘Phoenix’ factories alongside the great Russian-Baltic Wagon Factory works in Riga (founded in 1874).

Existing factories thus turned to the production of new products with high value-added. These years also witnessed the introduction of new industries to the region, manufacturing electrical-engineering products, also with high value-added (Siemens-Halske established several factories for electrical equipment). In spite of the impediments put in their way after 1878 by interventionist governments, the industries of the Baltic region thus continued to grow. They compensated for enhanced raw material costs by product enhancement. They overcame limitations on direct access to foreign capital by attracting foreign (particularly German) firms intent on tariff jumping. By 1900, the region had secured for itself a safe niche within the industrial structure of the empire. In machine making it encompassed 41 per cent of industrial production.

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64 Ibid.
65 Neopikhanov, Zhleznodorozhnie puti.
66 Fitzpatrick, Great Russian fair, p. 74.
67 Girault, ‘Finances internationales’; idem, Emprunts russe, p. 279.
68 Orlov and Budagov, Ukazatel’ fabrik i zavodov; Vazar, Spisok fabrik.
capacity (26.2 per cent in St Petersburg and 14.8 per cent in Riga)\(^70\) and together with the engineering shops of the central industrial region in 1896-1900, consumed 412,612 tonnes of imported iron and 92,000 tonnes of southern Russian pig iron and semi-fabricants annually.\(^71\)

IV

When government support of the railways was withdrawn and construction was reduced to low levels in the financial crisis of 1901, southern Russian producers had massive reserves of excess capacity available for the exploitation of these non-rail markets. Cartelization and continued but limited government support provided them with the means to do so. Towards the end of 1901 the major metallurgical firms in southern Russia, following the lead given by French banking interests earlier in the year, embarked on discussions which culminated early in 1902 in the formation of ‘Prodameta’. The 12 participant firms concluded an agreement covering sheet iron, girders, axles, and tyres. This set quotas on the yearly amount each firm could produce. Rails and assorted rolled irons were for the moment excluded from this agreement, as in that year the government agreed to allocate the bulk of its reduced orders for rails and rolling stock to eight firms at pre-crisis (1899) prices.\(^72\) With secured profit margins on these items, producers in the southern Russian industrial complex could thus now afford to ‘dump’ surplus production. As prices fell, the larger enterprises of the north-western industrial region, including the Alexandrovsk and Putilov works which possessed their own steel converters, disassociated themselves from their dependence on imported supplies of pig iron. They now rapidly increased their purchases from southern Russia. Sales of southern Russian pig iron and semi-fabricants grew from some 92,000 tons a year in 1896-1900 to 657,207 tonnes in 1907, almost completely displacing imports.\(^73\) Nor were the larger engineering shops of the north-western industrial region alone in feeling the impact of this aggressive marketing policy. By ‘dumping’ increasing quantities of pig-iron on Volga-Urals markets\(^74\) Prodameta fundamentally undermined ‘primary’ production in that region, precipitating what contemporaries saw as a major ‘crisis’.\(^75\) The number of blast furnaces operational in the region fell rapidly from 134 in 1900 to 94 in 1904 and 81 in 1910.\(^76\) There was a corresponding collapse in pig-iron production (figure 4). As indigenous production decreased and ‘imports’ of southern Russian pig iron grew, however, new Siemens Martin hearths

\(^73\) *Obzor’ vneshei torgosli Rossii za 1901 (-1909) god*.
\(^75\) Belov, *Knizi*, pp. 5-81.
\(^76\) Vyatkin, *Gornozavodskii Ural*, p. 32; *Sbornik statisticheskikh svedenii o gornozavodskoi promishlennosti Rossii v*’ 1910.
were built. Their number increased from 31 in 1900 to 45 in 1910. They poured forth the steel and iron required for the production of a burgeoning volume of semi- and fully fabricated wares.

By 1907, the Russian ferrous metal market had undergone a complete transition from primary pig-iron production to the manufacture of semi- and fully fabricated wares was facilitated by the formation of cartels—‘Gvozd’ (1903-9, nails and wire sales) and ‘Krovlya’ (1906-9, roofing iron sales). In pursuing a policy of discriminating monopoly between Urals-Siberian and European Russian markets, these gave producers a competitive edge in the sale of these fabricated wares in European Russia: Vyatkin, Gornozavodskii Ural, pp. 204-35; Tsukernik, ‘K istorii sindikata “Krovlya”’, pp. 120 ff.

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Figure 4. Urals production of pig iron, semi-fabricants, and finished wares, 1887-1913


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metamorphosis. During the previous seven years the producers of the southern Russian metallurgical complex had come to dominate the production of pig iron and semi-fabricants, contributing some 70 per cent of total output. Their contribution to the processing of these materials, however, was small. They still supplied most track and equipment (97 per cent) to the railway companies, yet in 1907, these supplies gave them only a 16 per cent share of the total market. In the non-rail market, they made only a small ‘direct’ contribution of 167,213 tonnes or 8 per cent. It was left to others to process and add value to the basic raw materials they supplied. Among these, Urals producers processing 1,029,582 tonnes of pig iron reigned supreme, securing a 52 per cent share of non-rail markets and completely monopolizing the market for such products as roofing iron.79

Nor did this situation change significantly during the subsequent industrial recovery. This saw total Russian pig iron production increase from 2.3 million tonnes in 1907 to 4.02 million tonnes in 1913.80 Many existing restrictive practices continued into this more buoyant age, creating ‘famine’ conditions. During these years, railway demand increased from 365,049 tonnes a year in 1907 to 719,625 tonnes in 1913.81 Thereby it slightly increased its share of the Russian ferrous metal market to 18 per cent. South Russian producers continued to dominate this sector. From 1909, they increased their monopolistic grip. Prodameta closed down rail-making capacity, and subjected the production of rails and assorted irons to an agreement on market shares.82 In raising prices by half, however, it caused strong complaints from the railway companies83 which increasingly placed their orders with firms outside the cartel. In 1909, Prodameta had orders amounting to 354,098 tonnes, encompassing 97 per cent of national rail output. By 1913, its orders for distribution among its members amounted to only 568,504 tonnes or 79 per cent of total sales. Urals rail producers during the years 1901-9 had worked at a fraction of total capacity. By 1913, having attained a 21 per cent market share, they sold some 151,121 tonnes of rail.84 Prodameta’s loss of market share here, however, was more than compensated for by its ability to maintain a monopolistic pricing policy. This, however, it now exercised in its new role as supplier of pig iron and semi-fabricants to the country’s metal fabricators. By restricting sales of pig and diverting incremental output to producing 445,902 tonnes of semi-fabricants it increased prices by half. Worst hit by these measures were the larger engineering shops of the north-western industrial region. They complained bitterly at the price increase and sought government permission to import 164,000 tons of pig iron a year in 1911-12 duty-free. As the rapidly

80 Khromov, Ekonomicheskoe razvitie, p. 457; Tsukernik, Sindikat ‘Prodamet’, p. 189.
81 Lyashchenko, Istoriya, II, pp. 124-5; Gatrell, ‘Industrial expansion’, p. 103; idem, Government, industry and rearmament, pp. 178, 188.
82 Lyashchenko, Istoriya, II, pp. 300-1, 304-5, 317.
83 Gatrell, Tsarist economy, p. 181.
84 Vyatkin, Gornozavodskii Ural, pp. 32-3, 154, 274-5.

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convened Litvinov-Falinskii Committee declared in 1913, however, this
decision to import duty-free pig iron in 1911 ‘had had no effect on the
iron and steel industry’.

Far more important in securing their position was the ability of fabricators to pass on the increased costs of the 1.6
million tonnes of pig iron that they ‘imported’ from southern Russia in higher prices on the defence contracts they now obtained from the
government. Others had different ways of defending their position. In
response to the pig-iron price increase, ‘imports’ to the Volga-Ural region
increased slowly to 482,472 tonnes a year. The production of indigenous
pig iron, however, grew rapidly. A total of 73 operational furnaces in
1913 produced 914,754 tonnes, or 10 per cent more metal than in 1900.
Total supplies of pig iron amounting to 1,397,226 tonnes were thus
available for processing in Martin hearths. By 1913, these numbered
some 69 in all. From these hearths in 1913 poured forth a flood of metal
to the Urals fabricators of semi- and fully finished wares. Moreover,
because of their high level of inter- and intra-enterprise product specializa-
tion, these fabricators enjoyed a greater flexibility than their southern
Russian counterparts in satisfying consumer demand. Only by heavy
cross-subsidization of their semi-fabricates were the latter able to secure
a 13 per cent ‘direct’ share of the non-rail market. The engineering
shops and foundries of north-western and central Russia, by processing
1,449,807 tonnes of raw materials, now shared with Urals producers 87
per cent of Russian non-rail ferrous metal markets.

Following Gerschenkron, historians have long contended that successive
railway construction and defence booms in 1856-60, 1867-1874/80, 1893-
1900, and 1909-13 exerted a dominant influence on Russian ferrous
metal markets. Importers and domestic producers supplying the needs of
the railway companies or defence industries were able to increase sales
about three-fold between 1866-80 and 1910-13. Yet, as will be seen
from table 3, by such means they were able to secure during successive
booms only a share of between 25 and 50 per cent and in intervening
slumps only between 15 and 25 per cent of the total Russian ferrous
metal market. Far more important in the evolution of Russian ferrous
metal markets was the development of non-rail demand. In 1867-80,
supplies dispatched to this market were nearly 50 per cent higher than
those destined for the railways, and sales therein increased six-fold
between 1866-80 and 1910-13. Suppliers of this market, among whom
Urals and central Russian producers were dominant, thereby secured a
total market share of between 75 and 85 per cent in boom conditions
and between 50 and 75 per cent in slumps. These Urals producers sold
Table 3. Railway-defence and non-rail shares of Russian ferrous metal markets, 1861-1913

<table>
<thead>
<tr>
<th>Date</th>
<th>Railway and defence market</th>
<th>Non-rail market</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ural share (%)</td>
<td>R&amp;D share (%)</td>
<td>(m. tonnes)</td>
</tr>
<tr>
<td>1861-6</td>
<td>15</td>
<td>0.04</td>
<td>0.22</td>
</tr>
<tr>
<td>1867-80</td>
<td>1</td>
<td>0.33</td>
<td>0.45</td>
</tr>
<tr>
<td>1881-5</td>
<td>7</td>
<td>0.29</td>
<td>0.43</td>
</tr>
<tr>
<td>1886-94</td>
<td>10</td>
<td>0.26</td>
<td>0.72</td>
</tr>
<tr>
<td>1895-1900</td>
<td>10</td>
<td>1.15</td>
<td>1.15</td>
</tr>
<tr>
<td>1900-9</td>
<td>3</td>
<td>0.37</td>
<td>1.96</td>
</tr>
<tr>
<td>1910-13</td>
<td>14</td>
<td>1.05</td>
<td>2.97</td>
</tr>
</tbody>
</table>

Note: Regional shares (Urals, South) are of sectoral markets. Railway and defence and non-rail totals indicate share of sector in total ferrous metal market. Periods of railway-defence booms are indicated by italics.

Sources: Russia, 1860-75: Khromov, Ekonomicheskoe razvitie, Rossi, p. 456; 1875-96: Keppen, ed., Materiali dlya istorii i statistiki zheleznoi promishlennosti Rossi; 1897-1912: Sbornik statisticheskikh svedenii o gornozavodskoi promishlennosti Rossi. Urals: 1860-1914: as fig. 1

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