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## Ukraine's Agricultural and Industrial Production in the Late 19<sup>th</sup> and Early 20<sup>th</sup> Century: Imperial and Global Context

**Annotation:** The article presents an empirical analysis of Ukraine's agricultural and industrial output and its significance within the Russian imperial and global markets. It underscores the remarkable contribution of Ukrainian provinces to the Russian Empire's economic growth after the 1870s. Although Ukraine comprised just 2% of the empire's land area and 19% of its population, it accounted for an impressive 26% of its cereal output and 42% of its grain exports. Ukraine positioned itself as one of the major grain producers, not just within the Russian Empire and Europe but also globally. By the early 20<sup>th</sup> century, Ukraine had solidified its position in the international food market, earning the title "breadbasket of Europe." Ukraine also emerged as one of the important industrial hubs in Europe, producing 3% of the world's coal, 2% of pig iron, and 4% of steel production. Ukraine's contribution was crucial for fueling industrialization and fostering economic and technological modernization within the Russian Empire, but its economic development was largely based on extractivism.  
**Keywords:** economic history, Ukraine, 19<sup>th</sup> century, extractivism, empires, colonialism

### Produkcja rolno-przemysłowa Ukrainy na przełomie XIX i XX wieku: kontekst imperialny i globalny

**Streszczenie:** Artykuł przedstawia empiryczną analizę ukraińskiej produkcji rolnej i przemysłowej oraz jej znaczenie na rynkach Imperium Rosyjskiego i globalnych. Autor podkreśla wkład prowincji ukraińskich we wzrost gospodarczy Imperium Rosyjskiego począwszy od lat siedemdziesiątych XIX wieku. Chociaż gubernie ukraińskie stanowiły zaledwie 2% powierzchni imperium a ich ludność - 19% populacji, to odpowiadały za imponujące 26% produkcji i 42% eksportu zboża. Gubernie ukraińskie stały się jednymi z głównych producentów zbóż, nie tylko w Imperium Rosyjskim i Europie, ale także na świecie. Na po-

czątku XX wieku tereny te umocniły swoją pozycję na międzynarodowym rynku żywności, zdobywając miano „spichlerza Europy”. Ukraina stała się również jednym z ważniejszych ośrodków przemysłowych w Europie, produkując 3% światowego węgla, 2% żelaza surowego i 4% produkcji stali. Ukraiński wkład był kluczowy dla rozwoju industrializacji i wspierania modernizacji gospodarczej i technologicznej w ramach Imperium Rosyjskiego, ale rozwój gospodarczy guberni ukraińskich opierał się w dużej mierze na ekstraktywizmie.

**Słowa kluczowe:** historia gospodarcza, Ukraina, XIX wiek, ekstraktywizm, imperium, kolonializm.

### Introduction

The Russian invasion of Ukraine in February 2022 intensified the discussions about Ukraine’s colonial status within the Russian Empire.<sup>1</sup> While several scholars presented evidence-based arguments allowing us to interpret the status of the Ukrainian provinces<sup>2</sup> as colonial to the imperial center, a systematic analysis based on comprehensive data is still needed.<sup>3</sup>

Economic development is just one aspect of understanding colonialism and coloniality. Still, discussions about a territory’s colonial status often begin by assessing its uneven economic contributions to the imperial center.<sup>4</sup> For instance, Dominic Lieven, in *The Cambridge History of Russia* (Vol. 2: Imperial Russia, 1689–1917), acknowledges that Russia “would cease to be a great power” without Ukrainian grain, coal, and metal.<sup>5</sup> However, the debates on Ukraine’s colonial status within the Russian Empire and its exploitation as a peripheral entity by the imperial center are often based on fragmented economic indicators. This paper is an empirical study aiming to collate and analyze reliable data on Ukraine’s share in imperial agricultural and industrial production.<sup>6</sup> It aims to provide a more accurate understanding of Ukraine’s role and economic contributions to the Russian Empire.

This article focuses on two strategic sectors: grain production and heavy industry – specifically coal and iron production. In the second half of the 19<sup>th</sup> century, grain

<sup>1</sup> The two previous waves took place in the 1920s and early 1990s. See: S. Velychenko, *The issue of Russian colonialism in Ukrainian thought. Dependency identity and development*, “Ab imperio” 2002, no. 1, 2002.

<sup>2</sup> The article focuses on the part of Ukraine, which was in the Russian Empire during the late 19<sup>th</sup> and early 20<sup>th</sup> centuries. It consisted of nine provinces: Chernihiv, Katerynoslav, Kharkiv, Kherson, Kyiv, Podolia, Poltava, Taurida, and Volhynia.

<sup>3</sup> М. С. Волобуєв, *До проблеми української економіки*, [in:] *Документи українського комунізму*, ред. І. Майстренко, Нью-Йорк 1962, с. 132-230; Б. Винар, *Економічний колоніалізм в Україні та інші праці*, Париж 1958, с. 1-60; S. Bilenky, *Laboratory of Modernity: Ukraine between Empire and Nation, 1772–1914*, Kingston 2023, p. 295-307, та ін.

<sup>4</sup> Lorenzo Veracini distinguishes colonialism and imperialism; “Profits accrue differently under empire and colonialism.... As a general rule, a colony primarily offers profitable trades; an imperial province primarily offers tribute.” See: L. Veracini, *Colonialism: A Global History*, London 2023, p. 3.

<sup>5</sup> D. Lieven, *Russia as empire and periphery*, [in:] *The Cambridge History of Russia: Vo. 2: Imperial Russia, 1689-1917*, ed. D. Lieven, Cambridge 2006, p. 9.

<sup>6</sup> Because the available data on the service sector and crafts are inconsistent and scattered on many sources, these sectors were excluded from the analysis. Livestock and poultry production are not included in this research because only statistics on livestock count were systematically collected. Still, such research is feasible and may be considered for future studies.

emerged as the principal export commodity of the Russian Empire. On the other hand, coal and iron were fundamental to the advancement of modern transportation and industrial sectors, essentially contributing to the technological modernization of the empire.

The data used in this article is sourced from official statistics compiled by various ministries. While the accuracy of this information can be inconsistent across different sectors, it collectively offers a comprehensive overview, making possible a detailed examination of the contributions made by different regions within the empire.<sup>7</sup>

### **Context: The Imperial Economic Development from 1870 to 1914**

Between 1870 and 1914, the Russian Empire experienced a period of significant economic development, though it was marked by considerable controversies. The predominantly agricultural empire embarked on rapid industrialization inspired by Western European models. The state sought to modernize the economy, but this ambitious pursuit faced many challenges.

Industrialization was facilitated by population growth, increased consumption per capita, and productivity gains, as indicated by the rising GDP. Russian industries experienced steady growth between 1885 and 1915, interrupted only in 1905.<sup>8</sup> Various expert estimates of the industrial development index reflect the high growth level in industrial production, which was sustained after 1885.<sup>9</sup>

The main result of imperial industrialization in the late 19<sup>th</sup> century was the creation of heavy industry. It became the basis for the formation of modern industry, characterized by regional specialization, the dominance of the factory and corporate organizational forms, the use of machines, and inanimate energy sources.<sup>10</sup>

Among the major controversies of imperial industrialization were the harsh conditions the emerging working class faced. The peasants migrated to cities to seek employment in the mushrooming factories were met with low wages, long working hours, and poor living conditions. This exploitation led to widespread dissatisfaction, labor strikes, and the rise of radical movements advocating for workers' rights and social reforms.<sup>11</sup>

The economic policies of the time were another source of controversy. Finance Minister Sergei Witte implemented policies aimed at rapid industrialization, emphasizing the expansion of railways, the growth of heavy industry, and the attraction of foreign investments.<sup>12</sup> While these measures led to significant industrial development, they also resulted in increased national debt and a focus on the industrialists and urban middle classes, further marginalizing the peasants.

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<sup>7</sup> И. Д. Ковальченко и др., *Массовые источники по социально-экономической истории России периода капитализма*, Москва 1979.

<sup>8</sup> С. В. Смирнов, *Динамика промышленного производства и экономический цикл в СССР и России, 1861–2012*, Москва 2012, с. 69.

<sup>9</sup> P. R. Gregory, *Russian national income, 1885–1913*, Cambridge 2004.

<sup>10</sup> С. В. Воронкова, *Российская промышленность начала XX века: источники и методы изучения*, Москва 1996.

<sup>11</sup> C. Wynn, *Workers, strikes, and pogroms: the Donbass-Dnepr Bend in late imperial Russia, 1870–1905*, Princeton 2014.

<sup>12</sup> P. Gatrell, *Government, industry and rearmament in Russia, 1900–1914: The last argument of tsarism*, Cambridge 1994.

Land ownership and agriculture remained contentious issues. The peasants, comprising most of the Russian population, faced land shortages, and the entire agricultural sector, despite some progress, suffered from low productivity. In the early 20<sup>th</sup> century, the contemporaries labeled the set of systematic problems in the agricultural sector as “agrarian crises.” This crisis encompassed rising land prices, mounting tax debts for peasants, and reduced productive lands per peasant household. Aleksandr Kaufman described the agrarian crisis as a triad: rural overpopulation, land scarcity, and low peasant agriculture productivity.<sup>13</sup>

Soviet historians expanded on this, noting the increasing incidents of peasant collective violence, seeing it as a sign of the crisis. Since 1861, peasants were discontented with their land allocations, and as the population surged, the average land size per household shrunk.<sup>14</sup> This disparity in land distribution heightened economic inequality and gave rise to “agrarian overpopulation.” This term implied that the economy couldn’t leverage all its human capital due to underdeveloped peasant agriculture, leading to hidden unemployment.<sup>15</sup> Solutions to this problem ranged from acquiring more land from the nobility to enhancing land productivity through more advanced crop rotation systems, using machines, and applying fertilizers.

While there were improvements in the peasant economy between 1861 and 1917, with increased productivity and production, these advancements were insufficient to resolve the “agrarian crisis.” The transfer of lands from the nobility to peasants did not meet the demand for productive lands. And while agriculture’s productivity rose, employing the entire peasant workforce was not enough. However, many peasants found employment in the rapidly developing mining and manufacturing sectors in Eastern Ukraine from the 1880s onwards.

How successful economic development was in the Russian Empire before World War I is a debated topic in economic history research. Alexander Gerschenkron argued that the Russian late 19<sup>th</sup>- and early 20<sup>th</sup>-century economy was backward and deviation from European norms. He argued that the country’s capital and bank credit scarcity was a major obstacle to industrialization.<sup>16</sup> In contrast, scholars like Paul Gregory pointed out the significant progress made by the Russian imperial economy after the 1870s.<sup>17</sup>

Positive interpretations of the late Tsarist era have emphasized Russia’s impressive GDP growth, resulting in modern economic growth and the integration of the Russian economy into the global economy. By 1913, the Russian Empire became the fourth largest economy in the world with 265 billion 1990 international GK dollars versus 568 in the United Kingdom, 528 in the United States, and 288 in Germany.<sup>18</sup>

However, despite the progress in Russian agricultural and industrial develop-

<sup>13</sup> А. А. Кауфман, *Аграрный вопрос в России. Т. 1: Земельные отношения и земельная политика*, Москва 1908, с. 135.

<sup>14</sup> В. П. Теплицький, *Реформа 1861 року і аграрні відносини на Україні 60–90-ті роки XIX ст.*, Київ 1959.

<sup>15</sup> S. L. Hoch, *On good numbers and bad: Malthus, population trends and peasant standard of living in late imperial Russia*, “Slavic Review” 53, no. 1, 1994.

<sup>16</sup> A. Gerschenkron, *Economic Backwardness in Historical Perspective*, Cambridge 1962, p. 17.

<sup>17</sup> P. R. Gregory, *Ibid.*

<sup>18</sup> Based on estimated imperial GDP from S. Broadberry, K. O’Rourke, *The Cambridge Economic History of Modern Europe*, vol. 2: 1870 to the present, Cambridge 2010, p. 34.

ment during the late 19<sup>th</sup> and early 20<sup>th</sup> centuries, the country's income per capita remained relatively low. Between 1885 and 1913, Russia's GDP per capita stood at \$111, in contrast to the world average of \$154 (1990 Int. GK \$). This figure was merely 40% of those of Germany and France, 27% of the United States, and 26% of Britain.<sup>19</sup> This disparity in GDP, juxtaposed with rapid industrial advancement, can be attributed to Russia's population growth, which outpaced that of Western Europe. Consequently, while industrialization was on the rise, the benefits were distributed across a rapidly expanding population, dampening the per capita income figures.

### Agriculture

The agricultural statistics reveal the empire's strategic utilization of Ukrainian provinces to bolster its economic growth and facilitate modernization. From the 1870s, there was a conspicuous surge in the cultivation of arable land within Ukraine, particularly directed towards cereal crops. The arable lands increased from 23.5 million ha in 1881 to 29.5 million in 1889, constituting 65% of all lands (except for roads, lakes, etc.). After that, arable land increased slowly to 31.9 million ha by 1917.<sup>20</sup> According to the agricultural census of 1917, arable land accounted for 73% of the total land area in five gubernias (Volhynia, Katerynoslav, Kyiv, Poltava, Chernihiv).<sup>21</sup>

This expansion was not merely organic but rather indicative of an imperial drive to harness the fertile lands of the region for economic profit, which can be interpreted as agro-extractivism.<sup>22</sup> Especially in the 1880s, when arable lands rose significantly, it is evident that the provinces of Katerynoslav, Taurida, and Kherson were specifically targeted to maximize agricultural output. The comparison with European countries further accentuates Ukraine's exceptional degree of land cultivation, marking its vital role in the imperial agrarian economy. For instance, the share of arable lands in Hungary in 1910 was 44%, in France in 1910 was 45%, and in Germany in 1900 was 48%.<sup>23</sup>

The livestock trends, a decline in sheep due to a reduction in pastures and a rise in cattle and pigs fed by fodder grains, underscore the empire's tactical reorientation of resources for maximizing export-oriented agricultural commodities.<sup>24</sup> By the beginning of the 20<sup>th</sup> century, all available land was already cultivated in Ukraine, especially in the *chernozem* area.<sup>25</sup> According to the *Zemstvo* census in Poltava province in 1900, farms below 50 ha cultivated 79% of the land in their use, while farms with over 50 ha cultivated 58%. However, by 1910, large farms reached 80% by reducing pastures, and small farms

<sup>19</sup> Source: A. Maddison *The Maddison-Project*, 2013. Retrieved from: <https://www.rug.nl/ggdc/historicaldevelopment/maddison>. For the period before the 1880s, see S. Broadberry, E. Korchmina, *Catching-up and falling behind: Russian economic growth, 1690s-1880s.*, "CEPR Discussion Papers" no. 17458, 2022.

<sup>20</sup> М. Б. Гуревич и др., *Сельское хозяйство Украины*, Харьков 1923, с. 45.

<sup>21</sup> С. Л. Перельман, *Поуездные итоги Всероссийской сельскохозяйственной переписи 1917 года по 57 губерниям и областям*, Москва 1923.

<sup>22</sup> C. W. Chagnon et al., *From extractivism to global extractivism: The evolution of an organizing concept*, "The Journal of Peasant Studies" 49, no. 4, 2022, p. 760-792.

<sup>23</sup> *Сборник статистико-экономических сведений по сельскому хозяйству России и иностранных государств*. Год 10-й, ред. Я. Ф. Ставровский, В. В. Алексеев, Ф. Ф. Багров, Петроград 1917, с. 2-3.

<sup>24</sup> М. Б. Гуревич, *Указ соч.*, с. 197.

<sup>25</sup> А. Н. Краснов, *Материалы для флоры Полтавской губернии*, Харьков 1891, с. 6.

cultivated over 85% of their land.<sup>26</sup> Such intense exploitation also signaled the onset of overexploitation, with almost all possible lands under cultivation. The empire's reliance on Ukraine's provinces was a strategic move to tap into its rich resources to achieve broader economic and modernization goals.

In the early 20<sup>th</sup> century, scholars such as Vitaly Morachevsky and Aleksandr Chelitsev already recognized the shift of the agricultural production center from central provinces to the South during the last quarter of the 19<sup>th</sup> century.<sup>27</sup> In contemporary literature, such transitions are commonly referred to as "commodity frontiers," denoting expanding zones of extraction and production meeting global demand for commodities. Production relocates to new, often peripheral regions as resources in older extraction areas deplete or become less accessible or profitable. These frontiers are marked by swift environmental transformation, changes in land use, and, frequently, social disruptions.<sup>28</sup>

With such many arable lands and crop yields 15% higher than on average in European Russia, Ukraine was well positioned to produce a high amount of grain.<sup>29</sup> Between 1909 and 1913, Ukrainian provinces alone grew an average of 19.4 million tons of main cereals (wheat, barley, rye, oats). In comparison, 51 provinces of European Russia (including Ukrainian) produced 60.3 million tons, with the total production of the Russian Empire reaching 75.8 million tons.<sup>30</sup> While encompassing just 11% of the land area and 25% of the population, Ukrainian provinces accounted for 32% of European Russia's total cereal output and 26% of the empire's entirety. Moreover, as Table 1 demonstrates, the share of Ukrainian cereal production grew in the early 20<sup>th</sup> century.

Table 1. Gross production of food and fodder cereals, average in the five years, in thousand tons<sup>31</sup>.

Years	Ukraine	European Russia	Share of Ukraine
1901-05	16,809		
1906-10	16,704	5,255	32%
1911-15	21,861	58,530	37%

How much of the grain produced in Ukraine was used locally, and how much was left for the market? The "Grain Production, Consumption, and Transportation in Russia: 1909–1913" study provides comprehensive data on grain distribution via rail and waterways. This research distinguishes between grain production and consumption, marking the difference as either surplus or deficit. According to this study, every Ukrainian province had a grain trade surplus, highlighting their role in both the domes-

<sup>26</sup> Г. Ротмистров, *Статистический справочник по Полтавской губернии на 1916 год*, Полтава 1916, с. 53.

<sup>27</sup> В. В. Морачевский, *Земледельческий центр и юг Европейской России. Общая характеристика областного района в естественно-историческом и статистико-экономическом отношениях*, С.-Петербург 1911; А. Н. Челинцев, *Русское сельское хозяйство перед революцией*, Москва 1928.

<sup>28</sup> S. Beckert, U. Bosma, M. Schneider, E. Vanhaute, *Commodity frontiers and the transformation of the global countryside: a research agenda*, "Journal of Global History" 16, no. 3, 2021.

<sup>29</sup> М. Б. Гуревич, *Указ соч.*, с. 168–181.

<sup>30</sup> *Статистический ежегодник России 1914 г. Год 11-й*, Центр. стат. ком. МВД, Петроград 1915.

<sup>31</sup> А. Я. Альтерман, *Хлебные ресурсы Украины*, Одесса 1923, с. 49; *М-во земледелия, Указ соч.*, с. 35, 61.

tic imperial and global markets. Specifically, they contributed 75% of the empire's rye surplus, 71% wheat, 54% barley, and 14% oats (Table 2). In total, they produced 58% of all primary cereals. The southern provinces of Ukraine were particularly noteworthy, generating 77% of Ukraine's grain surplus and 45% of the entire empire's surplus. Notably, the Ukrainian provinces had abundant major cereals, with wheat and barley standing out as the Russian Empire's main export items.

Table 2 Surpluses and deficits of the main cereals in 1909–1913, in thousand tons<sup>32</sup>

Province	Rye	Wheat	Barley	Oats	All
Kherson	178.7	651.9	949.6	-23.4	1,756.8
Katerynoslav	38.4	818.1	471.4	-8.4	1,319.5
Taurida	58.5	757.7	404.2	-7.8	1,212.6
Poltava	140.2	275.3	22.0	118.8	556.3
Kharkiv	40.3	219.2	52.3	32.9	344.7
Podolia	14.6	139.0	32.7	0.0	186.2
Kyiv	28.0	96.3	39.4	-10.8	153.0
Volhynia	-0.7	31.7	12.0	-20.2	22.9
Chernihiv	-8.3	-45.7	-0.4	70.7	16.3
Ukraine totally	489.8	2,943.5	1,983.4	151.7	5,568.4
The Russian Empire	651.7	4,174.8	3,700.3	1,062.5	9,589.3

What portion of Ukrainian grain was exported, and what was Ukraine's contribution to the overall grain exports of the Russian Empire? While we do not have an exact figure, there are some available data regarding grain exports through Ukrainian ports. From 1909 to 1911, an average of 4.9 million tons of wheat, rye, barley, and oats was sent yearly through land customs points and ports in Ukraine.<sup>33</sup> However, not all Ukrainian grain was shipped solely through these ports; some were exported through other ports within the Russian Empire or via land routes. Additionally, Ukrainian ports handled grain produced in other provinces of European Russia, not just in Ukrainian provinces.

According to Abram Alterman's calculations, in the period from 1909–13, Ukrainian ports were responsible for shipping about 4.3 million tons of wheat, rye, barley, and oats grown in Ukraine annually (ca. 89% of all grain exported through Ukrainian ports), while land customs points handled 0.3 million tons. This sums up to approximately 4.6 million tons of Ukrainian grain being exported.<sup>34</sup> In the same period, the Russian Empire exported 11.1 million tons of wheat, barley, rye, and oats annually,

<sup>32</sup> Е. Е. Яшнов, *Производство, перевозки и потребление хлебов в России. 1909–1913 гг.* Вып. 1: Рожь, пшеница, ячмень, овес, Петроград 1916.

<sup>33</sup> А. Я. Альгерман, *Указ соч.*, с. 73.

<sup>34</sup> *Ibid*, p. 73–74.

meaning that the share of Ukraine was 42%<sup>35</sup>. Moreover, the amount of grain produced in Ukraine was noticeable even globally. Table 3 demonstrates that Ukraine contributed 23% of the global grain trade. Just a single Kherson province exported 7.3% of the global grain market.

Table 3. Global grain trade in 1908–12 and the share of Ukraine, average per year in million tons<sup>36</sup>

	Global	Russian Empire	Ukraine	Ukraine's share in world trade
Wheat	14.2	4.0	2.9	21%
Rye	1.8	0.8	0.5	28%
Barley	5.4	3.6	2.0	37%
Oats	2.8	1.3	0.2	5%
Total	24.2	9.7	5.6	23%

Around 90% of Ukrainian grain was exported to global markets via five ports on the Black Sea and the Azov Sea: Mykolaiv, Kherson, Odesa, Berdyansk, and Feodosia (Table 4). All five ports played a significant role in exporting grain to England, Germany, and the Netherlands. However, each port also developed some specialization in its trade with other countries. Specifically, the port of Mykolaiv shipped a noticeable amount of grain to France (12.6%). Meanwhile, the port of Kherson focused on exports to Gibraltar, and Odesa had a notable share going to Turkey (4.5%). As for the port of Berdyansk, it directed 21.3% of its grain export to Italy and 23.6% to France. Lastly, the port of Feodosia's important destinations were France (11.6%) and Gibraltar (5.5%).<sup>37</sup>

Table 4. Annual export of wheat, barley, rye, and oats in 1909–13, in thousand tons<sup>38</sup>.

	Mykolaiv	Kherson	Odesa	Berdyansk	Feodosia	Five ports
Wheat	672	398	242	398	264	1,974
Rye	136	87	86	3	6	317
Barley	723	370	437	99	86	1,715
Oats	112	3	1	3	4	123
Total	1,644	858	767	502	359	4,129
Share	40%	21%	19%	12%	9%	100%

<sup>35</sup> *Денежные объемы экспорта «главнейших» товаров и товарных групп. 1802–1917* (сост. Т. Я. Валегов), доступ на странице: [http://www.hist.msu.ru/Dynamics/data/10\\_001.xls](http://www.hist.msu.ru/Dynamics/data/10_001.xls).

<sup>36</sup> В. Э. Ден, *Положение России в мировой хозяйстве. Анализ русского экспорта до войны*, Петроград 1922, с. 54–55; Е. Е. Яшнов, *Указ соч.*

<sup>37</sup> А. Я. Альтерман, *Указ соч.*, с. 76.

<sup>38</sup> *Ibid*, p. 76.



During the early 1910s, Germany and the Netherlands were the primary importers of Ukrainian grain, with shares of 29.2% and 26.8%, respectively. But a significant portion of the grain imported by the Netherlands was later redirected to Germany. Consequently, Germany was the main recipient of Ukrainian grain during that period, importing about half of the total.

The import patterns varied depending on the type of grain. In 1912, England ranked first in importing Ukrainian wheat with 33.2%, followed by the Netherlands with 25.1%, and France with 22.1%. For barley and rye, Germany and the Netherlands together accounted for over 75% of the imports, while France dominated the oat imports at 55.6%, and Italy took a smaller share at 17.8%.<sup>39</sup>

Ukraine's grain production and trade positioned it as a major producer within the Russian Empire, Europe, and on the global stage. By the 1890s, Ukraine had become essential to the global food market, gaining the brand "breadbasket of Europe."<sup>40</sup> However, recently, concerns were raised over this term, suggesting it perpetuates the notion of "resourcification" – viewing Ukraine merely as a resource for more industrialized and developed countries.<sup>41</sup>

### Industry

During the first half of the 19<sup>th</sup> century, the role of industry in Ukraine's economy was relatively limited, with agriculture being the primary economic activity. Before the Second Industrial Revolution in the late 1880s, industrial operations in Ukraine were primarily small-scale and part-time. The enterprises were often family-run and typically employed 15-20 workers, illustrating the prevalence of small-scale operations during this period.<sup>42</sup>

While the First Industrial Revolution was centered on the textile industry and steam engine technology, the Second Industrial Revolution revolved around steel, railroads, petroleum, and chemicals. The coal and iron production in Ukraine increased significantly after 1870. The intensive construction of rail transport was one of the most important factors enabling the industrial boom of the 1880s. The emergence of the rail network allowed the industrialists to choose sites closer to the sources of raw materials. The railroads significantly decreased transport costs, largely contributing to the diffusion of raw materials, machines, and goods.

Rail transport also served as an economic stimulus for industry and the service sector. Maintaining railroads required an army of mechanics, metallurgists, miners, and construction workers. Rail transport necessitated the standardization of time and the introduction of time zones.<sup>43</sup> Railroads became the largest enterprises of the 19<sup>th</sup> century, drawing on substantial financial, intellectual, and human resources.

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<sup>39</sup> Ibid, p. 77–79.

<sup>40</sup> The term began to be applied to Ukraine in this precise wording in the 1940s.

<sup>41</sup> A. Bazdyrieva, *No Milk, No Love*, "E-flux Journal" Issue 127 (May 2022). Retrieved from: <https://www.e-flux.com/journal/127/465214/no-milk-no-love>.

<sup>42</sup> *Статистический вѣстникъ Россійской имперіи*, серия 1, Центр. стат. ком. МВД, С.-Петербург 1866, с. 54–56; *Свод данных о фабрично-заводской промышленности в России за 1885–1887 годы*, Департамент Торговли и мануфактур, С.-Петербург 1889. с. 10 и след.

<sup>43</sup> W. Schivelbusch, *The Railway Journey: The Industrialization and Perception of Time and Space*, Berkeley 1986.

The development of railroads not only integrated various regions of Ukraine into a single market but also strengthened its ties with Russia. Through these railroads, Ukraine exported its natural resources to the Russian provinces, while Russia sent its workforce and goods to Ukraine. Serhiy Bilenky interprets this exchange as a significant factor that underscores arguments about Ukraine's colonial status. Bilenky additionally pointed out that the railroads shifted trade dynamics within Ukraine. Smaller fairs throughout the country diminished as bulk trading became centralized in major cities, where Russian merchants largely dominated commerce.<sup>44</sup>

The introduction of rail transport played a pivotal role in boosting the growth of heavy industry in Ukraine. The establishment of railway networks directly influenced the expansion of large-scale iron and steel production and the increased utilization of machinery in production processes. Especially important in this respect was the Katherine Railroad, constructed between 1880 and 1884, which linked the coal reserves of the Donets River Basin (Donbas) to the iron ore deposits in Kryvyi Rih (Kryvbas).<sup>45</sup> This strategic connection of coal and iron ore, facilitated by modern transportation methods, enabled a comprehensive production cycle of iron, steel, and rolled metal products within Ukraine.

The discovery of coal and iron ore deposits in Eastern Ukraine can be traced back to the 18<sup>th</sup> century, and they were mapped in the first half of the 19<sup>th</sup> century.<sup>46</sup> However, it was not until the introduction of rail transport that the region began to produce coal and metal on an industrial scale. Railways did not just spur the establishment of large modern corporations that started mass industrial production but also became the leading consumer of Eastern Ukraine's heavy industry outputs.

The period from 1871 to 1915 marked an era of exponential, though inconsistent, growth in coal, iron ore, and metal production in Ukraine. Fluctuations in output were attributed to changes in state economic policies, labor movements, and global economic cycles.<sup>47</sup> Despite these, the industries remained highly concentrated, amplifying production scale effects, aided by a narrow market focus and technological and managerial innovations.

After the intensive industrial growth in the 1890s in Ukraine, the last year of the 19<sup>th</sup> century was marked by the decline of heavy industry. The young heavy industry was unprepared for the crisis in the early 1900s. Many new enterprises were just over or still in their construction process. In addition, the government cut down funding for the railway construction program and consequently reduced its purchases of metallurgical products.<sup>48</sup> In 1902, at the lowest point of economic decline, the government ordered

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<sup>44</sup> S. Bilenky, *Ibid*, p. 306.

<sup>45</sup> *Россия на Всемирной выставке в Париже в 1900 г.*, С.-Петербург 1900, с. 80.

<sup>46</sup> П. И. Фомин, *Горная и горнозаводская промышленность юга России*, т. 1: *История горной и горнозаводской промышленности юга России со времени возникновения до восьмидесятых годов прошлого века*, Харьков 1915, с. 4; Н. К. Фукс, *Из истории познания Донецкого каменноугольного бассейна*, Харьков 1923; М. А. Воропаев, В. И. Нечволодов, Г. Г. Берст, *По Екатерининской железной дороге*, Екатеринослав 1903, с. 5.

<sup>47</sup> *Общий обзор главных отраслей горной и горнозаводской промышленности*, Петроград 1915, с. 242; Г. Д. Бакулев, *Развитие угольной промышленности Донецкого бассейна*, Москва 1955, с. 118.

<sup>48</sup> *Сборник статистических сведений о горнозаводской промышленности России. 1908 г.: Общий обзор*, Горный ученый комитет, Петроград 1917, с. 452.

railways from no more than six firms: the New Russia Company, Donets Steel, Russo-Belgian, Briansk, South-Dnieper, and Taganrog.<sup>49</sup> The decline in government purchases prompted entrepreneurs to explore new markets within Russia and internationally. Ironworks from Eastern Ukraine began exporting rails to Romania, Italy, Denmark, Bulgaria, China, Japan, India, and several other countries.<sup>50</sup> In 1905, the Russian Empire exported 7,355 tons of rails, but by 1910, this figure had grown to 68,567 tons.<sup>51</sup>

The contribution of Eastern Ukraine to the Russian Empire's overall coal and metal production increased significantly after 1870. In the 1860s, Eastern Ukraine, particularly the Donbas region, accounted for a third of the empire's total coal output. This figure nearly doubled in the subsequent two decades, with the region contributing over half of the total production post-1890 (Table 5). This dramatic increase underscores the pivotal role Eastern Ukraine played in the industrial spur of the Russian Empire, marking it as a cornerstone for coal and metallurgy production.

Table 5. Share of industrial production from Eastern Ukraine relative to the total imperial output during 1871–1915<sup>52</sup>.

Years	Coal	Iron Ore	Pig Iron	Rolled Metal
1871-80	46%	n/a	4%	4%
1881-90	46%	21%	13%	8%
1891-00	59%	45%	43%	33%
1901-10	67%	67%	62%	50%
1911-15	72%	71%	69%	58%

The expansion of production and construction of new metallurgical plants in the 1890s boosted Eastern Ukraine's output to half of the empire's total pig iron and rolled products. By 1914, Eastern Ukraine was the primary source, delivering almost three-quarters of coal and iron ore and over half of pig iron and rolled products to the Russian Empire.

Despite these advancements, international comparisons in the early 20<sup>th</sup> century illustrated the Russian Empire's modest production. Thanks to the high growth rates of heavy industry, the Russian Empire moved from sixth place among the largest producers of coal and iron in 1870 to fourth place in 1913, surpassing Belgium and Austro-

<sup>49</sup> J. P. McKay, *Pioneers for Profit: Foreign Entrepreneurship and Russian Industrialization, 1885–1913*, Chicago 1970, p. 272.

<sup>50</sup> Е. Н. Дик, *Промышленный экспорт России на нетрадиционных рынках в начале XX века*, "Отечественная история" № 4, 1993, с. 153–58.

<sup>51</sup> П. И. Фомин, *Металлопромышленность Украины. Труды Комиссии по металлу при Госплане УССР*, т. 19, № 2, Харьков 1926, с. 17.

<sup>52</sup> *Каменноугольная промышленность России в 1915 г.*, вып. 1: *ежемесячная статистика*,/ред. Н.Ф. фон Дитмар, Харьков 1916, с. 80; *Железрудная промышленность Южной России в 1912 г.*/ред. Н.Ф. фон Дитмар, Харьков 1913, с. 34; *Железная промышленность Южной России в 1915 г.*, Харьков 1917, с. 87.

Hungary. However, even in 1913, when the Russian imperial economy reached its zenith, the country produced 14 times less coal than the United States and eight times less than Britain or Germany. At that time, the United States made five times, Germany four times, and Britain twice as much steel and iron as the Russian Empire.<sup>53</sup>

Transport infrastructure lag and the population's low purchasing power were the impediments to industrial growth. The Russian Empire had lower industrialization and railway density compared to Western economies. However, the Katerynoslav province, hosting most of the largest industrial enterprises of Ukraine, boasted the densest railway network in the empire.<sup>54</sup>

The integration of Ukraine into the Russian imperial economic system had an ambivalent impact on the development of Ukrainian heavy industry. It opened opportunities for selling products on one of the world's largest national markets, but at the same time, Ukraine's industrialists had to fiercely compete for this market with producers from other economic regions of the Russian Empire.

Compared to heavy industry, manufacturing in Ukraine experienced slower growth after the 1870s. However, during the economic crisis of 1900–03, it was less adversely affected than the ironmaking sector. During this period, the growth rate of the light industry surpassed that of the heavy industry.<sup>55</sup>

Starting from the late 1880s, Ukraine's industrial development underwent structural changes. Manufacturing evolved to be dominated by factory production, becoming the leading mode of industrial organization. For instance, in Katerynoslav province in 1895, factories with steam engines accounted for over 90% of production and 77% of the workforce, even though they comprised only 60% of the total enterprises.<sup>56</sup>

Still, Ukraine's contribution to manufacturing was relatively modest compared to its role in heavy industry. Data from three industrial censuses in the early 20<sup>th</sup> century showed that Ukraine's industry represented up to 10% of the imperial workforce and 11% of goods in monetary terms (Table 5). Although some sectors were developed better: Ukraine was responsible for 35% of food processing and 23% of metalworking output.<sup>57</sup>

Table 6. Basic indices of industrial development (heavy industry excluded) in Ukraine<sup>58</sup>.

	Year 1900	Year 1908	Year 1912
Production in million rubles	566	865	943
Percentage of production of the Russian Empire	18%	18%	17%

<sup>53</sup> S. Broadberry, K. O'Rourke, *Ibid.*, p. 75.

<sup>54</sup> *Статистический ежегодник России за 1913 год*, С.-Петербург 1914., отд. XI, с. 17–19.

<sup>55</sup> Д. П. Маккей, *Развитие экономики и региональное предпринимательство в последний период Российской империи*, [in:] *Реформы или революция? Россия 1861–1917*, ред. В. С. Дякин, С.-Петербург 1992, с. 220.

<sup>56</sup> С. В. Воронкова, *Российская промышленность начала XX века: Источники и методы изучения*, Москва 1996, с. 124.

<sup>57</sup> С. В. Воронкова, *Указ соч.*, с. 110.

<sup>58</sup> С. В. Воронкова, *Указ соч.* 1, с. 195–98. Based on the regions defined as "Southern" and "South-western" which besides the Ukrainian provinces included Bessarabia and Don Host Oblast.

Number of workers in thousand	314	397	409
Percentage of workers of the Russian Empire	15%	17%	17%

Compared to extractive industries, the modest growth of the manufacturing industry can be attributed to the Tsarist government's strategic focus on the former, viewing it as crucial for national security and economic modernization. The prioritizing of the extractive economy resulted in imbalanced development across various sectors within Ukraine. The mineral-rich southeastern provinces of Katerynoslav and Kherson became industrial powerhouses, hosting major mining and metalworking activities. In contrast, the central and western provinces mainly focused on food processing, especially sugar beet processing and flour milling. Overall, raw material extraction and food processing overshadowed the production of finished goods in Ukraine.<sup>59</sup>

### Concluding Remarks

The article presents an empirical analysis of Ukraine's agricultural and industrial output and its significance within the Russian imperial and global markets. From the 1870s, the empire strategically utilized Ukraine's fertile lands, resulting in a noticeable increase in the cultivation of arable lands for cereal crops. It underscores the remarkable contribution of Ukrainian provinces to the Russian Empire's economic growth after the 1870s. Although Ukraine comprised just 2% of the empire's land area and 19% of its population, it accounted for an impressive 26% of its cereal output and 42% of its grain exports (Table 7). Ukraine positioned itself as one of the major grain producers, not just within the Russian Empire and Europe but also globally. By the early 20<sup>th</sup> century, Ukraine had solidified its position in the international food market, earning the title "breadbasket of Europe."

Table 7. Agricultural and industrial production of the Ukrainian provinces of the Russian Empire in the 1910s<sup>60</sup>.

	Year of observation	Ukraine	% of European Russia	% of the Russian Empire
Surface area, sq. kilometers	1913	483,730	11%	2%
Population, thousand	1913	31,789	25%	19%
Agriculture				
Major cereals, thousand tons	1909–13	19,411	32%	26%
Cereal export, thousand tons	1909–13	4,609		42%
Manufacturing				
Manufacturing enterprises	1913	8262		15%

<sup>59</sup> S. Bilenky, *Ibid*, p. 300.

<sup>60</sup> *Статистический ежегодник России 1914 г. Год 11-й.*, Центр. стат. ком. МВД, Петроград 1915; Sources for the tables 1 and 5.

Manufacturing production, million rubles	1913	701		13%
Workers in manufacturing, thousands	1913	625		16%
Heavy industry				
Coal, thousand tons	1911–15	24,165		72%
Pig iron, thousand tons	1911–15	2,832		69%
Rolled metal, thousand tons	1911–15	2,136		58%

Ukraine also emerged as one of the important industrial hubs in Europe, producing 3% of the world's coal, 2% of pig iron, and 4% of steel production. Railroads played a pivotal role, connecting rich coal and iron deposits, catalyzing large-scale industrial production, and integrating Ukraine into the empire's economic system. However, while extractive industries flourished, manufacturing witnessed a slower growth rate in Ukraine.

Ukraine's contribution to the imperial economic growth and the carbon-fueled industrialization came at a significant cost. To position the Russian Empire as the leading global cereal commodity trader, Ukraine embraced the agro-extractive model and had almost depleted its fertile lands through extensive cultivation by the early 20<sup>th</sup> century. Moreover, Ukraine extracted thousands of tons of minerals, including coal and iron, to fuel and forge imperial technological modernization. Such an insatiable appetite for resources not only sparked a social crisis and environmental disasters in Ukraine but also firmly established extractivism as the predominant principle of economic development for the ensuing decades.

The materials presented in the article can serve as an empirical foundation for further discussion regarding the economic significance of Ukraine within Russia's grand strategy. This involves examining how the empire struggled to keep a position as a superpower in the global system and exploring its consequences for both human and non-human actors in Ukraine.

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