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The paper is devoted to Yuli Zhukovsky — the 19th-century Russian publicist who represented the economic thought of “thick journals”. Zhukovsky demonstrated both traits that W. S. Jevons attributed to marginalism, namely the use of mathematical apparatus and the subjective value theory. Believing that he was following “the Smithian approach”, Zhukovsky advocated for the application of mathematics in political economy as it would increase the rigour of the discipline. Zhukovsky was also receptive of Bentham’s philosophy of utilitarianism, which brought him to acknowledge the subjective value theory. The eclectic combination of contemporary developments in political economy and the perception of utility as the fundamental driver of human nature brought Zhukovsky closer to the formulation of the contemporary neoclassical approach in economics.

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Section 1: Introduction

The contemporary history of economic science regards the marginalist revolution (1871) as a turning point in the development of economic science. The change in methodology was so fundamental that the science itself had to change its name from “political economy” to “economics” (Groenewegen, 1991). Piero Sraffa characterised the process as a transformation from a “picture of the system of production and consumption as a circular process” (political economy) into “a one-way avenue from the factors of production to consumption goods” (marginalism) (Sraffa, 1960, p. 93). Compared to political economy, marginalism (and later neoclassical economics) implied methodological individualism (compared to the holistic approach in political economy), focused on the static equilibrium (rather than dynamic analysis in political economy), and introduced the concept of rationality and the application of mathematics.

However, the revolutionary nature of the transformation in question is disputed in the modern literature. First, the transition was not uniform across different countries, since the predecessors of marginalism appeared both in the Old and the New World (Ekelund, Hébert, 2002). Second, it took several decades for academia to accept the marginalist approach as mainstream (Blaug, 1972). Third, the elements of the analytical approach advanced by marginalist authors had been known before 1871. William Stanley Jevons, one of the leaders of the marginalist revolution, was the first to present a systematic analysis of his predecessors (i.e., proto-marginalists, even if he did not use the term). His classification of proto-marginalist theories was based on the application of mathematical methods and “true theory” — the subjective value theory. According to Jevons, there were only two economists (Jules Dupuit and Hermann Heinrich Gossen) who demonstrated both elements in their research (Jevons, 1879, pp. x-lvii).

This paper considers the case of Yuli Zhukovsky, a Russian publicist and self-taught economist, who was not known to Jevons, but who also demonstrated elements of the proto-marginalist approach in his works.

Economic science in Russia in the 19th century was strongly influenced by Western ideas, precisely the theories of the Classical school (Avtonomov, 2002, 2021). Contemporaries described academic Russian economic thought before the 1860s as “extractions from Adam Smith” (Ivanyukov, 1891, p. 59). However, the rise of the literary (or “thick”) journals (e.g., *Sovremennik*) allowed for a change in the dominating school of thought.

The mid-19th century was characterised by public discussions sparked by the humiliating defeat in the Crimean War (1853-1856) and the death of Nicholas I in 1855 (Gorizontov, 2012). The

debates continued with the discussion and implementation of the “Great Reforms” of Alexander II, which included fundamental institutional changes, the most significant of which was the abolition of serfdom in 1861 (i.e., the Emancipation reform). The significant relaxing of censorship restrictions in the early years of Alexander II’s reign, associated with the liberal policy of the Minister of Education, Alexander Golovnin (1861-1866), contributed to the development of “thick journals” (Ruud, 1972). Thus, in the late 1850s and early 1860s under conditions of limited political activity “thick journals” became the main public forum in Russia (Belknap, 1997).

These public discussions allowed new socio-economic ideas to propagate including novel theories in political economy. Accordingly, “thick journals” soon became a valid institution of economic knowledge competing with academia represented by universities, professors, books, textbooks, and lectures. Journals made it possible to move away from the classical dogma of academic science, explore contemporary western ideas (e.g., Marxism), and propose original views of economic development (e.g., the Narodnik movement).

Zhukovsky was one of the publicists who represented the economic thought of “thick journals”. Notably, his works demonstrated both traits that Jevons attributed to marginalism. Firstly, Zhukovsky, believing that he was following “the Smithian approach”, advocated for an abstract methodology based on logical reasoning (Zhukovsky, 1871, p. 390) with the application of the mathematics as its epitome (Zhukovsky, 1909, pp. XVIII-XIX). Secondly, he acknowledged the subjective value theory through its philosophical foundations, namely the utilitarianism of Jeremy Bentham.

The aim of this paper is to outline the context for the formulation of Zhukovsky’s proto-marginalist approach. Section 2 summarises the major theoretical influences behind Zhukovsky’s ideas. Section 3 characterises the reception of Zhukovsky’s theory among his peers. Section 4 contains concluding remarks.

Section 2: The origins of proto-marginalist methodology

According to the classification proposed by Jevons, Zhukovsky’s theory demonstrated both the use of mathematical apparatus and subjective value theory and thus can be attributed to proto-marginalism.

Firstly, the application of mathematics in political economy was driven by the desire to mimic the positivist approach of natural sciences. Throughout his life, Zhukovsky believed that mathematics is “closely related not only to political economy but is fundamental to many other sciences”

(Zhukovsky, 1909, p. XIX). He used the development of chemistry as an example of how the extensive use of mathematics benefited the science (Zhukovsky, 1864a, pp. 27-30). As for political economy itself, Zhukovsky suggested that the discipline should follow the example of insurance, where mathematics was used in the form of applied statistics (Zhukovsky, 1871, pp. 402-403). “If political economy could precisely calculate the losses and benefits, prove and reason on the issue in figures, not in words, then it should long ago have arrived at a conclusion that was directly confirmed by experience” (Zhukovsky, 1871, pp. 403).

The universalism of science and a positive (rather than normative) approach were the methodological prerequisites that formed the basis of the works of the first marginalists (see, e.g., Gilles, 1981; Alter, 1982, p. 151). Zhukovsky followed a similar path, just as many other Russian thinkers did at the end of the 19th century. The spirit of positivism and praise for natural sciences filled the literature of 1860s Russia. The role models of the Russian intelligentsia were in fact positivists with Yevgeny Bazarov, the main hero of Ivan Turgenev’s *Otcy i deti* (*Fathers and sons*), being a medical student and Rakhmetov, the hero of Chernyshevsky’s *Chto délat’?* (*What is to be done?*), following a positivist approach in life.

In his writings, Zhukovsky attempted to formulate a positivist approach to political economy. He saw the contemporary state of the science as “anarchic”, with no established method or “solid scientific foundations” (Zhukovsky, 1864a, p. 24). Zhukovsky’s goal was to provide political economy with a more rigorous methodology, similar to the one applied in natural sciences. Zhukovsky proclaimed the benefits of his approach in a three-part article (Zhukovsky, 1864a). He believed he was following the Smithian approach, implying that the economic system has its own universal laws, and the main goal of political economy is to uncover them: “A theory is only true when it solves a whole series of special cases, and not a particular one” (Zhukovsky, 1864a, p. 43). He interpreted Smith’s theory as positivist, presenting the classic of political economy as the first positivist.³ Zhukovsky criticised the representatives of modern political economy, especially Russian academia, as having departed from the correct Smithian approach.

The origins of his positivism can be traced back to two European proto-marginalists, Henry Dunning Macleod and Johann Heinrich von Thünen.

Macleod’s theory was one of the main inspirations behind Zhukovsky’s methodology. The Scottish academic was known as a major critic of David Ricardo and contemporary political economy in general. Jevons was the first one to acknowledge Macleod’s theory as a step away from political

³ The interpretation of Smith as the first positivist and “father of the neoclassical school” is discussed in (Montes, 2013)

economy towards marginalism, claiming that “the writings of Mr H. D. Macleod exhibit a strong tendency to mathematical treatment” (Jevons, 1879, p. xxix). Macleod focuses on “the theory of prices” (rather than value theory) which is consistent with the modern supply and demand analysis. In fact, his demand is characterised by “the diminishing marginal significance of wants” (Robertson, 1951, p. 237). The modern history of economic thought follows Jevons and considers Macleod as a predecessor of marginalism (White, 2004). Zhukovsky presented a review of Macleod’s writings, where he summarised his main ideas (Zhukovsky, 1864b).

Macleod described the methodology of contemporary political economy as too *a priori* and deductive. He criticised the discipline as being condemned to explore itself in a vicious circle since the proof was based on *a priori* assumptions that were linked to themselves (Zhukovsky, 1864b, pp. 236-237). Macleod also saw the lack of precision in definitions as a major flaw of contemporary political economy. Zhukovsky considered rent as an example of a fundamental concept with a vague definition; in the works of Adam Smith rent is seen in a more realistic way (as the price of production factor), while in Ricardian theory rent is an abstraction (Zhukovsky, 1864b, p. 234).

Zhukovsky acknowledged these comments and concluded that the application of mathematics in political economy would solve most of its methodological flaws. In this aspect, he followed Johann Heinrich von Thünen, an acclaimed predecessor of marginalism (Ekelund, Hébert, 2002, p. 200). In his main work *Der isolirte Staat in Beziehung auf Landwirthschaft und Nationalökonomie (The isolated state in relation to agriculture and national economy)*,⁴ Thünen determined the value of wages and rents based on the principle of marginal productivity (Samuelson, 1983, p. 1468). Applying mathematics to the problem of agriculture and transportation he presented a microeconomic constrained optimization model involving comparative statistics to determine the most efficient way of extracting the maximum product out of a given amount of land in terms of resource allocation (Ekelund, Hébert, 2002, p. 202). Zhukovsky praised Thünen’s “rigour of scientific research” (Zhukovsky, 1872, p. 611; 1906, pp. 5-6).

This methodological foundation allowed Zhukovsky to formulate a mathematical interpretation of Ricardian rent theory (Zhukovsky, 1871, pp. 307-390). The interpretation included the mathematical formulation of labour theory, its application to the value of capital and the value of

⁴ The first volume of “*The Isolated state*” was initially published in 1826; the first part of the second volume was published in 1850 while the second part of the second volume, as well as the third one, was presented to the public only in 1863 after the author’s death in 1850. The book was translated into Russian in 1857 for the first time and was published under the name “*Uedinennoe gosudarstvo*” (“*Secluded State*”). The edition prepared by a Russian economist Matvej Stepanovich Volkov in Karlsruhe was not a straightforward translation from German but rather a loose interpretation with the translator’s own explanations, abbreviations, permutations, etc. though he praised Thünen as “the only contemporary who was able to resolve all socio-economic issues” (Volkov, 1857, p. II).

capital-intensive production (Zhukovsky, 1871, pp. 313-315). Zhukovsky's work also provided an algebraic proof of differential rent being a consequence of extensive use of land (the discrepancy between the supply of high-quality land and its demand) (Zhukovsky, 1871, pp. 321-327). Zhukovsky explicitly demonstrated the relationship between the natural value (what he considered the cost of production) and the exchange price or exchange value (market price) (Zhukovsky, 1871, pp. 349-363).

The interpretation of Ricardian theory was not possible without Macleod's understanding of supply and demand, which Zhukovsky adopted (Zhukovsky, 1864b, pp. 244-245). Macleod claimed that the value of a product depends on the relation between its supply and demand. He accordingly solves the diamond-water paradox by saying that the supply of diamonds is far less than the demand (Zhukovsky, 1864b, p. 243). Indeed, this allows Ricardian rent to be perceived as a special issue of the discrepancy between the supply and demand of arable land (Zhukovsky, 1864b, p. 246-247), thus having no direct effect on price.

However, the most significant aspect of Zhukovsky's mathematical interpretation of the Ricardian theory is its application to the statistical data of Prussia (Zhukovsky, 1871, p. 327-339). Such an exercise was inspired by the issue of quantifying the arguments in political economy on the one hand, and the debates on economic growth after the major agrarian reform and the abolition of serfdom in 1861 (see e.g., Kotsonis 1999) on the other. Zhukovsky concluded that the total rent (which he in fact calculated from Prussian data) should be seen not as a resource for the improvement of individual wealth, but as a natural fund that can finance economic growth.

The second element of proto-marginalism according to Jevons was the application of the subjective value theory. Its philosophical foundations (and the foundations of marginalism in general) are presented in the philosophy of utilitarianism introduced in the works of Jeremy Bentham (Sigot, 2002). In fact, Jevons himself considered Bentham as one of the forerunners of marginalism (Jevons, 1879, p. xxvii).

Zhukovsky's reception of subjective value theory originated in the reception of Bentham's philosophy. Despite his background in jurisprudence, Zhukovsky was more interested in the philosophical than the legal aspects of Bentham's theory (see e.g., Zhukovsky, 1867, p. XXIX-XXX). In the preface to the *Selected Works of Jeremy Bentham*, Zhukovsky set out the theses of the English philosopher in such a way that the proposed interpretation repeats the ideas that would later form the basis of the marginalist theory of value. Zhukovsky wrote: "Our activity is forced by nature itself to be carried out [...] under the influence of two principles: pleasure and displeasure. [...] The principle underlying such a law governing human actions is translated in one common word — utility"

(Zhukovsky, 1867, p. XXX). Zhukovsky saw Bentham's philosophy as the basis for the development of the social sciences (Zhukovsky, 1867, p. LXII). However, according to Zhukovsky, it is political economy that should take great value in Bentham's approach (Zhukovsky, 1871, p. 254). Based on Bentham's *felicitas calculus*, Zhukovsky accepts the notion of individual choice as well as the total public benefit as the main target of the ruler (Zhukovsky, 1871, p. 254-255).

The positive reception of Bentham and the deep knowledge of the contemporary developments in political economy led to remarkable results in Zhukovsky's later works. On the one hand, he acknowledged that Jevons and Walras presented a comprehensive way of describing consumer behaviour (Zhukovsky, 1906, pp. 14-20), although he pointed out that the assessment of utilities is subjective and unique for every agent thus bringing him closer to ordinalist value theory (Zhukovsky, 1906, pp. 16). On the other hand, he firmly believed that labour theory determined the value of the commodity (the cost of production) for the producer (Zhukovsky, 1906, p. 20). It is the market that enables two sides to agree on the price of a commodity. Thus, Zhukovsky came up with a Marshall-like view of economics as the supply-side determines the objective cost of production (as presented in the classical approach) and the demand-side determines the subjective value (as presented in the marginalist approach).

Section 3: Reaction to Zhukovsky's theory

Zhukovsky's works in general brought him a reputation as the most serious writer in the intelligentsia within the Russian Empire (Zhukovskaya, [1930] 2001, p. 263) and among Russians living abroad (Zhukovskaya 1932, p. 353). His advances in political economy were also recognized among his peers in academia: the book *Istoriya politicheskoy literatury 19 veka* (History of Political Literature of the 19th Century), where he described the mathematical interpretation of Ricardian theory, was positively received by universities in St. Petersburg and Odessa, both of which attempted to grant Zhukovsky a doctorship (although they failed due to government authorities) (Zhukovsky, 1909, p. XIX-XX). Zhukovsky's quest for rigour in political economy was followed by a fellow publicist Ludwig Zinovievich Slonimsky. He continued Zhukovsky's arguments from the "Smithian Direction" and pointed to Thünen's theory as the reference point for the development of political economy (Slonimsky, 1878).

Zhukovsky's proto-marginalist ideas also had an impact on the next generation of Russian economists. Vladimir Karpovich Dmitriev, a prominent Russian economist, who popularised the use of mathematics in political economy, mentioned Zhukovsky among his influences and praised his interpretation of Ricardian theory highly (Dmitriev, [1904] 1974, pp. 83-84).

During his long literary career, Zhukovsky became popular not only with the intelligentsia but with some government officials as well. During Zhukovsky's service in the Ministry of Finance, Nikolay Khristianovich Bunge, the minister of finance himself, turned out to be familiar with Zhukovsky's works as he "followed [Zhukovsky's] literary activities with great interest" (Zhukovsky, 1909, p. XXII). The positive reputation in the eyes of the minister facilitated the rapid development of Zhukovsky's career.

Zhukovsky's pursuit of a novel methodology and a critical attitude towards the classical approach in political economy led him to be the first critic of Marxism (Zhukovsky, 1877). In his critical analysis, Zhukovsky rejected the normative aspect of Marx's theory following his fundamental orientation to positivism. Zhukovsky studied *Das Kapital* from the methodological standpoint while he considered the apology of workers' rights as secondary. Zhukovsky claimed that the "flawed" Marxist approach to political economy could be improved by abolishing the oral arguments that contained a certain emotional undertone and, instead, employing mathematics — "the driest science". In his later book, Zhukovsky returned to the discussion of Marxism, expressing criticism and claiming that if all the political economists used mathematics such "nonsense, containing the logic of the deranged" would have no success (Zhukovsky, 1906, pp. 11-14).

Zhukovsky's later harshness towards Marxism had a reasonable cause. The initial publication of *Karl Marx and his book on Capital* in a liberal "thick journal" *Vestnik Evropy* immediately sparked a passionate discussion. Nikolay Konstantinovich Mikhaylovsky, a prominent Narodnik thinker, published a reply in the journal *Otechestvennye zapiski* later in the same year (Mikhaylovsky, 1877), where he laid out the critique of Zhukovsky's approach bluntly.⁵ Another academic who reacted to Zhukovsky's critique and defended Marxism was Nikolay Ivanovich Sieber (Sieber, 1877). The news of polemics around *Das Kapital* in Russian academia reached Karl Marx himself, though he did not provide any substantial commentary on the critics only leaving several derogatory remarks on the authors, calling Zhukovsky "a queer would be Encyclopedist" (Marx, Engels, 1991, p. 343).

Later Soviet history of economic thought followed Mikhaylovsky and Sieber in criticizing Zhukovsky. Soviet historiography reflected a teleological approach, presenting the development of political economy as a process of the ascent of ideas to Marxism-Leninism as the only true theory. Any objective assessment of works containing a critique of Marxism was impossible. In the works of Soviet historians, Zhukovsky is presented as a "hapless critic" and an "advocate of vulgar political economy" who failed to comprehend Marxist theory (Reuel, 1956, p. 256). Thus, Zhukovsky

⁵ Mikhaylovsky in fact held "a personal grudge" against Zhukovsky (Zhukovskaya [1930] 2001, p. 311) and used *Otechestvennye zapiski* as a platform for criticizing Zhukovsky (see e.g., Mikhaylovsky, 1871).

remained long-forgotten for the greater part of the 20th century until his theoretical legacy was reassessed in the late 1980s (see e.g., Shukhov, 1987).

Section 4: Conclusion

The contemporary history of economic thought acknowledges Zhukovsky's contribution to the development of economic thought; his name is mentioned in the discussion of the reception of Ricardian theory (see, e.g., Melnik, 2014, pp. 198-200), the development of mathematical methods in political economy (see, e.g., Dmitriev, 2013), and in the discussion of the early reception of Marxism (see, e.g., White, 2019, pp. 27-34; Allisson et. al., 2020, pp. 312-313). However, an analysis of his theory and methodology is still missing from the literature.

Zhukovsky was an economist of “thick journals”. These provided him with the necessary freedom to study contemporary western economic theory and pursue his own research, rather than being stuck in the classical dogma of Russian academia. Such freedom had a significant effect on his theoretical views. His deep interest in and opportunity to study natural sciences and political economy formed his belief in mathematics as the ultimate analytical instrument that would benefit any science (including political economy). The case of Yuli Zhukovsky presents another example of the interrelation and influence natural sciences had on the development of economics (see, e.g., Mirowsky, 1984).

Zhukovsky's ideas in political economy can be attributed to proto-marginalism. Firstly, his interpretation of Smith and his use of the methodology of the natural sciences set him on a positivist course in political economy. Zhukovsky's ideas originated in Macleod's critique of the classical school and Thünen's application of mathematics. The latter, according to Zhukovsky, would have been the solution to all of Macleod's criticisms and would have increased the rigour of the discipline in general. The idea to use algebra to express economic ideas and come to meaningful conclusions was novel for Zhukovsky's time. “But our goal is not to amuse the reader, but to give him a tool, the main advantage of which would be accuracy” wrote Zhukovsky (1864a, p. 136). Broad knowledge of natural sciences and a deep understanding of their methodology together with an appreciation of the use of mathematics in political economy made Zhukovsky follow Thünen's example and apply mathematical apparatus to the issues of political economy. Considering mathematics to be “the driest science”, he employed it as an analytical tool that would unify economic language and provide answers to the main questions in the discipline (Zhukovsky, 1864a, p. 136).

Secondly, Zhukovsky was receptive to Bentham's philosophy of utilitarianism, which brought him to acknowledge the subjective value theory. Thus, in terms of Jevons's classification

Zhukovsky's theory demonstrated both crucial elements of marginalist theory; the application of mathematical methods and "true theory". The eclectic combination of contemporary developments in political economy and a perception of utility as the fundamental driver of human nature brought Zhukovsky closer to formulation of the contemporary neoclassical formulation of the general approach in economics. It is worth mentioning explicitly that in the late 19th century, Zhukovsky was unaware of the developments in the western economic theory associated with the marginalist revolution. The concepts of subjective value theory, marginal utility, rationality, and maximizing behavior are absent from Zhukovsky's writings. His acquaintance with the representatives of marginalism (Jevons and Walras) happened only in the early 20th century and marginalism is present in one of his latter books (Zhukovsky, 1906, p. 14-20). Thus, we can conclude that Zhukovsky's proto-marginalist approach came from his interpretation of classical political economy through the prism of contemporary thinkers.

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