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Nicolaus Copernicus – A Forerunner of Monetary Policy

Abstract

This article recalls the figure of Nicolaus Copernicus as one of the most renowned scholars, also known for his contributions in the field of economic affairs. Relying primarily on the results of extensive literature studies and applying the deductive method, the paper offers a discourse intended to confirm the hypothesis that Nicolaus Copernicus fully deserves to be regarded as a forerunner of monetary policy in Poland. This is substantiated by his demands for the necessity of monetary reform in our country, which included the introduction of a single, stable coin of clearly defined, high value – intended for circulation across the lands of the Crown of the Kingdom of Poland, Lithuania, and Prussia, that is, throughout the territory of the Polish–Lithuanian Commonwealth. Copernicus formulated his proposals bearing in mind, among other things, the law by which bad money drives out good money, a principle now known as the Copernicus–Gresham Law.

Introduction

"Rerum cognoscere causas et valorem" ("To understand the causes and value of things") – this Latin maxim aptly captures the purpose of scientific inquiry, as undertaken by scholars in pursuit of progress. Science is a constant search for truth. In that pursuit, scholars are often compelled to engage in debate, to challenge one another and the views of their peers. Unfortunately, they often have to be uncompromising as this process frequently demands not only knowledge and skill, but also the courage to formulate hypotheses – even at the risk of contravening the legal norms of their time or acting against prevailing social conventions and customs. In their resolute quest for truth, researchers may face criticism, misunderstanding, or even exclusion. Yet, their scholarly achievements are recorded in the annals of science, and it is often only decades later that their discoveries, inventions or theoretical insights are revisited by subsequent generations of scholars. This provides the strongest possible evidence that, in the pursuit of science, it is by all means worthwhile to be uncompromising in the search for truth and courageous in sharing the results of one's research – when these results reflect the reality that surrounds us. Nicolaus Copernicus was just such a scholar – bold and unwavering.

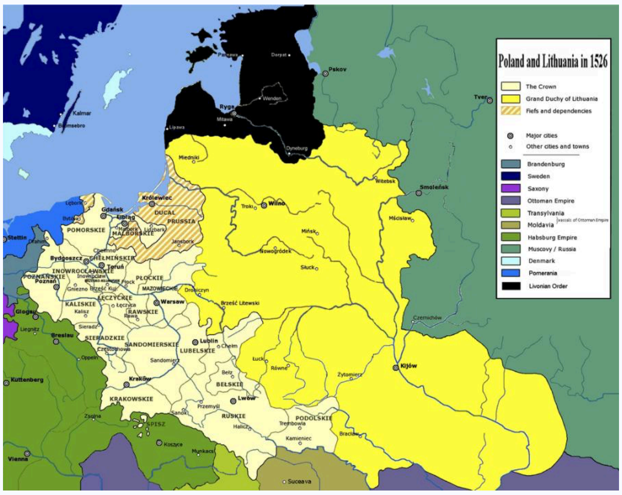
Copernicus is best known in the scientific world as an astronomer and the originator of the heliocentric model of the solar system, which he describes in his famous work *On the Revolutions of the Heavenly Spheres (De revolutionibus orbium coelestium)*[1]. However, it should be emphasised that his scholarly activities were by no means limited to astronomy and astrology. He was also a mathematician, lawyer, physician, administrator, diplomat, and Catholic clergyman holding a doctorate in canon law. Moreover, in his daily life, Copernicus was actively engaged in applied sciences such as cartography, military strategy, and economic matters. At the micro level, his interests included the principles of running a contemporary agricultural estate;

[1] See: Nicolaus Copernicus, *De revolvtionibvs orbium cœleſtium*, Book VI, Nuremberg: Johannes Petreius, 1543.

at the macro scale, he explored the functioning of the commodity-money economy in the Kingdom of Poland at the turn of the 15th and 16th centuries. Today, we know that Copernicus also conducted research in the field of what we now call economics – although at the time, it had yet to emerge as a separate, distinct academic discipline or be properly defined.[2] One of the sub-fields of economics is monetary policy – also referred to as currency policy – which was likewise a subject of Copernicus's research interests.

The aim of this article is to demonstrate the significance of Nicolaus Copernicus's contribution as a precursor to the development of monetary policy in the Kingdom of Poland of the time. This is confirmed by the numerous activities he pursued and texts he authored, which will be cited and discussed below. The research methods applied include an in-depth review of the relevant literature and deductive analysis. The working hypothesis of this study is that Copernicus' economic thought regarding monetary policy as proposed in his time merits recognition of said scholar from Toruń as one of the early forerunners of monetary policy in Poland.

Figure 1. Poland and Lithuania in 1526



Source: www.wielkahistoria.pl (accessed on: 13.06.2025)

Historical Conditions Determining Copernicus's Engagement with Monetary Policy

Nicolaus Copernicus was born on 19 February 1473 in Toruń. He was the son of Nicolaus Copernicus, a burgher of Kraków who traded copper with merchants from the city of Gdańsk, and Barbara Watzenrode, who hailed from Toruń's patriciate.[3] After his father's death, he was raised by his maternal uncle, Łukasz Watzenrode the Younger, then Bishop of Warmia. It is highly probable that his father's involvement in trade influenced Copernicus' later interest in matters of economic concern – in particular, trade and the commodity-money economy. At the age of eighteen, Copernicus began his studies in mathematics and the natural sciences at the Kraków Academy (today's Jagiellonian University). Upon completing his studies in Kraków in 1495, he continued his education in Bologna and Padua over the following years. It was likely there that he learned of the developing commodity-money economy, which in turn had a significant impact on the monetary reform proposals he would later formulate for his native country – the Kingdom of Poland.

[2] Economics became a distinct field of knowledge in the 18th century, following the publication of Adam Smith's *An Inquiry into the Nature and Causes of the Wealth of Nations* in 1776. The term 'economics' derives from Greek words referring to the principles of household management. These principles had been studied by scholars for centuries, and thus it is reasonable to consider Nicolaus Copernicus an economist – indeed, a great economist, in light of the significance of the monetary policy issues he addressed in his time.

[3] See: I. Polkowski, *Żywot Mikołaja Kopernika*, printed by J.B. Langie, Gniezno 1873, pp. III-V (source: Stanford University Library copy, 1969)

Following the victory over the Teutonic Knights and the Peace of Toruń concluded in 1466 – as well as the rapid development of trade in the port of Gdańsk – the implementation of a unified monetary system in Poland became a necessity. This was, in part, due to the fact that money was becoming increasingly widespread in trade as well as in agriculture, where it was used in the sale of agricultural produce. At that time, the level of agricultural development was reflected in how peasants settled on the land. Copernicus was an advocate of rent-based settlement (osadnictwo czynszowe) and, in pursuit of this idea, he brought peasants from Masovia to settle on the lands of the Warmian Chapter. He offered them favourable terms – initially exempting them from rent, and later requiring only moderate payments. It is reasonable to mention here that Copernicus administered more than 64,000 hectares of arable land, and that after the subsequent war with the Teutonic Knights (1519-1522), over half of this land lay fallow. Copernicus rightly believed that it was not serfdom but a rent-based agricultural economy that would prove the most effective way to re-cultivate and manage this vast expanse of farmland. For this reason, as an administrator, he recognised the importance and role of a stable currency – one he wished to see used consistently throughout the national economy.

Naturally, the development of Copernicus' economic thought – and of his role as a precursor to monetary policy in Poland of the time – was affected by the historical events of 1525, the year of the Prussian Homage. As part of the secular Duchy of Prussia being accepted as a fief of the Crown of the Kingdom of Poland, it was also agreed that a monetary reform would be implemented in the duchy, introducing a uniform coinage across the former territories of the Teutonic Order – an obligation assumed by Duke Albert.

It should be emphasised that in 1525, the Polish–Lithuanian Commonwealth comprised the lands of the Crown of the Kingdom of Poland, the Grand Duchy of Lithuania, and Royal Prussia. These territories had diverse monetary systems, and trade involved the use of more than a dozen different coins issued by mints located in cities both within and without the borders of the Polish state.

Nicolaus Copernicus's Economic Thought and Its Impact on the Monetary Policy of the Polish–Lithuanian Commonwealth

At the turn of the 15th and 16th centuries, in the Kingdom of Poland, the monetary system was gaining in importance, as the country was moving away from the feudal system towards rent-based settlement. This brought with it the need for a well-organised monetary system with a strong and stable currency. As Stefan Cackowski notes in his book *Nicolaus Copernicus as an Economist (Mikołaj Kopernik jako ekonomista)*, three monetary systems were in use in the Commonwealth at the time – the Polish, Lithuanian, and Prussian systems. In addition, a dozen or so different coins, created in various mints, were in circulation[4] Before the monetary reform of 1526, coins were minted not only in the Royal Mint in Kraków, but also in Gdańsk, Toruń, and Elbląg.

Figure 2. Shillings of Toruń, Gdańsk, and Elbląg.

Source: S. Cackowski, *Nicolaus Copernicus as an Economist*, op. cit., p. 25

[4] See: A. Rybarski, *O pewnych właściwościach pieniądza*, Studia Ekonomiczne. Gospodarka. Społeczeństwo. Środowisko issue 1/2018, Wydawnictwo Naukowe PWSZ w Nowym Sączu, Nowy Sącz, 2018, p. 103.

The Prussian estates were granted the right to mint coins in 1454 by King Casimir IV Jagiellon; Gdańsk and Toruń received similar privileges in 1457. Interestingly, coins were also minted in Elbląg, despite the absence of an official royal licence – hence they were considered "private," yet widely used in the economy of Warmia and Royal Prussia. Moreover, in the northern territories of the expanding Polish–Lithuanian Commonwealth, coins from the Teutonic monetary system were also approved for use in circulation. This was unfortunate, as the Teutonic Order exploited the situation by minting coins of progressively lower silver content. The value of these Prussian coins fell faster than others, which proved detrimental to the inhabitants of Royal Prussia and Warmia, where they were commonly used. Copernicus was aware of these phenomena and disapproved of them, becoming a strong advocate of monetary reform to bring an end to the chaos in this increasingly vital area of economic policy. Copernicus was also concerned about the declining purchasing power of the currency – that is, about inflation. One of his observations was that since the Battle of Grunwald, over the course of approximately 100 years, Teutonic coins had lost more than 80% of their value, mainly due to the decreasing silver content. Over the same period, coins made in royal mints lost about 40% of their value. Copernicus sought to identify the reasons behind this disparity in depreciation between coins used in the Crown of the Kingdom of Poland and those circulating in Royal Prussia. It should be emphasised that the right to mint coinage was of great importance for the development of any town or region, as it allowed for profits to be made from the minting process. An additional aspect to consider is that the nominal value of a coin was determined based on the value of the metal required to mint it, plus production costs – which often included a hidden profit, or margin, for the minting city. Copernicus took a critical view of this practice, including in the case of the royal mint. He believed that even the inclusion of a profit margin for the royal treasury contributed to the "debasement" of money, which he firmly opposed. In his opinion, only the value of the metal and the minting cost should determine a coin's nominal value. This proves that the distinguished scholar from Toruń stood firmly for the integrity and uniformity of the Polish currency from the outset. In observing the commodity-money economy, Nicolaus Copernicus noted that coins with a higher silver content were retained by goldsmiths or jewellers (and therefore entered circulation less frequently), then melted down, and the metal thus obtained was later used to mint a greater number of coins of the same nominal value, but with a lower share of that metal. In this way, Copernicus described the mechanism whereby good money was driven out of circulation by bad money – a principle known today as Gresham's Law or the Copernicus–Gresham Law. In economic transactions, parties would naturally seek to use the "worse" money and save the "better" money, a behaviour that seems quite intuitive, or even default. Unfortunately, those who benefited from this practice were mainly specialists in metal melting who could assess and compare the metal content – people we might today call "profiteers", ; if we wished to give the term a negative connotation. Ordinary participants in the growing commodity-money economy – peasants, townspeople, artisans – lacked such skill and knowledge, and suffered losses as a result. Copernicus's critical conclusions on these matters formed the basis of his proposed monetary reforms, the terms and principles of which he set out in his treatises. According to Stefan Cackowski, the most important of these are:

1. Private Reflections *(Meditata)*, 1517,
2. The Way to Strike Coin *(Modus cudendi monetam)*, 1519,
3. On the Valuation of Coin *(De estimatione monete)*, 1522,
4. On the Minting of Coin *(De monete cudende ratio)*, 1528.[5]

[5] S. Cackowski, *Mikołaj Kopernik jako ekonomista*, op. cit., p. 28

Judging by the few surviving texts in which Copernicus expressed his views on monetary reform, and considering the existing accounts of his speeches at the meetings of the Royal Prussian and Warmian Estates, we may infer that he favoured a reform that involved adopting a single coin minted in one royal mint. Copernicus also insisted on establishing clear standards for coins – not only the amount of metal they contained, but also the cost of labour required to mint them, without any additional minting margin. This is how he believed the nominal value of a coin – which he called its "valuation" or "estimate" (szacunek monety) – should be determined. For Copernicus, the real value of a coin was determined by its actual metal content.

Although Copernicus came from Toruń, a city with minting rights before the reform, he supported the idea of a single coin minted in the royal mint to serve the entire country. Another important claim he made was the need to withdraw all types of coins at the same time and replace them with a new, uniform coin to be used in commodity-money transactions throughout the Crown of the Kingdom of Poland, Lithuania, and Royal Prussia. Additionally, the scholar from Toruń argued that every 25 years, the coins in circulation should be exchanged for new ones due to their loss of value.

The monetary reform ultimately began in 1526, preceded by the publication of a treatise by King Sigismund I the Old's adviser, Justus Ludwik Decjusz. Copernicus elaborated his proposals in a 1528 treatise.[6] According to Cackowski, the following points were among his key postulates:

1. The reform should be presented following thorough consultations and adopted by unanimous resolution of the 'foremost citizens';
2. The minting of coins should be centralised; the existing multitude of mints should be replaced by a single one, issuing coins on behalf of the entire realm;
3. Upon the introduction of the new coin, the old should be withdrawn and its circulation prohibited;
4. From one pound of pure silver, 20 grzywnas of twenty-grosz coins should be minted, which would equalise the Prussian coin with the Polish one;
5. No excessive quantity of coins should be minted;
6. All types of the new coin should be put into circulation simultaneously.[7]

At the time, the monetary reform was implemented gradually and in accordance with Decjusz's proposals. For this reason, the king retained the right to profit from the minting of coins, but it was nonetheless possible to introduce uniform weights of precious metal for the various types of coins. Other old coins were withdrawn step by step – not all at once, as Copernicus had intended. Over time, individual cities such as Toruń and Gdańsk regained the right to mint their own coins. Copernicus sought to equalise the value of coins minted in the different parts of the Commonwealth – in Royal Prussia, Lithuania, and the Crown – in the belief that such measures would bring internal unity for the whole country. At least at the early stage of the implementation of the reform, this fundamental objective may be considered to have been brought into effect.

Conclusion

As appears from the thoughts cited above – and, most importantly, from the demands and proposals for carrying out a monetary reform in the Polish–Lithuanian Commonwealth – Nicolaus Copernicus undoubtedly deserves to be regarded as a forerunner of monetary policy in Poland. This is borne out by his expressed need for the adoption of a single, stable coin-based currency system to replace all other coin-based currencies previously in use – one that would, above all, contain a fixed amount of precious metal in line with its nominal (estimated) value. Copernicus's views on monetary policy and its

[6] Janusz Małłek addresses this issue from the historical perspective in his book *Prusy Książęce a Prusy Królewskie w latach 1525-1548*, Państwowe Wydawnictwo Naukowe, Warsaw 1976, p. 49

[7] S. Cackowski, *Mikołaj Kopernik…*, op. cit., pp. 47-48

further development show that he was a Polish patriot who, regardless of local or regional interests, sought to foster internal unity within the country.

He remained loyal to the Polish king but, at the same time, acting in the interest of the national economy as a whole, opposed the possibility of currency debasement – including that caused by the royal mint. By seeking to introduce a strong Polish coin into circulation, Copernicus was, in effect, defending the weaker participants in the commodity-money economy – those who, lacking the means to assess the amount of precious metal in a given coin, had no way of protecting themselves from the effects of the law under which bad money drove out good money. Today, that principle is known as Gresham's Law. However, according to the findings of a more in-depth literature analysis, the rule was first formulated in the 14th century by the French scholar and bishop Nicolas Oresme.[8] Copernicus may have come across Oresme's ideas during his studies in Padua or Bologna (in present-day Italy). Even so, it is worth stressing that he not only fine-tuned the principle, but also described its workings as a process – identifying the causes of a phenomenon that still appears to naturally unfold, assuming there is at least a trace of greed in each of us – a trait often described in economic terms as the desire for profit. In his treatises, Copernicus not only described these phenomena and laws, but also demonstrated a full understanding of them – which makes it all the more reasonable to consider this great scholar as a forerunner of monetary policy in our country.

[8] See: M. Bochenek, Znaczenie traktatu monetarnego Meditata Mikołaja Kopernika dla rozwoju myśli ekonomicznej (w 500 rocznicę jego powstania), "Ekonomista" 2017, issue 6, (http://www.ekonomista.info.pl), as well as: Bochenek, M. (2024). Wkład Mikołaja Kopernika do rozwoju myśli eko nomicznej i jego percepcja przez polskich uczonych. [in:] Szarzec, K. and Woźniak-Jęchorek, B. (eds.), "Instytucjonalne i historyczne wymiary dyskusji o ekonomii i gospodarce" (pp. 19–34). Wydawnictwo Uniwersytetu Ekonomicznego w Poznaniu. https://doi.org/10.18559/978-83-8211-237-5/1

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