Economic Society and Humanities Vol. 2 No. 5, 2025

Supply and Demand Perspective: Reconsidering the Impact of the Silver Monetization in the Ming Dynasty on the Capitalist Process

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Abstract: In the middle and late Ming Dynasty, silver gradually replaced the paper currency (Baochao) as the mainstream currency, a process referred to by historians as the monetization of silver. Existing research has confirmed that the monetization of silver in the Ming Dynasty effectively promoted the sprouts of capitalism. However, during the same period, social productivity did not significantly increase. This paper re-examines the monetization of silver in the Ming Dynasty from the perspective of supply and demand. By employing the framework of long-term growth theory, it conducts an in-depth analysis of its impact on the capitalist processes in China and Spain.

Keywords: Silver Monetization; Supply and Demand Perspective; Long-Term Growth Theory; Institutions; Capitalist Process.

1. Research Background

The Ming Dynasty, which existed during the same period as the Western Age of Exploration, demonstrated significant market economy vitality in global trade due to its advanced handicraft and commercial industries. It thus became a "black hole" for the world's silver flow: the huge demand for currency generated by the surge in trade led to a continuous inflow of silver from around the world into China through the tribute trade system and the Maritime Silk Road. Why did China and Spain, as the main suppliers and demanders of silver, only see the sprouts of capitalism but fail to achieve a capitalist transformation? What deeper key factors lay behind this apparent prosperity to hinder the capitalist process?

The academic community has not yet been able to analyze the impact of silver monetization on the capitalist processes of these two countries from an overall perspective, especially in terms of changes in the supply and demand of silver. This paper re-examines the impact of silver monetization in the Ming Dynasty on the capitalist process within the framework of long-term economic growth theory, using the supply and demand theory from applied economics.

2. Literature Review

2.1 Conceptual Definition

The monetization of silver in the Ming Dynasty refers to the comprehensive process from economic circulation to government taxation and fiscal expenditure. It was an inevitable result of the combined effects of the nature of currency, its civilian application, and government guidance. Capitalism, meanwhile, is an economic system characterized by private ownership, market economy, competitive production, capital accumulation and investment, as well as the free buying and selling of labor. Under this system, means of production (such as land, factories, and machinery) are usually privately owned, and the purpose of production is to generate profit rather than to meet direct needs. Capitalist economies typically use currency as a medium of exchange to facilitate the buying and selling of goods and services [1].

2.2 Previous Research on "Silver Monetization"

The influx of silver into China during the Ming Dynasty had a significant impact on domestic prices and inflation. Peng Xunwei, from the perspective of monetary history, and Ye Shichang, from the perspective of the evolution of monetary theory, both conducted in-depth research on the problem of the abundance of silver in the Ming Dynasty. Peng Xunwei (1994) and Ge Zhaoguang (1996) argued that the import of silver led to an increase in the money supply, which in turn caused a general rise in prices, especially for luxury goods and land. Research on silver monetization from a trade perspective discusses the issue within a broader context of globalization [2]. For example, Acemoglu et al. (2005) pointed out that the direct cause of the

rise of the Western world was the Atlantic trade, which provided sufficient material support for the bourgeois revolution in the West. The prosperity of maritime trade was inseparable from the sufficient supply of precious metal currencies. Following this logic, Zhang Yuyan and Gao Cheng (2004) proposed a unique theoretical model of "monetary shock-institutional change-economic growth." They argued that the substantial increase in the supply of American gold and silver led to the "Price Revolution" and the redistribution of social wealth, resulting in the rise of new merchant groups and the decline of the feudal nobility, which ultimately led to capitalist institutional innovation and the rise of the Western world [3]. A review of previous research on silver monetization reveals that studies have incorporated theoretical perspectives from multiple disciplines, including monetary supply theory, trade theory, fiscal theory, and consumption theory, to analyze the historical process and impact of silver monetization from various angles. Based on this finding, this paper attempts to use the supply and demand theory within the framework of long-term economic growth theory to re-analyze the issue of silver monetization in the hope of discovering the impact of silver on the capitalist processes of the supply and demand sides and drawing innovative conclusions [4].

3. Analysis of Silver Supply and Demand Changes

On the supply side, the inflow of silver from overseas was the main source of silver supply. The monetization of silver in the Ming Dynasty was a significant turning point in Chinese monetary history. According to the theory of supply and demand, the substantial increase in the global supply of silver since the 16th century was the material basis for the monetization of silver in the Ming Dynasty [5]. To provide a more intuitive understanding of the amount of American silver that flowed into China through different European countries, we collected relevant research data from Hou Zhigang's article "A Discussion on the Inflow of Foreign Silver into China (Mid-16th to Mid-19th Centuries)." According to the research data in Wang Yuxun's article "A Preliminary Study on the Domestic Mining and Foreign Inflow of Silver in the Ming Dynasty" and Li Longsheng's article "An Estimate of the Silver Stock in the Late Ming Dynasty," a total of 87,750,002 taels of Spanish silver flowed into the Ming Dynasty in the late period [6].

On the demand side, since the mid-Ming Dynasty, on the one hand, the vigorous development of the commodity economy created a huge demand for a universal equivalent. On the other hand, the acceleration of urbanization and the rise of the merchant landlord class generated a societal demand for assets that were easy to store and trade. The combination of these two demands made the penetration of silver monetization deeper and facilitated the development of a sophisticated market economy network in the Ming Dynasty. The development of market transactions, in turn, further stimulated the demand for silver [7]. Eventually, the government gradually accepted silver as a medium of taxation and exchange. The Chinese people's thirst for silver also left a deep impression on Spanish, Dutch, and other European trade adventurers. According to the records of the Spanish Sebastian Munoz: "The Chinese would go to hell to find new goods to exchange for the rials they craved (a type of silver coin popular in the Spanish colonial era, known for its high silver content) [8]. They even said in broken Spanish, 'plata sa sangre' (silver is blood)." Servix concluded that any country wishing to trade with the Chinese had to pay entirely in silver. It was summarized at the time that "without silver, no business could be done from Nagasaki to Surat." Thus, the demand for silver by Ming merchants had become one of the main driving forces of global trade at that time.

4. The Impact of Silver Monetization on the Capitalist Process of the Supply and Demand Sides

The surge in demand for silver in the Ming Dynasty profoundly stimulated the global supply of silver (Figure 1). As the maritime hegemon at the time, Spain dominated the global silver supply by increasing the mining of silver ore in its American colonies, forming a unique supply chain. From the perspective of the industrial chain supply and demand, considering that Ming China was the main demand side for silver and that the demand in Spain itself was relatively very small, we regard Castile (Castile was a medieval kingdom located in central Iberian Peninsula, which played a very important role in Spanish history. The Kingdom of Castile gradually expanded and eventually merged with

the Kingdom of Aragon through marriage, forming the main body of modern Spain.) and its colonies as the supply side. The logic of these changes has been fully combed from the perspective of silver supply and demand in the previous sections [9].

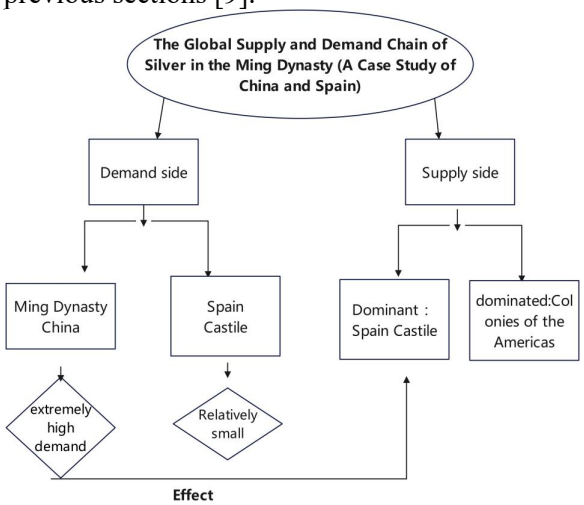


Figure 1. The Global Supply and Demand Chain of Silver in the Ming Dynasty

We have found that in the models of economic growth theory, the traditional neoclassical growth theory posits that the driving forces of development come from capital, labor, land, and the improvement of total factor productivity (TFP). Among these, institutions and technology are the most critical factors influencing TFP. Later, Robert Solow introduced the Solow-Swan Growth Model, which attributes the part of economic growth that cannot be directly explained by capital accumulation and population growth to a "residual factor," namely technological progress. Technological progress is considered the core driving force behind sustained economic growth [10].

The monetization of silver brought changes to the capital elements in both countries, but neither completed a transition to capitalism under this impetus. China during the Ming Dynasty only experienced a brief sprout of capitalism, while Spain achieved only a partial capitalist transformation. Following the trajectory of long-term economic growth theory, we will conduct a comparative analysis of the reasons and lessons learned. Combining the above theories, we will analyze each aspect in detail.

4.1 Ming Dynasty China

We examine the impact of silver monetization on the capitalist process and institutions through the lens of long-term growth theory. Since land is not the focus of this study, we will analyze the effects from the dimensions of capital, labor, institutions, and technology.

Firstly, the monetization of silver played a significant role in expanding the market economy during the Ming Dynasty. As a currency, silver reduced transaction costs, facilitated the circulation of goods, increased market depth and breadth, and established a rudimentary price mechanism-a key feature of capitalist economic resource allocation. Ray Huang (2002) argued that silver monetization provided a stable and widely accepted unit of account, promoting both domestic and international trade. Peng Xunwei (1994) further noted that silver monetization integrated regional markets, making silver the national currency. This integration, in turn, spurred the development of commercial networks and specialization in production. However, silver monetization also led to the "silver hoarding problem," resulting in a situation where grain was cheap but silver was scarce. Wealth did not effectively transform into capital for reinvestment in production. From high-ranking officials to wealthy merchants, people competed to hoard silver, removing vast amounts of currency from circulation. It is thus not surprising that despite the massive inflow of silver, the Ming Dynasty could not escape the quagmire of a "silver shortage." In this vicious cycle, silver hoarding in the Ming Dynasty was not a temporary self-regulation of metallic currency but led to a permanent decline in the money supply. Historians generally estimate that the total inflow of silver in the Ming Dynasty was between 200–300 million taels. At the end of the Ming Dynasty, as much as 150 million taels of silver were stored in the capital alone. If we consider the entire country, the amount of hoarded silver could likely approach or even exceed the total inflow of silver, completely offsetting the effects of silver inflow. Digging deeper, why was silver hoarding so widespread? The absence of private property protection institutions left merchants feeling insecure, forcing them to bury silver to safeguard their wealth [11].

Secondly, from the perspective of labor, silver monetization gradually freed people from identity and geographical constraints. Commerce and handicraft industries flourished, the merchant class expanded, and wage laborers

emerged. For example, in coastal regions, the poor turned to wage labor, driving a shift from paying grain and performing corvee labor to paying silver without corvee. This led to a reorganization of social classes, with merchants and artisans rising in status while the gentry declined relatively, providing human resources for capitalist development. The monetization of taxes and corvee labor changed the lijia system, with silver becoming the medium of the market and increasing people's employment opportunities. Looking deeper, the monetization of taxes and corvee labor altered the lijia system that had been in place since the Huangce system. Tax grain was no longer the shackle binding people to the identity of self-cultivating farmers. As the standard for all taxes and the medium of value exchange, silver as a circulating currency opened up a broad market not limited to a single form, giving people richer employment opportunities. Digging further into how taxes and corvee labor were monetized, political institutional innovation was a key factor. For example, in the tax system, the Jiajing period saw a landmark tax reform known as the "Single Whip Law," which consolidated various types of taxes (grain taxes, corvee labor, etc.) into one, payable only in silver. The Single Whip Law not only merged various miscellaneous taxes into a single silver-based tax but also spurred reforms in local fiscal budgeting systems. Under this system, silver became the main means of tax and labor levies, fundamentally changing the relationship between local governments and the central court in traditional China. However, after Zhang Juzheng's death, most of the reforms were abolished. The tax standard shifted ambiguously from population to land, and problems such as "fire consumption" and corruption in silver-based taxes raised questions about whether the burden on the people was actually reduced. Yet, the reform of taxes and labor levies was key to liberating labor. However, the proportion of free wage laborers remained very low in the total labor population [12].

Finally, from the perspective of technology, in traditional Chinese values, scholars, farmers, artisans, and merchants were strictly separated, with significant differences in status between scholars and merchants. Participating in the imperial examinations to become a scholar was seen as the only way to achieve social mobility. Therefore, technological research and innovation did not become mainstream at the time. Moreover, as the status of commerce increased, merchants sought to integrate into the upper class by engaging in cultural pursuits rather than investing their wealth in technological development. Overall, the technological element was virtually absent.

In summary, the Ming Dynasty did not establish institutions to protect private property, nor did it have supporting monetary and fiscal systems. Resource allocation efficiency was severely limited. It is thus understandable why the massive inflow of silver did not significantly advance the "capitalist process" or lead to a rapid economic leap in the Ming Dynasty. As the greatest beneficiary of the 15th–17th century Age of Discovery, the Ming Dynasty ultimately missed its historical opportunity.

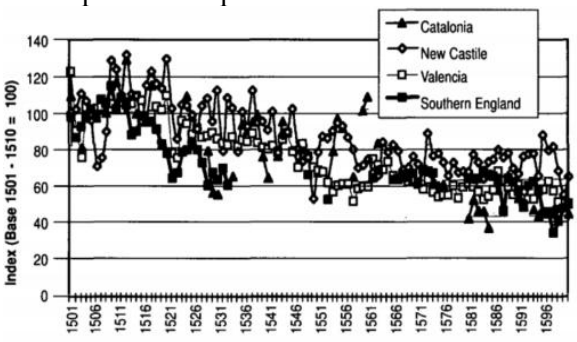
4.2 Castile, Spain

In past scholarship, Hamilton argued that the influx of precious metals from the Americas led to parallel increases in prices and wages, reducing industrial investment and thereby hindering capitalist development. Vilar, as a critic of this view, suggested that Spain, as the "highest stage of feudalism," accumulated primitive capital that froze and obstructed the structures necessary for capitalism. Wallerstein argued that the Americas were crucial in transforming Spain into a semi-peripheral region of the world market. We will continue to analyze this through the lens of long-term growth theory.

Firstly, from the perspective of capital, Spain experienced a brief economic boom. As the dominant supplier, Spain increased silver mining in the Americas in response to the surge in demand from the Ming Dynasty. This inevitably led to a portion of the silver flowing into mainland Spain. With the massive extraction of American silver, a portion spilled over into Spain. From 1545 to 1560, Spain transported an average of 5,500 kilograms of gold and 246,000 kilograms of silver annually from the Americas. Between 1560 and 1600, a total of 25,000 tons of silver were transported back. By the end of the 16th century, 83% of the world's precious metal output belonged to Spain. Meanwhile, innovative institutions stimulated the enhancement of capital elements. For example, in the mining of American silver, the "Encomienda System" was established. This early colonial system allocated indigenous labor to specific colonizers, significantly promoting mining and agricultural production. In debt

management, the Spanish crown issued bonds or "juros" (an early form of government bonds) to raise funds and manage national debt. In the operation of silver mines, the "Mining Concessions" system was proposed, granting individuals or groups the right to mine gold and silver in the colonies. Looking deeper, did this wealth transform into capital? Despite the immense wealth brought by the colonies, it was not effectively converted into capital. Instead, the influx of wealth led to inflation, exacerbated social inequality, and ultimately caused a long-term economic decline in Spain. Digging deeper, why was the efficiency of transforming wealth into capital so low? First, trade monopoly and unequal wealth distribution. The Spanish crown monopolized Atlantic trade, prohibiting anyone outside the royal family and licensed companies or ranks from engaging in international trade. This concentrated trade wealth in the hands of the royal family and a few nobles, squandered on the extravagant lives of the nobility and the costs of imperial wars. Second, Spain's mercantilist policy emphasized the accumulation of precious metals like gold and silver, based on the belief that "wealth equals currency." However, large amounts of gold and silver were used to purchase foreign goods, leading to excessive dependence on imports. The lack of investment and market for domestic industry and agriculture slowed their development, failing to form a complete industrial system and contradicting the economic structural transformation required by capitalism. Third, the fiscal system was unreasonable. The Spanish government imposed heavy taxes, including on the export of gold and silver and the rich tributes from the colonies. The heavy tax burden severely oppressed colonial residents and domestic industrial and commercial operators, spreading social discontent and suppressing economic vitality and innovation. Meanwhile, government funds were not invested in infrastructure construction, technological research, or other areas conducive to long-term economic development, leading to a gradual economic decline.

Secondly, from the perspective of the labor force, there was a partial release of labor, with changes in population structure and scale. The influx of gold and silver led to the decline of the old nobility and the rise of the merchant class. In the 16th century, the population of Castile increased from about 4.25 million in 1528 to around 6.5 million after 1580. There was growth in Spain's population, agriculture, and urbanization. In 1500, only Italy and the Low Countries had a higher degree of urbanization than Spain. By 1550, a network of cities had been established, with strong industrial vitality. The urban network in the Duero River Valley, though small, was dense, with over 50% of the population in places with more than 2,000 residents engaged in manufacturing. The southern cities, characterized by their agricultural features, were large in scale, and cities like Cordoba and Seville had strong commercial and industrial vitality. However, the phenomenon of free labor was only present in a few local areas. At the same time, the increase in the money supply led to the devaluation of gold and silver, rising prices, and the "Price Revolution." Spain suffered severe inflation, with price increases far exceeding those in other European countries. High prices for goods and labor led to a decline in industrial international competitiveness, industrial contraction, and increased dependence on external markets. Looking deeper, why was the phenomenon of free labor not widespread? The main reason was the impact of the "Price Revolution." In the 16th century, the rise in prices in Spain was much higher than in other European countries. The cost of goods was high, and labor wages lagged behind prices (Figure 2), leading to a decline in real wages. This resulted in the insufficient release of the labor force in Spain, increased dependence on external markets, vulnerability to external shocks, and an unfavorable environment for the stable development of capitalism.



SOURCES: My own elaboration from Reher and Ballesteros (1993) Appendix 1, Nadal, J. 1959) Appendix. Feliu, G. (1991), II, p. 88-95, Phelps Brown, E. H. and Hopkins, S. V. 1962), Appendix B).

Figure 2. Real Wages of a Building Craftsman in Spain and England(1501-1600)

Simultaneously, migration became a widespread trend. Historians estimate that in the 16th century, Spain experienced a significant wave of migration, with approximately 243,000 people

moving to the New World. Over one-third of these migrants originated from Andalusia, particularly Western Andalusia and Extremadura, regions that continued the population movement patterns from the Reconquista period and were relatively poor, prompting people to seek opportunities abroad. Early conquistadors were predominantly from Andalusia, such as Cortés and Pizarro. About one-third of the migrants also came from the central Iberian Peninsula, including Old and New Castile and León.

Finally, from the perspective of technological factors, both Spanish agriculture and industry saw development. Between 1500 and 1540, the volume of agricultural and sideline products shipped from the Port of Seville to the Americas increased from 8,000 tons to 50,000 tons. Urban industries were stimulated, with textile and metal production expanding in cities like Segovia, reaching a peak in the third quarter of the 16th century, although still lagging behind cities in Flanders and Northern Italy. Overseas colonial expansion also drove the development of the shipbuilding industry. In the early 16th century, Spain had nearly 1,000 merchant ships, with its fleet tonnage ranking second in Europe by mid-century. Looking deeper, why did technological factors only improve in certain industries? First, the Spanish nobility considered manual labor to be shameful, leading them to invest vast wealth in non-productive investments such as government bonds, rather than in the improvement of manufacturing and agriculture. This investment preference prevented the effective allocation of social resources into the real economy, hindering industrial development and technological innovation. Second, there was a lack of institutional innovation. The royal family and nobility were satisfied with the existing institutions, and the conservative political atmosphere made it difficult for Spain to adjust and reform its systems in a timely manner, missing opportunities for development.

5. Conclusion and Outlook

Ming Dynasty China, as the demand side for silver, experienced a brief economic boom due to silver monetization. However, silver did not fully transform into productive capital, the proportion of free wage labor was low, and total factor productivity (TFP) was constrained by institutional and technological factors, such as the absence of private property protection, limitations in the imperial examination system and technological development, and the household registration system that restricted labor liberation. Institutional factors permeated the optimization process of all elements.

Spain, as the main supplier of silver, gained immense wealth in the short term through large-scale silver mining. However, from the perspective of long-term growth theory, similar to Ming China, capital factors were not fully released, and silver did not fully transform into productive capital. Labor, institutional, and technological factors were partially released, with Spain performing slightly better than China, but still insufficient to drive a capitalist transformation. After a brief period of prosperity, Spain's growth slowed, industry shrank, and this posed obstacles to capitalist development.

The core of economic transformation is the enhancement of total factor productivity (TFP), which is essentially an institutional issue concerning free and fair competitive economic systems. TFP growth is unstable and easily affected by resistance to institutional reforms, stemming from the contradictions between new technologies and old institutions, as well as the emergence of new interest groups exploiting loopholes in new systems. The key to economic transformation in Ming China and Castilian Spain was whether reforms could correct institutional flaws and overcome marketization resistance. Without supporting fiscal and monetary systems, sudden wealth could not transform into capital, and factors such as labor, land, and technology failed to form a coherent growth chain, ultimately interrupting the capitalist process. It can be said that institutions are the most critical factor affecting TFP, which in turn is the most important factor influencing long-term economic sustainability and economic transformation.

This paper still has limitations. The econometric analysis is flawed, constrained by historical data and disciplinary limitations, and not all important indicators were included. It focuses solely on the monetization of silver at the end of the Ming Dynasty, without considering the complex stock of copper coins, and some non-critical factors were ignored in the long-term growth theory analysis.

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