The Issues with Using Silver Inflow as a Measurement for the Performance of the Late Imperial Chinese Economy

by

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Ron Paul, Congressman: "Do you think gold is money?"
Ben Bernanke, FED Chairman: "No it is not money.
It is an asset. Do you think Treasury bills are money?"
U.S. Congress, July 13, 2011

The conceptualization of the growth and development of the Late Imperial Chinese economy has been a frontline battlefield for many economic historians. In the last two decades, a number of research studies on Chinese economic history set out to challenge the long-established economic view of a long-stagnated Late Imperial China. Contrary to the long-established findings, these research studies argue that the Chinese state had indeed undergone sustainable and transformative economic growth and development. While they capture some of the economic dynamics of the Chinese state, the required proof to establish the argument of a progressive Chinese state is far from complete and thus requires immediate attention from historians. In *ReOrient* (1997), Andre Gunder Frank introduced research findings from monetary history, precisely connecting a quantitative theory of money and the impressive amount of silver inflow in late-Ming China. While Frank deserves invaluable credit for bringing Chinese monetary history into the discussion of Late Imperial Chinese economic development, this essay aims to evaluate the potential issues of treating silver inflow as the measurement of the productivity of the Chinese economy.[1] As much as silver acted as the medium of large transactions and tax payments to the state, this essay will argue that silver in the Late

[1] Andre Gunder Frank, *ReORIENT: Global Economy in the Asian Age* (Berkeley: University of California Press, 1998), 153-164.

Imperial China was an imperfect form of money; therefore, it may not be advisable to employ the quantity theory of money in dealing with the silver issue in China.

Evaluating the Quantity Theory of Money and Frank's Analysis

The ability to differentiate precious metals from money marks the evolution between preclassical and classical economics. The early modern mercantilist believed that gold and silver bullion treasure was equivalent to wealth. This bullionist assumption treated economics as a zero-sum game: the more silver inflow a country had, the richer that country was. Under this assumption, a trade surplus, a form of trade imbalance, was seen as the evidence of a nation's wealth accumulation.[2] The physiocrats and Adam Smith, the eighteenth-century predecessors of this bullionist economic thought, argue that this assumption involves two logical fallacies. Firstly, the price level is relative to the production and the amount of money in circulation in the economy. Given level productivity and with everything else constant, price increases when the amount of bullion treasure increases in the economy. It is not possible to judge the productivity level of the economy solely by its bullion flow. Secondly, the amount of bullion accumulated is different from the amount of money in circulation in the economy. The quantity of money in an economy is better understood through its speed of circulation

[2] Mark Blaug, *Economic Theory in Retrospect* (Cambridge: Cambridge University Press, 1997), 11-12.

rather than the absolute physical amount of the bullion. Therefore, the amount of silver that an economy accumulates does not necessary correlate with its nation's wealth.[3]

The quantity theory of money, as a result of this realization, was developed to measure a nation's wealth. It is safe to say that classical philosophical economists John Locke, David Hume and John Stuart Mill have all made significant contributions to the development of the theory.[4] Locke wrote that: "the quickness of its circulation [i.e. velocity]… to make some probable guess if we are to consider how much money it is necessary to suppose must rest constantly in each man's hands as requisite to the carrying on of trade."[5] This understanding of the importance of the velocity of the money in contributing to the measure of a nation's wealth and productivity level becomes the core concept of the quantity theory of money:

$$M \times V = P \times T$$

In this equation, M represents the total amount of **m**oney in circulation while V represents the transactions' **v**elocity of money, meaning the speed that people turn over their money. The product of M and V should equal to P×T, **p**rice level, a measurement of inflation and the real value of **t**ransactions, a measurement of production output in the market. If we rewrite this equation, the aggregate real value of the output would be:

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[3] Ingrid Rima, *Development of Economic Analysis* (New York: Routledge, 2009), 105

[4] See for example Carl Wennerlind, "David Hume's Monetary Theory Revisited: Was He Really a Quantity Theorist and an Inflationist?" *Journal of Political Economy 113*:1(February 2005), 223-237.

[5] John Locke, "Some Considerations of the Consequences of the Lowering of Interest, and Rising the Value of Money in a Letter Sent to a Member of Parliament, 1691" in The Work of John Locke vol.4: Economic Writings and Two Treatises of Government, 12th ed. (London: Rivington, 1824). Retrieved from the Online Library of Libe, URL: http://oll.libertyfund.org/index.php?option=com_staticxt&staticfile=show.php%3Ftitle=763&Itemid=27.

$$T = M \times \frac{V}{P}$$

This expression suggests that an aggregate way to understand the impact of the silver inflow in the economy would be to examine the change in the velocity of the money in circulation in respect to the change of price given the increase in money inflow. However, another version of the theory, called the Cambridge equation, which replaces the velocity of money with the flow of money (1/k), attempts to capture the interaction of the supply and the stock demand for money. However, Frank favoured using V over (1/k) in his work, so for consistency purposes, we will follow Frank's argument using V.[6] The essay will come back to this difference in its last section because I agree with Frank that this definitional difference will have a relatively minor influence on the analysis as a whole.

In the book, Frank applied this theory to illustrate the progressiveness of the Chinese state. He stated that:

> In terms of the MV = PT Fisher equation, the evidence suggests strongly that throughout most of Asia the increased arrival of money from the Americans and Japan did not substantially raise prices, as it did in Europe. In Asia instead, the infusion of additional new money generated increased production and transactions, as well as raising the velocity of money circulation though more extensive commercialization of the economy.[7]

Frank later presented the evidence that this money had stimulated the economic development in China, largely relying on Robert Marks' analysis. Frank summarized the findings as:

> The stimulatory and expansive effects of silver and trade were most dramatically notable in South China; suffice it here to offer only a tip-of-

[6] Frank, *ReORIENT*, 154.
[7] Frank, *ReORIENT*, 157.

> the-iceberg indication of commercialization and economically rational choice in South China… The agricultural and settlement frontiers expanded along with their commercialization, stimulated by demand from the outside which also generated local demand – and supply – and which were financed by the inflow of new money from abroad.[8]

Frank made a several assumptions to elaborate Marks' analysis in the context of the quantity theory of money.[9] Frank believed that the inflow of silver reflected the economic growth in China, of which he stated:

> Probably even more spectacular were the economically expansive effects of the infusion of silver into the Chinese economy from the mid-sixteenth century onward. The Ming economy was increasingly monetized on a silver standard and expanded rapidly at least through the 1620s…[10]

However, if Frank's conclusion held true, which was that given the increase of silver inflow, productivity levels increased even faster in comparison, then we would observe:

$$\Delta T > \sqrt{\Delta M \times \Delta V} > \Delta P$$

This means that when the increase in price level is low and the increase of productivity level is high in comparison, the other side of the formula $M \times V$ must fall somewhere in between the two variables. In the context of the Late Imperial economic history of China, the changes of ΔM and ΔP, the change in silver inflow and price level respectively, are far better understood than ΔV, the change of the velocity of money, mainly due to the technical difficulty in measuring this important independent variable in a premodern

[8] Frank, *ReORIENT*, 161-162.
[9] For the analysis of Robert Marks, see Robert B. Marks, "Commercialization without Capitalism. Process of Environmental Change in South China, 1550-1850," *Environmental History 1*:1 (January 1996), 56-82 & *Tiger, Rice, Silk and Silt, Environment and Economy in Late Imperial South China* (New York: Cambridge University Press, 1997).
[10] Frank, *ReORIENT*, 160-161

economy. As we will see, neither definition could fully overcome this measurement issue. ΔT, the change in productivity level, serves as a dependent variable to measure the size of the Chinese economy.

There are a few assumptions that Frank made to connect the silver story to the quantitative theory of money regarding to the measurement of M, V and P. Frank assumed that due to the silverization of the Chinese monetary system, silver became a reliable measure of the quantity of money. Recall that M stands for the total amount of money in circulation; however, using silver as the estimator of M will immediately run in two technical issues. First, copper-based currency existed throughout the Ming-Qing dynasty, so on what ground could silver currency be viewed as the representation of the total amount of money in circulation in a consistent manner? The next one has more to deal with the definition issue of whether silver in Late Imperial China could be defined as money. Money has specific functions as the medium of exchange, the unit of account and the standard of deferred payment in economics. If we accept that Late Imperial China was operated under a bimetallic monetary system (i.e. bronze coins and silver),[11] then we immediately run into another measurement problem with velocity, V.

Table 1: Velocity of silver

From To	Silver	Bronze coins	Goods
Silver		↑V	↑V
Bronze coins	↑V		No effect
Goods	↑V	No effect	

[11] See R. Bin Wong, "Chinese Views of the Money Supply and Foreign Trade, 1400-1850," in Sally M. Miller, A.J.H. Latham & Dennis O. Flynn, *Studies in the Economic History of the Pacific Rim* (London: Routledge, 2002), 175.

Table 2: Velocity of money (silver and copper coins)

From To	Silver	Bronze coins	Goods
Silver		No effect	↑V
Bronze coins	No effect		↑V
Goods	↑V	↑V	

As the two tables above show, treating silver as money versus treating both silver and bronze coins as money has a significant impact on the calculation of velocity. Employing the former definition in the equation would very possibly result in overcounting or undercounting the velocity of money given the imperial court, and given that there was no uniform exchange rate between the two established, therefore speculative activities within the currency system will biasedly scale up or scale down the measurement. This is because the imperial court had no monetary policy established on silver, but excised influence to adjust the value of bronze coins throughout the period.[12] Fourthly, since money, unlike a commodity, is a representation of the price level, whether silver could fulfill this goal in Late Imperial China is very much questionable. In other words, the debate of whether silver was price determining or price determined will greatly impact the estimation of the price level (P). Lastly, if silver is not a fair representation of money, then the issue of whether the importation of silver had facilitated Chinese economic growth as Frank and Marks suggested[13] or sucked out a considerable proportion of its productivity will also become debatable. Each of the issues will be explored in the remaining essay.

[12] See Richard von Glahn, *Fountain of Fortune, Money and Monetary Policy in China, 1000-1700* (Berkeley: University of California Press, 1996).
[13] Robert Marks, *The Origins of the Modern World: A Global and Ecological Narrative from the Fifteenth to the Twenty-First Century* (Lanham: Rowman & Littlefield, 2007), 80.

This essay will focus particularly on the late Ming period due to the availability of existing research studies and the unstable supply of silver inflow into the Chinese economy during that time, which could be valuable in testing this hypothesis from the opposite perspective, and which I hope will provide some insights to differentiate causation from correlation. This particular period also included the discussion of the debasement of bronze coins, further testing the definition of money under this bi-metallic monetary system.

Recent Studies on the Role of Silver in Ming Monetary Policy

William S. Atwell of Hobart and William Smith Colleges is one of the most influential scholars on the issue of silver flow in East Asia and the Ming-Qing transition. He devotes most of his academic career to investigating this relationship and proposes a seventeenth century monetary "crisis theory" that the decrease inflow of silver was one of major factors that caused the collapse of the Ming economy and dynasty in 1644. Although the Ming crisis was closely related to the silver from the New World, he insists that historians have to be extremely careful when drawing any linkage with the European seventeenth century crisis or generalizing the crisis as a regional one because the Chinese one was relatively short-lived and was a result of monetary policy failure.[14] However, the Chinese crisis was not an isolated incident, because it involved the global economy through the fact that domestic demand for imported silver and foreign demand for

[14] William Atwell, "A Seventeenth-Century 'General Crisis' in East Asia," in Geoffrey Parker (ed.), *The General Crisis of the Seventeenth Century* (London: Routledge, 1997), 247-248.

Chinese goods including gold had integrated the Chinese into the world economy.[15] In other words, while the decline in silver import was largely responsible for the monetary crisis in Ming China, it was the very unique economic structure in Ming China that characterized the nature of the crisis; therefore, a closer look at the function of silver is required in understanding this crisis.

In terms of the role of silver in the Ming economy, Atwell argues that silver indeed fulfilled at least some functions of money as outlined above. He is very straightforward in proposing that "un minted silver traded by weight as a medium of exchange," and that was due to the "distrust of paper currency and persistent shortage of good quality bronze coins."[16] While this statement was intended to cover the monetary attitude towards silver in a much longer term, Atwell adopts a similar reasoning to provide an explanation for the late Ming economic crisis in another article that he wrote earlier. The importation of silver increased the availability of money, in both the form of physical silver and the expansion of the credit market; therefore, this facilitated a high level of public expenditure, rapid urban growth and intense economic competition. As long as silver inflow was consistent, the potential problems resulting from this reliance on foreign silver would be temporarily supressed. But when silver inflow started to decline in the 1620s, the consequences were "proved to be socially and politically disruptive."[17] This was because while the Ming government was integrating itself into this global bullion market, when the silver import declined, the government was unable to replace

[15] William Atwell, "Ming China and the Emerging World Economy, c1470-1650," in Denis C. Twitchett & Frederick W. Mote (eds.), *Cambridge History of China The Ming Dynasty, 1368–1644, Part 2, vol.8*. (Cambridge: Cambridge University Press, 1998), 416.
[16] William Atwell, "Time, Money, and the Weather: Ming China and the 'Great Depression' of the Mid-Fifteenth Century," *Journal of Asian Studies 61*:1 (February 2002), 86-87.
[17] William Atwell, "Some Observations on the 'Seventeenth-Century Crisis' in China and Japan," *Journal of Asian Studies 45*:2 (February 1986), 227.

this loss from domestic sources. Therefore, the availability of money began to decline due to this absolute loss of bullions physically, the rising taxation to fight the Manchus in the Northeast and the tendency of people to convert as much as their assets to silver to protect the value against the deprecating bronze coins. Given that paper money was not a realistic option at that time, the market would adjust to the loss by debasing the existing bullions in order to maintain the supply of money at the current level. As a result, counterfeit bronze coins surfaced in the market in even greater quantity and the silver-copper ratio widened sharply in increasing speed. Under such unsustainable practices, the credit markets seized up and the supply of money declined at an even faster pace despite more bronze coins being minted. The cash crop and manufactured goods markets collapsed, but food prices soared, further driving up the price of silver; as a result, tax revenue plummeted, leading to the fiscal collapse of the dynasty.[18] The discussion of the late Ming economic collapse is crucial in construction of this analysis, because while the mid-Ming economic growth was accommodated by the growth of silver imports, the late-Ming economic collapse was accommodated by the decline of silver inflow. The late-Ming example served as a powerful proof to confirm this hypothesis from the opposite perspective.

A number of historians found this monetary fluctuation-centred explanation for the late Ming crisis not too convincing. For example Jack Goldstone only agrees with Atwell insofar as the silver trade "contributed" to the downfall of the Ming dynasty; however, to believe such bullion had a considerable causal relationship with the productivity growth in China was "quite hyperbolic" given the scale of the Chinese

[18] Atwell, "Some Observations on the 'Seventeenth-Century Crisis,'" 229.

economy at that time.[19] To paraphrase this statement, Goldstone agrees that while there was a growth of silver bullion in the economy, which is loosely related to ΔM, it does not imply that this increase in M will lead to strong productivity growth, ΔT. In the context of late Ming China, although the inflow of silver decreases, this alone could not be the prime factor for the economic collapse in the 1630s-1640s, given that the amount of silver bullion was relatively small in the Chinese economy as a whole. In other words, the velocity of money, the price level and even the definition of what is to be considered as money could all play a role in understanding the role of silver in relation to production.

Furthermore, Goldstone also challenges the seventeenth century crisis theory from a structural ground because the theory overemphasizes the importance of external factors, such as the American silver flow and undermines the internal intra-Asian changes, such as domestic price inflation. Goldstone believes that domestic fiscal mismanagement, rather than a decline in silver inflow, contributed more to the price inflation and destroyed the financial basis of the Ming dynasty. Even if silver inflow did manage to keep up with the previous growth trend, Goldstone doubts that such change would be enough to counter the decline purchasing power of silver in the long run.[20]

Brain Moloughney and Wenzhong Xia argue that such a direct causal relationship between the volume of monetary metal entering the empire and the socio-political condition of the empire is weak. The downfall of the Ming Empire was more due to the

[19] Jack A. Goldstone, "East and West in the Seventeenth Century: Political Crises in Stuart England, Ottoman Turkey, and Ming China," *Comparative Studies in Society and History 30*:1 (1988),115.
[20] Jack Goldstone, *Revolution and Rebellion in the Early Modern World* (Berkeley: University of California Press, 1991), 371.

factionalism in the dynasty rather than the international movements of bullions.[21] In other words, although the decline of the importation of silver bullions and the downfall of the Ming dynasty took place at the same time, it is difficult to conclude that the decline of silver bullion growth led to the dynasty collapse. Atwell devoted his academic career to studying the relationship between global silver flow and the early-seventeenth century regime changes in East Asia, but he never ignored the other factors that contributed to these political changes. For example, in another of his essays, he acknowledges that even the sudden increase in volcano activities, leading to a short-term regional climate cooling, was one of the factors for the collapse of the Ming.[22] While the direct relationship of silver may have been overestimated as Moloughney and Xia stated, the impact of decline of silver in circulation as one of the factors of the dynastic change is still worth investigating.

Dennis O. Flynn and Arturo Giraldez of the University of Pacific are a pair of scholars who study the global silver movement and its impacts on Europe as well as East Asia. Unlike Atwell, they view silver more like a commodity in that its movement depended on the global supply and demand of silver. Due to the difference in purchasing power of silver, this commodity tended to flow to places like Ming China where it could exchange more goods. This demand and supply theory suggests that silver was cheaper in places like the Americans and Japan where most of the new silver mines were located, but was more expensive in China, particularly because the government failed to provide a currency to facilitate large exchanges. Europeans and other traders became the

[21] Brian Moloughney and Wenzhong Xia, "Silver and the Fall of the Ming Dynasty: A Reassessment," *Papers on Far Eastern History 40* (1989), 68.
[22] William S. Atwell, "Volcanism and Short-Term Climatic Change in East Asian and World History, c. 1200-1699," *Journal of World History 12*:1 (2001), 64.

middleman of this silver trade primarily because profit could be made due to the price difference in silver.[23]

Flynn and Giraldez's work was heavily influenced by the previous findings from James Peter Geiss in which he showed that the decline in the import of silver in late Ming was due to its diminishing purchasing power as the stock of silver increased throughout the sixteenth century. As the Chinese economy became increasingly silvered, this excessive supply of silver would "in turn affect the prices of almost everything in the empire, for the structure of prices was tied to the value of silver."[24] In Flynn and Giraldez's words, this increase in silver inflow does not immediately imply a favorable trade imbalance, since silver, like other precious metals and export-goods, was a commodity. In order for China to import silver, it had to export other precious metals or manufactured goods in exchange, notably gold, silk and sometime even copper.[25] The modern trade deficit theory that Frank suggested viewed silver inflow as a favourable trade imbalance for the Chinese empire and therefore this could be an indication of the progressiveness of its economy. On the contrary, Flynn and Giraldez argue that the trade deficit theory does not fit into the reality of the early modern world trade because even though silver was an important, if not the most acceptable, commodity money in the empire, gold, silk and copper are other forms of commodity money that were being traded around the globe. They define money as "all types of high-value coins containing internationally recognized intrinsic content, such as gold and silver."[26] In Ming China, importing silver often meant exporting other forms of commodity money that were

[23] Dennis O. Flynn & Arturo Giraldez, "Born with a "Silver Spoon": The Origin of World Trade in 1571," *Journal of World History 6*:2 (Fall, 1995), 203.
[24] James Peter Geiss, "Peking under the Ming, 1368-1644," Ph.D. diss, Princeton University, 1977, 158.
[25] Flynn & Giraldez, "Born with a "Silver Spoon," 216.
[26] Flynn & Giraldez, "Born with a "Silver Spoon," 207.

viewed as "cheap" by the global standard. The global flow of silver, therefore, was profit driven due to the exploitation of the exchange rates of different forms of commodity money, rather than an indication of the progressiveness of the Chinese economy.[27] In short, from their point of view, while silver increased the physical amount of silver bullion, some other precious metals would have to be exported in order to get this silver in many cases. This was because not all silver trade involved exporting raw materials and manufacturing goods that were made in the country. Counting silver as the only form of money will undoubtedly overestimate the amount of money in the monetary system as the favourable silver exchange ratio encouraged international traders to export silver to China.

Silver in China was particularly expensive by the global standard due to its unique historical development in its monetary system. Since the second millennium, the Chinese empire had been facing a problem of bronze coin shortage. Paper currency was introduced in order to overcome this shortage, but mismanagement in monetary policy led to the collapse of the paper currency in early Ming. As a result, the private sector then first turned to another precious metal, American and Japanese silver, to overcome the problem of money shortage due to the public distrust in paper currency. These private sector developments in introducing silver into the Chinese monetary system led to responses from the government level. While an increasing portion of the government revenues and taxation were collected in the form of silver after the single wrap reform in the late sixteenth century, the empire was also accepting silver as tribute payment. By the

[27] Dennis O. Flynn & Arturo Giraldez, "Money and Growth without Development: The Case of Ming China," in Heita Kawakatsu & A.J.H. Latham (eds.), *Asia Pacific Dynamism, 1500-2000* (Routledge, 2002), 199.

late Ming, silver had become the medium of exchange in the Chinese monetary system, according to Flynn and Giraldez.[28] On the one hand, the adoption of silver into the Chinese monetary system then in turn increased the demand for silver from abroad, especially since the Empire had very few silver deposits. On the other hand, thanks to the development of new mining technologies in Japan and the discovery of American silver, silver in such markets became less expensive, and therefore, merchants could take advantage the price differences. Under this assumption, the difference in silver prices would converge over time, meaning that silver in Ming China would become "cheaper" due to the flood of new silver imports from the outside world. Data collected by Flynn and Giraldez suggests that the 1640s monetary crisis was indeed a supply and demand adjustment. By the 1640s, the exchange ratio of silver to gold in China and in Europe had converged due to the outflow of gold from China and inflow of silver to China. In other words, the decline of silver inflow was the reflection of diminishing profit-making opportunities for shipping or smuggling silver to China.[29] This theory aims to capture the fact that *some* portion of the world bullion trade was simply the exploitation of differences in precious metal exchange ratio around the globe, rather than the reflection of the growing intensified exchange of manufactured goods and raw materials, as we commonly understand in the modern world context. This further challenges the earlier hypothesis of silver equalling money, because global movement of silver does not reflect global movement of money in this context.

[28] Dennis O. Flynn & Arturo Giraldez, "Arbitrage, China, and World Trade in the Early Modern Period," *Journal of the Economic and Social History of the Orient 38*:4 (1995), 429.
[29] Flynn & Giraldez, "Arbitrage, China, and World Trade," 433.

The most important part of Flynn and Giraldez's analysis is the extent to which this inflow of silver stimulated economic growth in Ming China: the ultimate question that Frank wanted to answer. Flynn and Giraldez propose that economic growth and economic development or wealth accumulation are two separate concepts. The adoption of silver bullion was first a market response to the failing centralized paper money monetary policy, and in this specific historical context, silver did provide a solution to this existing problem during the early Ming. From this context, it was very likely that basing silver as a commodity currency helped improve the economic productivity of the early Ming China, since the shortage of money in circulation was a barrier to economic growth. However, importing foreign silver was not free. In order to obtain this metal, the Chinese needed to produce manufactured goods such as silk, or export other precious metals such as gold and copper for this silver. On the one hand, such developments integrated the Chinese into the global economy and stimulated economic growth through marketization, but on the other hand, the very same developments also prevented the empire from accumulating the necessary wealth to undergo significant and transformative economic development. In the long run, the import of silver helped the Chinese empire to grow economically in size at the expense of preventing it from undergoing transformative economic development.[30] For Flynn and Giraldez, this means moving beyond the quantitative theory of money to suggest that it could be meaningless to examine the growth of the size of the Chinese economy because a growing economy does not imply a developing economy. While Flynn and Giraldez have raised an extremely important point for understanding the role of silver in Chinese economy history, unfortunately, the length and the scope of this paper will not permit me to explore this issue in depth.

[30] Flynn & Giraldez, "Money and Growth without Development," 206-207.

Richard von Glahn of UCLA studies the impact of silver in China in great depth, advocating the importance of the changing role and value of bronze coins. He coined the term "parallel bimetallism" to describe the role of both metals in shaping the Ming monetary system. Bronze coins were often used as the instrument of exchange because they could be broken down into small units and often facilitated the local market exchange, whereas silver served as the money of account because it could be stored in large amounts relatively easily and often facilitated the interregional market exchange.[31] Despite silver having had the important function of being the means of state payments, bronze coins were still the primary currency for everyday transactions, one of the defining characteristics of money.[32] In handling the role of silver, Glahn suggests that the Chinese empire had a long history of adopting silver as a commodity currency. The Ming had long used silver as a standard of account before of the emerging world silver trade, but the inflow of silver did stimulate this trend of development. In other words, Ming China welcomed silver because of its long history of being a secondary currency in the Chinese monetary history.[33]

Glahn contributed greatly to this discussion because he introduced the dynamics of bronze coins in shaping the definition of money. Even though the imperial court minted and set the standard of the bronze coins, the quality of coins was never standardized. This is partly because the coins were never made to facilitate interregional market exchange and therefore the standard among provinces could vary, but more importantly, the copper contained in the coin was often worth more than the coin itself,

[31] Richard von Glahn, "Money Use in China and Changing Patterns of Global Trade in Monetary Metals, 1500-1800," in Dennis O. Flynn, Arturo Giraldez & Richard von Glahn (eds.), *Global Connections and Monetary History, 1470-1800* (Burlington: Ashgate, 2003), 194.
[32] Glahn, "Money Use in China," 201.
[33] Glahn, "Money Use in China," 188.

so it was in the interests of people to introduce debased private coins that reflected the true value of the metal in the local communities. The counterfeit coins were worth less than the government coins by their metal value and as a result, the cheap counterfeit coins drove the expensive government coins out of circulation because the government minted coins would get minted down to produce a greater number of counterfeit coins. This process can continue until the making of counterfeiting coin becomes unprofitable.[34] From an economic standpoint, the appearance of counterfeit coins may work the favor of the monetary system as a whole because, like foreign silver, this decentralized system could often adjust the supply of coins based on the size of its economy, since the value of the coins was based on the actual value of the metal itself and the market effectively resolved the problem of a coin shortage. Despite the numerous attempts from the imperial court to standardize the bronze coins, it failed to counter the market until the last decades of the dynasty.

During the years of the Tianqi Emperor (1620-1627), the state found itself powerless to resist the counterfeiting of coins, and as a result, the imperial court began to debase its own coins in the hope of driving the counterfeit coins out of circulation.[35] When the state began to debase its own currency by introducing zinc to decrease the copper content in the coins, the petty coins were worth even less. Depreciation set in but wages were paid in bronze coins and often lagged behind this fast debasement, so ordinary labourers and farmers suffered. The merchants and in particularly the speculators, defined by someone holding a large sum amount of silver as an asset, benefited from this debasement. The expanding money supply in the economy caused the

[34] Glahn, *Fountain of Fortune*, 99 & 167.
[35] Glahn, *Fountain of Fortune*, 153.

value of bronze coins to drop.[36] The silver to coin exchange ratio hit the unprecedented level of 1:2000+ from 1:500 a decade earlier.[37] The debasement of bronze coins, not the decrease in the inflow of silver, was the root of the monetary crisis.

Glahn rejects Atwell's "crisis theory," in which he suggests that the exchange ratios between silver and coins as well as other commodity money were determined by the supply and demand of the metals rather than the international flow of silver. On this issue, Glahn adopted the Ricardian specie flow mechanism theory in which value of commodity money was determined by demand and supply, rather than the flow of commodity money determining the wellbeing of an economy.[38] In the context of the quantitative theory of money, this important insight towards money established that the debasement of money increased the money supply, ΔM, which had an effect on some price level, ΔP, although the relationship is poorly understood as data suggests that the late Ming China did not experience a cross-sector all-out inflation.

Glahn is the only scholar here that directly mentions the use of quantitative theory of money in understanding the Ming monetary policy. He disagrees with the use of velocity, V, to measure the flow of money, but instead, favors the Cambridge equation using (1/k) instead, the demand to hold money. This demand is inflated by the total stock of the money in circulation, whereas the velocity of money is determined the willingness to spend the money. In other words, the short-term decline of silver inflow in the last decades of the dynasty would not have led to a monetary crisis because the price

[36] Glahn, *Fountain of Fortune*, 167.
[37] Richard von Glahn, "Myth and Reality of China's Seventeenth-Century Monetary Crisis," *Journal of Economic History 56*:2 (June, 1996), 431.
[38] Glahn, *Fountain of Fortune*, 6.

fluctuation is determined by the *overall* demand and supply of money stock. [39] The former focuses on the demand side of the money as it acknowledges that a large portion of silver was stocked as reserve and not being used in everyday transactions under the Ming monetary system, while the later stresses the supply side of the money, measuring the size of the money supply generated from the silver stock. If silver were a currency that was used as the instrument of exchange, like the contemporary fiat money, then the later Fisher theory that Frank adopted should have no shortcomings, but if silver were a reserved currency to serve as the money of account as Glahn proposes, then the Cambridge equation would doubtlessly represent better in this case.

Glahn further challenges Atwell's theory in that given the situation in late Ming China, if the supply silver had become so scare like Atwell suggests, then people would want to accumulate silver to protect their assets, instead of spending it right away. This in turn would bring the overall availability of money in circulation, ΔMV, down not up. For this hypothesis to hold true, we would witness an equal impact of ΔPT, price level and transactions in the economy, as well. If ΔPT was a negative variable, then it fails to explain why rice and silk, two important products to measure the price level, had skyrocketed as Atwell himself suggests.[40] To a great extent, this debate is a result of the positioning of silver in the definition of money. The main problem of applying the quantitative theory of money in the analysis of the Chinese economy is that it undermined the historical background of the dynamics of this "parallel bimetallist" monetary system. The late Ming economic collapse was particularly important in understanding the role of

[39] Glahn, *Fountain of Fortune*, 238.
[40] Glahn, *Fountain of Fortune*, 240.

silver because it showed the problems of using silver as the measurement of money, not to mention as an indication of the performance of the Chinese economy.

In terms of placing this silver narrative into the conceptualization of the long-term Chinese economic performance, Glahn argues that this inflow of silver had helped stimulate commercialization in Late Imperial China, and in particular, the silverization of the Chinese monetary system enabled some of the merchant class to make unimaginable fortunes, while exposing the entire population in the empire to the volatile global market.[41] Although Glahn agrees that the silver inflow did intensify the development of the market economy in China, unlike Flynn and Giraldez, he does not comment on its impact on the long-term development of the economy. Glahn contributes greatly to the existing scholarship because he places the dynamics of the bronze coins parallel to the development of the silver economy in Ming China, therefore enabling us to distinguish the difference between causality and correlation of the impact of silver flow in the economy.

Kent G. Deng from the London School of Economics explores two critical aspects of silver: the role of silver and bronze coins in the Chinese monetary system, and the distribution of silver in the Chinese economy. He concludes that it was a mistake to use silver to measure the size of the Chinese economy because silver was only a commodity that stored production surplus in the economy. The growing popularity of the metal was not because the economy had undergone some tremendous economic growth but because of the practicality of the metal as a means to store value. Silver, as a result,

[41] Glahn, *Fountain of Fortune*, 250.

was a commodity deposit that involved a transaction cost when converting it to currency, bronze coins, due to price fluctuations.

Like Glahn, Deng believes that silver and copper functioned in very different manners in the Ming economy. Even the Ming imperial court debated whether silver was an import, which was subject to taxation, or a currency that settled international trade. Deng goes as far as stating that silver was "treated as a commodity with value just like cloth and rice." When the imperial court paid its bureaucrats and soldiers in silver, they would convert the silver to bronze coins almost immediately. Silver, at most, was a secondary currency.[42] In other words, the function of silver in this economy was to store value. To simplify this process, peasants and artisans paid tax in silver instead of in kind to reduce the transportation cost. The imperial court received the silver and spent it on government projects such as wages of its bureaucrat and soldiers because this was what the imperial court was receiving from its people. Then the silver recipients would convert the silver to bronze coins to purchase goods and services. The ordinary peasants and artisans would then convert part of the bronze coins that they received to fulfill the tax obligation. This oversimplified process demonstrates that silver was only used in very occasional situations. Although in reality, silver was also used in the credit market, large transactions and long distance trade, this narrative provides a short version of the circulation of silver in the Chinese economy. The most important aspect of this narrative is that silver was only used in certain situations, and otherwise, it would get converted back to bronze coins.

[42] Kent G. Deng, "Miracle or Mirage? Foreign Silver, Chin's Economy and Globalization from the Sixteenth to the Nineteenth Century," *Pacific Economic Review 13*:3 (2008), 337.

Silver came to the Chinese economy because the Chinese were persistently producing a surplus but had no means to store the surplus value. According to Deng's analysis, without any transformative development and since industrialization was not an option for the Chinese, this massive economy ended up converting its surplus into silver stock, driving up the demand for silver. However, because silver was a commodity not a primary currency, and if such a trend continued, silver would be too expensive for the Chinese and they would turn to another commodity or would eventually export silver to exchange for other goods. The evidence of this hypothesis is that there was no uniform exchange between the two, and from a long term perspective, the relative price of bronze coin against raw silk and rice was much more stable than that of silver. As Deng puts it, the role of bronze coins was equivalent to the modern M0 (cash or assets that can quickly be converted into currency) whereas the role of silver was somewhat like the modern M2 (time-related deposits).[43]

In order to further prove that silver was not a primary currency, Deng calculated that much of the silver stayed idle most of the time. Even though the imperial court accepted silver as tax payment, it did not retain a large silver reserve like the modern central banks to protect the value of its bronze coins. The imperial count simply had no incentive to store a large amount of silver. Nor did a significant portion of the silver end up in the hands of wholesalers or native banks. Surprisingly, he estimated that more than half of the silver stock was held by pawnshops, in which ordinary people deposited their savings and pensions, and in turn, the pawnshops lent out money to the peasants. Since the loans were overwhelmingly towards services and consumption, most of the silver was

[43] Deng, "Miracle or Mirage," 340, 343.

sitting idle most of the years. As Deng points out, the loans were made at 1 to 3% interest per month, significantly low by the pre-modern standard, indicating that there was an issue of oversupply of loan credit in the sector.[44] Under the description of Deng, the Chinese state was able to produce some surplus, and very possibly experienced some production growth, as indicated by the increase of idle silver stock in the economy. The very same idle silver stock in the economy also indicates that the Chinese failed to move forward to industrialize their economy. In this aspect, Deng's position was similar to the conclusion that Flynn & Giraldez draw. However, this argument brings up other interesting questions that are closely related to other studies of economic history. For instance: If there were no shortage of credit supply, why did manufacturers not take advantage of this cheap credit and further achieve the economies of scale in production, one of the profound characteristics of the English industrialization?

In the context of quantitative theory of money, Deng basically rejected using silver as the measurement of money (M), because silver was only one part of the money system in Ming China. The velocity (V) of silver, according to Deng, was much lower than bronze coins. Therefore, although silver is part of the money in the equation, using it as the estimator of all the money and the velocity of money is unacceptable. In term of the price level (P), Deng mentions that the relative price of silver was not even a good estimator of the price level in Ming China. As a result, it is not possible to measure the transactions in the economy or the size of the economy using silver as the definition of money.

[44] Deng, "Miracle or Mirage," 352.

Measuring Chinese Economic Performance and the Quantitative Theory of Money

Despite the shortcomings of using silver as the measurement of the size of the Chinese economy, the author still agrees with Frank that the theory is a powerful analytical tool to enable historians to further the understanding of the performance of the Chinese economy. The issues in the debate earlier are not about the validity of the theory, but are about the quality of the estimator, silver, as money. Given the studies we have so far, the conclusion of whether the Chinese economy was indeed a progressive one cannot yet to be drawn.

In Ming China, bronze coins and silver were both being used as money, but each of them fulfilled different functions of money. The "parallel bimetallism"[45] that Glahn proposes should not be mistaken to mean that there were two currencies being used in a parallel manner in Ming China, but should be understood as expressing that the functions of money had been divided by two different metals. The bronze coins served as the main medium of exchange, whereas silver served as the unit of account. The value and the legal status of bronze were partly granted by the imperial government since it minted and set the standard of the coins, even though the state was under enormous pressure to assure this monopoly. Silver, on the other hand, was guaranteed by the natural value of the metal. Even though it was accepted by the imperial court as tax payment after the single whip reform, this alone could not explain the massive inflow of silver that began decades before the reform. Silver, to some extent, served as a secondary currency, since the state failed to produce enough bronze coins to serve the economy or establish a credit system

[45] Glahn, *Fountain of Fortune*, 8.

to relieve the pressure of hard physical coins. As Kuroda Akinobu states, low quality silver coins were often rejected by the Chinese altogether.[46] Since the bronze coins were partially backed by the government whereas silver coins were backed by the market value of the metal, there was no unified exchange rate established between the two currencies. Therefore, there is a measurement problem of converting bronze coins to silver units or using silver as the estimator of the overall amount of circulated money in the economy. In the long run, because the two currencies functioned so differently in the monetary system, using silver to generalize the overall money supply eventually runs into problems, as the discussion on late Ming economic crisis outlined earlier in the essay.

The measurement of the velocity of money will depend on what comprises money. As mentioned earlier, velocity is the interaction between goods and services and money. Silver undoubtedly had a much lower velocity than bronze coin because the latter served as the medium of everyday transactions. Silver in Ming China was like the U.S. Treasury Bills by the modern standard. Silver was used to store value and as a means to protect assets against time, since other commodities did not have a guarantee to store value. In the world of either Fisher's equation (V) or the Cambridge equation (1/k), silver is not a good indicator of the true velocity of money. In Fisher's world, the velocity of silver is low because although people tend to hold silver for a short period of time, much of the silver was sitting idle for the rest of the time. Similarly, the impressive silver inflow did not generate a bigger credit market or increase the money supply in the same manner since the demand for credit loans generated from silver stock was generally low despite a relatively low interest rate. Theoretically, each of the two versions of the quantitative

[46] Akinobu Kuroda, "Copper coins chosen and silver differentiated: Another aspect of the 'silver century' in East Asia," *Acta Asiatica 88* (January, 2005), 84.

theory is unique in its own way, but in this particular situation, they capture the same economic phenomenon.[47] Using silver as the measurement of price level faces even more challenges in this case. Since most transactions were done in bronze coins, it is doubtful that using silver as the measurement would yield a better result.

The Ming Chinese monetary system is fundamentally different from our modern monetary system. The choice is not between bronze coins or silver, because using bronze coins as the estimator would yield a different set of measurement problems that overlooks other aspects of the Chinese monetary system. Replacing silver with bronze coins in the formula will not solve any fundamental problems that were addressed earlier in the essay. The problem here is that silver and bronze coins were *used* in a parallel manner in the economy, but they did not *function* in a parallel manner. In such an economy, increasing the supply in bronze coins could not replace the use of silver, and it was impossible to "silverize" the entire economy given the world total silver stock at that time and the under-demanded credit market that the Chinese had. The Chinese preferred the use of silver in some situations, but bronze coins in the others. We need an independent estimator to capture the dynamic of bronze coins and silver when applying this equation: an estimator that could reflect the different rate of changes in velocity and price level driven by each currency. Only by obtaining this estimator, could we use this theory in measuring the change of economic growth in Late Imperial China. However, the construction of such an estimator is far beyond the scope of this essay and the ability of the author.

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[47] While Glahn argues that the two versions of quantitative theory are fundamentally different in explaining the situation in Ming China, but in the particularly context of the late Ming monetary crisis, the author argues that the two are yielding the same result. For Glahn's explanation, see Glahn, *Fountain of Fortune*, 238.

When interpreting Frank's work, historians have to be extremely careful not to adopt the opposite conclusion that the "ReOrient thesis" proposed that the Chinese had indeed undergone some significant economic growth. There are significant problems when using silver to measure the size of the economy; however, this alone does not imply that the conclusion that Frank drew was wrong. While Flynn and Giráldez argue that the money growth in China had resulted in an involuntary growth as suggested by Phillip Huang,[48] Huang's theory suggests that despite the growth of overall output level, per labour hour output was decreasing in Late Imperial China. From the context of silver inflow, it may be a premature conclusion to draw. The quantitative theory of money is a powerful analytical tool that is rooted deeply in economic analysis. It aims to understand the interactions between economic performance and money flow. As Frank believes, this valuable tool should be utilized to further the understanding in Chinese economic history. However, the uniquely positioned bimetallic monetary system in Late Imperial China led to some measurement problems that are extremely difficult to resolve. Further research into Chinese monetary practices and the quantitative theory of money will hopefully overcome some of the barriers that we have today.

[48] Flynn & Giraldez, "Money and Growth without Development," 200. See Phillip C.C. Huang, *The Peasant Family and Economic Development in the Yangzi Delta, 1350– 1988* (Stanford: Stanford University Press, 1990), 10.

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