

Stagnation Is Silver, but Growth is Gold: China's Silver Period, ca. 1430-1935¹

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Abstract

China's economy was the first country in the world to use paper fiat money during the Yuan Dynasty (AD 1271- 1368). Not being backed by silver, it soon lost trust and, after an aborted attempt to reinstate this currency during the early Ming dynasty (1368-1644), China's economy reverted to a *de facto* silver standard from about the 1430s when they accepted silver as payment. From this time onwards, the economy was mainly driven by supplies of uncoined silver and copper coins with the exchange rate being determined by the market for over 500 years. This paper discusses the question why this *de facto* silver standard remained stable for over 500 years despite various monetary supply and demand shocks and government attempts to modify this system. None of the standard monetary explanations, i.e. the absence of monetary demand and supply shocks, government fiscal expenditure, and culture, accounts by itself for this long run stability. Rather, an additional reason can be found in real economic development: Gresham's law states that in periods of stagnation and decline, as was the case in China during this period, the supply of coins must decline. In such a situation, it will be the best government accepted commodity (i.e. gold) that will be hoarded or disappear abroad, thus adding impetus to a *de facto* silver standard. The opposite will happen in periods of growth.

Introduction

According to standard theory, metal currencies such as copper, silver and gold may fulfil three functions in a society: they may function as a monetary standard (to which all money in a society can be related), as a coin to be circulated (means of exchange), and as a base for hoarding (i.e. store of wealth). Obviously, these three functions are strongly intertwined and can be fulfilled either by the government or private parties. Indeed, Chinese monetary policy from Han times (206 BC – AD 220) onwards has been based on conflicting thoughts of metallism (i.e. money in circulation has the value of the metal it is made of) and cartalism (i.e. money has the value the state or any other party attaches to it). In the case of metallism, money could function well for hoarding as, in adverse circumstances, the coin kept its value. In the case of cartalism, however, it depended on trust; either in the government itself, or in the monetary standard. After all, if a party, often the government, lowers the intrinsic value of the coin and, at the same time does not have enough precious metal to back up the monetary standard, we face a *de facto* situation of fiat money in which lost of trust can generate massive inflation. Of course, there is a natural tendency to move towards the cartalist system to generate extra income for the government or private person issuing this money. Indeed, in China, from the 5th century AD onwards, the cartalist view became dominant, implying that the state got entrusted with the task of keeping the balance between increasing production and maintaining the purchasing power of the people.

The 5th century currency system can be traced back to the Western Han Dynasty (202 BC – AD 8), from which period onwards the successive Chinese empires witnessed a multiple metal currency system, in which copper or iron coins, the *wen*, functioned as the

basic currency in day-to day transactions while long-term business and government finance which were paid in either gold or silver. However, the hoarding and the monetary standard were mainly performed in the strongest metal, being gold.

This situation lasted until, due to lack of metal currency in circulation, the late Northern Song government (AD 960-1127) had to tentatively introduce the paper money backed by copper. The shift towards uncoined silver as a money of account took place during the Jin Dynasty (1115-1234) which slowly replaced the Song Dynasty in Northern China. This Dynasty also issued paper notes backed by silver. Yet, it was only during the Mongol Yuan Dynasty (1271-1368) that several attempts were made to create fiat paper money, i.e. even though silver was still money of account, the paper currency was not convertible anymore in silver (Von Glahn 2010, and chapter 12, this volume). The bad economic and political situation combined with shortages of copper and silver induced strong inflation in this period. After the fall of the Yuan Dynasty, the Ming rulers (1368-1644) initially tried to re-establish a system based on paper money as money of account backed by copper. Since the Ming rulers encountered the same inflation issue as the Yuan did, the Ming rulers in the 1430s changed the paper money system back to bimetal currency system, in which copper coins were the basic currency for day to day transactions and uncoined silver was used both for large transactions and money of account. Even though at times there were attempts to increase the money stock (for example by printing paper money), this situation of an essentially bimetallic currency system with uncoined silver and minted copper coins remained in place from the 1430s up to the start of the twentieth century.

The period between the 1430s, when silver was finally formally accepted as a monetary standard by the government, and the start of the twentieth century when the silver standard was abolished, is the topic of this chapter. During this period, silver can be argued to be the anchor in the Chinese monetary system. This does not imply that it was fully accepted by the government. Indeed, except for the final decades in this period, the government did not mint any silver. At the same time, private coins existed and various discussions and attempts to reduce the role of silver occurred, but ultimately failed.

The main question is therefore why silver acted for a period of well over half a millennium as an anchor for the Chinese monetary system notwithstanding the existence of a variety of monetary crises as well as government attempts to modify the currency system. Various, mainly monetary, arguments have been brought forward, mostly related to the availability of silver, e.g. the existence of extensive silver deposits (and lack of gold), government preference for silver, cultural preferences for silver, etc (e.g. Scheidel 2009; Horesh 2014). Indeed, it is well known that during the period under study, these factors contributed to a gold to silver ratio which was well below that in the Western world thus leading to an outflow of gold and, hence, a de facto silver standard (see Sections 2 and 3).

Yet, in this paper we also would like to stress the importance of the real economy, i.e. (the lack of) income growth. Recent studies seem to indicate that Chinese per capita growth was negative in most of the Ming and Qing dynasties. Following Fisher's Equation, this must imply an excess of coins in circulation and thus decrease their price.

Following Gresham's Law, which states that bad money drives out good money if the exchange rates remain constant (i.e., if there are no monetary changes; see e.g. Mundell 1998), this causes outflow, or hoarding, of the highest valued metal, i.e. gold. This will eventually cause the replacement of gold by silver as the monetary standard, at least as long as there is less trust in the cheaper currency (Sullivan 2005).

Again, we have to stress that this real economy effect is additional to monetary shocks rather than being mutually exclusive. Yet, even though monetary factors such as government policy relating to silver and cultural heritage may play a role, we find limited evidence that the existing silver famines in China had a significant impact on money in circulation as has sometimes been argued in the literature (see the following Sections). Hence, unless culture and government policy are dominant, there may be another reason underlying this long period of stability in the use of silver. This is dealt with in Section 4 where we argue that, *ceteris paribus*, a silver anchor is mostly used in societies that experience economic stagnation and decline (i.e. when the money in circulation is too high given the level of economic development).

Supply of Silver and the Stock of Money in Circulation

As pointed out in the introduction, one of the monetary arguments as to why silver persisted for such a long period of time, is its sheer availability. This seems to contradict the argument brought forth by various authors about shortages of silver during the Ming-Qing transition (around 1644) as well as during the late Qing (last decades before 1912).

To assess this question, we will look at how these assumed reductions in supply affected the stock of money in circulation. Indeed, the availability of money (or the stock of money) in a society is long considered an important indicator of economic development.² The problem with the stock, however, is that it can be defined in various ways. Perhaps the easiest way to define is the monetary base (M0), i.e. the amount of coins and specie, which is also the most common in pre-modern economies such as for our study.³ Since the stock of money is based on a precious metal (i.e. silver) with copper being ancillary, it is in principle based on what Tlaga (2002) called a “honest” monetary system, i.e. where the money of account (i.e. silver) and the actual coins (i.e. copper) are related via their intrinsic value. In such a system, any in- or decrease of the stock of money carries in it the risk of debasements and other money generating, silver saving, activities that may undermine the system. Hence, it is important to look at these “silver famines” and assess why they did not lead to a change in the system.

Indeed, in the 500 years under study several of such ‘silver famines’ occurred without, however, significantly altering the system. In the literature, various such famines are discussed, most in conjunction with their effect on the real economy. For example, the seventeenth century crisis thesis argues that the collapse of the silver inflow, due to smaller imports from the Spanish Americas and the contraction of Japanese silver, caused rising prices and economic hardship leading to a breakdown in commercialization. This has been argued to have ultimately led to the fall of the Ming Dynasty in 1644 and its replacement by the Qing Dynasty (1644-1912). Likewise, the Kangxi (1662-1722) and Daoguang (1821-1850) depressions (e.g. Lin 2006) have been attributed to reductions in

silver inflow. So why was the silver-based system able to sustain irrespective of these supply-side shocks?

As argued by Von Glahn (1996 a, b), it may be questioned if the silver famines were as serious as is sometimes claimed. Perhaps the most contested is the silver famine in the mid-17th century, which allegedly caused the fall of the Ming dynasty and where various authors have suggested a large drop in silver inflows. Looking at the actual inflow of silver in this period, we follow e.g. Flynn and Giraldez (1995; 1997) and subdivide it into four main sources. There was a domestic production, but most of the silver supply originated from Japan, or from South America (the latter flowing into China either via Manila or Europe, both of which ultimately drew their silver from the Latin American mines (TePaske 1983)). Domestic production was indeed relatively modest even though the annual silver production significantly increased from 30,000 to 220,000 *tael* at the end of the 14th and start of the 15th century. Due to severe corruption, however, official silver production declined from 1453 onwards so that annual silver production dropped to 49,000 *tael*. From 1520 to 1644 the Ming government even abandoned silver mining altogether. Even though, after the rise of the Qing dynasty in 1644,

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domestic silver production resumed, it remained, with an annual production of 12,000 *tael*, at a low level (see Table 13.1, Figure 13.1), only to increase during the mid-Qing.

This relatively low level of domestic production was expanded by imports of silver from Japan, Manila, and Europe. The main import of silver from Japan took place between 1550 until this started to decline in the 1640s. This silver import has been quantified by many scholars (see Table 13.2). Most seem to agree of an annual import of ca. 1 million *tael*, which declined after 1650.

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A third main source of silver is the trade with Manila, which took off after its founding in 1571. Table 13.3 shows current estimates of the imports of silver from Manila. These estimates are to a certain extent controversial since a large amount of smuggling occurred (e.g. Flynn and Giraldez 1995). Hence, calculations vary widely (see Table 13.3).

However, as argued by Wu (2001), for the period between 1550 and 1649, Von Glahn (1996a), Liang (1989), Wang (1964), and Peng (1958) ignored parts of import of silver from Manila to China. On the contrary, Wan's (2004) estimate was based double counting of part of the silver that was imported into China. Therefore, we follow the estimates from Wu (2001) and Zhuang (1995) the average of which we will use further in the paper.

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Finally, from 1550 onwards, European merchants shipped some silver to China in exchange for Chinese products. As table 13.4 shows, most scholars seem to agree on annual imports in the order of ca. 400,000 *tael*. Indeed, as Liu (2009) argued, Wan's (2004) estimate suffers from severe double counting. Therefore, we take average from the, very similar, estimates of Von Glahn (1996) and Zhuang (1995).

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Combing the information on silver from domestic production, Japan, Manila and Europe (Tables 13.1-13.4) we can get some information on the total silver inflows into China around the Ming-Qing transition in the mid-17th century (see Table 13.5). Yet, in order to arrive at the total stock of

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money (M0) in circulation, we need to make an additional step of adding up these values before 1650 and subtracting roughly 50% (10% for wear and tear and 40% for hoarding) (Wu 2001, pp.228). Doing so results in roughly 130 million *taels* of silver in circulation in 1650 (see Table 6). This value corresponds to estimates from Liu (2005) who estimated the amount of silver in circulation to increase from 20 million *taels* in 1550 to around 130 million in 1650. It is clear from Table 13.6 that, even though there may have been a drop in imports of silver during Ming-Qing transition in 1644,

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this is very unlikely to have had a serious impact on the total stock of silver in circulation. At best, it would have diminished the stock in circulation with 5%, which implies a per capita availability of silver of 38 instead of 40 grams.

But if there is little evidence of a significant silver famine in the mid-17th century, perhaps there were more significant ‘famines’ during the Kangxi (c. 1700) and Daogang (c. 1830) depressions. Even though also in these years silver imports dropped, Table 13.6 does not show much evidence of any significant effect on the money in circulation.

Nevertheless, two observations need to be made. First Irigoien (2013) stresses that the Daogang crisis was not a supply, but a demand driven crisis where the demand for high quality coins induced imports of the peso. When the peso declined in quality due to Latin American independence, this led to deflation in China, which is also visible in rising number of copper coins that needed to be paid for silver. Yet, even if this argument is true, the share of foreign silver was small. Unfortunately, we do not have early 19th century information but, as shown by Dai (2003), in c. 1930 the share of foreign coins in the total Chinese silver circulation only made up 4.5%. In addition, as shown in the next section, most of the inflationary effects occurred during the Taiping rebellion (1850-1864), which, as shown by Shi (2008), were mostly caused by the government minting of low quality copper coins as well as the introduction of copper-based paper notes.

Likewise, as shown by Ni (2012) customs accounts show little, if any, sign of depression

in this period. Hence, little evidence exists that the influx of low quality silver nor the demand for high quality silver coins affected the Chinese monetary economy.

Here we should make a second observation about to the expansion of the money stock. From the mid-19th century onwards other ways to increase the money stock became available. For example, the government increasingly tried to engage in paper currency, basically enhancing its capability to extract wealth. As pointed out by Lin (2006: 166), in various studies, Wang Maoyin suggested 10 million, Bao Sichen 60 million, Huashana 100 million, and Wang Liu 900 million *tael* of paper notes to be introduced. Even though initially rejected, in the second half of the 19th century they were introduced anyway with increasing success. Huashana was the closest with his initial observation that ca. 12 % of the money supply could be in paper money, as well as his suggestion that these initial notes should be convertible. But not only the increase in the money base (M0) with paper money is important. Another indirect increase follows from the introduction of new financial instruments. As pointed out by Dai (2003), 768 million *tael* was stored at credit accounts c. 1930 and could therefore be attributed to M1 money stock, increasing M0 by about 50%. All these changes do show that the increase of the stock of money was substantial: whereas between 1650 and 1850 population increased about 3 times, the stock of money increased about 8 times, a number which would have been even larger if we had calculated it for 1930. Hence, there is little evidence of a lack of money in circulation compared to the real economy and, therefore, as argued in the introduction, no pressure on the silver standard existed.

Monetization and the Demand for Silver

The situation that the stock of money increased much faster than the population in the 17th century without apparent inflation has led various authors (e.g. Frank 1998; Atwell 2005: 476) to argue that the Chinese economy was growing and, hence, demand for silver was increasing. As we will see in the next section, this argument, even though supporting a stable monetary system, runs counter to our argument that it is, *ceteris paribus*, mainly in times of economic stagnation and decline that monetary systems based on silver are dominant. In addition, Xu *et al.* (2016) and Broadberry *et al.* (2012), show that the Chinese economy had embarked on a downward per capita path (and a very minor increase in total size) during this silver period. However, just showing that the economy was on a downward trajectory in per capita terms is insufficient as we also should explain why this silver system remained so stable. Hence, we should explain where all the additional money went that came into the Chinese economy if it were not absorbed by actual economic growth.

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A first step is to look at inflation. Looking at the silver prices of rice by Peng Xinwei (1958), we find very little evidence of inflation between the 14th and 17th centuries. For the 18th and start 19th century we do see a strong rise in rice prices, but this is mainly caused by a rise in the price of food, rather than a decline in the price of silver (e.g. Deng 2015). Another way of looking at this is by assessing the copper (coin) to silver ratio. This ratio was stable until the mid-18th century after which it rose, but much less than

prices, suggesting that silver increased in value versus copper (i.e. there was too little silver).

This apparently confirmed the argument that economic growth occurred. However, this assessment is incorrect for two reasons. First, as shown by Table 13.7, even though the coin/silver

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ratio undoubtedly increased in the 18th/19th century (with more coins given for the same amount of silver), once corrected for the purity and weight, the intrinsic copper to silver ratio remained roughly stable (with perhaps a minor decrease in the 17th century) suggesting that there was no real abundance or shortage of silver.

Second, much of the silver flowing into the country did not actually went to increase the amount of coins and specie to match economic growth. Rather, increasingly different currencies and barter trade was replaced by silver. Indeed, the often quoted, ‘Single Whip’ reform in which a part of Chinese taxes was bundled into one silver tax may be seen as evidence for this move from a country based on barter to one based on silver.

This reform introduced by the Ming government in order to

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convert tax into silver, started in certain provinces already in the 1530s, and lasted about 100 years before being complete. As Table 13.8 shows, the percentage tax expressed in silver went from close to zero percent in 1450 to over 20% in 1620. This changed even further after 1651 since, after its rise to power, the Qing dynasty started a serious reform by on the one hand increasing taxes paid in silver as much as possible and, on the other hand, by abolishing non-silver taxes which, at that time, still accounted for 1~2% of total revenue. As table 13.8 showed, non-currency taxes in textiles had been completely abolished, mainly because the government did not control textile production anymore, but the main difference was that the government had aborted many of its non-currency based activities. These reforms caused government finances to be for 64% in silver. Hence, it follows that there is little evidence of an undersupply of silver when looking at the silver to copper ratio. Neither do we find evidence, based on tax data, that the silver that came into the country was used for increasing the stock of money to cover economic development. Rather, it increased the stock to replace existing other means of payments such as produce or textiles.

One might still argue that, even though silver did not add to the total stock of money in circulation, it was still impressive that, within two centuries, the amount of tax paid in silver went from virtually nothing to about 65%. We have, however, to realize that actual silverization of the economy occurred much slower than the tax data seem to suggest. Indeed, as pointed out by Lin (2006: 5), the government paid many of its activities in silver, i.e. largely to official and soldiers in big cities. Likewise, long-distance trade and big merchants were using increasingly silver (e.g. Geiss 1979). However, smaller

provincial towns, let alone the countryside, paid overwhelmingly in copper coins. It is therefore wrong to take the 65% of government tax paid in silver at the start of the Qing dynasty as being indicative that the economy was also for 65% silverized. Indeed, Dai (2003) showed that, as late as 1917, the share of total silver in the 33 biggest cities in China to be 72 million *tael*, or ca. 40% with a total population of less than 1%. This suggests that the countryside and smaller cities were, even in 1917, much less silverized.

A more direct observation of the use of silver in society may be obtained from stone inscriptions. Based on a large number of local inscriptions across China in Qing dynasty, 48 observations are collected from Shanxi, Henan, Guangdong, Guangxi, Fujian, Jiangsu, Beijing and Shanghai, which report in detail which currency was spent in different construction projects such as temples, ancestral halls, drama stages, schools, dams, and guild halls (see table 13.9). By plotting these

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observations together, we thus get a picture of the actual money paid during the Qing dynasty. After correcting for different geographical regions, it becomes clear that, even though the share of silver payments increased in the late Qing, this increase remained relatively small (see Table 13.10). However,

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please keep in mind these are just observations for low skilled construction work while big merchants and government officials were more generally paid in silver. Hence, this increase in silver payments of even lower skilled workers tells us that the society as a whole did increase the level of silverization, even though much less as suggested by the tax data.

In sum, even though the use of silver as a means of payment only increased slowly, it is clear that the majority of silver that came into China became used to finance the transition of a barter economy to one based on precious metal payments. This is also confirmed by a constant silver to copper ratio, suggesting that the demand for silver from the economy was hardly rising.

In Silver we Trust?

In the previous Sections we argued that various monetary factors (mostly supply and demand shocks) do not seem to have affected the silver economy of China over this 500-year period. We find rather that the inflow of silver was mainly directed at replacing the old produce used for exchange. But even after subtracting this effect, the remaining net silver influx was an oversupply causing declining silver to copper ratio's.

So, the monetary factors discussed above did not upset the silver period over a period of over 500 years. This does not mean there was no effect, but these effects were often short lived. A similar situation we can find in other countries facing a period dominated by an (in or explicit) silver standard like England in the 17th century, or ancient Babylonia⁴

neither of which had immediate access to large silver deposits and which faced, by times, a shortage in silver. Nevertheless, both regions maintained their focus on silver.

But obviously, other monetary factors such as culture or government intervention might have had an effect as well. For example, Scheidel (2009) argued that the government wanted to maintain silver because it was able to debase copper and, hence, make a profit. Indeed, some debasement occurred as the share of copper in the coins diminished over time (see Table 13.7). However, as Lin (2006) already argued, in many cases the costs of minting coins were in fact higher than their value. Indeed, some suggestions of arbitrage for profit making within the government were in fact rejected. The argument was that the Chinese government had a socio-economic duty to maintain balance between the monetary situation and the purchasing power of the people as we already noted in the introduction. This essentially socio-cultural argument (see also Scheidel 2009) may thus also be enhancing the stability.

All we can thus conclude is that real economic development (GDP per capita growth) also must have had an effect, even though we cannot determine to what extent. Given the wide array of monetary factors influencing the gold to silver ratio, it is virtually impossible to empirically assess the effect of the real economy (we can never filter out all monetary shocks). Hence, the literature is mostly vague on this point. For example, Bordo *et al.* (2003) simply argued that monetary systems always move to the most stable anchor. However, gold is mostly more stable than silver, hence this hardly explains why China from the 18th century onwards kept relying on silver.

Hence, we do not argue that monetary factors such as the flows of silver (e.g. Horesh 2014), stable anchor (Bordo et al 2003), culture (Scheidel 2009), and government (Scheidel 2009) did not play a role, but rather that we have to add real economic development as an additional explanatory factor. Indeed, following Mundell (1998) and Butler (2002), we argue that this is caused by Fisher's-equation. According to Fisher's equation, the amount of money in circulation has a relation to the real economy. During periods of stagnation the real economy declines, implying that too much money is in circulation. According to Gresham's law, when filtering out the effects of monetary factors (i.e. assuming a constant gold to silver ratio) the high quality, strongest coins (i.e. gold) will be hoarded or transported abroad thus creating a de facto silver standard. Vice versa, if economic development occurs, expansion of the monetary base is necessary. This can be done by importing or dishoarding valuable metals like gold. In this way, a de facto gold standard comes into existence.⁵

Butler (2002) tested this hypothesis by looking at the historical experience of various countries switching back and forth from the silver (and gold) standard. For that purpose, Butler (2002) divides history in 4 periods of thousand years of economic advance, i.e. the Early Bronze age (3200-2300), the Middle and Late Bronze age (2000-1200 BC), the Roman period (700 BC – AD 337) and the modern period (1000-present). All periods are followed by an interlude of economic contraction. The end of these period is marked by an increased devaluation of the silver and a growth of the importance of gold, which actually heralds the interlude of decline. After the interlude silver returns to its role as the

primary monetary metal. After the Bronze Age, the ‘Dark Ages’ witness a severe breakdown of the market economy, the same is true for the period at the end of the Roman Empire and the Early Middle Ages. As we are now at the end of the fourth wave, with a gold standard in the 19th and early 20th century, Marion Butler predicts a new contraction coming soon.

Yet, as pointed out, switching between gold and silver standards depends in addition to real economic development, also on a dazzling number of monetary factors.

Disentangling these factors is close to impossible thus making it impossible to use actual historical outcomes as proof for the importance of the real economy for the stability of the Chinese silver system. All we can say is that Maddison (1998) showed, Chinese long-term growth from the Western Han Dynasty around 1 A.D. to the Qing Dynasty in 1912 could be divided into two phases. In the first phase, which lasted until the Sung Dynasty around 1000 A.D. the economy showed some small growth in per capita terms, even though countrywide turmoil and disasters sometimes interrupted the general pattern of growth. This phase experienced multiple metal currency systems with copper coin as money account. It knew a gold interlude, just before the collapse, in three richest dynasties, i.e. Western Han Dynasty (206 BC – AD 9), Tang Dynasty (618 – 907) and Northern Song Dynasty (960-1127). As Peng (1958) and Fang (2015) pointed out, gold was a standard currency in Western Han Dynasty, and played an important role of money account in both Tang Dynasty and Northern Song Dynasties.

A second way to look at the hypothesis is to look at the hoarding and export of gold. Indeed, looking at the dynasties from Han to Song all had their, admittedly limited, number of gold coins in circulation after which they disappeared almost completely. The main reason must have been the, well-recorded exports of gold, as well as a widespread hoarding of this metal over the post-Song dynasties. Indeed, hoarding was extensive as gold ingots were found in hoards in Ming and Qing China (Peng 1958). Obviously, this implies that, since gold was valued more than silver, not only, the more expensive metal (gold) was rapidly taken out of circulation, but also the value of gold increased versus the value of silver during these “silver periods” increased. This can be directly observed by looking at the data. As shown by Peng (1958), the gold to silver ratio varied in the order of magnitude of 5-6 (i.e. gold is valued 5-6 times as much as silver) up to ca. 1000 AD, roughly the start of the Song dynasty. After some fluctuations in the turbulent period of the Northern and Southern Song and Yuan dynasties, we can witness a rise in the gold to silver ratio from c. 5-6 at the start of the Ming dynasty, to 15 in the Qing dynasty, and rising even further in the Republican period.

So, the real economy might indeed have, besides monetary factors, also have had an impact on the stability of the silver system in China between the 15th and 20th century. But what does this tell us about the fall of the silver standard in China in 1935, even though that period still witnessed on average rising gold to silver ratio's? Of course, it is important to first look at the short-run dynamics. As shown by Xu *et al.* (2016), per capita GDP remained roughly similar, even though there was a small growth in total GDP. This was accompanied by an almost constant gold to silver ratio (Kong 1988, 481-

83). This relation breaks down, however, from 1929 onwards when the value of gold strongly increased versus that of silver.

No doubt wartime sentiments played a role in this increase, as did international relations. Yet it were mostly monetary factors that played a decisive role in the fall of the silver standard. As financial department in Republican Chinese Government claimed (1958), the silver purchase act of 1934 in the USA created a drain of silver from China and, hence, caused a strong deflation pushing China off the silver standard, and into real economy decline. But the severe economic and political turmoil caused also a further drain of all precious metals, among which gold, causing strong deflation as can be clearly seen from the decline in prices in Jiangsu between 1928 and 1934. The silver drain, combined with the rise on gold to silver ratio caused by a drain of silver, required the Republican government to replace silver with paper money, named *fabi*, as fiat money (Zhao and Sui, 2011) causing initially a modest inflation, followed by very strong deflation in the late 1930s and 1940s.

Conclusion

China witnessed a history of money that deviates from that of the Middle East and Europe. In China the first money consisted of copper coins, followed by paper money and finally a long period of silver money. In the West we see a development of silver to a combination of silver and copper, to paper money and other money instruments such as cheques. At all times gold played some role in the back ground. Silver appears to have

functioned well over very long periods of time. This is also true for China between the 1430s to the middle of the 20th century.

Many discussions have taken place about the silver standard period in China. Why was this system so persistent, with China even being the last country to leave the silver standard, in face of so many shocks that were potentially able to destabilize the system? Various answers have been brought forward. The most commonly used explanation is the abundant availability of silver within China. Indeed, we find little evidence that the drops in silver supply occurred in those periods, which severely affected the money in circulation. But monetary arguments such as an abundant supply of silver are only be a partial truth.

Indeed, we find that the period was only characterized by economic stagnation. Even given the stagnation, which implies that a decline (or at least a reduction in growth) of coinage in circulation occurred, still too much silver was flowing into the country as is shown by a declining silver to copper ratio. The fact that the money stock nevertheless increased, was mostly due to replacement of other goods such as textiles and produce that were functioning as means of exchange.

Hence economic decline or stagnation was combined with increases of silver while gold was predominantly exported or hoarded. Butler (2002) argues that this was common in periods of economic stagnation. The explanation may be found in Gresham's Law (Mundell 1998; Tlaga 2002): in countries that suffer from economic decline, money will

be subtracted from the stock. Obviously, the highest quality ones, i.e. gold, will be subtracted first, causing the fall of the gold based system and the rise of silver. In case of economic growth, the reverse happens. Yet, this is a *ceteris paribus* development, i.e. assuming monetary developments are absent. This is obviously not true as there are also many monetary factors that played a role. Hence, depending on which effect was dominant, historical periods of economic stagnation might be characterised by either a move to a gold or silver standard.

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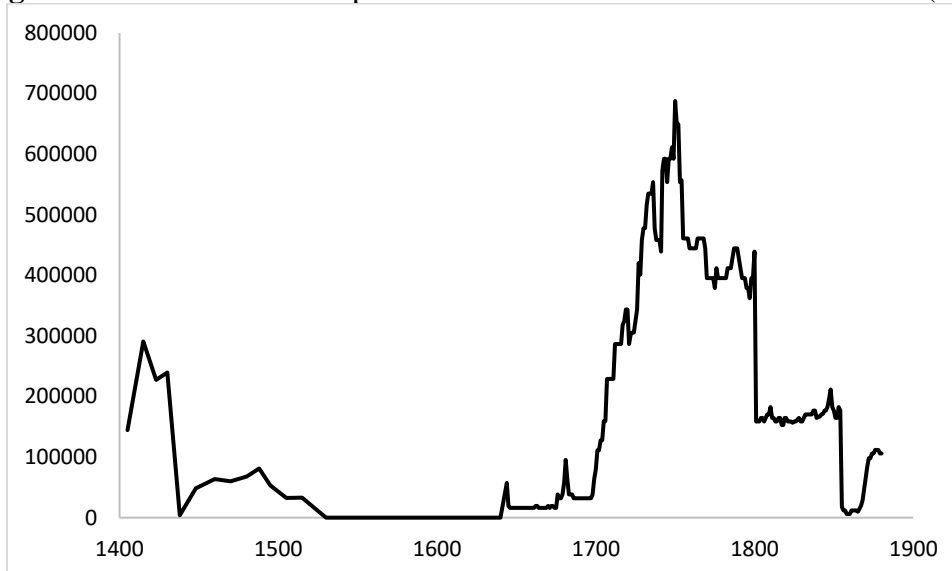
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Table 13.1. Official annual production of silver in China between 1380 and 1880

year	annual production(tael)
1380-1400	30,000
1401-1434	230,000
1435-1520	49,000
1662-1700	12,000
1700-1750	377,197
1750-1800	439,631
1800-1850	172,742
1800-1880	70,795

Source: Wu (2001); Qing archive of mining industry

Figure 13.1. Official annual production of silver between 1380 and 1880 (tael)



Source: See Table 1

Table 13.2. comparison of different estimates of silver imports from Japan between 1530 and 1708 (tael)

year	total amount of import	annual import	source
1530-1644	175,000,000	1,535,088	Zhuang (1995)
1585-1640	14,900,000	270,909	Boxer (1988)
1550-1645	98,990,000	1,042,000	Von Glahn (1996a)
1540-1647	79,581,250	743,750	Wu (2001)
1550-1645	224,000,000	2,357,895	Yamamura and Kamiki (1983)
1648-1700	27,733,333	533,333	Wu (2001)

Table 13.3. Comparison of different estimates of the import of silver from Manila to China (tael)

year	total amount of imports	annual import	source
1550-1645	61,570,000	648,105	Von Glahn (1996a)
1550-1645	35,200,000	370,526	Yamamura and Kamiki (1983)
1573-1644	20,450,000	288,028	Liang (1989)
1571-1644	38,160,000	522,740	Wang (1964)
1567-1644	43,200,000	561,039	Peng (1958)
1570-1644	203,200,000	2,745,946	Wan (2004)
1570-1649	68,552,250	867,750	Wu (2001)
1567-1643	75,000,000	986,842	Zhuang (1995)
1650-1699	14,837,000	302,796	Wu (2001)

Table 13.4. Comparison of different estimates of the Chinese imports of silver from Europe (tael)

year	total amount of imports	annual imports	scholars
1550-1645	32,800,000	345,263	Von Glahn (1996)
1570-1644	133,340,000	1,801,892	Wan (2004)
1569-1636	27,000,000	402,985	Zhuang (1995)
1700-1751	49,010,000	960,980	Yu (1940)

Table 13.5. Annual increase in silver in China via imports and home production (tael)

	Imports from Japan	Imports from Philippines	import from Europe	domestic production	export to Europe	net inflow
1540-1644	1,200,000	928,000	374,000	—		2,502,000
1645-1700	570,000	303,000	—	12,000		885,000
1701-1759	95,624		416,667	404,331		1,436,755
1760-1799			5,532,650	414,915	3,135,275	2,812,290
1800-1834			7,377,400	170,690	9,750,057	-
1834-1856						2,201,967
						-
						8,050,000

Source: Tables 1-4; Irigoien (2009)

Table 13.6. Narrow money (M0) in circulation in benchmark years in China (tael)

	silver	copper	notes	total
1550	20,000,000	47,000,000	-	67,000,000
1650	130,000,000	47,000,000	-	177,000,000
1750	317,000,000	133,000,000	-	450,000,000
1855	1,169,000,000			1,169,000,000
ca. 1900	907,900,000	365,400,000	194,600,000	1,467,900,000
ca. 1930	648,000,000	72,000,000	814,320,000	1,534,320,000

Sources: This text ; Liu (2009) ; Lin (2006, p. 85); Yan (2011)

Figure 13.2. Copper coin/silver ratio and silver rice prices

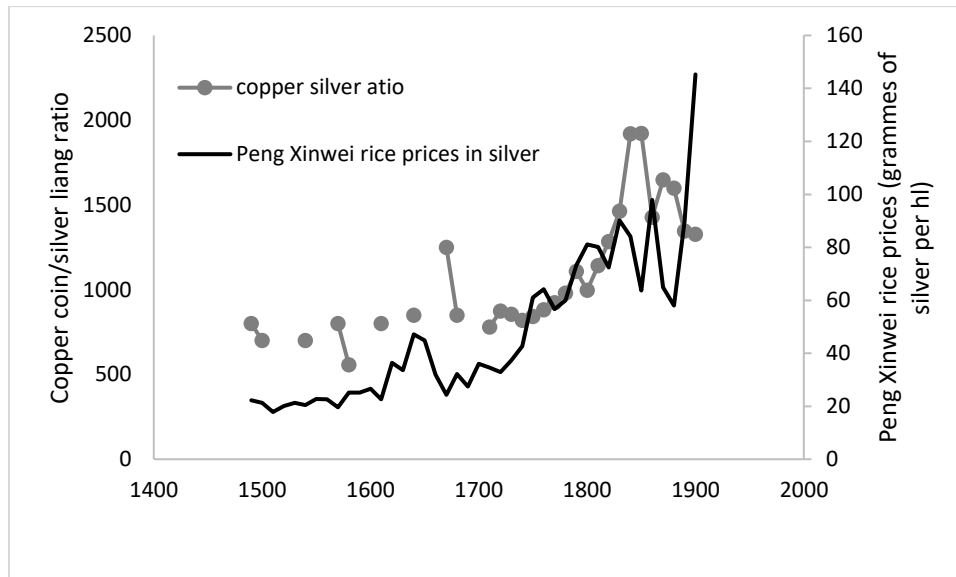


Table 13.7. copper coin/silver liang ratio corrected for share copper in coins

	copper coin/silver liang ratio	Percentage copper in copper coin	copper coin weight (grammes)	
1505	700	90%	3.72	630
1550	700	90%	3.72	630
1575	800	94%	3.72	750
1625	1000	50%	3.72	500
1740	830	50%	4.46	498
1800	1070	52%	3.72	556
1890	1530	54%	2.23	496

Source: Peng (1958); Yang (1962); Qian and Guo (1985); Liu (2003)

Table 13.8. Chinese government income by category (expressed in tael of silver)

	tax in produce	tax in textiles	tax in copper	tax in paper cash	tax in silver	total tax
1450	25,880,000	255,500		4,737	-	26,140,237
1500	30,900,000	766,000		3,247	32,000	31,701,247
1552	26,590,000	386,500		2,414	2,433,000	29,411,914
1602	28,370,000	345,500		0	4,582,000	33,297,500
1620	27,800,000	270,500		8	7,552,000	35,622,508
1651	10,482,525		2,430,722	64	23,065,302	35,978,614

Note:

(1) 5 benchmarks from 1450 to 1620 were annual government revenue in the Ming dynasty. The taxation levied by the Ming government was comprised of non-currencies, which were levied in wheat, rice, cotton clothing, and silk textile, as well as currencies, which were levied in both paper and silver cash. Based on the official price of both non-currencies and paper cash in silver, we convert both non-currencies and paper cash to silver. According to government policies, 1 shi in rice or wheat costs 1 tael in silver; 1 pi in cotton clothing costs 0.5 tael in silver; 1 pi in silk textile costs 1 tael in silver; 100 guan in paper cash = 1 tael in silver in 1430; 1000 guan in paper cash = 1 tael in silver between 1440 and 1470; 2000 guan in paper cash = 1 tael in silver between 1480 and 1620.

(2) The benchmark in 1651 was government revenue in Qing dynasty. The taxation levied by the Qing government still consisted of both non-currencies, which were levied in wheat, rice and hay, as well as currencies parts, which were levied in copper coin, paper and silver cashes. The official price of non-currencies, copper coin and paper in silver are following: 1 shi in rice or wheat costs 1 tael in silver; 1shu in hay costs 1 tael in silver; 1000 wen in copper coin costs 1 tael in silver; 2000 guan in paper cash = 1 tael, which is taken from Ming price.

Source: Wu (2001); *shizu zhanghuangdi shilu*, vol.60.

Table 13.9. Distribution of construction observation over Qing Dynasty

Period	Beijing	Shanghai	Henan	Shanxi	Jiangsu	Fujian	Guangxi	total
1650-1750			1			1		2
1750-1800	2	1	1		1		1	6
1800-1850		2		5	3		6	16
1850-1910		2		3	5	5	8	23
total	2	5	2	8	9	6	15	47

Source: Beijing : Wang, Shixiang ed.(2008): *Regulation of Artisans in Qing Dynasty*, China's Bookstore. Li, Hua(1980): *Stone Inscriptions of Guild Hall in Beijing Since Ming-Qing periods*, Relic Press. (王世襄编：《清代匠作则例汇编》，中国书店 2008 年版；李华：《明清以来北京工商会馆碑刻选编》，文物出版社，1980 年。)

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Table 13.10. Share of copper and silver payments in stone inscriptions

	Silver	copper
1750	5%	95%
1780	5%	95%
1820	6%	94%
1840	7%	93%
1860	7%	93%

1890	11%	89%

Endnotes

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Part of Section 2 is based on a previous paper published in Bas van Leeuwen and Yi Xu (2016: 119-132).

² It has been argued to affect the real economy via prices, foreign exchange and real business cycles.

Hence, the money stock may explain a boom or depression in the real economy but it will not affect long-run growth patterns. It remains the question, however, whether this is true given that many empirical analyses in this field have taken too little notice of the underlying structure of the economy when trying to measure the effect of monetary shocks on the real economy (e.g. Rasche 1998: 89). Indeed, monetary shocks may not only affect the financial system, but also changes the income distribution as well as the relative prices in a country thus placing it on a differ trajectory of growth (e.g. Bordo 1998; Van der Spek *et al.* 2015).

² In more complicated monetary systems also demand deposits are added to the stock (M1) or even saving deposits (M2). Obviously, in historical settings M0 will be the largest and easiest calculable. However, with the rise of the financial sector, also demand and saving deposits gain in importance hence causing the various M-indicators to diverge.

³ In more complicated monetary systems also demand deposits are added to the stock (M1) or even saving deposits (M2). Obviously, in historical settings M0 will be the largest and easiest calculable. However, with the rise of the financial sector, also demand and saving deposits gain in importance hence causing the various M-indicators to diverge.

⁴ Babylonia had a silver based economy for nearly 2000 years, apart from a few exceptions such as the Kassite period and Assyria in the 8th century.

⁵ At a first look it appears that such a system is gold based but in fact it is a fiat system as, for example, 10 grams gold is expressed in 10 token coins rather than in actual gold coins and these token coins or notes often are not convertible in gold.