China inside Out;

Explaining the flows of silver in and out of China 1820S-1870S

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In her book, *China Upside Down* Man Houng Lin (2006) revisited the established understanding that silver flows in and out of China were driven by the balance of payments in her commercial relations with Europe, more specifically England through the East India Company businesses. She established that China silver trade was determined by the supply of American silver which had replaced – by and large- the silver that China sourced from Japan until the 1680s. Lin also challenged conventional wisdom that attributed the outflows of silver from China in the 19th century to the opium "drain". More recently other research has contested this "supply side" explanation for the silver flows through China emphasising the demand side factors at work (Von Glahn 2012,2018, Irigoin 2009, 2018)[1]. Silver, in any form or shape, was the prime return for imported Asian merchandise (Indian and Chinese) throughout the 17th, 18th and a good part of the 19th century.[2] All western nations trading in Asia during the 18th century – namely all European chartered companies to the East Indies, the Spanish direct line Acapulco – Manila and even the US free traders at the turn of the 19th

[1] In turn both authors differ in the nature of the demand side factor; Von Glahn points (2012) at the "falling demand for a particular type of money, which lowered the price of silver, from a "languishing" production of export inside China (in Jiangnan) (2015) "a symptom, not a cause (2018 p 110)"; Conversely, Irigoin (2009, p 106-107), argues that Chinese altered their demand for silver means of payments once the quality of the coined silver produced in Spanish America changed for the worse which in turn ought to affect the production of exports. Like Lin, she argues for the importance of the American silver, but emphasises the quality rather than the quantity of silver coming into China

[2] Eventually China remained in the silver standard until 1935, was one of the latest to join the gold standard together with India (1893), Peru (1901) and Mexico (1905)

century replicated this pattern of remittances. This paper is the first exploration of monetary factors underpinning China's silver trade, which is part of the "demand side" explanation for the flows of silver through China (Irigoin 2020).

Meanwhile another stream of research has quantified China's international and domestic financial integration after the 1890s relying on the specie points mechanism underlying foreign exchange operations (Jacks, Yan and Zhao 2017; Palma and Zhao 2021) that can only be done for a period when data on parities are available. More recently, Kobayashi (2022) has revealed the role of triangular settlement system based on exchange operation and bullion arbitrage in the commerce between Britain, India and China in the 1850s-60s. Yet how triangular arbitrage and monetary factors interacted has not so far been well examined. As a result, the essential mechanisms behind the ebbs and flows of silver trade in the crucial decades leading to the opening of China to world trade remains out of sight. This paper addressed these issues by analysing a new comprehensive dataset on silver flows and prices, applying bullion point as well as econometric analysis to map dynamics of financial integration.

A lot has been written about the nature of the commerce between Europe and Asia; and because the lack of data to quantify volume, values, and trends over time there is not yet a definitive interpretation for the drivers of this trade and their changes over time into the period of modern economic growth. A significant body of research has related China's silver trade to the balance of payments between Britain and British India one the one hand and of each of them with China, on the other hand. Senior economic historians of Asia have highlighted the flows of silver – and its composition- that went from Britain to India throughout the 17th century – and further to China in the 18th to revert flowing into India and even to Britain in the 19th century (following the Bank Restriction Act of 1797), with considerable implications for the three economies (Hamashita 2008). Notably, Chaudhury (1983 p 808, 871) found that "the mechanism for foreign exchange was sensitive to arbitrage between the various trading centres" [3] and recently Kobayashi (2022) has established that

[3] "The actual mechanism of foreign exchange was quite complicated and sensitive to arbitrage operations between the various trading centres, the triangular connection between London, Canton and Calcutta being the most important determinant"

arbitrage was underpinning the China-India and Britain triangular settlement mechanism by midst of the 19th century.

This paper investigates the flows in and out of China for the period when robust data on prices and exchange rates are available; that is for the period from the cessation of silver imports by China in the 1820s until the 1870s. Hence, the "inside out" in the title as we explore the mechanics and the timing of the silver flows in the commerce China had with her main partners from the West in the crucial decades of the 19th century - when arguably China diverged from her own path and that of Britain. Thereafter, Western nations started minting special coins – trade dollars- to maintain their commerce with the Middle Kingdom. The paper extends Kobayashi's (2022) analysis about the settlement mechanism zooming out in the broad context of the longer run trade of Qing China for the period before and after the so –called "opening of China"[4]. It identifies the direction of the flows of silver in and out of China at particular points in time and, in so doing, it establishes that there were exchange operation and arbitrage between different types of silver among London, the two main Indian cities, Calcutta and Bombay, and the major commercial hubs in China, Canton / Hong Kong and Shanghai. Both were underpinning this triangular trade between the three economies and imbalances of exchange rates and bullion markets adjusted accordingly. Over the period, the historical trade imbalance between Asia and Britain reverted for the first time in favour to the latter. A shift in the composition of exports and imports of India and Britain respectively is also observable[5], and Britain finally balanced off her merchandise commerce with China after two centuries of trade deficits. Finally, China "opened" to international trade.

Our newly compiled dataset of silver flows highlights how they very imperfectly matched the evolving balance of trade between China, India and Britain. Notably, contrary to conventional wisdom, imports of opium in China into India turn out to be a very poor predictor of silver flows between the two countries. While the balance of trade deficit between Britain and China increased sharply between the 1830s and 1840s, large volumes of silver only started

[4] i.e. before and after the Opium Wards and the Treaties of Nanking with UK in 1842 and that of Whanghia with US in 1843.

[5] "India always exported more merchandise than she imported in return and the imbalance was corrected by a reverse flow of treasure. It is difficult to provide an entirely satisfactory explanation for this curious and persistently favourable balance of trade" Chaudhury (1983 p 825)

flowing from Britain into China in the 1850s, at the same time the (British) deficit in merchandise trade, for the first time, was closing up. Our analysis of silver prices and exchange rates provides new perspectives on these 'anomalies'. We have collected about 15,000 monthly observations on the price for the various types of silver bullion and species in circulation (such as the Spanish dollar "Carolus", Mexican dollars, Sycee and bars of the English standard) in London, Canton, Hong Kong, Calcutta, Bombay, and Shanghai between 1828 and 1870 from contemporary English language newspapers in Asia. The novelty of the analysis is multiple: First, is the adaptation of the bullion points methods to the particulars of the heterogeneity of the silver monies and monetary regimes involved. The method, used to analyze the mechanism of the pre-gold standard global monetary system, applied to the UK-Asia and intra-Asian monetary exchanges before 1870 is problematic as there was no par value for silver in the Chinese monetary system, as China never minted silver. To that end, we have standardized the variety of silver monies and bullion in circulation in the East India trade to an ad-hoc parity for their weight and fineness based on the English sterling standard. In the absence of a Chinese parity for silver – which would have enabled the application of specie points method- this conversion of the various circulating silver within Asia and the UK allows to track changes in the flows and trends on a consistent base (common denominator) in prices of silver and exchange rates before the Gold Standard. We can thus establish the essential mechanism of exchange rate system in - not only – the balance of payment adjustment but also in the equilibration of bullion market between heterogeneous monetary systems. In other words, these adapted "silver points" analysis enables to trace the bullion arbitrage back on time, as well as the determination of exchange rates among British gold standard, Indian silver standard, and China's particular silver-based money system (reliant on foreign coins) during the nineteenth century. Thus, the paper can identify the direction and the timing of silver flows in and out of China and the emergence of growing exchange operations, which by solving the "silver problem" of China –i.e. the dependence on an increasingly scarcer foreign coin- brought greater efficiency (diminished arbitrage and trade costs) to foreign commerce in Asia. This empirical analysis also sheds a brighter light on the relative weak role of opium imports conventionally associated with the drain of silver from China.

The second novelty is zooming in on the drivers and effects of a peculiar silver circulation for the transition of Chinese monetary economy to a more stable regime that might be associated with the so-called "opening" of China. Our price dataset shows for the first time how Chinese silver prices were systematically different across types of silver. Having largely relied on foreign silver money, since the 1820s Chinese commercial sector suffered from the lack of sound silver currency derived from the collapse of Spanish peso standard that followed the independence of Latin American countries (Irigoin 2009a). From 1820s to the 1840s newly minted Republican dollars were also exported to China but they circulated there at discount (not accepted by locals at its face value) because of wild variations in aspect, weights and fineness with the coins Chinese exporters were accustomed (Von Glahn, 2007; Irigoin 2009b). Thereafter, the vanishing Spanish dollar coins started to be priced with high premium, which progressively increased to the extraordinary rate 30% or more over its intrinsic value by the 1850s; all other coins started to be chopped to certify its value as they circulated within the Chinese mercantile community, increasing the domestic monetary disorder (Irigoin 2013). Along with a variety of foreign silver coins, even locally minted silver ingot of diverse weight and shape but generally of much higher content of fine silver, Sycee, started also circulating with variable premium/discount in relation to the Spanish dollar. In other words, because of a lack of coinage (and mint parities) in Chinese market, silver (species and ingots) was not valued by a standard silver price but by commercial values reflecting the difference of local demand on each type of silver.

Third, this data allows an econometric analysis of the integration – or lack thereof- of silver markets in the China, India and UK triangle in the period. The results are robust: arbitrage costs are firstly estimated directly, based on observed information for years when it was possible to draw data; and subsequently, we check with econometric tests on the convergence of silver prices to infer trade costs, as well as structural breaks in their levels. Both estimates shown in appendix figures (figs. 3a and 3b) consistently show that while trade costs between Britain and India were relatively low from the beginning, arbitrage costs in the China-Britain and, to a lesser extent, -India trade were first high; later they started to decline from the early 1840s and caught up with the Britain-India level by the 1850s. This flags the peculiar nature of the silver trade with China; while there was constant arbitrage profit by importing (increasingly rare) Spanish dollars into China, other coins (new Republican

dollars, rupees, etc) and Sycee were likely exported to Indian cities as (partial) return of opium trade deficits during the 1830s-40s. Having identified the opportunities for arbitrage with particular types of silver-seen in the bullion points for each different pair of marketplaces, a second econometric test on the speed of adjustment of pairs silver prices shows marked increases in efficiency also centred in the 1840s, first between China and Britain and then between China and India. The results in appendix figures/ figs 4 (a,b,c) suggest that during the 1840s, although different types of silver still had distinct values in each market, there was an incipient process of integration in money markets between China and the other two countries. Silver flows were complemented by the window of opportunity that a liberalised new financial system after the end of the Company in India – and of the Hong monopoly in Canton - promoted for the circulation of private bills to settle triangular trade, in spite of or because the monetary turmoil in China.

Similarly, the application of silver points and estimation of arbitrage costs identifies a turning phase of China's settlement system around the early 1850s. During the 1850s, in the wake of improvements in the coinage of their own dollar in Mexico, first in Canton/Hong Kong and later in Shanghai, while it was still favourable to export Sycee for the trade settlement, Mexican dollar's arbitrage pattern reverted from silver export- to import-orientation. Correspondingly, imports of silver by China resumed as suggested elsewhere (Irigoin 2009b), from Britain directly or via India. In addition, a further significant outcome is that China's commercial exchange rates on both Indian cities and London became increasingly well regulated by the bounds of reconstructed silver points. Efficient arbitrage implied increased scope for the settlement of trade deficits arising out of the UK-Asia triangular trade by means of by bills of exchange and the spurt in China's silver imports proved to be relatively short-lived. [See charts in appendix "specie points" enclosed and the summary in appendix figures fig.5]

Hence, the paper explores the mechanisms that allowed the (relative) stabilization of silver circulating medium in China by the 1860s. Problems for foreign traders from China's reliance on a disappearing foreign silver coins (the Spanish dollar) and its premium over finest sycee and the discount for other available silver coins (of comparable fineness and weight) ceased or diminished greatly once China adopted the *new* Mexican dollar in the 1850s. Improvements in the Mexican political situation had resulted in more consistent and regular

coinage of silver (Irigoin 2010, Kuntz 2022). By then the Mexican coin was a reliable and acceptable standard of value for the foreign trade in Asia. This conversion was relatively easier and expedite in Canton and Hong Kong, which started in 1853 by taking the Mexican coin at par with the Spanish dollar. It took longer in Shanghai, where a more intricate step by the creation of the Shanghai tael in 1856/57, as a unit of account which also ultimately pegged the new Mexican dollar to the value of the Spanish coin and served to anchor prices and exchange rates thereafter. Thus, the Mexican dollars started to be counted - by tale- as well, and became the new standard with which silver on China was officially received at Customs and used to price exports and imports. Similarly, the standardisation in the bullion markets witnessed the replacement of Sycee by the bars of English standard. Both quotes for sycee and Spanish dollar disappeared from news on the bullion and specie markets (although the latter continued being traded sparsely by foreign exchange banks for a while longer). Technically, this transition meant a crying down of silver inside China (and appreciation of the exchange rate). The stabilization of silver prices in China is visible in the narrowing of the bands for the specie points across deals with Indian cities and the UK. A greater efficiency is also apparent in the greater integration of money markets and the settlement mechanism in the triangular trade between Britain, India and China.

Discussion and Summary of findings

Figure 1 (appendix figures) below charts China balance of merchandise trade with India and Britain for the period under study, 1827 to 1874. It captures the essence of the historiographical understanding of the triangular relation and represents the shifts in the historical imbalance in the British trade with Asia. For most part of the time, surpluses in the commercial relation between China and India did offset Britain disequilibrium with China, until the mid-1860s when the secular British trade deficits nearly disappeared. Significantly too, the value of such commerce had doubled and grew more after the mid-1850s. Chaudhuri aptly summarised the implications of these shifts for the development of the India economy for historiography (Chaudhuri 1983, p 812, 813) [p..]. Hamashita (2008) in turn saw in the mechanism a conduit for the settlement mechanism in the more relevant (for Britain) triangular trade between the latter, and the US with serious implication for the subsequent industrial development of the two Western economies. More recently – in the wake of the

Great Divergence debate- new insights from the growth accounting research flagged up other more endogenous factors related to the attainment of "revolutionary" productivity levels (Broadberry & Gupta 2006)

Historians have estimated that until the late 18th century the bulk of China imports from the West had been treasure – indeed silver more specifically. Clearly, until the early 1820s silver made up the major part of Europeans exports to China's – and Asia. Silver trade has been customarily seen under the light of the British commerce and that of the East India Company. Since Dermigny (1964) masterpiece on Canton however, it has become clear that trade between the West and China was more diverse and more complex than such scholarship assumed.[6] Imports of silver through Canton in figure 2 (appendix figures) reveal a couple of relevant facts: a) silver continued flowing to China beyond the EIC's businesses, b) did it at larger ever values in the later years of the Company and c) after the 1780s the US became the main provider of silver to China and to India and their exports of silver continued until the mid-1820s, when they plummeted sharply after 1826 (Irigoin 2009: fig. 2) from 4.5 million Spanish pesos in 1826 to about 200,000 in 1829. Since it only includes flows from the UK and the US, the values it represents should be considered a lower bound: both the US and Britain were the two main and more consistent China's trading partners from the West from the 1780s, but other Europeans – only more occasionally – also continued sourcing of silver to Asia.

The idea of silver flying out of China comes from the traditional view of the trade balance between China and Britain and the "triangular trade" as stated above. However, as it was well known to English merchants and Parliament at the time, until 1830 US exports of silver to Canton more than offset the exports of silver from China. The timing of these flows in and out of China are meaningful as well. Whereas the silver "drain" from China to India has traditionally been associated with the import of opium, the continuation of silver exports by US merchants and its sudden collapse after 1827 have been interpreted as separated from the opium – silver exchange. Similarly, silver exports from the west to India reduced drastically around the same time. In any case, contrarily to Lin's view, throughout the 19th century there was enough silver in the international economy to supply China at the rate of

[6] Dermigny (1964) II:735; explained in Irigoin (2009), and reproduced in Deng (2008, 328); imports totalled 25million dollars (1785-91), 29 million (1799-1806), about 70 million between 1814 and 1827.

her historical imports at the rate of minting and exporting silver out of Mexico and through the US re-exports (Irigoin 2009b). Silver in excess for the outflows to India continued until the late 1820s, and despite they did not cease completely the silver balance of trade moved against China from the mid-1830s until 1850; and did so in substantial values. As opium made the bulk of Chinese imports, it fuelled the notion of the silver drain from China and the root of the various crisis in the country, like the Daoguang depression.

However, a closer look at the composition of Chinese silver exports to India allows for a finer grain understanding of the nature of this outflow. A "S*tatement of the value of bullion Imported into each of the Indian presidencies"* in the period 1830-1845 for the British Parliament, reveals that two thirds of Chinese exports to Calcutta was formed by the finest silver, sycee and bars, and the rest made of non-descript coins, which between 1837 and 1841 made more than 60% of the total imported treasure in Bengal.(appendix figures, fig. 6) [7] The distinction of the report is interesting, as it is the composition of the exports and the variation over time. This is a suggestion that at least for contemporaries in Asia silver was not any silver. There is evidence that the private assay by shroffs establishing the difference in weight and of pure silver between republican coins and "cut money" or broken dollars and the "shoes of pure sycee" was required when merchants had to pay duties to the government - "in pure sycee silver" or "its equivalent" already in the 1840s (Morrison 1848, 212).[8]

The flight of silver to India in the late 1830s and 1840s did not make a trend as the 1850s and 1860s witnessed a sharp inflow of silver directly from Britain of extraordinary proportions. Between 1853 and 1857 Chinese silver imports from Britain jumped to an annual value of 24 million dollars on average - roughly six times larger than the largest ever inflow of silver before the 1820s - and remarkably the flow out of China reduced for another decade. Significant outflows followed in the later 1860s into the 1870s but were also short-lived.

[7] BPP, imports of Treasure at Madras were negligible; unfortunately, Bombay data combines silver and gold values, and represented 2/3 of the total; The rest was Bengal's imports in the last two years silver rupee went back to India to make a 10% of the total and gold remittances was indeed minimal. This is a separate report so the context is missing.

[8] The difference (on average) ranged between 9% discount for the new (company?) rupees to 11% for the Chilean or Bolivian coin and 12% for the "cut money" or "broken dollars". Morrison states that "the rates at which foreign coins is taken were negotiated between merchants and the shroffs by the linguists or comprador".

There is nothing obvious in the merchandise trade to be related to the size and directions of silver flows in and out of China. Opium, for one, remained the major item of import from India, but its value greatly exceeded that of silver outflows from China to India, by a factor of 4, on average[9]. A poor association between the two series is confirmed by a Granger causality test, which soundly rejects the hypothesis that opium imports help predicting of silver outflows[10]. Clearly, a relation in the trends between the flows of silver and the volume of opium sent to China do not exactly match. Whichever it was the root of it, the silver problem for China did not settle in this period. After the 1860s and specially in the 1870s all Western trading nations – and Japan- coined some sort of silver specie – a trade dollar - which was specifically destined for the settlement of trade in China, as discussed below.

Cashless means of settlement and exchange rates

Economic historians argue that silver had been the traditional way of setting the balance of payment of the early modern trade; this changed in the decades under study for the use of cashless means of remittance. Bills were known to private agents trading within the East Company as the company issued bills drawn on the Company in London, or in Calcutta. The company used bills (and bonds) in deals with their captains and private country traders since the 1760s (Morse 1926, Irigoin 2022), who used them to repatriate profits to Britain. During the tight money markets of the "Restriction period", even bills denominated in Spanish dollars were even drawn on London and Calcutta (Morse 1926, IV). Bills boomed (and busted) in Calcutta in the 1830s along with the financial crisis and later recovery in the 1840s[11]. At the same time than US shipment of silver specie cased in the later 1820s, American traders started drawing private bills in London – not in the US- for their China trade.[12] Why did it take so long – if bills were known and available to take off in the US trade with China?

[9] This is the median ratio between 1800 and 1874; the mean ratio, 10, is significantly bigger still, reflecting a very broad range (from -50 to 275).

[10] With a chi-squared statistics of 0.760 and a P-value of 0.383 (the null hypothesis is that opium imports do not Granger cause silver outflows).

[11] In Bengal 1828-29 were years of the "money famine" followed by depression in prices between 1833-38 and a recovery only from 1843-47 (Bayly 2012)

[12] Irigoin (2009) p 213; Cheong (1978), p 27 Morse III:336-38 stated (American traders) "only developed the practice of taking bills on London from the US to Canton and selling there to the trader wishing to make remittances to India!". "Large portions of the US trade with China are *now* done with bills on banks which now work better than dollars at Canton" *Niles Weekly Register*, 5 April 1834, #1176, p 86.

According to the "Bengal Commercial Reports …" the trade at Bengal started using bills drawn on the government in the 1830s; from 1832, bills were drawn by the Company Court of Directors and by the Government of Bengal. The Company accounts show bills on the government paying for imports from the Coast of Coromandel, Malabar Coast, the Arabian and Persian Gulf and China – and exports to the UK. From 1832 to 1838, bills paying imports from China hovered around 8 and 9 million rupees a year to shrink sharply to 200,000 after 1839. Conversely, bills funding Calcutta imports from Britain went from half a million rupees to 22 million in 1840[13] – probably a prelude of the recovery of the commercial activity in Bengal during the 1840s. The relative efficiency gains are visible in the graphs 3a and b. Seemingly, bills then became the preferred means of settlement in that context.

Meanwhile inflows of silver to India and China came to a halt in the 1830s and while overall trade with goods increased, so did the outflow of silver from China[14]. Testifying before the Select Committee on the affairs of the East India Company in 1831, John Holsey Palmer, current governor of the Bank of England and partner in the house of Palmers, Mackillop and Co, with extensive business in Calcutta declared that:

> "no allowance of interest in the interval between money being advanced in one country and the repayment being made in another … All exchange operations in bills ***have reference to the actual produce of the remittance in bullion*** in the country to which those remittances are sent (BPP 1831/32, p 107)
>
> "The company ***will at all-time order bullion to be transmitted***, if bills are not procurable at the bullion rate (remitters calculated "the bullion rate by adding various costs for bullion shipping to its value. If a bill of exchange was not procurable at a cheaper rate than the bullion rate, bullion was remitted" (ibid p 111).

In China, some proceeds of Indian opium imports were converted into bills either from China to India and even from India to the UK (Greenberg 1951, pp 156-57, Chaudhuri 1983 pp 871-73). Agency houses in Calcutta who dealt with consignments from the UK and other Asian cities were re-exporting Chinese goods to the UK. They drew bills on London with bill of lading on exports and sold them in the exchange market to obtain payment in dollars. As they

[13] IOR/P/174/20 : 1795-1802

[14] After the Company monopoly on India trade ended in 1813, freer trade gave way to private houses they combined banking facilities and agency services. The received interest bearing deposits and did remittance of private profits to Britain through bills of exchange; they open branches in London or in Calcutta and financed commercial services, shipping, and the production and exports of indigo, cotton, sugar as intervened in the carry trade within Southeast Asia and China.

had to remit to India for the return of opium imports, they purchased bills on London or other Indian cities from the Company and exchange banks, and sent them to India exporters (BPP 1839 pp 353-54)

China's silver monies and the integration to the international economy

Other studies on China insertion in the global economy have used the specie points method – but all of them considered periods of time when China had at least an official parity with other foreign monies. However, before the 1890s (or 1914) China did not have a silver standard or silver currency of their own which could perform the task. Before 1914, China practically never minted silver as to produce an official coinage so China performed with a multiplicity of units of accounts (imaginary monies) and diverse means of payment with vary from province to province[15]. The so-often quotes bimetallic system (of silver tael and copper cash as small change) was just notional[16]. The large inflow of very consistent and reliable foreign coins -which made the bulk of her silver imports since the mid-18th century- originated the circulating medium of South China (Irigoin 2020). In practice, Chinese used different means of payment- i.e. cash of various metals and along with minted silver irregular ingots that coexisted with and paper instruments denominated in monies of account. The extraordinary volume of coinage of silver of consistent high quality in Spanish America after 1730s resulted in a de-facto silver standard for specie worldwide[17]. Registered annual exports to Spain peaked at 35-40 million in the 1780/90s when the Spanish control over their colonial trade started to wane (Irigoin 2020, Cuenca 2014) and silver flowed into Europe and the US directly for re-exports to Asia.

[15] With the advent of the Republic coinage became a prerogative of the central government for first time ever in 1914. The first Chinese dollar minted at Tsientsin had a rate of 72/100 with the Kuping tael, with 900 thousands of fine. Lack of uniformity kept the Mexican dollar in circulation still by 1924 and only small denomination specie was current. (Kann 411, 423).

[16] Occasional coinage in provincial mints, did not last, very limited and systematically displaced for the foreign coin. With the Ports Treaty a covenant shroff was appointed by the parties to assay weight and touch of the silver transacted. Formerly the job was done independent shroffs, silver dealers who certified the quality of the coin or bar; he sealed or marked (chopped) the item, at some point in time did it so with ink to protect the integrity of the coin or bar.

[17] Milled coins started in Mexico in the 1730s, in Lima (1750s) and Potosi (1770s). Mints output boomed until 1800 at an annual 2% growth rate. It added coined silver to the international economy tens of millions per annum (from 9 million pesos per annum in 1730-35 to 32 million in 1800-1805).

China' imports reduced drastically in the 1820 when the standard of the coin minted in Spanish America collapsed with the territorial fragmentation of the empire. During 20 or 30 years after 1810, only Mexico had ten working mint houses where there had been a single one for more than 250 years; and some privately run by foreign companies. This meant huge disparities in the quality of the coins rather than an expansion of the coinage (Irigoin 2009a). A similar fragmentation occurred in the minting of other silver rich districts in South America destroying the standard of the Spanish dollar known to that date. Thereafter South American or Republican coins of diverse standard, weight and features filled the void of the Spanish coin bearing the face of the Spanish King – i.e. Carolus. Notwithstanding prejudices to mining by wars of Independence, greatly diminished exports of silver out of Spanish America continued for the remainder of the 19th century[18]. Even at half or less of the previous output of the later 18th century, there was plenty of silver to supply China at the historical rates of imports of the previous decades (Irigoin 2009b).

Merchant houses in Asia started distinguishing among these coins. In 1829, the "Bullion Accounts" ledgers of Jardine Matheson & Co. separated "sycee" and "South American dollars" priced by weight (as commodity) against the sterling standard from the "Spanish dollars" quoted by tale as a varying rate. The unit of denomination in the bookkeeping was the "new dollars" with a price 1% over the Spanish dollar price, which might have represented their commission.[19]

In turn pre-colonial India minted silver in most of the presidencies, even before the EICo control of the territory. Yet silver was mostly imported to India. Under the rule of the Company and by the 1830s already, there were three main types of rupees on circulation, along with gold "pagodas": the sicca rupee of Bengal, the Arcot rupee from Madras and the rupee of Bombay, corresponding to the main three mints of British India. They had slightly dissimilar content of fine, hence price and exchange rate. In 1835 there was a unification of coinage with the creation of the Company rupee; this meant a reduction of intrinsic content of the sicca rupee of about 6.25% and provided for uniformity the coinage in India based on sterling standard of 180 troy ounce and .925 fine. Thereafter silver in India was quoted by

[18] The Spanish dollar remained legal tender – the single foreign coin along the US dollar- in the United States until 1856 (Irigoin 2009b)

[19] Long gone Spanish dollar remained the unit of account in the bookkeeping of the HSBC bank in Shanghai still in 1911. China problems in 1911-1913 were very similar to those in the 1850s (Kann, 408-409)

weight as rate of the sterling price although in private and company records the Spanish dollars were accounted separately, often by count (Bengal commerce report 1808-1842). Thus, there was no legal tender in China unlike there was in India. There was no silver par either until well into the 20th century[20].

[see specie points graphs]

The opening of China and the standardization of silver bullion and specie

Economic historians take the tael as currency unit but indeed, it was measure of value; however, the tael is a unit of weight[21]. Circulating silver in China took the form of ingots (sycee, the taels), foreign coins, and fragments after chopping or cutting coins – the so called broken or cut dollars- catalysed by the end of the silver standard. Only full Spanish dollars were taken by count and at the market rate. The commissioner of Customs and Statistical Secretary to the Chinese Customs – and historian of the EICo- HB Morse counted over 170 "well recognized" and different taels of silver at the time of the Treaty Ports. Thereafter four ideal taels were principal, and they were practically unit of accounts to standardize values in different sets of transactions and before particular authorities. Directions in the Treaty ports initiated (but not completed) a standardization of the peculiar system which, by relaying on foreign money was subject to wild monetary exogenous variations, that was idiosyncratic of China. It started, naturally, by establishing the ideal tael against which to fix a relation for the current silver to be used in deals with the Chinese Imperial Maritime Customs Service and with the Treasury. The treaty of Nanking created the Haikwan tael for payments to the first and the Kuping was geared to transactions with the Imperial Treasury in all government dues. The Tsao-piang tael was used throughout provinces and Shanghai and the Canton tael, the "heaviest" of the four, and which was the best known to foreign merchants. The Tsao-piang

[20] In 1914 the Chinese dollar with a standard of 72% of a Kuping tael and a fineness of .900 was defined as the standard. Coinage stared in Tietsin, and Nanking, Canton and Wuchang followed, but the republic could not maintain the standard for very long. Still in 1924 there was no reported lack of uniformity and central control on minting. (KAnn 1914 p 423)

[21] Silver was privately minted in ingots which differ is size, weight and touch (standard) from one city or region to another. Some ideal types of tael – as units of account- existed to pay taxes or dues to the Imperial government.

was the one quoted by the Banks in Shanghai[22]. The Treaty ports prompted westerners (Consuls) to demand steps towards some monetary standardization after the disruption and monetary turmoil of the Taiping rebellion. It was not the first time, and the request preceded the Opium wars; already in 1835, the Canton Register pressed for the introduction into Canton the circulation of the republican Spanish American dollars of equal fineness at par with the Spanish dollar. The article invoked an edict from 1825 by emperor Daoguang fixing the relative price of Spanish and incoming republican dollars[23].

The treaties allowed foreign merchants to establish the means of payment, and if different coins were introduced in the payment arising disputed could be appealed to foreign consuls, and their decision would be binding to local officials after establishing the parity among coins by an official assayer. This was the base of the monetary system in Hong Kong, which having failed to open a mint, took the Spanish dollar standard as their own despite their belonging to the British Empire. Through this channel, the (new) Mexican dollar taken at par with the Spanish dollar eventually replaced the latter as unit of account thereafter.

In the 1850s, concerted actions yielded better results in Canton where the Spanish dollar had been in circulation at the rate of 0.72/0.74 to the tael as foreign coins had flooded Canton (Irigoin 2020). Thus, it was easier – faster for imperials officials than among private agents, Chinese bankers, shroffs and merchants- to replace the Spanish dollar as unit of account for the Mexican peso and the references to the Spanish dollar slowly ceased in 1853.[24] The measure worked well in Canton[25] (seen in graph?) but it proved more problematic in Shanghai[26], probably because of the relation with producers of silk exports

[22] There are doubts about the assigned weight but some state it to be approximately 565.65 grains troy (565.697and some instances 565.704). The tael at Canton was heavier with a weight assigned of 578.85gr troy.
[23] by Imperial edict of March 4th 1825 fixing the currency of dollars received by the Hoppo. The edict was signed by emperor Daoguang. The Canton Register (1835) vol 8 # 3 20th January 1835, p 10. Having found differences in the assay of the Spanish and the republican dollars the proclamation the latter should be received at a discount of 2 ash "for the sake of public convenience".
[24] King states "as long as the supply of Carolus was adequate, the most important consequence of this policy was that other dollars were re-exported to India rather than accepted at a discount. The merchants were quite able to supply themselves with standard dollars and to calculate on the basis of them" p 169
[25] The treaty allowed foreign merchants to establish the means of payment, and if different coins were introduced in the payment arising disputed could be appealed to foreign consuls, and their decision would be binding to local officials after establishing the parity among coins by an official assayer. This was the base of the monetary system in Hong Kong, which having failed to open a mint, took the Spanish dollar standard as their own despite belonging to the British Empire.
[26] In June 1856 native banks on their own initiative were turning from dollars to sycee and issuing bills payable in Shanghai taels. In November 1856 *The Times* reported "sales of shirting *against sycee* or bartered", in

inland who staunchly demanded Spanish dollars for their goods [King 170, Irigoin 2013]. This prompted an even higher premium for the Spanish coin (and conversely a discount on the Mexican coin despite very similar specifications)[27]. A contract on Shanghai dollars was payable only in Spanish dollars or in other coins at a rate agreed upon the creditor [King 173]. But in Shanghai the dollar had a large premium over the Mexican coin – even larger than in Canton-, so a move to standardize money current in Shanghai implied a cry down on the Spanish dollar (on the silver prices in China) if the Mexican one was to be adopted.

This occurred during 1856 and 1857 as reported by the British consul at Shanghai to Sir John Bowring, 6 January 1858[28]:

> "unfortunately, there are two standards of silver, the pure sycee, in which imperial duties are paid, and Shanghai sycee, in which commercial transactions are effected [the latter being on average about 11.1/2 taels worse than the former in purity, hence it takes 111.1/2 taels of shanghai t make 100 taels of Haikwan (Custom House sycee).The Shanghai sycee, however rules, as the commercial medium and a tael weight of it represent the equivalent of a Carolus dollar. Still the inconvenience of bar or shoe silver as medium of value is very great, particularly in small transactions and the Mexican dollars is coming largely onto favour. It would be well if a tael or dollar coin could be struck, and thus set at rest the circulating currency of the port".
>
> "The fluctuations in the money market during the past year have been without parallel. In January it stood at 6s6d1/2; in March and April from 7s5d to 7s6d; in august it fell to 6s9d, and it now stands at 5s10d for long dates. the fall latterly may be ascribed to the large amount of bullion imported and the depression in the home markets. Exchange at any rate blow 6s4d is ls losing matter" "silver costs that laid down here; the consequence is that an export of 1,500,000 taels has taken place to India chiefly, and with present prospects, the probability is that it will continue. Copper cash, the currency of China, has been very scarce; a Spanish dollar that for three or four years was worth from 1,800 to 1,900 cash will not realise no more than from 950 to 1000 cash. This has a serious effect upon prices, in fact doubles the price of all ordinary articles. The importation has been large; it is difficult to know what amount arrived through private sources; but by the Peninsular and Oriental Company's steamers the amount may be taken in value at 20,400,000 Mexican dollars, or in sterling

December bills were quoted against sycee, which become practice in March 1857; merchants thus changed their accounts from dollars to tael, by June 1857. Differences remained -though the gap narrowed -with the use of tael (bullion) or dollar (Specie) as the standard to which the Chinese silver money would be pegged. Shanghai still needed Spanish dollars to pay for the silk good for exports inland and there was no domestic institution, which could enforce either a commodity or monetary standard to conversion.

[27] See figure ??; the exchange on London rose from 5s7d to a record 7s9d in 1856 while in Hong Kong was within 5 shillings - the historical invoice price of the Company. The premium of a Spanish dollar over its intrinsic value made it at par with the Shanghai tael and the Mexican coin was at 34% discount having very similar weight and fineness specifications. King indicates the Spanish dollar had become an imaginary money – a unit of account- the shanghai dollar "so scarce was the coin that it was no longer used in ordinary transactions but for remittances to the silk district" p 172.

[28] "Extract of a despatch by the consul at Shanghai to Sir John Bowring, 6 January 1858. (1857-58)(287) Copies of Correspondence received at the Colonial Office and the Foreign Office upon the subject of the supply of silver in the markets of China" "enclosure 34" p 70

> 5,400,000 pounds; a third maybe added for private hands 1,700,000, making an average total of 6,800,000 sterling"

Concerns on a steady procurement of the Mexican dollars and how the new coin would be based for the payments inland were old among British consuls; this was behind the creation of a mint in Hong Kong – "even against the opposition of the American consul" (King 172)[29]. Ultimately, the shift to the Mexican dollar occurred during 1857 In Shanghai[30] and bullion started to be taken for specie in Shanghai. In October 1856, the tael was at par with the dollar so Chinese agreed to denominate their accounts in Shanghai currency taels and accepted sycee in payment since March 1857[31]. Silver flows turned back into China until the mid-1860s, however the inflow did not last, and the flight even reached record amounts afterwards (appendix figure, fig. 2). Eventually, by pegging the Mexican dollar to the extinct Spanish dollar unit of account (despite the similar intrinsic value) meant a "demonetization" of the Spanish dollar.

The creation of the Shanghai tael/ dollar and taking Mexican dollars as a new "anchor" as in Canton did not ultimately solve the instability created by the demand on the non-longer existent Spanish dollar inside China -as the various "trade-dollars" minted specially for China trade until the 1890s attest. It did not end the dependence on foreign silver currency that Qing China particularly developed over the years, but it helped greatly to stabilise money prices in international trade with China. Thereafter other foreign dollars with very similar specifications than that of the Mexican coin were introduced in Shanghai or China at large with diverse but incomplete success. Between 1866 and 1868 Hong Kong coined 2 million dollars and closed the mint. With the machinery spared from Hong Kong mint, Japan produced a silver trade yen slightly under the intrinsic value of the Mexican coin (374.4 grains of silver for 377.25 of the Mexican)[32]. In 1885 and for ten years France minted the Saigon

[29] an initiative of foreign merchants (mostly based at Canton) pushed for the conversion and fixed the rate at 100 Mexican pesos to 75 Spanish pesos but failed (King p175)

[30] The process was slightly more complicated than in Canton and involved the creation of a Shanghai tael as unit of weight and unit of account, against which specie and bullion values fluctuated. The total issue a declaration making the Mexican coin acceptable at par [king 176]

[31] It is unclear what the Shanghai currency tael was. At 98/100 in relation to the Shanghai tael, it assumed at the standard sycee (.935); the shanghai dollar or currency tael was priced at 111.6 to the Canton tael, the Shanghai tael of bullion was 103.9 Tsaoping tael per 100 Canton (liang) tael. Yet this imaginary intrinsic value of the Shanghai silver matched the standard of the Spanish dollar up to 1772- (.916/000 fine).

[32] The Osaka mint yen "cried up" the yen in 1875 but the measure brought Mexican coins to Japan rather than replacing them inside China and in 1878 the yen was devalued again and circulated in Coastal China, Hong Kong

dollar with 378 grains of pure silver up to the amount of 13 million coins; being heavier and with higher silver content it ended hoarded or melted; in 1895 – after various attempts back to the 1850s- British trade dollars were minted in Calcutta for China. The most competitive coin was the US trade dollar, of 400 grains .900 fine minted for the Asia trade, to the amount of 36 million between 1874 and 1887.[33] Finally, and lastly, the first imperial silver mint opened in Canton in 1890, yet their coins could not displace the current Mexican dollar and was priced by weight in private transactions; but it succeeded to provide the smaller denomination coins (.800 fineness). Other provincial mints opened elsewhere in China[34], but Mexican dollars circulated at premium over intrinsic content still in 1913 – as the Carolus did after 1826-27. Once again, silver outflows renewed in the 1860s; nevertheless, the effects from this first stabilization of China silver markets are apparent in the graphs regarding a greater integration of the money markets from the reduction of arbitrage / trade costs.

The implications for trade were reproduced in the Times and are apparent in figure 1 (appendix figures); imports increased in Canton first, and then in Shanghai in the 1850s. The trends in the balance of merchandise trade seem to capture them. As seen there for first time ever trade with the UK balanced off[35]. Similarly, the observed direction of the silver flows and that of opium traditionally assumed does not seem to match – i.e. it is not inverse of the direction of the silver flows. Opium exports to China jumped in 1833-36, and they collapsed in 1836-40 in the crisis years and silver was exported to India. They jumped again in the 1840s until 1851 when bills made it for silver as means of remittance; peaked in 1854-57, along with renewed inflows of silver to China. Exports collapsed until 1860 when they bounced back up to 1862 and remained high but stable until 1870 showing a decreasing trend towards 1874. (Lin 2007, Irigoin 2013).

The stabilization of silver prices in China is visible in the narrowing of the bands for the specie points across deals with Indian cities and the UK. A greater efficiency is also apparent in the

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and South East Asia, between 1871 and 1897 Japan coined more than 165 million yen, 2/3 of which were shipped abroad (King p 179)

[33] The weight and silver content intended to include the cost of laying the dollar in China; it was not legal tender in the US but its success being more valuable that its face value with the depreciation of world silver made the rate US dollar/ US trade dollars 1:0.86 creating problems for the US treasury [King 180-181]

[34] A silver coin minted in Fukhien at 517 grains troy with the God of Longevity stamped and a legend indicating a value of 7mace 2 candareen (Kann p 406)

[35] Further implications for the exchange rates, domestic prices and terms of trade as on the composition of the triangular trade worth exploring further.

greater integration of money markets and the settlement mechanism in the triangular trade between Britain, India and China. Although this did not end completely China's problems from her dependence on foreign silver specie, through the workings of the consistent adjustment mechanism to commercial disequilibria and thanks to a relatively more stable monetary regime China became more integrated to the international economy that was functioning before the gold standard era.