The rise and decline of the global silver standard

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Abstract

In the early modern period, the world economy gravitated around the expansion of long distance commerce. Together with navigation improvements silver was the prime commodity, which moved the sails of such trade. The disparate availability and the particular demand for silver across the globe determined the participation of producers, consumers and intermediaries in a growing global economy. American endowments of silver are a known feature of this process; however, the fact that the supply of silver was in the form of specie is a less known aspect of the integration of the global economy. This chapter surveys the production and export of silver specie out of Spanish America, its intermediation by Europeans and the re-export to Asia. It describes how the sheer volume produced, and quality and consistency of the coin provided familiarity and reliability to the Spanish American peso, which made it current in most world markets. By the 18th century it has become a currency standard for the international economy which grew together with the production and coinage of silver. Implications varied according the institutional settings to deal with specie and foreign exchange in each intervening economy of that trade. Generalized warfare in late 18th century Europe brought down governance in Spanish America and coinage fragmented along with the political fragmentation of the empire. The emergence of new sovereign republics and the end of minting as known meant the cessation of the silver standard that had contributed to the early modern globalization.

Arguably, before the Gold Standard there was another monetary standard for the international economy, which bore similar currency but little resemblance with the institutions of the gold-backed pound sterling. In the early modern period, a coin of silver made in the New World was the base on which prices and exchange rates were established in far distant places as Leghron, Smyrna, Kingston, Bourbon island, Surat, Manila, Macao, Cadiz, Havana, Lima, Philadelphia, Buenos Aires and Bantam. Equally well known to Cotton Mother and to Alexander Hamilton or to the Mughal in Agra and Louis XIV of France, the Spanish American silver coin changed names and some features throughout the 16th, 17th and 18th century but remained the most successful world money before the 19th century. Coins manufactured in America, known in France as piasters, *duros* or 'hard' pesos in Spain, or *ryals* and Spanish dollars in the English world, whereas indeed the name is peso. Here both words are used interchangeably. They were demanded by Canton Customs for the 'measurement' and demurrage charges in Whampoa; it was the unit of account for bills on London of the cash-strapped English East India company and made the largest share of the Bank of Amsterdam collateral in the 1763 crisis; and the bulk of international movement of capital of the Jesuit Order - and most ecclesiastical investments overseas; It was the unit of denomination of the Continental Congress paper money and the template on which Alexander Hamilton anchored the US dollar; and the money of account of British Singapore and Jamaica well into the 1830s. In a world where the geography of money revolved more around individual cities than nation-wide states ((Flandreau, Galimard et al. 2009), the coin minted separately in three sites far apart in the Spanish New World was the first currency everywhere. As the Company factor John Lockyer indicated for Asia "dollars (pesos) are worth more in specie than when they are melted down" ((Lockyer 1711) p 141).

Together with the discovery of the sea route to India, Adam Smith considered the discovery of the New World was one of the "two greatest and most important events recorded in the history of mankind" (Smith 1776/2007) III, ch 7: 829). Indeed, it meant a defining change for the Old (Eurasian) world economies. Thus, the New World is associated with a number of windfalls to their discoverers, like the 'Columbian exchange' (Crosby 1972), the 'ghost acreage' (Pomeranz 2000) and improvements to European living standards (Hersh and Voth 2009) all which allowed Europeans to overcome the Malthusian limits to their path of development. Silver was paramount in this transformation. In Smith's words it was "one of the principal commodities by which the commerce between the two extremities of the world was carried on, and by means of it, in a great measure, that those distant parts of the world are connected with one another" (Smith, 1776/2007, I, ch 11: 287).

The Spanish American silver

Unlike spices and exotic foodstuff like cacao, Eurasian people and rulers knew tomato or maize, gold and silver; but the acquisition of the American continent allowed an access to precious metals of unimagined proportions. In Europe, the German silver mining boom of mid-16th century had increased five-fold the continent silver output. At its peak in the 1540s, output in Saxony, Thuringia, Bohemia, Slovakia and Hungary combined amounted to 52-55 tons per annum (Munro 2012) This volume was six times larger than the incipient inflow of American silver to Seville at the time. By 1560s quantities were comparable; in the next decade 1560s-70s European production was probably only half of New World' inflows. Thereafter, silver mining in central Europe stagnated or declined and American silver flooded the European and world economy once Potosi in Upper Peru (Bolivia today) and Zacatecas (Mexico today) went into production. Still in the 1790s Baron Humboldt was bewildered that one single mine in Guanajuato - the 'Valenciana'- could regularly supply 30,000 marks of silver per month, a quantity equal to "half of what is furnished by all the mines of Saxony (combined)" (1801/1811 p 171, 174). In Asia, Japan was too a very significant producer and her maximum output in the early 17th Century has been estimated in 150-200 tons a year – but declined sharply to 60 tons by 1640s and remained very low thereafter. Therefore, at a steady annual average of 350 tons for more than 250 years, Spanish American silver dwarfed the contemporary production of Central and Northern Europe, Central Asia and South East Asian mines in Siam, Burma and Cochin China (Vietnam) combined. A total of 86,000 tons of silver and 1,700 tons of gold was the total volume of precious metals mined in the Iberian possessions up to 1800s. This represented approximately 70-80-% of the world stock of silver and 40% of the worlds' gold stock throughout the 18th century. Scholars use (Soetbeer 1879) and (Barret 1990) estimates but their figures include 'silver equivalent' values – i.e gold expressed in silver pesos. Data used in this essay originated from the registered metal which was assayed, paid taxes or was coined, figures here should also be considered an absolute lowest bound (TePaske and Brown 2010) p 53,67,140).

This increment in the production and shipment overseas did not slacken until 1808 when Napoleon invasion of Spain brought down her rule in Spanish America' mainland but output and exports lapsed only after the 1820s. It had started by mid-16th century when large silver veins found in the mainland outshone the considerable –by standards of the time - gold mining in the Spanish Caribbean soon depleted by 1550. Thereafter, New Granada, today Colombia, became the most consistent producer of gold in the Spanish New World. With varying relative share, production continued in silver endowed areas like Mexico and Bolivia today - and boomed in Chile by the end of the Spanish rule.

Several other rich mining districts sprang up over time fuelling and financing the territorial expansion of the Spanish American economy. With a total population of about 12 million inhabitants – roughly the same as Spain' and less than of England's – by 1800 the colonial economy stretched from the new mining regions of Chihuahua and Sonora (near the Mexico-US border today) in the north to Copiapo and Coquimbo in Chile, in the south. Silver rich New Spain (Mexico) counted a number of additional very productive mines scattered throughout the territory, ie San Luis Potosi, Durango, Guanajuato, Guadalajara, and the central region neighbouring Mexico City, the main administrative centre in the Spanish kingdom. In the second half of the 18th century, other secondary sites flourished in Pachuca, Sombrerete, Bolaños, Rosario and in marginal regions in Central America like today Guatemala. (See map in appendix) A substantial gold rush since the 1690s in Portuguese Brazil, added nearly 1,100 tons of fine gold to the precious metals exported out of the New World – more than half of the total production until 1800. Yet, silver was consistently the chief commodity out of the Americas, for much larger values and for longer periods of time than any other export commodity produced in America with African slave labour like sugar of coffee.

Endowments were far more concentrated in South America – the 'Rich Mountain' of Potosi produced 80% of the New World silver outside Mexico, and sourced half or more of the world total during the 17th century. Minor sites – in proportion – in today Peru, Bolivia and Chile also contributed to Peruvian output although some regions boomed - and a few declined too after few years – like Carangas, Cailloma and Castrovirreyna. Still at the turn of the 19th century, other sites were incorporated like Norte Chico (Chile), Oruro (Bolivia) and Pasco (Peru). Peru also contained the very large quicksilver mines of Huancavelica, which supplied a vital input for silver refining. Amalgamation - the blending of pulverized ore with quicksilver to be washed away with salted water- replaced indigenous cupellation with blast furnaces in the refining and smelting of silver in Mexico in the 1560s and in Potosi in 1573. Together with reforms that instated the Spanish *mita* on indigenous labour in 1570 – known as *Ordenanzas del Virrey Toledo* - this new technology doubled production within 20 years -to 2.5 million pesos or 62 tons of fine silver. Associated with the exploitation of Indian labour the extraction of silver is a well-known – though ill-understood feature of the European rule in the New World. Wrongly, institutionalist economists often assume the coercive nature of this labour institution, though the collective property rights of indigenous to land was instrumental during the demographic crisis, but eventually raised the incentives to work for a wage when population replenished (Coatsworth 2006).

A stereotypical characterization of Spanish colonialism has overlooked other remarkable aspects of the silver economy in the early modern Spanish world. For instance: 1) the nearly complete *private* nature of the industry, which the monarchy taxed in proportion of the output given her domain of the subsoil.

2) the existence of miners of very diverse scale – predominantly small and only few, large, mining companies like the 'La Valenciana' which appeared later in 18th century Mexico. 3) The subsidization of the industry by the Royal Treasury which afforded inputs, like gunpowder and quicksilver, at lower than market prices. 4) the private-royal partnership - a feature of Spanish colonialism that extended to most other capacities of the state – that supplied quicksilver from Almaden or imported it from Germany at the expense of the royal purse; whereas the Huancavelica mine was leased to a local refiners' guild. 5) Labour in the Peruvian region was subsidised too as *mitayos* - a form of coerced indigenous labour- were indeed tributaries to the King, who assigned them to miners for regular work while guaranteeing effectively their collective property rights to land ((Bakewell 1984, Tandeter 1993, Barragán 2017). *Mitayos* were only a part of – unskilled- labour in Peruvian mining whereas in Mexico however free wage labour was prevalent. Further, in a 'developmentalist' state fashion (Grafe and Irigoin 2012) 5) taxes on mining were halved in Peru in 1736 and made equivalent to the 10% rate levied on output in Mexico. The sale price of quicksilver was further reduced in 1767 and again in 1777. 6) A greater agency of the State after the 1730s - paradoxically - reduced intermediation costs increasing the returns of miners and contributed to another leap in the silver production in the second half of the 18th century. Indeed, silver mining in Spanish America was largely a mix of private and commercial and non-market principles, which steadily expanded over the territory and grew in output over the centuries.

Private too was the bulk of the silver exported over the Pacific via Manila, and to Europe via Seville – or Cadiz after 1700 - throughout. Consistently more than 80% per cent of the silver transported over the Atlantic in the Treasure fleet – convoy of a dozen ships a year to and from Veracruz and Portobello - was private. The proportion persisted when shipping was deregulated after the 1740s; eighty ships from Spain plied a year by the 1770s and around a hundred in the next decade ((Hamilton 1929) (Morineau 1986)). When war in Europe cut off the colonies in the 1790s, US vessels were licensed to call in Spanish American ports expanding the carrying capacity and trade. Throughout though, interlopers like the Dutch in 1660s, occasional allies like Louis XIV' France, or royal-foreign private partnerships like the *Asientos* with the South Sea Company or Genoese consortia for the introduction of slaves, all them took a fair share of the Spanish American imports and silver exports. Hence, systematically some silver escaped the Spanish tax collector and cannot be accounted for. Well informed contemporaries at the end of the 18th century estimated that precious metals lost to 'contraband' represented a 17-20% of the total volume ever mined (Humboldt 1811/1808).

The global scope of Spanish American silver

Private remittances to Europe meant that most of the silver arrived in Europe as return to trade, not as result of fiscal or royal exaction as often assumed. Between 1500 and 1800 global trade grew at an

aggregate one per cent per annum and the production of Spanish American silver at 1.09 per cent a year. In the 18th century, European intercontinental trade grew at 1.26 per cent while Mexican (recorded) silver production did it at 1.35 per cent, much faster than the European tonnage to Asia – at 1.10 per cent (Maddison 2007) ((O'Rourke and Williamson 2002)table 1, 421). A rate which replicates the growth rate of European population - inclusive of Russia- but higher than that of Asian population growth – 0.4% for India between 1600 and 1800 (Habib 1995, 368) and China's at .08% ((De Vries 2009)p 730). However, the relation between the production and commerce of silver and the development of the global economy is not well understood yet because of the mild distinction scholars make between silver as commodity (bullion) and specie. Nor is the size or the role of the Spanish American consumption resulting from the purchasing power of silver ever assessed.

This massive inflow of American silver is well represented by the ratio to gold in Europe which stood at 10.75 in 1500 and increased to 15.61 in the 1800s on average (Laughlin 1896) Appendix II table A)[1]. Global monetary historians have emphasized the arbitrage that Europeans enjoyed in trading silver in Asia as a driver of the growth of international commerce in the early modern period. It is unclear however why the silver trade continued and even increased in spite of China' gold-silver ratio converged with the European ones after 1750s (Flynn and Giráldez 2002); or fluctuated well below and above the European ratio as in India (Habib 1982) table 9). This insinuates some other intervening factors independently of the two metals supply.

Large silver inflows during the 16th century persuaded economic historians of a 'price revolution'; which was later explained in Europe as result of demographic changes, higher productivity in agriculture and greater urbanization. Silver as re-export to Asia – and to the Baltic and the Levant – had to offset some aggregate effects. Similarly, a fall in the quantities arriving in Spain in the mid / later 17th century has been (wrongly) associated with a global crisis (Flynn 1982, Von Glahn 1996), although direct inflows to other European ports more than compensated for the fall. This was the case of the estimated 250 million livres *tournois* (roughly 1,278 tons of fine silver), brought to France by St Malo' ships between 1698 and 1724 (Lespagnol 1992/1997). In fact, silver production and exports soared during the 18th century: both doubled between 1710 and 1770 and increased by a further 50% between 1780 and 1810. At the same time China imports reached record levels. However, no significant aggregate effect has been identified in the contemporary development of Europe or Asia. In fact, as Morineau ((Morineau 1996), 266) pointed out twenty years ago: "the incorporation of precious metals in the general circulating medium of European (*and Asian*) economies, their effective role in the development

[1] It was 10-12: 1 (end of 16C), 15-16: 1 (end of 18C) in Europe; 5:1 (1300), 6:1 (1590), 10:1 (1750), 15:1 (1800) in China; 9:1 (1590), 11:1 (1660), 13:1 (1715) in India; and 10:1 (1590) in Japan and 10:1 (1500) in Persia. In 1800 Silver gold ratios were: Britain $14^{1/4}$:1, Hamburg 15:1, Paris $15^{1/2}$:1 Madrid 16:1 and Buenos Aires 17:1.

of the economy and of the armed forces, the concurrence with other means of payment, and the transition to the different modern monetary regimes of the 19h century" still remain to be explained.

To account the silver absorption by Europe as a result of the colonial trade of Spain - and Spain' balance of trade with other European nations - is misleading. Silver flows out of Spanish America not only served to pay for imports of European and Asian manufactures in Spain, where mainly French and Genoese houses controlled the trade; they helped also to cancel bills of exchange drawn on Cadiz and later in Barcelona or Corunna by English merchants for their smuggling from Jamaica or Trinidad. Within Europe, bills of exchange dominated the intra-European financial flows as they were a substitute for specie (Quinn 1996); this explains why these instruments were unseen in the commerce that Europeans maintained in China or Spanish America where specie had no substitute ((Bernal 1992), (Cheong 1978) p 27), unless business was conducted within schemes such of the East India Company. Bills denominated in foreign currencies offered an opportunity for arbitrage between specie and bills in different European markets too if exchange rates were favourable. This did not necessarily have to follow the movements in the stock of silver and gold – as a crude bimetallism would conceive.

Silver specie

Yet, the most remarkable aspect of the New World silver is that most of what was mined since the 1560s was minted – and thus exported overwhelmingly in the form of coins, more precisely in the form of one peso coins. Unlike Brazilian gold, which was partly minted in Lisbon, silver in Spanish America was minted locally under the control of private individuals. Spain, like other European sovereigns, cut their metallic coins from New World precious metals (Challis 1975). In Castile, private and royal mints in Madrid and Segovia coexisted until the 18th century. All of them operated under royal specifications for weight and fineness of gold and silver established in 1497 that fixed the ratio for gold / silver exchange and did not change until 1730. War with the United Provinces and other interventions in European conflicts in the 17th century prompted large debasements of copper coinage in Spain in 1634 and 1656 that channelled bullion to England. As the main port of arrival of silver, Seville was the largest manufacturer of coins in Spain. Estimates of metropolitan silver coinage calculate that a third of the New World output was minted in Castilian mints before 1640 ((Motomura 1997)(table 1; TePaske Brown, 2010 table 3.20). This represented two thirds of the silver received in Spain in the 16th century. Coinage as proportion of imports decreased in the 17th century, but silver mintage increased in France and England. (Motomura, 1997 table 2 p 339) The proportion decreased further from a third in the period 1586-1621, to a fifth by 1700; to barely a 6% of the total silver received in the 18th century when

around 900 million pesos total was coined in Seville (De Paula, 2016, p 366). The remainder arriving from Spanish America was coined already – and of high quality standard. Unlike Britain, and her empire after 1821, Spain lacked uniformity in her coinage and suffered from a very volatile monetary environment until well into the 19th century (Sardá Dexeus 1948). As a result of the jurisdictional fragmentation of the Hispanic Monarchy different kingdoms in the peninsula performed with different fractional coins and monies of account, which were not current everywhere or were overvalued in another city / regions.

In Spanish America, state or royal control over coinage was minimal, indirect and asserted only after 1730. A fraudulent adulteration of silver coinage in Potosi sometime in the 1630s and 1640s, triggered major reforms. The free reign of mint officials in Potosi had reduced the content of fine silver in the coin producing a debasement from 15 to 50 per cent between 1620 and 1650. Coinage nearly doubled there while the registered output stagnated, and even decreased, in the same decades (TePaske Brown 2010 table 5.12). The reaction of the Crown was swift. The intervention ended with a rare public execution of the responsible officials in Potosi and some large silver merchants of the city (Lane 2015). In both cases, in Spain and Potosi, a re-coinage sought to withdraw the debased specie from circulation: in Spain it achieved some price stabilization after copper inflation; in Spanish America it proved impossible given the chronic shortage of (any) specie in circulation and the limited increase in the pace of coinage. There was no copper coinage as small change and subsidiary moneys developed from pre-hispanic forms as cacao beans or pieces of cloth and jaggery from sugar cane. Local vested interests in charge of the mints, coupled with the poor fiscal capacity of the colonial state, were constraints to a more efficient management of coinage in the Spanish New World.

Thus, mints in America operated with great deal of autonomy. Precious metals were coined in a few cities: Early in 1535 mints opened in Mexico City and Hispaniola (Santo Domingo), which lasted as long as gold in the island; another one operated in Lima between 1568-1588, which was moved to Potosi in 1575. A third mint reopened in Lima in 1684 after the Potosi fraud. Gold coins were cut in Bogota since 1621, and occasionally minted in Lima and Mexico alongside silver, although in much lower proportion. Refining and minting facilities were located at great distance – or independently - of the mining sites. The distance to the Mexico City mint from Zacatecas was 600 kms, from Durango nearly 1,000 and 1,400 kms from Chihuahua mines. Oruro mines were 300 kms away from Potosi, and Huancavelica more than 500 kms from Lima; Chilean silver and gold had to travel 1,326 nautical miles to be coined in Lima. This gave ample opportunity to liquid merchants to purchase the metal from miners and refiners with cash and quicksilver advances. Thus, private agents also controlled the coinage business

under a distant supervision of royal treasury officials, or operated the mint house right away as a private venture like in 1740s Chile.

Silver was assayed and stamped with the royal mark; this certified the fineness of the bar (bullion) and the payment of taxes. Up to 1728, braceage represented 3 reales out of the 67 struck from a mark of 230 grams of fine silver. An additional real for mark was charged as seigniorage. However, chief offices at the mint like the Treasurer, Assayer, the Chief Smelter and the Engraver were sold; jobs like marking of the bars, keeping the weights and scales, and minor posts like scribes, guards and even porters were purchased also with nearly no requisite of qualification for the post. Like Treasury officials, they were subject to occasional inspection by other local bodies, and by special royal envoys in extraordinary circumstances. Office holders received an annual salary plus a compensation proportional to the number of silver marks assayed and minted. Returns to office were very large as to attract wealthy individuals or religious corporations empire-wide, who subsequently sold it to moneyed locals who eventually subcontracted the job to those able to carry on the task.

Royal decrees from 1497 conceived the real as the unit of denomination and a content of 930.5 thousand of fine and a weight of 3.4 grams (3.195 grams of fine silver). They also established multiples of two, four and eight reals, the peso and a fractional coins of one-half reals, however throughout the whole period between 85 and 95% of the coinage in America was struck in the form of 8-reals value, hence the piece of eight. These silver lumps (cobs) cut of bars with pliers weighted 27.46 grams; at 930.5 thousands standard they contained 25.61 grams of fine silver and performed as specie. Coins bore the initial of the mint of origin and of the assayer, so the notorious Potosi coin was easily discriminated. It traded at discount against the Mexican or the Seville specie in Surat already in 1647 (Foster 1618/69) and was distinguished in the East Indies Co ledger books. Main markets for silver at the time in Europe like Genoa, Milan, Paris, Flanders and Konigsberg prohibited its circulation. Even Portuguese Brazil counter stamped the specie lowering its value. The recoinage that followed changed the design of the peso replacing the Pillars of Hercules for the Jerusalem cross stamped on the coin; but kept specifications for weight and fineness. The pillars were at both sided of the coats of arms of King Charles I. The words *Plus Ultra* and the other engraved with the cross, lions and castles represented the kingdoms of Castile and Leon, the name of the king stamped together with the motto *Hispaniarum Rex* – for coins struck in the metropolis – *Hispaniarum Rex and et Indiarum Rex* in the American coins. Thereafter the *ryal* started to be known as dollar in English, also 'pillar' dollar / peso or '*columnaria*'.

More changes that are significant took place in the 18th century. Aiming at greater monetary order, there was an increasing intervention of the state in matters of coinage and monetary policy both in Spain and the American possessions. For one the alienation of mint offices from private individuals in

Seville and the New World placed coinage of gold and silver under the jurisdiction of the sovereign. In the metropolis a council, *Junta de Moneda,* was established in the 1730s with the purpose of centralizing decisions on monetary issues, but the autonomy of individual mints did not disappear completely. The centralization was limited to the engraving and manufacturing of the dies with which to stamp the coins. In addition, coinage of silver for the metropolis was separated from the one in America. The taille of the silver mark was reduced from 67 to 68 reals in America and to 80 in Spain, reducing the fineness of the latter – the *peso provincial* - to 826.4 thousand which implied devaluation vis-a-vis the Spanish American coin – *peso nacional*. The decoupling did not solve the problems of large outflows of hard currency from Spain paying for imports from all over Europe, so the premium on the Spanish American coin continued.

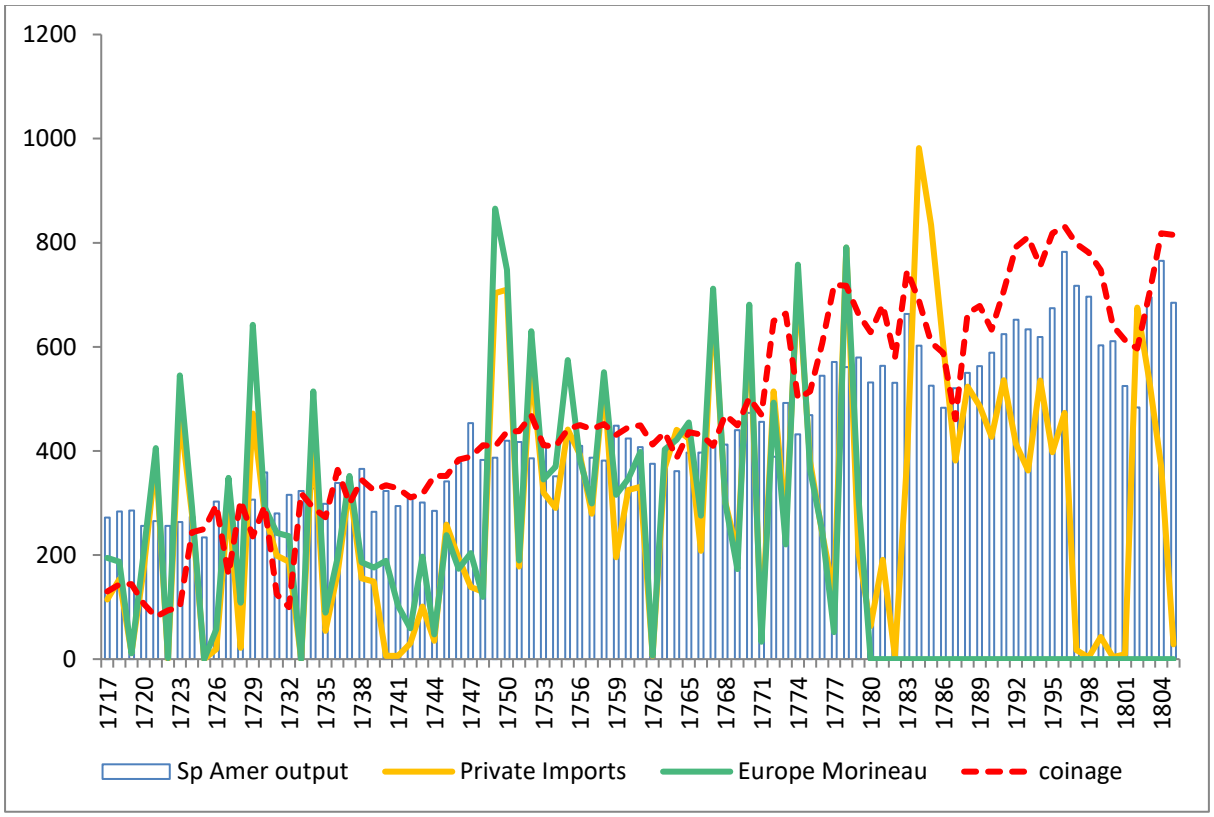
An overhauling of the minting technology, some institutional reforms and further changes in the specifications of the coin took production and mintage of silver to record levels. Until the 1730s coins were cut from hammered blanks of a consistent proportion of silver and alloy – hence the 'hammered dollar' as known in the US. Uniformity in the size, weight and fineness developed over the 16th and 17th centuries, when the growing volume of coinage granted consistency to the coin. A new technology of minting imported to America after 1730 used horse or mule-driven laminating (rolling) mills and screw-presses, thus coinage went through a revolution. The blanks were prepared using roller-mills that produced uniformly thick strips of silver from which to cut the blanks with metal punches. Two heavy iron screws pressed the metal to the desired thickness, producing a round or circular coin with a rimmed or milled edge, thereafter known as the "milled dollars". The circular coins were more uniform and the rimmed edge preserved the integrity of the specie. This prejudiced clipping or shaving the piece in an environment plagued with problems of 'small change' and allowed greater consistency in the size and appearance of the coin.

Stamping 68 reals per silver mark meant a slight reduction in the weight and fineness of the peso to 916.66 and to 27.064 grams total weight, making it for 24.81 grams of fine silver. Between 1730 and 1772, Mexico mint house only produced more than 461 million of these pieces – around 288 tons of fine silver a year. A further slight devaluation took place in 1772 but the royal Treasury absorbed the cost of coinage. Charles III debased the peso to 24.43 grams of fine silver, i.e. fineness was reduced to 902.7 thousands, and again to 24.25 grams in 1786 on the basis of 895.8 thousands of fine. The size and total weight did not change but the face of the King stamped replaced the pillars on the obverse. They were hence known as Carolous and "old heads", "Buddha heads" or *sikong-yin* in China. Over a billion of such coins were cut in Spanish America between 1772 and 1818.

To a higher productivity of mint houses contributed the direct control and funding the purchase of refined silver bars by the state from 1730, making coinage another monopoly like the supply of quicksilver and gunpowder. Royal treasuries earmarked revenues from (lower) mining taxes and seigniorage built the capital for the mints. A more direct state management improved the returns of miners, who formerly had to exchange their bars for coins at heavily discounted prices from concessionaires who afforded liquidity. The *rescate*, i.e. the smelting, weighting and assaying of silver bars was made available to other mining districts beyond the cities with mints. New and larger facilities for the existing mint houses were built, and additional mints opened in Guatemala in 1733 and in gold-rich Popayan (Colombia) in 1758; and the state took over the Santiago Mint in 1772. In 1732 royal appointees replaced concessionaires in Mexico. Royal management was imposed to Lima mints in the 1750s and Potosi in 1771. Mechanisation together with institutional reforms propitiated that a greater share of the output passed through royal mints increasing coinage. Results are visible by 1770s: coinage leapt doubling or more the levels produced before; it peaked in the 1790s and 1800s when volumes replicate trends of mining and exports.

[figure 1]

Spanish American silver production, exports and coinage, 1717-1805 (in tons)



Sources: Spanish American output (TePAske-Brown, 2010), Private Imports to Spain (Garcia Baquero Gonzalez 1996, Cuenca Esteban 2008); Arrivals in Europe (Morineau, 1986), Coinage (Cespedes del Castillo 1996)

Mints houses continued in operation until the first decade of the 19th century, when the French occupation of Spain had a decisive impact in America. The control over refining of silver bullion and coinage broke down together with the Spanish governance; mintage plummeted and exports volume abated. Within ten years in 1820s, Potosi and Mexican coinage fell to a third of the previous decade. Whereas additional mints opened in Spain, in Cadiz, Valencia, Barcelona and Galicia, during the war against the French occupation; in America new outlets for coinage sprang up in any region relatively well endowed with silver. Six new houses opened in the 1810s in Mexico only: in Zacatecas, Chihuahua, Durango, Guadalajara, Guanajuato and Sombrerete, which started manufacturing their own peso coin, and the number increased further in the following decades. The fragmentation of the coinage extended to all other silver rich regions mirroring the territorial fragmentation of the Spanish empire. Within five years of independence, by 1825, Peru had two additional mints in Cuzco and Arequipa; another one opened in the vicinity of Bogota and Popayan in Pasto. Republican governments in Bolivia ultimately maintained control over Potosi but started a steady debasement of the coin after 1826. Within few years, the minting multiplied and cash starved republics coined silver of any quality and weight, or worse, started issuing unbacked paper money fuelling a beggar-thy-neighbour process in monetary affairs among formerly integrated economies. Thus the features of the Spanish American peso standard disappeared which henceforth rarefied global markets for silver (Irigoin 2009).

World silver: bullion or specie? Supply or demand?

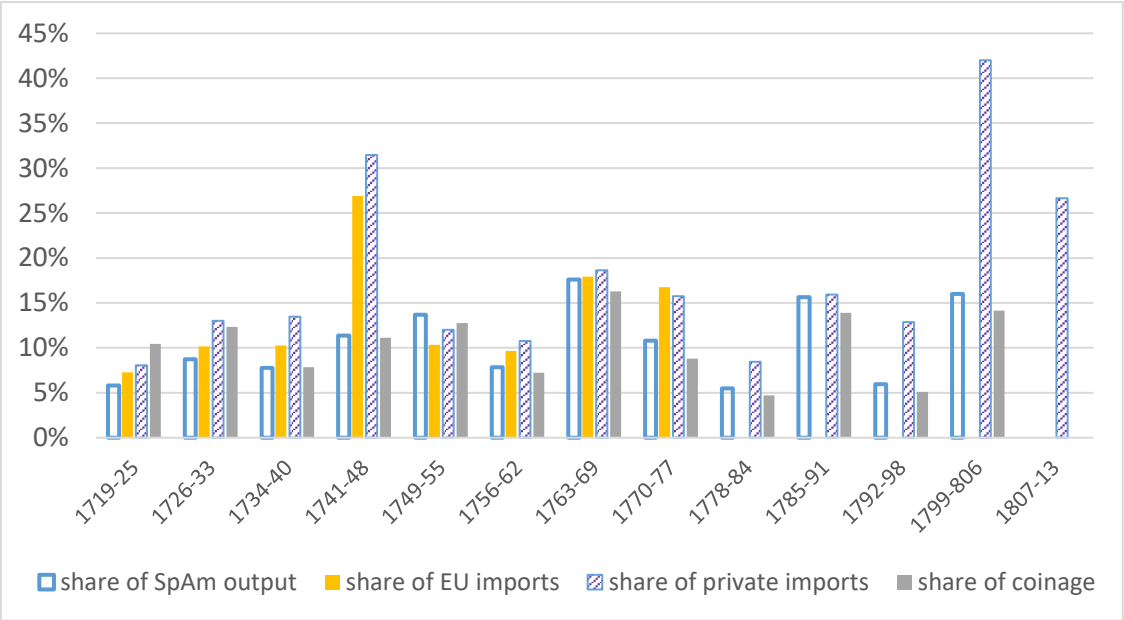
By 1500 the monetary stock of Europeans was roughly estimated in 3,500 tons of gold and 37,500 tons of silver ((Parker 1974) II, p 527). New World precious metals doubled or more the stock of silver and increased that of gold by a half. By 1810, this volume represented more than 3,400 billion of coins. Obviously, neither the geographical distribution nor the progression of coinage was even throughout; half of the 86,000 tons of silver were minted in the previous 80 years. It peaked in later 18th century adding about 28 million pieces of the same specie a year. This represented a yearly 700 tons of fine silver, 70% if which was produced by Mexico only (TePaske and Brown 2010, p 113).

Even if there were no consequential effects in the 16th century, the acceleration of silvers flows in the world economy in the 18th century - and its sudden stop in the 1820s- invites some scrutiny. A recent estimate puts the contribution of precious metals to the growth rates in Europe GDP for the period 1530-1790 at 1.3% (Palma and Silva 2017). Silver 'advanced monetization' in both Europe and China; it allowed more efficient functioning of productions and markets (Pomeranz 2000) and eased ongoing Smithian growth, although the relative impact in the productivity growth of each term of the

comparison is open to question (De Vries 2015). However, scholars discerning between the 'strength' of European demand and the inelasticity of Asian supply leave aside the role of American demand – and supply of specie –in the early modern global economy. It is not to argue for monetary factors in the Great Divergence but issues explaining the 'strength' of European demand and the inelasticity of Asian supply often argued do not fully consider the role of silver and the New World. Trade historians do not consider precious metals because of their monetary role and do not consider relevant their 'impact of intercontinental silver flows on aggregate price levels' (O'Rourke and Williamson, fn 4). Yet, silver had a higher purchasing power in Asia where apparently there was a persistent demand – as it was "a public necessity" (de Vries 2013) – thus price (and wage) differentials persisted. Given the structure of the Spanish American silver trade, there was another arbitrage to be made by Europeans trading there; where specie abundance traded European and Asian consumer goods -and capital goods like slaves- for silver coins at the lowest international relative price. This 'currency trade' expanded the demand potential of the Europeans in Asia, on top of the windfall from the 'ghost acreage'. As noted by Adam Smith 'the general advantage which Europe, considered as one great country" derived from the discovery of America and of the Passage to the East Indies "consisted first, in the increase of its enjoyments, and secondly, in the augmentation of its industry". The relative importance of Asia demand of silver in relation to Spanish American production and coinage is displayed in the figure below.

Figure 2

China' silver imports as share of Spanish America output, coinage and trade



Source: China imports from Dermigny, (1964) *La Chine et L'Occident*, II p 735; Output, EU imports, Private imports and coinage idem figure 1.

In spite of the largesse of its silver production and exports, Spanish America did not record comparable inflationary effects in prices (Garner 1985, Garner 1995). Contrarily, it was "the gradual enlargement of the market for the produce of silver mines in America, (was) probably the cause .. which has not only kept up the value of silver in the European market, but has perhaps raised somewhat higher that it was about the middle of the (18th) century". On top of population recovery, the market had become more extensive in America – as in Asia – as noted by Adam Smith, the "greater part of Europe has much improved, England, Holland, France and Germany, even Sweden and Denmark and Russia have all advanced considerably both in agriculture and in manufactures" (Smith, 1776/2007, Book I, ch XI, III p 161, also Book IV ch VII, III p 457). Silver coins permitted the extension - and specialization within - of the global market although economic historians tend to disregard the monetary aspects of the Eurasian trade with American silver (Chaudhuri 1975). Emphasizing the colonial trade of each European nation, their role of carrying trade and the demand potential in the New World are often overlooked. After all, "the re-exportation (of East India goods) to other countries brought back more gold and silver to that which carried on the trade than the prime cost of the whole amounted to" (Smith,1776/2007 Book IV, ch III, I p 364).

To great extent, this is an outcome of looking at the Great Divergence solely through the archives of the chartered companies. Over these centuries foreign silver accounted (roughly) for 90-93 per cent of the European cargo values to China and 75-80 per cent of the India-bound cargo (Dermigny 1964) II, 686). By mid-17th century –without silver endowments - Mughal India obtained silver mostly from overland routes through Central Asia and the Levant. China sourced it from Japan (Tashiro 1991) 77) where gold silver ratios were 1:11 / 12 vis a vis China's at 1:5 and 1:8 by late 16th and early 17th century. The availability of Spanish American silver from European intermediaries altered these flows within Asia. It filled in for the reduction in Japanese silver going to China following restrictions to gold and silver exports that historians considered a move to protectionism *(Sakoku)* by Tokugawa from the 1630s. In 1695 Shogun Tunayoshi directed a debasement of the standard of the first unified Japanese currency (Keicho) established by 1601-1606 – 80% fine minted silver- down to 64% (the Genroku ingot) (Hellyer 2009) p 52-68, (Innes 1980) II, 582). With further debasement into the 1700s, and growing silver flows through Manila, Chinese merchants withdrew from the coast of Japan – though Dutch and Koreans merchants who intermediated larger intra-Asian trade remained (Tashiro 1991, 78-79).

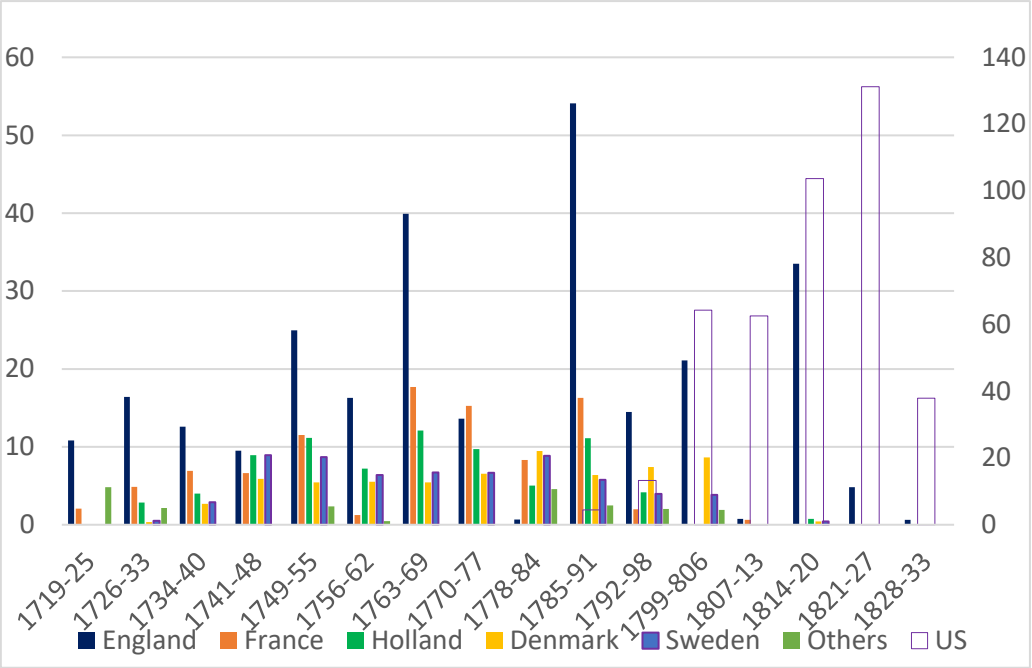
The arbitrage between (relatively) silver abundant Europe and silver scarce Asia engaged the Portuguese and Spaniards in South East Asia first and successively European companies joined in throughout the 18th century. Measured by the silver amounts taken to Asia over the Indian Ocean the VOC was leader until the 1720s; the French prevailed 1740s and the English were dominant after the

Seven Years War. With the Napoleonic wars, Dutch and French merchants almost disappeared from this commerce; and the 'supremacy' of the English company was soon challenged by the very fast growing free trade of the US already in the 1790s when US vessels, sailing around Cape Horn, joined the East Indies trade. After the American Revolution, the silver that England obtained in the West Indies since the Free Ports Act (1767) was diverted partly to the former British colonies. The US became close second to the British in China and in India in the 1800s when intermediation of Spanish colonial trade as Neutrals expanded their access to silver. Thus western silver trade and commerce overall with Asia prolonged beyond the life span of the monopolistic companies.

Commerce around the Cape of Good Hope was not the single – and possibly not the most important- source of silver. A continuous inflow arrived from the Pacific on the Spanish Galleon – another private-royal partnership of sorts for commerce in the East Indies - over 250 years. The low state capacity of the Spanish Monarchy bore no control upon –nor derived sizable revenues from - that trade either, so amounts are less known. However, evidence from bills of lading attests of a volume for Asian imports and a value for silver arriving in Manila comparable – and often larger- than the yearly 'investments' of the East India Company (Morse 1919, Bonalian 2010). Estimated at roughly 50-75 tons of silver a year, this flow was directed to China mainly, but thanks to the extensive intra-Asian carry trade, silver permeated to British India, Java, Surat, Laos, and even to Japan and Korea. South East Asia continued deriving Spanish American silver beyond the Galleon well into the 19th century. (Kobayashi 2017, Kobayashi 2018)

[figure 3]

China silver imports, composition by origin, in tons (US right axis)

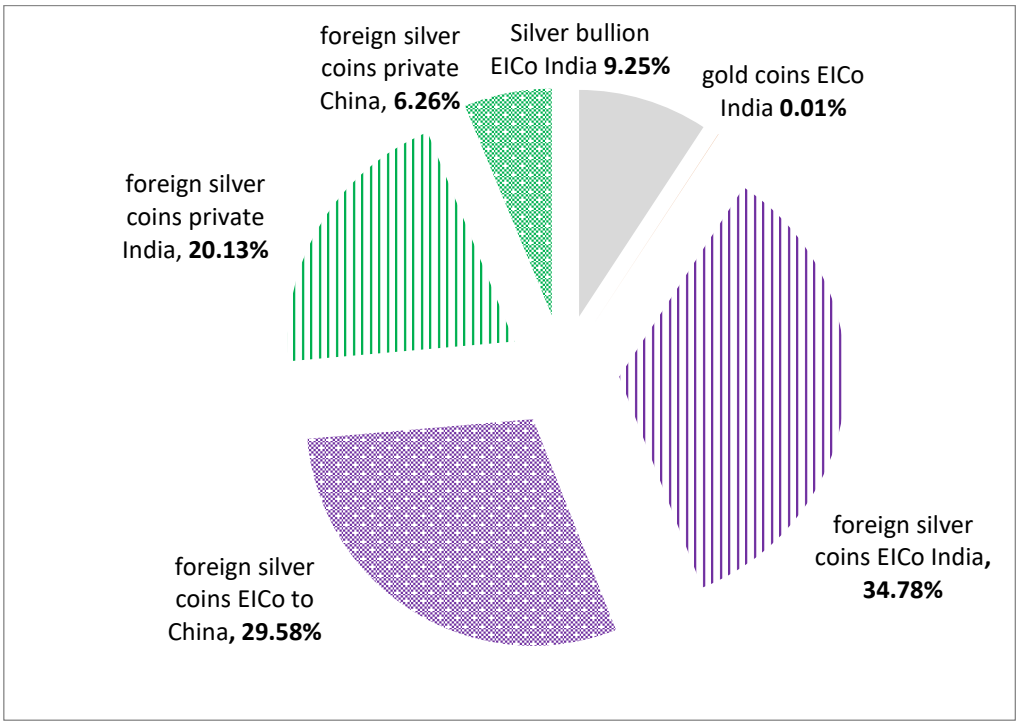


Source: own elaboration on Dermigny, (1964) *La Chine et L'Occident* , II p 735

Most of the silver arriving in India, coined or otherwise, was melted and re-coined in the various Mughal and the East India Company mints alike after 1757. It was not the case in China, however; she lacked mints to coin silver in any uniform standard. Taels of the highest purity but very diverse weight and size were manufactured privately. Alongside a very inconsistent coinage of copper, often debased, and private paper notes, the availability and consistency of the Spanish American peso satisfied the demand for a certified means of payment that Qin China lacked. Distinctly, Asian imports of coins - or rather European exports of specie - increased throughout the 18th century. In the 1720s the Dutch exported for a maximum value of 63 tons, 80% of which were made of pesos and rupees ((Van der Wee 2012), 95). France's exports between 1725 and 1780s had a 72% share of silver, of which 78% were *piastres* (Dermigny 1960) pp, 122,124, 138). Up to 1719, silver made 80% of British exports, half of which were Spanish American reals (Chaudhuri 1968) table 1); it was 75% of the trade with China in 1710-59 (Morse 1922)p 228). Between 1788 and 1809, the English company and private traders together exported an average 70 tons of silver a year, 92% of which were foreign – overwhelmingly Spanish American -coins ((PP 1810) Bullion Report 1810). Similarly, foreign coins made about 65% of the US total exports to China up to 1825 (Irigoin 2009) and amounted to 1.7 million of specie exported to India between 1802 and 1808 – two thirds of the total British exports in the same period (Seybert 1818) 56)

[figure 4]

Composition of Britain' precious metals exports to Asia, 1788-1809



Source: Parliamentary Papers, HC, The Bullion Report (1810) (PP 1810)

Silver had no substitute in the European – Asia trade until well into the 19th century. It was the single means to fund the 'return investments' of (any) the Companies ship. Pesos were 'the token' by which "the pound sterling and the woollen cloths of England were converted into the taels of silver and the silks and teas of China; and (..) whether the dollar delivered to the Company's treasury at Canton had cost to lay down four shillings, or five, or six, *might depend the degree of profit* on the round voyage" (Morse 1922, 228 emphasis added). The company systematically invoiced the Spanish dollar at 5s, which worked as 'anchor' for exchange rates in their financial business in the late 18th century. After the 1770s, the Company started drawing pesos on London –even in Guanghzu occasionally - at the Company's rate at 365 and even 720-days sight in times of plenty; whereas sterling denominated bills were used in private remittances through the company. Yet, the market rate of exchange of the peso in London (and Asia) varied below and above the Company's rate for bills. In so doing, the Company was capturing any possible arbitrage in exchange rates in London and Asia from a less than open trade.

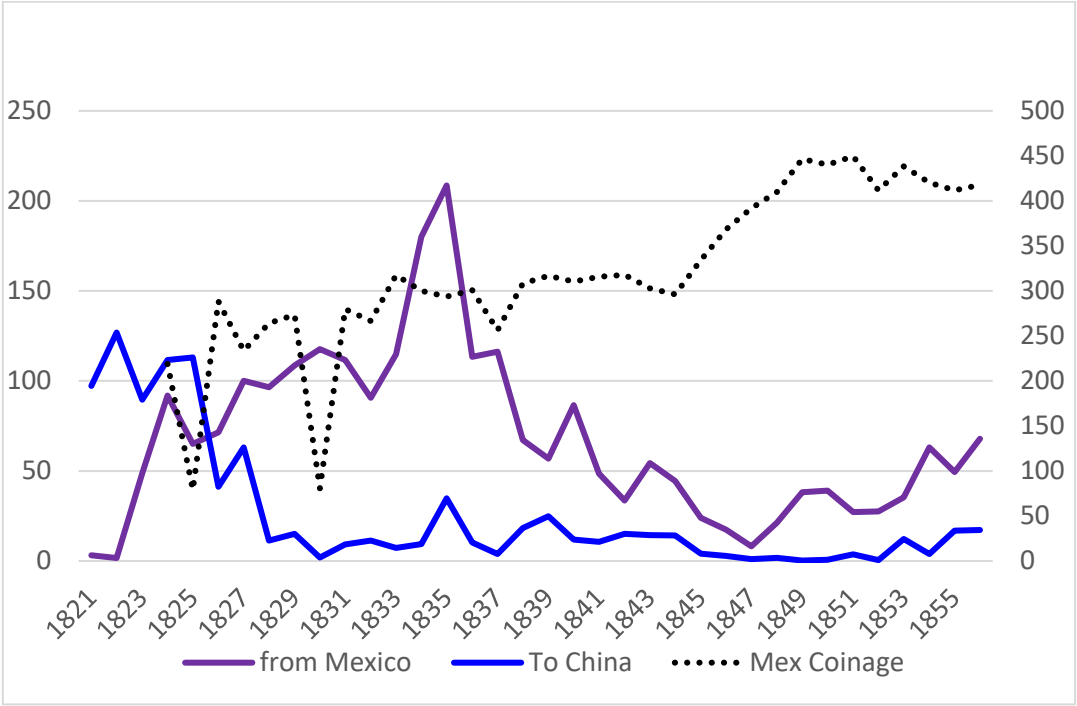
The decline of the global silver standard

Seen from Asia, China's divergence is explained by the stress on factor endowments that prejudiced the continuation of Smithian growth by 1800. This is not accurately reflected in trends of silver imports if the US exports are included. In fact, the drop in China' silver commerce was dramatic only after mid-1820s. Thus, some scholars explain the sharp fall as an exogenous supply-side shock attributed to mining disruption in Spanish America from the Independence wars (Lin Man-huong 2006). Yet the lowest ever recorded production in the 1810s was about 400 tons – a quantity several times larger than Chinese imports at the same time (60 to 140 tons) (Irigoin, 2009b, p 24-67). There was plenty of silver in America – even before the mining boom in Nevada – to continue the trade. This suggests a demand side aspect to the development of global silver trade that technological or institutional factors and endowments in Spanish America cannot sufficiently explain. Neither the 'precipitous' fall can reflect fully a 'languishing' production of exports inside China – in Jiangnan – and the "falling demand for a particular type of money (specie) which lowered the price of silver" (Von Glahn 2012). The fact that silver imports by China resumed in 1857 when there was another reputable standard of a silver coin, the Mexican peso suggests that even if there were demand side forces behind the shift in China's export performance this may not be necessarily endogenous. Arguably the disappearance of the silver standard of the Spanish peso in the world economy should have influenced the otherwise growing export economy inside China. This coevolution of the trends of Spanish American silver minting and exports, with the trend of Chinese imports, and European – and US - re-exports, is intriguing.

Only after 1791, was the US able to establish some sort of (federal) sound money. Along with the establishment of the Mint - and other fiscal and financial devices – Hamilton conceived the US dollar as a silver-backed currency, technically a bimetallic system, based on the value of the Spanish American peso. Although with a slightly lower silver content, the US dollar was established at par with the peso and the new US Mint revalued the price of silver above the English ratio of 15:1 versus 15.6:1 in Britain, hence remaining in a silver standard(Michener and Wright 2006). Added to the extended carry trade in Spanish American commerce - and returns from invisibles – monetary policy channelled specie to the US, making it the source of silver coins to China and furthering US foreign trade. The 1792 Mint Act fixed the exchange rate with other foreign coins in circulation The Spanish peso was also the anchor to establish a system for the conversion of monies and debt of the former colonies into a Federal money and remained as the single other legal tender in the US until 1856 (Irigoin 2009b).

[figure 5]

US Silver Trade (left) Silver Coinage Mexico (right), in tons



Source Irigoin (2009b)

In spite of the silver inflow, between 1795 and 1806 when President Jefferson suspended minting the federal government coined about $ 1.2 million silver dollars of large denomination – barely 25 cents per capita. The US coin was mostly exported to the Caribbean, but was rejected in China. Allegedly, 80 per cent of the specie in circulation in the US before 1830 was "composed entirely of Spanish coins"(Martin 1968), 431) and they made a large proportion of the specie reserves of the Bank of the United States even in 1831(Gordon Hayes 1933) p 678). Demand kept them in circulation as they "were *more valuable as money* than as commodity" (Martin 1968, 430) as in early 18th century India, hence again the demand for a particular type of specie increased the value of a coin above its intrinsic content.

The fact that China ceased to import silver in the 1820s whereas the US continued importing it from Mexico and other Spanish American republics is revealing. On the one hand this confirms there was no supply side shock to China after 1808, nor to the (re) exporter. On the other hand, as each economy had very different institutional setting to deal with silver and specie (and its vagaries) – the outcome when the standard disappeared was different. The US had a Mint that assayed and set the exchange rate and parities between gold and silver specie, while a banking system with reserves in silver specie

developed credit money. China lacked both. Hence China could not deal with the growing diversity in the quality of the republican silver coins originated after Independence from Spain (Irigoin 2009a), with consequences for the real economy. For the very same reason, in turn, India under the control of the Company that minted silver suffered much less from the end of the silver standard.

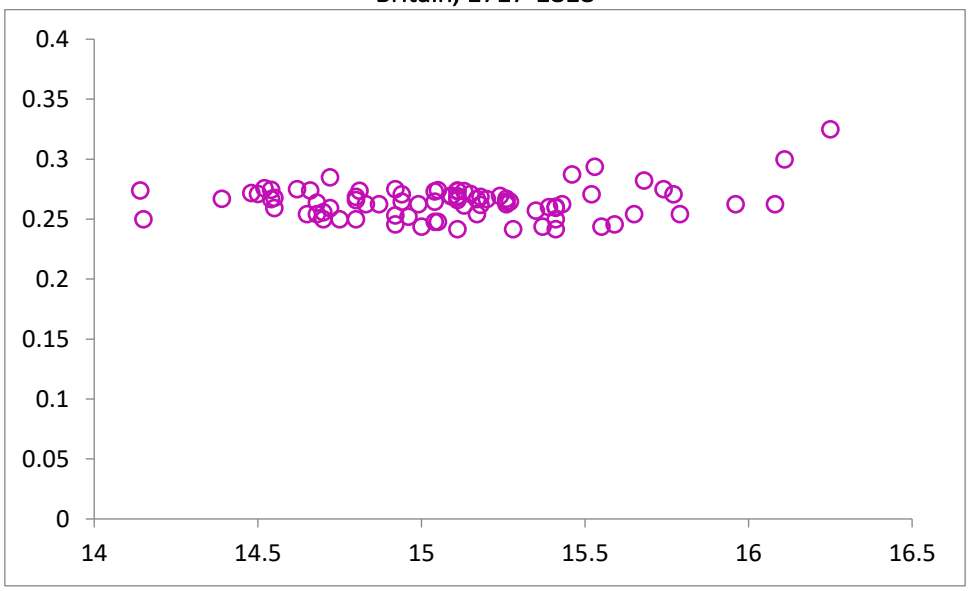
Indeed, early modern European, American and Asian economies had very different institutional set up to deal with precious metals and foreign exchange. Even within Europe, different states had also very different monetary capacity despite a notional bimetallic system. Whereas Amsterdam, like Hamburg and Genoa or Venice, had banks and allowed the free deposit and free export of silver, they mostly performed with monies of account and fixed exchange rates that were adjusted over time. For example, the Amsterdam Wisselbank devalued the parity of the current Dutch *gulden* to a content of 10.751 grams of pure silver in 1606-20, to 10.106 in 1621-59, 9.717 in 1659-81 and 9.557 grams of fine from 1681 onwards (North, 1991, 194). They minted different silver coins for different trades: the *rijksdaalder* for the Baltic trade, the *leeuwendaalder* for the Levant, *ducatoon* for the East India and *patagon* or *kruisdaalder* for domestic use which the Banks in Hamburg and Amsterdam tariffed independently of the intrinsic value ((Kleeberg 1995) 88). On the other hand, 16 and 17th centuries England had a relatively open domestic market for precious metals in all forms and a large production of silver plate by goldsmiths and silversmiths; until the 1740s when the Bank of England took over the business and goldsmiths faded away ((Mayhew 2012) (Clapham 1941). But export of English silver was effectively prohibited and coinage nearly disappeared in the 18th century, yet plate and specie exports to Asia augmented over the century. Foreign coins of gold and silver – increasingly Spanish dollars - made the Bank of England bullion reserves (Clapham 1958) and the East India Co exports. Interestingly, the Chinese were well acquainted with the English goldsmith mark, thus 'old plate (was) the most profitable silver you can carry with you, *when dollars are dear*' (in China) (Lockyer, 1711, p 136, 140 emphasis added). This should explain the failure of the Elizabeth' portcullis crown coined for the East India company in 1601 and that of the Emden trade *thaler* coined by *Preussisch-Asiatische Compagnie* in the 1750s which tried – unsuccessfully- to substitute Spanish American specie in Asia. Still in mid-19th century Britain tried to mint a silver coin for the trade in Asia, and the US eventually did it between 1873 and 1883.

With the 1696' Great Recoinage, the English Mint established the definitive standard for gold mintage in 1717 but the specifications for silver coinage did not change. It also established a mint price for gold and silver, which implied a fix ratio for both metals. Because the mint price of silver tended to be systematically below its market price, the system tended to overvalue and attract gold. But also the foreign silver coin, counterintuitively, was priced at a lower rate than foreign silver bullion in spite of

transport and coinage costs (Conduitt 1730 /1935), "set(ting) a floor or collar price for the sterling price of bullion and a collateral value of full foreign coins" ((Hotson and Mills 2015) p 218). This particular arrangement allowed foreign specie to remain in circulation and to be sent to the East Indies where it had higher purchasing power. It also provided means for the Bank to intervene in the money markets by deals with bullion, specie and foreign coins and exchange. The Bank derived a margin from differences between the collar or floor price and the mint (and market) price of bullion and foreign specie. It did not however forward the bullion and foreign specie to the Mint for coinage but retained it for further business also providing the means to, somehow, sterilize the money market through its foreign exchange interventions. The independence between stocks and flows of silver in England is apparent in the lack of correlation with the exchange rate of the Spanish American silver peso during the 18th century shown below.

[figure 6]

Gold-silver ratio and Spanish American peso exchange rate, Britain, 1717-1818



Source: own calculation from Gold/ Silver ratio from (Officer 1983) and exchange rate '(Parliamentary Papers 1718-1736, 1746-1811 (1812-13), 1811-19)

In the Early Modern 'geography of money', England's was a full nation–state scale single market; a rare 'island' in an 'ocean' of individual city markets. England was exceptional as were her institutions to deal with bullion, specie and foreign exchange. Elsewhere money markets were more local, confined to the commerce and finances of one city. Some countries had mints, others had banks; but none had the ensemble of centralizing institutions as England's – as later the US did. In 1780s France for instance had

17 working *Hotels de Monnaie* of different capacity to coin gold and silver (Dermigny 1955). In Asia for example, gold coins were more 'popular' in East Japan whereas silver was preferred in the West (Tashiro, 1991, 77); India comprised different currency zones and several mints: gold coins were current in the South whilst the North, including the Mughal Empire, performed with silver monies – and copper served as subsidiary to either. Even until 1835, the Company had separate coinage and currency system in each Presidency, but from the later 18th century silver coinage in Calcutta and Bombay was far more important that in Madras, which was better connected to silver rich Manila. As mentioned, China had provincial and local production of copper coins and private mintage of silver bullion of diverse quality but large size and weight. Thus, comparisons on the impact of flows of silver and gold in Eurasian economies - on top of distortions from very dissimilar size and population – may mean little. Within this variety of situations and monies, the Spanish American peso offered a stable, certifiable and most abundant fractional means of payment to economies orientated to commercial crops, manufacturing, international commerce, services and capital flows at global scale. It would be inadequate to consider the role of the silver specie in this period with the model of currency substitution in a neat bimetallic standard. The peso was a very suitable complement to large and small denomination means of payment worldwide. In turn the Bank of England reduced the denomination of its notes throughout the century from £ 50 (1696), £20 (1745), £ 10 (1759) £ 5 (1793) and to £ 1 and £ 2 after 1797.

By 1800 it was apparent that what China demanded was not silver bullion per se, but specie, a universally reliable means of payment made of silver: the coin minted in Spanish America since 1772 (Irigoin 2009b,(Irigoin 2013), Von Glahn 2012). Without its own coinage of silver, China had become reliant on the currency standard that the Spanish American coin provided. When its standard ceased the de- facto 'dollarization' of the Chinese economy made it too vulnerable to the resulting disorder in the international system of payments. The turmoil is traceable in the almost simultaneous trends of depreciation of copper cash and the appreciation of silver taels in China. But the workings of a pure bimetallic regime in China is less convincing when observing a *rise* in copper inflation alongside with *rising* imports of silver – as happened in the 1780-1795 period, or during the 1810s and 1820s (Irigoin 2013). Prices in copper skyrocketed after the 1830s to the mid-1850s, together with silver deflation; an anomaly which is often explained by political turmoil from domestic rebellions and foreign aggression.

Wars in 18th century Europe – the Seven Years and the Napoleonic wars in particular– had major global implications. They particularly affected Spanish America, which ended with her Independence from Spain in 1825. They also brought about shifts in their colonies commercial insertion in the world and the destruction of the virtues of the coin minted there. In fine, the cessation of the silver peso standard. During the 'Restriction Period', the Mint and Bank of England took the extraordinary step of counter

marking pesos – instead of re-coining the silver – launching some £ 5,000,000 pounds extra into circulation between 1797 and 1811. The pesos counterstamped with a mini George III face inside an octagon added to numerous private issues by colliers and textile millers in Glasgow, Lancashire and Derbyshire (for unknown quantities) who needed lower denominations coins for wages – and could no longer pay in kind with rising costs of labour and dearth of domestic silver specie in an inflationary context. In 1797 the Bank tariffed the coins at 4s9d from the 4s6d that was the mint price; two upwards revaluations (or a 22% devaluation of the pound in silver terms) to 5s in 1804 and 5s6d in 1811 contributed to alleviate the burden on foreign exchange from war expenses and subsidies to allies (Kelly 1976). Britain emerged victorious from the war and the inconvertibility of the pound by 1815-16. It took a further five years to redeem the 'five shillings' coins and to replenish the bank reserves and find a rate of exchange at which return to convertibility. Further, in 1819 silver was demonetized in England and gold became the single standard of value, formally, in 1821.

Conclusions

Monetary historians informed in modern monetary economics find difficult to conceive a currency standard contributing to an international system of payment prior to the Gold Standard, without central banks but currency traders instead. Global economic historians entrenched in disentangling the divergence within Eurasian growth paths look only at supply-side elasticities of these economies; yet the growth of the trade with the most important international commodity, silver, and the resulting demand potential of Spanish American, can reveal important unattended aspects allowing a more comprehensive understanding of the development of the early modern global economy.

This chapter has surveyed the production, manufacturing and commercial aspects of the silver mined in Spanish America. It has also emphasised the private nature of the production and of the trade with silver, and the particular character of silver specie as the main product with which the New World inserted in the international economy at the time. Silver endowments provided a windfall to Europeans - colonizers and intermediaries. Spanish America' s wealth in precious metals is legendary, and so is the poor understanding of her role in the development of the early modern global economy. The fact that Spanish America provided Europeans with the most desirable item of trade with wealthier and more advanced Asian economies has eclipsed the fact that the commodity produced there was indeed money; an almost universally accepted means of payment that her silver coin provided. Because of the sheer volume produced, coupled with the high consistency in the shape, size, weight and fineness, the South American coin became de-facto the most current international means of payment before the gold-backed British pound.

Significant developments in Europe and Asia, and individual economies within, are related in one way or another to the exchange of silver coins in wider and remote international markets. A steady increase in the world supply of silver dollars contributed to the growth the 'dollarized' economies –as the surplus in the goods trade balance (with the West) that Early Qin China enjoyed until the 1820s-30s. Within a metallic standard with free flows of capital the trilemma does not conceive room for monetary policy. The downside was the vulnerability to external shocks of those economies performing with 'imported' currency, as described above. Overall the global currency trade ought to have effects on the trade and output in the importing and intermediary economies along the way. Thus, the growth of the silver specie produced in Spanish America contributed to the contemporary Smithian growth in the global economy.

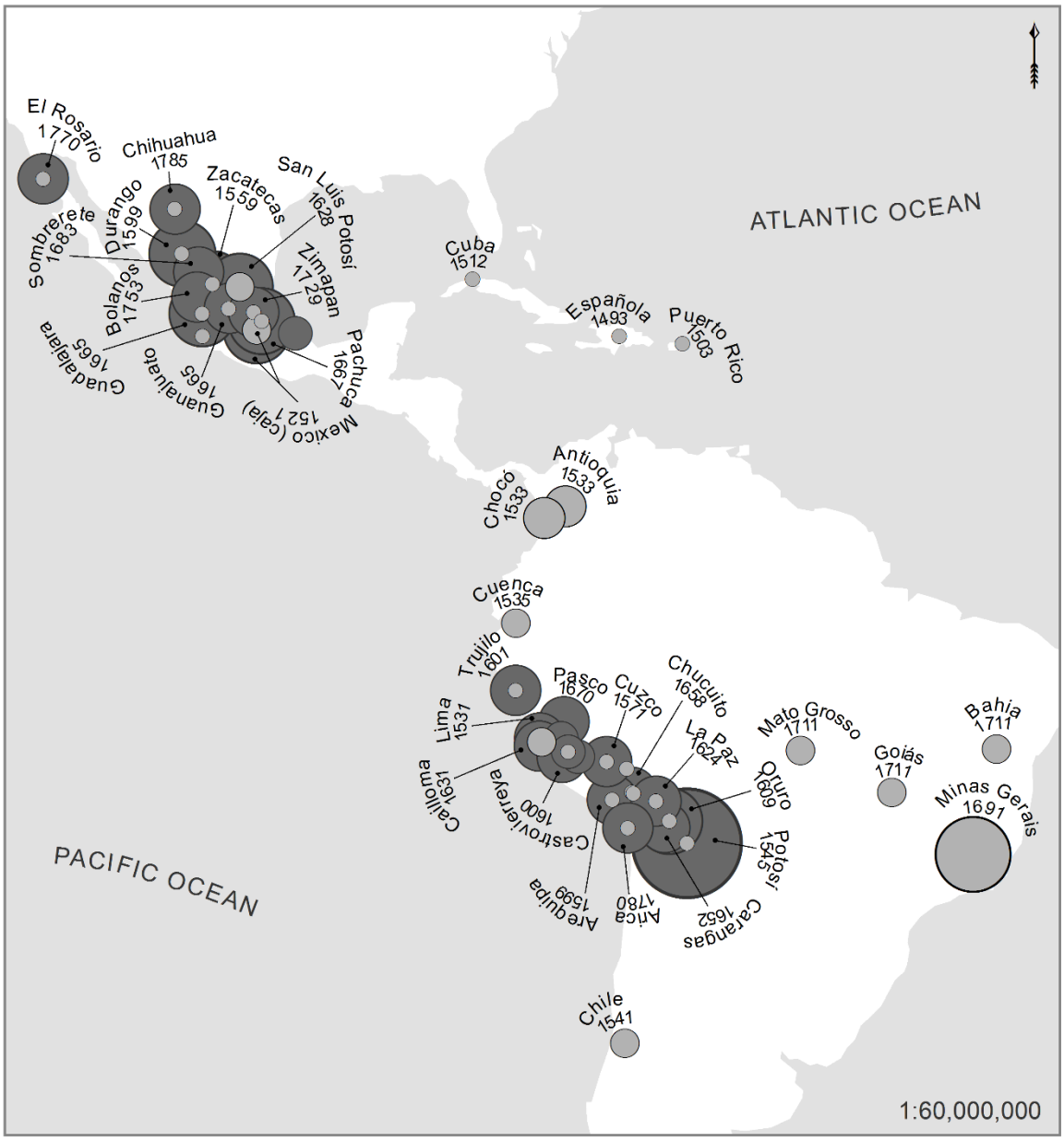
The New World did not escape from these effects. As Smith himself pointed out, (coined) silver was the means by which the extremes of Eurasia became in contact and traded with each other; it was also the driver of the European commerce over the Atlantic (and the Pacific) with the New World which offered – in turn - a potent demand for goods that a very poor labour to land ratio economy could not provide. America was food self-sufficient but labour scarce; tradable goods were relatively dear in comparison to other economies best endowed with labour. Thus, imports of African slaves were both a mean to exploit land where precious metals were lacking and, to obtain silver coins where they were abundant. Reliant on European intermediation for consumer goods, and capital inputs and technology for mining, abundance provided the lowest international relative price of silver to manufactures, which prejudiced any indigenous industrial development of note. A generalised Dutch Disease effect prevailed over huge transport costs imposed by distance and slow changing navigation technology. Colonialism – and lack of a merchant fleet - furthered Spanish American foreign trade dependence on the many different commercial agents who linked producers and consumers globally, imposing higher intermediation costs than otherwise.

These were the drivers of another arbitrage Europeans particularly enjoyed, namely the provision of consumer and capital goods to the New World (Irigoin forthcoming). This, coupled with the arbitrage originated in supplying silver money to China and other South and East Asian economies, allowed another sort of 'extra-profits' that Europeans obtained in their re-export trade within and beyond. This double de facto monopoly lowered the costs of increasing elasticity of demand of Europeans and eased their needs for liquidity on the margin. Crucial to it was the very particular institutions that one and another economy had to deal with money and foreign exchange – domestically and in the broader international economy. Comparatively, these institutions better reflect the political economy, and success, of European mercantilism. Instead, Asian large empires practically had not a monetary

sovereignty to account for or a large enough banking system to effectively create endogenous money in the form of credit. They 'outsourced' its 'central banking' functions to Europeans who provided a reliable high quality coin –of a convenient denomination. That specie originated in the largely private coinage in Spanish America, and was extracted overseas and circulated worldwide by ways of trade. Thus, it supplied a certifiable means of payment to the widest world economy that lowered transactions costs of the ongoing global Smithian growth. The counterfactual would have been a reduced demand for Spanish American Silver and a much lower trade for Europeans to intermediate.

Within Europe, different urban marketplaces organized differently around barely comparable institutions to deal with precious metals, bills and foreign exchange while maintaining an ever large import trade with Asia exchanging silver specie for textiles and other consumer goods for further re-exports. A particular monetary capacity based in an extraordinary set of monetary institutions and policies to deal with the flows of –in and out- of specie, which bear little relation with political institutions (Karaman, Pamuk et al. 2018), made 18th century Britain outstanding in that game. Generalised warfare in Europe and overseas by the end of that century put the structure of the trade to test: on the one hand, the consistency of the silver standard ceased with the colonial arrangement for mining and minting silver in Spanish America with definitive implications for producers and final consumers. On the other hand, Britain managed to wage the war and won it on the sea. Together with the Navy, the Mint, the Treasury and the Bank aligned with the Privy Council – the Parliament aside, managed to overcome the threat to her currency; thus after Waterloo the Gold Standard emerged alongside with England as the new leading industrial exporter of the world economy.

Appendix



Mining Quantities (kg) - 1493 to 1801

Source: N. Palma (2015), 'Harbingers of Modernity: Monetary Injections and European Economic Growth, 1492–1790, Unpublished Ph.D. thesis, London School of Economics, fig. 2. p. 63. I thank Nuno Palma for allowing the reproduction of this map

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