Money in England from the middle ages to the nineteenth century

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This conference asks fundamental questions about the nature of money, and our answers may have implications both for contemporary economics and for the way we study the past.

My paper will argue that the contrast between "commodity" and "fiat" money has been exaggerated. Precious metal coins are a liquid means of exchange making them significantly different from bullion. Coins have more in common with other forms of money, including fiat moneys, than with bullion or other commodities. The essential money-ness of money lies in government action creating money and supporting it by law.[1]

Accordingly there is clear distinction between coined money and bullion, illustrated by the fact that coins typically command a face value greater than their intrinsic value. For gold and silver coins that premium – usually about 5 or 10 per cent over their intrinsic content – reflected the cost of making the coins plus a seignorage charge, which people paid for the convenience of coin. Governments reinforced the desirability of coin by accepting, indeed requiring, it in payment of tax.

Ultimately, with government support, anything - with or without commodity value - can serve as money, although obviously such government support could only float a currency as far as its own writ ran. Beyond the boundaries of the coin-issuing state, any currency only has value in line with its intrinsic content or for the purposes of buying goods or services within that coin-issuing state. In short, a distinction needs to be drawn between the domestic and the international functioning of any currency. Historians have tended to focus on exchange rates - the international value of currencies – perhaps neglecting the importance of the domestic circulating means of exchange. The domestic

[1] I owe this insight to Christine Desan, *Making Money: Coin, Currency and the Coming of Capitalism,* Oxford 2014.

economy and price structure were governed by the internal valuation of money.

Evidence in support of these propositions will be drawn from the history of the English currency. I hope to show that bullion-based money was no more immune to monetary problems than fiat money. Concentrating too much on the physical form which money takes can divert attention from how money actually behaves. It also has implications for modern historical practice. Converting nominal prices to their silver weight equivalent may facilitate international price comparison, and an understanding of intrinsic content does inform our understanding of currencies. But this paper seeks to demonstrate that the widespread practice of converting prices or wages to equivalent weight of silver in order to compare standards of living is both philosophically and historically unsound.

Much comparative work on international price and wage history has involved the conversion of different currencies to their silver weight, [2] and this process is also thought to simplify comparison over time when intrinsic content may have varied. [3] However, this methodology extracts the raw historical data from its context, distances historians from the usual practice of the time, and can lead to a fundamental misunderstanding of the nature of money.

Moreover, while an appreciation of the intrinsic content of historical currencies can be useful, the conversion of nominal prices and wages to their silver weight equivalents has no bearing whatever on the international comparison of standards of living, which are based on the *ratio* of prices to wages. That ratio is entirely independent of the currencies involved, so conversion to silver weight is completely unnecessary. The time and energy

[2] For recent examples of conversions to silver weight see for example, Robert C. Allen, 'The Great Divergence in European Wages and Prices from the Middle Ages to the First World War', *Explorations in Economic History* 38, 2001, pp.411-447, and Kenneth Rogoff, Kenneth A. Froot and Michael Kim, 'The Law of One Price over Seven hundred Years', IMF Working paper WP/01/174 (2001).

[3] The conversion of currencies to their silver weight equivalent can usefully measure the extent of debasements, though it is important to recognise that silver is not itself a measure of unchanging value. In periods of heavy debasement contemporaries and historians do need to measure the degree of mutation. The French debasements of the fourteenth and fifteenth centuries gave rise to the *pied de monnaie*, which indicated the intrinsic content of each issue, but such arrangements were not required unless money lost touch with the open market price of bullion. Harry Miskimin, an authority on French mutations, makes the case for silver weight calculations in 'Silver, not sterling: a comment on Mayhew's velocity', *EcHR,* XLIX, 2 1996, pp.358-60, while I put an alternative view in 'Sterling, not silver: a reply to Prof. Miskimin', *EcHR,* XLIX, 2 1996, p.361.

expended on such calculations would be better spent improving our nominal price and wage data, which may not always be adequate to support the conclusions based upon it.[4]

Finally it needs to be firmly understood that the mint prices for silver, on which conversions are based, are not the same as market prices from which they can often diverge very significantly.[5]

Nominalism

In the first place it should be noted that coin in medieval and early modern England (and much of Europe) ordinarily passed within the kingdom at its nominal face value (by tale) as defined by government, rather than by weight. The model in Sargent and Velde's important work *The Big Problem of Small Change* is founded on the assumption that coins of a given denomination circulate by tale.[6] They trace the evolution of medieval law from Roman and canon law origins, which gradually came to treat intrinsic content as paramount,[7] through to the later middle ages when the importance of the face value of money of account began to be recognised, to a marked shift in the sixteenth century and thereafter when they found the value of money to be legally determined by government.

Sargent and Velde's principal interest lies in the development of small denominations with a face value set above their intrinsic content, and their focus is largely on continental Europe. In England, however, the right of government to determine the value of money is apparent from before the Conquest. In ninth-century Northumbria base *stycas* circulated by government fiat till the Viking invasions rendered them worthless, while in southern England Anglo-Saxon kings asserted their right to vary the intrinsic content of

[4] It may be noted that the term 'nominal price' has sometimes been used to include silver equivalent conversions. In this paper I distinguish between nominal prices and silver conversions based on them. For the avoidance of doubt I generally refer to nominal or face value or money of account prices and wages.
[5] This is one of a number of problems besetting general equilibrium theory in which a' numeraire good' allows the market prices of all goods to be expressed relative to one good, which might be silver, gold, wheat etc. Determining the fluctuating market price of the numeraire good may be highly problematic.
[6] Thomas J. Sargent and François R. Velde, *The Big Problem of Small Change,* Princeton 2002, pp.17, 24 (citing Adam Smith in support) and 37.
[7] However, it may be that such legal opinion merely railed against governments' continuing assertion of their right to set the content and value of their money.

their pennies without a change in face value.[8] Of course Anglo-Norman kings exploited concerns about the intrinsic value of coin in order to justify the exaction of supplementary payments by the Exchequer.[9] On rare occasions Plantagenet government permitted, or even encouraged the weighing of coins by the public.[10] After the introduction of gold coinage in England the greater value of individual pieces made them more likely to be weighed,[11] but the value of the sterling currency was still set by government; refusing the king's coin at the value he set on it was a punishable offence.[12]

Christine Desan's forthcoming study of the English law and practice pertaining to monetary payments and obligations[13] distinguishes between the Justinian Code, which affirmed the right of government to set the value of money, and later glosses which tried to deal with the realities of debased coin. It is these glosses and the arguments of canon lawyers, which Sargent and Velde find in the theory and practice of continental Europe. England, however, was different, as Desan shows: there money remained strong as governments generally funded their activities through taxation rather than debasement, and English kings retained a strong hold on the coinage, including the right to determine the value of the coinage and of the money of account, irrespective of its intrinsic value. Because English kings generally maintained the intrinsic content of the coinage, there was less occasion to challenge their right to manage the currency. The courts repeatedly confirmed that the nature and value of money was determined by the crown rather than by its intrinsic content.

Desan's full length review of this question affirms the practice of nominalism in England. The courts were particularly likely to rule on this question at times of

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[8] On stycas, 'the first substantial base-metal coinage in the post-Roman West', see for example Rory Naismith, *Money and Power in Anglo-Saxon England,* Cambridge 2012, p. 247. On weight variations see H. B. A. Petersson, *Anglo-Saxon Currency,* Lund 1969, though the interpretation of these variations remains a matter of debate.

[9] C. Johnson (ed.) *The Course of the Exchequer,* London, 1950.

[10] King John issued coin weights to allow the people to verify the weight of circulating coin in order to combat clipping and justify the recoinage of worn coin. N. Mayhew in C. E. Challis (ed.), *A New History of the Royal Mint,* Cambridge 1992, pp.97-8.

[11] In 1421 Henry V's government made weights and scales available at a price, to enable the weight of gold coins, afflicted by an epidemic of clipping, to be checked. See Martin Allen, *Mints and Money in Medieval England,* Cambridge 2012, pp.151-2 and 285-6.

[12] Nicholas Mayhew, *Sterling. The History of a Currency,* Penguin London, 1999, pp.49-50 for the royal enforcement of its currency values during and after the Tudor debasements.

[13] Desan, op. cit.

recoinage, when earlier issues were demonetised. Common law required that coin be taken at its nominal or face value: the writ of debt identified the count of money, not the weight of silver, as the medium that settled obligations. Desan cites a series of judgements beginning with Paveley vs Basset in 1250. The early thirteenth century *Laws and* Customs attributed to Bracton distinguished between coined money which went by count and other items which went by weight or by measure.[14] Cases resolving the difficulties caused by crockards and pollards around 1300 confirm the right of the crown to determine the face value of coin, independently of its intrinsic content.

From the 1340s English money was gradually devalued in a series of steps which cut the silver weight of the currency in line with the rising international value of silver. This process prompted parliamentary comment and some legal disputes, but the courts consistently upheld the rights of the crown to determine the value and content of the money, even when that right was abused by Henry VIII. The most celebrated judgement, handed down by the Privy Council in 1605, affirmed the right of Elizabeth to debase the Irish currency.[15] Despite all these reductions in the intrinsic value of the coinage, prices and debts were still set and met in money of account. Desan writes, 'The vocabulary thus identified the substantive obligation of debt with an abstract monetary value [eg solidus or libra], not a weight.'[16] Though the weight of the English penny fell from about 22 grains of sterling silver in the early fourteenth century to about 7.7grains in the early seventeenth century, the penny remained a penny regardless of its weight.[17]

Accordingly, within the kingdom money generally passed at its nominal, face value (by tale), rather than by weight. Apart from the implied challenge to the royal prerogative, regular weighing and/or assaying of payments by the public would have been enormously time-consuming and inconvenient, and would

[14] Desan, op. cit., Chapter 2, TSp25. See also *Fleta,* and Pluncknett, *Common Law.* Law Year Books for 1310 and 1321 confirm the distinction between things like money which are numbered, as distinct from other commodities which are weighed or measured: Desan, Ch 2, TSp30.

[15] See also David Fox, 'The *Case of Mixt Monies*: Confirming Nominalism in the Common Law of Monetary Obligations', *Cambridge Law Journal,* 70(1), March 2011, pp.144-174.

[16] Desan, op. cit., Chapter 2, TSp. 24. The pound of 240 pennies had long parted company with the pound weight.

[17] In 1504 for example Parliament explicitly confirmed the legitimacy of all silver pennies with the king's stamp. Throughout the middle ages clipped money could exceptionally be legally refused, though in practice much passed unchallenged.

have destroyed much of the utility of coin. If payments had been consistently weighed neither debasement nor clipping would have occurred, since both processes depend for their profit on the acceptance of the debased or clipped coin at face value. Yet we know the weight of the medieval English currency was officially reduced on four principle occasions,[18] while illegal clipping certainly occurred, shaving silver from individual coins which were then passed in payment at their face value.

England thus maintained the established principle of nominalism, prioritising the role of government in fixing the nominal, face value of the currency. Elsewhere in Europe repeated bouts of severe debasements gave the courts, and particularly the Church, a real interest in protecting the value of rents and other debts.[19] Yet, as Sargent and Velde show, from the sixteenth century onwards the use of moneys of account, and the legitimate need of government to be able to issue small change with a face value in excess of its intrinsic content, was increasingly recognised in the continental courts.

So despite occasional exceptions, money passed in its own territories by tale at the face value set on it by government. That valuation was by no means necessarily accepted abroad. Sovereigns regularly scrutinized the intrinsic content of foreign coin within their kingdoms and set a value of such coin accordingly. Thus exchange rates between currencies were closely based on intrinsic content, but domestic prices and wages were necessarily expressed in terms of the local currency at values set by the local government. [20]

Actual and theoretical intrinsic content of currency

[18] In this paper the term debasement is used to refer to any downward alteration in the intrinsic content of coin, whether achieved by reduced weight, reduced fineness of metal, or both. The weight of English coin was significantly reduced in 1351, 1412, 1464, and 1526, but these reductions reflected the rising international price of precious metals and did not result in rising prices. By contrast the debasements of 1542 to 1551 imposed highly inflated face values on coins of increasingly reduced intrinsic content.

[19] The debasements of fourteenth- and fifteenth-century France were intended to generate royal profits to finance war, and sharply reduced the intrinsic content of the currency. There is an important distinction to be made between monetary changes which merely followed the international bullion price and those which very severely over-valued the silver content in the currency. The French *mutations* provoked the indignant complaints of Nicolas Oresme, *De Moneta.*

[20] In Scotland and on the continent foreign coins were given a face value in terms of the local currency at which their circulation was permitted. Such tolerance was only exceptionally offered to foreign coin in England.

This principle of nominalism, long established in England, and certainly adopted elsewhere from the later middle ages, should remind us that coins commonly passed domestically at a face value only loosely connected to their intrinsic content. Indeed historians seem to have been more preoccupied with the intrinsic content of the currency than were the domestic users of that currency. The English coinage in the late seventeenth and eighteenth century demonstrates how far the silver currency might drift from its theoretical intrinsic value while remaining in circulation at its face value. Since this means that the theoretical weights on which historians base their estimates of intrinsic content were often invalid, it is worth exploring how this occurred in a little more detail.

From the restoration of Charles II until the Napoleonic wars the theoretical English mint valuation of silver fell well below that prevailing internationally. The debasements of Henry VIII and Edward VI had left England with a horror of any kind of alteration of the currency. Accordingly whenever enhancing the value of silver was again considered in England, it was rejected.[21] This mentality prevented the English mint from responding to the rising world price of silver in the later seventeenth century, when rising demand for silver exceeded rising supply. Consequently silver output from the London mint dwindled, while such full weight silver coin as could be found was increasingly likely to be carried abroad to the Continent and beyond where silver was more highly prized.[22] In the absence of new English silver coin the domestic currency consisted of old worn silver of increasingly light weight.

This state of affairs was fully recognized at the time, and led to the famous Lowndes-Locke debate about possible solutions. It was universally recognized

[21] In 1625-6 Sir Robert Cotton persuaded the Privy Council to abort a plan for recoinage just as it began to be implemented. See W.A. Shaw, *Select Tracts and Documents Illustrative of English Monetary History, 1626-1730* (London, 1896, reprinted 2009)
For a contemporary discussion of the Irish debasement of 1603, which did take place, see 'Sir Roger Wilbraham's diary' ed. H.S. Scott, printed in *Camden Miscellany X* (Camden Society, 3rd series, IV), published London, 1902. I am most grateful to Simon Healy for these references. It is interesting that Charles I did not debase in order to escape from his financial and political difficulties. Ireland, however, was a different matter: see above, p.*, The Case of the mixt moneys.

[22] Mayhew, 'Silver in England 1600-1800: Coinage Outputs and Bullion Exports from the Records of the London Tower Mint and the London Company of Goldsmiths' in John H . Munro (ed.) *Money in the pre-Industrial World: Bullion, Debasements and Coin Substitutes,* London 2012, shows how silver in England was shared between the Mint, the goldsmiths and the East India Company. If the Mint failed to match the price for silver offered elsewhere in London, it came to strike only gold and copper.

by the 1690s that reform and recoinage were required; the argument hinged on whether England should recognize the internationally rising price of silver by reducing the weight of its own silver coinage.[23] This was the course proposed by Lowndes, who pointed out that similar reductions in the weight of sterling had successfully been carried out repeatedly in the later middle ages. Locke, however, energetically opposed such a policy, and his arguments won the day. Accordingly the great recoinage of 1696 replaced the worn silver currency with new silver, at the full old weight, which more or less immediately left the country. Not only was full weight English silver coin likely to be carried abroad to regions where it enjoyed a higher price; in the eighteenth century the uncompetitive English mint price offered for silver bullion ensured that pitifully small quantities of silver were brought in for sale to the Mint.[24] In short, silver coin became extremely scarce and worn in eighteenth-century England. This demonstrates that currencies can be too strong – having too high an intrinsic content – as well as too weak. While much attention is rightly paid to the evils of debasement, over-valuing the currency or undervaluing silver can also create severe difficulties. Tying the currency to bullion does not allow governments to escape the difficult task of setting the value of their currency.

The fact that the actual silver content of the eighteenth-century English currency was below its theoretical content, means that converting English prices and wages to their theoretical legal weight of silver perpetrates an historical fiction. Payments were increasingly likely to be made in gold, copper, or by credit of one sort or another, and such silver as was to be found was accepted at a face value well above its actual weight. For most of the eighteenth century the actual silver weight of the circulating coinage was well below the weight at which the Mint struck it, but the problem was already evident before the Great Recoinage of 1696. The weight of silver coin then brought for recoinage was found to be almost 50% below its theoretical

[23] The rising international price of silver meant that coins representing a given face value could contain less silver. The high silver content of the English currency was effectively undervaluing silver.

[24] Kevin Clancy, *The recoinage and exchange of 1816-17,* (University of Leeds, 1999 PhD Thesis) p.23 estimates than some 84% of the eighteenth-century silver circulation was struck before 1700. Much of what follows is drawn from Clancy's unpublished doctoral thesis. However, very similar conclusions were drawn independently by Gary Oddie, 'The Circulation of Silver 1697-1817', *Token Corresponding Society Bulletin,* 7, 2001, pp.5-36.

weight.[25] As we have already noted, the Recoinage solved nothing. By 1754 *The Gentleman's Magazine* observed that crowns and half-crowns were rarely to be seen since most were thought to have been melted or exported, while many shillings and sixpences were of low weight.[26] A series of more quantitative contemporary estimates of the state of the silver currency over the century has been assembled by Clancy, including authoritative examinations by the Mint in 1786, 1787, 1798, 1807, and 1816.[27] These confirm that shillings and sixpences became particularly worn: shillings were 23 per cent light by 1786, sixpences 36 per cent light. By 1816 shillings were 30 per cent light, sixpences 40 per cent. In 1817 the £2.6 million in old silver withdrawn for recoinage was found to have lost an aggregate 26 per cent of its theoretical legal weight.[28]

Government had recognised this state of affairs in 1774, ruling that silver should only be taken by weight in payments over £25, but this meant that for payments of less than £25 worn coin was acceptable at face value regardless of weight. Clancy has characterized this as 'a tacit devaluation'.[29] Moreover employers seeking silver to pay wages found themselves obliged to pay one half or one per cent over the face value of the silver, despite knowing full well that its intrinsic value was perhaps 40 per cent light.[30]

Thus it is simply not now possible to speak with confidence about the weight of coin involved in any specific payment unless it was weighed and recorded at the time. On top of this uncertainty, it needs to be recognised that a widespread shortage of silver coin meant that payments were often not made in silver at all. Clancy has estimated that by 1790 the Mint had issued some 170 million copper coins, while counterfeit copper halfpennies and farthings exceeded that number. On top of that from 1787 millions of privately

[25] Clancy, p. 3, citing Challis, *New History of the Royal Mint,* 380-2, Feavearyear, *The Pound Sterling. A History of English Money,* Oxford 1963, pp.129-31.

[26] Clancy, p. 19
[27] Clancy, Table 2, pp.231-2. A similar table was independently compiled by Oddie.
[28] Clancy, p. 22, 145.
[29] Clancy, p. 12-13. Coin hoards show that silver was often worn so smooth that coins could no longer be read. Clancy, p.21
[30] Clancy, pp.35-6.

produced copper tokens were struck, and tolerated by the authorities since they appeared to be supplying a real need. [31]

Tokens of one kind or another were also struck in silver in an attempt to liberate the currency from the uneconomic mint price to which Locke had committed it a century before. The Bank of England issued tokens, as did numerous British towns and cities. The Mint also countermarked Spanish dollars for issue by the Bank giving them currency at face values more closely aligned to the prevailing open market price for silver than the Mint was permitted to recognize for its own official issues. These silver issues illustrate clearly the predicament in which the Mint found itself: the uncompetitive mint price set by Parliament left the Mint unable to strike the official British silver coinage, so it had recourse to unofficial alternative issues not shackled to an outdated mint price.[32]

In short, payments were either not made in silver at all, or if they were made in silver the weight of circulating coin was likely to be well below the legal standard. Consequently from the restoration of Charles II till after Waterloo the legal weight of the sterling silver coinage is no guide to the weight of circulating currency. So converting face value prices and wages to a silver equivalent based on the theoretical weight of the silver coinage is mistaken.

Of course other countries experienced worn currency too, but this problem was particularly acute in Britain between 1660 and 1817, because the mint price for silver offered there was further from the prevailing international level than elsewhere. This means that converting prices and wages to their theoretical legal weight would over-estimate silver contents generally, but to a greater extent in Britain than elsewhere. Converting nominal sums to silver weight not only creates inaccuracies, but it does so inconsistently.[33] Comparisons based on silver weight conversion can only be regarded as a very approximate guide.

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[31] Clancy, p.33-4.

[32] E. M. Kelly, *Spanish Dollars and Silver Tokens. An Account of the Issues of the Bank of England1797-1816,* London 1976.

[33] We cannot even be certain that the poor weight of the silver currency affected prices and wages equally. Social as well as economic factors may have allowed the more powerful party to any transaction to secure a better deal.

The variable value of silver

Silver weight conversion is unhistorical, because the theoretical weight significantly exceeded the reality, but the idea of calculating in terms of silver weight is also philosophically flawed, in so far as it assumes (as Locke did) that silver provides some kind of constant yardstick which can be applied over centuries and continents. In fact the value of silver varied markedly over time and place. This truth can most simply be illustrated by observing the behaviour of gold:silver ratios. As long ago as 1967 Andrew Watson drew attention to the disparity of gold:silver ratios between the early medieval West and the middle East.[34] Fourteenth- and fifteenth-century gold silver:rates in China stood as low as 1:5, rising to about 1:10 in the seventeenth century, when European rates were around 1:15.[35] Whether between neighbouring countries or trading continents, bullion flows wherever it is more highly prized. Even if the relative differences were not great, merchants were quick to recognize the advantage in buying abroad with whatever metal enjoyed a higher price. The resulting bimetallic bullion flows have often been noted within Europe, but they also characterize inter-continental trade. Most clearly while early modern England (and to a lesser extent Europe as a whole) valued gold at around 12 to 15 times the value of silver, in China gold:silver ratios commonly stood at around 1:9 to 1:11, though Chinese-European gold:silver ratios tended to converge from the second half of the eighteenth century. [36] Fluctuating gold:silver ratios of this

[34] Andrew M. Watson, 'Back to Gold – and Silver', *EcHR,* 2nd ser., XX, 1967, pp.1-34, especially pp.21-31.
[35] X. Peng, *A Monetary History of China,* Shanghai 1954, translated by E. H. Kaplan, Bellingham, 1993, pp. 764-8. D. O. Flynn and A. Giraldez, 'Global Economic Unity through the Mid-Eighteenth Century', *Journal of world History,* 13, 2002, pp.391-427. In the sixteenth century the price of silver in terms of gold in China was twice the price in Spain.
[36] Flynn and Giraldez cite Newton's 1717 opinion that 'in China…the ratio is 9 or 10 to 1 and in India 12 to 1, and this carries away silver from all Europe.' Peng, loc.cit.., Richard von Glahn, 'Money Use in China and Changing Patterns of Global Trade in Monetary Metals, 1500-1800,' in *Global Connections and Monetary History, 1470-1800,* eds. Dennis O. Flynn, Arturo Giraldez, and Richard von Glahn, Ashgate – Aldershot and Burlington VT, 2003, p.200 also notes convergence of gold:silver ratios between China and Europe in the 1640s, but confirms the later 17th century divergence and then renewed convergence in the later 18th century.

sort demonstrate clearly that the value of silver was not constant historically or geographically.[37]

Conversion to silver weight unnecessary

However, I confess it came as a surprise to me to realize that the results derived from converting nominal face value prices and wages to silver weight, and those reached by directly comparing nominal price:wage ratios are in fact identical. So long as both sides of the price:wage ratio are treated the same, we could as well multiply by any number as by the imagined weight of the silver currency; neither affects the *ratio*. This demonstrates the pointlessness of converting to silver weight; it fails to reflect the historical reality of practice at the time, and promotes the fallacy that silver is or has ever been a constant measure. Yet it does not alter the fundamental ratio between wages (or preferably earnings) and the cost of living.

So beyond the problems of conversion to silver weight equivalents, such conversions are not even necessary. In any case the original data on prices and wages has first to be collected in nominal, face value, prices. The cost of living can then be calculated relative to the wages of craftsmen or labourers, yielding a simple ratio, free of currency complications, which can still be compared internationally or over time. Converting the raw prices and wages to silver weight does not alter the ratio derived from nominal face value prices and wages, but is an unnecessary additional calculation, which may introduce error.[38]

Primacy of the underlying data

What remains important for all international comparisons, however conducted, is that the underlying raw data and their interpretation are sound. Put bluntly, we must re-emphasize the history in economic history. Allen, for example, has made several caveats, recognizing that more research is needed

[37] See also, Najaf Haider, 'Precious metal flows and currency circulation in the Mughal Empire', *Journal of the Social and Economic History of the Orient,* 39, 3, 1996, pp.298-364, especially at pp.349-55 for fluctuating gold:silver:copper ratios in India.

[38] Appendix 1 details mistakes arising from converting to silver weight at the time of the sixteenth-century English debasements.

in order to determine the appropriate allowance for housing costs within his estimate of the cost of living. [39] Phelps Brown and Hopkins also lamented the lack of data on rent, but additionally emphasized uncertainty about the number of days actually worked, which might vary because of holidays and still more because of the unavailability of work during 'hard times'.[40] Further concerns have been raised by Jane Humphries who recently questioned some of Allen's calculations, challenging his concept of Britain as a high wage economy.[41] In reply Allen has accepted that he underestimated the family's calorific requirements, but stands by his central contention that English wages compare favourably with those elsewhere.[42] In short, far more work needs to concentrate on improving the basic price and earnings data, rather than unnecessarily converting it to silver weight.

Nominal price and wage data in Strasbourg and China

For example, even a cursory re-examination of the price and wage data from Strasbourg and China suggests there is room for improvement.

The Strasbourg series of prices and wages forms the reference point for Allen's pioneering paper, 'The Great Divergence in European Wages and Prices from the Middle Ages to the First World War'.[43] Allen's Strasbourg wages are drawn from Hanauer's *Etudes économiques sur 'Alsace ancienne et modern,* but are in

[39] Allen set housing costs at 5% of labourer and craftsman expenditure, citing S. Horrell, 'Home demand and British Industrialization', *Journal of Economic History*, 56, . 3 (Sep., 1996), pp. 561-604. However, it may be noted that Horrell's figures range from 5.8% to 10.5, being notably higher in the nineteenth century and varying from one group of workers to another. Allen allows more spent on candles and lamp oil than on housing costs which seems odd. Elizabeth Gilboy, 'The Cost of Living and Real Wages in Eighteenth Century England', *The Review of Economics and Statistics,* vol.18, no.3, 1936, pp.135-6, suggests that 15 per cent of the average labourer's expenditure was devoted to rent and fuel, citing studies by Eden and by Davies. Arthur Young found that rent tended to equal about one-sixth of the labourer's annual wage: Gilboy, p.139. The assumption of a constant proportion of expenditure devoted to housing costs across the world may also require re-examination.

[40] E. H. Phelps Brown and Sheila V. Hopkins, 'Seven centuries of the prices of consumables, compared with builders' wage-rates', *Economica* 1956, reprinted in E. M. Carus-Wilson (ed.), *Essays in Economic History,* II, London 1962, p.179.

[41] Jane Humphries, 'The lure of aggregates and the pitfalls of the patriarchal perspective: a critique of the high wage economy interpretation of the British industrial revolution', *EcHR,* 66, 3, 2013, pp.693-714.

[42] Robert C. Allen, 'The High Wage Economy and the Industrial Revolution: A Restatement', University of Oxford, **Discussion Papers in Economic and Social History Number 115, June 2013.** Allen continues to convert English and French price and wage data to silver weight.

[43] Robert C. Allen, *Explorations in Economic History,* 38, 411-447 (2001). Keystone in the sense that the values of all the compared cities are presented in terms of their ratio to the Strasbourg values.

fact Alsatian wages, including much material from towns such as Mulhouse and Colmar, as well as Strasbourg itself.

Before 1600 the Hanauer series is composed mostly of Strasbourg wages, together with some from Haguenau (30km south of Strasbourg) and Eschau (8km south of Strasbourg), so in this early period this series does constitute a reasonable guide to Strasbourg wages. However, in the seventeenth century the series is dominated by wages from Mulhouse (117km from Strasbourg) and Colmar (79.5km from Strasbourg). Such explicitly Strasbourg prices which are noted are consistently higher than the averages presented by Allen.

Thus Hanauer records a Strasbourg wage of 10.5 grams of silver for 1631. This is included in Allen's average of around 6g, but Allen's figure is actually driven mostly by Colmar and Mulhouse wages. From 1633 to 1694 a single average figure of 6.1g is suggested, but the rare Strasbourg wages recorded were 7.9g (1646), and 7.6g (1670). Eschau and Haguenau wages from close to Strasbourg were similarly higher than those from further south.[44] In the eighteenth century genuine Strasbourg wages are even scarcer. From 1702 to 1764 the Mulhouse and Colmar averages stood at 4.32g, while the sole Strasbourg wage in this period recorded by Hanauer was for a worker's wage set by the town in 1753 at 12 sous, or 144 deniers tournois.[45] Subsequently Mulhouse wages rise gently from 4.5g (1765-72), to 5.4g (1773-9), to 6.75g (1780-1800), but the Strasbourg-based average for 1801 to 1815 of 11.25g confirms the impression that wages in Strasbourg stood significantly above those from southern Alsace. In a nut-shell, the seventeenth- and eighteenth-century Alsatian wage series is not a reliable guide to Strasbourg wages.

Hanauer's data for Strasbourg prices, especially the price of grain are much stronger, though he is at pains to point out, as Allen also confirms, that the

[44] Eschau 1672 and 1681: 8.7; Hagenau 1691:7.8. Hanauer presents his prices both in the original local money of account and in its equivalent in mid nineteenth-century francs. I have converted these franc wages to their silver weight equivalent (at 22 centimes per gram),for ease of comparison with Allen's wages given in silver weight.

[45] Hanauer p.416 converts this 12 sous to 2.40 francs, implying a silver weight of 10.9g, but this appears to be in error, since Jean Duplessy, *Les Monnaies Francaises Royales de Hugues Capet a Louis XVI (987-1793), vol II,* Paris 1989, p.320 no.1683, records the French coinage for Strasbourg 1741-71 at 2.948g silver for 12 sous tournois or 144deniers tournois. This is in any case a labourer's rather than a craftsman's wage, though the regulations for summer and winter work, with or without food and wine, with additional special payments for those not taking half hour breaks for lunch and tea are of some interest.

price of bread is what really matters for the urban cost of living.[46] Nevertheless, bread prices are far from straight-forward. Obviously the price of wheaten bread differed from that of rye bread, but wheat loaves cost nearly twice as much in Strasbourg as in Colmar, because the quality of wheat flour also varied greatly between wholemeal and the finest bolted flour. Local custom and regulation varied enormously from place to place and over time. The yield of flour from the grain might also vary according to whether the grain was milled dry or wet. Regulations and taxes varied from place to place and over time, while bakers selling their own bread operated with different rules from those baking householders' own flour or dough (the hussfurer or hussbrotbecher.)[47] The complexity of the matter is such that it may be difficult to be sure of the comparability of bread tariffs from town to town. Grain prices, though standing at one remove from the retail price of bread, may actually be more comparable.

Comparing prices and wages between China and Britain is made all the more difficult since silver was not used in ordinary payments for goods or wages in China, which were actually acquitted in copper cash.[48] Moreover, the value of cash in terms of silver was also highly variable.[49] Fluctuations in the value of cash explain why conversion to silver weight might seem desirable, but they also show how unreliable silver as a yard-stick must be. Allan and his co-authors, calculate the wage rate in ounces (tael) of uncoined silver ingots (sycee),[50] yet conclude 'The wage rate thus derived seems extraordinarily low',

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[46] Hanauer, pp.92-103for the price of grains, p.106 for the importance of bread prices,

[47] See Hanauer, pp.104-162.

[48] Chinese cash are variously described as copper cash (Peng) or bronze cash (von Glahn). Chinese cash are known from different periods in both brass (copper-zinc) and bronze (copper-tin), so 'copper alloy' describes them best; see M.Cowell and Helen Wang, 'Metal Supply for the Metropolitan Coinage of the Kangxi Period (1662-1721), *Numismatic Chronicle,* 158, 1998, pp.185-96, and M. R. Cowell, J. Cribb, S. G. E. Bowman, and Y. Shashoua, 'The Chinese Cash: composition and production; in M. M. Archibald and M. R. Cowell, eds., *Metallurgy in Numismatics 3,* 1993, pp.185-98.

[49] Robert C. Allen, Jean-Pascal Bassino, Debin Ma, Christine Moll-Murata, and Jan Luiten van Zanden, 'Wages, prices, and living standards in China, 1738-1925: in comparison with Europe, Japan, and India', *EcHR*, 64, S1, (2011), pp.8-38. Kent Deng and Patrick O'Brien, 'Locating a Chronology for the Great Divergence: A Critical Survey of Published Data Deployed for the Measurement of Nominal Wages for Ming and Qing China', forthcoming. See also Alejandra Irigoin, 'A Trojan Horse in Daoguang China? Explaining the flows of silver in and out of China', LSE Working Paper No. 173/13 illustrates the variable fineness of silver coin and bullion in China. Also Kuroda, 'Anonymous Currencies or Named Debts, Local Credits and Units of Account', pp. 57-80, for the variability of ingots.

[50] Peng Xin wei, *A Monetary history of China,* translated by Edward H. Kaplan, (Centre for East Asian Studies, Western Washington University) 1994, volume 1, p. xl, defines the Qing Treasury ounce (tael) as 37grammes.

which they attribute to an unspecified additional wage in food.[51] This is no doubt an important factor, as is confirmed by O'Brien and Deng,[52] though one also wonders about the accuracy of the cash-silver conversion, which was highly variable over time and from place to place.

The variable relationship between uncoined silver in which government operated, and the copper cash which served the daily needs of the common people must raise doubts about international comparisons based on silver. Peng and von Glahn offer tables presenting cash-silver equivalents which demonstrate this variability, rather than providing a usable exchange rate for conversions. [53]

For refined ingots see Joe Cribb, *A Catalogue of Sycee in the British Museum: Chinese Silver Currency Ingots,* (British museum, 1992.

[51] Allen et al., p.35. The authors recognize the limitations of their calculated wage rate, using only the resultant trend, not the wage level.

[52] Deng and O'Brien, point out that money wages were still exceptional in China, and those we do know of would probably have been supplemented by payments in kind; they were certainly insufficient to support a worker and his family. Uncertainties remain about the numbers of days worked per year, and about the role of supplementary income earned by other family members. Deng and O'Brien conclude,'…almost all the data …remains sparse, insecure and difficult to interpret.'

[53]For the following passage on silver-copper cash values, see Peng, pp.732-3; 736 fn., and Table 1; 739-40, including Table 2; and 759. Although Peng offers tables indicating the price of silver in standard cash, together with tables indicating the price of rice in both cash and uncoined silver, he warns frankly 'Naturally changes in the silver-cash coin exchange price influenced prices in general, but the nature of that influence depended on what money was used to express a price or what money was used to pay for something.' Peng, pp.740-1. Again, p.744. 'prices varied according to the type of coins people offered in exchange.'
Von Glahn also offers a table of highly variable silver/cash exchange rates, together with rice prices in silver and in cash from 1600 to 1800, indexed on 1691-1700, op.cit., Table 9.1, p.191.

Qing government attempted to fix the silver–copper ratio at 1ounce (tael) of silver to 1000 cash, but market prices were more variable, with light and heavy cash in circulation together, with different purchasing power; heavy coins were often melted and turned into privately issued lighter cash. Thus in 1702 heavy cash of restored weight were rated at 1000 to the ounce of silver, but new light cash were also officially issued at 1000 to 0.7 oz silver, to try to meet the need served by privately issued cash. Nevertheless, heavy cash continued to rise in price, buying an ounce of silver for well below 1000 cash. By 1722 an ounce of silver exchanged at 780 'capital large coins', though different rates applied to small coins or privately issued imitations. The attempt to fix the price of an ounce of silver at 1000 cash was renewed in an edict of 1730, but in 1732 capital large standard coins were still at 800 per oz silver. Despite the government's wish to stabilize the exchange price of an ounce of silver at 1000 cash, the market price was generally significantly lower. Huang Ang's contemporary account of 1752 noted: 'After 1740-41, the use of silver declined and the circulation of coin increased, to the point where today coin is employed almost exclusively. Even in transactions of ten or a hundred taels coin is used rather than silver.'….'Previously the silver:coin exchange ratio was 1ounce to 840 cash (at the beginning of the dynasty it had been 1:900). Later it declined to 1:800, and now it has fallen to 1:700.Coin is much more abundant than before. Yet in the past when coin was scarce its value was stable, but now the value of coin has risen sharply even though there is an abundant supply.'[54]

However, the nineteenth century brought a turning point in the silver and copper cash exchange rate. Earlier copper cash had been expensive, and silver relatively cheap. Thereafter silver became expensive and coins cheap. Private minting of small coins and an influx of light foreign coins increased the supply of cash, while silver became more expensive as it had started flowing abroad. In the eighteenth century, an ounce of silver had exchanged for 700 to 800 cash, rising during the Jiaqing period [1796-1821] to over 1000 cash. By the

[54] Quoted by von Glahn, p.193, who also notes that the use of cash rather than uncoined silver became standard in the grain trade by the 1740s, and dominant in wage contracts in the 1760s. von Glahn found that cash also became normal in sales of arable land spreading from Shandong in the 1760s to the Yangzi Delta in the 1770s and to Beijing in the 1790s. Peng's Table on p.736 also illustrates regional variations.

middle of the nineteenth century the price was rising to 2000 cash.[55] Peng argues that the opium trade reduced the quantity of silver sent to China after the end of the eighteenth century, and in the nineteenth century, English merchants began to export silver from China.

However, Irigoin introduces a further element into the story, distinguishing between the silver ingots, and the Spanish-American silver coins imported into China. The variable and uncertified weight and fineness of ingots made coined silver particularly attractive. [56] The absence of an officially issued Chinese silver coin, allowed foreign merchants to exchange dollars, especially the old Carolus dollar, in China for ingots (sycee) at a profit. In short, while the quality, weight, and availability of the copper coinage varied, so too did that of uncoined silver.[57]

Pitfalls in the path of the historian of Chinese prices and wages thus include the fluctuating international and Chinese values of silver bullion, silver coin, and copper, and the widespread circulation of both heavy and light official cash, and of privately issued light-weight cash. The manufacture of silver ingots was also decentralized.[58] Regional variations in a country the size of China were obviously highly significant, both between north and south and between town and country.[59]

As if these difficulties were not formidable enough, information on wages, and especially actual earnings, is hard to find.[60] Comparison between England and

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[55] Peng, p.740.

[56] Sycee tested in the British museum ranged from 99.6% to 93.2% silver, while their weight and size varied from 2098 grammes to 26 grammes; see Cribb, p.316. The fineness of dollars (pesos) also varied somewhat between different issues, but such changes were controlled, allowing users to distinguish between issues on sight. Distinguishing the fineness of ingots (sycee) required testing by shroffs, or pawnbrokers, since although ingots were stamped with makers marks there was no government control of their manufacture.

[57] Irigoin also suggests that it was the scarcity of Carolus dollars which led merchants to send opium to China in exchange for silver ingots (sycee).

[58] Cribb, op. cit., p.15: 'Both central and local government chose to pass the responsibility for making the ingots and setting the standards for their use to local bankers.'

[59] For further detail on the complexity and variability of Chinese currency, see also John E. Sandrock, *Copper Cash and Silver Taels. The Money of Manchu China,* Baltimore, 1995.

[60] Peng, p.738 is clear that Qing wages were very low, though his evidence is fragmented. Allen et al. rely on Gamble's series which seems to be the best we have, though it is very hard to know how far it is representative of wages for other types of work, or other regions. However, see now Debin Ma and Weipeng Yuan, LSE Economic History Working Papers , 201/2014,
' Discovering Economic History in Footnotes: the Story of Tǒng Tàishēng Merchant Archive (1790-1850) and the Historiography of Modern China', which draws attention to an important new source, which holds out the prospect of a very significant addition to the available data on Chinese prices and silver:cash ratios.

China in silver weight thus involves converting English prices and wages to silver weights which did not reflect reality, and converting Chinese cash prices and scanty wage data to uncoined silver weight according to formulae founded on patchy, and sometimes contradictory, surviving evidence.

Given such reservations about the quality of the international data with which the English evidence is to be compared, it seems we should focus effort on a fuller appreciation of the detailed prices and wage data as recorded originally in nominal, face value, terms. Silver conversion is an unnecessary diversion since the *ratio* between prices and wages is unaltered by conversion to silver weight.

Monetary Policy

Moreover, conversion of the original data to silver weight equivalent also obscures the role of national monetary policies, and the fact that currencies can hold different values domestically and internationally. And there are in fact other ways to make international price-wage comparisons. Broadberry chooses to approach living standards by comparing estimated GDP per capita. This method does not engage with actual wages at all, but it has the merit of using nominal prices in local currencies adjusted for purchasing power parity.[61] Purchasing power parity (PPP) is a concept which recognizes that currencies enjoy a different value domestically in terms of goods and services from that indicated by foreign exchange rates. Since labour was not internationally tradable, the analysis of wages needs to focus on the domestic value of currency. PPP focuses on domestic price and wage structures, rather than foreign exchange rates, just as prices and wages expressed in domestic face value money of account are a better guide than converted silver weight prices.

Nevertheless the fact of price divergence from place to place is not to be disputed. Price differentials and divergence between more and less prosperous regions are normal and recur throughout history. Then as now, price differentials are the fundamental basis of trade, moving goods from regions

[61] Stephen Broadberry, 'Accounting for the Great Divergence' (26 January 2013) Circulated paper. Comparisons are made on the basis of 1990 international dollars. Since these international dollars are based on purchasing power parity exchange rates they have the merit of reflecting the domestic value of currencies rather than their foreign exchange rate. It should be noted, however, that working in 'international dollars' has its own problems.

readily supplied to those of greater demand. The cheaper grain from Poland commanded a higher price if shipped to the Low Countries; livestock farmed in Scotland and the north of England was sent to supply demand from southern towns and agricultural regions growing grain. In this way a region's natural advantages promoted local production and dietary habits of a particular character, and coloured trading patterns with its neighbours. Trading relations across continents performed in the same way, as Spanish-American silver was shipped to Europe and to Asian suppliers of textiles, dye stuffs, tea, and spices.[62] Nor is it disputed that international trade made some regions more prosperous than others. A healthy long-term balance of payments founded chiefly on wool and cloth allowed England to establish a strong currency of high intrinsic content, which is well attested from the early middle ages until modern times.[63] The importance of divergence lies above all in the rise and fall of regions' prosperity and the measures taken to achieve or retain advantage.

Strong currencies are the hallmark of prosperous trading nations, which typically enjoyed a higher standard and cost of living necessarily accompanied by higher wages. Germany, or Japan supply similar contemporary examples of the same phenomenon, though it may be noted that the recent strength of the mark and yen was built on much weaker post-war exchange rates which facilitated reconstruction. While prosperous trading nations were characterized by hard or strong currencies, less fortunate regions tend to devalue, that is to say in a historical context, to debase. Debasement and devaluation could of course generate ruinous inflation, destroying any confidence in the currency, but a well-judged devaluation could promote exports, stimulate the economy as a whole, and provide a much needed boost to the domestic money stock. Conversely, the attempt to maintain a currency which was too strong could restrain nominal prices but also deny the domestic economy an adequate circulating means of exchange, depressing economic activity. In short, establishing the appropriate strength for the currency had important implications for the performance of the economy as a whole. While these truisms appear trite and commonplace for economists and modern

[62] Broadberry notes the special role of long distance trade in developing divergence, citing Acemoglu, D., Johnson, S. and Robinson, J. (2005), "The Rise of Europe: Atlantic Trade, Institutional Change, and Economic Growth", *American Economic Review*, 95, 546-579.

[63] Indeed the strength of sterling, and the high wages and cost of living which are associated with it, are a constant feature of English economic history before the twentieth century.

economic historians, it needs to be fully appreciated that the same mechanisms were at work in an age of bullion-backed currencies. Though foreign exchange values depended on the balance of payments and on the intrinsic content of currencies, the domestic economy – including the internal price and wage structure – was determined by the national government's valuation of its own currency. Yet considerations of this sort are completely masked by the conversion of prices and wages to silver weight.

Preoccupation with intrinsic content is an obstacle to a proper understanding of how currency operates. It obscures the essential continuity between currencies composed of, or backed by, precious metal and modern currencies without such backing. Silver weight conversions are essentially 'a barbarous relic'.

Appendix

The useful databases made available by the University of California, Davis,[64] take their evidence for the silver content of the English currency from Jastram's *Silver: The Restless Metal,* when Challis' *New History of the Royal Mint* would have provided a sounder guide.[65] Clark's calculated silver weights for the English currency during the sixteenth-century debasement period consequently completely miss the significance of the Great Debasement.[66]

Such mishaps can only become more likely with every additional calculation which distances the data from its evidential base. Even where the calculations are sound, they may obscure as much as they reveal. For example, concentrating on silver weight prioritises the currency adjustment of 1351, when the big story here is the seismic shift in population and the supply of and demand for labour. In the same way the falling silver weight of wages resulting from currency adjustments in 1412, 1464 and 1526 mask the fact that the value of that silver had risen.

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[64] gpih.ucdavis.edu/Datafilelist.htm accessed on 10 Feb 2014

[65] Roy W. Jastram, *Silver: The Restless Metal,* (New York) 1981, 164-188. C.E.Challis, *A New History of the Royal Mint,* (Cambridge) 1992. For a detailed tabulation of English mint prices, finenesses, and pence struck per pound, see Winton Institute website, which also hosts Anthony Hotson's database of the London market's silver price including weekly quotations.

[66] A table illustrating this discrepancy appears in Mayhew, 'The circulation of money and the behaviour of prices in medieval and early modern England' in *A History of Market Performance from Ancient Babylonia to the modern world,* eds. R.J.van der Spek, Bas van Leeuwen and Jan Luiten van Zanden, Routledge 2015 (recte 2014?), Table A16.1, p.434.