

In honour of Henry Thornton,  
the man who ‘knew everything’<sup>1</sup>

## **The illusion of paper money as ‘the dominant means of payment’**

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‘Once paper money became the dominant means of payment, coin never regained its prominence.’ O’Brien & Palma (2016)<sup>3</sup>

‘Bills, since they circulate chiefly among the trading world, come little under the observation of the public. The amount of bills in existence may yet, perhaps, be at all times greater than the amount of all the bank notes of every kind, and of all the circulating guineas.’ Henry Thornton (1802)<sup>4</sup>

### ***Abstract***

*From its first appearance to this day, paper money has been the subject of countless controversies and misconceptions. One of the most widely spread such misapprehensions, above all in the 19th century, has been the alleged dominance of paper money as a means of payment. In this view, paper money became dominant after it supplanted coins for day-to-day payments, and then deposit money broke this dominance in its turn. The misconception has endured to this day, as evidenced by numerous academic papers and many modern-day economics textbooks. Such an erroneous perception of the evolution of money and payment systems has had a major impact on the design of monetary measures, making them unsustainable in the long run. A misunderstanding of money is also evident in the increasingly lively debate on central bank digital currency (CBDC). This paper, therefore, will document and dispel the illusion that paper money was the dominant means of payment. Finally, the paper will explain on why banknotes were unable to assume a commanding position in payments in spite of their being the perfect form of money.*

**Key words:** *paper money, means of payment, banknotes, convertibility, coins, deposit money, check, payment system, clearing house, retail / wholesale payments, velocity, money evolution.*

## Introduction

The lack of understanding of the evolution of money and payment systems, shrouded in the mist of economic history, lies at the heart of many misconceptions, misinterpretations, and unrealistic theoretical constructs. Of all the forms of money, it was paper money that has created the most controversy and conflict between fundamentally opposed opinions, but has nevertheless remained poorly understood to this day. An important and widespread misconception of paper money is the assertion that it was during the ‘Suspension Era, the suspension of cash payments in Britain from 1797 to 1821, that this form of money replaced coins as the dominant means of payment. According to this reading of monetary history, paper money then lost importance under the assault of deposit money, which became commonplace as cheques entered general use. In this paper we will prove and document the illusion that paper money was the dominant means of payment.

It seems hardly credible that perceptions of the dominance of paper money have persisted to this day, even though the works of the classics of monetary analysis demonstrate and prove the error of this line of thought. This is why there is merit to once again re-affirming the findings of Henry Thornton, the father of modern monetary analysis, who proved as early as the 19th century that paper money was not dominant, in his marvellous *An Inquiry into the Nature and Effects of the Paper Credit of Great Britain* (1802). Thornton’s views received powerful support in Sir John Clapham’s comprehensive monetary history and statistical overview of paper money from the late 17th century to 1914, and arguably the best work on the subject, *The Bank of England: A History, 1694-1914* (Bank of England, 1944). Also a useful source are the *Proportion of Cash Payments* and the explanation of the *Cheque and Clearing System* given by Stanley Jevons in his notable *Money and the Mechanism of Exchange* (1875).

Apart from these sources, the paper also relies on other works that reconstruct the scant statistical information about the flows and structure of means of payment.<sup>5</sup> Particularly helpful was research that gives insights into the characteristics of paper money, its development, and its evolving role in the payment system, monetary sector, and the broader economy. Use is also made of some of the best-known modern-day economics and monetary economy textbooks, which – as with most such references – contain similar misconceptions and skewed interpretations.

The structure of this paper follows the historical development of paper money, which took place at the various stages of the evolution of payments systems. This allowed us to compare the means of payment in the periods examined on equal terms and contrast trends in England, the birthplace of the banknote, and other countries. The term ‘banknotes’ will be used throughout instead of ‘paper money’ as it is unambiguous and carries no disparaging overtones.<sup>6</sup>

This Introduction (1) is followed by: Emergence of banknotes as a means of payment (2); Expansion of banknotes to the late 18th century (3); Banknotes in the Suspension Era, 1797-1821 (4); Attraction of banknotes after in the Convertibility Era, 1821-1914 (5); Payment in banknotes

in other countries to 1914 (6); Thornton's understanding of 'the observation of the public' (7); Features of banknotes and their role in payments (8); and Conclusion (9).

The paper demonstrates that banknotes were not the dominant means of payment, either in England or most other countries, in any of the periods under consideration. The post-1914 era was not examined as the share of banknotes in total payments began a downward trend as early as the 1850s. The analysis of the emergence and development of banknotes (Sections 2 and 3) also reveals that the most widely accepted understanding of the evolution of money – metal (commodity) money to paper money to deposit (cheque) money – does not tally with the historical record. Payments in banknotes outside Great Britain to 1914 were analysed through a comparison of figures for the United States, France, Germany, Sweden, and Japan (6). The penultimate section presents a comparative assessment of the dominant means of payment across the global economy in global foreign exchange markets and the GDPs of the top five economies and worldwide output. Here, the latest 2018 and 2019 data are analysed to prove the accuracy of Thornton's observation and confirm the key assumptions of the paper (7). The link between the features of banknotes and their role in payments was examined in the final Section to explode another persistent myth – the illusion of banknotes' inferiority (8).

### **The emergence of banknotes as a means of payment**

At the very start of Chapter I, The Development of Central Banking in England, of her famous 1936 doctoral dissertation, *The Rationale of Central Banking*, Vera Smith summarises the key facts and misconceptions about the beginnings and development of the issue of notes: 'It must have been generally true that, chronologically, deposit banking preceded the issue of notes. At least this was so in England and in the early banks at Hamburg and Amsterdam. But banking in general only became important with the development of the issue of notes' (V. Smith, p. 6).

However, deposit banking not only precedes the 'issue of notes' chronologically, but also functionally as well. Goldsmiths' and other notes would not have been feasible had not the Bank of Amsterdam and other public banks restrained the monetary chaos of the early 17th century. England lagged behind Amsterdam and Hamburg in deposit banking by a hundred years, and trailed Venice by more than three centuries. Unfortunately, Vera Smith was not aware of Thornton's analysis at the time her dissertation was written (1935)<sup>7</sup>; had she been, she would have known that the issue of notes had not made banking more important so much as giving it greater visibility amongst the broader public.<sup>8</sup>

The early history of banknotes is generally well known, but the sequence of key events is still worth sketching out. In the latter part of the 17th century, the goldsmiths of London, who had emerged as the city's main deposit-takers, issued receipts and notes to their depositors. 'Meanwhile, their promissory notes payable on demand, which were issued to depositors, had come to be used as a convenient means of making payments and could, if desired, be cashed in

part only. It is from these goldsmiths' notes that the Bank of England note ultimately derives' (Bank of England, p. 211).

The failed 1660s experiment of Palmstruch's private Stockholm Banco with issuing notes was an isolated incident that had no broader impact on the monetary trends of the day. Banknotes were introduced from England to the European mainland via Scotland by her most famous son, John Law. Clapham is here absolutely right. 'The issue was the last of the classical banking functions to evolve spontaneously in England, and it was England's main contribution to the evolution of European banking' (Clapham, I, p. 5). Scotland's influence was none the less important, but would have been difficult for it to materialise without the country's financial ties with London.

Nevertheless, the emergence of banknotes cannot be explained without an understanding of the monetary environment. 'The medieval and early modern economies experienced a degree of monetary chaos that is hard today to comprehend. There was a bewildering profusion of coin, much of it of poor quality, and coin was generally in short supply' (Kohn, p. 1). England faced similar constraints with coin as the rest of Europe: '[...] the shortage of metallic currency was a serious problem in the England of the Stuarts. Hence the numerous schemes for supplementing the currency' (Richards, p. 232).<sup>9</sup>

The Dutch Republic faced the direst straits in the early 1600s. 'Around 1600, the Dutch Republic was a small open economy with 800 to 1,000 different circulating coins; each province and many cities had official mints while private mints, neighboring states and counterfeiters offered competing coins' (Dehing & Hart, p. 40)<sup>10</sup> The solution was to incorporate the Amsterdamsche Wisselbank, or the Bank of Amsterdam, in 1609: 'The bank was owned by the city, took deposits, charged a small fee for withdrawals, and was not to lend. The bank's purpose was to guarantee the quality of coins upon withdrawal' (Quinn & Roberds, 2007, p. 253).

The Bank of Amsterdam created a new unit of account, the bank florin, which was in circulation only as deposit money or money of account: 'The Dutch bank florin was the dominant currency in Europe over much of the seventeenth and eighteenth centuries' (Quinn & Roberds, 2016, p. 63). This reined in the monetary chaos that had afflicted Europe, facilitated international trade and payments, and justified the Bank of Amsterdam's official title of 'Exchange Bank'.

This deposit money or bank money (deposits in public banks) was by far the most convenient means of payment in large commercial transactions: 'it can be paid away by a simple transfer without the trouble of counting, or the risk of transporting it from one place to another' (Smith, p. 448). These advantages made deposit money the perfect fit for a commercial world.

The Bank of Amsterdam represented the peak of development of public deposits banks: it was modelled after Venice's Banco di Rialto (1587), and followed by the Hamburger Bank or Bank of Hamburg (1619). Even though the immeasurable contribution made by these banks to the monetary stability of early 17th century Europe has been explored only partially, it is beyond question that they created an environment in which banknotes could emerge. Most of these public

banks were not doomed to fail by the superiority of note issuing banking: most were swept away only by the Napoleonic wars. In any event, in most countries the share of banknotes in total payments never came close to the significance of deposit money, as demonstrated by this paper.

To begin with, there is fascinating proof of the superiority of deposit payment models of these early public banks buried deep in the archives of monetary history. ‘Immediately upon the conversion of the Prussian Bank into the Reichsbank, the transfer business of the new Bank was considerably extended through taking over the state Girobank of Hamburg, which had developed transfer transactions, as local business, almost to perfection [...] the transfer business of its predecessor, the Prussian Bank, was almost negligible’ (NMC, 1910a, p. 89). In short, in the 1870s, a public bank more than 250 years old (established in 1619) operated the best developed system of transfer transactions in the new German Empire. This ‘local’ business of a public bank based in one single city had a volume of transfers 3.2 times greater than the principal bank of Prussia, the state that accounted for two-thirds of the Empire’s territory and three-fifths of its population.<sup>11</sup>

### **Expansion of banknotes to the late 18th century**

The early 18th century was a time for growth of banknotes, and not just in England. ‘During the first half of the 18th century the credit of the Bank’s notes successfully withstood such shocks as the Jacobite rebellions of 1715 and 1745 and the South Sea Bubble crisis of 1720. [...] The notes issued after 1725 were in mainly printed form and they began to appear in fixed denominations; the first was for £20’ (Bank of England, p. 212). That very same year of 1725 saw the first printing of Bank of England notes in various other denominations, from £30 to £1,000 (ibid, p. 222). Clearly, their high face value made all of these notes, as well as other banks’ and bankers’ notes in circulation, into instruments of commerce (Smith, p. 276). For context, the majority of Londoners had never seen a banknote before the 1790s.

By contrast, Scotland was at the time an example of ‘the early adoption of and extension of the note issue to the point at which gold and silver virtually disappeared, [replaced by] notes, particularly of the smaller denomination’ (Checkland, pp. xvii-xviii). The Bank of Scotland played a pioneering role. ‘In these early years the real basis for an extended business was the issuing of notes. This the Bank began immediately after its foundation. From the outset of its note issue the Bank abandoned the Scots pound and used sterling units’ (ibid, p. 31).

Nevertheless, arguably the decision that most determined the fate of banknotes, not just in Scotland but worldwide, had to do with their denominations. ‘In 1704, the Bank of Scotland, after a good deal of thought, decided to issue notes of £1, a most important move. It opened the way for a great extension of the note issue, and for the beginning of the displacement of coin in smaller transactions’ (ibid, p. 38)

Unlike issuers north of the border, London bankers were increasingly abandoning their notes in favour of those of the Bank of England. Incontrovertible proof of the dwindling number of banknote issues by other major London banks is provided by the structure of bank liabilities in

England at the time: The Bank of England – Bank Notes, Private Deposits and London Banks’ Deposits [small amount]; London’s Private Banks – Private Deposits and Country Banks’ Deposits; Country Banks – Country Banks’ Notes and Private Deposits (Arnon, p. 32, Figure 2.1, A schematic structure of the banking system in the mid-eighteenth century).

This is exactly when the shaping of the modern banknote began, a process that took slightly under a century, from the 1750s to the 1850s. The most thorough explanation of the development and growth of banknotes during the 18th century and their interaction with other means of payment came from Henry Thornton, in his *An Inquiry into the Nature and Effects of the Paper Credit of Great Britain* (1802), a work that Friedrich Hayek found ‘amazing’. His conclusions remain exceptionally topical to this day, even though the study saw its second edition only in 1939, prefaced with a brilliant introduction by Hayek.<sup>12</sup>

As a highly knowledgeable participant in the banking practices of the day, Thornton is an invaluable witness. ‘There are in London between sixty and seventy bankers, and it is almost entirely through them that the larger payments of London are effected. [...] The notes in their hands form, probably, a very large proportion of the whole circulating notes in the metropolis. It is certain, at least, that only a very small proportion of Bank of England notes circulate far from London [...] Liverpool and Manchester effect the whole of their larger mercantile payments not by country bank notes, of which none are issued by the banks of these places, but by bills at one or two months date, drawn on London’ (Thornton, p. 113, 94).

Still, large payments were not made in banknotes even after these ‘one or two months’. ‘Merely by the transfer of the debts of one merchant to another, in the books of the banker, a large portion of what are termed cash payments is effected at this time without the use of any bank paper’ (Thornton, p. 101). Here, Thornton’s footnote provides one of the best descriptions of the purpose of a clearing house: ‘[...] to shew the strength of the disposition which exists in those who are not the issuers of bank notes to spare the use both of paper and guineas’ (ibid).

‘A large proportion of the London payments are payments of bills accepted by considerable houses [...] The London payments are, moreover, carried on by a comparatively small quantity of notes’ (Thornton, p. 114). These were exclusively Bank of England notes, which were primarily used for settlements after interbank clearing. Starting in 1854, these notes were replaced by cheques drawn on bank deposits with the Bank of England. Of course, as is still the case today, cashiers issued some of the notes to clients taking out money from the bank.

Country banks expanded much later, in the 1780s and 1790s, ‘between the American and the present [Napoleonic] war’ (Thornton, p. 168). However, unlike London’s private banks, they were unable to keep deposits with the Bank of England until 1825.

Country bank notes became payable to the bearer in the 1790s, slightly before the start of the Suspension Era, as non-interest-bearing means of payment.<sup>13</sup> Despite these modernising efforts, the total number of banknotes in England and Wales did not change appreciably and consistently

lagged behind deposit money in relative terms. The velocity of circulation could not alter the proportion of banknotes used for total payments, especially given the concentration of Bank of England notes in the hands of London bankers.

Conversely, Scotland was an exceptional example of the displacement of coins by newly-dominant banknotes. 'Instead, by 1772, a good deal of the business of a large part of Scotland was done in notes issued by bankers. [...] These changes involved a significant extension of the number and range of banking institutions' (Checkland, p. 91). Interestingly, Scotland's embrace of banknotes was not prompted by their convertibility. 'Instead, the Scottish system was one of continuous partial suspension of cash payments' (ibid, p. 185).<sup>14</sup>

### **Banknotes in the Suspension Era, 1797-1821**

Cash payments had been suspended several times before 1797 when war had threatened, but such restrictions had never lasted so long. The extended constraints were dictated by the Napoleonic wars, protracted and hugely damaging conflicts on an unprecedented scale. One urgent action taken as soon the suspension was announced was to authorise the printing of small denomination notes. 'As gold became scarcer the £1 and £2 notes were used more and more for wage paying and retail trade, especially in the London area' (Clapham, II, p. 3).

Thornton is again the eyewitness for the quantity of notes and volume of payments in the Suspension Era: 'since the suspension of the cash payments of the bank, the number of its notes has been the same, or nearly the same, as before that event, if those two millions of one and two pound notes, which have been a mere substitute for gold, are deducted' (Thornton, p. 223). By way of a comparison, Thornton had previously estimated that 'the sums paid daily by the bankers of London may not be less than four or five millions' (Thornton, p. 113). It would seem that the total additional stock of small denomination Bank of England notes for the first five years of the Suspension Era was two to three times smaller than the sums paid daily by the bankers of London.

This ratio implies that the stock of banknotes did not dictate aggregate payment flows. Thornton has an explanation for this apparent paradox: 'Several causes may have contributed to spare the use of notes. First, it is to be remembered, that a small extension of their quantity may be sufficient to effect a comparatively large number of additional payments; for the private bankers in London, who are the chief holders of Bank of England paper, by no means find it necessary to enlarge their stock of it in full proportion to the increased number of their pecuniary transactions' (Thornton, p. 222).

David Ricardo shared Thornton's views of what the dominant means of payment were. Even though his *Proposals for an economical and secure currency* focused on the issue of banknotes, he had no illusions as to their actual proportion in total payments, particularly wholesale transactions: 'If no payments were made by checks on bankers; by means of which money is merely written off one account and added to another, and that to the amount of millions daily, with few or no bank notes or coin passing' (Ricardo, p. 12). Ricardo's intimate knowledge of the means

of payment in early 19th century Britain is undisputed, since he was a highly successful stockbroker and the wealthiest theoretical economist of all time.

### **Attraction of banknotes in the Convertibility Era, 1821-1914**

The 1821 introduction of banknote convertibility into gold and silver put Britain on a *de jure* gold standard, as recommended by the high-profile Bullion Committee of 1810, in contrast to the *de facto* gold standard that had operated before the Suspension Era. Parliament also made the important decision to cease issuing notes of under £5, which were considered a temporary wartime expedient.<sup>15</sup> This regressive ban on small-denomination notes remained in force until 1833, driving down the take-up of banknotes in the economy in favour of hard cash.

Surprisingly, modern-day students of the period have drawn different conclusions. ‘Once people got used to using paper money there was no going back. Despite the adoption of the “classical gold standard” in 1821, banknotes continued their steady rise as a percentage of the total money supply into the nineteenth century’ (O’Brien & Palma, p. 27). The assertion that the share of banknotes in the total money supply increased into the nineteenth century is disputed by all the sources and evidence presented in this paper, even though it would be perfectly sufficient to just take a look at the elementary statistics given at the end of this section (Jevons & Clapham). This claim was what prompted this examination of the widespread misconception that paper money was a dominant means of payment (ibid, p. 28).

Indeed, the relative proportion of banknotes in total cash is open to questioning. ‘Even in the nineteenth century the role of coined money was in many places dominant, and everywhere important’ (Spufford, p. 395). In fact, the turning point was the issue of small denominations, which allowed the broadest public to become familiar with notes and learn about how they could be used on a daily basis. Apart from serving as a test for fiduciary banknote issue and cementing the central position of the Bank of England, this is where the Suspension Era left its greatest legacy.

The illusion of the dominance of banknotes became entrenched in public opinion in the 1830s. Schumpeter explains why: ‘Notes and any troubles that arose about them were clearly visible. Whereas deposits, the use of which was as yet confined to a much smaller sector of the public, passed practically unnoticed’ (Schumpeter, p. 663). This impression was reinforced by the still large number of issuing country banks, which reached 800 in 1810 (Clapham, II, p. 90): ‘In the country the number of private banks declined continuously, but in the early forties almost 400 still issued notes’ (ibid, p. 133).

The frequent redemption crises that plagued many country bank note issuers and caused public discontent were finally resolved by the Bank Charter Act 1844. ‘The Act of 1844 was a purely English Act. It dealt with country banks only in England and Wales’ (Clapham, II, p. 186). The public mood in the run-up to the Act’s adoption was tense. ‘What the average M.P. presumably thought he was doing when he cast his vote for Sir Robert Peel’s bill, was that he was stopping a flagrant abuse and protecting the people’s money’ (Schumpeter, p. 663).



Splitting the Bank of England into two parts – the Issue Department and the Banking Department – and the limits imposed by the Act on fiduciary issue were designed to ensure the convertibility of banknotes and their future expansion. In a seemingly surprising development, this was the tipping point after which banknotes began their stagnation and later gradual decline. This was primarily due to a fall in the profitability of banknote issues given the legislative changes, with the Bank of England remaining ‘the sole note-issuing bank in England and Wales by the 1920s’ (Vuković, p. 2).

‘Scotland, along with Ireland, was placed, in 1845, under its own Act for the regulation of note issue, analogous to the English Bank Act of 1844’ (Checkland, p. 456). In spite of the legal constraints, Scottish banknotes retained a major role in payments over the coming decades.

John Fullarton, one of the leading lights of the Banking School, was aware of the negligible part played by banknotes in wholesale payments, noting that ‘in payments on the great scale, and connected with the higher order of mercantile transactions, as well as in many others, bank-notes perform only a very small and subsidiary part’ (Fullarton, p. 42). James Gilbart, another prominent member of the Banking School and Director of the London and Westminster Bank, believed banknotes were needed in areas not covered by banks or their branches: ‘For country districts where banks are separated by long distances, and a large part of the population is outside the reach of banking facilities, bank notes are a necessity. To a population such as the peasant population of rural France, bank notes are a much more convenient form of currency than bank cheques’ (Gilbart, p. 139).

A more comprehensive view of the role of banknotes was outlined by Thomas Tooke (an advocate of country bank notes), perhaps the most steadfast adherent of the Banking School. He emphasised the need for notes of the smallest denominations for retail trade and the payment of wages. ‘All the larger amounts might be, and most probably would be, supplied by cheques and bills of exchange and settlements. [...] cheques [that] constitute the actual instruments of interchange, and effect payments concurrently with bank notes.’ (Tooke, pp. 21, 23).

Robert Torrens, the leading figure of the opposing Currency School, held a different opinion of the role of banknotes at the time: ‘In all the larger transactions of the market, bank-notes are employed, to the entire exclusion of coin, as the medium or instrument by which property is transferred’ (Torrens, p. 6). This emphasis of notes in ‘all the larger transactions of the market’ was probably motivated by his strong support for Sir Robert Peel’s Act of 1844, as evidenced by the very title of Torrens’s most important work. This observation holds true only for retail payments, and even then only in the closing decades of the 19th century. During the era of convertibility, banknotes were used in a distinct minority of total payments.

‘During the second half of the nineteenth century the development of joint stock banking, the growing use of cheques and a larger circulation of gold coin led to a relative decline in the importance of bank notes. The Bank’s note circulation increased by less than fifty per cent between

1844 and 1900, although the national income had probably more than trebled during this time' (Bank of England, p. 214).

Jevons presents a rare piece statistical proof of the structure of a private bank's means of payment during the final days of 1864: 'cheques and bills 94.1 per cent, Bank of England notes 5.0 per cent, coin 0.6 per cent and country bank-notes 0.3 per cent' (Jevons, 285).

'The total circulation of bank-notes, English, Scotch, and Irish, was, in 1846, 39 millions, and in 1866, 38½ millions' (Jevons, p. 310). At the same time, the real value of British and Irish exports had risen more than threefold (ibid). Of course, the Bank of England's notes made up the largest part of this stagnant circulation. 'The total bank-note circulation of England and Wales in June 1914 was almost precisely what it had been in 1866 and in 1844, that is, between £28,000,000 and £29,000,000. Peel's Act became a class-room theme, while with every decade the bank note became less and less important' (Clapham, II, p. 270).

At the same time, in the 1870s, debts owed by the London Clearing House 'to the average amount of nearly twenty millions sterling per day are liquidated without the use of a single coin or bank-note. [If these were] paid in gold coin [they] would weigh about 157 tons [...] If paid in silver the weight would be increased to more than 2500 tons' (Jevons, pp. 263, 202). These data, highlighted by Clapham and Jevons, are impartial witnesses of the importance of banknotes as a means of payment and their alleged dominance in Britain in the latter part of the 19th century.

Finally, here is what a well-informed contemporary had to say in 1910 about the role of banknotes in England: 'The note issues are almost obsolete as currency, the Bank of England's being used chiefly as reserve by the other banks, while the issues of the country banks are so small as to be negligible. Most of the commercial and financial transactions of England to-day are settled by checks drawn on the banks by their consumers' (Withers, p. 24). Since cheques were not legal tender, banks enjoyed complete freedom in issuing them. 'This check currency is provided by the banks without any legal restriction or supervision' (ibid). Similar trends, which inevitably occurred in other countries as well before 1914, have been termed British Monetary Orthodoxy (Fetter).<sup>16</sup>

In contrast to England, Scotland remained devoted to the banknote. Even businessmen were hostile to cheques, despite the Edinburgh Clearing House being set up in 1865.<sup>17</sup> 'For some thirty years after the Bank Act of 1845, the Scots businessman typically drew not more than one cheque per day, usually for an even amount, for which he took such notes as were needed to settle his transactions for twenty-four hours. [...] From the later seventies the use of chequing facilities in Scotland became much more general. But until after 1880 notes were clearly the chief mode of payment' (Checkland, p. 487).

## **Payment in banknotes in other countries to 1914**

To assess payment in banknotes outside Britain to 1914 a comparison was made of the payments environment in the largest economies, the United States, France, and Germany, as well as the distinct examples of Sweden and Japan.

Friedman and Schwartz document the division between currency and deposits in the United States in this period. 'In 1867, the public divided its stock of money almost equally between deposits and currency: it held about \$1.20 of deposits for each dollar of currency. In the five years after 1867, deposits rose to \$2 for each dollar of currency. The deposit-currency ratio fluctuated around this level until 1880, and then began to rise again' (Friedman & Schwartz, p. 16). It ought to be recalled that a dual monetary standard was in effect at the time – the greenback dollar and the gold dollar – when an expansion of the greenback occurred during the Civil War. Consequently, by mid-1867, U.S. notes and National bank notes accounted for 67.8 percent of total currency (ibid). In time, unlike coins, the share of banknotes followed a downward trend, from 34.5 percent in 1897, to 32.3 percent in 1905, and 30.2 percent in 1914 (ibid, p. 179).

Nevertheless, the stock of money only hints at the structure of payments. An official 1900s breakdown of transactions by means of payment is more accurate: 'It is estimated that about four or five per cent of the business transacted in the United States is transacted through the means of actual cash or money' (Thralls, p. 53). Deposit money became as dominant as it did due to the existence of more than a hundred clearing houses, chief amongst them the New York Clearing House (established in 1853).

Historical circumstances resulted in an unenviable position of banknotes as a means of payment in France. 'The Banque Royale closed its doors in 1721, and the various companies founded by Law were liquidated at great loss. It was a disaster which caused the ruin of a large number of people. The memory of this failure remained fresh in the minds of all classes of people, even the poorest, during the whole of the eighteenth century' (Liesse, p. 8). John Law's worthless banknotes even made 'bank' a hated word. Nevertheless, during the revolutionary decade of the 1790s, the French found themselves in possession of yet another worthless batch of paper money, the assignats, issued by the state.

Neither the gradual re-appreciation of banknotes in the first half of the 19th century nor 'the monopoly of the Banque de France as a bank of issue' (Liesse, p. 65), which it gained in 1848, could fully dispel public hostility towards banknotes, which never exceeded coins in circulation until the 1890s (NMC, 1910b, p. 345). Payments in banknotes at the Banque de France from 1878 to 1903 were unable to reach one-half of the volume of transactions executed using transfers (deposit money) (ibid, p. 350). The actual mismatch was much greater, as 'the old-established and strong private banks in Paris, e.g., the houses of Rothschild, Davillier' (Goodhart, p. 118) had always traditionally used transfers as a dominant means of payment. This conclusion is also borne

out by the rapid growth in transactions at the Paris Clearing House, in spite of its relatively late establishment in 1872, nearly a century after the London Clearing House.

The Prussian Bank was transformed in 1876 to create the Reichsbank for the new German Empire, but at the same time its position had to be 'reconciled with the well-earned rights of the existing 32 private banks of issue (*Privatnotenbanken*)' (NMC, 1910a, p. 36). The number of other note issuing banks posed no constraint to the newly-established central bank: 'Bank notes are the most important liabilities of the Reichsbank' (ibid, p. 68). Still, this was not enough to tip the balance in favour of banknotes, even in retail transactions, which accounted for a minority of all payments. The reason lay in the extension of transfers (ibid, p. 93), to meet the growing needs of wholesale payments, although the first clearing house was set up in Berlin as late as 1883 (ibid, p. 117).

Public habits offset the displacement of banknotes from large payments to some extent, as 'the public mostly used cash as a means of payment, and deposits more as a savings medium (there was relatively little use of checks as a medium of exchange); the ratio of cash to sight deposits was, therefore, high' (Goodhart, p. 111).

Nonetheless, the share of notes steadily declined relative to gold and silver coins in circulation: the notes/coins ratio stood at 0.52 in 1876, 0.50 in 1886, 0.40 in 1896, and 0.37 in 1906 (NMC, 1910b, pp. 245-6). In the final year of these records the proportion of notes in overall cash had fallen to a mere 27 percent. Evidently, banknotes were far from dominant in retail payments.

The singular history of banknote issue in Sweden is inseparable from that of one bank, initially, from 1656, Palmstruch's Bank of Stockholm or Stockholm Banco, then the Rikets Ständerds Bank (RSB) or the Bank of the Estates of the Realm, from 1668, and, finally, the Riksbank or National Bank, from 1867 (Flux). The Riksbank is considered to be the world's oldest central bank. The commencement of operations of this first central bank was marked by a curious restriction, as '[the] RSB's regulations officially banned any issuing of notes' (Edvinsson et al, p. 301). In all, this was a highly unusual bank: it 'operated effectively as a commercial bank, with two peculiar features. First, for almost all the period from its foundation in 1656 until the 1830s, it was the only bank in Sweden, as well as the primary source of notes. Second, as already noted, it came to be owned and supervised by Parliament in 1668' (Goodhart, p. 123).

Ultimately, in the 1830s, new private *enskilda* banks emerged that were able to issue notes. Stockholms Enskilda Bank first began developing the deposits side of its business as late as 1856 (Flux, pp. 52-53), and deposits grew thereafter thanks to new non-issuing joint-stock banks. Finally, 'under the law of 1897, Parliament agreed to centralize the note issue – after a transitional period – in the sole hands of the Riksbank' (Goodhart, p. 127).

According to reconstructed official data, banknotes nominally surpassed coins in 1756, whilst bank deposits exceeded M0 (Riksbank notes + coins) for the first time as late as 1863, only to increase to 7.9 times that figure by 1873 (Edvinsson et al, pp. 323, 328). These numbers imply that

banknotes played a dominant part in all payments for more than a century, from the 1750s to the 1860s, after which a modern payments system began to emerge in Sweden.

The Bank of Japan was established in 1882. After less than two years the Bank was authorised to issue notes, and issued the first banknotes in 1885. At the same time, the gradual retirement of the notes of the national banks was performed (Sprague, p. 187). ‘The loss of privilege of note issue proved no obstacle to the establishment of numerous banks throughout Japan’ (ibid, p. 188).

In the 1900s, the Bank of Japan had a highly atypical structure of liabilities in its balance sheet. Notes were dominant throughout this period, accounting for as much as 78 percent of the total in 1903, except in the war year of 1905 when government deposits skyrocketed. This dominance was the product of the Bank’s business policy: ‘Practically all of the credit operations of the Bank involve an issue of its notes’ (ibid, p. 190).

The flipside of this practice was an underdeveloped national payments system: ‘Nor did the Bank make much attempt to develop improved payments and transfer facilities throughout Japan: this was left to the private banks’ (Goodhart, p. 157).

This examination of the use of banknotes for payment transactions in the most advanced economies of the time leads to the same conclusion as can be drawn for England: notes were used in a relatively minor share of all transactions, and were overshadowed by coins for retail payments up until the very end of the 19th century. Notable exceptions were, similarly to Scotland (until the 1880s), Sweden (until the 1850s), and Japan (the latter half of the 19th and the early 20th century). In these countries, banknotes offset the limited use or absence of deposit money in their underdeveloped payment systems.

### **Thornton’s understanding of ‘the observation of the public’**

Thornton’s valuable explanation, that payments ‘among the trading world, come little under the observation of the public’, is also relevant for the academic community, which has based its observations of money primarily on examination of retail payments. The analysis presented in the foregoing sections has borne this out emphatically.

This focus on money in retail payment systems has endured to this day, as Thornton’s summary cited above seems to have gone unremarked. A comparative analysis of retail and wholesale payments reveals the dominance of the latter in the ‘trading world’ ever since merchants first met at mediaeval fairs to settle their accounts, which accelerated the development of wholesale payments based on rudimentary clearing methods.

As financial markets moved into high gear in the 17th century, wholesale payments became increasingly more dominant, in a trend that has continued to this day. Global foreign exchange (FX) markets now enjoy undisputed superiority by the volume of payments. The extreme expansion of global FX markets is based on electronification, which has enabled the rise in

electronic and automated trading, in particular high-frequency trading. Plainly, the growth of offshore trading and the increasing diversity of participants in such complex markets means that settlement risk inevitably remains a major concern (Wooldridge, p. 15-16).

The scale of this largest financial market is fascinating. Turnover in global FX markets reached \$6.6 trillion per day in April 2019 (up from \$5.1 trillion in April 2016). Foreign exchange trading is concentrated in offshore hubs: the combined share of the top four trading centres of London, New York, Singapore, and Hong Kong SAR, amounts to 75% of global FX turnover (Schrimpt & Sushko, pp. 21, 33).

By way of a comparison, in 2018 US GDP stood at \$20.5 trillion, China’s amounted to \$13.6 trillion, and world output reached \$85.9 trillion.<sup>18</sup> The table below shows these proportions expressed as ratios of GDPs of the world’s largest economies and world output to daily turnover in global FX markets as of April 2019 (\$6.6 trillion). The 365/days ratio shown in the rightmost column is an approximation of the extent to which the 2018 annual turnover in global FX markets (extrapolated amount) exceeded the GDPs of the observed countries and global output.<sup>19</sup>

Table 2. Relationship between GDP and turnover in global FX markets

Economy	Rank	GDP / daily FX markets turnover	365/days
United States	1	3.11 days	117.4
China	2	2.06 days	177.2
Japan	3	0.75 days	486.7
Germany	4	0.60 days	608.3
United Kingdom	5	0.43 days	848.8
World		13.02 days	28.0

Sources: BIS Triennial Central Bank Survey, 2019; data.worldbank.org, December 2019.

The ratios are astounding. In April 2019, weekly turnover in global FX markets was greater than the combined annual GDPs of the five largest economies in 2018. At the annual extrapolated level, turnover in the world’s largest financial market exceeded the GDP of the top-ranked economy, the US, by more than 117 times and that of the UK by 849 times, and was greater than world output by 28 times. Comparing only turnover in US dollars, the dominant global currency, reveals a US GDP/USD daily turnover ratio of 7.06 days, meaning that dollar turnover in this market exceeds US GDP by more than 52 times (or, \$52 FX payments for every \$1 of US GDP). It goes without saying that these transactions rely on deposit money, or ‘the buying and selling of bank deposits denominated in different currencies’ (Mishkin, p. 434).

Of course, it ought to be borne in mind that GDP, despite being ‘the most comprehensive measure of a nation’s total output of goods and services’ (Samuelson & Nordhaus, p. 386), excludes intermediate goods, which multiply severalfold the amount of payment transactions that make up the aggregate output of an economy. Nevertheless, even if all payments for intermediate goods and services are included into the calculation in addition to final uses of GDP, the volume of payment transactions made in trading financial and real assets remains much greater. This is borne

out by recent studies: ‘the 2019 survey shows that the evolution of FX trading volumes continues to be dominated mostly by financial institutions’ motives as opposed to needs arising directly from real economic activity’ (Schrimpt & Sushko, p. 23). This is the context in which the relevance of the income velocity of money ( $V=GDP/M$ ) and transactions velocity of money ( $V_t=PT/M$ ), first formulated by Irving Fisher (Mishkin, p. 494), can best be assessed.

It is apparent that Thornton’s claim that payments ‘among the trading world, come little under the observation of the public’ is now, over two centuries later, more topical than ever. The modernity of Thornton’s views is extraordinarily borne out by retail and wholesale payments data from the latest BIS Annual Economic Report (released in June 2020).

Table 2. Features of retail and wholesale transactions

	Annual volume of transactions	Annual value (USD)	Annual average (USD)
Retail	2,000 bn	35 tn	20
Commercial (Wholesale)	250 bn	650 tn	2,500
Financial (Wholesale)	2 bn	5,000 tn	2,500,000

Source: BIS (2020), p. 73.

The table above shows that the value of payment transactions in the financial sector exceeds operations in the real sector by a factor of 7.3, whilst the value of total wholesale transactions is 161 times greater than that of retail transactions. This mismatch will only grow with time, as wholesale payments will become increasingly dominant relative to retail payments. At the same time, the already low share of cash in retail transactions is falling, with banknotes soon likely to become a relict of monetary history.

## Features of banknotes and their role in payments

Having made it thus far, the persevering reader may conclude that banknotes are inferior to other forms of money as a means of payment. The truth is in fact quite the opposite: banknotes are the perfect form of money, but their use is severely curtailed by one characteristic: they are not suitable for wholesale payments. All types of money were created and developed primarily for use in commerce and by ‘the trading world’. Banknotes emerged for this same reason, and were the money of trade until the late 18th century, as evidenced by their initially high denominations. Deposit money, first recorded three centuries before banknotes, nevertheless always remained superior for the purposes of trading. Seventeenth-century public banks and 18th-century clearinghouses reinforced the dominance of deposit money.

The latest Comparing Means of Payment study, released by the US Federal Reserve System (the Fed) in August 2020, evidences the superiority of banknotes (or cash): ‘For the comparison conducted in this paper, a payment mechanism is measured along seven broad categories: accessibility, anonymity, bearer instrumentality, independence, operational efficiency, programmability, and service availability’ (Wong & Maniff, 2020). The paper compares CBDCs

and the contemporary payment systems, RTGS systems, ‘RTGS+’ arrangements, and cash, for use in retail and wholesale payments. Cash scores by far the highest, 5.0 (‘high’), in as many as five of the seven assessed categories, namely accessibility (accessible to everyone); anonymity (instrument is fully anonymous); bearer instrument (ability to possess physical instrument); independence (no intermediaries or equipment needed); and service availability (available 24/7; high operational resilience).

Nonetheless, comparing retail and wholesale payments systems is methodologically controversial. It would be sufficient to say that anonymity has never been desirable for wholesale payments, which in fact require proof of payment, and this entails the involvement of payment intermediaries.

It goes to follow that the features of banknotes emphasised above – their anonymity, being a bearer instrument, and independence – make them suitable not for use in wholesale transactions, which dominate the market, but only in small-scale retail payments. This also explains why banknotes, first conceived for the express purpose of trade, never managed to become the dominant means of payment. Sporadic episodes in which they temporarily dominated relatively isolated economies (such as Scotland, Sweden, and Japan), as noted above, reflect the under-development of these national payments systems that long operated primarily on a cash basis.

At the very end of the discussion stands the trillion-dollar question: if retail transactions account for a negligible 0.6 percent of all payments (see Table 2), why have CBDCs caused such a stir, since electronic or digital central money has been used for over 99 percent of all (wholesale) payments for decades? The answer, in short, is profit. Although it may seem hard to credit, revenue on retail payments, even though they make up 0.6 percent of overall volume, is nearly eight times greater than revenue on wholesale transactions that account for 99 percent of all payments. Indeed, retail transactions are nearly eight times as numerous as wholesale ones. This phenomenon is termed ‘economies of scale’ in the payments world. ‘Financial intermediaries can substantially reduce transaction costs because they have developed expertise in lowering them; and because their large size allows them to take advantage of economies of scale, the reduction in transaction costs per dollar of transactions as the size (scale) of transactions increase’ (Mishkin, p. 35).

The circumstances in which banknotes emerged and evolved as a means of payment were exceptionally significant, too. This is not just a topic for monetary history, but also the key to understanding the genetic code of money and its evolution. All the citations referred to in this paper make it clear that, until the 1950s, most economists had no doubts as to the principal evolutionary paths of money or means of payment: metal (commodity) money led to deposit (cheque) money, which in turn led to paper money (banknotes). The latter half of the 20th century saw a shift in how these historic circumstances were perceived, leading to today’s most widely accepted timeline of money: metal (commodity) money to paper money (banknotes) to deposit (cheque) money. An illustration of this view requires quoting no more than two standard textbooks on the subject, the highly respected *Economics* (Samuelson & Nordhaus) and the equally highly regarded *The Economics of Money, Banking and Financial Markets* (Mishkin):



‘Money as a medium of exchange first came into human history in the form of commodities. By the eighteenth century, commodity money was almost exclusively limited to metal like silver or gold. [...] The age of commodity money gave way to the age of paper money. [...] Paper money issued by governments was gradually overtaken by bank money – the checking accounts’ (Samuelson & Nordhaus, p. 459).

‘Money made up of precious metals or another valuable commodity is called commodity money. The next development in the payments system was paper currency (pieces of paper that function as a medium of exchange). [...] another step in the evolution of the payment system occurred with the development of modern banking: the invention of checks’ (Mishkin, p. 53-54).

Nevertheless, historical facts support the traditional opinion of the main route by which money evolved, namely metal (commodity) money to deposit (cheque) money to paper money (banknotes).

## **Conclusion**

This review of the development and importance of banknotes to payment transactions, from their emergence in the 1660s to 1914, has clearly demonstrated the unfoundedness of the frequently cited view that banknotes were the ‘dominant means of payment’. The illusion of the dominance of banknotes, even in the 19th century, runs counter to historical fact, contemporary testimonies, and statistics. Thornton exploded these illusions as early as the 1800s, by noting that wholesale payments using deposit money, ‘since they circulate chiefly among the trading world, come little under the observation of the public’. Thornton’s modernity is borne out by retail and wholesale payments data from the latest BIS Annual Economic Report (released in June 2020), also analysed in this paper.

The exploration of the means of payment used in Great Britain and other developed economies (the US, France, and Germany) and their structure in this paper has revealed that banknotes accounted for a relatively low share in total payments. Banknotes were overshadowed by coin even for retail transactions until the very end of the 19th century, with the exceptions of Scotland (until the 1880s), Sweden (until mid-19th century) and Japan (latter half of the 19th and early 20th century).

This does not mean, however, that banknotes are inferior as a means of payment to other types of money. On the contrary: banknotes are the perfect type of money. This was borne out by the Fed’s latest Comparing Means of Payment survey released in August 2020. Still, one feature of banknotes severely limits their use: they are inconvenient for wholesale payments. All forms of money were created and developed above all to meet the requirements of commerce and the trading world. Banknotes emerged in response to the same need and remained the money of trade until the 1790s, and this is evidenced by the high denominations in circulation at the time. Deposit money, first seen three centuries before banknotes, nonetheless remained superior for trade, and its dominance was reinforced in the 17th century by public banks and in the 18th by clearinghouses.

Finally, as many of the citations referred to in this paper make it clear, until the 1950s most economists had no doubts as to the principal evolutionary paths of money or means of payment: metal (commodity) money led to deposit (cheque) money, which led to paper money (banknotes). Optics then shifted, and deposit (cheque) money was moved forward in the timeline to come after paper money (banknotes). Yet, inescapable historical facts testify in favour of the traditional view of the evolution of money.

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<sup>1</sup> 'Robertson knew that this was so, though I suspect that he did not read Thornton until the reprint appeared in 1939. I remember telling him that I was preparing the lecture, of which the present paper is an elaboration. 'Oh, Thornton', he said, 'he knew everything'. John Hicks (1967), p. 187.

<sup>2</sup> *Central Bank Money Research*.

<sup>3</sup> Patrick O'Brien and Nuno Palma (2016), p. 28.

<sup>4</sup> Henry Thornton (1802), p. 94.

<sup>5</sup> 'The banks had always insisted upon secrecy. Their business was theirs alone, and no concern of the public, or, indeed, of the state. [...] Down to 1865, the shareholders and sometimes even the directors of banks, had no information on the reserves, knowing only the dividend' (Checkland, p. 478).

<sup>6</sup> The expression 'paper money' is too vague, as there used to exist various other 'paper' means of payment, such as currency notes and promissory notes, apart from banknotes, which were ultimately the only ones to remain. In a strictly formal sense, cheques are paper means of payment too. It is revealing that no one has ever referred to cheques as 'worthless bits of paper', even though they are often made out to much larger sums than the face value of regular banknotes and are

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issued by inherently unstable commercial banks, as opposed to banknotes, which are mainly issued by central banks.

<sup>7</sup> Henry Thornton is not referred to either in the body, the references, or the index of the 1936 first edition.

<sup>8</sup> It is enigma why there is not a mention of Henry Thornton in Vera Smith's doctoral thesis, considering that her mentor, Professor Hayek, already knew and highly regarded his analysis? (F.A. Hayek, *The Period of Restrictions, 1797-1821, and the Bullion Debate in England [1929]*, in: *The Collected Works of F.A. Hayek*, Volume 3: *The Trend of Economic Thinking* (1991), p. 176-216).

<sup>9</sup> Intriguingly, the shortage of coins in Stuart times was preceded by a monetary expansion under the Tudors, which was the product of Henry VIII's dramatic debasements of coins and their extreme proliferation. 'For example, from 1542 to 1551, England's Henry VIII ordered some ten debasements, each of 30-40%. In all, Henry's "Great Debasement" reduced the silver content of the pound sterling from 6.4 troy ounces to less than one troy ounce. [...] An aggressive debasement was able to raise this much revenue, not only because of the higher seigniorage rate, but also because it increased enormously the volume of coin minted (Henry VIII had to open six new mints to accommodate the increased business)' (Kohn, 1999a, p. 17).

<sup>10</sup> Cited after Quinn and Roberds (2007), p. 252.

<sup>11</sup> 'Transactions on transfer accounts, which had amounted in 1875 at the Prussian Bank to only 834,000,000 marks and at the Hamburg Bank to 2,658,000,000 marks' (NMC, 1910a, p. 105).

<sup>12</sup> Apart from Hayek, Thornton's monetary analysis received the highest praise from many other authors. Schumpeter's assessment is particularly authoritative: 'Thornton's contributions outdistanced all others so far as width of comprehension and analytic power are concerned, [...] my opinion [is] that as analyst of money Ricardo was inferior to Thornton' (Schumpeter, p. 658, 675). Nevertheless, Thornton remained undiscovered as a monetary economist until the 20th century. His analysis swayed the Directors of the Bank of England in a series of monetary crises, famously described by Walter Bagehot his celebrated *Lombard Street*, first published in 1873. To complete this note, here is a quotation from a private letter of 1804 about the Irish Committee: 'Thornton attends these constantly; and he understands these matters better than anybody else in London' (Thornton, 1939, Introduction by F.A. von Hayek, p. 53).

<sup>13</sup> 'The practice of issuing notes payable to bearer on demand became very common a few years antecedent to the present war, when various circumstances united to encourage this part of the country banker's employment' (Thornton, p. 172).

<sup>14</sup> 'No one really expected to be able to enter a Scots bank, perhaps especially a public bank, with a large holding of notes and receive the equivalent immediately in gold or silver. They expected, rather, an argument, or even a rebuff. At best they would get a little specie and perhaps bills on London. If they made serious trouble, the matter would be noted and they would find the obtaining of credit more difficult in future' (Checkland, 185).

<sup>15</sup> 'Leave to issue these small notes – in England – had always been treated by Parliament as a temporary thing, a war measure, to be discontinued as soon as the metallic basis for the currency should be completely restored' (Clapham, II, p. 75).

<sup>16</sup> '[T]he main features of pre-1914 orthodoxy: the gold standard; a central bank nominally independent of government, with a virtual monopoly of the note issue, holding a major part of the nation's gold reserve, and prepared to act as a lender of last resort in time of crisis; and other banks, although stripped of the right of issue, virtually unmolested in the creation of deposit currency' (Fetter, p. vii).

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<sup>17</sup> ‘Its object was to facilitate the clearing of cheques and other banking documents in the same way as bank notes were exchanged; indeed, the same premises were used for both functions’ (Checkland, p. 486).

<sup>18</sup> GDP data source: [data.worldbank.org/data-catalog/world-developments-indicators](https://data.worldbank.org/data-catalog/world-developments-indicators).

<sup>19</sup> The low inflation of recent years has minimised the difference between nominal and real GDP.