Where it All Began: Lending of Last Resort and the Making of Sterling as the Leading International Currency in the 1860s

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Abstract:
The National Monetary Commission was deeply concerned with importing best practice based on British experience. However, when the lessons were learned, the British experience was known through direct experience or secondary sources. One key aspect of the focus of contemporaries was the connection between the money market and international trade. It was said that Britain's lead in the market for "acceptances" originating in international trade was the basis of its monetary predominance and US policy makers sought to create a similar market. Yet many aspects of the British experience are still imperfectly known or understood. In this paper, we use a so far unexplored source to document the portfolio of bills that was brought up to the Bank of England for discount. We focus on the 1860s, the period when the Bank of England began adopting lending of last resort policies and compare 1865, which was a "normal" year, to 1866 when the so-called Overend-Gurney panic occurred. Important findings include: (a) the statistical predominance of foreign bills in the material brought to the Bank of England; (b) the correlation between the geography of bills and British trade patterns; (c) a marked contrast between normal times lending and crisis lending in that financial intermediaries only showed up at the Bank's window during crises and (d) the importance of money market investors (bills brokers) as chief conduit of liquidity provision in crisis.

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During the consultations organized after 1908 by the US National Monetary Commission with a view to create the Federal Reserve System, banker Paul Warburg delivered an account of the functioning of the money market in "Europe" (Warburg 1910). He drew a comparison with the American system. In America, he explained, the money market was based on the stock exchange. As there was no central bank standing ready to rediscount short-term commercial credit instruments ("acceptances"), the liquid portion of the money market was made up of repos to the stock exchange. Those with available short-term cash lent it to stock market dealers in exchange for securities, and got their cash back or renewed their positions periodically.

According to Warburg, this arrangement lacked resilience. It made the US financial system vulnerable to balance-of-payment shocks. If payments abroad increased, e.g. in the event the trade balance deteriorated and foreign creditors demanded settlement, cash was withdrawn. And since cash was with the stock exchange, it was withdrawn from there and took speculators wrong-footed. This forced fire sales. Ensuing decline in the price of securities (i.e. the deterioration of collaterals) prompted brokers to increase their margin requirements. Lenders distributed money sparingly. The balance-of-payment shock morphed into a stock exchange crisis, then into a credit crisis. Reluctance to lend and declines in values completed the circle and led to commercial bankruptcies.

By contrast, in Europe – Warburg reasoned – the existence of a large volume of bills that could be rediscounted at the central bank provided more leeway and facilitated financial stabilization. Most contemporary observers (and this included US economists and policy makers involved in the debates surrounding the US National Monetary Commission) were struck by the fact that the tradable bill or "acceptance" was the staple instrument in European money markets. Their generous availability, their liquidity, and the fact that central banks stood willing to rediscount them in crises were seen as a source of financial resilience. When liquidity requirements grew, banks could turn to the central bank and rediscount acceptances. The liquidity thus obtained enabled banks to keep supporting their customers. The central bank thus acted as a lender of last resort. The result was that Europeans could deal with crises more effectively than Americans. The mix of acceptances and central bank support was seen as Europe's secret recipe for financial stability, and the only thing the US needed to do was introducing such a market. This would bring one century of financial stability. History may have eventually decided otherwise, but later scholars have generally concurred that there was widespread belief that creating a market for acceptances "*à la* Europe" would provide the public good of financial stability.

"Europe" was code for England. While the National Monetary Commission concerned itself with studying other central banks, US bankers and policy makers had cast their sights on the Bank of England and the London market for acceptances, the center of world liquidity. This is natural, since this is where best practice was defined. Franc and mark bills enjoyed some international circulation,

but they were junior to sterling.[1] Moreover, beyond the goal of finding a remedy to crises, one concern of the National Monetary Commission was to devise ways to short-circuit London and save on the "tribute" that was paid annually to UK bankers in the form of acceptance commissions. Warburg and his supporters intended to defeat Europe on its own turf, and this started in London (Broz 1997).

At that time, the central banking wisdom that prevailed in central banking was what Frank Fetter would call the "British monetary orthodoxy" (Fetter 1965). A prominent feature of this orthodoxy was its identification (which contemporaries associated with the Bank Charter Act of 1844) of the central bank's key lending rate (the discount rate) as the legitimate policy tool to protect the gold reserve and peg the external value of the currency although some observers grew uneasy with the interest rate volatility this induced and made suggestions for improvements (Palgrave 1903).[2] But this said little as to how one should construct a market.

The National Monetary Commission produced four reports on the English banking system.[3] There were two books. One was an already published book due to an Austrian scholar, Eugen Von Phillippovich, now translated from German (Phillippovich 1910). It was devoted to the historical evolution of the relations between the Bank of England and the State. The other was a joint volume, with contributions of varied lengths by a number of City experts (Withers et al. 1910). And there were two pamphlets. The first was due to Jacobs (1910), and the other was the already mentioned contribution by Warburg (1910). The reports by Jacobs and Warburg were superlative on the beauties of the European system, but they were concise. The contribution by the City writers also lacked detail. Withers dealt with "the merchant bankers and accepting houses" in less than five pages, although there was laid manifestly the secret of making fire.[4] A characteristic of most reports submitted to the National Monetary Commission is that they generally abstracted from more tedious microstructure aspects.[5] This omission is intriguing. It may have reflected an English antipathy for detail. But a lot of relevant information was concealed that way. We fail to understand why American counterparts were content with material that was so general it could hardly serve as the basis of a blueprint for monetary design. This conflicts with the National Monetary Commission's mission to inspire the creation of a market and new instruments – a mission that would succeed or fail on microeconomic cleverness, not on abstract principles.

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[1] See Lindert (1967), Flandreau and Gallice (2005); Flandreau and Jobst (2006).

[2] . R. H. Inglis Palgrave was an editor of *The Economist* between 1877 and 1883, reflecting the continued influence of this journal in setting the tune of proper policy making.

[3] . We leave aside the statistical volumes that combined information on various countries, such as e.g. Aldrich (1910).

[4] . Withers (1910, p. 56) has an intriguing digression on the Bank of England being the "final arbiter" of the market when the credit of certain houses came under suspicion. The brief discussion suggested a command of deep and complex interactions between prudential regulation and market making, which modern policy makers have (re?)discovered in the course of the subprime crisis.

[5] . For more detailed discussions of the international dimensions of the London market see Clare (1891) and Rozenraad (1900).

This makes the historical experience of the Bank of England as it was known or ought to have been known at the time when the Federal Reserve was created an important subject. This should shed light on how the European precedent shaped the US policy choices of the 1910s (the assignment of this article) and to improve our knowledge of issues that are still relevant today (the interest of participants to this conference). Indeed as we shall see, there is a fascinating parallel between the way the Bank of England found itself involved into rescuing a "shadow banking system" of non-bank, limited liability, money market institutions known as bill brokers (or perhaps more adequately "discount houses" although the two words were used interchangeably) despite its initial insistence on not supporting it because it saw it as a source of speculation and financial vulnerability. But when markets learned of the failure of Overend, Gurney, which the Bank had refused to help, liquidity seized and a violent panic set it. The Bank of England was forced to resume support to the shadow banking system. The analogy with the Fed's refusal to help Lehman in September 2008 and the events that followed is not only tempting: it is legitimate.

In effect the crisis of 1866 ended up being a turning point. As we argued in earlier joint research with Vincent Bignon, the adoption of a "modern" policy of "lending of last resort" (materialized by generous lending against good collateral) consolidated precisely at this time (Bignon, Flandreau, and Ugolini 2009). The result was the adoption of "Bagehotian" principles for lending of last resort. These had been expounded in *The Economist* during the 1840s (before Bagehot's time) and then, with increasing assertiveness, during the 1860s, by Bagehot himself. These ideas came to be organized in *Lombard Street*, a book published in 1873. The book advocated generous liquidity support to the money market in periods of crisis. This begs for a greater research effort to provide for a better understanding of the how and why of this revolution. But it is fair to say that little recent work has been done to understand in finer detail the microeconomics of the Bank of England's lending of last resort. The way it selected bills, the way it protected itself against moral hazard, the way it monitored the market, and so on, are not really known – both qualitatively and quantitatively.[6] We are not aware of any recent study providing an empirical exploration of the relations between the Bank of England and the London money market.[7]

As a result, older accounts still rule. They are of superior quality, and this *per se* has acted as an entry barrier. Classics include important works by historians who discussed in detail the operation of the money market and the Bank of England's relation to it (King 1936; Sayers 1936). Another important work is Sayers' (1968) account of Gilletts, a mid-size bill broker or discount house (the two words were used interchangeably to designate intermediaries in the bill business). Later research by Goodhart (1972) and Sayers (1976) completes the picture.

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[6] . This is in contrast with the situation for some other central banks of lesser international importance such as the Bank of Japan, for which recent econometric work is available (Okazaki 2007).

[7] . Except for some investigations on the determinants of interest rate setting by the Bank of England such as Tullio and Wolters (2003a). For counterpart studies on the central banks of France, Germany, and Austria-Hungary, see Tullio and Wolters (2003b, 2003c, 2007) respectively.

While these works are still outstanding, some recent progresses in the availability of sources open new possibilities. We exploit here two types of ledgers that provide critical information on Bank of England crisis lending. First we use the ledgers for daily discounts, which record, as they occur, the succession of liquidity provision operations the Bank performed with counterparties. Second, we use the customers' ledgers, which were the instruments through which the Bank monitored its exposure to individual risks. As far as we know, neither the daily discounts ledgers nor customers' ledgers have been exploited systematically so far. The reason is that they involve accounts of private customers of the Bank, for which a full embargo used to apply, now shortened to a moving wall of one hundred years.[8] Thus, while known to some previous scholars, this source could not be used as openly as we do it here.[9]

The tremendous value of such material is obvious. When asked by the conference organizers to document the "European background" to the Federal Reserve Act of 1913, we decided to embark on a project that would provide new evidence on the Bank of England's crisis lending before the founding of the Fed, instead of repeating the excellent work of earlier scholars. However, the present paper falls short of fulfilling the initial grand scheme of complete characterization of the interactions between the Bank of England and the British money market throughout the succession of the main crises that occurred in England before the Federal Reserve Act -- namely 1866, 1878, 1890, and 1907. First, we discovered that the amount of work needed to master the enormous volume of information in the Bank's ledgers was beyond reach. Any reasonable project was to adopt, by virtue of necessity, a substantially less ambitious perspective. This explains this paper's focus on the Overend-Gurney panic of 1866, and if consolation is needed, we argue that this is when and where it all began. Second, working with the Bank ledgers cannot control for the self-selection involved in presenting given financial instruments to the discount window. The view we give of the money market must by construction be partial, and the only defense is that the central bank's perspective to the matter remains crucial and that future research ought to provide further scrutiny of our main findings.

The methodology in this paper is the following: We provide a statistical exploration of the financial instruments the Bank of England purchased during May 1866 (the month when the so-called Overend-Gurney crisis of 1866 peaked) and compare it with a "normal" month exactly one year earlier (May 1865). By combining these two pictures ("normal" and "crisis time"), we seek to understand better the changeover that occurred either in the type of instrument or of the type of customer. There are three key findings. First, we discover the considerable importance of the non-bank counterparties for the

[8] . This rule has an effect on study of the 1907 crisis. Since some ledgers contain material covering the period after 1910 (and thus still embargoed), the Bank remains reluctant to communicate them today.

[9] An exception is Sayers (1968), who was shown by Bank of England archivists the entries for Gilletts in the Bank's "Brokers Ledger". Having been commissioned a history by Gilletts themselves, he had most probably been provided the needed clearance, thus releasing the Bank from its confidentiality duties towards customers. As a result, Sayers was able to document the episodes when Gilletts sought Bank of England support (as rarely as possible). Sayers (1968, pp. 55 ff) also notes that his *Bank of England Operations* "had not the benefit of access to the Bank's records, but fits tolerably well with Gilletts' transactions at the Bank, inspection of which has now graciously been allowed by the Bank".

Bank of England's operation during crisis periods. This can be put in relation with the importance of the present shadow banking system and the way the central bank can end up being hostage of financial innovation.[10] Second, we discover that more than two thirds of the bills discounted at the Bank's window had been originated abroad, i.e. had been issued by foreign correspondents of British banks. It is a striking feature that the staple instrument for the conduct of British monetary policy and crisis lending was related to foreign trade. Last, we emphasize the importance of central bank's supervision in fostering the liquidity of certain instruments. We suggest the "trade acceptances" were convenient instruments to supervise and this is why they ended up as the chief support for liquidity provision. This last result, we conjecture from the first two points and from our evidence, rather that "demonstrate" properly speaking. We leave it to future research the task to further investigate our conjecture. But if it's true then it suggests that the root of the special status of sterling was not international trade but Bank of England's supervision.

The remainder of the paper is organized as follows. Section I reviews our new source in relation to the operation of the money market. Section II explores the rise of the "shadow banking" system in England until the crisis of 1866. Section III looks at who came to secure cash in 1865 and 1866. Section IV explores what was brought in. We end with conclusions.

Section I. The London Money Market and Bank of England's Ledgers

Conventional descriptions of the set of instruments comprised under the heading "British money market" traditionally emphasize the role of acceptances. Acceptances were bills that one merchant or banker (the drawer) had drawn on another merchant or banker (the drawee) and that the drawee had "accepted" by putting his signature on the bill. Prestigious drawees were leaders in the acceptance business and sold their signature for a fee. Previous literature has emphasized the role of "merchant banks" but also of some British foreign and colonial banks as key providers of acceptances, and mention the presence of some private and joint-stock banks although their importance is said to have only started much later (Jenks 1927; Chapman 1984). From that point, conventional accounts suggest, flowed a kind of "circuit" whereby the acceptances (initially supplied by correspondents of leading British merchant banks and then certified by those very merchant banks) were purchased, through the agency of bill brokers, by large commercial banks, for reserve purposes. Bill brokers, it is said, were also invested in these acceptances for their own account, using resources they collected through "call loans" (essentially, time deposits) from the commercial banks. In case of crisis commercial banks would secure liquidity by going to the Bank of England and re-discounting the acceptances they held and get cash in return. They called back their deposits with the bill brokers who would have had to

[10] . On the shadow banking system, see Gorton (2010).

unwind their own balance-sheets by discounting bills with the Bank of England, in order to meet the cash requirements of the commercial banks.[11]

While this description will receive serious qualification later on, it has a heuristic value as a starting point. It helps understand that the Bank of England's discount window was a bit like the pond in the savannah – the place where the wild beasts of the money market come to water. Data pertaining to what was happening at the discount window has rich informational value. In this paper we exploit information on the London ledgers of the Bank of England, in order to provide a detailed picture of the Bank's lending of last resort activities.

It is convenient to think of the individual operations between the Bank of England and its customers as "security-for-cash swaps". There were two types of swaps. In the first case, called "discounts", the Bank made an outright purchase of a security or "bill". The second case, known as "advances", amounted to a modern repo operation: the Bank took in bills or bundles of bills ("parcels"), but the counterparty was understood to repurchase the security from the Bank at a given date.[12] Advances were secured by the security given in repo, to which a haircut was added (and alas, at the current stage it has proven impossible to us to get systematic data on the haircuts). As decades passed, the number of securities eligible for advances increased but for the period under study, advances could be made on acceptances or on government stock such as Consols (for "Consolidated", as British government bonds were known) or on gold-denominated, British government guaranteed, Indian government bonds.[13] Discounts on the other hand, were exclusively based on acceptances. They were secured by the signature of both the discounter and the acceptor and by the underlying "real" asset (commodity) that had led to the credit operation.

Not anybody could come at the Bank of England's window. The Bank had a list of eligible discounters. In London (on which we focus here) discounters could be any kind of firm involved in "trading" (i.e. commerce or industry) merchant banks, commercial banks, and bill brokers. To become eligible, one had to be recommended by some authority and the so-called "rating books" bear mention

[11] . Withers' report for the National Monetary Commission, (Withers 1910, pp. 53-55) is thus characteristic when it emphasizes that the business of acceptance is "largely in the hands of the leaders among the old merchant firms, whose acceptance of a bill stamps it at once as a readily negotiable instrument" and states later on (Withers 1910, p. 61) that "the discount houses in London carry on a business that is chiefly ancillary to that of the banks".

[12] . The practice was quite old and seems to have developed along with other discounting facilities. In early times, the statistical separation between "discounts" and "advances" was not always available. C30/3 for instance only gives the breakdown from 1853 onwards.

[13] . Bagehot (1873) complained that railway bonds ought to have been included as well. At the time of the National Monetary Commission, these included all securities traded on the London Stock Exchange except those relating to mining companies (highly speculative: Aldrich 1910, p. 20).

of the authority that had provided recommendation (often a senior merchant bank or a bank director).[14] There were 438 discounters in 1865, 503 in 1866.[15]

The Bank kept a record of discounters approaching it for cash procurement, regardless of whether it agreed or not to the swap (in the overwhelming majority of cases it did), and then when it agreed to the operation, several entries were created according to a very meticulous system, bearing witness of a careful monitoring of risks and exposure by the Bank of England. First, there was a Bank of England's window's journal. Day after day the so-called "daily discounts" ledger entered individual discounters' applications as they came. As an excerpt from May 3rd, 1866 shows (Figure 1) the information recorded included the number of bills brought in for discount by individual discounters, the rate, the name of the discounter benefiting from the discount or advance, the amounts discounted or advanced, the number and amount of bills rejected if relevant, and a "remarks" column that could be used to give reasons for rejecting the application. In the example displayed, reasons for rejecting a bill included "sighting altered" (suggesting a poor-looking bill, perhaps a forgery) and "beyond 95 days" (usually the Bank restricted its discounting to bills with less than three months to run).[16]

Consistently with the evidence in the "rating books", the Bank controlled its exposure on a per customer basis and every operation -- discount or advance -- was reported in individual accounts in discounters ledgers which organized by institutional types as we explain below. Because the discounting of bills was secured by both the acceptor and the discounter two entries were created each time a bill was taken in: one in the discounter's account and the other in the acceptor's. Discounter ledgers were manifestly used to monitor "at a glance" the position of customers: they did show, for each entity, the outstanding amount of credit secured, or guarantees provided, by that entity, through advances, discounts, or as acceptor.

Figure 2 shows the entry for Bischoffsheim & Goldschmidt, a merchant bank, from March 1866.[17] As can be seen, for each security-for-cash event the ledger documented several characteristics: the place where the drawer of the bill (if the event involved a bill) was located (1st column), his name (2nd column), the date of the liquidity provision event (3rd column), the page where the account of the "other signature" was kept (i.e. the account for the acceptor if Bischoffsheim was the discounter or the account of the discounter if Bischoffsheim was the acceptor) (4th column), the name of the "other signature involved" (whether acceptor or discounter) (5th column), the maturity (6th column) and

[14] . These are found in ledgers from the discount office archive, bearing the title: "Rating books, showing each discounter's credit limit". These handwritten "rating books" were updated when needed and bore many corrections until a wholly new rating book was issued and in turn updated, corrected etc.

[15] . BoE Archive C30/3. It is impossible from the source we used to know whether the number corresponds to eligible discounters or those of the eligible discounters who sought discounts from the Bank, although we suspect it is the former.

[16] . The daily "discounts" also contain convenient monthly and yearly recapitulations, with some useful totals, such as the aggregate value of applications received, rejected, a breakdown of advance and discounts, and occasionally, some additional evidence such as the breakdown between bills drawn by a domestic bank or by one located abroad and known respectively as "inland" and "foreign" bills.

[17] . Bischoffsheim & Goldschmidt was a merchant bank and is thus found in the discounters ledgers or C22.

finally, the amount of credit granted by each operation registered in the proper column.[18] As can be seen in the example shown, during the period considered (March-October 1866) discounts of paper by Bischoffsheim & Goldschmidt predominated until late April, and then the Bank mostly took paper drawn "upon" Bischoffsheim & Goldschmidt but presented by other customers.

As said, the Bank did recognize differences among customers and this motivated the use of different ledgers. The "Discounters ledger" (as the Bank called it) included predominantly "merchant banks and trading houses", such as Bischoffsheim & Goldschmidt. It was a mixed bag by nature: merchant bankers being heavily involved in international trade and commodity trade, the line separating "traders" and "merchants" was a thin one. "Bill brokers" had also their ledgers. Under this item were found a variety (though not all) of a number of money market funds variously known as "bill brokers", "discount houses", "discount brokers" or "credit companies".[19] Yet another group, the bankers, initially included in the bill brokers ledgers came to have a ledger of its own (in 1864).[20] These were joint-stock such as the London Joint-Stock Bank or private firms such as Glyn Mills Currie & Co or Barclay & Co. They could be located in London (such as the ones mentioned above), in the rest of the Kingdom (such as the Royal Bank of Liverpool), in colonies (such as the Union Bank of Australia), or abroad provided they had a London branch (such as the Imperial Ottoman Bank).[21] Finally, there were a number of bills that had been drawn on acceptors who were not customers of the Bank (probably because the guarantees offered by the discounters were considered as sufficient, or because the acceptor, while not a customer with the Bank was considered to be of a sufficiently high standing). With so-called "upon ledgers" we are able to track most of the material that was taken to the Bank.

II. The Shadow Banking System and the Crisis of 1866

As noted earlier, Withers called the bill brokers "ancillary". They are the Cinderella of the reports to the National Monetary Commission, perhaps because, by the late 19th century, they had managed to

[18] . That is, in the "With" column if Bischoffsheim & Goldschmidt was the discounter, and "Upon" if it was the acceptor, controlling for whether the operation was a discount or advance.

[19] . Effingham Wilson's *Bankers' Almanac* of 1866 does distinguish between "recognized discount brokers" (i.e. private houses such as Alexanders Cunliffes & Co) and "principal discount and credit companies" (i.e. joint-stock structures that operated as money market funds). Adding up the entries in the Bank fo England ledgers, we find 57 "bill brokers", a subset of which only operated in 1865-66. All of Effingham Wilson's "recognized discount brokers" are listed in the Bank's ledgers. But the Bank of England's bill brokers ledgers has also a large list of private bill brokers not found in the Bankers' Almanac of that year perhaps because they were not yet operative in 1866. Regarding joint-stock structures, only 7 of the 19 "principal discount and credit companies" are in the Bank's ledgers, implying that some of these funds (such as the "Ottoman Financial Association") did not get a discount account at the Bank of England.

[20] . Before that date they were included in the bill brokers ledgers.

[21] . Another group was the "Drawing Office Discounters" that included a variety of merchant banks and other trading customers. For instance, we find Allard (a bullion dealer and refining house) along with industrial concerns such as shipbrokers, brewers, linen factors, but also Crown Agents etc. in "Drawing Office Discounters". For all practical purposes we decided to aggregate the two categories.

become such a perfectly integrated part of the money market machinery that they could go unnoticed. Yet their importance never escaped the attention of the best connoisseurs of the London money market (King 1935, 1936, Sayers 1968). King (1936) has strongly emphasized the role of bill brokers in promoting the market for acceptances in the first half of the 19th century. These were started as private finance companies, with unlimited liability, and essentially acted as money market investors. They looked for safe instruments but had higher returns (for instance because they came from initially segmented markets). Gradually, their prudent policy and excellent reputation enabled them to attract deposits at low rates. In the late 1840s, two private firms, Overend, Gurney and Alexanders emerged as leaders of this industry. They had very large credibility and are generally described (though we lack reliable figures) as a having captured an increasing market share. The resulting leverage which was increased over time boosted returns (King 1935 gives ratio of capital to deposits as 1 to 10-15 in 1847 and rising). Partners had the reputations to have amassed "fabulous fortunes".[22]

In a first stage the development of bill brokers is said to have been wholeheartedly supported by the Bank of England. King and Clapham argue that the growth of the money market in London occurred when the Bank of England permitted certain chosen bill brokers to open discount accounts.[23] When the brokers sought liquidity, they could go to Threadneedle Street and found the Bank ready to swap the bills of exchange they held against cash.[24] Several authors have described the relation between the Bank of England and the bill brokers as symbiotic. There were constant, cordial exchanges between leaders of the industry and the Bank. Another theme we find in the literature is the role of bill brokers as a transmission mechanism for monetary policy. The bill brokers, had large, leveraged, inventories and always suffered when the Bank rate rose because this forced them to liquidate at a loss. According to Sayers (1968), a sudden hike in the Bank of England's rate could easily wipe out one year's profits. As a result, when an interest rate increase was in sight, bill brokers covered themselves by pushing lending rates in the open market, thus making the Bank rate effective ahead of actual changes.[25]

In the late 1840s however, an adversarial relation developed and further deteriorated after the crisis of 1857.[26] As was declare in a subsequent Parliamentary Committee the Bank found that, during the crisis, about 36% of London advances had been made to bill brokers "partly upon securities which, under other circumstances, the Bank would have been unwilling to accept".[27] This large number contrasted with the smaller figures that were observed in normal times, when bill brokers tried to minimize their refinancing and reserves at the Bank of England.[28] The Bank decided that the brokers

[22] . *Bankers' Magazine* about Samuel Gurney, quoted in King (1936, p. 217).
[23] . See King (1936, pp. 68-69 and 89-90) as well as Clapham (1944, Vol. II, p. 142).
[24] . Focusing on the 1830s, Tamaki (1974) describes a system whereby bills drawn by US correspondents on Barings could be invested upon by Gurney & Co, who could then get refinanced at the Bank of England.
[25] . This was even recognized by Withers (1910, p. 63).
[26] . King (1936) relates to the new statutes resulting from the Bank Act of 1844
[27] . See King 1936, p. 200, who relies on the report of the Select Committee on the Operation of the Bank Act 1858.
[28] . They earned money from leverage and the difference between the lending rate and the rate at which they secured funds, so any balance at the Bank of England or rediscount there was a loss of money.

were free riding on the Bank's window. This concern, according to Bagehot (1873) and to a number of other contemporary and subsequent writers was amplified by directors' preoccupation with profitability. The Bank would have suffered from brokers' competition and was thus less and less willing to help them out in difficult times. Insurance they would be bailed out by the Bank, it was argued, made them even more aggressive in normal times. As a result, the Bank inaugurated a new rule that banned bill brokers from discounts and, practically, advances too.[29] Support in crisis times was not excluded, but the Bank would see.

This led to an era of conflicting relations and King has argued that the "'sixties therefore, were marked by a pronounced lack of co-operation between the Bank and the bill market".[30] Verbal threats and retaliatory moves followed. The Bank was said to be discriminating against bill brokers. The heart of the confrontation was with the leading discount house (Overrend, Gurney). In 1860, in an act of defiance Overend, Gurney withdrew from their account at the Bank "no less than £1,650,000 all in £1,000 notes". The Bank had no other solution than to raise brutally the interest rates, causing chaos in the money market.[31] Interdependence between the Bank and the market was a two-way street. Leading discount houses then decided to virtually ignore the Bank and refrain from borrowing. The decision by the Bank of England to provide separate discount ledgers for bankers and bill brokers in 1864 may have reflect the Bank's attempt to ring fence the bill brokers.

The full story of the money market during that period remains to be written. An issue that emerges clearly from earlier accounts is that the Bank was preoccupied with what we would call today supervisory and prudential issues. The decade from the mid-1850s saw the expansion of international trade and the increased role of British capital in funding it. The liquidity of the London market gave it a competitive edge for both imports and exports. Reflecting the initial illiquidity of a number of trading niches, merchant banks moving into trade acceptances secured large commissions, which they could get without immobilizing any resource, provided that there were ready buyers for the bills.[32] Continental merchant bankers moved to London to avail themselves of these enormous benefits and joint stock banks with an international orientation were created in the 1860s.[33]

Attracted by the fortunes of the early leaders in the field, and pushed by the resulting supply of bills, which looked for holders, money market vehicles were created in the form of joint stock discount companies that took advantage of the new limited liability law. It is not impossible, when one looks at the name of the sponsors of the new companies to surmise that in many cases, the vehicle

[29] . Only a lifeline to advances routinely made during "shuttings" (i.e. when dividends on British debts were paid) was maintained.
[30] . King (1936, p. 216).
[31] . This was abundantly discussed in the contemporary press. See the famous discussion in Bagehot (1873). See King (1936), p. 213 for details.
[32] . For instance, Roberts (1991, pp. 527-537) reports figures suggesting that fees on acceptances (which involved no immobilization of capital provided that bills could be readily sold) were as large as 1.5% in the early 1860s. This large number is consistent with figures for commissions, which are said to have varied from 0.5% to 1.5% and shows how specialization in a new market could put a merchant bank close to the upper bracket.
[33] . See King (1936, pp. 176-7).

were precisely created by the acceptors of bills in order to find a ready outlet for their securities. Companies such as the London Discount, the National Discount the Joint Stock Discount, or later the Discount Corporation, the Consolidated Discount Company the Mercantile Discount Company, or the Financial Discount Company were created. Just like modern money market funds, they were supposed to invest in blue chip bills but often ended up attempting to boost returns by taking more risk onboard -- in the familiar way: They invested in illiquid bills and bonds. It was also said that their limited liability setup made them less vigilant than their private predecessors. There were suggestions of "questionable operations" and adventures in "paper that […] should not have [been] touched".[34] The weakening in investing standards was said to facilitate dubious forms of origination. These included "finance" or "accommodation bills" whereby a firm asked a correspondent to draw on itself without any physical guarantee and then had the bill taken by a broker, the employment of agents to push the bills into discount houses, the creation of a circulation of fictitious credit among networks of suppliers, or the mortgaging of bills with long maturities (which amounted to securing the bill not by a real security, but by another one).

Overend, Gurney & C° had the misfortune to buck the trend. While previously known as a prudent money market fund concerned with "setting its face" against questionable practices, it developed during 1855-65 into something that looked more like a financial conglomerate. Successive failures of companies whose bills it had subscribed led it to end up with industrial assets, which it tried to run for its own account. At one point, Overend owned two miniature fleets that had belonged to Anglo-Greek merchants. The firm was also heavily invested in railway shares and other industrial securities, thus essentially becoming a universal bank. In what shareholders later described as a last ditch attempt to hide its collapse (but judges and WTC King disagree), the firm finally transformed itself into a limited liability company. The stock market collapse that occurred in late 1865 and early 1866 battered the company's balance-sheet. Failure of a number of Overend customers forced the company into further losses. The Bank of England was approached but the "Governor took the view that the Bank could not assist one concern unless it was prepared to also assist the many others which were known to be in similar plight".[35] This was decided after a confidential report was commissioned to investigate whether assistance by the Bank or a consortium of London commercial banks was merited. Desperate calls to other bankers were unsuccessful and at 3:30 p.m., May 10, 1866, Overend, Gurney & C° suspended payment.

The result was the "wildest panic", contemporaries compared the event with an "earthquake" and King writes that it is "impossible to describe the terror and anxiety which took possession of men's minds for the remainder of that and the whole of the succeeding day".[36] Markets seized completely, all transactions were suspended and the only thing people wanted was Bank of England notes or bullion.

[34] . King (1936, p. 228).
[35] . King (1936, p. 242).
[36] . King (1936, p. 243).

Several banks and discount houses stopped payments or came close to it. Meanwhile, the Bank met all "legitimate" demands, lent over £4millions in one day and say its reserve fall by close to £3 millions in the same time. Then the Governors sought from the Treasury the permission to infringe the Bank Act (suspend convertibility), obtained it, raised the Bank rate further and stood ready to provide massive relief. As in previous crises and subsequent ones too, "suspension" of the Peel Act was the signal for the panic to subside.

Section III. Credit in Ebb and Flow: Who Came?

The evidence we constructed in this paper is destined to help us understand better the lending policy of the Bank of England during the crisis of 1866. In this section we begin our foray by documenting the profile and needs of those who came to the Bank of England to get cash. We work with the daily discount ledgers, and identify both volumes and the identity of those who came to secure cash. Because the Bank worried with customers' types, such information is available in the ledgers.

Figure 3a and b show daily (nominal) amounts sought for in either discounts or advances, as well as the amounts rejected for each category, in May 1865 and 1866 respectively (each business day is represented as a bar). As can be seen, lending literally exploded on May 11 when the suspension of the Act was granted to the Bank of England. As a result, the crisis month (May 1866) was characterized by much larger amounts of cash supplied compared to the normal month (May 1865). The share of rejected bills was also reduced in May 1866 compared to its 1865 counterpart. This is suggestive of an extensive role of the Bank of England to support the market. Last, we see that discounts predominated during both periods, but the relative share of advances increased markedly during the crisis and neared half of the amounts provided in the peak of the crisis. The implication is that in crisis times the range of instruments supplied and accepted by the Bank was broadened as people desperately sought to provide adequate collateral in exchange for cash.

The next figures decompose the amounts distributed in discounts (Figure 4a and b) and advances (Figure 5a and b) according to the "institutional" categories identified above. We separate amounts received by bill brokers, bankers, and "ordinary" discounters (which mix together merchant bank and other "trading houses"). Let's begin with discounts (Figure 4a and b). The crisis saw a dramatic transformation in the identity of those who came in. While bill brokers and bankers were virtually absent in 1865, they became very important customers during the crisis. A similar pattern is observed for advances: again banks and bill brokers represent a large share of the amounts advanced during the crisis (Figure 5a and b).[37]

[37] . In aggregate numbers for the entire two months, bill brokers and bankers represent respectively 0% and 2% of the total discounts and advances in 1865, but 21% and 33% in 1866.

The reasons for the changeover in the position of bill brokers and banks is of course natural in view of what we said earlier: Banks faced the risk of a run of depositors and sought to increase their cash holdings. This was secured at a lower rate on the inter-bank market but in case of a panic, this market froze an the only possibility they had was going to the Bank and withdrawing their deposits from other banks and from the bill brokers. Bill brokers, who managed their portfolio of bills with resources from the banking sector had to meet the banks' cash withdrawals. The Bank of England then became the natural counterparty in a vanishing market. There was just nowhere else to go explaining why the Bank had to support the market and why in such instances, it could always expect to benefit from a suspension of the Bank Act as this was the only way to backstop the market. We therefore see why the anti bill brokers rhetoric of the Bank was put to rest immediately when crisis hit: the share of bill brokers in advances made in London during the crisis of 1866 (Figure 5b) is of the same order of magnitude as the one that had been observed during the crisis of 1857. The Bank of England may have had normal times' customers, loyalties, and preferences. But in a crisis it was just impossible to escape the responsibilities laid on her shoulders by the community (and encapsulated in "suspensions" of the Bank Act, granted by the Treasury). While it could continue to tender to its regular customers in difficult times (and we see that discounts and advances to merchant banks and trading houses increased as well), it was also bound to enlarge the size and scope of its liquidity provision operation.

To deepen our foray, we now take a look at the characteristics of the population of customers who came to the Bank's window in 1865 and 1866 to get discounts or advances. This we do by collecting data from the daily discounts ledgers. The results are organized, not on a discount event basis, but on a discounter basis: this means that in case a discounter came several times during that month, we use the total of all discounts made with that customer for that month. As can be seen in Table 1a, there were 269 customers who came to the Bank in May 1865 to get discounts, and 372 in May 1866 (representing respectively 61% and 74% of the Bank's eligible discounters for the respective years).[38] Customers asked for widely varied amounts of cash, ranging from £30 to more than £100,000 in 1865, and from £43.81 to £692,520 in 1866. Reflecting this increase in maximum amounts required, the mean also shot up from about £8,000 to about £27,000 and the median also rose (from about £3,700 to about £5,200). Similar features are observed for the advances, which are reported in Table 1b.

A nice way to capture what was going on is to construct "Pareto curves" of the demand for discounts and advances during the two periods. This is done in figure 6a and b. While in 1866 the 20% largest discounters received 80% of the cash dispensed by the Bank of England (the Pareto rule!), in 1865 the proportion had been only 65% (Figure 6a). A similar pattern is observed for advances: the 20% largest receivers of advances secured above 75% of totals in 1866 but only about 60% in 1865 (Figure 6b). Another way to put it is to note that the top three discounters received 13% of the total in

[38] . The year 1866 saw an upsurge in the number of customers, possibly because the crisis led to an increase in applications. These numbers we compute under the already mentioned assumption that data in C30/3 relate to the number of eligible discounters, not to the number of applicants.

1865, but 18% in 1866. Respective numbers for the top ten are 30% and 36%. In other words, the distribution of funds was more unequal during crises. This is consistent with the view that there was more "commercial lending" in normal times while during crises generous lending to the needy predominated. Last, we also note that this "concentration" of lending should not obfuscate the fact that lending remained quite scattered: the number of institutions receiving significant amounts was not modest (there were more recipients in 1866 than 1865, we found). In other words, central bank lending in crises was both extensive (more aggregate lending to all) and intensive (more relative lending to some).

Of course, in view of the previous finding that the crisis was also characterized by the emergence of certain customers, it is tempting to argue that the reason for the increase in inequality was the arrival at the Bank's window of cash hungry financial intermediaries who sought to secure large amounts of refinancing. To explore this, we delve further in the data and take a look at the identity of the top discounters and recipients of advances. Figures 7a and b and 8a and b show "market shares" (shares in total amounts during the relevant months) of the top fifty institutions receiving the biggest amounts of discounts and advances in May 1865 and May 1866 respectively. As can be seen, the evidence fully confirms the impression we had from earlier pictures. The increase in the share of bill brokers and commercial banks during the crisis, as well as the rise of Gini coefficients, does reflect the arrival of a limited number of customers who asked for (and received) generous credit. In 1865, the top three discounters belonged to the "merchant banks and trading houses" category.[39] In 1866 however, the top three, for much bigger amounts, were two leading bill brokers (private Alexanders Cunliffes & Co and joint-stock National Discount Co) and one private commercial bank (Barclay & Co). A very similar phenomenon occurs for advances. There again, "merchant banks and trading houses" dominated in 1865, while bill brokers and commercial banks led the way in 1866. An interesting feature is the greater lead by banks compared to bill brokers in advances. It may have reflected the fact that it was legitimate practice for banks to hold parcels package by the bill brokers or prime securities. It may be that the non-bill business of the bill brokers, was a harder confession to make to the Bank of England.[40]

Thus the increase in the concentration of discounts during crises was due to the sudden arrival of big requests from institutions that were not regular customers of the Bank – financial intermediaries facing liquidity shocks. In crisis mode, Bank of England lending continued to service the London

[39] . Bischoffsheim & Goldschmidt, Cavan Lubbock & Co, Frith Sands & Co: These merchant banks had, respectively, connections with Continental Europe, Canadian and Indian orientations).

[40] . During the period under study (the 1860s) we get the impression that, other things being equal, advances were made at a more penalizing interest rate, suggesting that the Bank of England did discriminate on the margin against advances. This is said to have been the case in following decades: Withers (1910, pp. 6-7) reports that in his times a customer "taking advances on securities […] usually pays one-half of 1 per cent above Bank [discount] rate".

traders and merchants.[41] But their requests were dwarfed by London financial Gibraltars – both banks and "shadow banks".

Section III. Discounting in Ebb and Flow: What Did They Bring In?

Next, we study what did discounters bring in. This means opening the black box of the money market and getting an understanding of the types of instruments that were allowed to flow freely from the market to the Bank. Data limitation imposes to narrow down the focus of our study to the geography of bills discounted. We thus exclude bills pledged as collateral.[42] Given the statistical importance of discounts, this should nonetheless provide relevant information. Addressing this question breaks new ground. We are not aware of any related previous attempt to uncover the nature of the material traded in the London money market, apart from the discussion by Sayers (1967) of the portfolio of a junior bill broker (Gilletts) at two benchmark dates. Most available evidence we are aware of is qualitative.[43]

Ideally, one would want to get some idea of the "risks" associated with the categories of paper that were taken by the bank. However, for lack of independent, "rating like" assessment of the bills, we are bound to circumnavigate the issue a bit and find indirect ways to approach the contours of eligible instruments. Three questions will guide our discussion: First, we are interested in knowing the respective proportion of domestic vs. foreign bills taken by the Bank. The reason is that the expansion in discount houses was related to the increase in international trade. It would be interesting to know the extent to which the Bank did support this trend in the market.[44] Next we are interested in the identity of the acceptors and in particular by knowing whether the crisis led to distortion in the type of paper that was brought in. Consequently, we are also interested in knowing more about the geography of sterling acceptances. In particular, we would like to test whether it reflected British trade patterns. To the extent that acceptances were predominantly created as a counterpart to trade flows, we expect the Bank of England's material, if it does support the new tendencies in an undiscriminating way, to have reflect underlying opportunities (trade shares). Last, we are interested in the identity of acceptors. Earlier accounts such as Chapman (1984) suggest that the market for acceptances was very

[41] . The large presence of Bischoffsheim & Goldschmidt at a time of active international bullion arbitrage reflects the use by some merchant banks of central bank facilities to conduct their operations (Flandreau 2004, chapters 5 an 6). Ugolini (2010) discusses Bischoffsheims' bullion business.

[42] . Advances are not systematically documented by our sources. This is because some material was made of bundle of bills called "parcels" that were "unpacked" in statistics, because other securities than bills were not documented, and because (reflecting this) the handwriting for advances is often frustratingly bad.

[43] . Such as the discussion in Bagehot (1873) that during the 1825 crises "anything" had been brought to the Bank.

[44] . This would also have independent value for discussion of the aggregate supply of inland and foreign bills. This matter is not well-known. King (1936, p. 271) argues without quoting numbers that "the decline [of the inland bill at the expenses of foreign bills] may be said to have begun shortly after the 1857 crisis, although it was not until the 'seventies that it became at all marked". Later scholars have argued that the growth in the use of foreign bills as opposed to inland bills was a later phenomenon, tied to the "amalgamation movement" in British banking of the late 19th century (Nishimura 1971).

concentrated, reflecting the quality of a limited number of signatures.[45] One interesting issue would be to determine whether the Bank of England delegated to prestigious acceptors the responsibility for screening the bills (in which case it would tend to concentrate its discounts on a few high prestige signatures), or whether instead it sought to diversify its exposure (in which case we would expect the Bank to buy bills endorsed by many different acceptors).

As discussed in Section I, the location of the drawer and thus the geographical origin of the bill was documented in discount ledgers. In the Bischoffsheim & Goldschmidt entry shown in Figure 2, we can discern (this is in the first column on the left): Saint Petersburg, Alexandria, New York etc. With patience and modern technology (there is nothing that patience and the unlimited magnifying power of zillion pixel pictures cannot do) it is possible to reconstruct most of the geographical origin of the bills. Provided that a proper sample is constructed (and the appendix provides insights on how we proceeded), we should in principle be able provide answers to the questions we raised. In what follows, we exploit information for two separate samples, corresponding to the portfolio of bills discounted by the "top discounters" and "top acceptors", respectively.

a) The Inland/Foreign Split

We begin with the inland/foreign split of Bank of England's discounts. That is we document the share of the value of bills drawn from abroad in the value of total discounts by the Bank of England. Using both the "top discounters" and "top acceptors" we found that the share of foreign bills was huge in 1865 and 1866. The percentage of foreign bills is 85% in 1865 and 63% in 1866. With the "top acceptors" sample, the proportions are 89% and 86% respectively. Beyond the difference across samples discussed below, the evidence provides strong supportive evidence for the foreign orientation of the prime material traded in the London money market (and thus willingly taken in by the Bank).

For comparison, Clapham (1944) provides relevant material for the early 19th century. We also found a number of totals computed by the Bank of England itself and reported in the last pages of the Annual Volumes for the Daily Discounts (1854, 1855, 1856, and 1859).[46] Figure 9 summarizes the evidence and bears witness of a drastic progression in the share of foreign bills compared to the beginning of the century and accelerating during the late 1850s and early 1860s. We should also note that paper drawn from London or England ("inland") was not unrelated to foreign trade. In fact an important source of domestic paper, we'll see, was Liverpool, which was in the habit of drawing on London to finance shipping with the United States.[47] In other words, the data emphasizes that the development of lending of last resort operations is intrinsically related to the growth of trade finance.

[45] . There is disagreement, however, as to when this concentration occurred. King (1936, pp. 280-281) suggests that this only occurred after 1870. He argues that other banks (private and joint-stock) were also active in the market of acceptances, but less so – and only later in the century. Chapman (1984, pp. 39-41) believes in a fairly early concentration of the market for acceptances (as early as in the 1830s). A conventional view in previous work is that when the amalgamation movement occurred in the 1890s, the giant clearing banks also became large suppliers of acceptances – although here again it is usually said that merchant banks' material still reigned supreme.

[46] . Details in appendix.

[47] . Hidy (1949), Perkins (1975).

And if stories that the growth of discount companies was motivated by the concern with taking advantage of expanding trade finance, we are bound to conclude that the Bank of England certainly did not resist the trend.

The second interesting feature from our data is the fact that during the crisis of 1866, the relative share of foreign bills in the discounters' sample declined (but their total increased a lot). This reflects the fact that top acceptors in the London market were specialists in foreign bills unlikely to change their specialization in the event of a crisis. Therefore, the relative decline in foreign bills in the discounters' sample during the crisis month (very relative, as it nonetheless remained a hefty 65%) does reflect the scramble for cash and the use of domestic bills that did not normally reach the central bank. This is reflected by the rise in the *number* of acceptors with a greater domestic oreintation. Using our "top discounters" sample, we found 369 identifiable acceptors in May 1865, but 1055 in May 1866: this increase is much more substantial than the increase in the number of discounters (see Table 1a).[48] Figure 10 looks at the domestic/foreign decomposition of the material turned in by "bill brokers", "commercial banks" and "merchant banks and trading houses" in 1865 and 1866. As can be seen, the increase in domestic material occurred across the board, and was fairly homogeneous across categories. Therefore, the increase in domestic paper had not so much to do with changes in the identity of discounters, but with the fact that customers brought to the Bank instruments that were normally traded on the inter-bank market.

b) Key Acceptors

Tables 2a and b document, for each period, the ranking and the market share of the biggest acceptors in the "top acceptors" sample. As can be seen, both ranks and market shares are rather stable. Since this corresponds more closely to the biggest acceptors in either period of both, the suggestion is that, unlike the identity of discounters, the identity of acceptors (i.e. the composition of what was brought, in terms of accepting houses) was stable.

One major finding that emerges in Tables 2a and b is that merchant banks hardly represent the only, let alone the main, source of acceptances.[49] Contrary to what has been often emphasized, several commercial banks were a prominent source of acceptances in this early period. This seems to be in blatant conflict with accounts that have emphasized the undisputed role of merchant banks in this market. Of course, it could be that there is a major selection bias in the Bank of England material. It could also be that the rise of the supremacy of merchant banks was a later phenomenon although scholars usually argue exactly the opposite.[50] Another interpretation is that the market for acceptances was much more diverse and scattered than has been recognized so far and that the Bank of England, rather than delegating to a few prestigious house the responsibility to screen the bills, preferred to diversify its exposure.

[48] . Note that this latter number is vastly superior to that for discounters with access to the Bank of England.
[49] . This result is fully robust to considering the discounters' sample instead.
[50] . See above and also Withers (1910, p. 56)

Next, we ask whether and how things changed with the crisis. We saw that rankings remained stable at the top, but this could go along with many entries at the bottom.[51] Figure 11 documents the market share of the top ten and top three acceptors in 1865 and 1866, and compares it to rankings for discounters. We see that while top discounters controlled a greater share of totals during the crisis, top acceptors lost out.[52] Combined with the stability of rankings at the top, this implies that the crisis saw an increase in the number of small acceptors, as already suggested. This confirms the notion of broadening in the range of paper discounted at the Bank, and again squares with a generous lending of last resort policy: indeed, the range of collateral accepted by the Bank of England was not restricted but expanded during the crisis.

Another interesting thing that can be explored with the help of our data is the way the paper brought to the Bank had been structured. This we do by looking at the material drawn upon a number of leading acceptors. The reason for focusing on leading acceptors is tied to the fact that these will have endorsed substantial values making inferences more meaningful.

There are several ways in which acceptances per acceptor can be decomposed. We look here at geographical make in order to assess whether acceptors were diversified geographically.[53] Results, for 10 leading acceptors are shown in Figure 12a and b.[54] Different acceptors had different geographic bias. One sees for instance the importance of drafts from the United States and Caribbean in Rothschilds' acceptances, or the importance of the US for Barings, or that of the Mediterranean for Fruhling & Goschen. Therefore, the conventional view that bankers on whom drafts were drawn operated in niches, where they had information advantages, is fully supported by the data.

A big finding is that foreign bills were by no mean the hunting ground of merchant banks. The vast majority of paper on the London Joint-Stock Bank or on the Colonial Bank, for instance, was drawn from abroad. Paper on Barings, on the other hand, included a non-trivial amount of domestic drafts. Of course, banks with clear domestic orientation, such as Barclay & Co, show a much greater share of domestic drafts – as one would expect. In fact the real split is with the political arrangements prevailing in the foreign zone(s) under consideration: banks shown mostly drafts from the British Empire (India, Caribbean, Australia, Hong Kong and Singapore), while merchant banks were drawn by correspondents in non-Empire locations (the US, Latin America, the Continent).

c) Geography of Acceptances

To conclude, we now take a look at the aggregate geography of acceptances. Focusing on the "top discounters" sample, we document the spatial breakdown for bills drawn abroad, and compare it with data on the structure of British trade at about the same date. The assumption, implicit in this exercise,

[51] . The numbers we find for the number of acceptors in the two portfolios of top discounters for each period suggest a drastic increase in the number of acceptors.

[52] However, this should not be overemphasized, as the market share of acceptor ranked number one (i.e. the London Joint-Stock Bank) is underestimated (see Table 2b).

[53] . Most accounts suggest they were not (Chapman 1984).

[54] . The selection was mostly heuristic and we do not seek to make any general inference. There are four commercial banks and six merchant banks.

is that there is a sort of "gravity theory" of the material that formed the staple goods of the London market – and which, as a result, was brought to the Bank of England. In other words, regions heavily related to Britain as far as trade is concerned ought to have also drawn more bills on London bankers, and this should be reflected in the composition of the portfolio we study. This is consistent with the notion that the Bank of England did not set its face against the development of the London money market along lines heavily influenced by international trade.

To construct the relevant data, we extracted information on the drawing place for all bills covered by the "top discounters" sample. This painful task was performed for both May 1865 and May 1866. Then we extracted from the RICardo database one cut, corresponding to the geographical composition of British trade for the year 1865. Both databases were then aggregated in the following way. We identified five main geographic areas that corresponded to broad regions with trade relevance for Britain. These were, respectively, the British Empire, Northern European markets (Holland, Scandinavia, Northern Germany, the Baltic, and Russia), Latin America and the Caribbean, the United States of America, and finally "Other" which covers the rest of Europe, non-Empire Asia and Africa, and the Middle East. At a later stage, we shall provide a finer decomposition of this latter group.

The correspondence between trade and finance is shown in Figure 13. While there is no formal criterion to judge the "fit" of the two distributions, the eye impression is indeed one that is consistent with the assumption that trade patterns were closely associated with financial patterns. We think this as quite a striking result: our exploration of the portfolio of acceptances bought by the Bank of England yields a picture which is similar to the one we would reach if we looked at the statistics of the Board of Trade instead. We conclude that the association between international trade and the rise of sterling as an international currency is probably stronger than anybody recognized so far.

Sterling was constructed as an international currency and it occurred during the 1850s and 1860s when both old (merchant banks) and new institutions (joint stock banks) took advantage of the expansion of global trade and of London financial know-how to organize, with the help of a booming "shadow banking system" a large and liquid money market. This is, arguably, when sterling became an international currency and not earlier contrary to what some popular quotes have suggested in the past.[55] To perfect this market, the help of the Bank of England was needed and given the importance finance had for British political supremacy, it is perhaps not surprising that the Bank of England, despite its vituperation against the bill brokers, found itself doing what was needed.

Section IV. Lending of Last Resort and Supervision

The pending question is that of determining whether the Bank of England's policy created moral hazard and how did the Bank manage its exposure. This matter is way beyond the reach of the data

[55] . We have in mind the oft-quoted declaration by Nathan Rothschild that "this country in general is the Bank of the whole world; all transactions in India, in China, in Germany, in the whole world, are guided here and settled through this country". Its quoting by King (1936, p. 264) ensured the sentence an enduring popularity.

exploited here. Moreover, as said, evidence on the procedures used to minimize risk is limited. We know nothing about the exact "haircuts" that were taken when the Bank provided advances to the market. The screening of discounters and acceptors by contrast has left some traces and could be examined somewhat more carefully in future research. But we should not underestimate the challenges involved.

Nonetheless, we volunteer here some thoughts, which represent the "state of the art" on the matter, given informational constraints. Our starting point is the finding by Bignon et al. (2009) that, paradoxically, the making of lending of last resort operations was accompanied with a decrease – not an increase – in central bank's exposure to insolvency in the money market. This, they measure by looking at the amount of outstanding bad debts which the Bank recorded. On this account, the crisis of 1866 was typical of the transition: Very few problems reached the bank, even when the Bank had had intercourse with financial institutions that failed. For instance we found that two of the largest recipients of Bank of England's advances in 1866 were banks that collapsed during the crisis.[56] And yet their collapse did not create substantial for the Bank of England.

We conclude from this that the key element explaining the outcome must have been either a radical transformation in the screening procedures of the Bank of England or a transformation in the type of instruments and security that the Bank was taking in. If a dramatic transformation of screening procedures had occurred, then it would have left some traces, which we were not able to find so far. An alternative is the revolution that occurred gradually in the type of instrument that the Bank preferred. The rise of the share of foreign bills that came to dominate the market during the period under study may provide a hypothesis. We speculate that the reason why the Bank of England became a lender of last resort and could provide generous liquidity was because of the rise in the fully secured business of international trade finance: it may not take a huge credit analysis talent to understand that a shipment secured by the commodity, traveling in a British ship, hoarded in a British entrepôt guaranteed by the importer, his banker, and the drawee in London has little scope for going bad. The Boom in global trade in the 1850s and 1860s and the supremacy British banks achieved in financing it, meant that there was now a large supply a wonderful collateral, on which the Bank of England could lend freely.

Conclusions

This paper has brought fresh light on the relation between central banking, crisis lending, the shadow banking system and the making of sterling as an international currency, providing emphasis on the relation between the Bank of England and the international money market. We used so-far unexplored Bank of England's ledgers to provide a picture of liquidity provision during both stress

[56] . The two banks were Agra & Masterman and Bank of London. See the account provided by *The Economist* in its *Bankers' Gazette* section during the month of May 1866.

periods (May 1866, when the Overend-Gurney panic reached its apex) and "normal times" (May 1865, or one year earlier). Important findings include:

the considerable diversity of discounters, and the even greater diversity of acceptors;

the spectacular increase in amounts discounted by some houses in crisis period, and the concurrent increase in the diversity of the material that was discounted;

the emergence of new borrowers when crisis hit – and among them, the considerable importance of bill brokers: while brokers were not coming to the Bank in normal times, they drew about one third of total cash during the crisis;

the large predominance of foreign bills in normal times, and their relative predominance during crises;

the very diverse nature of the market for bills: many houses, both merchant banks and commercial banks (all with geographical niches) were being drawn upon by a vast array of correspondents;

the lack of a predominant source of acceptance at this date, with leading acceptance firms never controlling more than a tiny fraction of the totals brought to the Bank;

and finally, the overlap between the geographical reach of British trade and the geographical composition of acceptances.

While several of these findings have been anticipated in earlier literature, some actually run counter to modern wisdom (or go on side tracks). For instance, we are not aware of previous scholars having acknowledged the extent to which the assets forming the London money market (or at least the sub-sample found in the Bank of England archive) were so international, at such an early time. From a political economy point of view, it implies an extremely tight relation between the Bank and the trading interests.

Another important feature that emerges from the evidence here is the enormous importance of specialized operators of the London money market, namely the bill brokers. While British writers commissioned by the National Monetary Commission saw them (as already stated) as "chiefly ancillary to banks", we found that their refinancing was a central facet of lending of last resort. Why was it so? Perhaps, given the scattered nature of the products traded in the London money market, there was a serious need for experts to be able to sort bills and construct portfolios, and thus screen, secure, and eventually make ends meet. These specialized dealers did not compete against commercial banks, and as a result they were wholly interested in the success of the market they operated. They provided the Bank of England with a convenient instrument to support the market at arm's length. Conversely, to keep on ensuring the liquidity of bills, given the risk of mismatch, the bill brokers obviously needed the Bank of England just as badly as the Bank needed their knowledge to screen risks. Thus in summary, while international trade provided the necessary condition for a successful market to emerge, other micro-structural features were needed, and they included Bank of England's lending of last resort operations and bill brokers. That this was not emphasized too strongly by British

experts when asked by American policy makers should not surprise us exceedingly. There, after all, laid the secret of making fire.

Archival Sources

Bank of England Archive (London), Cashiers' Department:

C22/27-34 (Discounters' Ledgers)

C23/3 (Drawing Office Discounters' Ledgers)

C24/1 (Bankers' Ledgers)

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Tables 1a and b. Descriptive Statistics for the Population of Borrowers.

Discounts			
May 1865		**May 1866**	
Number	269	Number	372
% of Bank's Customers	61%	% of Bank's Customers	74%
Min	30.00	Min	43.81
Max	100,974.62	Max	692,520.76
Mean	7.999.22	Mean	27,584.59
Median	3,690.00	Median	5,820.18
Total	2,151,791.03	Total	10,261,467.88

Advances			
May 1865		**May 1866**	
Number	25	Number	69
% of Bank's Customers	6%	% of Bank's Customers	14%
Min	1,200.00	Min	800.00
Max	138,000.00	Max	750,000.00
Mean	20,084.00	Mean	74,611.59
Median	10,400.00	Median	20,000.00
Total	502,100.00	Total	5,148,200.00

Source: Authors, from database.

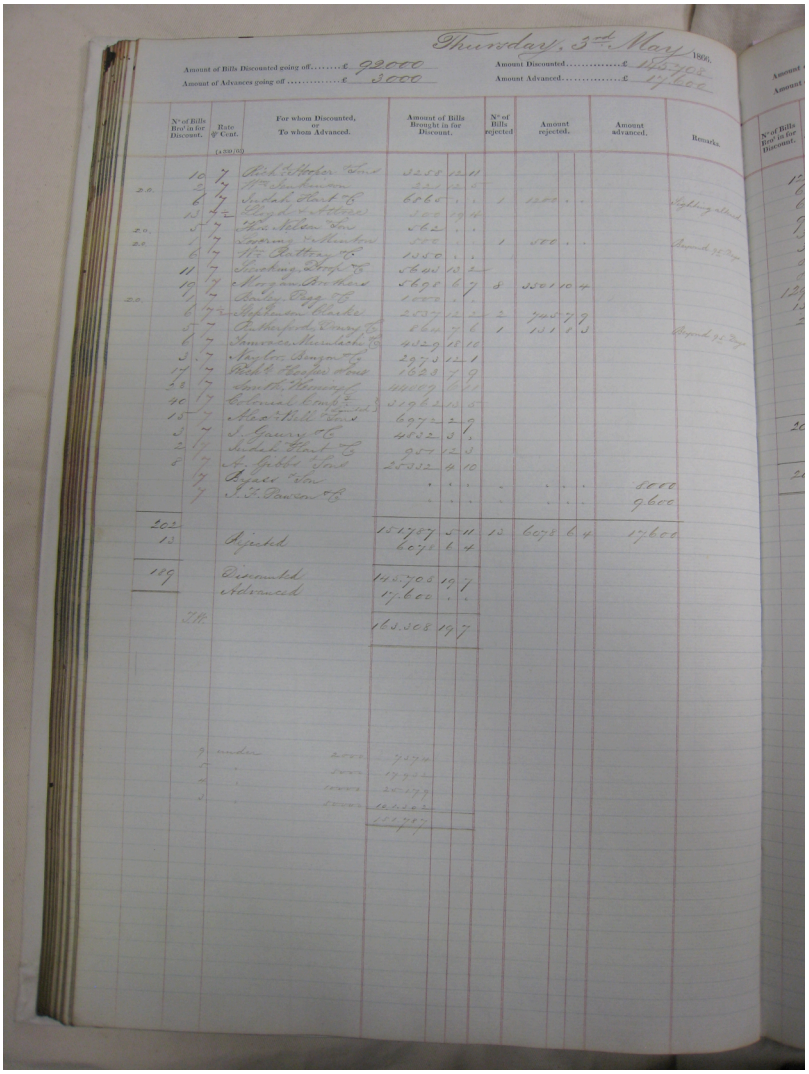
Tables 2a and b. Rankings of top 25 acceptors from the "top acceptors" sample.

May 1865			
1	London Joint Stock Bank	166'862.66	7.75%
2	Union Bank of London	84'419.34	3.92%
3	London & County Bank	69'317.37	3.22%
4	City of Glasgow Bank	52'555.49	2.44%
5	Imperial Ottoman Bank	42'580.81	1.98%
6	Frühling & Goschen	42'560.03	1.98%
7	The City Bank	39'170.67	1.82%
8	Drake Kleinwort & Cohen	29'261.21	1.36%
9	Bank of London	26'359.61	1.23%
10	Agra & Masterman's Bank	24'504.00	1.14%
11	Baring Brothers & Co	21'635.55	1.01%
12	Finlay Campbell & Co	19'216.32	0.89%
13	F Huth & Co	19'029.89	0.88%
14	The National Bank	15'793.46	0.73%
15	Finlay Hodgson & Co	14'456.01	0.67%
16	NM Rothschild & Sons	12'853.00	0.60%
17	Union Bank of Australia	12'498.68	0.58%
18	Dadalhai Naoroji & Co	12'000.00	0.56%
19	Glyn Mills Currie & Co	11'956.26	0.56%
20	Merchant Banking Co of London	11'264.87	0.52%
21	Oriental Bank Corporation	11'139.60	0.52%
22	Moses Brothers	10'200.00	0.47%
23	Colonial Bank	10'179.34	0.47%
24	Alliance Bank	9'101.34	0.42%
25	JH Schroder & Co	8'421.57	0.39%
	TOTAL	777'337.08	36.13%

May 1866			
1	London Joint Stock Bank	637'028.01	6.21%
2	Union Bank of London	474'520.92	4.62%
3	The National Bank	321'824.83	3.14%
4	Frühling & Goschen	279'321.03	2.72%
5	Agra & Masterman's Bank	191'511.83	1.87%
6	The City Bank	188'088.95	1.83%
7	North Western Bank	175'129.64	1.71%
8	London & County Bank	150'793.66	1.47%
9	Baring Brothers & Co	147'425.16	1.44%
10	Royal Bank of Liverpool	146'905.89	1.43%
11	Drake Kleinwort & Cohen	144'033.20	1.40%
12	F Huth & Co	125'467.88	1.22%
13	Finlay Hodgson & Co	123'896.58	1.21%
14	City of Glasgow Bank	96'051.60	0.94%
15	JS Morgan & Co	95'764.03	0.93%
16	Bank of Liverpool	85'577.62	0.83%
17	Ebbw-Vale Company Limited	80'771.80	0.79%
18	Smith Fleming & Co	80'741.91	0.79%
19	Consolidated Bank	80'253.50	0.78%
20	R & J Henderson	77'485.63	0.76%
21	Oriental Bank Corporation	77'025.64	0.75%
22	Finlay Campbell & Co	75'030.05	0.73%
23	Merchant Banking Co of London	72'484.53	0.71%
24	Dickinson W & Co	62'141.31	0.61%
25	Glyn Mills Currie & Co	61'882.74	0.60%
	TOTAL	4'051'157.91	39.5%

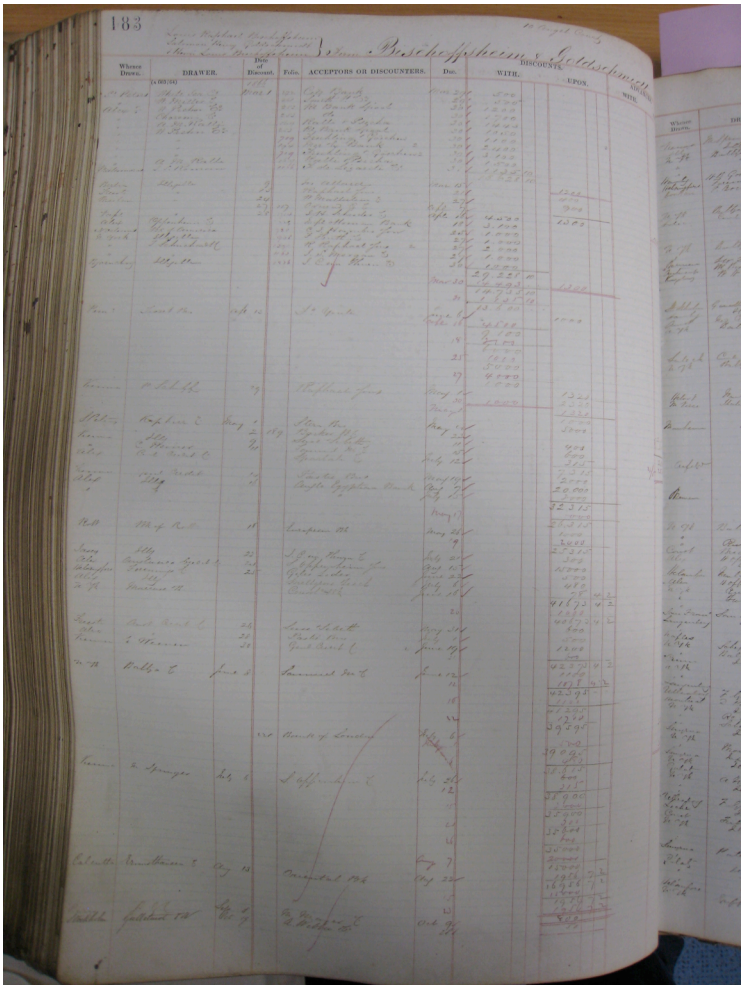
Source: Authors, from database.

Figure 1. An excerpt from the "Daily Discounts" ledgers (May 3rd, 1866).



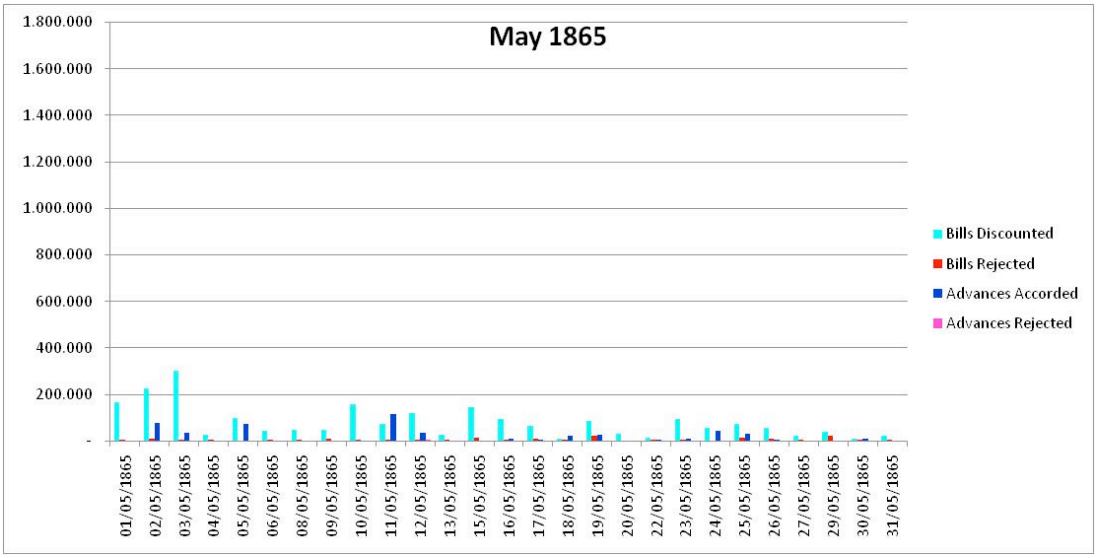
Source: Bank of England Archive, Daily Discounts 1866, C28/26.

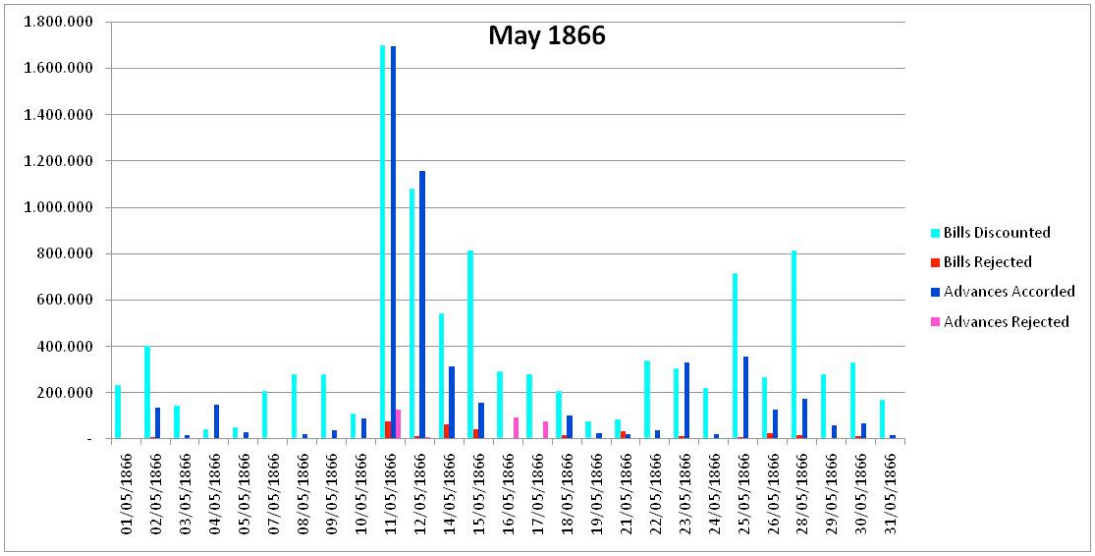
Figure 2. Bischoffsheim & Goldschmidt's entry in Bank of England's "Discounters" ledgers.



Source: Bank of England Archive, Discounters' Ledgers, C22/31.

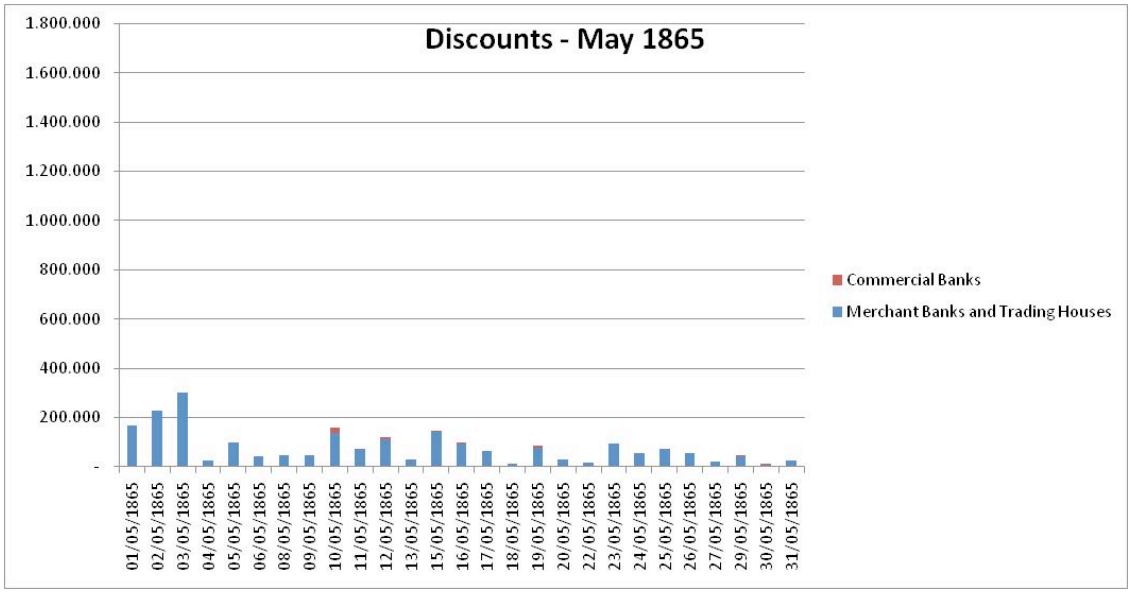
Figures 3a and 3b: Total amounts discounted, advanced, and rejected by the Bank of England.

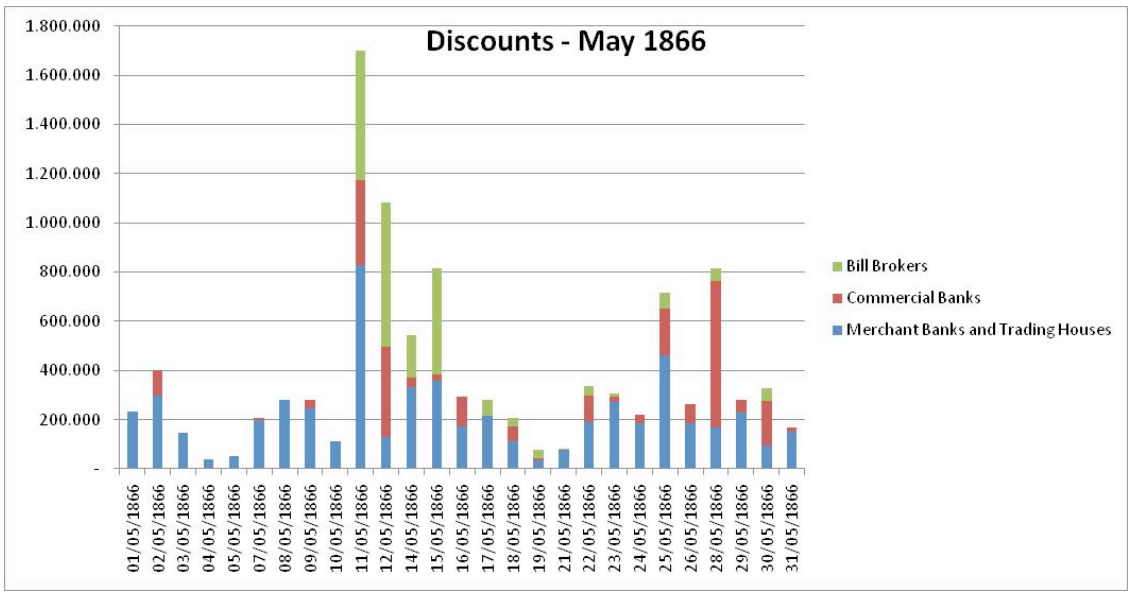




Source: Bank of England Archive, Daily Discounts, C 28/25-26.

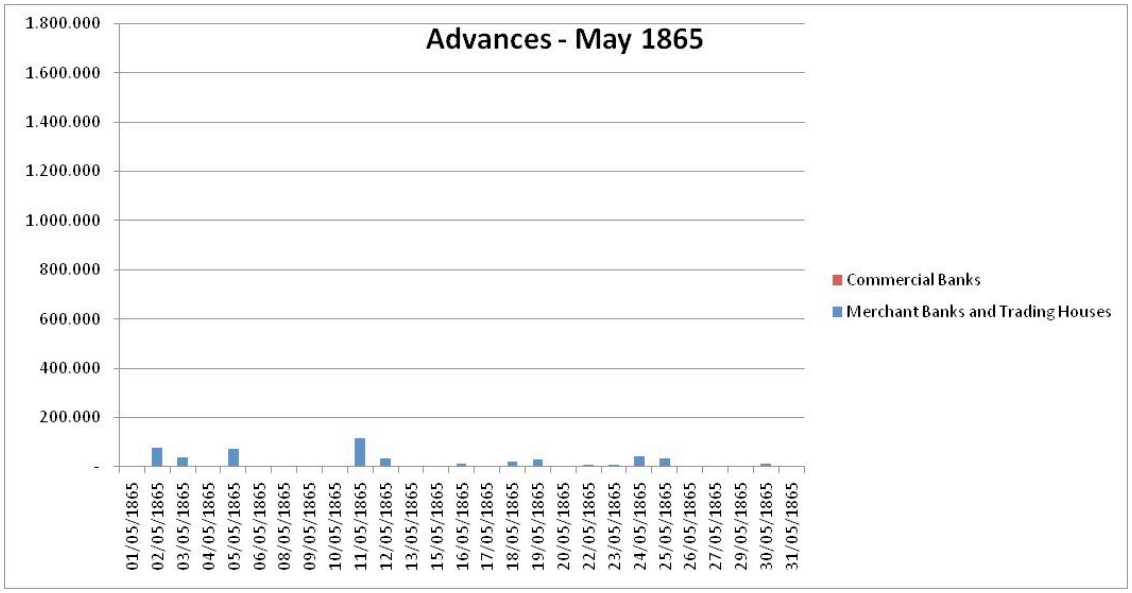
Figures 4a and 4b: Total amounts discounted by the Bank of England, per type of customer.

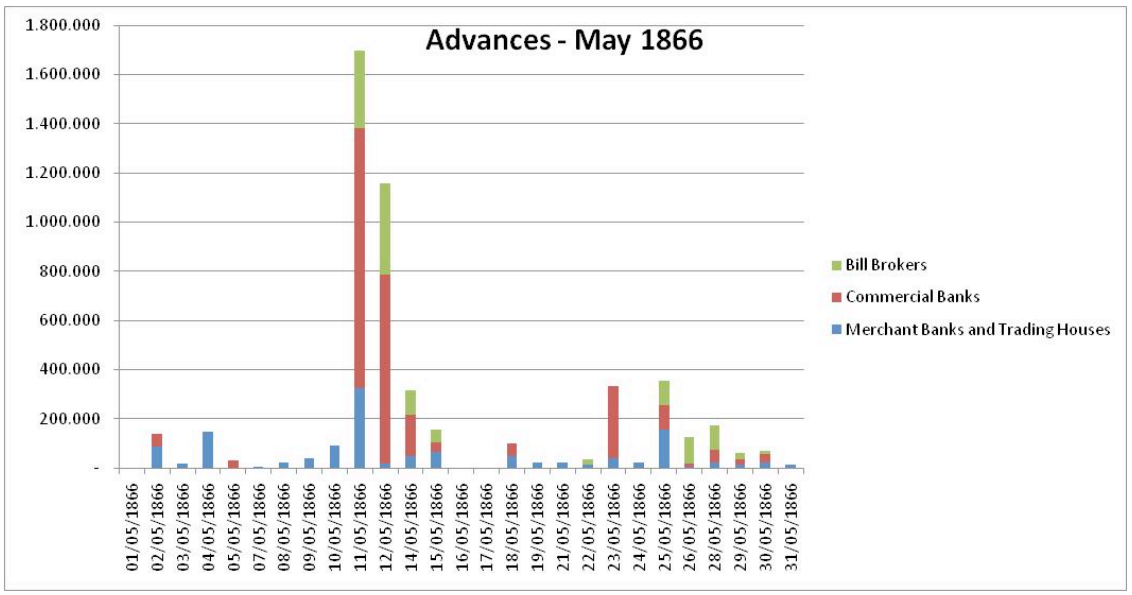




Source: Authors, from database.

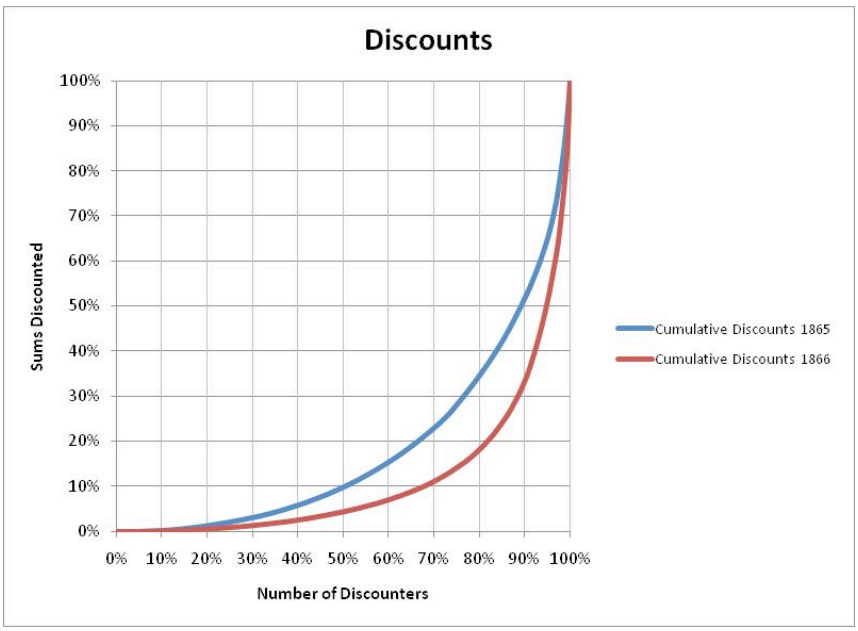
Figures 5a and 5b: Total amounts advanced by the Bank of England, per type of customer.

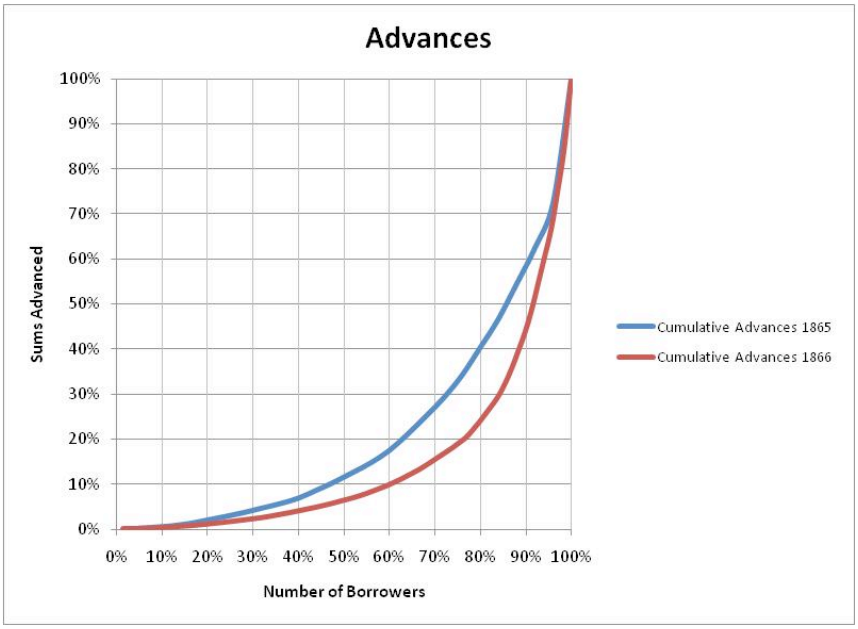




Source: Authors, from database.

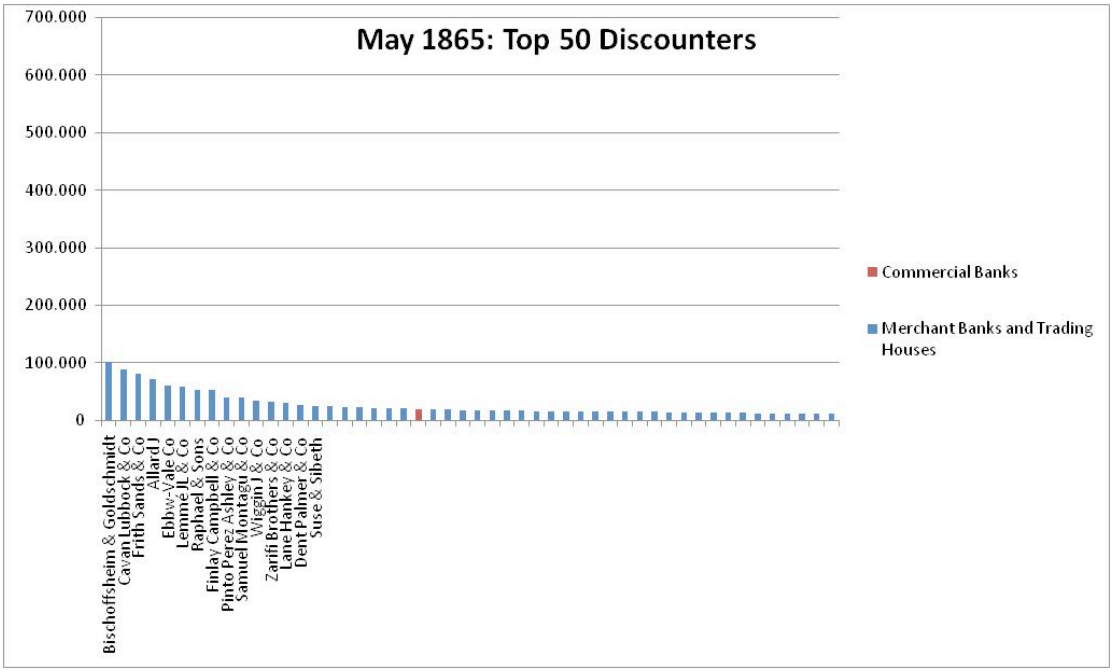
Figures 6a and b: Pareto curves for borrowers at the Bank: cumulative proportion of loans by x% smallest borrower.

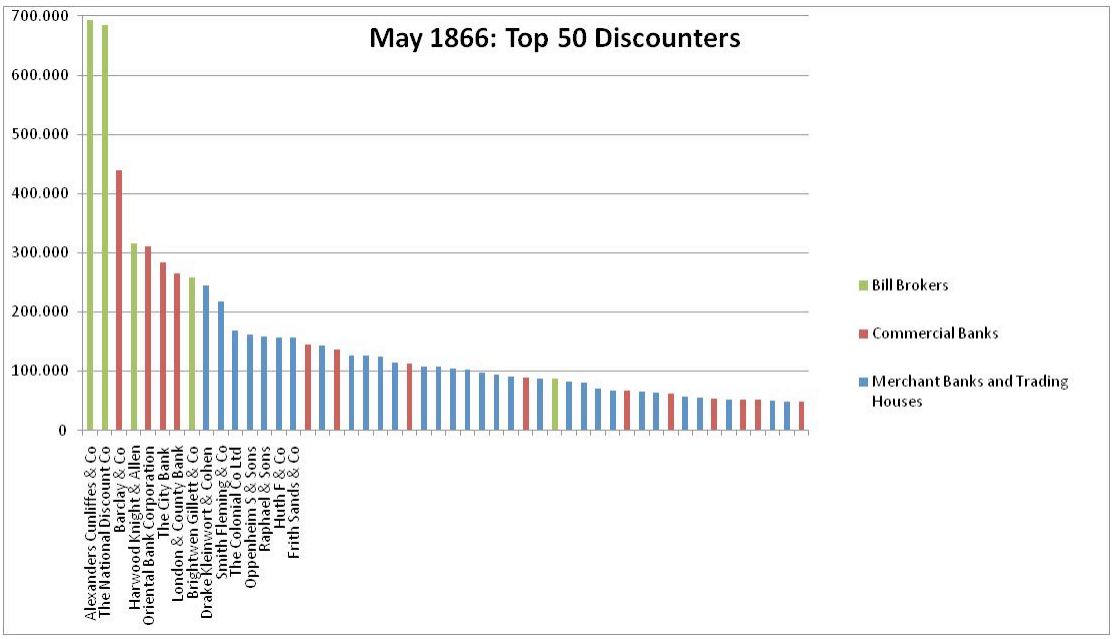




Source: Authors, from database.

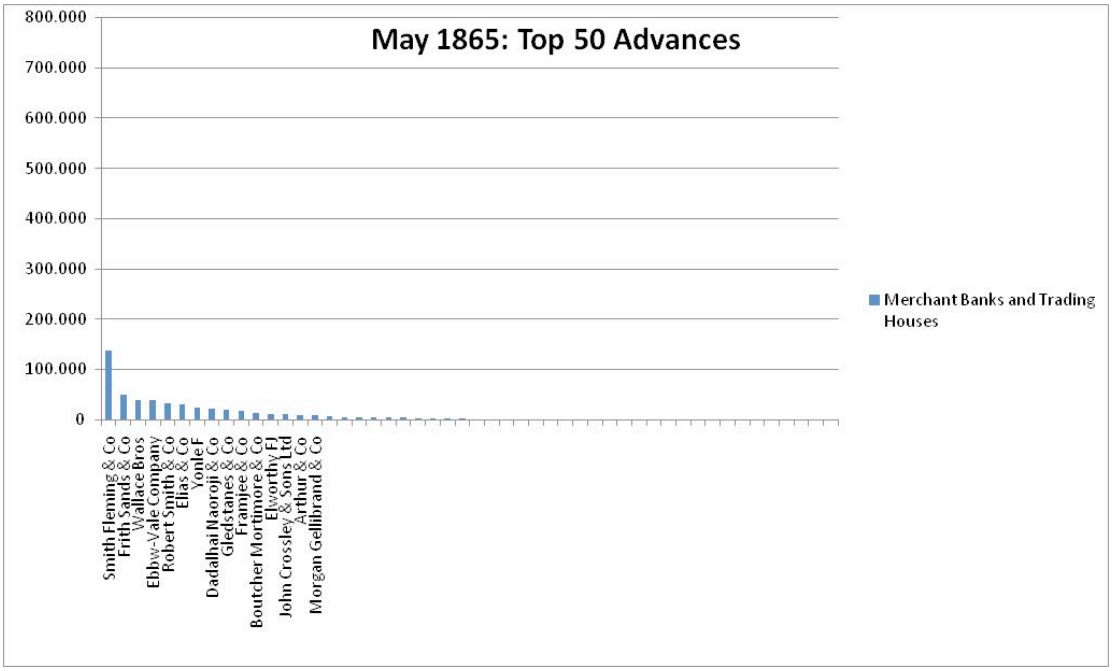
Figures 7a and b: Top discounters at the Bank of England, per type of customer.

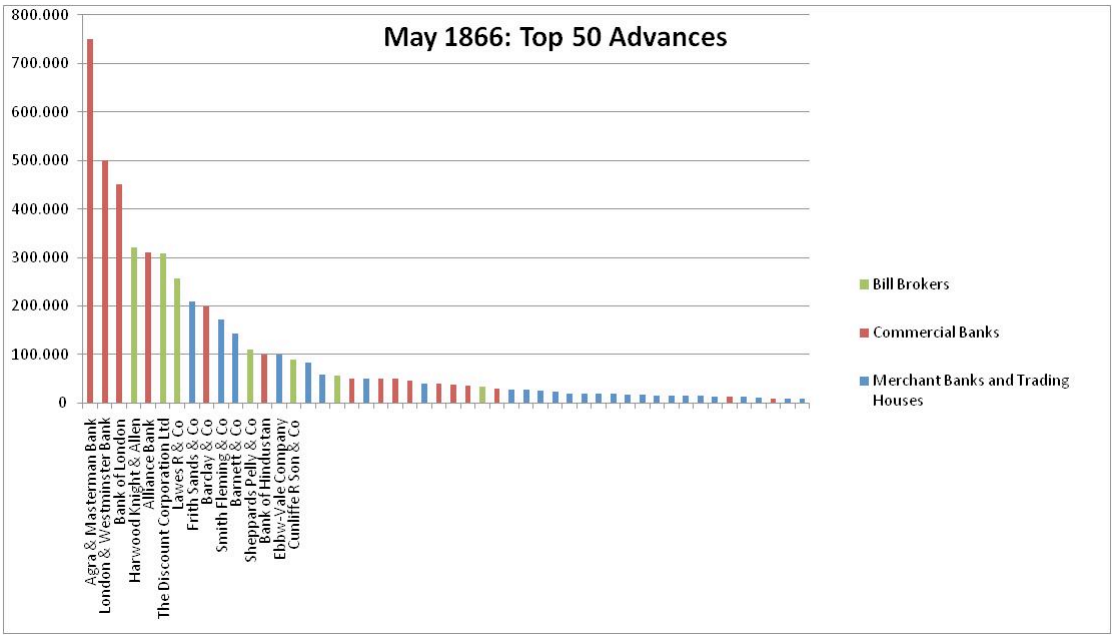




Source: Authors, from database.

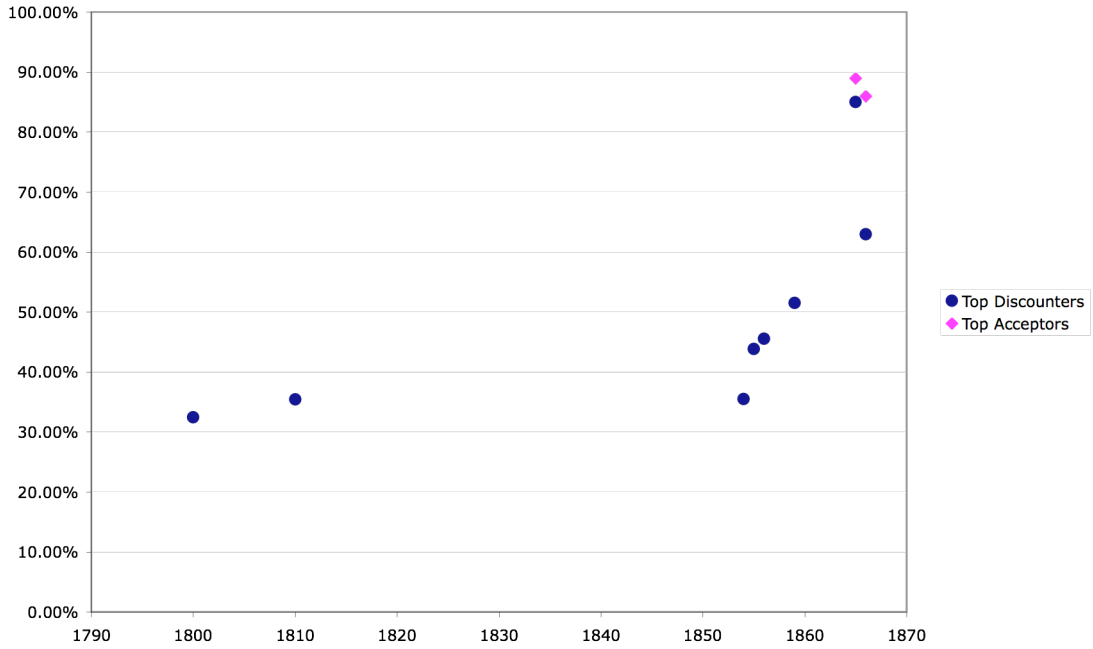
Figures 8a and b: Top advances at the Bank of England, per type of customer.





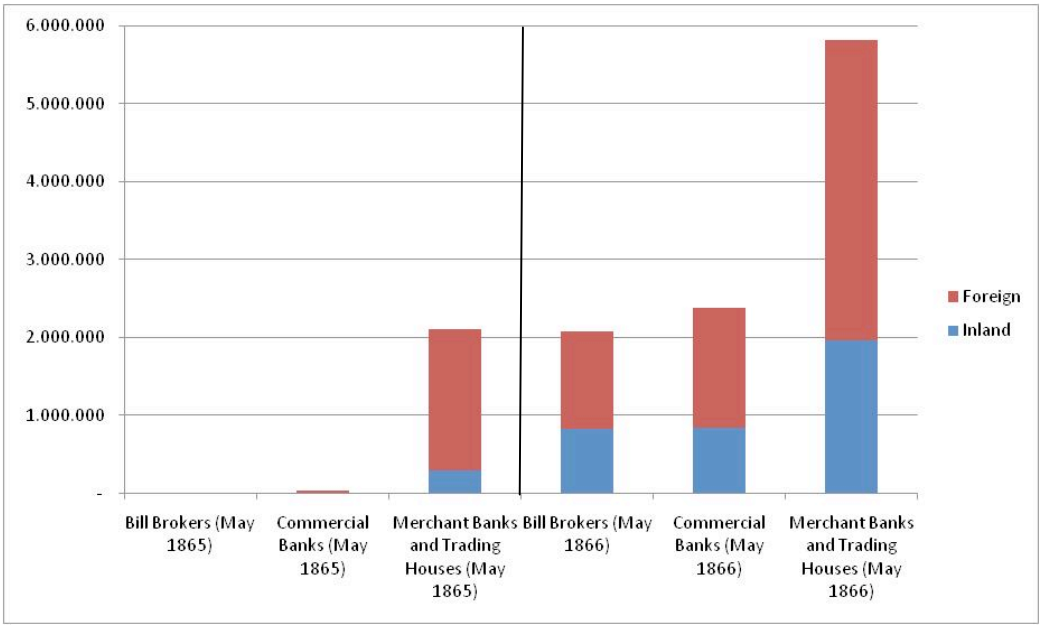
Source: Authors, from database.

Figure 9. Share of Foreign Bills in Bank of England's Discounts



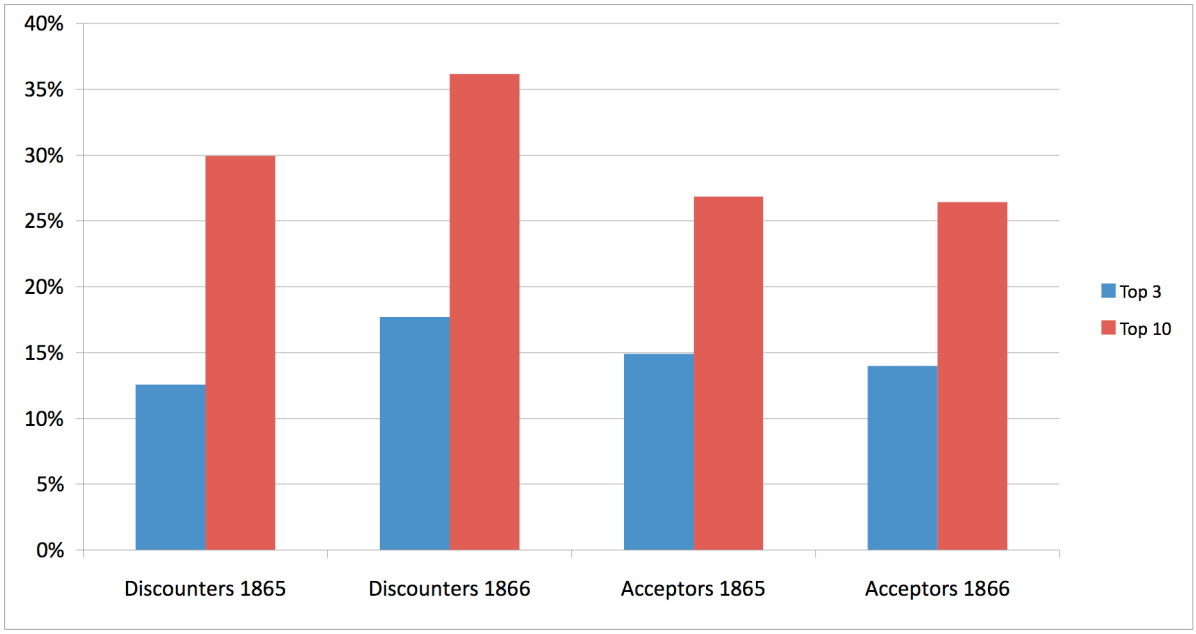
Authors, See Appendix for sources

Figure 10: Breakdown inland vs. foreign bills (estimates are taken from the "top discounters" sample, and then normalized for the true total of discounts provided by the daily discounts ledgers).



Source: Authors, from database.

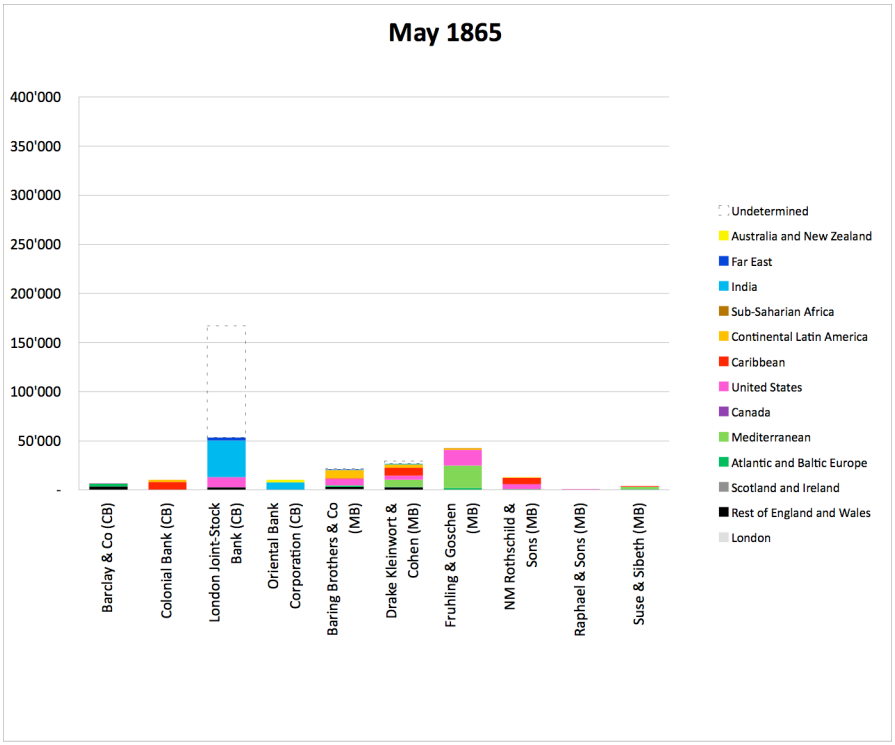
Figure 11. Market shares of top discounters and acceptors.

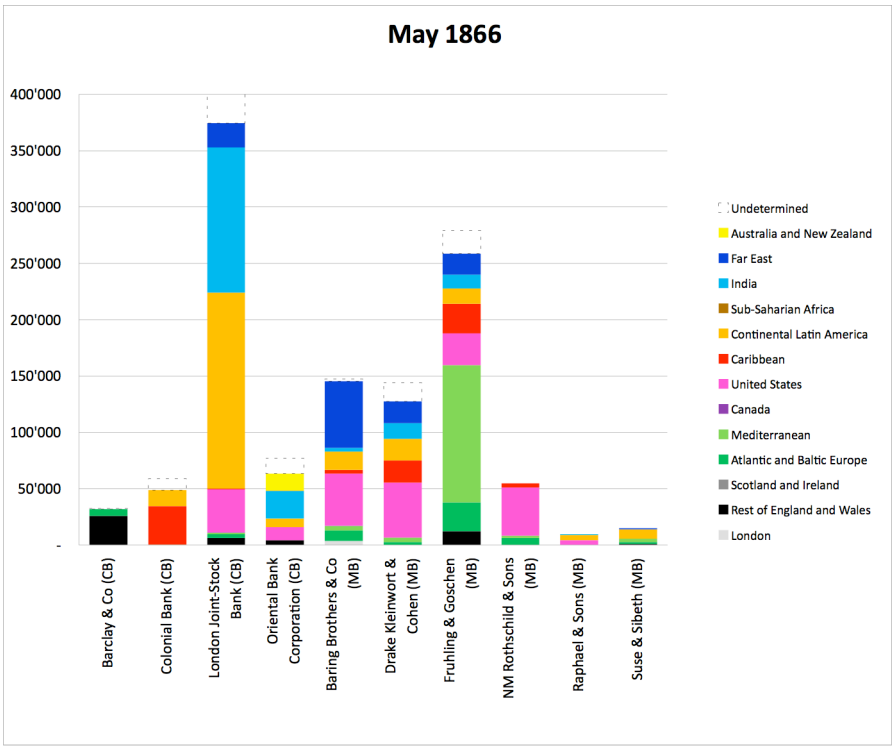


*Note: The market share of acceptor ranked #1 in May 1866 is underestimated as its account is incomplete.

Source: Authors, from database.

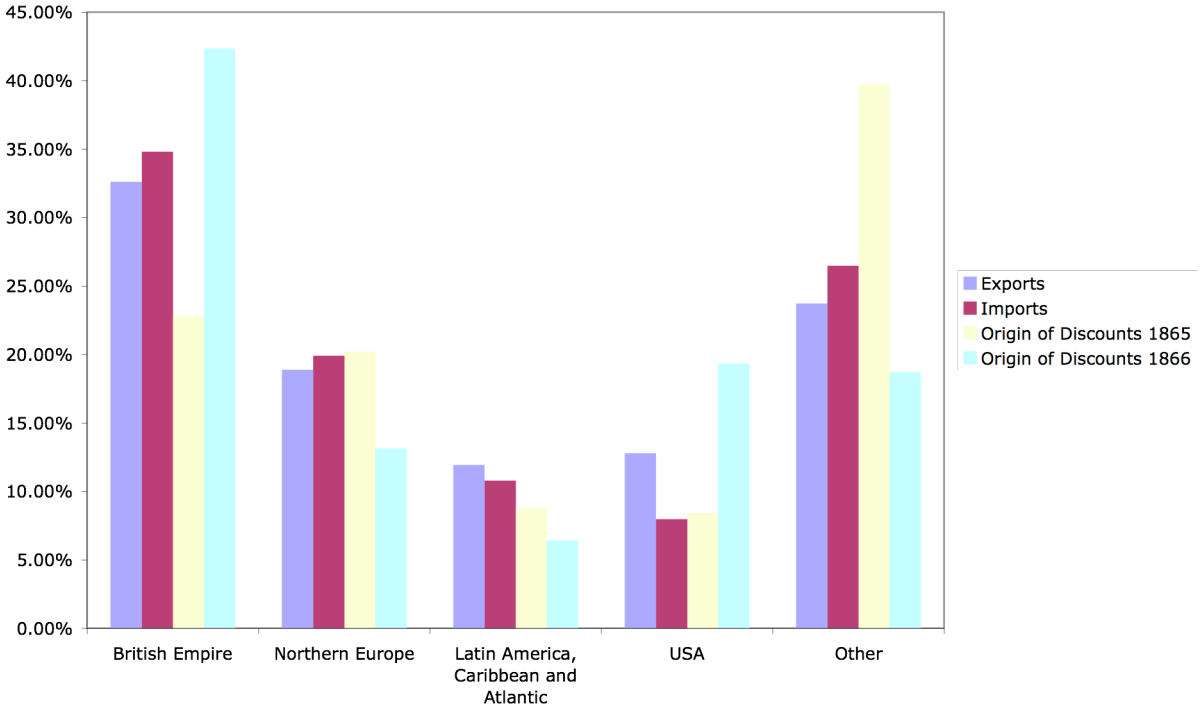
Figures 12a and b. Geography of drawers for a selection of leading acceptors.





Source: Authors, from database.

Figure 13. Breakdown of British trade (1865) and of the geography of drawers of the bills included in the "top discounters" sample (May 1865 and May 1866).



Source: Authors, from database and RICardo database.

Appendices:

A- Methodological Issues

The task of documenting the origin of the paper discounted is daunting. This is not only due to the volume of information that must be collected and organized, but also to the fact that sampling is not easy. In contrast with discounts (for which there are daily recaps), there is no comprehensive source to let us know about total acceptances per acceptor for any period of time. Given how the material is organized, we could not think of a simple way to produce a reliable sample of the population of accepted bills. If acceptors are very concentrated or fairly concentrated (as earlier literature has argued), then taking a random sample may leave out important houses. This is because (as previous historians have suggested) acceptors had specialized lines of business, both in terms of identity of correspondents and geographical reach[57] so that they will tend to cluster on a sub-set of discount accounts. Therefore, what may look as the most natural approach (construct a "representative sample" of the "typical" material brought to the Bank by a set of appropriately selected discounters) stumbles of potentially lethal bias that cannot be known in advance. Individual discounters' portfolio of bills can hardly be described as a "random draw" from the "population" of discounts. For instance, Sayers (1967) argues that some bill brokers developed specific regional expertise and this may show up in the material they took in or in the material that their customers (the banks that purchased bills from the said bill brokers) took in. The other way to go would be to directly consult the discount accounts of those acceptors, which we suspected were most relevant. Since all bills underwritten by a given acceptor and then bought by the Bank gave rise to an entry in that acceptor's account we are sure to capture the total population of bills accepted by that house. While interesting as such, this information may fall short of saying anything meaningful regarding general patterns.

In other words, all strategies we could think of were undermined with a "catch 22" problem: Given the underlying distribution, we cannot know the proper sampling method until we have sampled. This is compounded by the fact that we operate under resource constraints (an exhaustive collection of all the material would imply collecting thousands of pictures for hundred thousands of individual entries, some of them minuscule).[58]

Facing these constraints and the need to avoid straining the patience of archivists, our strategy was to begin with collecting the accounts that had "substantial" length (meaning entries with typically several pages). Since accounts combined the customer's position as both discounter and acceptor, our fieldwork collection rule picked counterparties with either large discounts, or large acceptances, or both. In other words, it was voluntarily biased towards capturing big accounts and thus cannot at this stage be described as strongly representative.

[57] . Hidy (1949).

[58] . Moreover, given the constraint in access to sources, some valuable information to adjust the data collection methodology was discovered after pictures had been collected (we did not know the distribution of discounters, for instance, until we organized it from the Bank's daily discount ledgers).

In practice, we thus ended up with two types of "samples" that may be used to address, either simultaneously or separately, different sets of questions. The first "sample" uses information obtained from the material brought in by the top discounters (for both May 1865 and May 1866) for which we have pictures (we call it the "top discounters" sample, bearing in mind that some top discounters were overlooked when we collected the data). Given the modification in the identity of those who came to the Bank of England, this means that the ranking of "top discounters" changes a lot between the two periods. The second "sample" uses information from pictures for "top acceptors" as they were captured through the field technique described above. That is, we have material for only a selection of acceptors, which are fully documented. Since there is no material to document the full distribution of acceptors, we are unable to compare our "sample" to the "true" population.

Another limitation of our dataset has to do with strategic behavior. It may be, for instance, that the very best paper was kept in portfolio by the discounters or sold over the counter on better terms, while only the "worst best" paper was brought to the Bank of England (by "worst best" we mean paper that was good enough for the Bank to take it, but not so good as to command a significantly higher price outside the Bank). A more complete study would try and control for discounters' ratings and interest rates charged by the Bank of England, in order to form a better sense of possible strategic bias in the supply of bills. At this stage, it is not clear whether such a study is feasible at all. Our conclusions must therefore be taken with some prudence

Tests of the quality of the samples we used are possible. From the daily discounts ledgers, we know the total amount of bills brought by all discounters (or D_t) in each period t. From individual customers' ledgers (by focusing on the "upon" columns: see Section I), we also know the total amount of bills accepted by the acceptors included in the "top acceptors" sample (or a_{it}). The proportion of bills accepted by a given acceptor i in a given period t (or $\pi^a_{it}= a_{it}/D_t$) is thus its exact market share as an acceptor. Yet, the number of acceptors for which the exact market share can be reconstructed is limited. Now, through the "top discounters" sample (i.e. by looking at who accepted the bills brought in by the top discounters) we can provide an estimate of the market share of each acceptor, including those not included in the "top acceptors" sample. Calling d^{TOP}_t the total amount of bills discounted by the top discounters in period t, and a^{TOP}_{it} the amount of those bills accepted by acceptor i, we get an estimate of its market share (or $\pi^{a,TOP}_{it}=a^{TOP}_{it}/d^{TOP}_t$). One condition for the sample to have desirable properties is that $\pi^{a,TOP}_{it}=\pi^a_{it}$. This property can be formally examined. We generally found the results encouraging. They are supported by regression analysis, which show that there definitely a satisfying consistency across samples.

B- Data on Foreign Bills

We provide below a Table that documents the sources and the methodology in the background of our Figure 9. There are essentially three sources: First, the Bank of England estimates reported in Clapham (1944) and which we examined. Second, the statistics for total foreign vs. inland bills discounted in a given year and reported in some discount ledgers. Last, our estimates from the two samples (discounters and acceptors) which are limited to one month in the year. We give technical details below.

Date	Method	Percent. Foreign Bills	Source
1800	"Amounts Discounted to Agents with Specialized Activities" (see Clapham 1944)	32.5%	M6/1
1810	"Amounts Discounted to Agents with Specialized Activities" (see Clapham 1944)	35.5%	M6/1
1854	Bank of England Ledgers	35.5%	C28/14
1855	Bank of England Ledgers	43.8%	C28/15
1856	Bank of England Ledgers	45.6%	C28/16
1859	Bank of England Ledgers	51.5%	C28/19
1865	Estimated from sample of top discounters	85.0%	authors
1866	Estimated from sample of top discounters	63.0%	authors

Source: Authors, from Bank of England Archive