

# ACCOMMODATING CHANGES IN THE RELATIVE DEMAND FOR CURRENCY: FREE BANKING VS. CENTRAL BANKING

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## Introduction

What is commonly called “money” can be held in either of two forms. There are deposits, from which payments can be made by check, and currency or hand-to-hand money. Even though the total demand for money may be stable or even constant, a change in the public’s desired ratio of currency to deposits requires accommodative changes in the relative supply of each if monetary instability is to be avoided. This paper examines the relative capacity of free banks and central banks to accommodate changes in the demand for currency when total money demand is unchanging. It also discusses some consequences of a disequilibrium currency supply, showing the role it has played in past monetary crises.

As used in this paper, a “free banking” system is one in which banks are bound by the law of contract only, without being subject to any special regulation. Entry into a free banking system is unrestricted, and free banks may extend their liabilities to the public in any form, including circulating bank notes as well as checkable deposits. Free banks are assumed to invest the proceeds from liability expansion in assets producing the highest expected risk-adjusted interest return. They must, however, redeem their inside bank money liabilities on demand in some outside base money, which is held as a reserve to be used to settle clearings among the banks.

A central banking system, in contrast, is one in which a single bank possesses a monopoly in currency supply, which allows its liabilities

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to fill the greater part (or perhaps all) of the reserve needs of the deposit banks. The liabilities of the central bank may be the ultimate "outside" money in the banking system or they may themselves be redeemable in some other, outside money. Unlike free banks, which seek to maximize profits, a central bank is assumed to aim consciously at achieving monetary stability.

### The Relative Demand for Currency

Before proceeding with our comparison of free and central banking as means for accommodating changes in currency demand, we must carefully distinguish currency demand from outside-money demand. The former is simply a demand for circulating means of payment, whereas the latter reflects the public's desire to hold a form of money that does not involve granting credit to private banks. A rise in currency demand is a routine occurrence that does not involve any loss of confidence in banks; it can in theory be satisfied by a circulating form of inside bank money. In contrast, a rise in outside-money demand means a demand to exchange inside money for outside money, the ultimate money of redemption. In a closed system this implies either a loss of confidence in banks issuing inside money or a failure of the banking system to provide enough inside money for use as currency.<sup>1</sup> In this paper the demand for outside-money is assumed to be unchanging; only changes in currency demand are considered.

The public's division of its demand for money between deposit demand and currency demand is not arbitrary. Particular sorts of plans call for holding currency rather than checkable deposits. Currency is more useful for making change, for example. More important is the fact that the demand to hold currency reflects the degree to which sellers more readily accept currency than checks. Currency permits sellers of goods and services to avoid the inconvenience of depositing or cashing checks, and the acceptance of a check requires a level of trust beyond what is required in accepting currency of equal face value. The acceptor of a check has to have confidence both in the bank upon which the check is drawn, which may or may not

<sup>1</sup>Under central banking with fiat money the distinction between currency demand and outside-money demand is blurred; there is no observable difference between the two, since the ultimate money of redemption is also the only currency in the system. Nevertheless it is still possible conceptually to distinguish the desire to acquire hand-to-hand media from the desire to withdraw savings from the banking system. Under central banking with a commodity standard, the former manifests itself in increased demand for the notes of the central bank, whereas the latter involves redemption of those notes for the money commodity.

be good for the transferred sum, and in the drawer of the check who may or may not possess an adequate deposit balance.

Nor is the relative demand for currency constant. As Eugene Agger (1918, p. 85) notes, it changes along with "basic changes in the economic life of the community" and with "changes in the disposition that is to be made of . . . borrowed funds." In the United States until the 1930s the historical trend was toward less reliance upon currency and greater use of checks and other means for the direct transfer of deposit balances. This was due mainly to improvements in deposit banking, which were spurred on in part by the suppression of competitive note issue. In the last fifty years or so the trend has changed, however, and the demand for currency relative to total money demand has grown substantially.<sup>2</sup>

Other factors have historically caused the currency-deposit mixture to alter in a less regular way. An increase in retail trade relative to wholesale, including financial trade, favors greater use of currency because the former involves smaller, anonymous exchanges where less trust is possible, whereas the latter involves larger exchanges among previously acquainted parties. In the past, when wage payments were more often made in currency, payroll requirements caused weekly and quarterly cycles in currency demand. The demand for currency also increased during the autumnal expansion of agricultural activity, and there are still seasonal peaks in demand due to holidays (such as Christmas), which involve a burst of retail trade. Besides these influences Phillip Cagan, in his study of "The Demand for Currency Relative to Total Money Supply" (1958), lists the following: expected real income per capita; interest rates available on demand deposits (a measure of the opportunity cost of holding currency); the volume of travel; the degree of urbanization; the advent of war; the level of taxes and incentives for tax-evasion; and the extent of criminal and black market activities.<sup>3</sup> Changes in the currency ratio in the United States due to these and other factors since the turn of the century are shown in Figure 1.

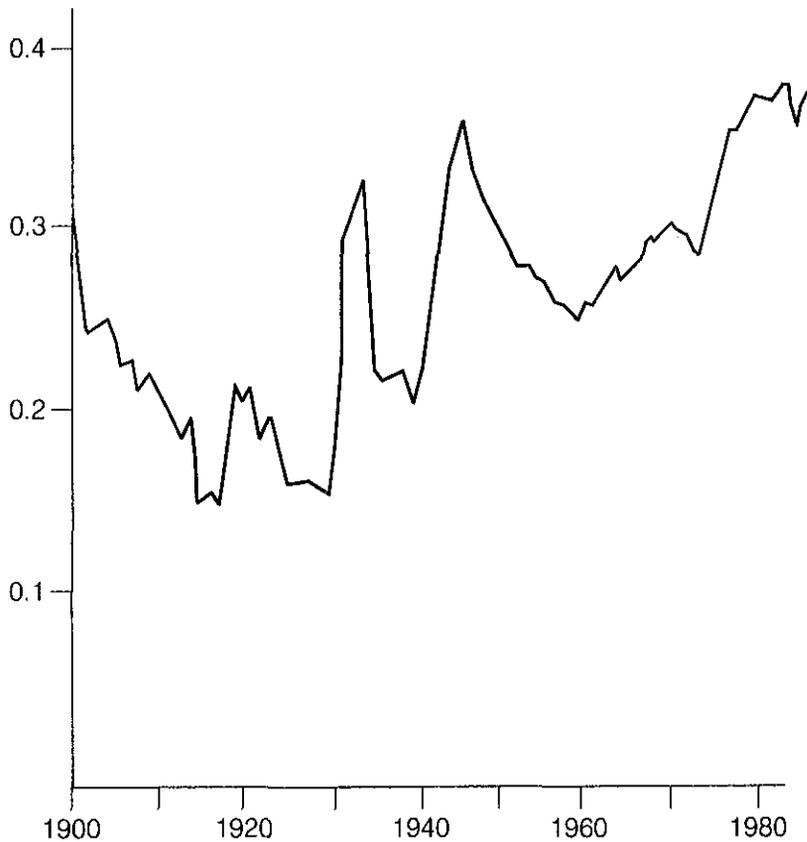
A final factor already alluded to that affects the relative demand for currency is the extent of business confidence. According to Agger

<sup>2</sup>According to Bowsher (1980, pp. 11-17), the ratio of currency to demand deposits rose in part because of a fall in the importance of demand deposits relative to savings accounts. Nevertheless the trend is surprising in view of the development of alternatives to currency, such as credit cards, and of the substantial increase in interest rates, which are a measure of the opportunity cost of holding cash. Many economists attribute this growth in demand for currency to the expansion of the "underground" economy.

<sup>3</sup>On the influence of war in particular, see McDonald (1956). On that of changes in interest rates on demand and time deposits, see Becker (1975).

FIGURE 1

RATIO OF CURRENCY TO CHECKABLE DEPOSITS SINCE 1900



SOURCE: Adapted from Meyer (1986, p. 97).

(1918, p. 86), a decline in confidence “lessens the acceptability of the check as an instrument of exchange and usually involves an increase in the demand for media of more general acceptability.” Except during panics a loss of confidence extends only to individuals and not to banks so that, although it causes an increase in currency demand, it does not involve any increase in outside-money demand; that is, it does not imply a desire on the part of the public to remove outside money from the banking system. “Ordinarily,” Agger (1918, p. 87) notes, “the shifting of demand is rarely so complete [and] it is only isolated banks that suffer a complete loss of confidence.”<sup>4</sup> Pres-

<sup>4</sup>To consider only currency demand and not outside-money demand is not to neglect

sure is more likely to be exerted by depositors desiring currency, including bank notes, than by holders of notes seeking to redeem them in outside money.<sup>5</sup>

This variety of influencing factors makes the relative demand for currency highly variable and sometimes unpredictable.<sup>6</sup> In consequence, banks may have difficulty accommodating changes in the relative demand for currency even when the demand for inside money as a whole is predictable or does not change. Yet it is essential that the public be able to acquire media of exchange in a mixture that suits its needs. Holders of inside money want to be able to switch from deposits to currency or vice versa depending upon which means of payment or combination of means is most convenient and best suits the circumstances. If the public's wants are not satisfied, significant inconvenience and reduced opportunities for making desired purchases result.

Bank borrowers also may need to receive credit in one rather than the other form (checkable deposits or currency), so that a relative deficiency of either will cause credit-market stringency just as if the total availability of loanable funds were reduced. As Agger (1918, p. 87) puts it:

Inability to meet an expanding demand or impediments in the way of issue of either form of bank credit may entail serious consequences. For those desiring credit in any form and unable to obtain it [for want of the desired media] the situation is alarming. The normal conduct of their business may depend upon obtaining bank accommodations of an acceptable form. Stringency in the market for such accommodation is . . . bound to be costly and a source of anxiety.<sup>7</sup>

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the usual consequences of a falling off in business confidence. Historically, when a general decline in confidence has led to increased outside-money demands it has been because of banks' failure to meet depositors' increased demands for currency through increased issues of inside money. For evidence of this, see below. On the problem of panics under free banking, see Selgin (1988, pp. 133–39).

<sup>5</sup>Somers (1873, pp. 204–25) writes with regard to conditions in 19th-century England that "when the situation is so bad that distrust or panic sets in it is the withdrawal of deposits by their conversion into currency, and not the cashing in of notes, that gives the fatal blow to a tottering establishment."

<sup>6</sup>See Cagan (1958); also Agger (1918, pp. 78–86), McDonald (1953, 1956), Brechling (1958), Ahrens Dorf and Kanesthasan (1960, pp. 129–32), and Khazzoom (1966). According to these studies the traditional assumption of a constant or predictable currency ratio, determined predominantly by custom and institutional factors, is not supported by the empirical evidence.

<sup>7</sup>Agger's general discussion (pp. 76–90) surrounding this passage is one of the best on this whole subject.

The amount of credit granted in a well-working banking system should not depend on the form of payment medium desired, so long as there is no special demand for the ultimate money of redemption. A well-working system should also permit the unrestricted interconversion of deposits and currency once either is outstanding, without leading to undesired changes in the total money stock.

### Currency Supply under Free Banking

When banks are unrestricted in their ability to issue bank notes, each institution can meet increases in its clients' demands for currency *without difficulty and without affecting its liquidity or solvency*. Under such free banking conditions the "transformation of deposits into notes will respond to demand," and banks will be able to supply credit in the form that borrowers require (Agger 1918, p. 154). When the customers of a note-issuing bank—either borrowers or depositors—desire currency, the bank offers them its own notes instead of a deposit balance. The supply of currency is flexible under unrestricted note issue because bank note liabilities are, for a bank capable of issuing them, not significantly different from deposit liabilities,<sup>8</sup> making it, as Agger (1918, p. 154) explains, "a matter of indifference to the note-issuing bank which form its credit takes." The issue of notes in exchange for deposit credits merely involves offsetting adjustments on the liability side of the bank's balance sheet, with no change on the asset side. When no longer needed in circulation the notes return to the issuing bank, which may use them again the next time the demand for currency increases. This feature of competitively-issued notes renders them different in a crucial way from monopolistically supplied currency, which tends to be employed as high-powered money.<sup>9</sup>

Freedom of note issue thus ensures the preservation of an equilibrium money supply as demand shifts from deposits to currency and vice versa. It assures that savings are intermediated even when those who wish to save want to hold bank promises in a form useful in circulation. It also assures that a growing demand for inside money that involves an *absolute* increase in currency demand is readily met instead of going unsatisfied because of a shortage of currency.<sup>10</sup> The

<sup>8</sup>See Agger (1918, p. 76) and Dunbar (1917, pp. 17–18).

<sup>9</sup>Active interbank clearing and redemption of competitively issued notes and checks restrict the ability of free banks to overissue money—whether in the form of deposits or currency. See Selgin (1988, chaps. 3–6) and Dowd (1988).

<sup>10</sup>"Generally speaking, an increase in the supply of money in the form of check-currency [deposits] must normally appear as part of a composite supply, in which other types of currency are represented; . . . the absence of these other types may effectually prevent the issue of check-currency itself." See Marget (1926, p. 255).

ability of free banks to function smoothly as intermediaries, even in the face of changing currency demand, stems from their note-issuing powers.

### Monopolized Currency Supply

When the supply of currency is monopolized, the ability of non-note issuing (deposit or commercial) banks to convert deposits into currency is restricted. Deposit banks are not able independently to fulfill currency demands. This causes them to treat the liabilities of any privileged, currency-issuing bank as a valuable asset, used both to supply their customers with currency and as a high-powered money for the settlement of interbank clearings. The amount of this high-powered money and its division between banks and the public (like the amount of commodity money in a free banking system) becomes a key, proximate determinate of the size of the total stock of inside money. When the public's demand for currency increases, deposit banks are forced to relinquish their holdings of notes or fiat currency (or deposits convertible into notes or fiat currency) of the monopoly bank of issue.<sup>11</sup> This means that they lose their reserves of high-powered money. Unless the monopoly bank of issue adjusts the amount of its credits to the deposit banks to offset their reserve losses to the public,<sup>12</sup> the lending power of the deposit banks must fall, and the banks will have to contract their balance sheets. Thus, in the presence of a monopoly bank of issue, a change in the *form* in which the public wishes to hold money balances causes a disequilibrating change in the *total supply* of money.<sup>13</sup>

The same conclusion holds for uncompensated reductions in the relative demand for currency. In a system with monopolized currency issue, such a change results in a return of currency to the deposit banks, which then add it to their reserve holdings and use it as a

<sup>11</sup>According to Somers (1873, pp. 207–8), “when [the unrestricted right of note issue] is stopped, and notes are only authorized from a central source, the facility a bank may enjoy in supplanting itself with currency for the uncertain demands upon it can only be in proportion to its proximity to the Issue Department.”

<sup>12</sup>The amount of “reserve compensation” needed will be less than the actual increase in currency demand.

<sup>13</sup>Thus McLeod (1984, pp. 65–66, n. 15) writes that a system of competing banks of issue (where no distinction is made between note and deposit liabilities as far as reserve needs are concerned) “has certain practical advantages if, as is usually the case, there are seasonal fluctuations in the public's demand for notes relative to deposits. In [a system with monopolized currency supply] the peak seasonal demand for notes withdraws reserves from the banks and causes a seasonal credit stringency, and in a managed money system the central bank or other monetary authority must consciously act to offset any such tendency.” The same is true concerning cyclical but nonseasonal changes in the relative demand for currency.

basis for credit expansion. A fall in the relative demand for currency results in monetary overexpansion even though the demand for money has not fallen and even though there is no expansion of credit by the monopoly bank of issue. If changes in the relative demand for currency are not to result in monetary disequilibrium under central banking, the central bank must engage in continual “reserve compensation.” It has to adjust the supply of base or high-powered money in response to changes in the amount of base money needed in circulation. When there is an increase in the relative demand for currency under central banking, the authorities must adjust the base by the amount of the increase in the relative demand for currency (the shift from deposit demand to currency demand) minus this value multiplied by the reserve ratio.<sup>14</sup>

This result, that changes in the relative demand for currency will affect total money supply under central banking unless offset by reserve compensation, is well recognized in the literature on central banking.<sup>15</sup> But past writers have tended to view the problem as one inherent in all fractional-reserve banking, whereas the truth is that it is only a problem in systems where the issue of currency is monopolized.<sup>16</sup>

### Instruments for Reserve Compensation

How can reserve compensation actually be undertaken by a central bank when the public’s demand for currency changes? Let us continue to assume that the total demand for money (currency plus deposits) is unchanging and that only its division between currency demand and deposit demand alters. To simplify the problem even further, let us also assume that the relative demand for currency is known to the monetary authority. We thus put aside the greater part of the challenge that confronts the central bank (which has to do with how it can know how much currency it ought to supply) to consider whether the bank can actually make desired adjustments of a known dimension. Our concern is to examine the efficacy of various instruments for reserve compensation—statutory reserve requirements,

<sup>14</sup>Reserve-compensation formulae for changes in the demand for currency under central banking appear in Selgin (1988, pp. 113–15 and pp. 124–25).

<sup>15</sup>See for example Cagan (1958) and Friedman (1959, pp. 66–67).

<sup>16</sup>Friedman (1959, p. 69) revealed an awareness that the problem stems from monopolization of the currency supply when he noted that it might be solved by allowing competition in note-issue. At the time, however, Friedman was less sympathetic toward (and, one might add, less understanding of) free banking than he is today, and he described the solution of competitive note-issue as “the economic equivalent to counterfeiting.” Cf. Friedman (1953, p. 220).

open market operations, and rediscount policy—in accommodating a known currency demand.<sup>17</sup>

Statutory reserve requirements, the first instrument we will consider, highlight the significant distributional impact of certain approaches to reserve compensation. Although a correct adjustment of the aggregate supply of base money preserves monetary equilibrium on the whole, the improper distribution of reserve credits or debits brings welfare losses or gains to particular banks.<sup>18</sup> Since changes in the relative demand for currency do not affect all banks simultaneously or uniformly, an ideal policy would have to make continual adjustments in statutory reserve requirements, bank by bank. This poses an impossible administrative problem. Furthermore, it requires that the central authority know, not just the total extent of the public's shift into (or out of) currency, but also which banks are affected by the shift.

Second, for adjustments in statutory reserve requirements to be adequate to accommodate substantial shifts into currency, the supply of base money held in "free" statutory reserves would have to be large. A reduction in statutory reserve needs frees up more base money for use in circulation, but this is of no avail if the total supply that can be released is less than the increase in demand. The phasing out of statutory reserve requirements would obviously not be possible if they were needed for reserve compensation.

The last point is important since statutory reserve requirements are themselves a barrier to automatic adjustments in the supply of deposit money. This becomes apparent when the assumption that the total demand for money is unchanging is (momentarily) relaxed. Of course the monetary authorities, if they knew the extent of changes in total money demand, could make the necessary modifications in their reserve requirement adjustments, but this would just add another layer of complexity to an already tremendous administrative and calculational burden.<sup>19</sup>

A second vehicle for reserve compensation is open market operations. The fundamental problem with this instrument is also dis-

<sup>17</sup>By "known" I mean that the total quantity of currency demanded is known; I do not mean that the distribution of this demand—how changes in it will affect the reserve position of particular deposit banks—is known. To assume otherwise would be to grant too much in favor of the case for central banking.

<sup>18</sup>Obviously these welfare changes affect not just the banks but also their borrower customers. In the event of a severe currency drain, depositors at some banks may also become victims of a restriction of payments.

<sup>19</sup>For further comments on the shortcomings of statutory reserve requirements as instruments for monetary control, see Friedman (1959, pp. 45–50).

tributive. Although it allows direct control of the total amount of base money created or withdrawn, it does not provide any means for ensuring that base money is issued to banks experiencing currency withdrawals or, alternatively, that base money is withdrawn from banks experiencing redeposits of currency. Laughlin Currie (1934, p. 17) draws attention to this point:

If the reserve banks should buy bonds to the amount of the increase in cash in circulation, less the amount of the reserve formerly held against withdrawn deposits, it would appear that the composition of money has changed but not its volume. This would be true if the reserve bank funds, arising from the purchase of bonds, go to those banks . . . experiencing withdrawals.

But, as Currie (1934, p. 114) observes, the banks receiving the new base money from open market sales will probably be different from those stricken by currency withdrawals. Those banks that receive new base money and do not need it to offset reserve drains will employ it like any other increment of excess reserves, to increase their loans and investments.<sup>20</sup>

Opposite consequences follow attempts to offset by open market sales an inflow of currency due to a shift in demand from currency to deposits. "Here again," Currie (1934, p. 114) writes, "the difficulty is that the bank gaining reserves from the deposit of cash currency may not be the same bank losing reserves from the selling operations of the reserve banks." As with adjustments in statutory reserve requirements, monetary equilibrium in the gross sense will be preserved, but with substantial welfare effects.

To some extent interbank lending might reduce these welfare effects from reserve compensation. But this possibility is limited by the fact that banks receiving excess base money will not necessarily lend it to other banks in need of reserve compensation. This may or may not be the most profitable avenue of employment for the surplus funds. Banks suffering reserve losses from currency drains might not offer to pay a high enough interest rate to attract emergency loans, especially if they fear the currency withdrawals may be permanent ones, which would make it difficult to repay the loans.

A final instrument for reserve compensation is rediscount policy. This seems to offer the advantage of automatically channeling emergency supplies of base money only to banks in need of them, without requiring the monetary authorities to make decisions on a bank-by-bank basis. Murray Polakoff (1963, p. 203), generally a critic of rediscount policy, writes that it "is particularly well suited to supply a

<sup>20</sup>Cf. Whitney (1934, pp. 159–60).

portion of reserves for seasonal needs and reserve losses and supplying them directly and immediately to the points where they are most needed." He adds that "this is not true of open market operations."<sup>21</sup> A defect of rediscounting, however, is that it relies on deposit banks' knowing whether currency is being withdrawn from them because of (a) an increase in their clients' demand for currency or (b) dissaving (a fall in the demand for all types of inside money).<sup>22</sup> In general it is not possible for banks to know which of these causes is behind some withdrawal of currency by their depositors. Banks may mistakenly borrow base money from the central issuer (by rediscounting) to offset drains of the second type, forestalling the credit contraction needed in such cases to preserve monetary equilibrium. Distributing emergency base money by the rediscount mechanism does not guarantee that it goes to banks suffering from currency drains due solely to changes in the relative demand for currency.

All this assumes that banks, if they knew how, would borrow from the central issuer only the precise amounts needed to compensate their losses caused by changes in the relative demand for currency. But the extent of borrowing also depends on the rate of rediscount charged by the central bank. A rediscount rate below the market rate encourages borrowing, not merely for reserve compensation but also for acquiring excess reserves to relend at a profit. Furthermore, even if banks borrow from the central bank only to offset reserve losses due to currency withdrawals, the return of currency from circulation when the relative demand for it declines may not lead to offsetting repayment of borrowed reserves. If the rediscount rate is too low, the surplus base money will be relent instead.

Winfield Riefler (1930, p. 161) cites an example of this in the United States just after World War I. Commercial banks had borrowed heavily from the Federal Reserve during the war to offset reserve losses due to an increased relative demand for currency. At the close of the war, when demand shifted back to deposit balances, returning Federal Reserve notes "were not used to repay member bank borrowings in any corresponding amounts." Instead, redeposited currency "went in considerable part to build up member bank reserve balances":

Member banks as a group . . . were content to maintain their indebtedness [to the Federal Reserve banks] at about the level it had previously attained, using funds released from circulation . . . to

<sup>21</sup>For a general discussion of the disadvantages of rediscount policy as a means for monetary control, see Aschheim (1961, pp. 83-98).

<sup>22</sup>This possibility does not violate the assumption of a fixed total demand for money so long as there is an equal increase in money demand elsewhere in the system.

expand their loans, for which there was an active demand at attractive rates.

The resulting expansion of the money supply undoubtedly contributed to the boom-bust cycle of 1920–1921.

An above-market rediscount rate, a “penalty” rate, also does not ensure proper borrowing for reserve compensation. A penalty charge for funds borrowed to be kept in reserve leads to a less than optimal amount of reserve compensation, since a bank that pays penalty rates for its reserves is not, at the margin, better off than one that contracts its liabilities to make do with reserves it already has. Therefore a penalty rediscount rate is likely to lead to insufficient reserve compensation at times of expanded relative demand for currency. This conclusion applies with greatest force when increases in the relative demand for currency are expected to be long lasting or permanent.<sup>23</sup>

All of this assumes that a penalty rate or below-market rate of interest can at least be identified. In truth the variety of interest-earning assets available to banks, with different nominal rates of interest, makes it difficult to choose a measure for “the market rate” against which the rediscount rate may be compared. As Polakoff (1963 p. 192) notes, the existence of a distinct market rate is a peculiarity of English banking not present in other systems:

In Great Britain, it is the bill dealers and not the commercial banks that borrow directly from the Bank of England. Since the former specialize in a particular kind of asset—formerly commercial bills and now Treasury bills—and since the Bank rate is higher than the rate on bills, the discount rate in that country truly can be considered to be a penalty rate when dealers are forced to seek accommodation at the central bank.

Finally, even where some reasonable rule for setting a proper rediscount rate does exist, the rate has to be continually adjusted to reflect changes in the market rate.<sup>24</sup>

## Historical Illustrations

History contains many episodes of banks failing to respond adequately to changes in the relative demand for currency. Most have been due to the failure of central banks to supply deposit banks with supplementary high-powered money to satisfy their depositors’ tem-

<sup>23</sup>See Currie (1934, p. 113). This insight is also relevant to the German experience, discussed below, where emergency issues of currency were subject to a 5 percent annual tax.

<sup>24</sup>See Friedman (1959, pp. 40ff).

porary withdrawals of currency. A few examples will help to illustrate points made in the previous sections.

We have already noted the 1919 episode in the United States where an uncompensated shift of money demand from currency to deposits resulted in an excess supply of inside money taken as a whole. More notable and frequent, however, have been cases in which the supply of inside money has been allowed to contract excessively due to insufficient issues of currency to accommodate depositor withdrawals.

In London, for example, the Bank of England has been the sole supplier of currency since it was established in 1694. Other London banks rely upon their reserves of Bank of England notes to supply depositor's currency needs. Through most of the first one and a half centuries of its existence, the Bank of England felt no obligation to assist other bankers who found themselves stripped of cash by a shift of demand from deposits to currency. Partly in consequence of this, financial crises occurred in 1763, 1772, 1783, 1793, 1797, 1826, 1836, and 1839. Each was marked by a significant increase in the demand for currency for making payments in and around London. Confidence in Bank of England notes was not lacking, and there were few demands to redeem these in specie. Nor was there any evidence of a rush to redeem notes of "country" banks (which were allowed to issue notes because of their location outside of a 65-mile radius from the center of London) or to exchange them *en masse* for Bank of England notes. The problem was that country bank notes were not suitable for use in London where their issue and redemption were prohibited. A drop in the acceptability of checks and other noncurrency means of payment in and around London translated, therefore, entirely into greater requests for the notes of London's sole issuing bank.

Henry Thornton ([1802] 1978, p. 113), referring to the crisis of 1793, observed:

The distress arising in London . . . was a distress for notes of the Bank of England. So great was the demand for notes, that interest of money, for a few days before the suspension of payments of the bank, may be estimated . . . to have been about sixteen or seventeen per cent. per ann.

Had other London banks been allowed to issue notes the pressure might have been significantly reduced, since their customers might simply have converted their deposits into notes that were also liabilities of the banks. Bank of England notes would not have occupied a privileged position in bank portfolios, and they would have been routinely returned to their issuer for redemption like other competitively issued liabilities. The public, in turn, would have had no special reason to demand Bank of England notes, since notes of other banks would probably have been just as useful for making payments

throughout the city of London. As matters stood, however, the extraordinary demand for currency in London could only result in an extraordinary demand for Bank of England notes. Because the directors of the Bank of England were concerned only with their Bank's solvency, however, they did not manage its issues to protect other London banks or to prevent a general contraction of credit. Instead, observing the prevailing state of panic and confusion, and fearing that bank closings would generate a general loss of confidence that would threaten the Bank's (specie) reserves, the directors often *contracted* its issues, making matters even worse. Perhaps this action was not even calculated to serve the interests of the Bank of England, but then the extent of the Bank's involvement in the monetary affairs of the rest of the country was not fully appreciated. Indeed, although changes in the relative demand for currency were a frequent cause of what later became known as "internal drains" upon the resources of the London banks, Hayek (p. 39) observes in his introduction to Thornton's *Paper Credit of Great Britain* that "it took some years . . . for the Bank of England to learn that the way to meet such an internal drain was to grant credits liberally."

The Bank Act of 1844 ("Peel's Act") not only restricted the ability of the Bank of England to generate excessive quantities of base money (as the Bank had, according to the Bullion committee, in the years following the suspension of 1797); it also prevented the Bank from making needed adjustments to the supply of currency in response to greater demand. In addition, by limiting the note issues of the country banks the Act caused them to employ Bank of England notes to meet depositors' demands where before they might have been able to rely exclusively upon their own issues.

Thus after 1844 episodes of credit stringency were as frequent as before, with interest rates fluctuating in response to the periodic ebb and flow of the relative demand for currency. Peel's Act had to be suspended in 1847, 1857, and 1866. Rates rose every autumn—when currency was used instead of checkbook money for agricultural transactions—and also at the close of every quarter when stock dividends were paid (often in cash). William Jevons (1884) was so impressed by this pattern that he devoted a lengthy article to an analysis of it. He observed (pp. 170–71) the growing tendency of the London and country banks "to use the Bank of England as a bank of support, and of last resort."<sup>25</sup> Jevons (p. 179) also remarked that freedom of note

<sup>25</sup>Particularly significant is Jevons's finding that, in the course of the "autumnal drain," coin and bank notes—including notes issued by "country" banks—moved together. This confirms the view that there was no rush for gold or Bank of England notes as such, but rather a rush for all types of currency. The pressure upon the Bank of England came when the other banks had exhausted their own authorized note issues.

issue along the lines of the Scottish banks was an inviting alternative means for English banks to accommodate their clients' demands for currency, especially since additional currency issued this way would "return spontaneously as the seasons go round."<sup>26</sup> In spite of his observations, however, Jevons did not recommend that England adopt free banking. On the contrary, he ended his article by defending the Bank of England's quasi-monopoly of note issue, suggesting incoherently that proponents of free banking were guilty of "confusing" free banking with freedom of trade (p. 181).

Except for his opposition to free banking, Jevons in many ways anticipated<sup>27</sup> Walter Bagehot who, in *Lombard Street* (1874, pp. 235–53) drew so much attention to the "lender of last resort" function that it came to be regarded as an official responsibility of the Bank of England and as a rationale for periodic suspension of the Bank Act. Because of his influence, Bagehot is sometimes viewed as the first champion of scientific central banking. Yet the truth is that Bagehot preferred in principle the "natural system" of competitive note issue—the kind of system that "would have sprung up if Government had let banking alone." His formula for central banking was not a *recommendation* of monopolized note issue but an attempt to make an "anomalous," monopolized system work tolerably well. Bagehot (pp. 67ff) did not want to "propose a revolution." Nor would he have seen any need for one—or for a lender of last resort—save for the fact that monopolization of note issue prevented banks other than the Bank of England from using their own notes to fulfill depositors' demands for currency.<sup>28</sup>

Bagehot was aware of the true connection between the monopolization of note issue and the need for a centrally directed monetary policy. Unfortunately, many of those who followed him, including later advocates of central banking, forgot it. Ralph Hawtrey (1932, p. 285) wrote: "When a paper currency is an essential part of the mon-

<sup>26</sup>Unfortunately Jevons believed as well that emergency currency supplied by the Bank of England would also be withdrawn from the system once it was no longer needed in circulation. This was incorrect. Bank of England notes might eventually return to those banks from which they were withdrawn (assuming no change in banks' shares in the deposit business), but having come this far they went no further—they were retained as a vault cash instead of being returned to the Bank of England for redemption and so their total supply would not fall to its original level. Instead, the notes were once again used as reserves to support further lending until the Bank of England made some conscious effort to contract their supply.

<sup>27</sup>Jevons' article first appeared in the *Journal of the Statistical Society of London*, vol. 29 (June 1866), pp. 235–53.

<sup>28</sup>See the discussion of Bagehot's views in Smith (1936, pp. 121ff) and in White (1984, p. 145).

etary circulation *and one bank possesses a monopoly of note issue*, that bank can secure to itself the position of central bank. It can cut short the supply of currency and drive other banks to borrow directly or indirectly from it." Precisely. Yet Hawtrey, who more than anyone saw the lender of last resort function as the principal rationale for central banking, did not see how central banks' ability to cut short the supply of currency once they possess a monopoly of note issue creates the need for them to serve as lenders of last resort in the first place. If there is a competitive note issue, the traditional argument for a lender of last resort carries much less weight.

The case of England is only the most notorious example of problems arising from a lack of currency under monopolized note issue. In Germany a law similar to Peel's Act was passed in 1875. It placed a ceiling on the note issues of the Imperial Bank, Germany's monopoly bank of issue, which could be exceeded only upon the Bank's payment of a 5 percent annual tax on the excess. Though, according to Hawtrey (1928, p. 101), the limit was at first rarely exceeded, it was surpassed frequently prior to 1914 despite several increases in the fixed limit itself. This was especially true during quarterly payment periods, when the relative demand for currency would rise temporarily, and despite a provision in the law allowing a higher limit on these occasions. Continuing *secular* growth of the demand for currency in Germany led, on the other hand, to longer-lasting contractions of credit. According to Charles Conant (1905, p. 128) "high discount rates became the rule . . . as soon as the business of the country grew up to the limit of the note issue." The high rates prevailed until "the limit of the 'uncovered circulation' of Imperial Bank notes was raised to conform to the increased needs for currency growing out of the expansion of business."<sup>29</sup> Had banks other than the Imperial Bank been free to issue notes, periodic restrictions of credit would have been avoided. The banks could profitably have supplied the public's growing demand for currency. Nor would this have introduced any danger of inflation (as might have arisen had the Imperial Bank been entirely free to exercise its monopoly note-issue privilege) because competitively issued notes would not have served as high-powered money. Notes issued in excess by any bank would have been returned to their issuer for redemption rather than being held as reserves by unprivileged banks to support a multiple, disequilibrium expansion of deposits.

<sup>29</sup>Compare McGouldrick (1984, pp. 311–49), who claims that the Reichsbank carried on a successful, countercyclical policy throughout most of the period in question.

The American crises under the pre-Federal Reserve National Banking System were also aggravated—and in some cases perhaps caused—by restrictions on note issue by deposit banks. In this case, however, the problem was not monopolization of the currency supply, since note issue was still decentralized. Instead, the currency supply was restricted by special bond-collateral requirements imposed on national bank note issues.<sup>30</sup> When eligible bond collateral was in short supply and commanded a premium, note issue became excessively costly. In consequence, banks sometimes met their depositors' requests for currency by allowing them to withdraw greenbacks (a form of currency issued by the Treasury), which also functioned as a reserve medium. The consequence was a contraction of total bank liabilities equal to a multiple of the lost reserves.<sup>31</sup> That greenbacks were sometimes not available in desired, small denominations also added to the inconvenience suffered by the public.<sup>32</sup>

The problems of the National Banking System before 1914 would have been much less severe had note issue been unrestricted, that is, had banks been able to issue notes on the same terms as they created demand deposits. Free note issue would have satisfied most customers' currency requirements while leaving banks' reserves in place. It also might have made it unnecessary to resort to an agency for reserve compensation such as finally emerged in the shape of the Federal Reserve System.<sup>33</sup> As Milton Friedman and Anna Schwartz note in their *Monetary History of the United States* (1963, p. 295, n.77), the troubles of the National Banking System "resulted much less from the absence of elasticity of the total stock of money than from the absence of interconvertibility of deposits and currency." To achieve the latter, free note issue would have been not only adequate, but more reliable than centralized note issue.<sup>34</sup>

<sup>30</sup>State bank note issues had ceased following a prohibitive 10 percent federal tax on them in 1865.

<sup>31</sup>See Friedman and Schwartz (1963, p. 169). Forced par collection, lack of branch facilities for convenient redemption, and the fact that bond-secured notes were perceived as being a lien on the federal government rather than on their nominal issuers encouraged national banks to hold and reissue notes of their rivals instead of seeking actively to redeem them. Thus these notes were, unlike bank notes in an unregulated system, a kind of high-powered money. Their supply would not contract in response to any fall in the demand for currency, and their issue on more liberal terms (short of complete deregulation) might have led to serious inflation. This was, however, not a problem of practical concern in the latter part of the 19th century. On the downward-inelasticity of national bank notes, see Dunbar (1897, pp. 14–22).

<sup>32</sup>On this, see Timberlake (1978, pp. 124–31).

<sup>33</sup>See Smith (1936, pp. 133–34).

<sup>34</sup>Although many contemporary writers saw free note issue as a potential cure for the

The most significant financial crisis caused by an uncompensated drain of currency from bank reserves was the "great contraction" in the United States from 1930 to 1932. This involved a large-scale movement from deposits to currency, which was only partly offset by Federal Reserve note issues. The result was a drastic decline in the total money stock followed by a terrible banking collapse.<sup>35</sup>

According to James Boughton and Elmus Wicker (1979, p. 406), this particular shift from deposits to currency was triggered by the "massive decline in income and interest rates" that began in the fall of 1929 and led to an increase in the relative frequency of small payments combined with a reduced opportunity cost of holding currency.<sup>36</sup> Also encouraging the shift from deposits to currency were a two percent federal tax on checks (enacted in June 1932) and an increase from two to three cents in the postal rate for local letters (from July 1932 to June 1933). As Boughton and Wicker (1979, p. 409) point out, these changes increased the cost of paying local bills by check. Finally, when state authorities began declaring bank holidays in response to insolvencies caused by currency withdrawals and loan losses, they unwittingly provoked even greater withdrawals of currency by depositors. When banks go on holiday, deposits are immobilized and checks become practically useless in making payments. Currency can, however, still circulate while banks are temporarily closed. Therefore, any suspicion by the public that their banks will go on holiday will lead to a wholesale flight to currency as consumers rush to protect themselves against the risk of being caught without

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problems of the national banks, most believed that some agency was needed for supplying the system with emergency reserves. See for example Morawetz (1909), Noyes (1910), and Perrin (1911). These writers, as well as Sprague (1910), tended to view reserve losses (and consequent monetary contraction) as a distinct problem rather than as a consequence of restrictions on note issue.

The evidence contradicts the view that currency not backed by bonds or not centrally issued would have been unacceptable for supplying depositors' demands during crises. For example, Canadian bank notes flowed readily into northern states to fill the void created by insufficient national bank note issues, even though Canadian notes were not backed by any special collateral. See Johnson (1910, p. 118). Also, clearinghouse certificates and loan certificates were issued in various places and were accepted even though they were of questionable legality. Finally, cashier's checks and payroll checks of well-known firms were issued in small, round denominations to serve as currency. The only shortcoming of such emergency currency was that there was not enough of it. Nonetheless what there was showed every sign of being acceptable to the public, and there is every reason to think that freely issued bank notes would also have been accepted. On emergency currencies issued during the Panic of 1907, see Andrew (1908). On clearinghouse note issues, see Timberlake (1984).

<sup>35</sup>For a general discussion of this episode, see Friedman and Schwartz (1963, chap. 7).

<sup>36</sup>See also Boughton and Wicker (1984, pp. 366-67).

any means for making purchases.<sup>37</sup> The failure of the federal authorities to provide adequate reserve compensation during this flight to currency contributed significantly to the severity of this phase of the Great Depression. It caused interest rates, which for a decade had probably been below their "natural" level, suddenly to rise substantially above it.

In all of these historical episodes undesirable changes in the total supply of money occurred as a result of changes—sometimes merely seasonal changes—in the relative demand for currency. Had it not been prohibited, freedom of note issue would have gone far in eliminating this problem, and where note issue was relatively free, as it was in Scotland and Canada, the problem did not arise.<sup>38</sup> Dependence upon a lender of last resort, on the other hand, does not get to the root of the problem, since it generally involves a monopolized currency supply that is also "inelastic" and that can be managed properly only with great difficulty, if at all.

## Conclusion

Obviously, changes in the relative demand for currency are only one of many difficulties banking systems have to confront. Because free banking is better equipped than central banking to deal with this particular adjustment does not, therefore, mean that it is a superior system all-around. Nevertheless, when one considers the very large contribution disequilibrium currency supplies (that is, unaccommodated fluctuations in currency demand) have made to past monetary crises, this single advantage of free banking seems to be a very important point in its favor.

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<sup>37</sup>In view of this, it would have been better had state authorities declared a mere restriction of payments, prohibiting withdrawals of currency and coin, instead of outright holidays. This would have allowed checking-account transactions to continue and would not have provoked as complete a flight to currency in neighboring states.

<sup>38</sup>On the supply of currency in the (pre-1935) Canadian banking system, see Holladay (1934) and Root (1894).

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