Monetary Policy and the Dollar

Peter L. Rousseau, Vanderbilt University and National Bureau of Economic Research

1. Introduction

Twenty-first century Americans take for granted that a dollar is worth a dollar, meaning that a given Federal Reserve note at a point in time carries a fixed purchasing power regardless of who tenders it or where it is tendered. And though one may rightfully say that prices of goods with identical physical characteristics can and do differ across localities and that a dollar may therefore not be worth the same amount of goods everywhere, economically speaking, an apple in New York is a distinct good from an apple in Cleveland, with each subject to its own supply and demand conditions just as are apples and oranges in Chicago. This means that a dollar is still worth a dollar with no questions asked of its holder.

When the United States adopted the dollar as a common currency shortly after the ratification of the Federal Constitution in 1788, it represented the birth of the monetary system that for the most part continues to the present day—a system that eventually led to the dollar's universal acceptance and rise to its position as the world's leading currency. With it came a central bank, a mint, the start of modern banking operations and securities markets, and a newly-found confidence among investors in the ability of the young nation to service its financial obligations. The new system and its specie standard represented a marked improvement over the fiat paper money systems that had operated in the British North American colonies prior to their independence in 1776, and an enormous improvement over the rapidly-deteriorating monetary conditions that existed during the during the Revolutionary War (1776-1781) and under the Articles of Confederation (1781-1788). During the war un-backed paper money issued by the Continental Congress gave way to an inflationary spiral, debt depreciation, and a scarcity of real

money balances. Later issues of paper money by individual states in the 1780s were also unable to retain their value. The need to unify the nation's currency and to restore the public's confidence in it through adoption of a specie standard must have weighed heavily in the minds of the founding fathers as they drafted a Constitution that forbade emissions of paper money by individual states.

These men based the decision on their more recent experiences, yet the experiments with fiat paper monies conducted in the colonies over the eight decades leading up to the Declaration of Independence can hardly be considered a woeful failure. At the same time, the monetary systems under which the colonies operated were vastly different from the one now used in the United States. While the colonists did indeed exchange "pounds" for goods in many of their transactions, they were not the British pound sterling. Rather, individual colonies issued their own "pounds," each with markedly different and frequently varying relative valuations from one another and against the British pound. And though these local "pounds" were usually employed as the unit of account in each colony, meaning that prices of all goods were generally set in terms of them, a wide range of exchange media might be accepted in actual payment for goods, including but not limited to a colony's own paper pounds, those of other colonies, and various foreign coins that traded at varying rates against the local "pound."

Often money did not change hands at all. Rather, those desiring goods received credit from a shopkeeper, who would then record a debt for the local currency value of the goods extended. Repayment might then occur in goods acceptable to the merchant and in a quantity that would erase the debt, or in any of the monetary forms described above. Sometimes transactions occurred by simple barter between two individuals, such as a two bushels of wheat for eight hours of work on the farm.

Given these conditions, it would seem that the colonists could have benefited considerably from standardizing at least their paper currencies, if not their coins as well. But the fact remains that these arrangements worked reasonably well most of the time, especially in light of restrictive policies imposed by the mother country. It was only when the supply of paper money increased to great excess that bouts of hyperinflation and depreciation would destroy wealth and lead to public consternation. Because these events were relatively rare, it is not immediately obvious that the founding fathers should have preferred the ban on state currencies that eventually made its way into the Federal Constitution.

In this essay I will develop the argument that, though perhaps not an obvious decision at the time, the ban on state-issued currencies was in retrospect a very good idea. This is because the transition to the dollar and all that came with it succeeded in *monetizing* the modern sector of the U.S. economy, a feat that was not possible in an era when colonial legislatures were unable to commit credibly to controlling currency emissions. In making the case, I will describe how the monetary systems of the colonial and confederation periods operated and compare these systems with those put in place early in the nation's Federal period and under today's more-familiar Federal Reserve. Many aspects of these systems, including how colonial paper monies managed to retain their value and the relative benefits of shifting the money creation process from the government to the private sector, are ones of current academic debate. In these instances, I will review the contending viewpoints in the course of synthesizing an overall view of how the monetary systems in America worked before and after the transition to the dollar.

2. The Economics of a Currency Union

The property that a U.S. dollar is worth a dollar regardless of its holder, or in other words, that the states today operate as a single currency area within a monetary union, has its

advantages. Consider the alternative of a loosely-connected group of territories, as were the colonies, with each operating under its own monetary standard. In such a world, an agent purchasing goods outside of his or her area would first need to exchange that area's money with a currency that was valid in the area where the purchase would occur. Either that or the purchaser's currency would likely be accepted at a lower value than it could command in its own area. The discount would be taken because transporting the "foreign" currency back to the location where it could ultimately be redeemed involved costs, and because of uncertainty regarding how much the currency would be worth upon its return. These "deadweight" losses, as economists call them, have to fall somewhere, and often upon the consumer. Today such a system of separate currency areas within a single nation would likely be rejected as inefficient and replaced with a system based on a common currency. Even in the case of connected yet distinct nations seeking greater adhesion, such as the European Union, separate currencies and exchange rates across them often give way to a common currency, as has occurred with the euro.

One consequence of operating under a common currency is some loss in the ability of individual areas within the union to control the amount of money available to their citizens, and therefore to control the general level of prices in any particular area. For example, prior to the establishment of the euro zone, if, say, the Bank of France believed that putting more francs (i.e., the former French currency) into circulation would keep prices stable in the midst of heightened economic activity, the central bank could, for example, buy a bond from the government, printing francs to do so, and the government could then proceed to use these francs to pay its employees for services, or engage in some other form of consumption or investment. If there were enough of the government's bonds already outstanding, it could of course also accomplish its goal by buying some of these bonds back from the public.

If, on the other hand, the monetary authority believed that stabilizing the franc's external value with respect to other currencies was a higher priority than stabilizing prices within France, it might choose instead to create money only if it found the franc appreciating excessively against other currencies. Though achieving both internal price stability and a fixed exchange rate with another currency is generally not possible in economic theory and in practice, the fact remains that under a national currency individual governments and their central banks have some degree of autonomy in deciding which of their policy goals are the most important to pursue.

Now consider a common currency, say the euro. Continuing the example, if economic activity were to increase in France, there would be downward pressure on French prices as the same euros would now have to suffice for purchasing a larger quantity of goods. The downward price pressure would draw euros from other members of the European Union into France as they sought to purchase cheaper goods, but it might take some time for prices to return to their original level. In the meantime, if economic activity were to remain stable outside of France, the draw of euros into France would decrease the money supply elsewhere, lowering prices in other parts of the union. In this case, it might be less disruptive for the European Central Bank (the monetary authority of the European Union) to stabilize prices by simply injecting fresh euros with France as the entry point. But as part of a currency union, some of the new money would make its way in the ordinary course of transactions to other countries within the euro zone, meaning that stabilizing prices in France might require even more money issues. If the other countries receiving these indirect monetary flows do not increase economic activity commensurately, they would then see upward pressure on prices (i.e., inflation). This would counteract some of the original corrective action taken in France. Thus, there could be what

economists call serious "general equilibrium" effects whereby actions taken to encourage price stability in one member of a currency union can have destabilizing effects on other members.

At the same time, a common currency allows a monetary authority to manipulate the amount of money available in targeted areas while keeping the money supply of the currency zone as a whole on some pre-determined long-run path. In this sense, the union's monetary authority can maintain the strength of the common monetary unit while still using some discretion in meeting the internal needs of its individual member areas. A common currency also often goes hand in hand with an integrated banking system and financial markets that reduce redundancies and improve the efficiency with which financial transactions take place. Uncertainties about exchange rate fluctuations between times of contracting for goods and paying for them across countries in the zone would be eliminated, and could well increase the propensity of the member countries to engage in welfare-enhancing trade. In addition, a common currency may render its members better insulated from speculative attacks and the financial crises that can often follow in small countries with inadequate reserves. All this said, of course, if the currency of a large region such as the euro zone were to come under a successful attack the damages would be catastrophic.

As cogent as the issues surrounding the establishment of a monetary union may seem in today's financial climate, it may come as a surprise to some readers that the United States came to grips with many of the same issues more than two centuries ago in the years that followed the 1788 adoption of the Federal Constitution. At that time the nation officially made the transition from a loose confederation operating under a system of multiple state-issued fiat currencies to a nation in which transactions were unified under a single unit of account, with the money creation process placed largely in the hands of privately-owned banks.

The coordination problems associated with the lack of a monetary union were quite serious in the colonies. Currencies of distant colonies did not pass in hand-to-hand transactions at their stated values, but rather for considerably less. Currencies of nearby colonies, such as those within New England, however, were often accepted at their stated values. Though the latter arrangement may share some features of a monetary union, it was nonetheless problematical in that there was no central authority to control the total supply of paper currency.

{FIGURE 1 HERE}

Figure 1 shows the course of the per capita supply of paper money in the New England colonies from 1720 through 1751, with all local pounds converted into sterling equivalents to facilitate direct comparisons. This was done by dividing the amount of outstanding paper money by the total population of each colony, and multiplying the result by average annual sterling exchange rates for Massachusetts.[1] In this case, with specie (i.e., gold and silver coins) effectively driven from the New England area by 1723, paper money represented the entire money stock for most of the period in the figure.

A few observations can be made at this point. First, the per capita stock of paper money declined in Massachusetts, New Hampshire and Connecticut through the 1720s and 1730s. By 1740 it had fallen to less than £0.5 sterling in all three. Second, the behavior of Rhode Island's money stock was much different, following an upward trend from 1710 through 1747. This small state, with a population of 25,000, one-sixth that of Massachusetts, had discovered that it could

[1] The quantities of outstanding bills of credit for the New England colonies are from Brock (1992, Table 1). Colonial populations are from U.S. Bureau of the Census (1975, p. 1168, series Z-3, Z-6, Z-7, Z-11) and use constant growth rates to interpolate between decadal benchmarks. Sterling exchange rates are annual averages of local pounds per 100 pounds sterling from McCusker (1978, Table 3.1, pp. 138-45).

issue paper money that would depreciate only to the extent that it undermined confidence in the money stock of the entire *region*. This in effect allowed Rhode Island to levy taxes indirectly on its neighbors. The issues can be considered taxes because they could be used to purchase goods outside of Rhode Island, thereby increasing the usable money supply of the neighboring colonies and leading to inflation. (After all, inflation is just a way of taxing those who hold money by eroding its value.) Finally, when the New England colonies all began to emit larger quantities after 1745 to pay for King George's War, the ensuing expansion of the region's money supply led to a rapid inflation.

Recognizing its difficulties in managing paper money, Massachusetts reformed its currency between 1749 and 1754, at first using most of a parliamentary grant of £183,650 that was belated compensation for expenditures made by the colony during King George's War to purchase silver (and some copper) to retire its paper money. After that, Massachusetts issued only "treasurer's certificates," which bore interest and were redeemable on demand in silver. This effectively placed Massachusetts on a specie standard for the remainder of the colonial period (Brock, 1975, pp. 244-56).

Rhode Island's ability to exploit the system of currency finance underscores an important disadvantage of monetary independence in a tightly-wound regional economy—the domestic value of one currency becomes dependent on actions taken by other members of the "union." The forbidding of state bills of credit, formation of a central bank, and growth of the banking system after 1790 can be viewed as attempts to reduce the possibility of these problems arising.[2]

[2] Rolnick, Smith, and Weber (1993) contend that the colonies operated under flexible exchange rates and that the desire to eliminate them was the main reason why the U.S. Constitution forbade state currency emissions.

This is not to say that the young United States decisively tackled the problems of monetary control within a currency union either, but by settling upon the dollar as the monetary standard it certainly made progress in that direction. Much of the credit seems appropriate to bestow upon the nation's first Secretary of the Treasury, Alexander Hamilton. By establishing a federal mint in 1792, Hamilton brought order under a bi-metallic standard to the collection of foreign coins and various local currencies that had previously comprised the nation's money stock, and formally introduced the dollar as the common unit of account.

Hamilton also succeeded in building legislative support for the charter of a national bank, the First Bank of the United States. And though its charter was not renewed in 1811 for political reasons, the functions performed by the First Bank as the federal government's fiscal agent helped to demonstrate the advantages of a common currency with centralized control over the government's deposits and disbursements. For one, the Bank made it easier for the government to deposit revenues in certain regions and disburse them in entirely different ones. The Second Bank of the United States, formed in 1816 and surviving until 1836, continued along the path set by the First Bank, and with a much expanded capitalization, was able to further the monetary and financial integration of the nation.

Overall, the banking system would grow rapidly over this period. Starting with only three banks in 1789, 28 new banks obtained state charters in the 1790s and another 73 were chartered in the decade that followed (Fenstermaker 1965a, p. 13). The profitability of these early banks, for which annual dividends of more than 8 percent were common, sparked a rapid expansion in their number that reached a high-water mark of 834 state banks by 1840. Then, after a brief decline during the depression of the early 1840s, by 1860 the number of state banks nearly doubled again. Figure 2 shows this evolution along with estimates of paid-in banking

capital.[3] Like the rise in number, the increase in capital (in 1860$) from $3 million in 1790 to $426 million by 1840 reflects the growing role of banks in mobilizing resources and in providing credit and other financial services.

{FIGURE 2 HERE}

The most substantive change, however, was the transfer of much of the control over the money supply from the public to the private sector. Rather than a system in which government officials and politicians controlled the issuance and redemption of paper—functions that placed them at the center of a credit allocation process aimed largely at the agricultural sector— banks were able to amass private capital and issue notes that could promote investment and foreign trade by seeking the highest returns.

By issuing notes, I mean that individual banks could now print their own paper money, redeemable into specie on demand at the bank's counter, and allow these notes to circulate among the public over the time between issuance and redemption. At first this may seem to represent little improvement over the colonial system, where at least there were legislators and the crown to keep track of the quantities issued, but over-issuance of demand notes by banks turned out to be the exception rather than the rule. One reason for this was that most banks feared large and unpredictable presentations of paper at their counters for immediate redemption

[3] Total paid-in capital for state banks was constructed by extending backward the series for 1837-1850 that appears in U.S. Bureau of the Census (1975, series X587). This was done by multiplying the paid-in capital of reporting state banks in each year from 1803 to 1837 by the ratio of the total number of state banks to the number of reporting ones (Fenstermaker, 1965a, pp. 66-68; Fenstermaker, 1965b, p. 406), and joining the result to the Census series. I then used percentage changes in the authorized capital of all state banks from 1790-1802 (Fenstermaker, 1965a, p. 13) to approximate the series through 1790, and converted to 1860 dollars using the consumer price index from David and Solar (1977, p. 16).

in specie, and practiced some restraint in issuing notes for this reason. At the same time, many banks were known to have over-issued notes, and especially in the 1830s. Yet the central bank, at the times when one existed, could and did impose some discipline on over-issuing banks by accumulating notes of such banks and then presenting them all at once to the issuer for redemption. In other words, excessive note issues by a large number of soon-to-be-insolvent banks in one region could disrupt the economy generally if they undermined confidence in other banks, but the excesses of a single issuer (i.e., in this case a single bank), unlike that of an entire colony, were unlikely to disrupt the entire financial system.

At the same time, it can be fairly said that bank money in early United States was not homogeneous in that its value did depend on the ability of the issuing bank to make good on the promise to redeem its own notes on demand and in specie. Indeed, uncertainty about the strength of these promises and the costs of verifying them did cause bank notes to pass at discounts away from their points of issue (Gorton 1996), and the use of notes of closed banks and counterfeiting did occur (Mihm 2007). But in the end a note was always tethered to its place of issue by the redemption option and would eventually return there, limiting the extent to which excessive issues could disrupt prices in nearby states. So even if lacking some features of a full currency union in the modern sense, the early United States had many of such a union's advantages.

3. Challenges of Monetary Control

The currencies of the colonies were essentially fiat monies, meaning that they were deemed an acceptable means of payment by government decree. Given this, one question that often arises is how the colonial bills of credit managed to retain their value as well as they did amidst a wide range of monetary and real economic shocks. Indeed, why would anyone value them at all? One could well ask the same question with regard to today's U.S. currency, which is

also a fiat money, yet the "full faith and credit of the U.S. government" means a lot more today than it meant 250 years ago. This is because the Federal Reserve has for some time maintained a commitment to control the quantity of money that is available in the economy, and is equipped with the means for doing so through interactions between the banking sector and the purchases and sales of the government's debt securities.

For example, if the Federal Reserve Bank chooses today to increase the supply of money, perhaps with the objective of achieving some targeted rate of interest, it purchases outstanding government debt securities (i.e., Treasury bills, notes, bonds, or other acceptable paper) from the public and many of the payments go into the sellers' checking accounts where they immediately become reserves for the banking system. Individual banks then create money by lending on the new reserves. Since banks need only maintain a fraction of their deposits as reserves, an additional dollar in reserves in ordinary times supports the creation of many new dollars through the making of loans. For example, with a reserve requirement of ten percent on deposits, one additional dollar in reserves can be multiplied into $10 of new money. This occurs because loans are initiated by creating checking account deposits for the borrowers, and checking deposits are part of the narrowly-defined money supply (i.e., M1). An economist would say that the expansion had occurred through a "money multiplier" effect, with the multiplier in this case taking a value of ten.

To contract the money supply, possibly with the objective of making money more scarce and thereby raising interest rates, the Federal Reserve does the opposite, selling Treasury securities to the public, reducing the checking balances of those who buy them and draining reserves from the banking system. A so-called "reverse money multiplier" then takes over through which each dollar of lost reserves forces an affected bank to reduce its assets by the

multiplier. If, as in the previous example, the reserve requirement is ten percent and the "multiplier" is therefore ten, each dollar of drained reserves forces the bank to contract deposits by $10, a task that is sometimes accomplished by calling in loans.

When the Federal government needs money to finance its expenditures that cannot be acquired through taxes, it instructs the Federal Reserve Bank of New York to conduct an auction that sells bonds to the public on its behalf. If the debt is purchased by domestic entities and the government spends the funds quickly, it generates only a temporary reduction in the money supply. It is temporary because the reserves drained in the sale make their way back into the banking system quickly as the government spends the funds and the recipients deposit them.

If the debt is purchased by foreigners using dollar-denominated balances in banks outside of the United States, the effective money supply would increase because the government would spend the fresh funds and they would end up in individual checking accounts, where they would increase domestic reserves and be subject to the multiplier effect. All else the same, this would place downward pressure on interest rates. To hold interest rates at the target, the Federal Reserve may therefore choose to sell some of its own inventory of securities to offset the expansion coming from foreign sources.

The main point here is that this system of "open market operations," as employed in the United States today, is more or less effective in controlling the main monetary aggregates.

There were no such open market operations to control the money supply in the British North American colonies. To use a modern analogy, increasing the money supply in a colony would have been much like today's Federal government forcing the Federal Reserve to purchase its IOU, printing cash to do so, and the Federal Reserve choosing not to offset the resulting increase in the money supply with its own open market sales. The fiscal authority could,

however, promise to exchange the cash at some future date for individual tax obligations and to ultimately return these tax payments to the Federal Reserve for shredding. This would extinguish the original IOU and remove the cash from circulation.

If executed according to design, such a system would tax the public only once – in advance through the monetary emission. Indeed, if the public were to maintain confidence in the government's resolve to redeem and destroy the cash according to a well-defined schedule, this anticipation would dampen inflationary pressures associated with the emission since it would be understood to be temporary. Interestingly, the greatest challenge of monetary control faced by the colonies involved the timely "retrieval" of currency through later taxation.

Of course, the individual colonies did not have central banks, nor any real banks to speak of other than a few small, private ones operating primarily in New England, so colonial legislatures, in conjunction with the crown, had to function as their own central bankers. When a colonial legislature needed money (perhaps to finance skirmishes with its French, Spanish, or Native American neighbors, or to pay its employees or make loans to farmers for land purchases), it authorized itself, usually with the consent of the crown, to print paper money (i.e., write itself an IOU). It would then spend the newly-printed "bills of credit," as they were called, increasing the money supply of the colony and imposing an indirect tax on holders of previously-issued bills. Inflation would sometimes ensue, the extent of which would depend on the size of the issue, the quantity of gold and silver coins in circulation, the growth of real activity, and most importantly the plausibility of the legislature's plans to redeem the bills.

In the middle colonies such as Pennsylvania and New York, bills of credit were usually issued with specific schedules for redemption in the form of the cancellation of individual tax liabilities. The bills would be burned after collection, thereby reining the money supply back.

Some scholars believe that when the public was confident that these operations were being carried out as planned, as they were most of the time in the middle colonies, the bills of credit were in effect "backed"—not by gold or silver, but by their promised acceptance in payment of future taxes (Smith 1985).[4] Indeed, in a growing economy where it is known that paper money issues will be removed from circulation in a timely manner and the emissions are not excessive, the government's balance sheet may be relatively unaffected and inflationary tendencies dampened (Wallace 1981; Sargent and Smith 1987). This is because the paper issues represent a liability for the government that is offset by a receivable, namely the future tax payments.

In other colonies, such as those of New England in the 1740s and South Carolina before 1730, however, the commitment to collect and destroy bills of credit according to schedule was less steadfast than in the middle colonies. After all, defending against neighboring foes was seen as crucial to the survival of the British Empire, so the colonial legislatures met with little resistance from the crown when emitting paper money in amounts sufficient for funding such conflicts. But once the new money was spent, it was hard to commit to accepting it in lieu of taxes. Even if collected, there was a temptation to recycle the bills for new expenditures rather than destroying them. Even outright theft could and did sometimes occur.

Thus, when the need for the new money ceased with the end of military operations, if other sectors of the economy had not grown adequately in the meantime, there was often too much money in circulation to hold prices steady. This was a recipe for inflation, depreciation, and the destruction of wealth. Colonists would first try to exchange the bills for specie in the course of everyday transactions when confidence in them fell, but the bills would quickly

[4] Others disagree, most prominently Michener (1987) and McCallum (1992).

depreciate. In this scenario a speculative attack was avoided only because the colonial legislatures did not attempt to peg the bills to gold or silver, or in other words, did not commit to maintaining fixed exchange rates between bills and specie.

The period of the Revolutionary War and the provisional government under the Articles of Confederation, though ending in military and political triumph for the former colonies, saw further deterioration of monetary control. Calomiris (1988), Perkins (1994), and Michener and Wright (2005), among others, describe how the Continental Congress, a political body that lacked the power to ensure redemption of paper money by levying taxes, authorized their issue anyway to finance the conflict. Given the history of problems that the colonies had faced in redeeming their bills of credit even with the authority to impose taxes, it is in retrospect not surprising that the new paper money depreciated virtually to the point of worthlessness.

The saga of the "continental" currency is a classic example of what economists refer to as the "time inconsistency" problem in monetary policy. The burden of financing the Revolutionary War, which was much greater than experienced during the French and Indian War (1755-1763), called for drastic measures. The former colonists had never experimented with a common currency, and when debt proved difficult to sell domestically, fiat money became a viable option for financing the Revolution. Uncertainty about the size of the new issues and perhaps even misplaced optimism about the terms of their redemption allowed the bills to retain their value long enough to support expenditures in the first year or two. But when the paper depreciated the Continental Congress could not successfully turn to the device a second time. The continental was officially devalued at 40:1 in 1781 and in the end Hamilton's funding plan of the 1790s provided for redemption of the remaining bills at a ratio of 100:1 (Perkins 1994, pp. 97-8).[5]

[5] The popular phrase "not worth a continental" has its origins in experiences with this currency.

The thirteen states also issued their own fiat currencies during and immediately after the War of Independence, and rapid depreciation commenced on these as well. By the mid-1780s, seven states had reissued fiat currencies that were backed by future tax collections, but these never managed to circulate at par. Pennsylvania, for example, which is often credited with having among the more stable of these later arrangements, saw the value of its currency value depreciate by 20 percent against sterling between November 1780 and June 1785 (Bezanson 1951, p. 346). At the same time, the Federal government was in default on its foreign debts, primarily to the French government and to Dutch investors. The 1780s saw attempts by financial leaders such as Robert Morris and Hamilton to hasten the privatization of the financial system by establishing the nation's first real banks in the commercial centers of Philadelphia and New York (Perkins 1994, esp. Ch. 6). Political opposition to these banks was strong, however, and they were at that time unable to serve as much more than a model for the changes that were to come (Sylla 2002; Rousseau and Sylla 2005).

In other words, the ability of the young United States to finance its military efforts in the Revolutionary War does not imply that its monetary policies in this transitional period were optimal or stable. After all, an ability to write-down (and effectively write-off) state and federal obligations at pennies on the dollar can hardly be considered a desirable policy—even among a general population that was reluctantly willing to accept the Continental issues as the taxes that they were. Further, the depreciating currency, in the absence of a banking system or organized and liquid securities markets, was the only domestic financial asset that could function of a store of value. It is clear why savings and capital accumulation were stunted under such conditions.

When the transition to the dollar occurred in the 1790s, an accompanying flurry of activity led to the establishment of a banking system and a central bank that achieved better

control over the money supply. This is not to say, however, that a system similar to today's "open market operations" was achieved—this did not occur until the founding of the Federal Reserve Bank in 1914. The main problem was that the First Bank of the United States, with its large-for-the-time capitalization of $10 million, still lacked several features of a modern central bank. For one, it lacked the capital and mandate to act as a lender of last resort and in effect guarantee the notes of the banking system in times of crisis. Indeed, an expansion of its own note issues in late 1791 and early 1792 and then a sharp contraction as the Bank lost reserves probably contributed to the first financial panic of the Federal period in March-April of 1792. In the end it was Secretary Hamilton who averted the panic by using Federal monies to purchase bonds and inject liquidity into the New York market (Sylla, Wright, and Cowen 2009). In addition, the First Bank lacked the span-of-control required to fine-tune the aggregate money supply in an era when banks were not bound by reserve requirements.

At the same time, the Bank was able to set an important example of how to handle note issue responsibly, and a decentralized system of individual banks soon followed the lead and issued their own demand notes backed by gold and silver coins. The backing of the paper money supply with specie increased the confidence of foreign investors in the commitment of the United States to make scheduled payments of interest on its public debts in hard money, encouraging capital flows to the young nation.

From that point until 1914, the quality of the money supply in the United States was based upon the acceptability of bank notes. Even though banks in most states operated without any form of reserve requirements until the 1860s, state banks realized that they would be out of business quickly if they allowed specie balances in their vaults to get too low. Financial panics remained an important part of the antebellum economic landscape, with notable ones occurring

in 1814, 1819, 1837, 1839, and 1857, but it is worth noting that hyperinflations such as those experienced by the colonies and the provisional government became a thing of the past in the United States. At the same time, banks were able to expand note issues as the needs of commerce increased, and while contracting the supply of bank notes was still more difficult than expanding it, the money supply saw greater elasticity in the fifty years following the Constitution than it ever did beforehand (Rousseau 2006). Transferring control of the money supply to a series of quasi-public and private banks was at the time the right decision, and establishing a specie standard was an important intermediate step that would set the stage for the fiat system that would evolve in the latter half of the twentieth century.

4. Backing of Paper Currencies and the Potential for Economic Growth

Thus far, I have proceeded under the premise that the acceptability of the paper money issued by the colonies for the cancellation of future tax liabilities was the feature that gave real economic value to these emissions. Put another way, it was the credibility of the government's promise that the bills would someday be usable at their nominal values to pay off an otherwise unavoidable debt that limited the extent to which the bills could depreciate before that date. This form of "backing" was quite different from the system that existed after the adoption of the Constitution in which it was public confidence in the readiness of convertibility to specie that rendered a bank note as good as specie or better, at least in the vicinity of the issuing bank.

One of the fundamental tenets of monetary economics is that the relationship between money, output, and prices can be described, to a first approximation, by a simple identity commonly known as the "quantity theory of money." In its most basic form, the quantity theory posits the following "equation of exchange":

$$MV = PY \qquad (1)$$

where M is the quantity of money in circulation, V is the velocity of money, or the number of times that a typical single dollar is used in transactions over some fixed period of time, P is the general level of prices, and Y is the extent of transactions carried on, often measured by real output or gross domestic product. This simple yet elegant expression shows that, assuming Y and V to be fixed in the short term, an increase in the supply of money should be quickly reflected in an increase in the level of prices, or put differently, that money should depreciate in value. Similarly, a decrease in the money supply should quickly lead to a proportionate decline in prices and increase in the value of money.

The quantity theory is of particular interest to scholars of the colonial period because some evidence suggests that the predicted direct and proportionate relationship between money and prices did not always hold at that time. For example, West (1978) estimated the relationship between the quantity of bills of credit in circulation and prices in New York, Pennsylvania and South Carolina using a standard linear regression model and found no significant correlation between the two, while Smith (1985) obtained similar results for Maryland and the Carolinas. These findings ignited a discussion that has persisted for decades about whether the West-type regressions capture a failure of the quantity theory or simply a failure of the extant data for the colonies to reflect the quantities of interest.

Michener (1987) develops a theoretical model of the colonies in which paper money and specie are perfect substitutes, meaning that emissions of paper drive specie out of circulation and reductions generate offsetting specie inflows, thereby keeping the total money supply (i.e., paper plus specie) on some stable long-run path. If true, failure to find the relationship between money and prices implied by the quantity theory could just reflect the exclusion of specie from the measured money supply. This opens up the possibility that econometric tests would support the

quantity theory if only the money supply could be measured accurately. It is also consistent with the view that paper money retained its value in the face of new emissions (i.e., did not have the expected effects on the price level) because offsetting specie outflows would leave the total money supply unaffected. In the latter case, money would depreciate via the quantity theory only after enough bills of credit had been issued to drive all specie out of a colony and further emissions had begun to increase the total money supply even more. Prior to this, paper money and specie would be exchangeable at some fixed rate. Given the observed lack of correlation between paper money and prices, the theory is most plausible if there was a lot of specie in the colonies most of the time to support the fixed exchange rate.[6] It also requires an ability of colonial legislatures to contract paper money quickly to keep the total supply steady in the face of specie inflows. As stated earlier, the colonies had great difficulties in accomplishing this.

Advocates of the backing theory, such as Smith, interpret the failed correlation between paper money and prices not as one of measurement but rather as a direct violation of the quantity theory. In this view, specie and paper money are not perfect substitutes, but rather complements much of the time, so that fluctuations in the supply of paper money would indeed closely reflect movements in the total money supply. Under these conditions, the quantity theory fails because the public believes that new emissions of paper money will at some point be removed from circulation, which delivers a smaller impact on current prices than the quantity theory would predict, and possibly no impact at all.

Formally, the backing theory as proposed by Wallace (1981) and Sargent and Smith (1987) predicts a zero inflationary response to paper money issues only under technically stringent conditions. In particular, the colonial legislature making the emission must commit to

[6] Michener (1987, pp. 253-56) is careful to note that his model is expository and that exchange rates were not fixed at all times, as the model requires, and that specie was not always abundant.

raising future taxes at the same rate as it has increased the supply of money through currency issues, thereby increasing the current demand for currency as an asset, and must maintain confidence in the promise that the bills will be collected later. Another way to think of it is that the government puts the new money into circulation by purchasing physical assets, and the future returns to these assets are passed back to citizens through the later acceptance of the bills for taxes. In this case, the present value of the returns from the assets must equal the value of the new notes in order for the price level to remain undisturbed.

Even if not operated precisely in the non-inflationary manner described, the Wallace-Sargent-Smith mechanism would still dampen inflationary pressures in an economy where bills of credit are perceived as tax anticipatory notes. The theory is thus consistent with West's failure to find statistically significant correlations between paper money quantities and prices.

The backing theory does not imply offsetting inflows and outflows of specie as the supply of paper money contracts and expands. It also does not imply fixed exchange rates between paper and coins, but rather exchange rates that fluctuate with the ebbs and flows of paper, specie, and real activity. Further, the system could work in a region where specie was scarce, and would be consistent with the view, supported by much of what was reported in the contemporary press, that the colonies issued paper money because they could not maintain a supply of coins that was large and stable enough to keep prices from fluctuating excessively.

The controversy between the backing and quantity theorists, at the end of the day, hinges on how much specie was in the colonies. Unfortunately, scholars of the period will probably never know the answer with certainty.

An alternative that I have proposed in Rousseau (2007) supports the quantity theory of money while retaining elements of the backing theory, and does not require fixed exchange rates

or an abundance of specie in the colonies. Returning to the equation of exchange, I assume velocity (V) to be constant but allow monetized transactions (Y) to vary. In this arrangement, increases in the supply of money could encourage more individuals to use it in transactions because of its greater convenience over barter or bookkeeping entries. Indeed, economies experiencing growth in modern sector activity (i.e., manufacturing, construction, commerce), such as those of the colonies and the young United States might have found money to be increasingly useful from a development perspective.

If the mechanism is correct, emissions of paper money would push more transactions through the formal market sector of the economy, with the side-effect of increasing the amount of activity occurring in the market sector itself, in either case raising Y in the equation of exchange. Thus, increases in M on the left-hand side would be at least partially offset by increases in Y on the right-hand side, requiring long-run prices (P) to move less, or in the case of complete absorption of the new money, not at all.

To work in the colonies, it would have been essential for legislatures to keep the money supply from expanding more rapidly than it could be absorbed in newly-monetized transactions. To the extent that the public believed that the new money would be accepted as future tax payments, this would have helped money to retain its value as the public began to use the new bills in a wider range of transactions, and would have allowed for lags between the actual emissions and associated increases in modern sector activity. While fixed exchange rates are not required, exchange rates between specie and paper money could still have remained relatively stable over extended periods. An abundance of specie is also not required as the bills of credit would be backed by future tax collections rather than gold or silver coins. Only excessive issues would erode public confidence in the backing and lead to inflation.

It is important to note that the quantity theory holds under the mechanism that I propose, but emphasizes conditions that differ from those emphasized by McCallum and Michener. Yet the extent to which money could be created in the colonies, despite an excess demand for its services, was limited by the extent to which colonists could be convinced of the colonial legislature's resolve to redeem the notes. This means that the colonial monetary systems could have been growth-promoting, and certainly more so than in a system without paper money, but that the power of this mechanism was limited by the gradual and incremental manner in which it could be utilized. It also suggests that breaking away from the constraints on money creation inherent in the colonial systems, as occurred early in the Federal period, could lead to improved macroeconomic outcomes. Rearranging (1) with *V* held constant immediately yields

$$Y = F(M/P), \qquad (2)$$

a relation in which real activity in the market (i.e., modern) sector is a direct function of real money balances. Rousseau (2007) offers support for a finance-led growth of this type for colonial Pennsylvania and the early United States in a set of vector error correction models, with the strongest results obtaining for the early Federal period. The mechanism is most likely to have operated at times when the amount of specie available in the colonies was small, meaning when they were under-monetized. The next section examines the prevalence of this condition.

5. Specie Shortages and Under-Monetization in Colonial America?

Specie shortages seem to have been common in the colonies during the period preceding the Revolutionary War. Shortages arose because England prohibited exports of specie in the course of commerce from the mother country to the colonies, and prohibited the colonies from minting their own coins. Though the colonists did manage to produce some copper coins on their

own in direct disobedience of the crown, the specie base in the colonies consisted mainly of the small quantities of British coins that did make it across the Atlantic to reimburse military expenses and to pay British soldiers stationed there and other foreign coins. The most common foreign coin, the Spanish silver dollar, or "piece of eight," arrived primarily from the West Indies in the course of international trade with other countries and parts of the globe. Other coins in common circulation included the Spanish gold pistole, and the Portuguese gold Johannes (or "Joe" as it was called by the colonists), and the Portuguese gold moidore. It is very likely that this collection of coins, due to their shortage as well as their minting in denominations too large to be useful in most transactions, was inadequate to support all of the exchange activity for which some form of money would have been desirable.

The scholarly record also generally suggests that the supply of specie was usually inadequate. For example, Brock (1975, p. 532) asserts that "in ordinary times, the supply of specie was at best meager and uncertain, and was not infrequently wanting altogether." The second chapter of Bezanson (1951, p. 10) opens with the claim that between 1770 and 1775 only "a minor amount of coin furnished the medium of exchange in domestic trade." Lester (1938, p. 326) states that "gold and silver coins were a luxury in the colonies." In terms of quantitative estimates, McCusker and Menard (1985) place the share of specie at about 25 percent of the money supply, and Grubb (2004) estimates that specie was used in about 20 percent of market transactions. If these scholars are anywhere close to the mark, money would certainly have been in insufficient supply if limited to specie alone.[7]

[7] This is not to say that there is universal agreement about the amount of specie in the colonies. Using the results of Jones's (1980) study of colonial probate records from 1774, Michener (1987, p. 528) estimates that about two-thirds of the money supply in New York and Pennsylvania was comprised of specie. Problems with using probate records to estimate the money stock, and most importantly that such measures represent the specie holdings of wealthy individuals and are thus

Specie, to the extent that it was available, also had a tendency to flow into colonies that valued it more in terms of the local currency and out of colonies that valued it less. All the while, specie was under pressure to go abroad to settle trade deficits with England. This meant that international trade typically involved foreign coins flowing into the colonies from other points in the western hemisphere, such as the sugar islands, with at least some of these transactions initiated in Europe, and a one-sided outflow of these coins to England.

If we are to believe, along with the majority of scholars of the period, that specie was in short supply, then it would seem unlikely for the colonial bills of credit to have maintained fixed exchange rates against the British pound sterling. The extant data on exchange rates also indicate that they moved around quite a bit (McCusker 1978). All of this suggests that the notion of the colonies operating under a version of the quantity theory in which specie need not be abundant and in which exchange rates need not be fixed is certainly plausible.

Since the colonies found it difficult from the very start to maintain an adequate supply of coins for conducting standard transactions, other forms of credit were needed to take their place. Massachusetts declared corn to be legal tender as early as 1631, setting its value in terms of pounds, shillings and pence. Virginia followed by declaring tobacco to be legal tender. As might be expected, colonists soon began using inferior grades of these commodities as money, saving the higher grades for direct consumption or barter transactions. Economists have recognized this tendency for "bad money to drive out the good" and named it "Gresham's Law." Virginians quickly came to understand this principle and began to establish warehouses where government

---

unrepresentative of the population at large, are described in Smith (1988, p. 29) and McCusker and Menard (1988, pp. 264-5). Smith (1988) includes a summary of other estimates of the colonial money supplies and the conceptual problems associated with each. Michener (1987, pp. 278-9) discusses inconsistencies in McCusker and Menard's calculation.

inspectors could verify the quality of incoming tobacco and issue certificates based upon its grade. These certificates would then circulate as money among merchants. Even though this system proved difficult to maintain, its very existence demonstrates that by the early 18th century Americans had already experimented with a collateralized form of paper money.

As the colonial experiments became more adventurous with the introduction of fiat paper money, the main problem, as stated earlier, was that the bills were relatively easy to print and circulate but difficult to rein in when necessary. In other words, the money supply exhibited an asymmetric elasticity, depending on whether more or less currency was needed. But inelastic or not, when the New England colonies or the Carolinas needed to pay soldiers and purchase military supplies, they turned to bills of credit as a means of advancing themselves a loan. The bills were needed because the specie base was unable to expand to meet such exigencies. For the middle colonies, which did not face the same ever-present military threats, the goal was to increase the supply of paper money in a way that would not undermine confidence in its value. Keeping issues small and redeeming them on schedule was the best way to accomplish this.

Despite the inefficiencies and crises that many scholars focus upon, the colonial experience with paper money was far from a complete failure. Several colonies were able to control the rate of depreciation of their paper money and to keep it in circulation for decades. And even though the possibility of rapid depreciation made colonists less willing to hold currency as a store of value, it had little effect on their willingness to use it in hand-to-hand transactions. Thus, depreciation had only a small effect in redistributing wealth— rather, the existence of an actively circulating medium increased wealth generally. At the same time, the negative experiences with currency depreciation that did occur led all colonists to place some

positive weight on the possibility that their currency might one day become worthless. This limited the volume of bills that colonial governments could issue.

The more stable experiments with paper money in Pennsylvania, New York, and New Jersey avoided catastrophic depreciations because issues remained manageable. It does not follow from this, however, that these colonies had an optimal monetary arrangement. McKinnon (1973) shows how, in the absence of a well-articulated financial system, money and capital can be complements in a developing economy due to money's role as a conduit for savings. This did not occur in the colonies because of the failure of paper money as a store of value. Rather, these colonies had great difficulty monetizing, at least if measured by the real value of paper money in circulation. Figure 3 shows the per capita stock of paper money from 1710 to 1775 in these mid-Atlantic "successes" after converting to sterling equivalents.[8]

{FIGURE 3 HERE}

It may be surprising that Pennsylvania (given by the dashed line in Figure 3), often touted as the great example of currency finance at its best, saw its per capita stock of paper money fall steadily from 1724 until 1755. It rose from 1755 to 1760 in the midst of the French and Indian War, but then fell rapidly, reaching its lowest point in the pre-Independence period by 1773. In

[8] Bills of credit in circulation for Pennsylvania are from Brock (1992, Table 6). For New Jersey they are from Brock (1975, Table VI, p. 93) for 1724-52 and Brock (1992, Table 5) for 1753-74. The amount of outstanding bills for New York is available on an annual basis after 1747 from Brock (1992, Table 5). For 1709-47 Brock (1975, pp. 66-73) includes records of emissions, anticipated redemptions, and many actual redemptions, as well as a few benchmark estimates of the overall stock of bills. Using this information and linear interpolation for missing years in the time paths of individual issues and their retirements, I approximated the stock of bills for New York. Colonial populations are from U.S. Bureau of the Census (1975, p. 1168, series Z-9, Z-10, and Z-11) and use constant growth rates to interpolate between decadal observations. Sterling exchange rates are annual averages of local currency per 100 £ sterling from McCusker (1978, Table 3.5, pp. 162-67 for New York; Table 3.6, pp. 172-73 for New Jersey; and Table 3.7, pp. 183-88 for Pennsylvania), with interpolations filling in between occasional missing observations.

1750, bills per capita were about £ 0.7 (14 s.) in local Pennsylvania currency or £ 0.4 in sterling equivalent. This amount could purchase, for example, using December prices from Cole (1938, pp. 31-2), one gallon of rum (3 s.), one bushel of wheat (4.5 s.), one bushel of corn (2.5 s.), and 2 lbs. of cotton (2 s.). In other words, the stock of paper money could have supported purchases of staple goods if it had changed hands frequently enough. Yet any savings or other hoarding of coin would have lowered velocity, and the colonists were faced with other cash expenses such as building materials, capital goods, and farm maintenance costs.

A comparison of bills of credit per capita in Pennsylvania with England's per capita money stock further suggests that the colonies were under-monetized. Cameron (1967) estimates England's M2 in 1750 at about 52 million in 1790 sterling. Since England's population was about 6 million in 1750 and the consumer price index (1790=1) was 0.779, real money per capita was about £ 6.80—much more than the £ 0.4 sterling equivalent for Pennsylvania. Even allowing for the generous possibility that specie accounted for two-thirds of Pennsylvania's money stock, the per capita money stock (paper money plus specie) could therefore not have exceeded £ 1.20 in sterling equivalent. If specie accounted for about 22.5 percent of the money supply— the average of the estimates from McCusker and Menard (1985) and Grubb (2004), per capita holdings would be closer to £ 0.52 sterling. It is true that many English citizens could use money as a form of savings more easily than the colonists due to the presence of a still small but rapidly expanding set of country banks, and that their consumption possibilities in the market economy were wider, but it is hard to imagine that these differences would have created anywhere from a six to thirteen-fold increase in the demand for money.

To make another comparison, 14 Pennsylvania shillings in 1750 would be worth about

$38 U.S. at the end of 2004.[9] This amount of currency would be insufficient for an individual in the United States today to complete weekly purchases without using checks and/or credit cards (i.e., instruments of a modern financial system), even if consumption possibilities were limited to those available to the colonists. Indeed, the U.S. monetary base (currency and coin) now exceeds $2,000 per person, and M1 (currency and checking deposits) exceeds $4,000 per person.

The per capita stock of paper money in New Jersey, given by the dotted line in Figure 3, was more variable than that of Pennsylvania but has the same downward trend from 1725 to the start of the French and Indian War. New York, given by the solid line, was more successful in monetizing between 1710 and 1760, but bills of credit per capita were still only £ 1.1 in sterling equivalent by 1750. Figure 3 suggests that, given reasonable conjectures about velocity of money and the amount of specie likely to have been in circulation, much of the middle colonies' transactions must have occurred outside of the formal monetary system.

6. Did monetary "founding choices" jump-start the early U.S. economy?

The U.S. economy monetized much more rapidly after 1790. Data from Temin (1969) and Rousseau and Sylla (2005) illustrated in Figure 4 indicate that the per capita money stock grew at an average annual rate of 0.8 percent per year from 1790 to 1850. Growth was even faster from 1790 to 1805—the first 15 years after Hamilton's plans were enacted, reaching 1.7 percent per year, and rose rapidly after 1830. These estimates probably represent minimum

[9] I obtained this estimate by multiplying £ 0.4 sterling in 1750 by the 6.15 percent total increase in English consumer prices between 1750 and 1900, converting to 1900 U.S. dollars using the exchange rate of $4.87/£, and multiplying the result by the 18-fold increase in U.S. prices that occurred between 1900 to 2004. I built a continuous index of English prices using U.S. Bureau of the Census (1975) by ratio-splicing the Schumpeter-Gilboy index for 1750-1819 (Table 14.1.B, pp. 719-20, with Rousseaux's index for 1820-45 (Table 14.3, p. 722) and the Sauerbeck-Statist index for 1846-1900 (Table 14.4, p. 725).

quantities of money in that they do not account for issues by private banks and other un-denominated (i.e., unmeasured) moneys, but the latter omission holds for the colonial estimates as well. In any event, as we measure it, with the exception of one year, the per capita stock always exceeded its 1790 level. The mean of the series from 1790 to 1850 is £ 2.1 per person. This is almost 50 percent above the highest level ever achieved in New York before the Revolutionary War, even assuming that specie accounted for 40 percent of the money supply.

{FIGURE 4 HERE}

At the same time, it is clear that the per capita money stock showed its largest advances after 1830—a time when the Second Bank of the United States lost much of its resolve to control monetary issues of state banks as its charter was allowed to lapse. A few comments seem appropriate here. First, the relative flatness of per capita money from 1790 to 1830 hides how extraordinary the advancement of the total money stock was given the rapid population growth that the nation was experiencing. For example, while per capita money was falling rapidly in the colonies (i.e., 1720-1750), total population was growing at an annual rate of 3.1 percent, just about the same rate achieved over the 1790-1830 period despite the much larger population base of 3.9 million in 1790 compared to 1.2 million in 1750. The fact that the money stock could even keep up with the population from 1790 to 1830 was quite an accomplishment in itself. Second, the acceleration in per capita money from 1830-36 can be attributed to a number of factors unrelated to the demise of the Second Bank, most importantly a rise in the specie stock that a ready banking system was able to multiply (Temin 1969).

But it was not so much growth in the amount of currency available for transactions that promoted the modernization of the U.S. economy as it was the way in which it grew, in

particular by increasing opportunities for entrepreneurs to obtain private sector credit through the banking system. Rather than having a system in which government officials and politicians controlled the money supply process and the direction of credit, banks were able to amass private capital and issue notes that could promote investment and foreign trade. This shift in emphasis to private sector credit helped to poise the nation for industrialization by 1815, a feat that would have been more difficult had the money supply remained under the control of state legislatures.

{FIGURE 5 HERE}

Along with rapid monetization and the successful placement of public debt came the emergence of the nation's first securities markets. Figure 5 shows the total money stock in 1840 dollars as well as the number of securities listings from Rousseau and Sylla (2005) that appeared in the financial press of three major cities (New York, Philadelphia, and Boston) near the end of each calendar year. Both series show evidence of a "take-off" around 1815. The average growth rates of both series from 1790 to 1850 were about 4.5 percent per year, which is higher than the 1.9 percent average growth rate of real GDP for 1790-1850 reported by Berry (1988) or the 3.8 growth rate of the Millennial Edition GDP Series included in Carter et al. (2006), and implies rapid financial deepening.

{FIGURE 6 HERE}

Fortunately, better data are available to measure development of the "modern" sector in the early Federal period than are available for the colonies, at least if we consider private domestic investment and foreign trade as broadly reflective of activity in that sector. Figure 6 shows foreign trade and private domestic investment from 1790 to 1850 in 1840 dollars. These

series also indicate an acceleration beginning around 1815, which is consistent with the rise of a modern sector at about this time. The similar rhythm of the financial and real aggregates suggest that the financial system established in the United States during the 1790s was ready to meet the demands of financing real economic activity just as the technologies of the First Industrial Revolution were arriving on the nation's shores.

Rousseau and Sylla (2005) and Rousseau (2006) explore the timing and causal direction of links between the financial and real sectors of the early U.S. economy between 1790 and 1850 with a set of vector autoregressive statistical models. They find strong evidence of unidirectional statistical causality from the money stock and the number of securities listings to real value of investment and international trade. These results suggest that it was not so much that the financial sector responded to real economic opportunities, but rather than it enabled these opportunities to come to fruition.

7. Conclusion

In this essay I have advanced the proposition that the transition to the dollar and the move from a fiat to specie standard that came with it was a pivotal moment in the nation's early history that marked an improvement over the monetary systems of colonial America. The earlier systems were unable to monetize their respective regions due to an inability of colonial legislatures to increase the money supply adequately to support the volume of transactions for which it would have been useful. The legislatures could not do this because they feared the depreciation that would set in if the public's confidence in the backing were to weaken. The possibility of rapid depreciation, which was quite real to the colonists, discouraged them from holding paper money as a store of value and promoted the hoarding of specie when available. Most of the time, however, the colonists simply chose to forego long-term investments that required

agglomerations of capital. This could not have been conducive to economic growth.

The Federal Constitution of 1788 with its forbiddance of state currency issues was a positive step in that it established a specie standard and transferred monetary control to Congress by explicitly giving it the power "coin money and regulate the value thereof." Secretary Hamilton then used an expansive interpretation of this short clause along with a "necessary and proper" clause to get the First Bank of the United States enacted and then used the Bank as an example to promote more state banks. These actions were important not because the states would have been unable to administer issues of currency, but because the supply of money could then be tied more closely to the capital market and the provision of credit. Of course this system did not share all of the features of today's monetary system, but the similarities outweigh the differences. In particular, while the central bank now control a money supply backed only by the faith and credit of the United States, it is still the banks that multiply it through the provision of credit to businesses and households. And though banks can and do sometimes become overly sanguine in their expectations surrounding the returns from their lending activities, this is not a new phenomenon, with the pattern of occasional setbacks followed by even greater advances repeating time and time again in the nation's history.

With the credit of the United States at an all-time low in the 1780s, the switch to a specie standard was at the time necessary to restore domestic and international confidence in the *system*, and this standard served the country well during the long transition to a point when it was no longer necessary. In this sense, it is no exaggeration to say that as the young United States pushed forward into an era of fiscal and monetary responsibility under a common political and monetary union spearheaded by the transition to the dollar, it embarked upon a financial revolution that shaped the early character of the nation and continues to shape it today.

References

Berry, Thomas S. 1988. Production and population since 1789: revised GNP series in constant dollars. Richmond, VA: Bostwick Paper No. 6.

Bezanson, Anne. 1951. *Prices and Inflation during the American Revolution: Pennsylvania 1770-1790*. Philadelphia, PA: University of Pennsylvania Press.

Brock, Leslie V. 1975. *The Currency of the American Colonies, 1700-1764: A Study in Colonial Finance and Imperial Relations*. New York: Arno Press.

Brock, Leslie V. 1975. *The Currency of the American Colonies, 1700-1764: A Study in Colonial Finance and Imperial Relations*. New York: Arno Press.

Brock, Leslie V. 1992. The colonial currency, prices, and exchange rates. *Essays in History* 34, http://etext.virginia.edu/journals/EH/EH34/brock34.htm.

Calomiris, Charles W. 1988. Institutional failure, monetary scarcity, and the depreciation of the continental. *Journal of Economic History* 48, 47-68.

Carter, Susan B., et al. 2006. *Historical Statistics of the United States: Millennial Edition*. Cambridge: Cambridge University Press.

Cameron, Rondo. 1967. England, 1750-1844. In *Banking in the Early Stages of Industrialization: A Study in Comparative Economic History*, ed. Rondo Cameron, Olga Crisp, Hugh T. Patrick, and Richard Tilly. New York: Oxford University Press.

Cole, Arthur H. 1938. *Wholesale Commodity Prices in the United States, 1700-1861: Statistical Supplement, Actual Wholesale Prices of Various Commodities*. Cambridge, MA: Harvard University Press.

David, Paul A., and Peter Solar. 1977. A bicentenary contribution to the history of the cost of living in the United States. *Research in Economic History* 2, 1-80.

Fenstermaker, J. Van. 1965a. *The Development of American Commercial Banking: 1782-1837*. Kent, OH: Kent State University Press.

Fenstermaker, J. Van. 1965b. The statistics of American commercial banking, 1782-1818. *Journal of Economic History* 25, 400-414.

Gorton, Gary. 1996. Reputation formation in early bank note markets. *Journal of Political Economy* 104, 346-397.

Grubb, Farley. 2004. The circulating medium of exchange in colonial Pennsylvania, 1729-1775: new estimates of monetary composition, performance, and economic growth. *Explorations in Economic History* 41, 329-360.

Jones, Alice Hansen. 1980. *Wealth of a Nation to Be: The American Colonies on the Eve of the Revolution*. New York: Columbia University Press.

Lester, Richard A. 1938. Currency issues to overcome depressions in Pennsylvania, 1723 and 1729. *Journal of Political Economy* 46, 324-374.

McCallum, Bennett T. 1992. Money and prices in colonial America: a new test of competing theories. *Journal of Political Economy* 100, 143-161.

McCusker, John J. 1978. *Money and Exchange in Europe and America, 1600-1775: A Handbook*. Chapel Hill, NC: University of North Carolina Press.

McCusker, John J., and Russell R. Menard. 1985. *The Economy of British America: 1607-1789.* Chapel Hill, NC: University of North Carolina Press.

McKinnon, Ronald I. 1973. *Money and Capital in Economic Development*. Washington, DC: The Brookings Institution.

Michener, Ronald. 1987. Fixed exchange rates and the quantity theory in colonial America. *Carnegie-Rochester Conference Series on Public Policy* 27, 233-307.

Michener, Ronald, and Robert E. Wright. 2005. State "currencies" and the transition to the dollar: clarifying some confusions. *American Economic Review* 95, 682-703.

Mihm, Stephen. 2007. *A Nation of Counterfeiters: Capitalists, Con Men, and the Making of the United States*. Cambridge, MA: Harvard University Press.

Perkins, Edward J. 1994. *American Public Finance and Financial Services, 1700-1815.* Columbus, OH: Ohio State University Press.

Rolnick, Arthur J., Bruce D. Smith, and Warren E. Weber. 1993. In order to form a more perfect monetary union. *Federal Reserve Bank of Minneapolis Quarterly Review* 17, 2-13.

Rousseau, Peter L. 2006. A common currency: early US monetary policy and the transition to the dollar. *Financial History Review* 13, 97-122.

Rousseau, Peter L. 2007. Backing, the quantity theory, and the transition to the U.S. dollar. *American Economic Review* 97, Papers and Proceedings, 266-270.

Rousseau, Peter L., and Richard Sylla. 2005. Emerging financial markets and early U.S. growth. *Explorations in Economic History* 42, 1-26.

Sargent, Thomas J., and Bruce D. Smith. 1987. Irrelevance of open market operations in some economies with government currency being dominated in rate of return. *American Economic Review* 77, 78-92.

Smith, Bruce D. 1985. Some colonial evidence on two theories of money: Maryland and the Carolinas. *Journal of Political Economy* 93, 1178-1211.

Smith, Bruce D. 1988. The relationship between money and prices: some historical evidence reconsidered. *Federal Reserve Bank of Minneapolis Quarterly Review* 12, 18-32.

Sylla, Richard. 2002. Financial systems and economic modernization. *Journal of Economic History* 62, 277-292.

Sylla, Richard, Robert E. Wright, and David J. Cowen. 2009. Alexander Hamilton, central banker: crisis management during the U.S. financial panic of 1792. *Business History Review* 83, 61-86.

Temin, Peter. 1969. *The Jacksonian Economy*. New York: W. W. Norton and Company.

U.S. Bureau of the Census. 1975. *Historical Statistics of the United States: from Colonial Times to 1970*. Washington, DC: Government Printing Office.

West, Roger C. 1978. Money in the Colonial American economy. *Economic Inquiry* 16, 1-15.

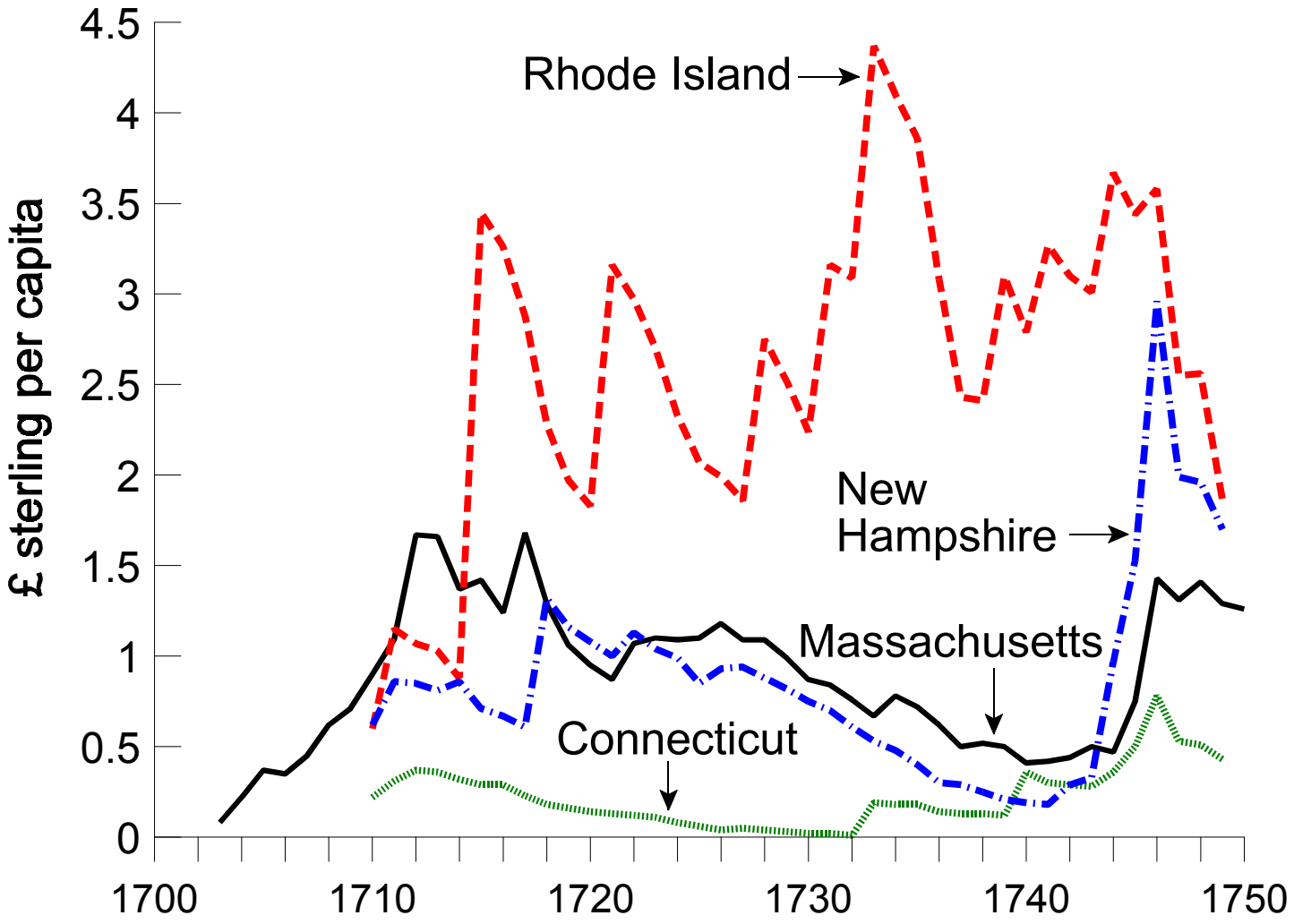

Fig. 1. Bills of Credit per Capita, New England Colonies 1703-1749

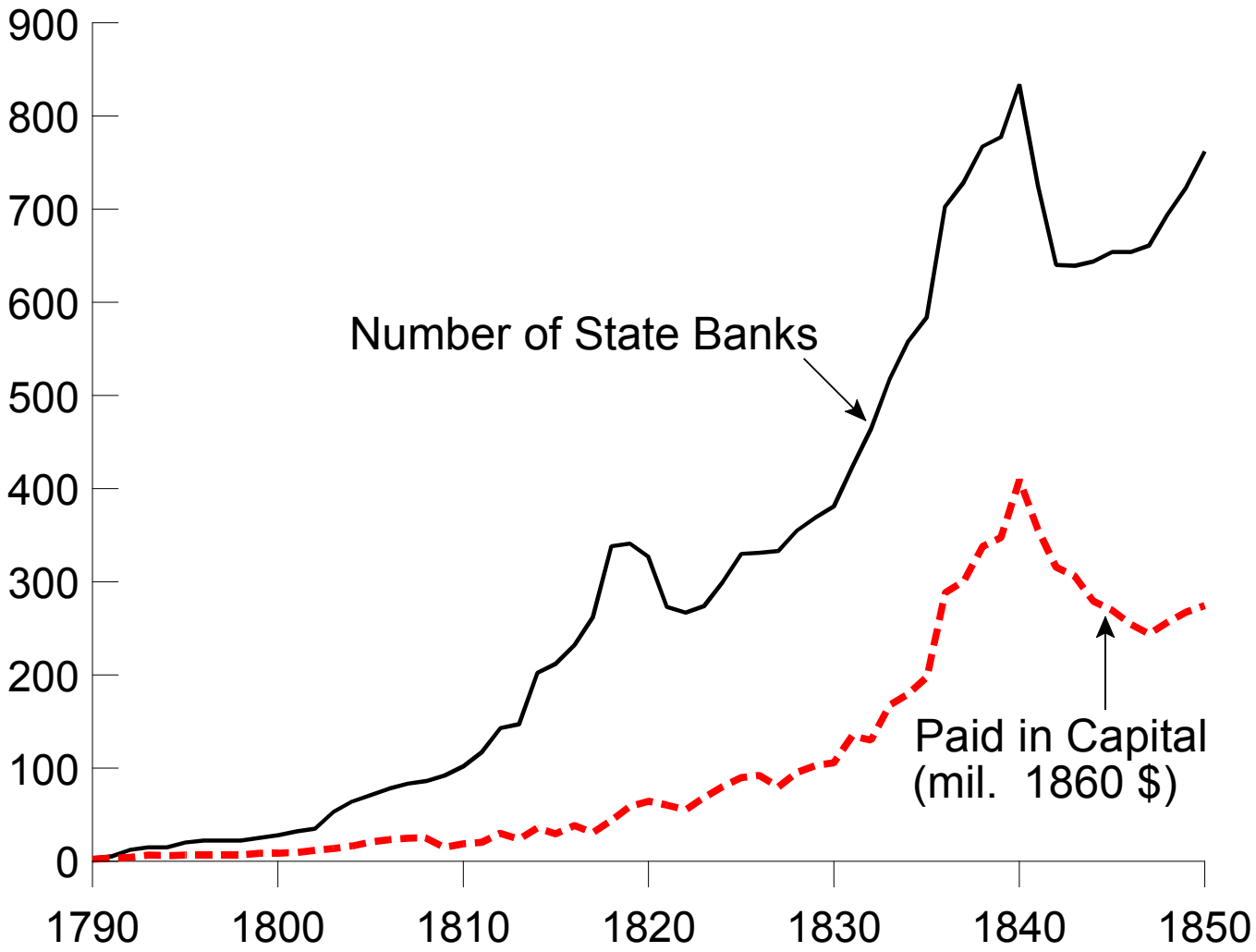

Fig. 2. The Growth of State Banks, 1790-1850

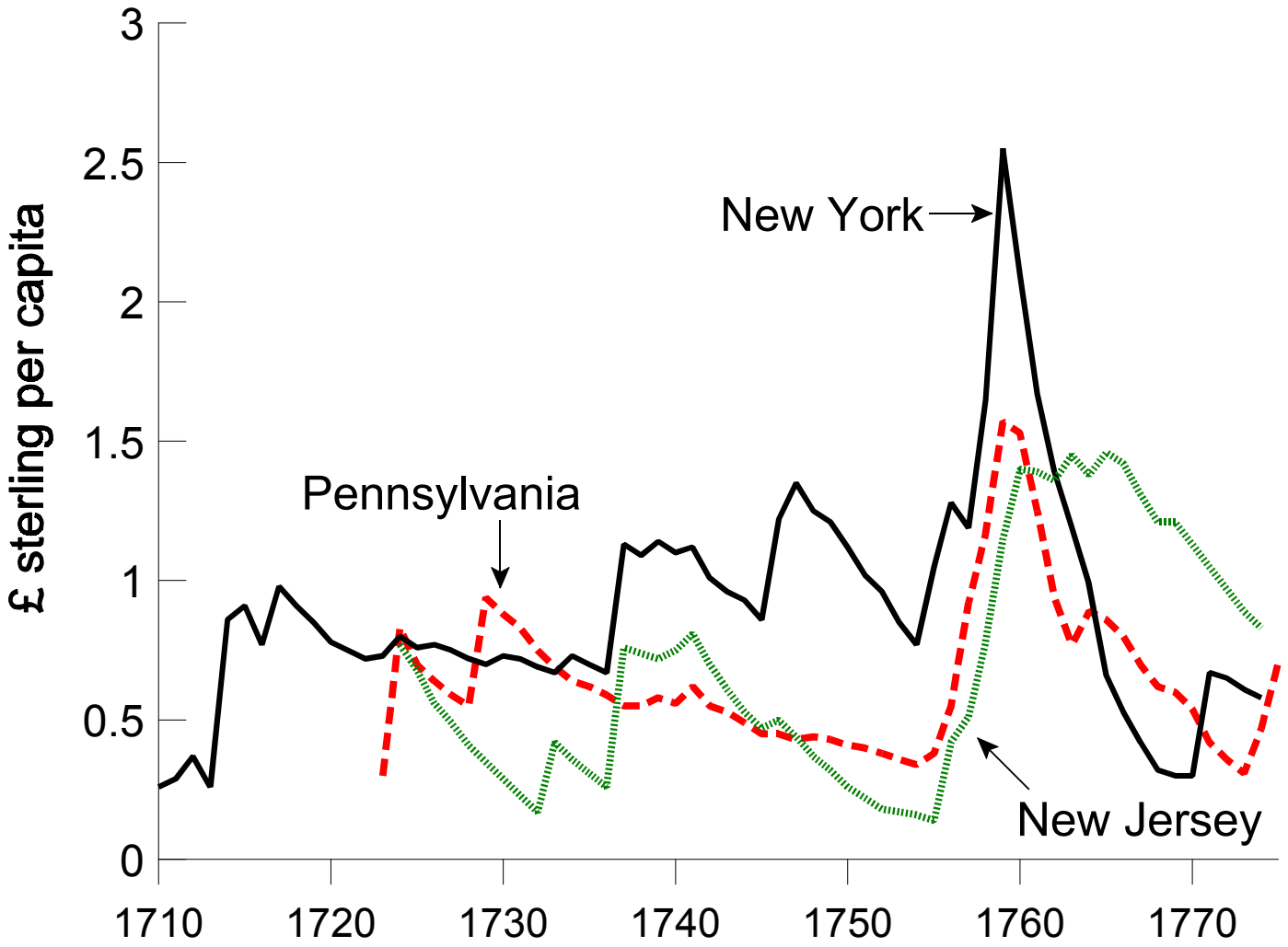

Fig. 3. Bills of Credit per Capita, Mid-Atlantic Colonies 1710-1775

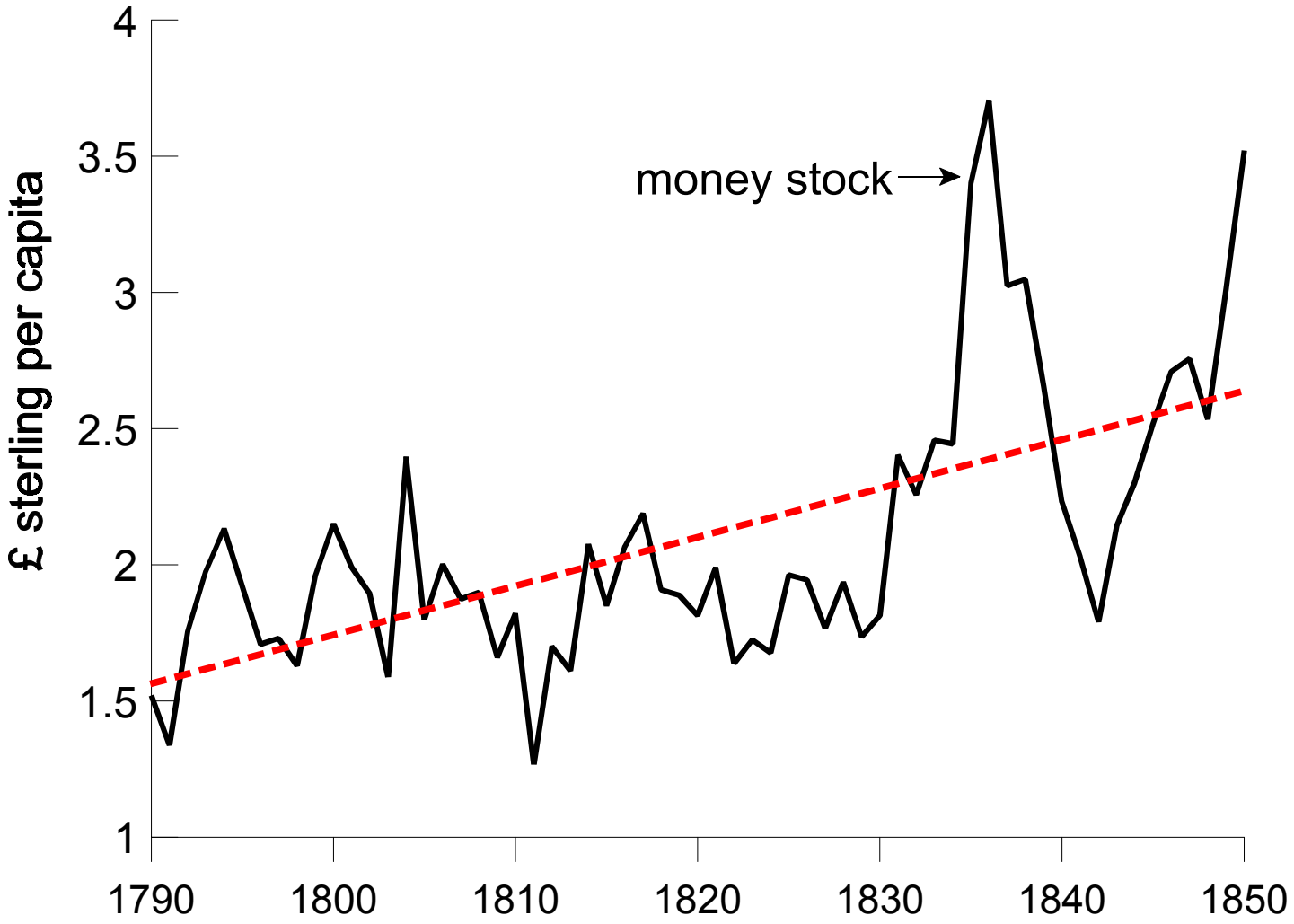

Fig. 4. Money Stock per Capita in Sterling Equivalents 1790-1850

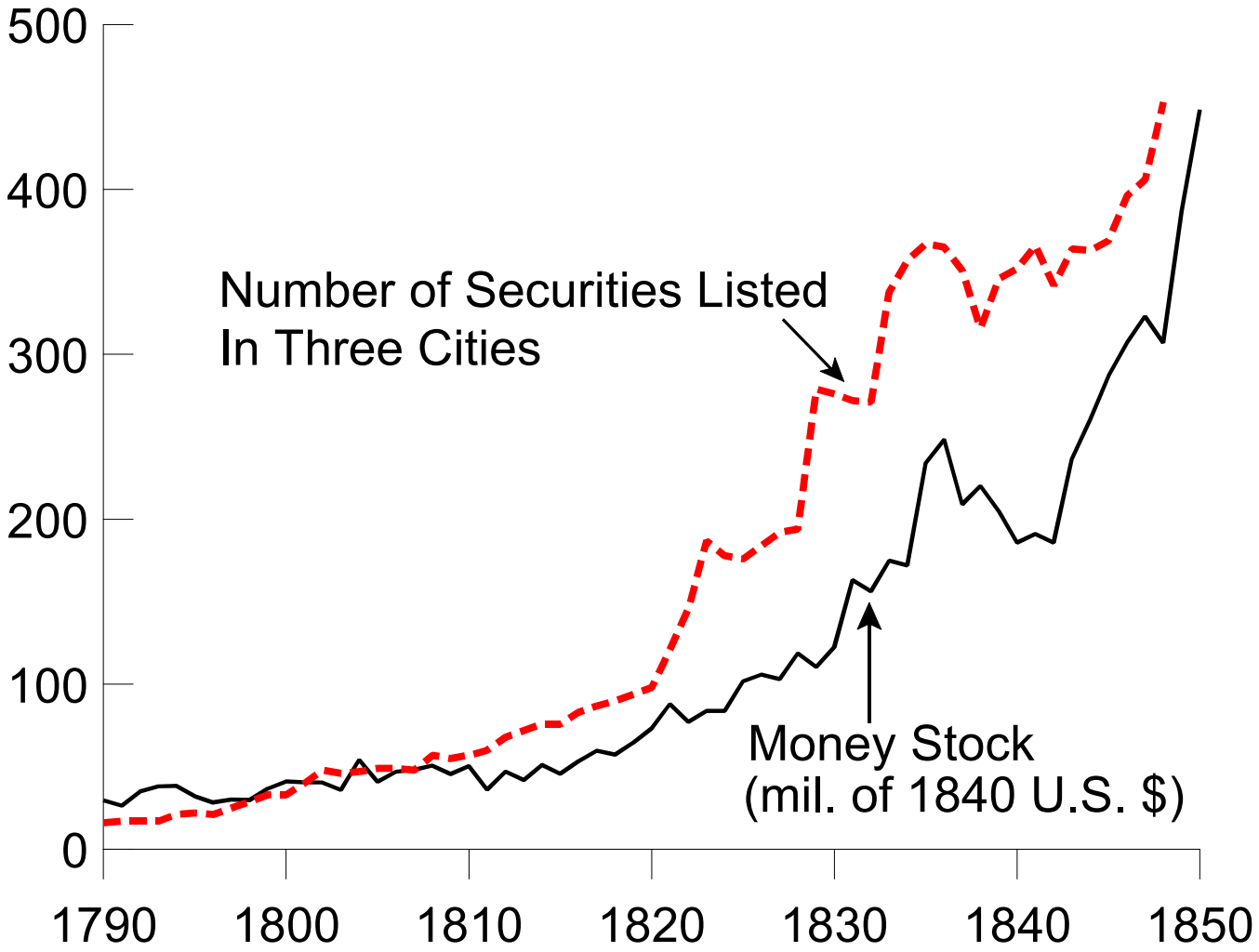

Fig. 5. Monetary and Financial Aggregates, 1790-1850

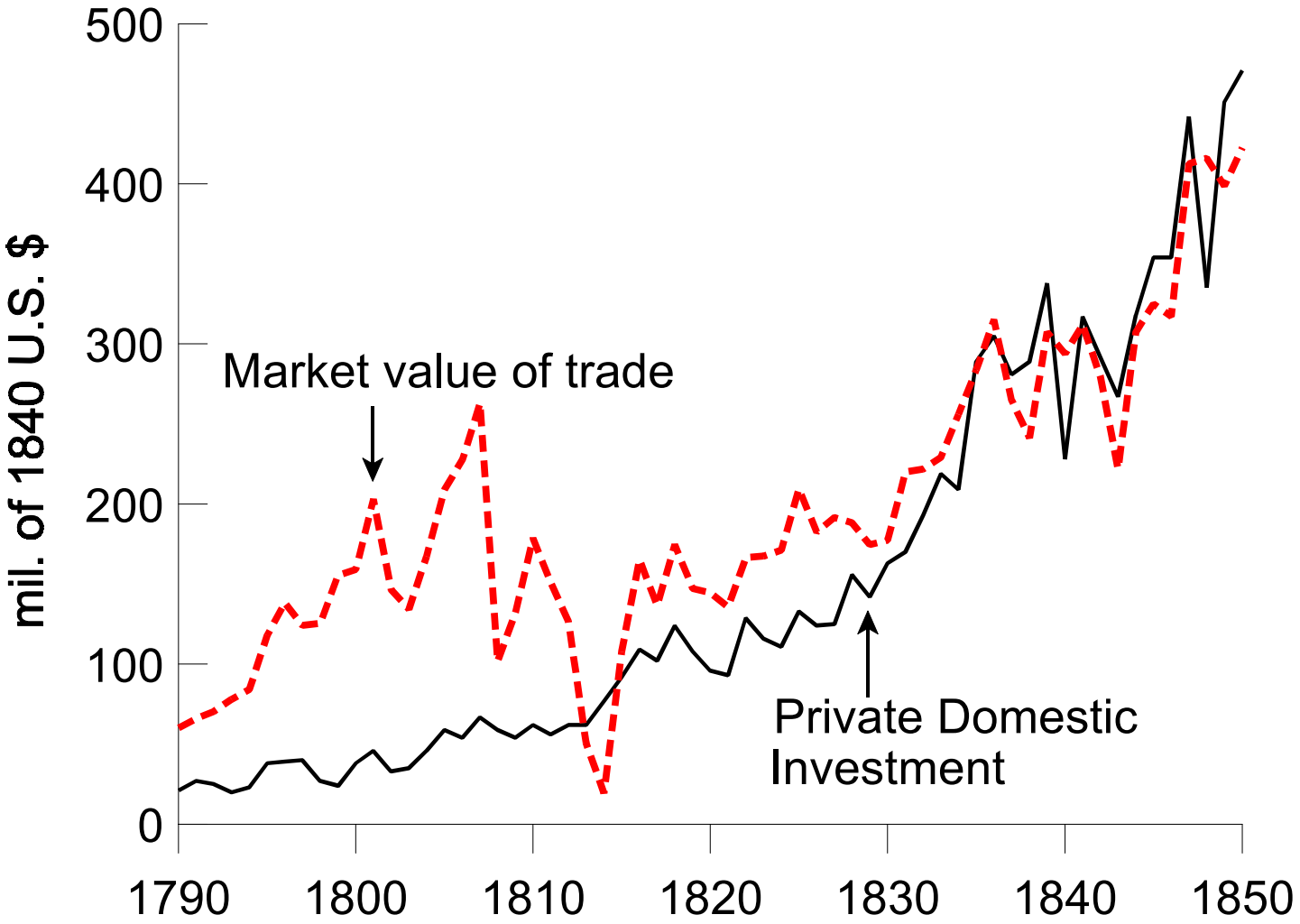

Fig. 6. Investment and International Trade, 1790-1850