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MONEY AND PRICES IN COLONIAL AMERICA: A NEW TEST OF COMPETING THEORIES

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ABSTRACT

A long-standing but unsettled controversy concerning monetary experiences in colonial America has recently been reopened with considerable vigor. Ignoring doctrinal aspects, the main substantive issue concerns the relationship between money holdings and price levels during episodes in which various colonial governments issued paper currency (bills of credit) in large amounts. In several instances, large and rapid increases in the stock of outstanding paper currency led to negligible changes in price levels. But alternative interpretations are possible, since colonial money included specie as well as paper currency. According to the "quantity theory" or classical hypothesis, total money stock magnitudes did not rise sharply during the disputed episodes; instead, the sharp paper currency increases led to corresponding losses of specie--as suggested by standard commodity-money analysis. According to the "backing theory" or anti-classical hypothesis, by contrast, there was little specie present so money stock magnitudes could and did rise sharply (in percentage terms). This fundamental factual disagreement has eluded resolution because data on both stocks and flows of specie are almost nonexistent.

The present study develops and applies a strategy for circumventing the unavailability of specie data by exploiting conflicting implications of the two hypotheses regarding magnitudes of real per capita holdings of paper currency, relative to normal real money balances, at dates of maximum paper issue. A major feature of the analysis is a new method for the estimation of normal real money holdings, one that relies on paper currency data for a few inflationary episodes.

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I. Introduction

A long-standing¹ but unsettled controversy concerning monetary experiences in colonial America has recently been reopened with considerable vigor by Smith (1985a, 1985b, 1988) and Michener (1987, 1988).² Putting aside doctrinal aspects, which have been prominent but distracting,³ the main substantive issue concerns the relationship between money holdings and price levels during episodes in which various colonial governments issued paper currency (typically, bills of credit) in large amounts. In several instances, dramatically large percentage increases--e.g., 400 percent over four or five years--in the stock of outstanding paper currency were followed by negligible changes in the colony's general price level. But it was of course the case that colonial money--generally accepted media of exchange--included specie (silver or gold coins) as well as paper currency, so the behavior of the total money stock could in principle be quite different than that of paper currency. Indeed, according to the classical hypothesis supported by Brock (1980), Michener (1987), and McCallum (1989, pp. 299-309), total money stock magnitudes did not rise sharply during the disputed episodes; instead, the dramatic paper currency issues led to corresponding losses of specie, just as suggested by traditional monetary theory.⁴ According to the anti-classical view of Smith (1985a, 1988) and others,⁵ by contrast, there was little metallic currency present in the colonies and convertibility into specie was not maintained so total money stock magnitudes rose sharply in percentage terms. This fundamental factual disagreement has eluded resolution because data on both stocks and flows of specie are extremely sparse.⁶

The present study develops and applies a strategy for circumventing the unavailability of specie data by exploiting conflicting implications of the two hypotheses. According to the anti-classical hypothesis as put forth by

Smith, real money balances rose dramatically during the episodes in question⁷ and paper currency constituted the bulk of the money stock. Consequently, the anti-classical position implies that real per capita holdings of paper currency became very large during these episodes. In other words, deflated per capita holdings of paper currency were much larger than normal real money balances at dates of maximum paper issue. By contrast, the classical commodity-money theory implies that real holdings of paper currency would have been equal to or less than normal levels of real money balances. An investigation of these conflicting implications is carried out in this paper, with well-known sources providing most of the raw data. A major feature of the analysis is a new method for the estimation of normal real balance magnitudes.

The paper's organization is as follows. Some basic facts are reviewed and the two theories' implications are developed in more detail in Section II. Next, the crucial step of estimating the magnitude of normal real money balances for the three major colonial regions is undertaken in Section III. Evidence is then marshalled and compared with the contrasting implications in Section IV. Finally, some pertinent doctrinal issues are reviewed in Section V, which is followed by a brief conclusion.

II. Implications of Competing Theories

It may be useful to begin with a few remarks concerning colonial monetary arrangements. In each of the British colonies in America, prices were quoted and debts contracted in terms of the traditional British words for the unit of account: pounds, shillings, and pence (£, s, d). The official par value of these units in terms of silver differed, however, among the colonies. Furthermore, the various par values were altered from time to time in attempts to attract *spécie*.⁸ Throughout the period, Britain's

monetary system was firmly metallic, with all bank notes convertible into specie. In fact the British system was bimetallic, but for present purposes it may simply be thought of as a conventional commodity-money arrangement with silver (or gold) as the standard commodity.⁹ The colonies' systems were presumably intended by their founders to conform to the British standard, but British regulations prohibited the operation of any mint in America and in various ways tended to drain the colonies of specie. Consequently, the colonial governments were unable to take the steps necessary to maintain their commodity money standards in conventional ways. In particular, after paper currencies were established (via the emission of bills of credit) the colonial governments apparently failed to provide convertibility between these paper currencies and silver. In part, it is that failure that gives rise to the dispute under investigation.

The classical commodity-money (or "fixed-exchange-rate") view favored by Michener (1987), Brock (1980), McCallum (1989), and others is that, despite the governments' failure to provide convertibility, colonial paper currencies typically maintained their values in terms of silver or sterling at rates approximately equal to those defined by the current par values. Exceptional episodes occurred, of course, when more paper currency was issued than money holders demanded at the official values. In such cases, virtually all specie would be driven out of circulation and the local paper-currency price of sterling would rise well above the previous official par value. Such episodes occurred in New England during the period 1715-1750 and in the Carolinas during 1712-1730. But in most other cases, local paper and specie circulated side by side, roughly at par, as described by Mill (1848, Book III, Ch. XIII). Fluctuations in the volume of paper currency outstanding would then be offset, according to this hypothesis, by outflows or inflows of specie. Such flows would leave the colony with a sum of specie plus paper

currency that would be roughly equal to the quantity of real balances demanded times the prevailing price level.

The opposing view put forth by Smith (1985a, 1988), and supported at least in part by Calomiris (1988) and Wicker (1985), among others, is that there was too little specie present in the colonies for specie flows to keep total money quantities constant in the face of observed fluctuations in paper currency outstanding. If a colony's stock of paper currency were quadrupled, for example, the total quantity of nominal money would be increased (according to the hypothesis) by nearly a factor of four. If prices did not significantly rise, therefore, money holders would be left with roughly four times the volume of real money balances as before--a result that conflicts with classical monetary analysis.

These two positions, it should be mentioned, are often described as the "quantity theory" and "backing theory" positions, instead of classical and anti-classical. The former terminology is not adopted here because the phrase "quantity theory" connotes price changes that occur in response to money stock changes, whereas the episodes under consideration are ones in which the dispute is basically over the question of whether substantial money stock changes actually took place. Consequently, the term "classical" seems more appropriate for the traditional point of view--and "anti-classical" for the opposing position. Elaboration and discussion of related matters will be provided below, in Section V.

The principal episodes open to dispute have been emphasized in a series of papers by Smith (1985a, 1985b, 1988). The main features of ten of these episodes, in each of which a colony's stock of outstanding paper currency was drastically increased over a period of a few years, are summarized in Table 1. The next-to-last column indicates for each episode the ratio of peak-to-initial stocks of paper currency in per capita terms.

Table 1

Disputed Episodes Involving
Rapid Growth of Paper Currency

No.	Smith Reference	Colony	Dates:		Ratio, Peak Year to Initial Year Price of Currency ^a Sterling	
			Initial	Peak		
1	1985a, pp.544-5	Pennsylvania	1728	1729	1.68	0.99
2	1985a, pp.546-7	New York	1736	1737	3.10 ^b	1.00
3	1985a, pp.547-8	New Jersey	1730	1737	2.65	na ^e
4	1985a, pp.557-9	Massachusetts	1755	1761	9.80 ^c	1.05
5	1985b, pp.1188-92	South Carolina	1749	1760	4.19	0.96
6	1985b, pp.1194-5	North Carolina	1728	1729	4.20	na ^e
7	1985b, pp.1194-7	North Carolina	1750	1761	3.04	1.50
8	1988, .p. 24	Virginia	1755	1760	4.25 ^d	1.09
9	1988, pp.24-6	New York	1754	1759	3.09	0.93
10	1988, pp.25-7	Pennsylvania	1755	1760	3.75	0.94

^aThis column gives the ratio of per-capita values of paper currency in the peak year to the initial year, as listed.

^bBased on currency figures reported by Smith.

^cWith 1754 as the initial date, the ratio is 27.2.

^dWith 1754 as the initial date, the ratio is ∞.

^eInitial figures unavailable; ratio is presumably close to 1.0.

Thus, for example, the per-capita¹⁰ stock of paper currency in Virginia increased by a factor of 4.25 (i.e., a 325 percent increase) between 1755 and 1760. Yet in all of the episodes cataloged in this table, price level increases were extremely modest. That fact is indicated in the final column, which reports the peak-to-initial ratio of colonial prices of sterling for the years in question. For the 1755-60 Virginia episode, for example, the price of sterling in terms of Virginia currency was in 1760 only 1.09 times its value as of 1755--suggesting a very minor increase in the Virginia price level. Together, these ten episodes constitute the main evidence cited by Smith as indicating a dramatic "failure of the quantity theory" (1985a).

In each of these episodes it is clear that major increases took place in real per capita holdings of paper currency. According to the anti-classical hypothesis, furthermore, paper currency constituted the bulk of the total money supply for each of the colonies in question. Each of the episodes, therefore, involved major increases in real money holdings under this hypothesis. Unless the initial dates for the episodes featured money holdings far below their normal value, it would then follow that total real money balances would be very high relative to normal magnitudes at the peak dates. Indeed, to a first approximation, real money holdings should at those dates be equal to multiples of normal magnitudes with these multiples given by the numbers in the next-to-last column of Table 1. Per capita holdings of paper currency in Virginia in 1760 should, for example, be equal to about 4.25 times the normal level of money balances--according to the anti-classical theory.¹¹

The classical theory, by contrast, suggests that enough specie was present for initial real money holdings to be much greater than initial real paper-currency holdings. As the episodes progressed, then, paper currency would replace specie¹² with total money stocks remaining approximately

unchanged. At the peak dates, moreover, per-capita holdings of total real money balances would continue to equal normal values. Peak-date holdings of paper currency deflated by price levels would consequently be equal to or smaller than normal magnitudes of real money holdings--according to the classical theory.

The question, then, is whether the volume of real money balances was high relative to normal in the peak years in these episodes. Was Virginia's quantity of paper currency in real terms about four times its normal money holdings in 1760, as suggested by Smith, or approximately equal to (or smaller than) its normal holdings, as implied by classical theory? Clearly, in order to answer this question it will be necessary to have some usable estimates of the normal per-capita quantities of money demanded. To develop such estimates is the principal task to be undertaken in the next section.

III. Normal Money Holdings

It will be necessary to begin with a brief discussion of the concept of normal money balances to be used in this paper. In principle, it would be desirable to use as "normal" the quantity of real balances, under non-inflationary and non-extreme cyclical conditions, as predicted by a money demand function that relates per capita real balances in a particular colony to current levels of transaction and opportunity-cost variables. Data are not available for these variables, however, so we are required to neglect cyclical fluctuations over the period studied. Furthermore, there is insufficient data to develop different estimates for each of the thirteen colonies. It is widely believed, however, that real money holdings were typically much greater in the Mid-Atlantic and Southern colonies than in New England. Consequently, we shall assume that real per capita money demands are the same for all colonies within each region (as well as over the cycle),

but possibly different across these three major regions. It is of course unfortunate that separate estimates cannot be obtained for each of the thirteen colonies, but it seems likely that this neglect of differences would not involve errors of more than 20-30 percent in magnitude. Since the episodes in question are ones for which the outcomes predicted by the two theories typically differ by 200-400 percent, the procedure should be adequate for the purpose of discriminating between these theories.

The foregoing statement does not rule out the possibility of incorporating trend or secular effects on the normal magnitudes of per capita balances. As it transpires, however, the available evidence does not indicate the presence of any significant trend effects over the period considered. Operationally, then, our concept of normal real money balances reduces to three figures hypothesized to pertain (on a per capita basis) to each of the colonies within the three regions and to each of the episodes. Our general strategy will be to base estimates of these three magnitudes on data for total money holdings for the few cases for which such data are available.

But that strategy gives rise to the question: What type of data will be utilized for total money holdings? In that regard, the most straightforward type of evidence, used by previous writers, relies upon bits of information that were developed and reported by contemporary observers. One well-known example of this type is Alexander Hamilton's estimate, cited by McCusker (1978, p. 7), that "on the eve of the Revolution" there had been a total of £6,750,000 sterling of specie and paper in circulation in the thirteen colonies together. With a population of roughly 2.4 million in 1774, Hamilton's estimate implies a figure of £2.8 sterling per person.¹³ Such evidence is, however, highly questionable. In this case, for example, a much smaller direct estimate for the same date was published ten years after

Hamilton's by Pelatiah Webster (1791). His considered figure for total specie and bills in 1774 is \$10 million, which amounts to about £0.9 per person, only a third of Hamilton's value. Michener (1987, p. 279) has suggested that Webster's estimate is the more plausible of the two figures for 1774.¹⁴

But even without the extreme disagreement between the 1774 figures of Hamilton and Webster, estimates of the direct type would seem to be subject to considerable unreliability since there were no regular sources of information on specie holdings. Furthermore, these two estimates are not broken down by region. Clearly, therefore, it would be highly desirable to have an alternative procedure for estimating total money holdings during the 1700s. A major objective of the present paper, accordingly, is to develop such a procedure.

The basic idea of our alternative method for estimating total money holdings is to rely principally on the comparatively reliable figures pertaining to paper currency issues themselves. In most years in most colonies these holdings represented only a fraction of total money balances, according to the classical line of argument, but there are a few episodes for which there is general agreement that little or no specie remained in circulation. Consequently, paper currency figures for these particular episodes can reasonably be taken as indicative of total money holdings.¹⁵ Such magnitudes pertain only within the relevant regions, but cross-regional relationships can be inferred from the probate figures of Jones (1980).

The most prominent of the episodes of the above-mentioned type is that of New England during the years 1715-1749. As many writers have described, the New England colonies' issues of paper currency were genuinely excessive. As a result, specie was driven out of circulation and the currency price of silver and sterling rose dramatically--to several times the preexisting par

value. The crucial data for this period are reported in Table 2. For each year the first column gives the aggregate quantity of paper currency outstanding as reported by Brock (1975). The relevant monetary region included all of New England, since the paper bills of credit issued by Massachusetts, Rhode Island, Connecticut, and New Hampshire circulated throughout the area and exchanged with each other at par.¹⁶ Population estimates, generated as described in footnotes 10 and 13, are given in the second column while the third tabulates exchange rates (as compiled by McCusker (1978, Table 5.2) with Britain, expressed as the price in colonial pounds of a pound sterling. In the table, and in what follows, £st will be used as an abbreviation for pounds sterling while the symbol £ without qualification will denote pounds in local colonial units.

The figures in the first three columns are used to calculate the per capita holdings of paper currency when expressed in terms of sterling. Under the presumption that paper currency formed the bulk of the circulating money stock during this particular episode, and with the British price level treated as approximately constant,¹⁷ these figures--given in column four--constitute estimates of total real money holdings per capita in the New England colonies.

As is readily apparent, these estimates are slightly in excess of £1.0 sterling between 1710 and 1720, but fall to the £0.6 - 0.8st range during the 1720s, 1730s, and early 1740s. Then in the late 1740s, they climb back into the range £1.2 - 1.5 st. We are then forced to consider which of these values is best viewed as reflecting normal money holdings for a New Englander of the day. The position taken here is that the values for 1723-1743 probably provide the best indication because they pertain to the period after silver was definitely driven from circulation but before the inflation of the

Table 2
New England Inflation, 1709-1749

Year	Bills of Credit Outstanding, £ thous ^a	Population, thous	Exchange Rate, £/£st	Per Capita holdings, £st
1709	69.4	112.6	1.511	0.41
1710	112.9	115.1	1.550	0.63
1711	142.9	119.7	1.467	0.81
1712	214.0	124.6	1.500	1.14
1713	219.5	129.6	1.500	1.13
1714	196.4	134.8	1.533	0.95
1715	254.5	140.2	1.603	1.13
1716	241.0	145.9	1.625	1.02
1717	310.9	151.8	1.700	1.20
1718	308.9	157.9	2.000	0.98
1719	290.5	164.3	2.167	0.82
1720	276.9	170.9	2.194	0.73
1721	307.6	175.0	2.260	0.77
1722	363.4	179.3	2.298	0.88
1723	386.8	183.7	2.418	0.87
1724	415.7	188.1	2.679	0.82
1725	446.4	192.7	2.891	0.80
1726	477.9	197.4	2.910	0.83
1727	459.7	202.2	2.920	0.78
1728	522.3	207.1	2.988	0.84
1729	507.3	212.1	3.133	0.76
1730	494.9	217.3	3.377	0.67
1731	545.7	223.6	3.343	0.73
1732	532.0	230.2	3.395	0.68
1733	770.1	236.9	3.500	0.93
1734	829.6	243.8	3.550	0.96
1735	812.2	250.9	3.600	0.90
1736	794.2	258.2	4.300	0.71
1737	801.0	265.7	5.167	0.58
1738	813.0	273.5	5.000	0.59
1739	859.3	281.4	5.000	0.61
1740	924.3	289.7	5.250	0.61
1741	1046.7	296.1	5.484	0.64
1742	1070.8	302.6	5.503	0.64
1743	1138.3	309.2	5.507	0.67
1744	1412.2	316.0	5.886	0.76
1745	2033.3	322.9	6.448	0.98
1746	3267.3	330.0	6.425	1.54
1747	3854.1	337.3	9.250	1.23
1748	4034.9	344.7	9.125	1.28
1749	4033.6	352.2	10.333	1.11

^aIncludes Boston merchants' notes, 1733-1743, as reported by Brock (1975)(1980).

middle 1740s that was so rapid that price adjustments may have been incomplete within the year.^{18 19}

All in all, then, the episode of 1715-1749 suggests that normal per capita money holdings for New England were somewhat below £1.0 sterling, probably in the range £0.6 - 0.8st. As a point estimate, let us use a figure of 0.70. There is no apparent upward trend over this period, indicating that the effects of growing income levels, increased monetization of exchange, and technological advances in payments practices roughly canceled out on net.²⁰

A second episode yielding evidence based on paper currency issues stems from the experience of South Carolina over the years 1720 - 1749. Beginning in 1712, the colonial government issued paper in amounts that resulted in major price-level and exchange-rate increases. Presumably most of the specie had been driven out of the colony by 1720, at which date the price of sterling had risen to about £4.0 (from a value of 1.5 in the early 1700s). The available data are summarized in Table 3. An issue that arises, in all cases pertaining to colonies in which slavery was widespread, is how to treat the black population in calculating per capita money holdings. Since most blacks in these colonies were slaves, and slaves were not typically money holders, it seems appropriate to exclude them from the population count used to determine per capita values. It is of course true that slave owners would need to engage in additional transactions and therefore hold more money as a consequence of the additional human activity, but that effect will be allowed for to some extent in our recognition of regional differences. Consequently, in Table 3, and in other tables below pertaining to southern colonies, the reported "per capita" money holdings are actually money holdings divided by estimates of the white, rather than total, population.

From the figures in Table 3 it would appear that normal per capita money balances in South Carolina were about £1.7 - 1.8 sterling in the 1720s. The higher figures for the early 1720s should be discounted as representing a transitory situation, one that obtained before prices had fully adjusted to the large currency issues of 1715, 1716, and 1720. This interpretation is supported by the sharp exchange rate increases over the period 1721 - 1723. The figures pertaining to 1727-1730 are, by contrast, highly stable. Those, consequently, form the basis for a point estimate of £1.75st per capita in the Southern colonies.^{21 22}

It remains to develop an estimate for the Mid-Atlantic colonies.²³ In this region there were, as a result of the authorities' restraint, no episodes of the type in which specie was driven out of circulation. In the absence of any such episode, my procedure will be to estimate the Mid-Atlantic figure in proportion to those for New England and the South, with the proportionality ratios determined by Jones's (1980) figures for per-capita "cash" holdings. As these figures are based on probate records, it is not my intention to use them as representative for the population at large.²⁴ But it seems plausible that they could be satisfactorily employed as indicative of cross-regional differences.

From Jones's Tables 2.5 - 2.7 and 5.1, it is straightforward to calculate per capita cash holdings of £0.42, 1.92, and 1.74 sterling (respectively) for the New England, Mid-Atlantic, and Southern colonies. Then using our New England point estimate of £0.7 we obtain an estimate of $(1.92/0.42)(0.7) = £3.2\text{st}$ for the Mid-Atlantic colonies. Alternatively, our South Carolina point estimate translates into a figure of $(1.92/1.74)(1.75) = £1.9\text{st}$ per capita. Since these two values are substantially different, we need to consider which to adopt for the Mid-Atlantic estimate. In this regard, it might be argued that the episodal data seem better--i.e., more

Table 3

Experience of South Carolina, 1720-1749

	<u>Paper Currency Outstanding, £ thous^a</u>	<u>White Population, thous</u>	<u>Exchange Rate, £/£st</u>	<u>Currency Per Capita £st</u>
1720	100.0	5.05	4.00	4.95
1722	80.0	5.78	5.80	2.38
1723	120.0	6.20	6.75	2.87
1727	106.5	8.15	7.00	1.87
1728	106.5	8.72	7.00	1.74
1729	106.5	9.34	7.00	1.63
1730	106.5	10.00	6.44	1.65
1731	211.3	10.41	7.00	2.90
1749	133.0	23.76	7.25	0.77

^aSource: Smith (1985.b). (Evidently compiled from narrative in Brock (1975).)

fully documented--for the New England case. But it seems rather difficult to accept the implication of Jones's figures that New Englanders held only about one-fourth as much cash (specie and paper money) as their contemporaries in the other colonies. Accordingly, our point-estimate for the Mid-Atlantic colonies will be taken to be £2.0st per capita, although a figure as high as £2.5 could be justified.

In conclusion it is worthy of mention that, for the thirteen colonies together, our figures lie between the direct estimates of Hamilton and Webster. That fact is helpful in generating confidence that the estimates obtained by our method are entirely plausible.

IV. Evidence for Disputed Episodes

Armed with estimated values for normal real money balances in the three regions, we can now examine the episodes outlined in Table 1 to determine whether the evidence is more nearly consistent with the classical or the anti-classical hypothesis. As explained above, an implication of the former is that the per capita quantities of paper currency outstanding should be equal to or less than the normal value for the relevant region, at each episode's peak year, while the anti-classical position suggests that these quantities should be much greater.

Let us begin with a case in which the results are quite clear-cut, namely, that of Virginia over the period 1755-1760. Relevant figures are provided in Table 4. From the final column it can be seen that the maximum per capita stock of paper currency amounted to about £1.1 sterling. That figure is substantially below our estimated value of £1.75st for normal money holdings in the Southern colonies. Thus the magnitudes in Table 4 are more consistent with the classical than the anti-classical hypothesis.

In fact, the Virginia episode reveals quite clearly the inappropriateness of percentage-change comparisons such as those presented in Table 1 and utilized by Smith (1985a, 1985b, 1988) and, implicitly, Wicker (1985, p. 881) and Calomiris (1988, pp. 49-50). Those comparisons contrast ratios (or percentage changes) at two dates for paper currency and prices. But if paper currency is a minor constituent of the total money supply in the initial date, its percentage change could be enormous without implying anything anomalous from the perspective of classical theory. That point is dramatized by the fact that Virginia had no outstanding paper currency in any year before 1755. So the percentage change between 1754 (or any earlier year) and 1755 or any subsequent year would be "infinite," i.e., indefinitely large. But the percentage change in the total money stock would of course be finite--possibly even zero or negative.

It would be possible to discuss tables similar to Table 4 for each of the disputed episodes listed in Table 1.²⁵ Examination of all ten would be tedious, however, so the remaining details are relegated to the appendix and a summary tabulation is presented in Table 5. In this presentation, the per capita holdings of paper currency in £ sterling units is given for the peak year of each episode in the final column. Also included are the three basic figures used to calculate those values.

Examination of the final column of Table 5 quickly reveals that in seven of the ten cases the peak-year holdings are less than our estimated values of normal real money balances. These seven cases--Pennsylvania in 1729, New York in 1737, New Jersey in 1737, North Carolina in 1729 and in 1760, Virginia in 1760, and Pennsylvania in 1760--therefore clearly provide support for the classical, "quantity-theory," "fixed-exchange-rate" hypothesis. For the remaining three, some discussion will be appropriate.

Table 4

Episode of Virginia, 1755-1760

	<u>Paper Currency Outstanding, £ thous^a</u>	<u>Adjusted Population, thous</u>	<u>Exchange Rate, £/£st</u>	<u>Paper Currency Per Capita, £st</u>
1754	0.0	153.9	1.275	0.000
1755	60.0	160.6	1.294	0.289
1756	100.0	167.7	1.284	0.464
1757	180.0	175.0	1.397	0.736
1758	261.5	182.7	1.379	1.038
1759	308.8	190.7	1.400	1.157
1760	316.2	199.1	1.414	1.123
1761	312.9	204.4	1.437	1.065
1762	317.5	209.9	1.524	0.992
1763	251.9	215.5	1.599	0.731
1764	220.9	221.3	1.607	0.621
1765	218.1	227.3	1.604	0.598
1766	215.2	233.3	1.285	0.718

^aSource: Brock (1980).

First, the case of Massachusetts in 1754-1761 is one that actually does not belong in the table at all. It is included in our list of ten disputed episodes because of its presence in Smith's (1985a) discussion, but other students of colonial money have agreed that the paper issued by Massachusetts during this period did not circulate as a medium of exchange. This paper took the form of treasury notes that paid interest at a rate of six percent per year and which were typically issued only in denominations of £6.0 and over. Except for a small quantity issued in smaller denominations for payment to soldiers, consequently, these notes functioned as a store of value but not as a circulating medium. For additional discussion of this case, the reader is referred to Brock (1975, preface and pp.273-4), Brock (1980, pp.39-40), Michener (1987, pp. 243-244), and Wicker (1985, pp.872-3).

That leaves the cases of New York and South Carolina during the period of the French and Indian Wars. With respect to South Carolina, it has been suggested by Wicker (1985, p.876) that the issued tax certificates (as distinct from bills of credit and public orders) should not be included in the measured money stock, since they were designed to be quickly returned to the treasury in payment of taxes. Another reason is that these certificates "were customarily issued in denominations of £5 to £50" (Brock, 1975, p. 459). If one excludes these certificates, the nominal stock of paper currency in 1760 becomes £725.6 rather than £863.8, and the per capita real balance figure drops from £3.36 to £2.82 sterling. Furthermore, Marcotte (1989) has refined Brock's estimates for South Carolina by interpolating series between dates with reported values, and adoption of his revised value for public orders in 1760 further reduces the real balance figure to £2.49 sterling. With respect to New York, Michener (1986, p. 286) has explained that, because they reflect quantities authorized rather than those issued, Brock's figures tend to overstate the quantity of paper in circulation during

Table 5

Results for Disputed Episodes

<u>No.</u>	<u>Colony</u>	<u>Peak Year</u>	<u>Currency Ratio</u>	<u>Real Paper Currency at Peak, £st per capita^a</u>
1	Pennsylvania	1729	1.68	$68.9 / (49.1 \times 1.49) = 0.94$
2	New York	1737	3.10	$70.5 / (58.7 \times 1.65) = 0.73$
3	New Jersey	1737	2.65	$60 / (46.7 \times 1.70) = 0.76$
4	Massachusetts	1761	9.80	$505 / (206 \times 1.40) = 1.75$
5	South Carolina	1760	4.25	$864 / (36.7 \times 7.0) = 3.36$
6	North Carolina	1729	4.20	$52 / (26.2 \times 5.0) = 0.40$
7	North Carolina	1761	2.95	$95.3 / (80.9 \times 2.0) = 0.59$
8	Virginia	1760	4.32	$316 / (199 \times 1.41) = 1.12$
9	New York	1759	3.09	$481 / (112 \times 1.68) = 2.54$
10	Pennsylvania	1760	3.75	$446 / (184 \times 1.59) = 1.53$

^aFigures indicate currency divided by product of population and exchange rate.

the period under discussion. The magnitude of the justified adjustment is, however, unknown.

In addition, it must be observed that for both of these colonies--and also in Pennsylvania and Massachusetts--there is evidence indicating that local price levels rose substantially, relative to sterling exchange rates, over the span of years 1755 to 1760. The four wholesale price indices of Cole (1938) cited by Wicker (1985, p. 879), for example, indicate price level increases of about 20 percent while local prices of sterling exchange were declining about 5-10 percent. So for this particular period, our use of exchange rate data is arguably inadequate to determine real money holdings. Adjusting the per capita real balance figures downward by the indicated 25 percent would put the Table 5 result for New York very close to the estimated level of normal real balances in the Mid-Atlantic region (i.e., £2.0st) and would put the revised South Carolina figure within ten percent of the normal estimate for the South (i.e., £1.75st).

It deserves emphasis, however, that even without any of these last adjustments the New York and South Carolina figures are much closer to the magnitudes predicted by the classical hypothesis than to those predicted by the anticlassical position. For South Carolina, for example, the latter, plus the assumption that 1749 real money holdings were equal to the normal magnitude of £1.75st, would imply a 1760 figure of £7.35st. But actual real currency holdings were less than one half of that magnitude.

We can then very briefly summarize the evidence for the ten disputed episodes as follows. First, the case involving Massachusetts in 1755-1760 must be deleted from the sample, since that colony's "paper currency" did not circulate as money during this period. Second, of the nine remaining cases, seven are clearly consistent with the classical hypothesis. Of the final two, one should be classified as a borderline case and the other is only

mildly inconsistent with the classical position. Third, in none of the cases is the computed stock of real paper currency even close to the value implied by the anticlassical hypothesis under the assumption that initial-period money holdings were equal to the normal magnitude of real money balances.

V. Doctrinal and Theoretical Issues

In most of the previous literature on colonial monetary experiences, the hypotheses here designated as classical and anti-classical have instead been described as "quantity theory" and "backing theory" or "finance theory" positions, respectively. The term quantity theory has not been used in this study because, as mentioned above, the dispute at hand actually concerns the magnitude of money stock changes that took place in certain episodes, not the magnitude of price level responses to postulated money stock changes. As for the opposing position, it has typically been termed the backing theory by its proponents on the basis of a contention that the response of prices to any given monetary change will depend upon the quantity and quality of the money's "backing," i.e., on the existence and credibility of governmental fiscal plans to prevent future expenditures from exceeding tax revenues.²⁶ But again this contention or hypothesis pertains to price responses to postulated money stock changes, which is not the matter of dispute. So emphasis on fiscal backing also tends to distract attention from the points that are in need of investigation.

Although price level responses to monetary changes are not the subject at issue here, it should nevertheless be mentioned that from that perspective the content of the alternative theories has been depicted in the literature with considerable lack of clarity. In particular, it has not been adequately recognized that both theories predict that prices at any point in time will depend upon expectations regarding future rates of money growth.²⁷ Indeed,

modern versions of the classical or quantity-theory approach to price level determination typically amount to variants (often with rational expectations) on the model of Cagan (1956). But models with precisely that same price-money relationship are regularly utilized by leaders of the backing school of thought--see, e.g., Sargent and Wallace (1981, 1982). So, as commonly practiced by their adherents, the two theories of price determination share the same predictions in many circumstances. It is only when the analytical framework in use recognizes the existence of government bonds--i.e., government debt that is not used as money--that the two approaches can be distinguished by their price level predictions.²⁸

Nevertheless, the backing-theory line of argument was intended by Wallace (1981), Sargent-Wallace (1981, 1982), and Smith (1985a, 1985b) to conflict with the classical or quantity-theory approach to price level determination. Thus the sympathetic citations of Calomiris (1988, p. 49) and Wicker (1985, p. 871) would seem to provide justification for regarding those two analysts as supporters of the anticlassical point of view.²⁹ A second justification is that, as mentioned above, each of these writers implicitly makes use of percentage-change comparisons involving prices and paper currency (Calomiris 1988, p. 49-50) (Wicker 1985, p. 881). But such comparisons are of interest and relevance only under the assumption that specie is an insignificant component of the money stock--i.e., that paper currency and money are essentially synonymous--and denial of that assumption is central to the classical hypothesis. Accordingly, despite these authors' disagreements with some of the contentions of Smith (1985a, 1985b), it would perhaps be appropriate to list Calomiris and Wicker among the group of anticlassical analysts.

Returning now to the evidence under consideration, a few words of explanation are needed with regard to assumptions regarding timing that have been adopted in our discussion of the implications of the classical theory. In particular, the discussion in Section II assumes--as in McCallum (1989, pp. 299-309)--that specie flows across colonial borders take place as promptly as do adjustments in the price level. Thus the portion of classical analysis of a commodity-money system that focuses on "short run" or point-in-time determination of prices (for a given money stock) is ignored. Instead, attention is focused on the portion of the classical analysis that is concerned with "long run" or ultimate effects on money stock determination. This emphasis is warranted, I would argue, by the small open economy nature of the individual colonies.

There is one final point that warrants explicit discussion. In a few of the colonies, most notably Virginia and North Carolina, commodity certificates--i.e., paper claims to specified quantities of "rated" commodities--circulated and indeed served as a significant component of the money stock (i.e., the stock of assets generally acceptable in exchange). Thus the discussion in Sections II - IV is incomplete, as it has proceeded as if paper currency and specie were the only two forms of money. The question arises, therefore: How does the foregoing analysis need to be modified to take account of the presence in some colonies of circulating commodity certificates?

Fortunately, the answer is that, for analysis of the disputed episodes of Tables 1 and 5, no account of commodity certificates is necessary. This is because the question at hand is simply whether or not the deflated quantity of paper currency exceeds the normal level of real (total) money balances. From the perspective of that question, it does not matter whether it is specie or commodity certificates that are driven from circulation by

the issue of paper currency.³⁰ The Table 4 results for Virginia, for example, would not be invalidated by a finding that money holdings in 1754 consisted primarily of circulating tobacco claims rather than silver coin. If the paper currency issued during 1755-1760 drove out £0.80st of tobacco certificates plus £0.32st of specie by 1760, our results would be just as valid as if £1.00st of specie and £0.12st of tobacco claims were displaced.³¹ Recognition of this point may help to reconcile our classical-theory findings with the view that several colonies were not well endowed with specie in the 1700s.

VI. Concluding Remarks

It may be useful to conclude with a brief recapitulation of the argument of the paper, including the formulation of the issue under study and the evidence obtained. A first basic point to keep in mind is that the dispute between anticlassical writers including Smith (1985a) and classical writers such as Michener (1987) and McCallum (1989) is not principally about the response of prices to money changes. The dispute, instead, concerns whether or not there were substantial money stock changes associated with measured changes that pertain to paper currency alone. For a few cases there is widespread agreement, but the present discussion has featured nine episodes that have been put forth by anticlassical writers as examples of the failure of classical monetary analysis. In each of these cases, large percentage increases in the stock of paper currency were followed by little or no response in price levels. Since the anticlassical position contends that specie supplies were minimal, it implies that large increases in real money balances occurred. If the episodes began with normal money holdings, then, peak years should be marked by holdings of paper currency that (in deflated terms) were much greater than normal levels of real money balances. The

classical hypothesis, by contrast, is that outflows of specie (or commodity claims) occurred leaving colonies with deflated levels of paper currency not significantly in excess of normal real money balances.

A crucial step in the analysis is the estimation of normal real money balances. Two types of evidence are considered in Section III, the first of which involves direct estimates of total money holdings made by contemporary observers. This type is judged as unreliable, as well as lacking in regional detail. The second type of evidence exploits the available data on paper currency issues alone by examining episodes in which it is generally agreed that specie and commodity claims were virtually nonexistent (because of excessive issues of paper currency). From this type of evidence, augmented by cross-regional ratios based on probate records, estimates of normal real money balances were developed for the New England, Mid-Atlantic, and Southern regions.

Of the nine disputed episodes, it was found that in seven cases real holdings of paper currency in the crucial peak year were smaller than our estimates of normal real money balances--just as predicted by the classical theory. Of the remaining cases, one is of a borderline nature and the other is also if appropriate adjustments are made. Even without adjustments, the last case would be inconsistent with the classical hypothesis to only a small extent. None of the nine cases features a computed stock of paper currency close to the value implied by the anticlassical hypothesis under the assumption that initial-period money holdings were equal to normal magnitudes. The evidence, therefore, is rather strongly supportive of the classical--often termed "quantity theory"--position.

Appendix: Statistics for Eight Disputed Episodes

<u>Colony</u>	<u>Year</u>	Paper Currency,	Population, ^a	Exchange ^b	Paper Currency Per Capita
		<u>£ thous</u>	<u>thous</u>	<u>Rate, £/£st</u>	<u>£st</u>
Pennsylvania	1727	38.9 ^c	44.3	1.50	0.59
"	1728	38.9	46.7	1.51	0.55
"	1729	68.9	49.7	1.49	0.94
"	1730	68.9	51.7	1.52	0.88
New York	1736	22.1 ^d	57.1	1.65	0.23
"	1737	70.5	58.7	1.65	0.73
New Jersey	1730	17.6 ^e	37.5	n/a	
"	1731	14.6	38.7	n/a	
"	1732	11.5	39.9	n/a	
"	1733	28.5	41.2	n/a	
"	1734	25.4	42.5	n/a	
"	1735	22.7	43.9	n/a	
"	1736	20.0	45.3	n/a	
"	1737	60.0	46.7	1.70	0.76
South Carolina	1749	133.0 ^e	23.8 ^f	7.25	0.77
"	1750	n/a	25.0	7.02	
"	1751	n/a	26.0	7.00	
"	1752	n/a	27.0	7.00	
"	1753	152.3	28.1	7.00	0.77
"	1754	156.1	29.2	7.00	0.76

"	1755	221.3	30.3	7.00	1.04
"	1756	311.8	31.5	7.14	1.39
"	1757	542.8	32.7	7.00	2.37
"	1758	595.6	34.0	7.00	2.50
"	1759	521.4	35.3	7.00	2.11
"	1760	863.8	36.7	7.00	3.36
North Carolina	1728	12.0 ^g	25.4	n/a	
"	1729	52.0	26.2	5.00	0.40
"	1730	52.0	27.0	n/a	
North Carolina	1750	20.6	53.2	1.33	0.29
"	1751	20.1	55.2	n/a	
"	1752	19.0	57.2	n/a	
"	1753	18.3	59.4	n/a	
"	1754	57.9	61.6	1.67	0.56
"	1755	56.0	63.9	1.60	0.55
"	1756	57.9	66.3	1.80	0.48
"	1757	68.2	68.8	n/a	
"	1758	70.2	71.4	n/a	
"	1759	69.5	74.1	1.85	0.51
"	1760	75.8	76.9	1.90	0.52
"	1761	95.3	80.9	2.00	0.59
"	1762	85.3	85.1	2.00	0.50
New York	1754	126.1 ^c	90.8	1.79	0.77
"	1755	179.1	94.8	1.80	1.05
"	1756	230.8	98.9	1.83	1.28

"	1757	219.3	103.2	1.78	1.19
"	1758	307.2	107.6	1.73	1.65
"	1759	481.2	112.3	1.68	2.54
"	1760	410.4	117.1	1.67	2.10
"	1761	366.2	121.1	1.81	1.67
Pennsylvania	1754	81.5 ^c	142.0	1.68	0.34
"	1755	96.0	148.3	1.69	0.38
"	1756	147.5	154.8	1.73	0.55
"	1757	247.0	161.5	1.66	0.92
"	1758	312.8	168.6	1.59	1.17
"	1759	422.9	176.0	1.53	1.56
"	1760	446.2	183.7	1.59	1.53
"	1761	409.0	188.7	1.73	1.26

^a Interpolations based on U.S. Bureau of the Census (1975), Series Z, 1-19

^b McCusker (1978), Table 5.2

^c Brock (1980)

^d Smith (1985a)

^e Brock (1975)

^f White population; see Section III

^g Smith (1985b)

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Footnotes

¹As Michener (1987, pp. 237-8) has pointed out, Ricardo (1817, Ch. XXVII) disputed aspects of Adam Smith's (1776, Bk. II Ch. ii) analysis of colonial experiences. Writers of the time typically attributed currency depreciation to the absence of adequate "backing" (Nettels, 1934, p. 257) but "quantity theory" reasoning was preferred by Douglass (1740). During the 1930s, Lester (1939) debated the merits of these two positions with several writers.

²Other recent participants in the debate include Weiss (1970), Ernst (1973), West (1978), Hanson (1979), Brock (1980), Wicker (1985), Bordo and Marcotte (1987), Laidler (1987), Calomiris (1988), and McCallum (1989).

³The debate is often described as pertaining to the validity of the "quantity theory of money." Reasons for using a different terminology are explained in Section II and some of the relevant doctrinal issues are discussed in Section V.

⁴The traditional theory is well represented by Mill (1848, Book III, Chapters 7-10). My own version is described in McCallum (1989, pp. 249-268 and 299-309).

⁵In previous drafts of the present paper, Calomiris (1988) and Wicker (1985) were also listed at this point as proponents of the anticlassical point of view. These writers have privately objected, however, to that categorization and it is certainly the case that their views differ in significant ways from those of Smith. My compromise treatment in the present draft is to describe (in Section II) their position as supportive "at least in part" of Smith's, and to explain (in Section V) why I consider that view to be warranted.

⁶Wicker (1985, p. 871) says, "this [classical] hypothesis cannot be tested directly because there are no reliable estimates of the total money stock of the separate colonies."

⁷Smith also emphasizes the sharp declines in nominal currency quantities that occurred at the end of several of these episodes, but these declines do not provide corresponding opportunities for testing because total money stock magnitudes are always at least as great as paper currency holdings. The declines are not as important for the issue at hand because they typically served mainly to reverse sharp increases that had occurred a few years earlier.

⁸A colony's motivation for departing from the British standard apparently involved the belief that raising the shilling value of silver coins would attract specie to the region. The ultimate fruitlessness of such attempts was pointed out by Adam Smith (1776, Bk. II, Ch. ii).

⁹Silver was the principal circulating metal before Newton's recoinage act of 1717 and gold afterwards.

¹⁰For Southern colonies, in which slavery was prominent, per capita values are based on white (rather than total) population figures. This point will be discussed more fully in the following section.

¹¹Proponents might conceivably argue that the anti-classical position does not imply that real money holdings would be equal to normal values at all initial dates. But presumably it would still imply equality on average of initial and normal holdings.

¹²In some cases, commodity certificates may have played the role here attributed to specie. For discussion of that possibility, see Section V.

¹³Here, and in all that follows, population figures are based on decadal estimates given in Series Z 1-19 of the U.S. Census Bureau's Historical Statistics of the United States (1975, p. 1168). For intervening years, the figures are obtained by interpolation assuming constant growth rates within each decade.

¹⁴Michener's suggestion gains some support from the Comptroller of the Currency's figure for circulating currency in the United States in 1800 (as reported in Historical Statistics of the United States, p. 993). That figure is \$26.5 million, so with a population of 5.3 million in 1800 the per capita value is \$4.99. Since a dollar was the equivalent of 0.222 pounds sterling, this estimate amounts to roughly £1.11 sterling per capita.

¹⁵Except, that is, for colonies in which commodity claims are known to have been important as a medium of exchange--e.g., North Carolina.

¹⁶There seems to be general agreement among scholars on this point.

¹⁷This treatment seems appropriate, given the price index numbers in Mitchell and Deane (1962).

¹⁸Figures from the late 1740s should also be excluded because monetary reform was anticipated from 1747 on.

¹⁹It is arguable that the New England figures should be adjusted upward to counteract the reduction in real balances that would result from moneyholders' anticipation of continuing inflation. The magnitude of such a reduction would depend, of course, upon the responsiveness of money demand to the opportunity cost variable and to the latter's initial value, as well as upon the magnitude of the inflation anticipated. Suppose that, for example, the opportunity-cost elasticity of money demand is assumed to equal half of the Baumol-Tobin value of 0.5 and that the zero-inflation opportunity cost of holding money is 0.08 on an annual basis. Then an expected inflation rate of five percent (i.e., 0.05 in fractional terms) would lead to a relative reduction in real money balances of $0.25 (0.05/0.08) = 0.156$ --i.e., a reduction of about 16 percent. For present purposes this effect will be neglected.

²⁰In 1750 Massachusetts began a monetary reform that returned the colony to a metallic standard, and Connecticut followed suit in 1756. In Rhode Island and New Hampshire, by contrast, paper currency continued to prevail as the circulating medium until 1763. Brock's (1975) data for these two colonies is evidently unsatisfactory, but Weiss (1970) has reported a few figures for Rhode Island that are based on an unpublished thesis by MacInnis (1952). In particular, Weiss reports that the quantity of paper currency outstanding in 1760 was £31.5 per capita. McCusker does not include an exchange rate series for Rhode Island in his Table 5.2, but reports a number of figures for 1760 on pp. 136 and 154. These values cluster tightly around £26.0 per pound sterling, so the implied quantity of money holdings per person comes to roughly £1.2 sterling. This figure is so far in excess of our values for 1715-1749 as to suggest that the MacInnis estimates may be unreliable. In any event, the £0.7st estimate for New England will be retained.

²¹For additional information concerning South Carolina, see the recent thesis by Marcotte (1989). In his Chapter 4, Marcotte develops a revised money stock series that is based on the same values as used by Brock, but modified in an attempt to reflect more accurately the time of currency retirements. For the years 1927-30, the revised figures are the same as Brock's.

²²It might be thought that a fourth episode would be provided by the experience of North Carolina during the period 1715 - 1722, as the exchange rate went from £1.5 per pound sterling to £5.0. But while specie may have been absent, commodity claims reportedly constituted a major fraction of the circulating medium even during these years. See Brock (1975, pp. 106-8) and Bullock (1900, pp. 131-156).

²³These include, for the record, New York, New Jersey, Pennsylvania, and Delaware. The New England colonies are Connecticut, Massachusetts, New Hampshire, and Rhode Island while the Southern group consists of Maryland, Virginia, North Carolina, South Carolina, and Georgia.

²⁴As it happens, however, my estimates for New England and South Carolina correspond rather closely to Jones's figures, which represent extrapolations to the general population of her basic probate records. Methods are described on pp. 347-351 of Jones (1980).

²⁵For a few of the episodes, data availability reduces the length of the tables.

²⁶Under conditions, that is, such that the money in question is not fully (100 percent) backed by commodity reserves.

²⁷Smith (1985b, pp. 1191-2) briefly mentions such expectational considerations but only in the context of specific episodes in South Carolina.

²⁸This line of argument is basically consistent with that of Michener (1987, pp. 240-253). In my opinion, however, Michener is overly generous in his statement that "Wallace's [(1981)] model offers the premier example of a fully articulated economy in which money creation is not necessarily inflationary" (1987, p. 241). In McCallum (1983, 1986) it is explained that in Wallace's model the asset termed "money" does not actually function as a medium of exchange--which is the defining characteristic of money.

²⁹Both Calomiris (1988, pp. 49-50) and Wicker (1985, p. 870) also mention with apparent approval the "Ricardian" proposition developed most prominently by Barro (1974). In the context of the colonial-money dispute such a citation seems inappropriate, however, since the Ricardian proposition pertains to the effects of a bond-financed change in tax receipts under the condition of an unaltered time path for money issues and government purchases. Indeed, the proposition is developed by Barro (1974) within an analytical framework that does not include money in any capacity. Wicker's (1985, pp. 870-1) suggestion, that price level invariance to paper currency issues might be explained by the absence of "net wealth" effects, seems to confuse the Ricardian proposition with the distinct point that price level responses depend upon expectations of future money issues, as well as the current level.

³⁰The issue of paper money would free tobacco to be exported, rather than held for use as a medium of exchange.

³¹The presence of commodity certificates during normal periods would, of course, affect our estimates of normal money holdings. But the effect would be to bias our estimates downward, which would make it more likely that disputed-episode magnitudes would exceed the estimated normal values. Thus recognition of commodity claims during normal periods could only serve to strengthen our principal conclusions.