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ABSTRACT

The U.S. Congress issued paper money called Continental Dollars to finance the American Revolution. The story of the Continental Dollar is familiar to all -- a lot were issued and hyper-inflation ensued. However, the details of this story are less well known. Scholars even disagree over how much was issued -- disagree by over 50 percent. Meaningful monetary analysis of the Continental Dollar cannot proceed given this confusion in the data. Evidence is gathered here to reconcile past estimates and establish the exact amount and time path of Continental Dollars emitted thereby overcoming the entropy that has crept into the historical record.

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The Continental Dollar: How Much Was Really Issued?*

The U.S. Congress issued paper money called Continental Dollars to finance the American Revolution. The story of the Continental Dollar is familiar to all—a lot were issued and hyper-inflation ensued. However, the details of this story are less well known. Scholars even disagree over how much was issued—disagree by over 50 percent. Meaningful monetary analysis of the Continental Dollar cannot proceed given this confusion in the data. Evidence is gathered here to reconcile past estimates and establish the exact amount and time path of Continental Dollars emitted thereby overcoming the entropy that has crept into the historical record.

From 1775 through 1779 the U.S. Congress financed the American Revolution largely by issuing fiat paper money—the Continental Dollar (Bolles, 1969, v. 1, p. 69; Ferguson, 1961, p. 44). The basic story of the Continental Dollar is familiar to all—a lot were issued and hyper-inflation of prices in Continental Dollars and hyper-depreciation of Continental Dollars in terms of specie dollars ensued. They became worthless. "Not worth a Continental" was a common derogatory phrase (Atack and Passell, 1994, p. 72; Phillips, 1866, pp. 245-251; Scott, 1957, p. 262). They ceased to circulate as a currency after May of 1781 and were soon forgotten (Bezanson, 1951, pp. 12, 344; Breck, 1843, p. 16; Ferguson, 1961, p. 66; Webster, 1969, p. 502).

The accuracy of this story is less well established. Scholars even disagree over how many Continental Dollars were issued—disagree by over 50 percent. Before meaningful monetary analysis of the Revolution can proceed, the amount and time path of the emission of Continental Dollars should be better established. The goal here is to do this for the years 1775 through 1781—the years between the first and last emission as presented in the various estimates in the literature and up to when Continental Dollars ceased to circulate as a currency.[1]

This is also a story about how entropy crept into the historical record. The analysis traces how errors in early estimates of the emission of Continental Dollars were copied by subsequent scholars who in turn added their own errors to the estimates they had copied. This process repeated itself until now—some 230 years later—a plethora of different estimates exists. Little

has been done in the literature to reconcile these conflicting estimates. Scholars may be tempted to choose the estimates most convenient to their purposes—succumbing to the moral hazard that entropy fosters. As such, a secondary goal is to reconcile past estimates by imposing structure on the accounting process. This reconciliation of past estimates adds validation to the estimates offered here of the true amount and time path of the emission of Continental Dollars.

The Emission of Continental Dollars, 1775-1779

The total amount of Continental Dollars emitted by the U.S. Congress during the American Revolution has never been well established (Ferguson, 1961, p. 29, fn. 13). A variety of estimates has been offered in the literature; see Figures 1 and 2. For example, in the modern literature the total amount reported as emitted ranges from $204 to $250 million (e.g. see Atack and Passell, 1994, p. 71; Calomiris, 1988, p. 58; Ferguson, 1961, pp. 28-30, 67; Hughes and Cain, 2007, p. 79; Michener, 1988, p. 690; Newman, 1997, pp. 58-69; Perkins, 1994, p. 97; Tindall, 1988, p. 226). These estimates are derived from estimates ranging from $191.5 to $387.5 million found in the older authoritative literature (e.g. see *American Almanac*, 1830, p. 183; Bolles, 1969, v. 1, pp. 31-88; Boyd, 1954, v. 10, pp. 42-43; Breck, 1843, pp. 8, 15; Bronson, 1865, pp. 88-89, 112-115; Bullock, 1895, pp. 135, 174, 177; Elliot, 1843, pp. 8-9, 11; Gouge, 1833, II, p. 25; Harlow, 1929, pp. 50-51; Hepburn, 1967, p. 16; Nourse, 1828, p. 7; Phillips, 1866, pp. 198, 199; Ratchford, 1941, p. 37; Sumner, 1968, v. 1, p. 98).

[Place Figures 1 and 2 Here]

Appendix Table A presents these estimates and reconciles them with each other and with the original evidence in the *Journals of the Continental Congress* (*JCC* hereafter) and the *Papers of the Continental Congress* (*PCC* hereafter).[2] The inclusion of evidence from the *PCC* (m247, r146, i136, p. 647—*Report of the Board of Treasury on the State of Emissions and Loans,*

September 14, 1779) is important to this reconciliation process as well as to interpreting the true amount and time path of emissions. This evidence consists of a report submitted by the Board of Treasury to Congress, at Congress' request, detailing the course of emissions through September 2, 1779. Only the total outstanding as of that date, and not the details of how the Board constructed that total, were recorded in the *JCC*. Scholars have used that total but not noted the details of its construction, which appear in the *PCC* only. As such, the *PCC* evidence used here represents a new addition to the literature on the analysis of the emissions of Continental Dollars.

The *PCC* evidence makes several corrections to the evidence taken from the *JCC*. In particular, it reveals that not all of the $4 million authorized by Congress on February 17, 1776 were printed, reveals that the $500,000 mentioned by Congress on November 2, 1776—the existence of which scholars have puzzled over—were not printed, and definitively establishes how the emissions of May 20, 1777 and April 11, 1778 are to be counted—resolving a major confusion within the prior scholarship (discussed in more detail below). It also reveals that an amount from January 5, 1776 was counted as a new emission when in fact it was not new, an error that Congress did not catch when incorporating the Board's report into its future decisions. The details of how this *PCC* evidence affects the true amount and time path of emissions, and how it affects the reconciliation of past estimates, are explained in Appendix Table A.

Regarding the estimates in the prior literature, some suffer from errors of addition, some from errors of omission, some from errors of transcription, and some from errors of definition. For example, Thomas Jefferson's 1786 table of emissions omitted $16 million that were in fact emitted between July 1775 and February 1777 (Boyd, 1954, v. 10, pp. 42-43). This error of omission was repeated in the report given to the 28th Congress in 1843 (Elliot, 1843). Elliot in turn is one of the primary sources used by Ferguson (1961). Bronson (1865, pp. 113-114)

erroneously includes $500,000 as a new emission by Congress on November 2, 1776 when in fact this sum was not actually emitted. Bolles (1969, v. 1, pp. 42-54) in his account of emissions in 1884 omitted $5 million from May 1776 that in fact were emitted. Phillips (1866, pp. 198-199) made several transcription errors and Bullock (1895, pp. 135-136) made an error in addition of $9.95 million when summing his entries—errors often uncorrected by subsequent scholars. Correcting these errors, as well as accounting for the rounding of numbers by scholars, goes some way toward reconciling the different estimates of total emissions given in the literature. The two remaining sources of discordance across the literature are discussed in detail below.

Discarding the Very High $357-$387.5 Million Estimate

The very high estimate of $357 to $387.5 million Continental Dollars emitted by Congress as reported by the *American Almanac* (1830, p. 183); Elliot (1843, p. 11); Gouge (1833, II, p. 25); and in 1924 by Hepburn (1967, p. 16), besides having a somewhat mysterious provenance, appears to count all U.S. Treasury disbursements measured in Continental Dollars as the unit of account and not the emission of Continental Dollars *per se*. As such, this very high estimate should be discarded. The following analysis makes the case for its discard.

The yearly estimates summing to $357 million for the total emission of Continental Dollars were first reported in the *American Almanac* (1830, p. 183)—with no reference source given. Gouge (1833, II, p. 25) repeated, with minor typographical errors, these numbers citing only the *American Almanac*. Elliot (1843, pp. 10-11) in his report to the 28th Congress repeated these numbers and indicated that they came from Alexander Hamilton, Secretary of the Treasury, in 1790.[3] Bronson (1865, pp. 115, 164) repeated these numbers citing Gouge and the *American Almanac*, but indicated that these numbers were reported by the Secretary of War (Henry Knox) in 1790. Bronson also thought these numbers measured the "entire disbursement of the Treasury,

[counted] in continental money…" and not the emission of Continental Dollars *per se*. In 1891, Sumner (1968, v. 1, p. 98) repeated the cumulative total from these numbers with no caveats. Bullock (1895, pp. 174, 177) repeated these numbers—citing Elliot. Bullock also assumed they originally came from Hamilton and measured total expenditures and not the emission of Continental Dollars *per se*. In 1924, Hepburn (1967, p. 16) repeated the cumulative total from these numbers citing only Gouge with no caveats.

Ferguson (1961, pp. 28-29, 64-65) repeated these numbers but took them as measuring total expenditures and not the emission of Continental Dollars *per se*. Ferguson (1961, p. 28) also indicated they originally came from a report ordered by the *House of Representatives of the United States* on Robert Morris' Memorial appointed on March 19, 1790 with the report published on February 16, 1791. The congressional record shows that such a committee was formed and delivered its report on the dates indicated, with James Madison speaking for the committee (United States Congress, 1834, v. 1, pp. 1464, 1964). The report, however, is not in the congressional record. *The Papers of James Madison* indicates that Madison was on a committee on March 9, 1790 to inquire into the accounts of Robert Morris' administration and delivered a report on February 16, 1791. Madison, however, wrote only a brief summary with nothing related to the numbers at issue. The report itself is not reproduced therein. Madison, however, indicated that the committee had obtained a general account of receipts and expenditures from the Registrar of the Treasury and that those materials, unaltered, made up the bulk of their report to Congress (Hobson and Rutland, 1981, v. 13, pp. 95, 392-393).

The Registrar of the Treasury was Joseph Nourse, and his report for the "Madison Committee," ordered on March 19, 1790, was delivered by him to that committee on August 30, 1790. It is reproduced in the *Papers of Robert Morris* (Nourse, 1999, v. 9, pp. 905-940). In the

portion of this report that incorporated material from the Secretary of War, Henry Knox, are tables reporting "An Estimate of the Expenditures and Advances made at the Treasury of the United States" separately for each year from 1776 through 1781.[4] When the totals from each year are extracted and listed together in a single tabulation, it replicates exactly that displayed in the *American Almanac* (1830, p. 183) and the copies of that tabulation published by others thereafter. There can be no doubt that this 1790 report by Nourse (1999, v. 9, pp. 930-936) is the original source for this line of estimates of the emission of Continental Dollars.

It is also clear that this report by Nourse is counting the entire disbursement of "Expenditures and Advances made at the Treasury of the United States" measured in Continental Dollar units of account. In the report itself, Nourse explicitly stated on page 35 that Knox's tables of "Treasury Expenditures" (so converted and listed on that page in specie value) included "Loan Office Debt" (Nourse, 1999, v. 9, p. 939). This observation is corroborated by a statement made in the United States Congress (1834, v. 2, p. 1566) on May 11, 1790 which said that the Secretaries of War and Treasury laid a report before Congress "…of the sums of money, including indents and paper money of every kind…which have been received from, or paid to, the several States by Congress, from the commencement of the Revolution to the present time." This is the same report given to the Madison committee (so identified by the language on top of page 25 of the report, see Nourse (1999, v. 9, p. 929)). Congress' reference to "indents" and to paper monies of "every kind" affirms that this report was not measuring the emission of Continental Dollars *per se*, but instead was only using Continental Dollars as a unit of account to tally up total expenditures. As such, the very high estimate of $357-387.5 million Continental Dollars emitted represents an error of definition and so cannot be reconciled with any of the other estimates of the emission of Continental Dollars in Appendix Table A except by being

totally discarded—as the case made here supports doing.

The January 14, 1779 Emission

One last point of discrepancy exists, and it is by far the main source of variation in the estimates of total emissions reported across the remaining literature. Because of extensive counterfeiting, Congress on January 2, 1779 called in "…the whole emissions of May 20, 1777, and April 11, 1778."[5] These old bills were to be exchanged for new bills—with the old bills being "examined and burned." On January 14, 1779 Congress authorized a total of $50,000,400 in bills of a new design "…to be emitted for exchanging others, agreeable to the resolutions of the 2nd instant, *or for supporting the war the ensuing year*…" (*JCC*, v. 13, pp. 22, 64-65—italics added) How much of this emission was swapped for old bills and how much was new spending *for supporting the war the ensuing year* was not recorded.

Lacking direct evidence on this division, guesses in the literature vary widely—see Figures 1 and 2 and Appendix Table A. For example, Nourse (1828, p. 7) and Michener (1988, p. 690) counted the entire January 14, 1779 emission ($50 million) as new. In effect, they were counting total printings or gross emissions rather than total net new emissions outstanding. However, total printings *per se* are largely meaningless numbers for assessing the financial and economic impact of the Continental Dollar. Information on the total net new emissions outstanding is needed to evaluate congressional spending, money creation, and its impact on the economy. And to assume that none of the January 14, 1779 bills were swapped for old bills and so were all net new emissions is clearly erroneous as the *JCC* (v. 13, pp. 53, 98-99, 140, 255, 259, 302, 392, v. 14, p. 731, 774-775, 817, 820-821, 846, 881, 943; v. 15, pp. 1431, 1436) documents a considerable number being exchanged one-for-one for old bills.

Most estimates attempt to identify total net new emissions outstanding by netting out that

portion of the January 14, 1779 emission that was swapped for old bills. For example, Harlow (1929, pp. 50-51) assumed that all $50,000,400 were exchanged for old bills leaving no net new emissions from this authorization. No justification, however, was provided for this assumption.

One obvious question is how many old bills were eligible to be swapped for new bills? The authorizing legislation of January 2 and 14, 1779 explicitly listed the entire emissions of May 20, 1777 and April 11, 1778 and no others as eligible for exchange. Thereafter, only these two dates were mentioned, and mentioned often, in reference to exchanging old bills for the new bills of the January 14, 1779 emission (see *JCC*, v. 13, pp. 21-22, 53, 65, 74, 98, 129, 140, 255-256, 259, 302; v. 14, pp. 557, 695, 731, 774-776, 795-796, 817, 820-821, 846, 881, 943; v. 15, pp. 1186, 1431, 1436, 1451-1452; v. 16, p. 312; v. 19, p. 430). Scholars, however, have differed over how to count the emissions of May 20, 1777 and April 11, 1778.

For example, Bullock (1895, pp. 135-136) assumed that each authorization date represented a unique emission. Because only $5 million was authorized on May 20, 1777 and another $5 million was authorized on April 11, 1778, he assumed that only $10 million was eligible for exchange.[6] Assuming all $10 million were so exchanged leaves $40,000,400 out of the $50,000,400 authorized on January 14, 1779 as a net new emission. Bullock's interpretation, however, is questionable given that Congress had never authorized more than $10 million in net new emissions on a single date before (see Appendix Table A).

By contrast, Newman (1997, pp. 64-69) assumed that authorization dates do not represent unique emissions. A given emission represented all authorized amounts—even if authorized on different dates—that were printed with the same cut and in the same design and style, i.e. that were indistinguishable from emissions on other authorization dates. As such, he considered the emission of May 20, 1777 as including not only the amount authorized on May 20, 1777 ($5

million) but also that authorized on August 15, November 7, and December 3 of 1777 and on January 8 and 22, February 16, March 5, and April 4 and 18 of 1778 (an additional $11.5 million). The bills from these separate authorization dates were all indistinguishable from one another, e.g. all had printed on them "…*according to a Resolution of* CONGRESS, *passed at* Philadelphia, *May* 20, 1777." They were also distinguishable from all other emissions.

Newman (1997, pp. 64-69) considered the emission of April 11, 1778 to include not only the amount authorized on April 11, 1778 ($5 million) but also that authorized on May 22, June 20, July 30, and September 5, 1778 (an additional $20 million). The bills from these separate authorizations were all indistinguishable from one another—all had printed on them "…*according to a Resolution passed by Congress*, *at Yorktown*, 11th April, 1778." Again, they were also distinguishable from all other emissions. In total, the emissions of May 20, 1777 and April 11, 1778 amounted to $41.5 million.[7] If all of these amounts were so exchanged, it would leave $8,500,400 out of the $50,000,400 authorized on January 14, 1779 as a net new emission—an amount clearly within the $5 to $10 million typical of net new emissions authorized on specific dates by Congress (see Appendix Table A).

The authorizing language in the *JCC* supports this interpretation. The May 20, 1777 emission differed from previous emissions in that it had a new date (May 20, 1777) printed on the bills (*JCC*, v. 7, p. 373). The next nine authorizations all carried the same instructional language, namely "…that the bills shall, excepting the numbers, be of the same tenor and date as the emission now executing, be numbered from the last number of each respective denomination of that emission progressively…" (*JCC*, v. 8, p. 646; v. 9, pp. 873, 993; v. 10, pp. 28, 83, 175, 223, 309, 365) The April 11, 1778 emission also differed from previous emissions. The language of the authorizing legislation explicitly stated that for these bills "…new cuts be used

for striking off and printing: That the form of the bills be as follows: …according to a resolution passed by Congress, at York, 11 April, 1778." The next four authorizations all carried the same instructional language, namely "That the bills shall…be of the same tenor and date as the emission directed on the eleventh day of April last, and be numbered from the last number of each respective denomination progressively…" (*JCC*, v. 11, pp. 524, 627, 731, v. 12, p. 884)

The *PCC* (m247, r146, i136, p. 647) provides definitive corroboration for this interpretation.[8] Therein the Board of Treasury explicitly identifies the emissions of May 20, 1777 and April 11, 1778 as comprising the additional authorization dates listed above with a cumulative total of $41.5 million emitted across these dates as comprising the totality of the emissions of May 20, 1777 and April 11, 1778.[9] The Board's report explicitly subtracts this sum from the $50,000,400 authorized on January 14, 1779 when tallying up the cumulative net new emissions outstanding as of September 2, 1779—which was then stated to be $159,948,880.

This total was accepted by Congress (*JCC*, v. 15, pp. 1019, 1052-1053). It was also the only time Congress reported such a total prior to permanently ending emissions. However, the sum of net new emissions authorized as of September 2, 1779 as listed in the *JCC*, counting the January 14, 1779 emission as $8,500,400, totaled $160,001,660. The difference between the *JCC* and *PCC* totals to that date equals $52,780. This discrepancy is fully accounted for by the fact that the *PCC*, but not the *JCC*, adjusted the February 17, 1776 authorization down by $62,780 to account for bills not actually printed, and by the fact that the *PCC*, but not the *JCC*, mistakenly counted $10,000 from January 5, 1776 as new. In other words, the true *JCC* total ($160, 001,660 – $62,780) = the true *PCC* total ($159,948,880 – $10,000) for cumulative net new emissions outstanding as of September 2, 1779 (see Appendix Table A).

The discrepancy between this total and the totals reported across the literature to that date

can be used to readjust the guesses across the literature about how much of the January 14, 1779 authorization should be counted as new. This residual-calculation method was first used by Thomas Jefferson in 1786 (Boyd, 1954, v. 10, pp. 42-43) and Elliot (1843). However, because both Jefferson and Elliot erroneously omitted $16 million of pre-1779 emissions and because both did not know about the required reduction of $62,780 and overage-error of $10,000 in the *PCC* numbers relative to the *JCC* numbers for 1776, their residual estimate is off by exactly $15,947,220 ($16,000,000 - $62,780 + $10,000). Applying this residual-calculation method with the correct emission numbers from the *JCC* and *PCC* completes the reconciliation of estimates across the remaining literature—producing a consistent estimate (sans rounding) of $199,990,000 as the cumulative grand total of net new emissions of Continental Dollars (see Appendix Table A).

Direct Evidence Corroborating the Above Estimate of the Amount of Currency Swapped

Having established that $41.5 million old Continental Dollars were eligible to be swapped for the newly printed dollars of the January 14, 1779 emission still leaves the question of whether the swap actually took place. For example, Ferguson (1961, p. 29, fn. 13; p. 45) assumed that little of the eligible amount was actually swapped leaving more as a net new emission.[10] Direct evidence on the amount of currency swapped, however, can be taken from reports by the Registrar of the Treasury, Joseph Nourse, and the Continental Treasurer, Michael Hillegas. On January 14, 1786, Nourse reported the amount of Continental Dollars paid into the U.S. Treasury from May 1779 through 1785 (*JCC*, v. 30, pp. 22-25). These amounts included bills sent back to the Treasury as part of the currency exchange of the emissions of May 20, 1777 and April 11, 1778 for the emission of January 14, 1779 (Grubb, 2007).

In 1779 the *JCC* (v. 15, p. 1436) recorded the amount of new bills sent out between late

June and early August of 1779 to be exchanged for old bills. This amount totaled $15.3 million. Phillips (1866, p. 99) reports a statement in the Philadelphia newspaper, the *Pennsylvania Packet*, indicating that by January 1780 a total of $19.8 million old bills had already been exchanged for the new bills. These numbers are very close to the total Nourse reported ($19.1 million) as being sent back to the Treasury for all of 1779 (*JCC*, v. 30, pp. 22-25). In addition, the individuals who received the new bills for exchange as recorded in 1779 in the *JCC* (v. 14, pp. 817, 821; v. 15, p. 1436) are the same individuals Nourse reported in 1786 as having remitted Continental Dollars to the U.S. Treasury in 1779 (*JCC*, v. 30, pp. 22-25).

The period over which bills from the May 20, 1777 and April 11, 1778 emissions could be exchanged for bills of the January 14, 1779 emission was initially set as ending on June 1, 1779, but was continually extended by Congress. On July 2, 1779 Congress extended it to July 2, 1780 and on March 28, 1780 to January 1, 1781. As late as April 1781 Congress was still dealing with, and as late as January 1782 the Treasury Department was still dealing with, destroying the exchanged sums from the May 20, 1777 and April 11, 1778 emissions (Ferguson, 1980, v. 5, p. 139; *JCC*, v. 13, p. 22; v. 14, pp. 695, 731, 774, 795-796; v. 16, p. 312; v. 19, p. 430).

In May of 1782, Michael Hillegas, Continental Treasurer under the administration of Robert Morris, reported to state Governors a preliminary portion of the report given by Nourse to Congress in 1786 (Ferguson, 1980, v. 5, p. 139). This portion covered from November 25, 1780 through February 23, 1782. Hillegas' report is basically identical to Nourse's 1786 report for the period that the two reports overlap. However, Hillegas' report, unlike Nourse's 1786 report, identifies which of the remittances were of the bills of the May 20, 1777 and April 11, 1778 emission that were being swapped for the bills of the January 14, 1779 emission. Comparing the two reports indicates that a substantial portion of the remittances of Continental Dollars into the

U.S. Treasury in Nourse's 1786 report, for the period when the two reports overlap, represented remittance of the bills of the May 20, 1777 and April 11, 1778 emission.

The total sums that were eligible for exchange were estimated above to be $41.5 million. Nourse's 1786 report of remittances of Continental Dollars into the U.S. Treasury from May 1779 through January 1, 1781 totaled $34.4 million and through April 1781 totaled $39.9 million. This total rises to $41 million when the amounts that Hillegas explicitly identifies as being exchanges of the May 20, 1777 and April 11, 1778 emissions for bills of the January 14, 1779 emission that took place after April 1781 are added.[11] The closeness of these estimates ($41.5 versus $41 million), given that Nourse admits that his numbers are neither comprehensive nor complete, is further corroboration that of the $50 million Continental Dollars authorized by Congress on January 14, 1779 only $8.5 million should be counted as new.

Reconciliation of Past Estimates and the Exact Amount and Time Path of Emissions

When the addition, omission, transcription, and definition errors in the past literature are corrected, the discrepancies between the *JCC* and *PCC* evidence taken into account, and the method for calculating the net new emission from the January 14, 1779 authorization described above used, the discrepancies across the literature can be completely eliminated—revealing a single consistent estimate (sans rounding) of $199,990,000 Continental Dollars emitted from 1775 through 1779 and, as shown below, still outstanding as of 1780.[12] With the exception of Harlow (1929), this estimate is the lowest in the literature—in many cases lower by a substantial margin. The corrected time path of emissions by year and the cumulative total emitted and still outstanding by month from 1775 through 1779 are shown in Table 1, in Figures 1 and 2 as the *JCC* estimate, respectively, and as the *JCC* column in Appendix Table A.[13]

[Place Table 1 Here]

The Continental Dollar, 1779-1781—Two Experiments to Reduce Emissions

Taxes to pull Continental Dollars out of circulation were not initiated in earnest until after 1780 (Bolles, 1969, v. 1, pp. 53, 194-198; Bronson, 1865, pp. 120-138; Bullock, 1895, p. 129; Ferguson, 1961, pp. 30-35, 53, 64-65; Harlow, 1929, p. 67; Ratchford, 1941, pp. 32-33, 37-38). Congress' authorizing legislation "pledged" the "thirteen United Colonies for the redemption of the bills of credit" which were "emitted on the faith of the United States." While this was an obligation that bound Congress, i.e. the Federal Government, Congress did not have the power to directly tax the public before 1789 and so could not, itself, directly redeem Continental Dollars from the public. Congress therefore asked the states to accept Continental Dollars in payment of state taxes and then to remit them to Congress as part of the funding requisitions each state owed Congress (*JCC*, v. 2, pp. 103, 221-222; v. 3, pp. 457-459; v. 4, p. 339; v. 6, p. 1047).

The states, however, failed to provide the funds requested before 1780—which explains why Congress had to resort to ongoing emissions of paper money to finance its war efforts. As far as states not taking Continental Dollars in payment of state taxes before 1780, this should not be surprising, as Congress' own authorizing legislation set the redemption date of these emissions far into the future. Congress set the initial payment (redemption) of its first emissions in the summer of 1775 as not being required until the end of 1779, those emitted in late 1775 as not being required until 1783, and the redemption of the bills issued in early 1779 as not being required until 1797 (*JCC*, v. 2, pp. 103, 221-222; v. 3, p. 458; v. 13, p. 64). Thus states saw no urgency, and certainly no value to themselves, in redeeming Continental Dollars before 1780. On June 28, 1781 the Secretary of Congress, Charles Thomson, reported that (excluding accounts for Georgia) $195 million Continental Dollars were still outstanding (Ferguson, 1973, v. 1, p. 194). Thus, it appears that the whole $199,990,000 of accumulated net new emissions were still

outstanding as of spring 1780.

Continental Dollars began to depreciate in 1776.[14] Figure 3 shows that this depreciation proceeded at a slow and steady pace from 1777 through late 1778 and accelerated thereafter. The rate derived from the Philadelphia price index, and possibly from the merchant account books, represents what was being experienced in contemporaneous consummated transactions. The other depreciation rates were created after 1779 to be retroactively applied to contracted debt obligations whose payments were not yet consummated. This action was taken and deemed necessary once states removed the Continental Dollar's legal-tender status as requested by Congress in 1780—discussed in more detail below. Most of the depreciation shown in Figure 3 occurred after Congress ceased issuing Continental Dollars, i.e. after November of 1779.

[Place Figure 3 Here]

Congress thought that the principal cause of the increasing depreciation of the Continental Dollar after 1776 was the excessive amounts issued and currently outstanding. Congress' exhortations to the states to help reduce the quantity of paper money outstanding and to pay their funding quotas to Congress so Congress could have monies to spend in place of issuing more Continental Dollars had no effect (for examples, see Bolles, 1969, v. 1, pp. 55-56; *JCC*, v. 7, p. 36; v. 9, pp. 954-957, 989; v. 13, pp. 20, 492-493; v. 14, pp. 614-615, 720, 729-732; v. 15, pp. 1052-1062; v. 16, pp. 205-207, 216-217, 262-263; v. 17, pp. 782-783; v. 19, pp. 376-378, 398-400, 406-415; v. 20, pp. 438-440, 577; Oberg, 1998, pp. 229-232). Congress had to find some other way to reduce its reliance on new emissions of Continental Dollars.

The June 1779 Loan Indexation Experiment

If Congress could borrow Continental Dollars back from the public it would have paper money to spend without further increasing the Continental Dollar money supply.[15] On June 11,

1779 Congress resolved to try this approach by borrowing $20 million Continental Dollars from the public.[16] But in the escalating inflationary environment of 1779, how could Congress get the public to loan their Continental Dollars back to Congress? To overcome such disincentives, Congress enacted several ingenious safeguards for the lender. The interest rate was set at 6 percent, which can be interpreted as the zero-inflation real-risk only interest rate.[17] To insure the lender against inflation risk, Congress resolved that the "interest [rate]…shall be increased in proportion to the increase of the sum of continental money which may be in circulation after the date of such loans…" In effect, the interest rate was indexed to the (Continental Dollar) money growth rate. Congress provided another safeguard to protect the real value of the principal lent by allowing lenders the right "…to continue [the principal at]…interest until the…continental bills in circulation … [did] not exceed the sum in circulation at the time of the loan." On June 18, 1779, Congress enacted a motion by Gouverneur Morris to extend the same interest rate-to-money growth indexation back to loans made after March 1, 1778 (Bolles, 1969, v. 1, pp. 80-82; *JCC*, v. 14, pp. 716-720, 747-748, 783-785).

The presumption in Congress was that the movement in the price level as expressed in Continental Dollars, and to the specie value of Continental Dollars, was determined by the quantity of Continental Dollars in circulation. Congress also expected that the states would (eventually) reduce this quantity through taxation redemption. Under this presumption, lenders would not have to call in their loans until the real value of the principal was equal to, or had returned to, what it was when initially lent. In the meantime, lenders would receive inflation-compensated interest payments. Thus, lenders appeared fully protected against inflation risk.

This experiment, however, was a complete failure. As far as can be determined, almost no Continental Dollars were lent to Congress. Ferguson (1961, p. 38) regarded it as a novelty

that was "…never operative and had little, if any, effect upon the volume of loans." The *PCC* (m247, r146, i136, p. 647) lists $26 million in loans received between March 1, 1778 and September 10, 1779. This amount, however, is in Continental Dollar units of account not Continental Dollars *per se*.[18] Most of these loans appear to be loan certificates issued not for Continental Dollars but to directly pay for real goods requisitioned or confiscated from the public to support the war effort (Carp, 1984, pp. 68-73, 90, 97, 186; Ferguson, 1961, pp. 39-40). The report by the Registrar of the Treasury of the amount of Continental Dollars sent back to Congress from May 1779 through 1785 (once the emissions of May 20, 1777 and April 11, 1778 sent back to be swapped are netted out) leaves almost nothing remaining that could be deemed to be Continental Dollars lent back to Congress under this loan scheme (*JCC*, v. 30, pp. 22-25).

Direct indexation of payments to the rate of (Continental Dollar) money growth was never mentioned nor enacted by Congress regarding any claims before this $20 million loan scheme nor was it ever mentioned for anything else afterwards. There was no general indexation of payments to the rate of bill creation.[19] What Congress did do, but only after it permanently discontinued issuing Continental Dollars, was promise certain groups, i.e. military personnel and holders of loan certificates, that they would be compensated for depreciation by being paid what the specie value of their Continental Dollars were at the time they were received or lent. For example, on June 28, 1780, Congress stipulated that on loans made after March 1, 1778 the lender would receive 6 percent interest on what the specie value of those Continental Dollars were at the time they were loaned. No mention was made therein of any interest-rate adjustment to the rate of bill creation (*JCC*, v. 15, pp. 1334-1336; v. 16, pp. 343-345; v. 17, pp. 566-569).

Why did this loan scheme fail? One reason is that the indexation did not compensate for expected inflation. Between June 11 and December 1, 1779 the Continental Dollar money supply

increased by 38 percent. It did not increase thereafter, see Table 1. Thus for a loan made at 6 percent in late June 1779 the lender would at best get an interest rate of 8.3 percent by December 1779 (0.38*6 + 6) with no increase thereafter. In the marketplace, inflation of prices in Continental Dollars and depreciation of Continental Dollars in terms of specie dollars raced far ahead of this projected 2.3 percentage point gain in interest, rising significantly even after emissions (money growth) had ceased, see Figure 3. Between June 1779 and June 1780 price indices expressed in Continental Dollars rose 342 percent and the exchange rate between Continental Dollars and specie dollars went from 20 to 1 to 60 to 1, respectively (Bezanson, 1951, p. 344; Webster, 1969, pp. 501-502).

Congress' indexation plan failed to compensate lenders for expected inflation because the quantity of Continental Dollars in circulation was not the only determinant of its depreciation. Congress' failure to back the Continental Dollar with real assets, i.e. to redeem them for taxes or specie in a timely manner, affected its value (Calomiris, 1988). Changes in the quantity of substitute monies, i.e. specie flows and state paper money emissions, affected its value. Finally, Congress' failure to pay interest and principal on domestic loans affected its value. Even with indexation, loaning Continental Dollars back to Congress did not pay and so was not done.

The Continental-State Dollar Experiment

With the failure of the indexed loan experiment, Congress reverted back to relying on the emission of new Continental Dollars to meet current expenses, which it knew was unsustainable. As such, on September 3, 1779, Congress initiated what would lead to its last gambit to control and so save its paper money public finance structure—the Continental-State Dollar experiment. On September 3, 1779 Congress set an absolute limit of $200 million Continental Dollars that could be emitted before emissions were permanently discontinued, a limit which Congress

thought it reached on November 29, 1779 (Appendix Table A; *JCC*, v. 14, p. 1013; v. 15, pp. 1019, 1053, 1171, 1324). Having permanently discontinued new emissions, Congress was now at the mercy of the states for its current and future revenue (Ferguson, 1961, pp. 46-47). It had no way to enforce its requisition requests on the states—who ignored Congress with impunity.[20] In Congress, efforts by some to create enforcement mechanisms were rebuffed by the majority—see the proposals made in April and May of 1781 that were subsequently rejected or buried in committee (*JCC*, v. 20, pp. 440, 445, 471, 495, 578).

Congress also faced the dilemma that if the states paid Congress only Continental Dollars to meet their funding quotas, Congress would not have ready resources to meet current and near future expenses. Continental Dollars, having been pledged to be destroyed upon tax redemption, could not be re-spent, and Continental Dollars acquired via loans would have little value until the quantity in circulation was reduced enough to appreciate their value in the marketplace. After November 1779, Congress needed the states to make at least some of their payments to Congress in real resources or in specie so Congress could meet its current and near future expenses.

With the requisition act of March 18, 1780, Congress attempted to achieve both of these goals, namely induce states to make some specie payments to Congress as part of their funding quotas and to reduce the quantity of paper money outstanding from $200 million Continental Dollars to $10 million "Continental-State" Dollars (Ferguson, 1961, pp. 51-52; *JCC*, v. 19, pp. 164, 411; Ratchford, 1941, pp. 37-38). To achieve the first goal, Congress gave a discount when requisitions were paid in specie. The act stated, "That the several states continue to bring into the continental treasury, by taxes or otherwise, their full quotas…as assigned…the 7th of October, 1779… That silver and gold be receivable in payment of the said quotas, at the rate of one Spanish milled dollar in lieu of 40 dollars of the bills [Continental Dollars] now in circulation.

That the said bills, as paid in…be not re-issued, but destroyed." (*JCC*, v. 16, pp. 263-265)

While stated as a discount for paying in specie, this act was widely regarded at the time as a "great and deliberate breach of public faith" by Congress (Bolles, 1969, v. 1, pp. 97-98, 135-136; Bullock, 1900, p. 72; Ferguson, 1975, v. 2, pp. 70-71; Phillips, 1866, pp. 160-166; Sumner, 1968, v. 1, pp. 87-89; Webster, 1969, p. 111). In other words, Congress was viewed as partially, though perhaps temporarily, defaulting on the Continental Dollar. While Continental Dollars traded at an even greater discount in the marketplace, the 40 to 1 rate remained that at which Congress would credit the states for the payment of their quotas (taxes) owed to Congress from 1780 through 1789 (*Archives of Maryland*, v. 43, pp. 258-259; Boyd, 1953, v. 7, pp. 221-223; Bullock, 1895, pp. 136-138; Elliot, 1843, pp. 77-82; *JCC*, v. 16, p. 265; v. 23, pp. 560-561, 590).

Interestingly, the vote on the requisition act of March 18, 1780 split sharply on North-South grounds. Not only did all the states south of Pennsylvania (Delaware, Maryland, Virginia, North Carolina, and South Carolina) vote against the resolution, but every single delegate from these states voted against it (no vote from Georgia was recorded). By contrast, not only did every single state north of Delaware vote in favor of the resolution (New Hampshire was divided), but every single delegate from these states, with the exception of Peabody of New Hampshire and Fell of New Jersey, voted in favor of it (*JCC*, v. 16, p. 267). The fact that by 1780 the war had shifted from the North to the South may explain some of this division of support in Congress.

To achieve the second goal, i.e. the reduction of the quantity of Continental Dollars outstanding, the requisition act of March 18, 1780 also stated that "…as the said bills [Continental Dollars] be brought in to be destroyed,…other bills be issued, not to exceed, on any account, one-twentieth part of the nominal sum of the bills brought in to be destroyed." (*JCC*, v. 16, p. 264) The new replacement bills were called "Continental-State" Dollars. Typically

scholars have not counted these new bills as part of the paper money emissions of Congress but rather as paper money emitted by the various states. For example, in 1795, Oliver Wolcott Jr., the current Secretary of the Treasury, in direct reference to this Continental-State currency stated that "This species of paper has never been considered as forming any part of the debt of the United States." A similar conclusion was stated in 1802 by Albert Gallatin, the current Secretary of the Treasury (*American State Papers*, 1834, Class IX, Claims, v. 1, pp. 174, 215, 250).

The emissions of these new bills were by and at the discretion of each state individually (for example, see the case of Connecticut in Bronson, 1865, pp. 126-127). Each state was also directly responsible for the redemption of the bills it issued. The bills themselves were distinguishable by state, i.e. were state-specific. They had printed on them, "The possessor of this bill shall be paid [denomination of the bill] Spanish milled dollars, by the 31st of December, 1786, with interest, in like money, at the rate of five per cent per annum, by the State of [specific state issuing the bill], according to an act of the legislature of the said State…" And while congressional authorization for these state bills made Congress the guarantor in case of state non-redemption, that guarantee held only during wartime and so lapsed at the Revolution's conclusion. Finally, the congressional authorization also required that each state turn over four-tenths of any Continental-State currency emitted to Congress for Congress' use (*American State Papers*, 1834, Class IX, Claims, v. 1, pp. 174, 215, 250; Bolles, 1969, v. 1, pp. 94-96; Elliot, 1843, p. 73; Hepburn, 1967, pp. 16-17; *JCC*, v. 16, pp. 264-265; v. 19, p. 411).

Continental-State Dollars are seldom talked about or talked about correctly in the literature, in part because the experiment was short-lived, not lasting past mid-1781 (*JCC*, v. 19, pp. 398-400, 411; v. 20, pp. 438, 577).[21] Its short life appears to be due to confusion among the public and across the states regarding this currency. Some treated it like the old Continental

Dollar, refusing to price goods and taxes in the new currency and depreciating it toward that of the old Continental Dollar. Some states issued none of the new currency, e.g. Connecticut, Delaware, North and South Carolina, and Georgia. Rumors persisted that states would not accept these new bills in payment of their taxes, and so on (Bezanson, 1951, pp. 51-56; Bolles, 1969, v. 1, pp. 101, 140-141; Bronson, 1865, p. 126; Phillips, 1866, pp. 171-172, 177, 182).[22] Because of this, it is sometimes assumed that little of this Continental-State currency was issued, thus by inference few Continental Dollars were called out of circulation via this mechanism.

Yet there appears to have been a fair amount of Continental-State currency issued, mostly in the second half of 1780 and first half of 1781—no evidence has yet been found of any issued after 1781. For example, on December 13, 1781 the state of Maryland reported that it had 73,082 Maryland pounds of Continental-State bills in circulation (*Archives of Maryland*, v. 48, p. 22). The total Continental-State bills issued across all the states in 1780 and 1781 is reported by the *American Almanac* (1830, p. 183); Elliot (1843, p. 11); Gouge (1833, II, p. 25); and Hepburn (1967, p. 16) to be $2,070,485 and none thereafter. The original source of this estimate is a 1790 congressional report prepared by the Registrar of the Treasury, Joseph Nourse (1999, v. 9, pp. 930-936). Based on a different source, Elliot (1843, p. 73); Ferguson (1961, p. 30); and Perkins (1994, p. 97) reported a total of $1,592,222 for the same period. This latter estimate is from Alexander Hamilton's report to Congress on May 11, 1790 (see *American State Papers*, 1832, Class III, Finance, vol. 1, p. 58; Elliot, 1843, pp 65-83; Syrett, 1962, v. 6, pp. 412-414; United States Congress, 1834, v. 2, pp. 1544, 1566).[23]

If these numbers are correct, then during 1780 and 1781 a total of either $41,409,700 or $31,844,440 Continental Dollars were called out of circulation via this mechanism—given the 20 to 1 emission rate allowed in Congress' requisition act of March 18, 1780.[24] The states were to

send these old Continental bills to the U.S. Treasury to be destroyed. As such, by mid-1781 the amount of Continental Dollars still outstanding had been reduced by between 16 and 21 percent (from its peak of almost $200 million at the start of 1780 to $158.5 or $168.2 million by mid-1781) via this mechanism alone. This estimate accords closely with the guess made by the U.S. Treasury on April 18, 1781 that roughly $160 million Continental Dollars were still outstanding and unredeemed at that date (*JCC*, v. 19, pp. 405, 411; v. 20, p. 577).[25]

These numbers are close to the amount of Continental Dollars (face value) Alexander Hamilton reported to Congress on May 11, 1790 as being remitted by the states to the U.S. Treasury during the period covered by the Continental-State Dollar experiment (*American State Papers*, 1832, Class III, Finance, v. 1, pp. 58-59; Elliot, 1843, pp. 73-76; Grubb, 2007; United States Congress, 1834, v. 2, pp. 1544, 1566). Hamilton's report started in November of 1780 and reached the $31.8 and $41.1 million Continental Dollars remitted to the U.S. Treasury under the Continental-State mechanism estimated above by August and November of 1781, respectively—about when the experiment ended, given the lag between when states pulled Continental Dollars out of circulation and when said Dollars showed up at the U.S. Treasury to be burned.[26]

While this reduction in the amount of Continental Dollars outstanding could be considered quite an accomplishment, the mechanism for calling them out of circulation appears to have ended quickly with the demise (depreciation) of Continental-State currencies (for examples, see *Archives of Maryland*, v. 45, pp. 397-398; v. 48, p. 22; Bullock, 1895, p. 137; Sumner, 1968, v. 1, p. 86). Many states, such as Connecticut, New York, and Pennsylvania, preferred their own state paper money, which continued to be in circulation, to adding this new Continental-State money to the mix (Bezanson, 1951, pp. 51; Bronson, 1865, p. 127; Phillips, 1866, p. 182). States had more to gain from issuing their own paper money than in issuing

Continental-State currency. By law they had to give four-tenths of the Continental-State Dollars they issued to Congress even though the states were obligated to redeem that portion (e.g. see New York State's address to Congress in *JCC*, v. 20, pp. 472-473, 577). In essence, state-government-interest in acquiring Continental Dollars as a vehicle for issuing new Continental-State paper money evaporated quickly in 1781. On April 25, May 10, and May 20, 1781 Congress complained bitterly about this lack of interest by the states (*JCC*, v. 20, pp. 438-439, 495, 577-578). With the demise of state interest in issuing Continental-State currency went the ready market for Continental Dollars.

The End of the Continental Dollar as a Circulating Currency

By all accounts Continental Dollars ceased to circulate as a currency around May of 1781. Newspaper price currents (price indices), merchant account books, George Washington's account book, etc. all stop quoting prices in Continental Dollars in May 1781 (Bezanson, 1951, pp. 12, 344; Breck, 1843, p. 16; Ferguson, 1961, p. 66; Webster, 1969, p. 502). Some authors claim that this cessation was ordered by Congress and/or that Congress repudiated the Continental Dollar at this time or shortly after in 1783 (for examples, see Bullock, 1895, pp. 137, 240; Ferguson, 1961, p. 51; Harlow, 1929, p. 61; Hughes and Cain, 2007, p. 83, fn. 10; Phillips, 1866, pp. 185, 190-191; Ratchford, 1941, p. 38; Sumner, 1968, v. 1, p. 87; Tindall, 1988, p. 265).

A definitive statement by Congress of such, however, cannot be found. Several proposals were put forth that might be interpreted as repudiation, but all were rejected or sent to committee never to reappear.[27] Nothing close to a statement of repudiation was enacted in 1781 or in 1783 (*JCC*, v. 20, 24-25). The requisition act of March 18, 1780 called on the states to bring in their monthly quotas of old Continental Dollars and replace them with Continental-State currency through April 1781—which, if strictly adhered to, would have removed all Continental Dollars

from circulation by that date (*JCC*, v. 16, p. 263; v. 20, pp. 438, 495). Of course, the states, as had become usual, did not fulfill their quotas (Ferguson, 1973, v. 1, pp. 194, 196; 1995, v. 8, pp. 57, 749; 1999, v. 9, pp. 139, 908). An unfulfilled quota, however, was not repudiation.

The cessation of Continental Dollars as a circulating currency was driven by market forces and not legal pronouncements. The coincidence of three factors caused its disappearance as a circulating currency. First, as discussed above, state interest in acquiring Continental Dollars through state taxes as a vehicle for being allowed to issue Continental-State currency dried up quickly in the spring of 1781 and with it dried up a ready market for Continental Dollars.

Second, some states flatly refused to accept any more Continental Dollars in payment of state taxes once they had met their quotas set by Congress. Other states accepted them but only at rates higher than the 40 to 1 set by Congress, such as 75 to 1 set by Pennsylvania on December 23, 1780—in effect hedging against the risk of not being fully credited for taking on the quotas owed by other states (*Statutes at Large of Pennsylvania*, 1904 v. 10, pp. 249-251). For example, on February 8, 1783 the state of Delaware enacted a law saying:

> Whereas it appears, that considerable balances of taxes directed by law to be raised within this state in Continental bills of credit, in the years One Thousand Seven Hundred and Seventy-eight, On Thousand Seven Hundred and Seventy-nine, and One Thousand Seven Hundred and Eighty, are yet due and uncollected: *And whereas* the said bills of credit have been called out of circulation, and this state hath paid to Congress their computed quota of all the said bills, for the purpose of sinking and destroying the same; whereby it is become inexpedient and useless to levy said balances in such bills;
>
> *Be it therefore enacted by the General Assembly of Delaware*, That from and after the passing of this act, no Collector of the said taxes shall receive any of the bills aforesaid in payment of the taxes… (*Laws of the State of Delaware*, v. 2, pp. 774-775)

Such actions reduced the ready market for Continental Dollars as well as undermined the universality of acceptance of Continental Dollars across states, which had been one of the important attractions to using Continental Dollars as a circulating currency.

Third, in conjunction with Congress' March 18, 1780 resolution that partially, though

perhaps temporarily, defaulted on the Continental Dollar and to be consistent with that act's recognition of depreciation, on March 20, 1780 Congress recommended that states "…revise their laws…making the continental bills of credit a tender in discharge of debts and contracts, and to amend the same in such manner as they shall judge most conducive to justice, in the present state of the paper currency…" (*JCC*, v. 16, p. 269) From late 1780 through mid-1781 states complied by revoking their laws making the Continental Dollar a legal tender in their respective states. For example, Delaware passed its law revoking the legal-tender status of the Continental Dollar on November 8, 1780; New Jersey on January 5, 1781; Virginia on May 5, 1781; and Pennsylvania made its temporary suspension of legal-tender status permanent on June 21, 1781 (*Laws of the State of Delaware*, v. 2, pp. 718-719; *Acts of the Council and General Assembly of New-Jersey*, p. 157; Hening, v. 13, pp. 412-413; *Statutes at Large of Pennsylvania*, 1904, v. 10, pp. 204-205, 228-229, 247-249, 337-344).

Revocation of the legal-tender status of the Continental Dollar was neither a repudiation of the Continental Dollar nor the direct reason why the Continental Dollar ceased to circulate as a currency. Such a conclusion would be a misunderstanding of how legal tender laws impacted behavior. Legal tender laws did not set the value of exchange, enforce a fixed exchange rate, or otherwise support the use of Continental Dollars as a transaction medium in private voluntary contemporaneous exchanges. Market forces determined the pricing of voluntary contemporaneous exchanges. A quick look at the Philadelphia price index expressed in Continental Dollars in Figure 3 (above) confirms this. Individuals were free to negotiate whatever price they believed was warranted given the inflationary conditions of the currency in their private voluntary contemporaneous exchanges. As Benjamin Franklin rightly observed in 1788, "The making of paper [money] with such a sanction [a legal tender law] is…a folly, since,

although you may by law oblige a citizen to take it for his goods, you cannot fix his prices; and his liberty of rating them as he pleases, which is the same thing as setting what value he pleases on your money, defeats your sanction." (Smyth, 1907, v. 9, p. 638)

What legal tender laws affected were the values in non-contemporaneous exchanges that ended up in court when one party sued the other for breach of contract. (Non-contemporaneous exchanges are when the payment by one party is at some future date from the initial contract or delivery of the goods involved for that payment.) When finding in favor of the plaintiff or creditor, courts would make the plaintiff whole by enforcing the payment promised. In cases where the defendant or debtor either could not deliver the specific payment promised, e.g. did not have the specific horse he promised to deliver, or where the contractual payment was vague regarding the monetary instrument, e.g. 16 dollars, the court had to assign a monetary substitute that would make the plaintiff whole. The presence of a legal tender law more-or-less tied the hands of the court. The money substitute had to be the designated legal tender at the rate set by law, and Congress had set that rate by printing it on the face of its Continental Dollars, i.e. one Continental Dollar equaled one specie dollar (Newman, 1997, pp. 58-68).

As inflation set in and the Continental Dollar depreciated against specie dollars, especially after 1778, people owing payments on contracts incurred prior to 1779 had an incentive not to pay and instead have their creditors sue them for breach of contract. If they lost in court, they would still come out ahead because judges—being constrained by legal tender laws—were likely to order restitution in Continental Dollars (the legal tender) at the rate printed on the Continental Dollar (one paper dollar equaling one silver dollar). Thus the debtor could satisfy the contract's completion by paying a vastly depreciated sum (in Continental Dollars) compared with the real value stipulated in the original contract. This incentive held for all

contracts involving non-contemporaneous payments regardless of the type of payment originally contracted to be paid by the debtor, i.e. whether it was to be in goods, other paper monies, or specie monies. This aspect of legal-tender laws was one of the issues underlying the debates over monetary powers at the 1787 Constitutional Convention (Grubb, 2006).

Expecting courts to order payment in Continental Dollars in breach-of-contract cases, debtors would seek to acquire Continental Dollars. If debtors could not acquire Continental Dollars at depreciated rates to pay off their creditors as ordered by the courts, then the benefits of this breach-of-contract gambit would have been lost. As such, when states revoked the legal-tender status of the Continental Dollar it removed another market demand for that currency and so helped drive it toward being a non-circulating currency.

The statutory language in the state laws repealing the legal-tender status of the Continental Dollar supports this interpretation of how legal tender laws operated. For example, the Pennsylvania statute, passed June 21, 1781, that permanently revoked the legal-tender status of the Continental Dollar explicitly referred to any contract made

> …since the first day of January, one thousand seven hundred and seventy-seven in any foreign money…or in any commodity, and which have not since been paid…or discharged shall be deemed…due…and the same may be sued for and recovered in any court of justice within the commonwealth…in so much gold and silver money as shall be equal in value to the debt…according to the terms of the contract. (*Statutes at Large of Pennsylvania*, 1904, v. 10, pp. 338-339)

Finally, the removal of the legal-tender status of the Continental Dollar and the passage of state laws in 1781 creating retroactive depreciation tables of Continental Dollars to specie dollars was not a coincidence. The first action directly led to the second action (for examples, see that for Delaware, New Jersey, and Virginia in *Laws of the State of Delaware*, v. 2, pp. 718-719, 749; *Acts of the Council and General Assembly of New-Jersey*, pp. 157, 160; Hening, v. 13, pp. 412-413, 471-473, respectively). For courts to have guidance as to how to make the plaintiff

whole in a breach-of-contract case, courts needed to know the approximate market value of Continental Dollars at the time of initial contracting. The retroactive depreciation tables gave them that guidance. The application of these depreciation tables eliminated, for the most part, any potential gain from depreciation via a court-ordered payoff of a contract in Continental Dollars. As such, the currency demand by debtors for Continental Dollars disappeared.

Conclusion

The history of the Continental Dollar is important to understanding the financial revolution that arose during the early Republic. It influenced debate over monetary powers at the 1787 Constitutional Convention (e.g. see Calomiris, 1988; Grubb, 2006). This history, however, has remained murky—suffering from serious entropy. The exact time series of emissions has not been well established previously. The estimates presented here establish those series and improve their accuracy and trustworthiness. Meaningful monetary analysis of Congressional spending, money creation and its impact on the economy can now proceed on a more secure evidential foundation. In particular, a total of only $199,990,000 Continental Dollars were actually issued, far fewer than previously thought. In addition, what happened to the Continental Dollar during the two years after it ceased to be issued is more firmly established and given a clearer political and market-driven interpretation. Loan indexation and Continental-State currency experiments, changes in legal tender laws and establishment of depreciation tables, and the slippage of the Continental Dollar into being a non-circulating currency are given an integrated and rational story line.

[Place Appendix Table A Here]

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Table 1. Continental Dollars Emitted by Congress, 1775-1779: Corrected Estimates of Total Net New Emissions (Face Value)

1775	June 22	$2,000,000	1778	July 30	5,000,000
	July 25	1,000,000		September 5	5,000,000
	November 29	3,000,000		September 26	10,000,100
1776	February 17	3,937,220		November 4	10,000,100
	May 9	5,000,000		December 14	10,000,100
	July 22	5,000,000	1779	January 14	8,500,400
	November 2	5,000,000		February 3	5,000,160
1777	February 26	5,000,000		February 12	5,000,160
	May 20	5,000,000		April 1	5,000,160
	August 1	1,000,000		May 5	10,000,100
	November 7	1,000,000		June 4	10,000,100
	December 3	1,000,000		July 17	15,000,280
1778	January 8	1,000,000		September 17	15,000,260
	January 22	2,000,000		October 14	5,000,180
	February 16	2,000,000		November 17	10,050,540
	March 5	2,000,000		November 29	10,000,140
	April 4	1,000,000	*End of Emissions*		
	April 11	5,000,000			
	April 18	500,000	Total Cumulative		
	May 22	5,000,000	Net New Emissions		
	June 20	5,000,000	Outstanding:		199,990,000

Notes and Sources: See Appendix Table A.

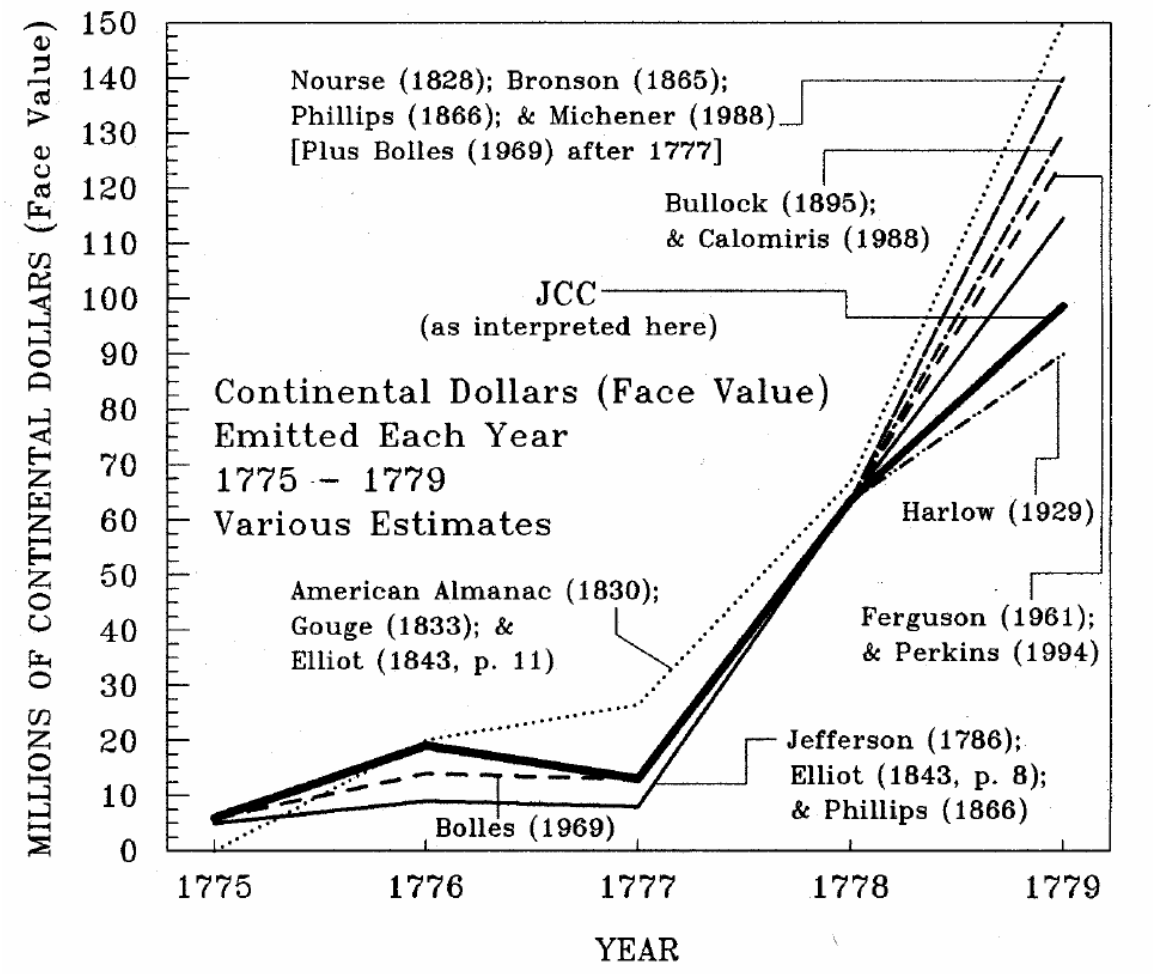

Fig. 1 Net New Continental Dollars Emitted Each Year from 1775 through 1779 (Face Value)—Various Estimates

Sources and Notes: Derived from Appendix Table A. Sources cited therein. JCC stands for the *Journals of the Continental Congress*. Only yearly totals are shown because several sources only report yearly estimates. See Appendix Table A for a more detailed and refined comparisons by authorized emission dates.

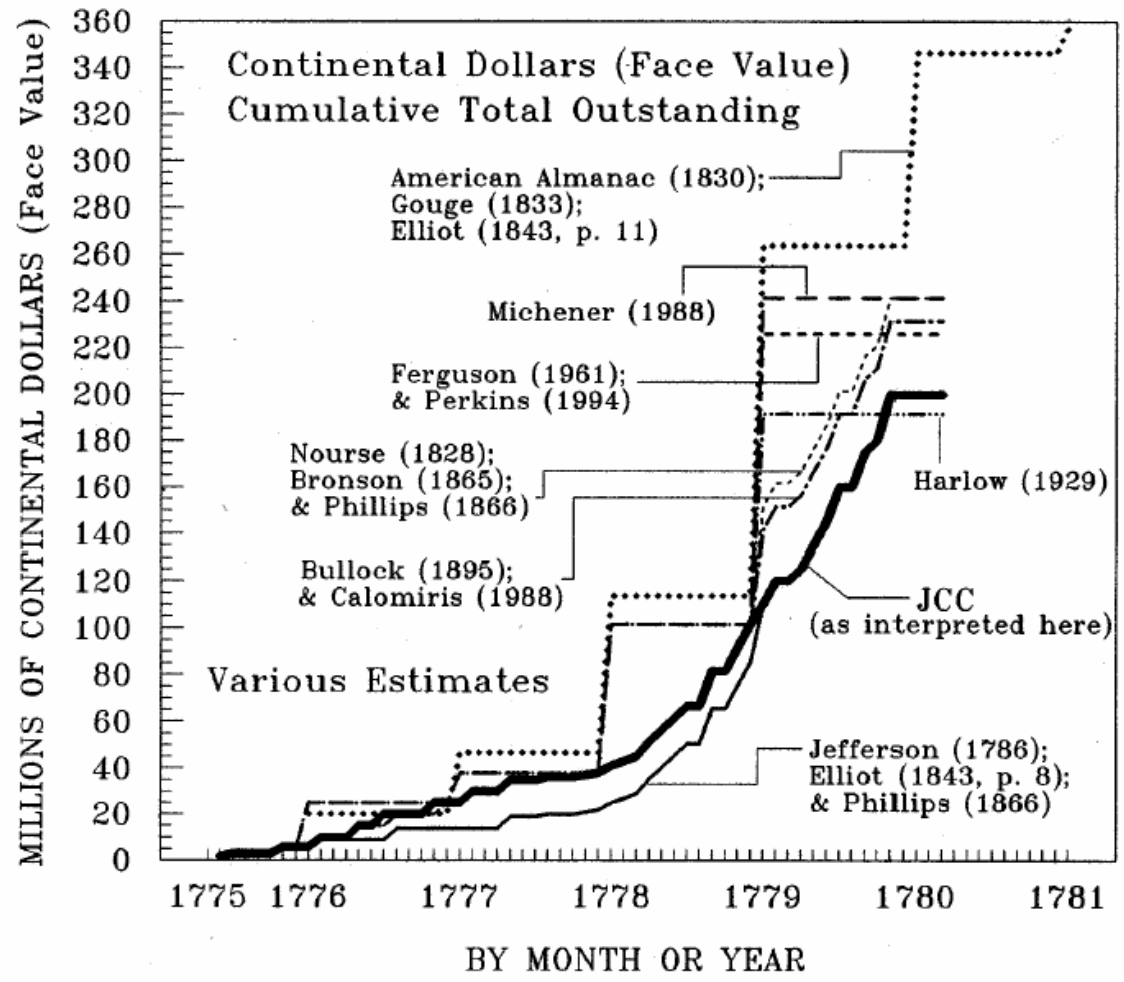

Fig. 2 The Continental Dollar: Cumulative Total Net New Emissions Outstanding (Face Value), 1775-1781—Various Estimates

Sources and Notes: Derived from Appendix Table A. Sources cited therein. JCC stands for the *Journals of the Continental Congress*. See Appendix Table A for a more detailed and refined comparisons by authorized emission dates.

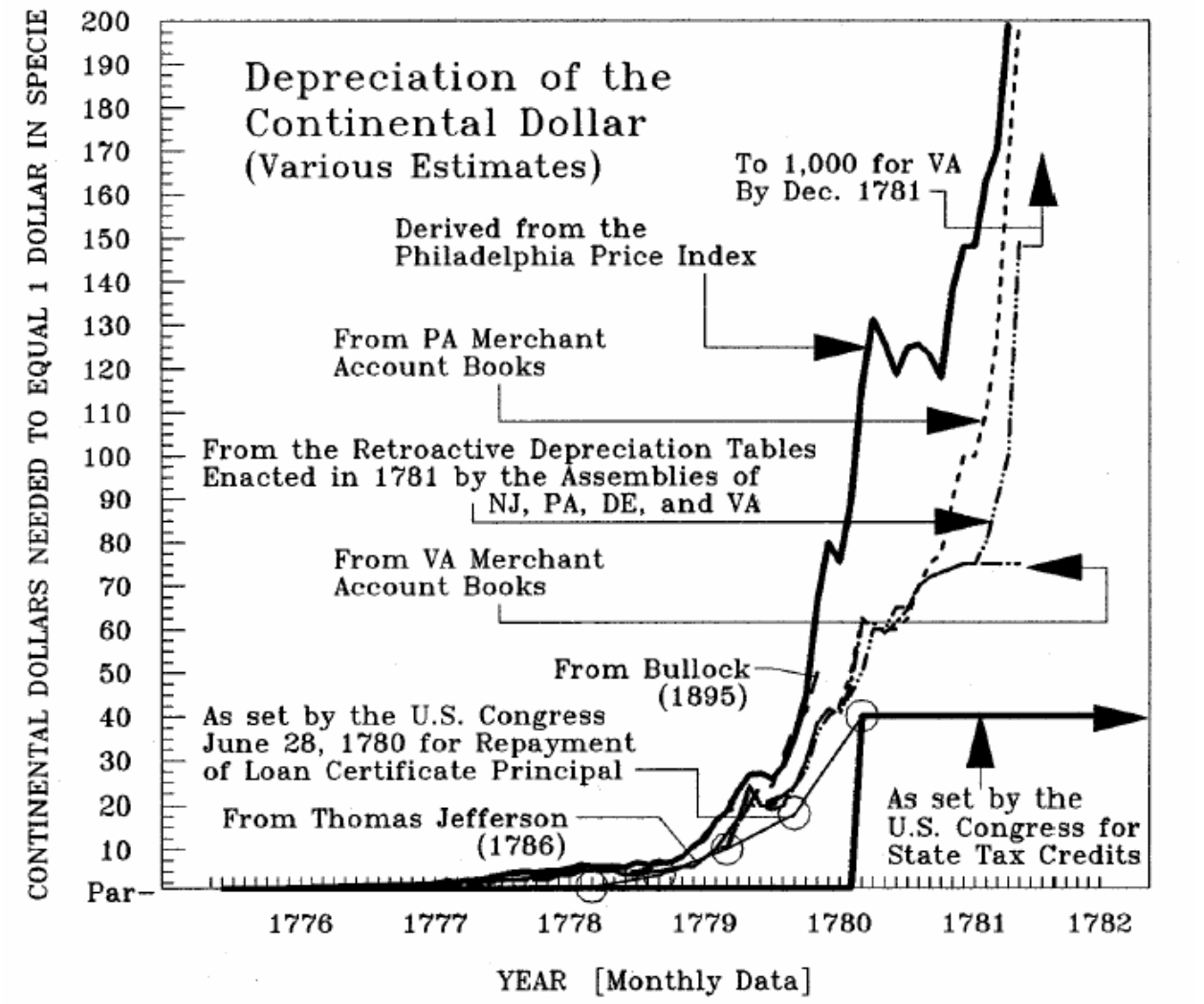

Fig. 3 Depreciation of the Continental Dollar, 1775 through 1781: Various Estimates

Sources: For the Philadelphia Price Index: Bezanson (1951, p. 344); for Jefferson: Boyd (1954, v. 10, pp. 42-43); Bullock (1895, p. 135); for the U.S. Congress rate set for State Tax Credits: *JCC* (v. 16, p. 264); for the U.S. Congress rate set for repayment of loan certificates: *JCC* (v. 17, pp. 567-569); for the PA and VA merchant account book rates and the PA Assembly Depreciation Rate: Webster (1969, pp. 501-502); for DE Assembly Depreciation Rates: *Laws of the State of Delaware* (v. 2, p. 749); for NJ Assembly Depreciation Rates: *Acts of the Council and General Assembly of New-Jersey* (p. 160); and for VA Assembly Depreciation Rates: Hening (v. 13, pp. 471-472).

Notes: Bullock (1895, p. 134) reports the highest depreciation rate found in any state and his estimate stops in November of 1779. Jefferson's estimate also stops in November of 1779. The Philadelphia price index is a 15 commodity weighted arithmetic index for prices in Continental Dollars and stops in April 1781. The index as reported is divided by 100 to get the number reported here. The other estimates stop in May of 1781 except for the DE and NJ Assembly's Depreciation Rates which stop in July of 1780 and the VA Assembly's Depreciation Rate which continues through December of 1781. Slight variations occur across the NJ, PA, DE, and VA depreciation tables enacted in 1781, but they are not large enough to show up here and so these four series are presented here as one single line.

APPENDIX

Table A. Continental Dollars Emitted by Congress, 1775-1781: Reconciliation of Estimates of Total Net New Emissions (Face Value)

Listed By: **Year** *Month* [Day][a]	20th Congress 1828: Nourse (1828) & Bronson (1865) & Phillips (1866)	Thomas Jefferson's 1786 Table: Boyd (1954) & 28th Congress Elliot (1843, p. 8) & Phillips (1866)	Bullock (1895) & Calomiris (1988)	[*American Almanac* (1830) {*AA*} & Gouge (1833) & Elliot (1843, p. 11)]; Plus Harlow (1929); Plus Ferguson (1961) & Perkins (1994); Plus Michener (1988); Plus Bolles (1969)	Newman (1997)	*JCC—Journals of the Continental Congress*; and [*PCC—Papers of the Continental Congress*, Sept. 14, 1779]
1775			$6,000,000	*AA*, Elliot, & Gouge = 0 Bolles, Ferguson, Harlow, & Michener $6,000,000		
June						
[22nd]	$2,000,000					$2,000,000 [2,000,000]
[23rd]		$2,000,000			$2,000,000	
July						
[25th]	1,000,000	?			1,000,000	1,000,000 [1,000,000]
Nov.						
[29th]	3,000,000	3,000,000			3,000,000	3,000,000 [3,000,000]
1776				*AA* & Elliot = 20,064,667 Gouge = 20,064,465[k] Ferguson & Harlow = 19,000,000 Michener = 18,947,220 Bolles = 14,000,000		
Jan.						
[5th]						(10,000)[q] [10,000][q]
Feb.			4,000,000			
[17th]	4,000,000	4,000,000[b]			4,000,000	4,000,000 [3,937,220][r]
May			5,000,000			
[9th & 22nd or 27th]	5,000,000	?			5,000,000	5,000,000 [5,000,000]
July						
[22nd]						5,000,000 [5,000,000]
& *Aug.*			5,000,000			
[13th]	5,000,000	5,000,000			5,000,000	

Nov. [2nd]	500,000[c]	[Bronson only]				(500,000)[c] [(500,000)][c]
Nov. [2nd] & *Dec.* [28th]	5,000,000	?	5,000,000		5,000,000	5,000,000 [5,000,000]
1777				*AA*, Elliot, & Gouge = 26,426,333 Bolles, Ferguson, Harlow, & Michener = 13,000,000		
Feb. [26th]	5,000,000	?	5,000,000		5,000,000	5,000,000 [5,000,000]
May [20th]	5,000,000	5,000,000[d]	5,000,000[*]			5,000,000 [5,000,000]~
[May 20th 1777 through April 18th 1778]					16,500,000[#]	
Aug. [1st]			1,000,000			1,000,000
[15th]	1,000,000	1,000,000				[1,000,000]~
Nov. [7th]	1,000,000	1,000,000	1,000,000			1,000,000 [1,000,000]~
Dec. [3rd]	1,000,000	1,000,000	1,000,000			1,000,000 [1,000,000]~
1778				Ferguson = 63,400,000 *AA*, Elliot, & Gouge = 66,965,269 Harlow & Michener = 63,500,300 Bolles = 63,500,000		
Jan. [8th]	1,000,000	1,000,000	3,000,000			1,000,000 [1,000,000]~
[22nd]	2,000,000	2,000,000				2,000,000 [2,000,000]~
Feb. [16th]	2,000,000	2,000,000	2,000,000			2,000,000 [2,000,000]~
Mar. [5th]	2,000,000	2,000,000	2,000,000			2,000,000 [2,000,000]~
Apr. [4th]	1,000,000	1,000,000	6,500,000			1,000,000

						[1,000,000]~
[11th]	5,000,000	5,000,000*			5,000,000#	5,000,000
						[5,000,000]~
[18th]	500,000	500,000				500,000
						[500,000]~
May			5,000,000			
[22nd]	5,000,000	5,000,000			5,000,000#	5,000,000
						[5,000,000]^
June			5,000,000			
[20th]	5,000,000	5,000,000			5,000,000#	5,000,000
						[5,000,000]^
July			5,000,000			
[30th]	5,000,000	5,000,000			5,000,000#	5,000,000
[31st]						[5,000,000]^
Sept.			15,000,000			
[5th]	5,000,000	5,000,000			5,000,000#	5,000,000
						[5,000,000]^
[26th]	10,000,100e	10,000,100				10,000,100
						[10,000,100]
[Sept. 26th 1778 through July 17th 1779]					75,001,080	
Nov.			10,000,000			
[4th]	10,000,100	10,000,100				10,000,100
						[10,000,100]
Dec.			10,000,000			
[14th]	10,000,100e	10,000,100				10,000,100
						[10,000,100]
1779					95,051,695	
				Bolles = 140,052,480 *AA*, Elliot, & Gouge = 149,703,857 Harlow & Michener = 90,052,080 Ferguson = 90,099,600		

Adjustment Made for January 14, 1779:
In addition to the above, on January 14, 1779 Congress voted $50,000,400 to be exchanged for the May 20, 1777 and April 11, 1778 emissions that were being counterfeited (*JCC*, v. 13, pp. 64-65; *PCC*, m247, r146, i136, p. 647, September 14, 1779). Estimates about how much of this amount represented a net new emission vary. ++ = the exchanged sum chosen by Jefferson and Elliot such that "**C**. **Discrepancy** [**A** – **B**]" equals zero, san correcting for the $10,000 Board of Treasury error (see below). * = emissions exchanged as interpreted by Bullock. ** = emissions exchanged as implied in Ferguson. # = emissions exchanged as interpreted by Newman. + = the total of all emissions in the style, tenor, and design of the May 20, 1777 and April 11, 1778 emissions designated for exchange as described in the *JCC* and as explicitly identified as such in the *PCC*—with ~ designating emissions that were part of the May 20, 1777 emission and ^ designating those that were part of the April 11, 1778 emission (above).

Issued:	50,000,400e	50,000,400	50,000,000	50,000,400	50,000,400	50,000,400

						[50,000,400]
Exchanged:	-0[f]	-25,552,780[++]	-10,000,000[*]	-15,300,000[**]	-41,500,000[#]	-41,500,000[+]
Equals Net						[-41,500,000][+]
New:	50,000,400	24,447,620	40,000,000	34,700,400[**]	8,500,400	8,500,400
				Harlow = 0		[8,500,400]
				Michener = 50,000,000		
				Bolles = 50,000,400		
				AA, Elliot, & Gouge = ?		
Feb.			10,000,000			
[3rd]	5,000,160	5,000,163				5,000,160
						[5,000,160]
[12th]		5,000,160				
[19th]	5,000,160					5,000,160
						[5,000,160]
Apr.			5,000,000			
[1st]	5,000,160					5,000,160
						[5,000,160]
[2nd]		5,000,160				
May			10,000,000			
[5th]	10,000,100	10,000,100				10,000,100
						[10,000,100]
June			10,000,000			
[4th]	10,000,100	10,000,100				10,000,100
						[10,000,100]
July			15,000,000			
[17th]	15,000,280	15,000,280[d]				15,000,280
						[15,000,280]

Comparison Interlude:

A. Totals so far—to September 2, 1779:

				Ferguson = 186,148,880[g]		
				Michener = 201,448,480[g]		
	201,501,660	159,948,883[++]	191,500,000	Harlow = 151,501,260[g]	155,001,480[g]	160,001,660
	202,001,660[c] [Bronson]					[159,948,880]

B. Total Congress Declared in Circulation on September 2, 1779 (*JCC*, v. 15, pp. 1019, 1052-1053; *PCC*, m247, r146, i136, p. 647, September 14, 1779):

	159,948,880	159,948,880	159,948,880	159,948,880	159,948,880	159,948,880[s]
						[159,948,880][s]
Correction of Board of Treasury Error:[s]						
	-10,000	-10,000	-10,000	-10,000	-10,000	-10,000
Equals:						[-10,000]
	159,938,880	159,938,880	159,938,880	159,938,880	159,938,880	159,938,880
						[159,938,880]

C. Discrepancy [**A** – **B**] = Ferguson = +26,210,000
Michener = +41,509,600

	+41,562,780	+10,003[h]	+31,561,120	Harlow = -8,437,620	-4,937,400	+62,780[t]
	+42,062,780[c] [Bronson]					[+10,000][s]
Sept.			15,000,000			
[17th]	15,000,260[e]	15,000,260				15,000,260[u]
Oct.			5,000,000			
[14th]	5,000,180	5,000,180				5,000,180
Nov.			20,050,000			
[17th]	10,050,540	10,050,540				10,050,540
[29th]	10,000,140	10,000,140				10,000,140
None thereafter except				**1780** *AA*, Elliot, & Gouge = 82,908,320[p]		
				1781 *AA*, Elliot, & Gouge = 11,408,095[p]		
Total Implied, Summed, or Reported 1775-1781	241,552,780	200,000,003[h]	241,500,000	Harlow = 191,552,380 Michener = 241,500,000 Ferguson = 226,200,000 Bolles = 236,552,480 *AA*, Elliot, & Gouge = 357,476,541[k,p]	195,052,600[i]	200,052,780[n] or 200,000,000[j]
	242,052,780[c] [Bronson]					
Corrected for Addition, Omission, and Transcription Errors:						
	0	+15,999,997[h]	-9,950,000[l]	0	+5,000,180	0
	-500,000[c] [Bronson]			+5,000,000 [Bolles]		
Then Re-Corrected using {C. Discrepancy [A – B]}, such that net new emissions for January 14, 1779 are uniform at 8,500,400 and the January 5, 1776 Board of Treasury error of 10,000 is corrected:[m]						
	-41,562,780	-16,010,000[h]	-31,561,120	Harlow = +8,437,620 Michener = -41,509,600 Ferguson = -26,210,000 Bolles = -41,562,480 *AA*, Elliot, & Gouge = ?	-62,780	-62,780[n] or -10,000[j]
Final Corrected Total Amount (face value) Outstanding at the beginning of 1780 (at the end of 1781):[m]						
	199,990,000	199,990,000	199,988,880[o]	Harlow = 199,990,000 Bolles = 199,990,000 Ferguson = 199,990,000 Michener = 199,990,400[o] (*AA*, Elliot, & Gouge = 357,476,541[p])	199,990,000	199,990,000[u]

Sources: American Almanac (1830, p. 183); Bolles (1969, v. 1, pp. 31, 38-54, 70, 74, 88); Boyd (1954, v. 10, pp. 42-43); Bronson (1865, pp. 88-89, 112-115); Bullock (1895, pp. 135-136); Calomiris (1988, pp. 57-58); Elliot (1843, pp. 8, 11); Ferguson (1961, pp. 29-30); Gouge (1833, II, p. 25); Harlow (1929, pp. 50-51); *JCC* (v. 2, pp. 103, 105, 207; v. 3, p. 390; v. 4, pp.

32, 157, 339; v. 5, pp. 599, 651, 697; v. 6, pp. 912, 918; v. 7, pp. 161, 373; v. 8, pp. 377-380, 597, 646; v. 9, pp. 873, 993; v. 10, pp. 28, 82-83, 174-175, 223, 309, 337-338, 365; v. 11, pp. 524, 627, 731; v. 12, pp. 884, 962, 1100, 1218; v. 13, pp. 64, 139, 209, 408; v. 14, pp. 548, 687-688, 848-849; v. 15, pp. 1019, 1053, 1076-1077, 1171-1172, 1285, 1324-1325, 1436); Michener (1988, p. 690); Newman (1997, pp. 58-69); Nourse (1828, p. 7); Perkins (1994, p. 97); Phillips (1866, pp. 198-199); *PPC* (m247, r146, i136, p. 647—*Report of the Board of Treasury on the State of Emissions and Loans, September 14, 1779*). Perkins (1994) simply repeats Ferguson (1961) and so is not listed separately in the table.

Notes: Numbers in parentheses are amounts mentioned in the respective record but are amounts that do not actually add to net new emissions because either they were not printed or were designated for currency swaps. These amounts are not counted in that column's total. Numbers in brackets represent those reported in the *PPC* (m247, r146, i136, p. 647—*Report of the Board of Treasury on the State of Emissions and Loans, September 14, 1779*).

[a] The difference in the [Day] reported by different scholars for what are the same emissions represents the difference between the [Day] that Congress first authorized the emission versus a later [Day] when Congress commented on some aspect of the implementation of its initial authorization. The first date is used for the column derived directly from the *JCC*.

[b] Jefferson's original entry was for $1,000,000 as listed in Boyd (1954, v. 10, pp. 42-43). This clearly is a typo as this entry was also listed as being worth $4,000,000 silver dollars with no depreciation. Elliot's (1843, p. 8) transcription of this table also reported it as $4,000,000.

[c] Bronson (1865, pp. 113-114) erroneously included this $500,000 in his list of net new emissions. He is the only scholar to do so. Other scholars have excluded it based on the fact that searches over the years have failed to uncover any vestiges of its existence, e.g. see Bolles (1969,

v. 1, pp. 49-50); Bullock (1895, p. 134); Phillips (1866, p. 57). This should not be surprising as, largely unnoticed by prior scholars, the *PPC* (m247, r146, i136, p. 647) explicitly indicates that this $500,000 sum, separate from the $5 million authorized on November 2nd, was never printed. The *PCC* also does not count it therein when tallying up total emissions. The *JCC* (v. 6, p. 918) indicates that this $500,000 sum, while mentioned on November 2nd, was part of the $5 million authorized on that date, namely that part which was to be hastily emitted. The *JCC* also indicates that this hasty-emission action was not followed through on. As such, this $500,000 sum is not regarded as part of or counted toward the amount of net new emissions derived from the *JCC* separate from (or in addition to) the $5 million authorized on November 2nd.

[d] Phillips (1866, p. 199) erroneously transcribed the entry for May 20, 1777 as $5,000,090 and erroneously transcribed the entry for July 17, 1779 as June 17, 1779.

[e] Phillips (1866, p. 198) erroneously transcribed the entry for September 26, 1778 as $10,000,000; the entry for December 14, 1778 as $10,000,000; the entry for January 14, 1779 as $50,000,100; and the combined entry for September 17, 1779 as $15,000,360.

[f] Bronson (1865, p. 113) claimed to have omitted from his list of total emissions "…the $10,000,000 less five dollars, authorized January fourteenth and May seventh, 1779, which were designed to take the place of the counterfeited emissions of May twentieth, 1777, and April eleventh, 1778." In fact, he did not subtract that sum from the list of emissions he reported.

[g] Because Jefferson's and Elliot's (1843, p. 8) numbers for 1779 and for September 26, 1778 through November 29, 1779 sum to the same total as those for Newman, Harlow, and Michener (and close to those for Ferguson once adjusted for rounding), the values reported by Jefferson and Elliot (1843, p. 8) were used to apportion Newman's, Ferguson's, Harlow's, and Michener's

numbers for 1779 into before versus after September 2, 1779 subtotals. Not enough information is given in Bolles, Elliot (1843, p. 11), and Gouge to do this kind of comparison.

[h] Jefferson omitted $16,000,000 between 1775 and early 1777, designated as "?" in the table here [also omitted in Elliot's (1843, p. 8) transcription], and his individual entries sum to $200,000,003 not the total in his table ($200,000,000) as reported in Boyd (1954, v. 10, pp. 42-43). The "extra" three dollars in the February 3, 1779 entry is most likely a transcription error. Elliot (1843, p. 8) transcribed Jefferson's table without the extra three dollars. Both Jefferson and Elliot (1843, p. 8) set the amount of net new emissions from the January 14, 1779 authorization to be the residual needed to add up to the cumulative total net new emission stated by Congress of $159,948,883 through September 2, 1779. Because this stated sum included an erroneous $10,000 unnoticed by Congress, Jefferson's and Elliot's residual calculation is off by an additional $10,000 here—to which the missing $16 million mentioned above will be added later.

[i] Aggregating Newman's list of emissions can be done in two ways. Both start with the subtotal of $71,500,000 emitted through September 5, 1778. To this number add $75,001,080 Newman reported for the period September 26, 1778 through July 17, 1779 [the total for this period derived from the *JCC* is $80,001,260]. Then add in the emissions after July 17, 1779 ($40,051,120) as reported in Nourse (1828), Boyd (1954), and Elliot (1843, p. 8). Finally, add in the estimated amount of the January 14, 1779 emission that was new ($8,500,400). This yields a grand total of $195,052,600 emitted, which is the method used and total reported here. Alternatively, to the $71,500,000 emitted through September 5, 1778 add the amount emitted through the rest of 1778 ($30,000,300) as reported in Nourse (1828), Boyd (1954), and Elliot (1843, p. 8), and then add in the total Newman reports for 1779 ($95,051,695) [the total for this period derived from the *JCC*, sans the January 14, 1779 emission, is $90,052,080]. This yields a

grand total of $196,551,995. Whether Newman included in his 1779 total the estimated amount of the January 14, 1779 emission that was new ($8,500,400) is unclear. If he did not, then adding that amount in would yield a grand total of $205,052,395. Newman does not give enough detail in his accounting of separate emissions after September 26, 1778 to identify where the problem lies and resolve the discrepancies in these different grand total estimates for him.

[j] $200 million was explicitly stated by Congress to be its final cumulative total net new emissions (*JCC*, v. 15, p. 1019, 1036, 1053, 1055, 1171). This number was based on the Board of Treasury report (*PCC*, m247, r146, i136, p. 647, September 14, 1779) that claimed that $159,948,880 had been emitted through September 2, 1779. When this Board of Treasury number is added to that emitted from September 17 through November 29 of 1779, after which emissions were permanently discontinued, the total adds up to $200 million. The Board of Treasury report, however, erroneously included $10,000 from January 5, 1776 as a net new emission in its $159,948,880 total emitted through September 2, 1779, when in fact this $10,000 was not a new emission. As such, Congress thought it had emitted $10,000 more than it actually had. See also notes n, q, s, and t below.

[k] Gouge (1833, II, p. 25) reported the same total for his table of emissions as the *American Almanac* (1830, p. 183) and Elliot (1843, p. 11), even though Gouge's yearly numbers sum to $357,476,339. The $202 difference between Gouge's and *AA*-Elliot's summed totals comes from what they reported for 1776. As such, Gouge's number for 1776 may just be a typo and it should really be the same as the *AA*-Elliot number for 1776.

[l] Bullock's individual entries sum to $231,550,000 and not to the $241,500,000 he reported as the total—an addition error that was left uncorrected in Table 2 of Calomiris (1988, p. 58). This addition error does not occur in or affect the analysis in Figure 1 of Calomiris (1988, p. 56).

[m] The January 14, 1779 adjustment is made uniform across estimates, i.e.[$50,000,400 – $41,500,000 (exchanged)] = $8,500,400 of net new emissions. This adjustment also uniformly accounts for the $10,000 error in the Board of Treasury report where applicable. The remaining differences are due to rounding or minor transcription errors. This correction, when made to Bullock's estimate, solves the anomaly that Bullock himself puzzled over (Bullock, 1895, p. 136). This estimate also accords with Ferguson (1961, p. 45) who claims that $41,500,000 was exchanged out of the $50,000,400 authorized for exchange on January 14, 1779 which would then potentially leave $8,500,400 as a net new emission from that date—even though Ferguson did not use this observation when constructing his estimate of net new emissions. Finally, this estimate also accords with the limit set by Congress on September 3, 1779 of a maximum of $200,000,000 Continental Dollars that could be emitted before emissions were permanently discontinued (Ferguson, 1961, p. 46; *JCC*, v. 15, p. 1019, 1036, 1053, 1055, 1171; and Jefferson's assessment in Boyd, 1954, v. 10, pp. 25, 42), which when the $10,000 Board-of-Treasury error is subtracted (see notes n and q below) yields the true final cumulative total outstanding.

[n] This total represents the sum of the authorized net new emissions mentioned in the *JCC*, i.e. $160,001,660 to September 2, 1779 plus $40,051,120 emitted from September 17, 1779 through November 29, 1779, as opposed to the final total stated by Congress (see note j above). The $52,780 in excess of the $200 million Congress stated as emitted represents the fact that the authorized net new emissions mentioned in the *JCC* failed to note that $62,780 of the $4 million authorized on February 17, 1776 was not printed (see note r below) and that the amount declared by Congress as emitted through September 2, 1779 ($159,948,880) was erroneously overstated by $10,000 due to a Board of Treasury error on the January 5, 1776 emission (see notes j above

and q below). In other words, Congress set a $200 million limit on emissions but did not realize that its true emission numbers, when summed up, were $62,780 long on one account (the February 17, 1776 emission) and $10,000 short on another account (the amount it could emit after September 2, 1779 before it reached $200 million) for a net $52,780 over $200 million.

[o] The difference between the number listed and $199,990,000 is due to rounding.

[p] This total represents an error of definition and so cannot be reconciled with the other estimates. It should, therefore, be discarded. See the text for further analysis.

[q] On January 5, 1776 Congress resolved "That the sum of ten thousand dollars, be struck, for the purpose of exchanging ragged and torn bills of the continental currency; That the bills, making this sum…be lodged in the treasury, to be applied to the sole purpose aforementioned." (*JCC*, v. 4, p. 32; v. 5, p. 697) Being a one-for-one swap for existing bills outstanding, this $10,000 does not represent a net new emission nor does it add to the cumulative total of bills outstanding. That these kinds of swaps actually took place is corroborated by a statement recorded in Congress on February 9, 1779 that a "…quantity of torn bills, was laid before Congress, soliciting that the same be exchanged…" (*JCC*, v. 13, p. 158) Therefore, this $10,000 is not counted here as a net new emission when summing the entries in the *JCC* column. No subsequent scholar has counted this $10,000 as a net new emission (see also Bronson, 1865, p. 113). However, the Board of Treasury, in its report to Congress where it stated that $159,948,880 had been emitted through September 2, 1779—a sum accepted by Congress, had included (erroneously) this $10,000 as a net new emission in constructing its $159,948,880 estimate (*PPC*, m247, r146, i136, p. 647, September 14, 1779). Thus, the Board of Treasury overstated the true amount of net new emission by $10,000—an overstatement that Congress, as well as all subsequent scholars, did not catch (see also notes j above and t below).

[r] The report by the Board of Treasury to Congress on emissions through September 2, 1779 listed the $4 million Congress had authorized on this date but indicated that only $3,937,220 were printed out of this authorization (*PPC*, m247, r146, i136, p. 647, September 14, 1779). This $62,780 shortfall has not been previously noted in the literature. See notes n above and t below.

[s] See notes j and q above.

[t] The *JCC* entry for February 17, 1776 (item A of the comparison) overstates emissions by $62,780 compared with the *PCC* entry for that date (item B of the comparison). In addition, the *JCC* cumulative total through September 2, 1779 (item A of the comparison) does not include the overstatement error of $10,000 from January 5, 1776 that is in the *PCC* cumulative total reported to Congress (item B of the comparison), and so the *JCC* entry for item A of the comparison does not need to be corrected for that $10,000 error. See also note r above.

[u] The *PCC* evidence on emissions does not continue past September 14, 1779 (*PPC*, m247, r146, i136, p. 647), thus only the *JCC* estimate can be carried through to the end of emissions and only the *JCC* evidence can generate a final corrected total amount emitted.

Footnotes

[1] What happened to the Continental Dollar after 1781 is a topic of future research. For a preliminary version see Grubb (2007).

[2] Only estimates that track emissions over some time interval, i.e. by year, month, or day, are included for reconciliation in Appendix Table A. See also fn. 12 below.

[3] Elliot (1843, p. 11) is the only source to report the highest estimate—$387.5 million. It was mentioned in 1843 by Senator Woodbury who was a former Treasury Secretary.

[4] "The Henry Knox Papers" (Knox, 1960, microfilm P17, reel 26, May 10, 1790) includes Knox's letter with the preamble to his portion of the report that was incorporated into Nourse's report for the Madison Committee (reprinted in Nourse, 1999, v. 9, p. 929) and indicates that Knox's portion of Nourse's report was enclosed with that letter. Knox's actual report, however, is not among his papers. Nourse (1999, v. 9, p. 907), however, clearly treats this portion of his overall report, i.e. section [E.], as coming from the Secretary of War.

[5] While a number of attempts to counterfeit paper money have been documented for the colonial and revolutionary periods, quantitatively determining how numerous, successful, and troublesome these attempts actually were is difficult. American governments had experience detecting and effectively dealing with counterfeiting (Bolles, 1969, v. 1, pp. 73-74, 150-157; Scott, 1957). The estimates here indicate that British counterfeiting of Continental Dollars affected at least 21 percent of total emissions—$41.5 million out of the $200 million emitted by Congress, being the whole emissions of May 20, 1777 and April 11, 1778. Efforts to counterfeit other emissions of Continental Dollars may have resulted in no more than a nuisance effect, say 1 percent of these emissions, though the exact impact is yet to be discovered (Scott, 1957, pp.

253-263). Estimating the impact on monetary performance of the counterfeiting of Continental Dollars is a topic of future research.

[6] Bronson (1865, p. 113) reached a similar conclusion about the amount exchanged ($10 million) but then failed to deduct that sum from his table of emissions.

[7] This number is close to the $46,500,000 proposed in Congress on October 28, 1778 as the amount that had to be taken out of circulation to stop the counterfeiting problem (*JCC*, v. 12, p. 1073). The 6 could just be a typo for a 1. By contrast, in 1780 Webster (1969, p. 92) claimed that the amount to be exchanged was only $33 million, being $8 million from the May 20, 1777 and $25 million from the April 11, 1778 emission. As such, Webster's numbers are the same as Newman's (and that used here) for the April 11, 1778 emission, but he apparently omitted $8.5 million from the May 20, 1777 emission. See also Ferguson (1961, p. 29, fn. 13).

[8] This interpretation also makes sense when it is considered that the currency swap was to remove bills that were being counterfeited. As such, all bills from the same "cut" with the same design, style, tenor, and date, i.e. that were indistinguishable from each other, would have to be included in the recall-exchange or the point of the anti-counterfeiting exercise would be lost.

[9] The Board's report made one minor error, namely it listed the authorization on April 11, 1778 as being part of the May 20, 1777 emission instead of listing it properly as part of the April 11, 1778 emission. This error does not affect the sum of the two emissions to be exchanged ($41.5 million) as tallied by the report (*PCC*, m247, r146, i136, p. 647).

[10] Ferguson (1961, p. 29, fn. 13) assumed that none were so exchanged after August of 1779 and that because only $15.3 million were so exchanged between late June and early August of 1779 (*JCC*, v. 15, p. 1436) he deduced that the rest must have remained outstanding. Thus, his calculation would imply $34.7 million net new emissions out of that authorized on January 14,

1779. In reaching this conclusion, he missed both the extension into 1781 of the date over which exchanges could take place and the numerous statements of exchanges taking place after 1779 recorded in the *JCC*. See the discussion in the text below.

[11] This number must remain approximate because from July 1780 through 1781 Continental Dollars were also being remitted to the U.S. Treasury as part of the Continental-State currency scheme (discussed below). The evidence does not fully distinguish the reason for each specific remittance. By November 1781, however, total remittances were enough to fully account both for the $41.5 million currency swap and the $41.1 million remitted under the Continental-State currency scheme (discussed below), see fn. 26 below and Grubb (2007).

[12] Breck (1843, pp. 8, 15); Ratchford (1941, p. 37); Benjamin Franklin (Oberg, 1998, p. 231); Jefferson (Boyd, 1954, v. 10, pp. 25, 42); and Webster (1969, p. 76) accepted Congress' statement on September 3, 1779 that set the maximum limit at $200 million Continental Dollars after which emissions would be permanently discontinued (Ferguson, 1961, p. 46; *JCC,* v. 14, p. 1013; v. 15, pp. 1019, 1053, 1171, 1324). They also noted that the amount emitted between September 2, 1779, when Congress stated that there were $159,948,880 currently outstanding, and the last emission it made on November 29, 1779 exactly equaled the amount needed to reach $200 million from $159,948,880. As shown here, however, the $159,948,880 number is erroneously high by $10,000—an error unnoticed by Congress or in the previous literature. Thus, both Congress and these scholars thought the $200 million limit had been reached when in fact only $199,990,000 had been emitted. Bolles (1969, v. 1, p. 88) also stated that a total of only $200 million was emitted. This total, however, is internally inconsistent with the sum of what he states was issued by year. See Appendix Table A.

[13] Congress appears to have spent each authorized emission entirely before authorizing the next emission (see the statement by Samuel Chase in *JCC*, v. 6, p. 974). However, the exact flow of spending between authorized emissions is not well known and is a project for future research.

[14] The first statement of depreciation of the Continental Dollar reported in Congress occurred on January 11, 1776, with the next one—a more forceful statement—occurring on January 14, 1777 (*JCC*, v. 4, p. 49; v. 7, pp. 35-36; Phillips, 1866, pp. 44-46).

[15] Congress had attempted to borrow from the public before 1779, but without much success (Ferguson, 1961, pp. 35-40). Through the end of February 1778, the public had only loaned Congress a total of $7.5 million in Continental-Dollar units of account (*PCC*, m247, r146, i136, p. 647—*Report of the Board of Treasury on the State of Emissions and Loans, September 14, 1779*). How much of these loans came in as Continental Dollar paper money versus specie money or real goods was not recorded. This amount was at best equal to about half a year's spending by Congress in 1776 and 1777 (see Appendix Table A).

[16] While borrowing $20 million in Continental Dollars from the public, as opposed to accepting other items such as specie money on loan, was not explicitly mentioned in the congressional resolutions, the language of these resolutions from June 11 and 29, 1779 strongly implies that Continental Dollar paper money was what was being targeted for borrowing.

[17] By the end of 1776 Congress had to offer 6 percent to secure loans in pound sterling (*JCC*, v. 6, pp. 1036-1037). If payment in sterling (specie) is taken to reflect zero inflation risk, then 6 percent represents just the real risk-adjusted opportunity cost of capital facing Congress.

[18] This is also a somewhat trivial sum, representing about 5 months worth of congressional spending in 1778, see Appendix Table A.

[19] Calomiris (1988, pp. 59, 60, 61, 62, 63) asserted that in mid-1779 Congress indexed wages, taxes, and loan principals "to the rate of bill creation" thereby extending "…the indexation rule established for soldiers' pay in December 1776." No such indexation rule in the *JCC* could be found for December 1776 or in mid-1779 for anything other than the June 11, 1779 $20 million loan scheme—extended back to loans made after March 1, 1778. Adjustments of military pay to compensate for past depreciation first occurred in December of 1779 and only for officers' pay (thus Calomiris' 1776 may just be a typo for 1779). These adjustments were not extended to soldiers of the line until April 10, 1780. For both groups, these adjustments involved the application of *ex post* depreciation tables—tables created after bill creation had been discontinued. They were not direct indexation links to past, on-going, or future monetary activity (rates of bill creation). See Ferguson (1961, pp. 50-51); *JCC* (v. 6, pp. 997-1060; v. 14, pp. 971-979; v. 15, pp. 1334-1336; v. 16, pp. 343-345; v. 17, pp. 566-569).

[20] States paid only a small fraction of the monies requisitioned by Congress. By June of 1781, of the $3 million in specie value requisitioned in 1779, only 1.3 percent had been paid. Of the $8 million in specie value requisitioned after 1780, only 13 percent had been paid by November of 1783, only 18.6 percent by January 1, 1784, and only 25.5 percent by November 1, 1784—from the reports of the Registrar of the Treasury, Joseph Nourse, reproduced in *The Papers of Robert Morris* (Ferguson, 1973, v. 1, p. 196; 1995, v. 8, pp. 57, 749; 1999, v. 9, pp. 139, 908).

[21] For example, Calomiris (1988, p. 59) and Michener (1988, p. 689) could be interpreted as saying that the Continental-State currency mechanism was an increase in the nominal money supply. Calomiris (1988, p. 59) alluded to "an intention effectively to double the existing nominal bill supply." Michener (1988, p. 689) said that "Had this plan been fully implemented, it would have…doubled the money supply." Such interpretations would be erroneous if applied to

the nominal face value of the Continental paper money supply. The legislation explicitly entailed a net reduction of 20 Continental Dollars to each Continental-State Dollar issued. If they are interpreted as referring to the depreciation-adjusted Continental Dollar money supply in 1780 using Congress' 40 to 1 rate ($200 million/40 = $5 million) compared with the face value of Continental-State Currency ($10 million), then a doubling of the depreciation-adjusted nominal "Continental" money supply would be implied if the plan had been fully implemented. This, of course, ignores both the depreciation of Continental-State Dollars as more were issued, and the appreciation of the Continental Dollar as the quantity in circulation was reduced.

[22] For examples of these sorts of confusions for the state of Maryland see, *Archives of Maryland* (v. 43, pp. 205, 258-259, 277, 279, 297-298, 460; v. 45, pp. 73-74, 279, 382, 397-398, 441, 453, 577; v. 47, pp. 37, 84, 107, 131, 142-143, 230-231, 437; v. 48, pp. 21-22, 101, 165).

[23] Elliot (1843, p. 11) reported estimates by Senator Woodbury, former Secretary of the Treasury, of $2,070,240 and $2,071,085 Continental-State Dollars emitted. By contrast, Ratchford (1941, p. 38) said that "$4,468,625 of these new bills [Continental-State Dollars] were put into circulation" citing Harlow (1929, p. 62). However, Harlow (1929, p. 62) really said, "Less than half the authorized total—about $4,468,625—was put into circulation…" Half of $4,468,625 is $2,234,313, which is almost the total given by Elliot (1843, p. 11); Gouge (1833, II, p. 25); and Hepburn (1967, p. 16). Unfortunately, Harlow cited *JCC* (v. 19, pp. 399-400) April 15, 1781 as his source. It turns out there is no entry in the *JCC* for April 15, 1781—it was a Sunday and Congress did not meet—and none of Harlow's numbers are mentioned on the pages of the *JCC* he cited. For another possible source of this $4,468,625 number see Bronson (1865, p. 125) and Bullock (1895, p. 138). Bronson (1865, p. 126) himself estimated the total emissions of Continental-State Dollars to be $3,980,556. He arrived at this total by taking the number

reported by Hamilton to Congress on May 11, 1790 of $1,592,222 Continental-State Dollars (*American State Papers*, 1832, Class III, Finance, v. 1, p. 58; Elliot, 1843, p. 73) and assumed this was only the Federal Government's share, i.e. four-tenths of the total emitted. Scaling up from four-tenths yielded $3,980,556 for the total emission of Continental-State Dollars. This also seems to be the source of Bullock's (1895, p. 138; 1900, p. 72) estimate of $4 million Continental-State Dollars issued. Hamilton's statement is somewhat ambiguous as to whether the reported sum is the global total or just the Federal Government's four-tenths share. However, the $80 million Continental Dollars that would have had to have been called out of circulation by the states in 1780 and 1781, given the 20 to 1 rate set by Congress, to be consistent with the $4 million Continental-State Dollars these authors say were emitted cannot be sustained by the direct evidence or made consistent with the other evidence these authors present (Grubb, 2007). The confusion can be straightened out by the report sent to Robert Morris by Charles Thomson, the Secretary of Congress, on June 29, 1781 (Ferguson, 1973, v. 1, pp. 193-194). Thomson reported $195 million Continental Dollars outstanding, which if all were cashed in for Continental-State Dollars would yield $9.75 million Continental-State Dollars of which Congress would get four-tenths or $3.9 million Continental-State Dollars. As such the $4 million is the *maximum amount possible* that Congress could acquire (200,000,000 * 0.05 * 0.4 = 4,000,000) of Continental-State Dollars and not what it did acquire. As such, Bronson (1865, pp. 125-126); Bullock (1895, p. 138, 1900, p. 72); and Ratchford (1941, p. 38) may have simply confused the *maximum amount possible* that Congress could have gotten for the actual amount of Continental-State Dollars emitted by the states.

[24] Ferguson (1961, p. 53) reported that about $2 million Continental Dollars were withdrawn by January of 1781 with an additional $29 million withdrawn by July of 1781, for a total of about $31 million via this mechanism.

[25] This is also consistent with the estimate given by Benjamin Franklin ($30 million) for what had been called out of circulation in the early 1780s (Oberg, 1998, p. 231).

[26] Hamilton's report appears to deliberately exclude for the most part Continental Dollars remitted as part of the currency swap of the emissions of May 20, 1777 and April 11, 1778 for the emission of January 14, 1779 (discussed above), see fn. 11 above and Grubb (2007).

[27] For example, on March 28, 1780 Congress ordered "That all bills of the said emissions not brought in by or before the said first day of January next [January 1, 1781], be afterwards irredeemable." (*JCC*, v. 16, p. 312) This statement, however, only applied to the emissions of May 20, 1777 and April 11, 1778 (discussed above). Some scholar may have erroneously interpreted this statement as a general repudiation of Continental Dollars. Similarly, a committee report was read in Congress on May 10, 1781 that said "…after the first day of July next, the said Bills [Continental Dollars] be not received in discharge of any tax, debt or contract, or be current in any of the United States." (*JCC*, v. 20, p. 495) This report, however, was not acted on. Again, some scholar may have erroneously interpreted this statement as a general repudiation of Continental Dollars (see also Harlow, 1929, p. 61). Finally, Harlow (1929, p. 61) said that "Less than a year from [March 18, 1780]…Congress officially rated the bills [Continental Dollars] at seventy-five to one"—citing *JCC* (v. 19, p. 165). However, this was not an official congressional adjustment to the redemption rate of 40 to 1. This 75 to 1 rate was a suggestion made in a committee report—a report that was sent back to committee and not subsequently acted on.