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THE CONTINENTAL DOLLAR:
INITIAL DESIGN, IDEAL PERFORMANCE, AND THE CREDIBILITY OF CONGRESSIONAL COMMITMENT

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ABSTRACT

An alternative history of the Continental Dollar is constructed from the original resolutions passed by Congress. The Continental Dollar was a zero-interest bearer bond, not a fiat currency. The public could redeem it at face value in specie at fixed future dates. Being a zero-interest bearer bond, discounting must be separated from depreciation. Before 1779 there was no depreciation, only discounting. In 1779 and again in 1780 Congress passed ex post facto laws which altered the redemption dates of past Continental Dollars in ways that were not fiscally credible. These laws were the turning point. Depreciation and collapse followed.

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The Continental Dollar: Initial Design, Ideal Performance, and the Credibility of Congressional Commitment

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An alternative history of the Continental Dollar is constructed from the original resolutions passed by Congress. The Continental Dollar was a zero-interest bearer bond, not a fiat currency. The public could redeem it at face value in specie at fixed future dates. Being a zero-interest bearer bond, discounting must be separated from depreciation. Before 1779 there was no depreciation, only discounting. In 1779 and again in 1780 Congress passed *ex post facto* laws which altered the redemption dates of past Continental Dollars in ways that were not fiscally credible. These laws were the turning point. Depreciation and collapse followed.

The United States Congress financed the War for Independence (1775-83) by issuing paper money—the Continental Dollar. From 1775 through 1779, new emissions totaled \$200 million in face value and accounted for 77 percent of congressional spending. No new emissions occurred after November 1779.¹ The traditional history of the Continental Dollar treats it as a fiat currency. As outstanding emissions accumulated, the Continental Dollar depreciated and prices rose. In 1781, having run its course as an inflation tax, it was abandoned.²

An alternative history of the Continental Dollar is offered here. Three points are made. First, the Continental Dollar was not a fiat currency, but a zero-interest bearer bond. The par value of a Continental Dollar was not its face value but its present value, namely its face value reduced by time-discounting from its fixed future redemption (maturity) date. Second, when

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¹ Grubb (2008a, 2008b).

² Baack (2001, 2008); Bolles (1969); Breck (1843); Bronson (1865); Bullock (1895, 1900); Calomiris (1988); Ferguson (1961); Gouge (1833); Harlow (1929); Hepburn (1967); Lint (1996, v. 9, pp. 427-96); Oberg (1992, v. 29, pp. 354-6); Perkins (1994); Phillips (1866); Ratchford (1941); Sumner (1968).

time-discounting is distinguished from depreciation, no depreciation occurred before 1779. Many contemporaries, as well as subsequent scholars, mistook time-discounting for depreciation. Third, Congress changed the redemption rules in 1779 and again in 1780 in ways that were not fiscally credible. Depreciation, as opposed to time-discounting, and the collapse of the Continental Dollar monetary system followed shortly thereafter.

Initial Design and Ideal Performance

In a series of resolutions from 22 June through 26 December 1775, Congress determined the amounts and the structural design of the first two emissions of Continental Dollars, see Table 1. Congress maintained this structural design in all subsequent emissions, changing only the amounts issued and denominational spacing. Congressional debates were private and the delegates were sworn to secrecy. Why Congress structured the Continental Dollar the way they did must be deduced from their actions.³

For the first emission, the first three million—those with the date *May 10, 1775* printed on the bills, Congress passed redemption instructions on 29 July 1775. States were to remit fixed quotas of Continental Dollars to the Continental treasury to be burned. Each state's quota was roughly proportional to its respective population share in the union. Congress explicitly left each state free to decide how best to redeem Continental Dollars from the citizens within its jurisdiction. State remittances to the Continental treasury were to be in four equal yearly installments spread over a contiguous four-year period, beginning on 30 November 1779 and ending on 30 November 1782. No contemporaneous taxes or other debts payable to the states in these Continental Dollars were required before the redemption years indicated. No state was required to remit more than its quota, and Continental Dollars paid no interest. States with a

³ *Journals of the Continental Congress* [JCC hereafter] (v. 2-3). The private letters written by congressmen reveal little (Smith 1976, v. 1-2).

Table 1 Continental Dollar Redemption/Maturity Dates Set by Congressional Legislation

| Procedural Authorization Dates | Date Printed on the Bill (Emission #) | Stated Specie Redemption Option | Redemption/Maturity Dates | Current New Emission | Applied to Other Emissions |
|--------------------------------|---------------------------------------|---------------------------------|--|---|-------------------------------|
| July 29, 1775 | May 10, 1775 (Emission 1) | yes | ¼ on or before Nov. 30, 1779 ¼ on or before Nov. 30, 1780 ¼ on or before Nov. 30, 1781 ¼ on or before Nov. 30, 1782 | \$1,000,000 | \$2,000,000 from 22 June 1775 |
| Dec. 26, 1775 | Nov. 29, 1775 (Emission 2) | yes | ¼ on or before Nov. 30, 1783 ¼ on or before Nov. 30, 1784 ¼ on or before Nov. 30, 1785 ¼ on or before Nov. 30, 1786 | \$3,000,000 | |
| Feb. 21, 1776 | Feb. 17, 1776 (Emission 3) | --- | nothing | \$4,000,000 [\$3,937,220 printed only] | |
| May 22, 1776 | May 9, 1776 (Emission 4) | yes ^a | “in such manner...as Congress shall hereafter direct...” ^a | \$5,000,000 | |
| Aug. 13, 1776 | July 22, 1776 (Emission 5) | yes ^a | “ | \$5,000,000 | |
| Nov. 2, 1776 | Nov. 2, 1776 (Emission 6) | --- | “ | \$5,000,000 | |
| Feb. 26, 1777 | Feb. 26, 1777 (Emission 7) | --- | “periods...that shall be fixed by Congress...” ^a | \$5,000,000 | |
| May 22, 1777 | May 20, 1777 (Emission 8) | --- | nothing | \$5,000,000 | |
| Aug. 15, 1777 | “ | --- | “ | \$1,000,000 | |
| Nov. 7, 1777 | “ | --- | “ | \$1,000,000 | |
| Dec. 3, 1777 | “ | --- | “ | \$1,000,000 | |
| Jan. 8, 1778 | “ | --- | “ | \$1,000,000 | |
| Jan. 22, 1778 | “ | --- | “ | \$2,000,000 | |
| Feb. 16, 1778 | “ | --- | “ | \$2,000,000 | |
| Mar. 5, 1778 | “ | --- | “ | \$2,000,000 | |
| Apr. 4, 1778 | “ | --- | “ | \$1,000,000 | |
| Apr. 11, 1778 | Apr. 11, 1778 (Emission 9) | --- | “ | \$5,000,000 | |
| Apr. 18, 1778 | May 20, 1777 | --- | “ | \$500,000 | |
| May 22, 1778 | Apr. 11, 1778 | --- | “ | \$5,000,000 | |
| June 20, 1778 | “ | --- | “ | \$5,000,000 | |
| July 30, 1778 | “ | --- | “ | \$5,000,000 | |
| Sept. 5, 1778 | “ | --- | “ | \$5,000,000 | |

| | | | | | |
|----------------|---------------------------------|------------------|---|--------------|--|
| Sept. 26, 1778 | Sept. 26, 1778 (Emission 10) | --- | “ | \$10,000,100 | |
| Nov. 4, 1778 | “ | --- | “ | \$10,000,100 | |
| Dec. 14, 1778 | “ | --- | “ | \$10,000,100 | |
| Jan. 2, 1779 | Jan. 14, 1779 (Emission 11) | yes ^b | \$15,000,000 for 1779 and annually \$6,000,000 for 18 years to 1 January 1797, with any additional emissions in 1779 redeemed in the same manner and within the same time period ^c | \$8,500,400 | applies to all prior emissions and to all subsequent emissions to 1780 |
| Feb. 3, 1779 | Jan. 14, 1779 ^d | yes ^b | nothing new added | \$5,000,160 | |
| Feb. 19, 1779 | “ | yes ^b | “ | \$5,000,160 | |
| April 1, 1779 | “ | yes ^b | “ | \$5,000,160 | |
| May 5, 1779 | “ | yes ^b | “ | \$10,000,100 | |
| June 4, 1779 | “ | yes ^b | “ | \$10,000,100 | |
| July 17, 1779 | “ | yes ^b | “ | \$15,000,280 | |
| Sept. 17, 1779 | “ | yes ^b | “ | \$15,000,260 | |
| Oct. 14, 1779 | “ | yes ^b | “ | \$5,000,180 | |
| Nov. 17, 1779 | “ | yes ^b | “ | \$10,050,540 | |
| Nov. 29, 1779 | “ | yes ^b | “ | \$10,000,140 | |

Source: Grubb (2008a, p. 286); *JCC* (v. 2, pp. 103, 105, 207, 221-3; v. 3, pp. 390, 398, 407, 457-9; v. 4, pp. 157, 164-5, 339-40, 374, 380-3; v. 5, pp. 599, 651, 724-8; v. 6, p. 918; v. 7, p. 161; v. 8, pp. 377-80, 646-7; v. 9, pp. 873-4, 993; v. 10, pp. 26, 28, 36, 82-3, 86, 174-5, 223-5, 308-12, 337-8, 364-5; v. 11, p. 521-4, 627, 731-2; v. 12, pp. 884, 962, 967, 1073, 1100-01, 1133, 1217-18, 1266; v. 13, pp. 19-21, 64-5, 139-41, 209-10, 408-9, 420-1; v. 14, pp. 548-9, 683-4, 687-8, 847-9; v. 15, pp. 1076-8, 1171-2, 1285, 1324-5); *Papers of the Continental Congress* (m247, reel 33, item 26, 'Reports of the Committee on the Treasury and Finance, 1776-1788', pp. 1-5, 13-14; m247, reel 145, item 136, 'Reports of the Board of Treasury, 1776-1781, Volumes 1-2 (1776-1778)', v. 1, pp. 181, 355-7, 462, 507; v. 2, pp. 29, 83, 125, 199, 217, 373, 427, 529, 573, 669, 761; m247, reel 146, item 136, 'Reports of the Board of Treasury, 1776-1781, Volume III 1779', pp. 69, 111, 209, 215, 351, 477, 641, 727, 817, 845).

Notes: Dates are for when procedural details were given for each emission. An emission is all bills issued with the same date printed on the bill (Newman 1997, pp. 58-69). The date printed on the bill was the only way the public could distinguish between bills of different emissions and hence between bills with different redemption procedures. Some emissions had several authorizing resolutions in terms of when additional amounts were added to an emission.

^a Stated in coinage rating resolutions but not in emission resolutions (*JCC* v. 4, pp. 339-40, 382; v. 5, p. 724; v. 7, p. 36).

^b See fn. 23.

^c By the end of 1779 a total of \$199,990,000 net new Continental Dollar had been emitted. To redeem all the Continental Dollars as the 2 January 1779 resolution specified would entail raising the annual payments over the 18 year period from 1780 to 1797 from \$6,000,000 to \$10,277,778.

^d Some bills belonged to emission #10.

quota deficiency of Continental Dollars were to make it up in specie. The Continental treasurer was to retain this specie and advertise its availability. Citizens with Continental Dollars in states that had filled their quotas and had ceased redeeming Continental Dollars could redeem them at face value in specie directly from the Continental treasury, in effect claiming the specie remitted by the states with a deficiency of Continental Dollars.⁴ For the second emission, the second three million—those with the date *November 29, 1775* printed on the bills, Congress passed redemption instructions on 26 December 1775 that were identical to those for the first emission, except that the four-year redemption period was moved forward to begin after the last of the first emission was redeemed, namely to begin on 30 November 1783 and end on 30 November 1786.⁵ In short, the Continental Dollar was a zero-interest bearer bond.

Congress' redemption instructions were widely disseminated. Congress circulated a handbill that contained its Continental Dollar resolutions passed before 30 July 1775.⁶ This handbill was reprinted in numerous newspapers—the first being in the *Connecticut Journal, & New-Haven Post-Boy*, 25 October 1775. Between 25 October and 4 December 1775 all three newspapers in Connecticut, three of the four in Massachusetts, one of the two in Rhode Island, one of the four in New York, and two of the five in Pennsylvania reprinted it. Out of the surviving newspapers consulted, 10 of the 24 reprinted the handbill.⁷ The redemption procedures covering the second emission were reprinted in *The Pennsylvania Evening Post*, 12 March 1776. This information was also disseminated when Congress published its journals at the

⁴ *JCC* (v. 2, pp. 221-3).

⁵ *JCC* (v. 3, pp. 457-9).

⁶ United States, Continental Congress (Philadelphia?: s.n. 1775)
<http://memory.loc.gov/service/rbc/bdsdcc/00301/0001.jpg> [accessed 9 May 2011].

⁷ Grubb (2011).

end of 1775 and later in 1776.⁸ The public was well informed of the structural design of the Continental Dollar.

For the next eight emissions, totaling \$95,500,300, no explicit redemption instructions were issued.⁹ The pattern of redemption for these eight emissions, however, could be deduced from the pattern set by Congress for the first two emissions. This pattern set redemptions far into the future, with redemption intervals consistent with feasible and historically acceptable tax rates. Across the first two emissions, the redemption of just \$750,000 each year implied a tax rate per capita per year of \$0.33. In the 13 colonies between 1770 and 1774, the average tax rate per white-capita per year for all taxes was \$0.41.¹⁰

The forward-shifting contiguous four-year redemption pattern across the first two emissions is difficult to explain except in reference to maintaining a fiscally credible per year per capita tax rate for retiring Continental Dollars at face value. Otherwise, a redemption interval for a zero-interest bearer bond creates a cumbersome medium of exchange. The present value of a particular Continental Dollar depends on when within its redemption interval it was expected to be redeemed. Redemption intervals had to be short enough to keep the present value of all Continental Dollars from a given emission comparable, but wide enough to execute their retirement at face value via taxation.

⁸ *JCC* (v. 2, p. 208; v. 3, pp. 263-4, 393, 427); Smith (1976, v. 1, p. 695). *The Constitutional Gazette*, 20 December 1775; *New-York Gazette and the Weekly Mercury*, 25 December 1775; *New-York Journal; or, The General Advertiser*, 21 December 1775; *The Pennsylvania Journal; and the Weekly Advertiser*, 13 December 1775; and the *Pennsylvania Gazette*, 23 October 1776 advertised the proceedings of the Continental Congress for sale.

⁹ After 1775, Congress shifted monetary issues from Congress, sitting as a whole, to congressional subcommittees. Redemption instructions for subsequent emissions fell between these administrative cracks. Not until emission #11 did Congress, sitting as the whole, resolve this administrative lapse.

¹⁰ Derived from Bezanson (1951, p. 344); Boyd (1954, v. 10, pp. 42-3); Carter, *et al.* (2006, v. 1, p. 25; v. 5, pp. 652-3); Grubb (2008a); McCusker (1978, p. 10); Rabushka (2008, pp. 796, 825, 862-3). Congress placed the redemption of the first emission four to seven years into the future because that was when the war was expected to be over, e.g. Silas Deane, congressman from Connecticut, wrote 1 July 1775, “The Warr will not last Seven Years if I have any Judgment in Matters” (Smith 1976, v. 1, p. 567). At that point, trade would resume and generate the income necessary to pay the taxes needed to redeem Continental Dollars at face value.

Using the pattern set by Congress for the first two emissions, the public could forecast the redemption structure for the next eight emissions. In particular, redemption would be pushed successively into the future for each subsequent emission. Redemption intervals would not overlap across emissions. Three forecasts are consistent with the redemption pattern set by Congress in 1775. First, a four-year contiguous redemption interval would be maintained for each subsequent emission (Forecast 1). Second, redemption intervals would be adjusted to maintain a constant \$750,000 per year redemption rate (Forecast 2). Third, redemption intervals would be adjusted to maintain a constant per year per capita tax rate. Forecast 1 is identical to Forecast 2 when emission sizes are identical, which is approximately true for emissions 1 through 7, but not thereafter. The third forecast requires forecasting population growth. Because it falls between Forecast 1 and Forecast 2, it is not presented separately here.

Table 2 and Figure 1 present the ideal performance of the Continental Dollar based on its initial design in terms of its redemption dates, both legislated and forecasted, using a 6 percent discount (interest) rate.¹¹ Table 2 shows the present value at inception of each emission, using Forecast 1 for emissions 3-10. It also calculates the present value of the accumulated total Continental Dollars emitted to that date weighted by the dollar size of emissions, using both Forecast 1 and Forecast 2 for emissions 3-10. Figure 1 illustrates the present value of each emission from inception to maturity, collapsing the redemption interval to its last date, using Forecast 1 for emissions 3-7. Each emission starts at a present value well below its face value and then rises to its face value by its last redemption date. While a given emission's present value is rising over time, the addition of new emissions that start at successively lower levels pulls the present value of the average Continental Dollar down over time.

¹¹ Six percent was the rate used by the national government for loans between 1776 and 1790, see Homer and Sylla (1991, pp. 274-313); *JCC* (v. 6, p. 1037; v. 7, pp. 102-3, 158; v. 9, p. 955; v. 14, pp. 717, 783; v. 16, pp. 264-5; v. 17, p. 568); *Pennsylvania Gazette* (30 April; 21 and 28 May; 25 June; 2, 16, and 23 July 1777).

Table 2 **Legislated/Forecasted Redemption Dates and Valuations for Continental Dollar Emissions**

| Date Printed On the Bills: Emission # (Amount Referenced) | Maturity/ Redemption Interval (L) = Legislated (F) = Forecasted | Expected Value at Inception ^a 100 = par | Thomas Jefferson's Depreciation Table ^b 100 = par | Philadelphia Price Index: Derived Valuation ^c | Philadelphia Merchant Account Book Valuations 100 = par | Implied Tax Rate Per Year Per Capita ^d |
|--|---|---|--|---|---|---|
| May 10, 1775 (\$3,000,000) | Nov. 30 1779— Nov. 30, 1782 (L) | 63.8 - 76.8 [63.8 - 76.8] | 100.0 (100.0) | ----- | ----- | \$0.33 |
| Nov. 29, 1775 (\$3,000,000) | Nov. 30, 1783— Nov. 30, 1786 (L) | 51.7 - 61.9 [58.7 - 70.3] | 100.0 (100.0) | ----- | ----- | 0.28 |
| Feb. 17, 1776 (\$3,937,220) | Nov. 30, 1787— Nov. 30, 1790 (F) | 41.3 - 49.5 [52.3 - 62.7] {51.7 - 62.7} | 100.0 (100.0) | 89.6 | ----- | 0.32 |
| May 9, 1776 (\$5,000,000) | Nov. 30, 1791— Nov. 30, 1794 (F) | 32.8 - 39.3 [46.1 - 55.3] {43.2 - 54.3} | 100.0 (80.0) | 66.4 | ----- | 0.36 |
| July 22, 1776 (\$5,000,000) | Nov. 30, 1795— Nov. 30, 1798 (F) | 25.7 - 30.7 [41.6 - 49.7] {37.0 - 47.4} | 100.0 (80.0) | 65.0 | ----- | 0.32 |
| Nov. 2, 1776 (\$5,000,000) | Nov. 30, 1799— Nov. 30, 1802 (F) | 20.9 - 25.1 [38.0 - 45.5] {32.5 - 41.9} | 100.0 ^e (66.7) | 42.7 | ----- | 0.28 |
| Feb. 26, 1777 (\$5,000,000) | Nov. 30, 1803— Nov. 30, 1806 (F) | 16.8 - 20.1 [35.1 - 42.1] {29.0 - 37.5} | 37.5 ^e (32.3) | 29.9 | 50.0 | 0.25 |
| May 20, 1777 (\$16,500,000) | Nov. 30, 1807— Nov. 30, 1810 (F) | 13.4 - 16.1 [27.8 - 33.3] {19.8 - 27.3} | 37.5 ^e (33.3) | 20.9 | 40.0 | 0.72 |
| Apr. 11, 1778 (\$25,000,000) | Nov. 30, 1811— Nov. 30, 1814 (F) | 11.2 - 13.3 [22.9 - 27.4] {13.7 - 19.5} | 16.7 ^e (20.0) | 11.7 | 20.0 | 0.97 |
| Sept. 26, 1778 (\$30,000,300 ^f) | Nov. 30, 1815— Nov. 30, 1818 (F) | 9.2 - 11.0 [19.3 - 23.1] { 9.9 - 14.2} | 20.0 ^e (16.7) {25.0} | 11.5 | 20.0 | 1.03 |
| Jan. 14, 1779 ^g (\$199,990,000) | Nov. 30, 1779— Jan. 1, 1797 (L) | 34.0 - 98.7 [34.0 - 98.7] | 12.5 ^e (5.9) | 5.6 | 10.0 | 3.82 ^g |
| All Emissions ^h (\$199,990,000) | April 1780— April 1781 (L) | 2.5 ^h [2.5] | 2.5 ^h (2.0) | 0.7 | 1.7 | 79.20 1.98 ⁱ |
| Tax Rate per White Capita per Year on Average in the 13 Colonies (all taxes), 1770-1774: | | | | | | 0.41 |

Sources: Table 1; Bezanson (1951, p. 344); Boyd (1954, v. 10, pp. 42-3); Bullock (1895, p. 135); Carter, *et al.* (2006, v. 1, p. 36; v. 5, p. 652); Grubb (2008a); *JCC* (v. 2, pp. 221-3; v. 3, pp. 457-9; v. 13, pp. 20-1; v. 16, pp. 262-7; v. 17, pp. 567-8); Rabushka (2008, pp. 796, 825, 862-3); Webster (1969, pp. 501-2).

Notes: See Table 1 and the text. Forecasted amounts are based on the pattern set by the first two emissions that set a contiguous four-year redemption interval for each emission that started when the redemption interval for the immediately preceding emission ended (Forecast 1). Regarding interest rates, see fn. 11.

^a Continuously discounted at 6 percent off the face value on the bill from the redemption interval dates to the date printed on the bill expressed as the value of \$100 in Continental paper money. The high-low range spans the redemption time interval. The numbers in brackets are the expected values for the cumulative emissions outstanding to that date weighted by their dollar size (Forecast 1). The numbers in { } represent an alternative forecast of the expected values for the cumulative emissions outstanding to that date weighted by their dollar size, namely that only 750,000 Continental Dollars per year were to be redeemed (Forecast 2).

^b This is the standard depreciation reported throughout the literature, see *JCC* (v. 17, pp. 567-8); *Pennsylvania Gazette* (19 July 1780); United States Congress (1834, v. 2, pp. 2243-51). Jefferson reported it as the number of Continental Dollars (face value) needed to equal one Spanish silver dollar (Boyd 1954, v. 10, pp. 42-3). That number is converted to a percentage discount off the face value expressed as the value of \$100 in Continental paper money. The numbers in parentheses are derived from the depreciation rates reported in Bullock (1895, p. 135). The number in { } comes from *JCC* (v. 17, p. 568).

^c From the unweighted Philadelphia price index in Bezanson (1951, p. 344). Base prices were reset to June 1770 through May 1775. This base price was divided by the average of the price index beginning with the month just after the date on the bill listed. Taking the reciprocal of that number and multiplying by 100 equals the number reported in the table. This process yields a comparable number in terms of expected valuation relative to par = 100, but in this case par equals the average base price from June 1770 through May 1775.

^d Population is extrapolated linearly between decadal benchmarks and is for the white population only. Only the tax burden needed to redeem Continental Dollars at face value is reported. Rates are expressed in Spanish silver dollars. Rates expressed in pounds sterling are converted to Spanish dollars following McCusker (1978, p. 10).

^e Jefferson does not list all emissions nor emissions by date. Thus, some dating approximations were necessary.

^f Some emissions after 14 January 1779 also had this date on their bills.

^g Applies to all past and future net new emissions (\$199,990,000) regardless of the date on the bill. The tax rate per white capita per year for this remittance structure averaged \$3.82 across the redemption interval. See the text for how it varied over the interval.

^h Enacted 18 March 1780 and covered all past emissions. How to calculate the expected value at inception is unclear. The resolution's 40 to 1 conversion rate is used. See *JCC* (v. 16, pp. 262-7).

ⁱ Evaluated at 40 Continental Dollars equals \$1 in specie as established in the 18 March 1780 resolution.

Continental Dollars from different emissions should trade contemporaneously at different values. In addition, Continental Dollars from a given emission should have different values at different points in time. Such differences across and within emissions make for a cumbersome medium of exchange. Little evidence of differential treatment within and across emissions has been noted previously, in part because no one has looked for such and because market participants typically recorded monetary transactions in units of account and not media of exchange.¹² For example, out of 3,127 commercial advertisements placed in the *Pennsylvania*

¹² Bezanson (1951, pp. 3-4, 10-11).

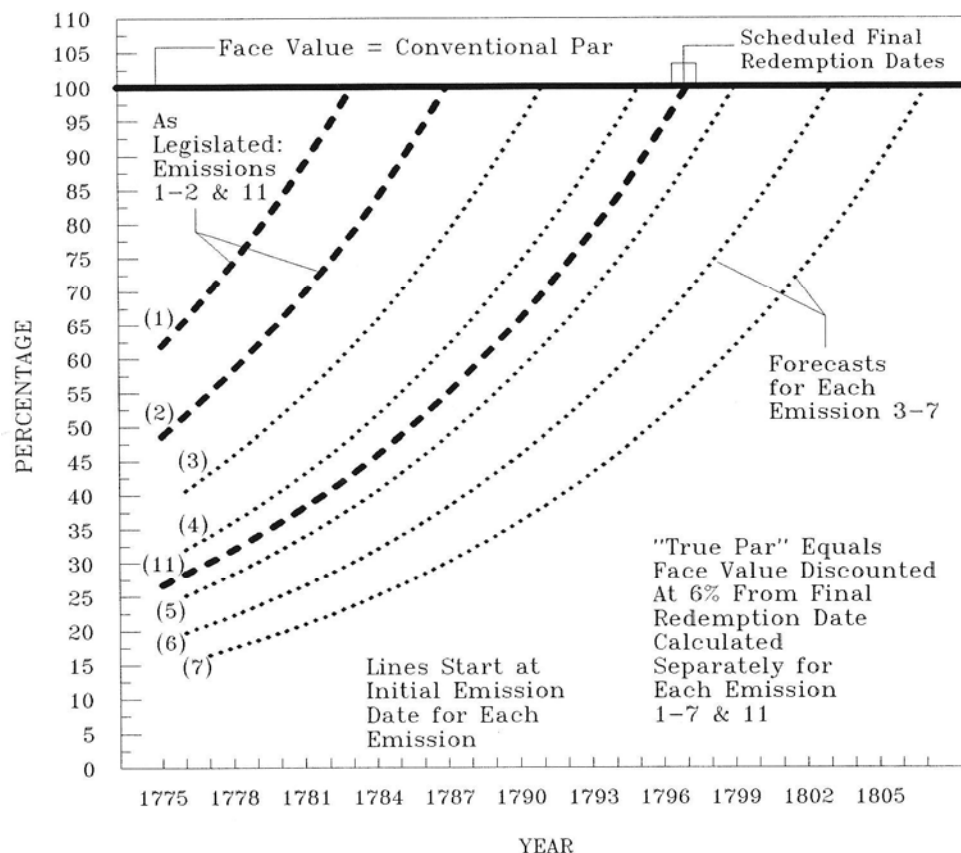


Figure 1 "True Par": Face Value Discounted From Final Redemption at 6 Percent for Various Emissions of Continental Dollars (Forecast 1)

Sources: Tables 1 and 2.

Notes: The last redemption date for each redemption interval is used. For discussions of interest rates and legislated versus forecasted redemption dates, see Table 2 and the text. Forecast 1 sets a contiguous four-year redemption for each emission that starts when the redemption interval for the immediately preceding emission ends. Emission #11, the last emission, covers all present, past, and future emissions. The forecasted patterns for emissions 8, 9, and 10—below and to the right of emission 7—are not drawn.

Gazette between March 1775 and April 1780 that listed a monetary statement, only 3 percent referred to a particular medium of exchange.

That said, after Congress altered the redemption rules on 2 January 1779 making the present value of all Continental Dollars identical regardless of emission date, a few market participants noted such. Edward Bonsall and Abraham Shoemaker advertised in the 27 January 1779 *Pennsylvania Gazette* that they would sell a tract of land "For Continental Currency of any

date [italics in the original]." The implication of this previously unused phraseology is that prior to 2 January 1779 Continental Dollars from different emissions were treated differently when settling accounts.¹³

Lack of evidence on a value distinction across emissions pre-1778 may also be due to Continental Dollars not being used as a medium of exchange. Table 3 shows that Continental Dollars were large-valued bills. The smallest emitted in 1775 was a \$1 bill, equivalent in face value to \$15 in 1990. Over 60 percent of the bills emitted in 1775 were equivalent in face value to, or larger than, a \$50 bill in 1990. Large currency denominations were difficult to use as a medium of exchange. Transactions that required change could not be made unless change was given in some other medium. Fractional Continental Dollars were only issued in emission #3, early in 1776, and never again thereafter. When Congress asked the states on 22 November 1777 to stop emitting their own paper monies, they specifically exempted small denominations, recognizing that such was needed for making change.¹⁴ As the present value of Continental Dollars fell with subsequent emissions, the problem of making change in Continental Dollars was mitigated, and increasingly they could serve alone as a medium of exchange.

Early on, Congress may have hoped that the primary recipients of Continental Dollars, namely soldiers, would hold their dollars for future redemption. Soldiers' pay absorbed nearly half of all the Continental Dollars emitted through 1777. Congress fixed the pay of soldiers on the same day, 29 July 1775, that it passed the resolution establishing the Continental Dollar's zero-interest bearer bond structure with fixed future redemption dates. A private was paid \$80 per year. Privates were the primary recipients of military pay, receiving 78 percent of the money paid to each military company. British army privates were paid \$55 per year. American privates,

¹³ See also the *Pennsylvania Gazette* (10 and 17 February; 7 and 14 April 1779).

¹⁴ *JCC* (v. 7, p. 125; v. 9, pp. 955-6); Newman (1997, pp. 58-69, 106-10, 121-3, 170-4, 202-11, 235-40, 255-9, 281-7, 347-56, 390-6, 415-22, 440-51).

Table 3 Paper Currency Pyramids: Volume and Value of Units Issued by Denomination

| Continental Paper Dollar Denominations | Continental Dollar: First 2 Emissions (All in 1775) | | Continental Dollar: Next 3 Emissions (All in 1776) | | Approximate Equivalence of 1775-1776 Bills in 1990 Values ^a | Comparison with U.S. Dollar Paper Currency in 1990 | | |
|--|---|----------------|--|----------------|--|--|----------------|-------|
| | Units Issued % | Value Issued % | Units Issued % | Value Issued % | | Units Issued % | Value Issued % | |
| | | | | | | \$1 bill | 37.8 | 1.9 |
| \$1/6 bill | 0.0 | 0.0 | 10.8 | 0.5 | \$2.5 bill | | | |
| \$1/3 bill | 0.0 | 0.0 | 10.8 | 1.0 | \$5 bill | \$5 bill | 9.6 | 2.4 |
| \$1/2 bill | 0.0 | 0.0 | 10.8 | 1.6 | \$7.5 bill | | | |
| \$2/3 bill | 0.0 | 0.0 | 10.8 | 2.1 | \$10 bill | \$10 bill | 9.6 | 4.7 |
| \$1 bill | 12.0 | 2.2 | 4.9 | 1.4 | \$15 bill | \$20 bill | 25.9 | 25.7 |
| \$2 bill | 12.0 | 4.4 | 7.7 | 4.5 | \$30 bill | | | |
| \$3 bill | 12.0 | 6.6 | 7.7 | 6.7 | \$45 bill | \$50 bill | 5.2 | 12.6 |
| \$4 bill | 12.0 | 8.8 | 7.7 | 8.9 | \$60 bill | | | |
| \$5 bill | 12.0 | 11.0 | 6.5 | 9.4 | \$75 bill | | | |
| \$6 bill | 12.0 | 13.2 | 6.5 | 11.3 | \$90 bill | | | |
| \$7 bill | 12.0 | 15.4 | 6.5 | 13.2 | \$105 bill | \$100 bill | 10.4 | 52.3 |
| \$8 bill | 12.0 | 17.7 | 6.5 | 15.1 | \$120 bill | | | |
| \$20 bill | 1.0 | 3.9 | 0.0 | 0.0 | \$300 bill | | | |
| \$30 bill | 3.0 | 16.4 | 2.8 | 24.3 | \$450 bill | | | |
| | 100.0% | 100.0% | 100.0% | 100.0% | | | 98.5% | 99.6% |

Sources: Grubb (2008a, p. 286); *JCC* (v. 2, pp. 103, 105, 207; v. 3, pp. 398, 407, 457-8; v. 4, pp. 157, 164-5, 339-40, 374, 380-3; v. 5, pp. 599, 651); Newman (1997, pp. 58-63); Federal Reserve, <http://www.federalreserve.gov/paymentsystems/coin/data.htm>.

^a From <http://eh.net> “measuring worth—relative value of U.S. Dollars” and uses the 1790 to 1990 conversion algorithm. The Spanish silver dollar in 1790 and in 1775-6 were almost equivalent.

however, were paid in paper Continental Dollars, whereas British privates were paid in specie. In November 1775, the present value of 80 Continental Dollars of the first emission was between \$63 and \$53, or comparable with the present value of a British private's yearly pay.¹⁵

The strange denominational structure of Continental Dollar emissions is also consistent with Congress intending to pay soldiers in large bills that would be held for future redemption

¹⁵ Derived from Fortescue (1910-30, v. 4, pt. 2, p. 935); *JCC* (v. 2, pp. 89-90, 220-3; v. 3, pp. 322-3); *Pennsylvania Gazette* (14 August 1776); Williamson (1796, p. 27); and http://footguards.tripod.com/01ABOUT/01_payscale.htm (accessed 21 June 2011). Currency conversions are from McCusker (1978, p. 10). Relative to private's pay, the pay of upper ranks increased less in the American than in the British army. Thus, by-rank comparisons above private are less informative.

rather than spent as currency. Throughout the American colonies, as well as in modern economies, currency denominations were typically spaced by factors of two, three, or five, and in a pyramid structure with more units in the lower than in the higher denominations. These features reduced the transaction costs of using the currency as a medium of exchange in terms of making change. Table 3 shows that the denominational structure of the Continental Dollar did not have these features. Continental Dollar denominations were not spaced by a multiple factor, and the units issued had a rectangular rather than a pyramid structure.¹⁶

This structure makes sense if Congress intended to pay soldiers in the fewest bills necessary, and thus in large-valued bills that were not intended to circulate as a currency. Three months pay for a private, \$20, could be accommodated with one or various combinations of three, four, or five large-valued bills. One month's pay for a private after clothing deductions, \$5, could be accommodated with one or various combinations of two large-valued bills. For higher ranked military personal, paying them with a few large-valued bills was even easier.

Soldiers' pay was fixed by Congress in nominal terms in July 1775. As the war continued, the present value of soldiers' pay when made in subsequent emissions fell. In November 1775, the present value of a full year's pay for an American private, when paid with dollars from the second emission, would be between \$50 and \$41—below the present value of a British private's yearly pay. For subsequent emissions, it was even lower. In effect, Congress was financing the war by extracting zero-interest borrowings from its citizen-soldiers and increasingly so as the war progressed. This created problems for the financing system regarding military pay over a long war. The problem was partially solved by the 2 January 1779 resolution that made the present value of all Continental Dollars the same regardless of emission date. Late in the war,

¹⁶ *JCC* (v. 2, pp. 220-3; v. 3, pp. 322-3); Newman (1997); Telser (1995); Van Hove (2001).

Congress also promised military personnel that Congress would make up "the deficiency of their original pay" when feasible.¹⁷

After 1777, congressional payments for war supplies absorbed more Continental Dollars than soldiers' pay.¹⁸ When Congress spent Continental Dollars in the marketplace for supplies and services, prices could be raised by suppliers and service providers to reflect the present value of the Continental Dollars offered in payment. Suppliers and service providers were more likely to re-spend the money paid them because they had subcontractors and employees they had to pay. Figure 2 shows that market participants in Philadelphia did not start denominating transactions in dollar units, above that used prior to the first emission of Continental Dollars, until sometime after mid-1776. By mid-1777, Congress and the public were using Continental Dollars as a medium of exchange.

Discounting Versus Depreciation

Table 2 and Figures 3 and 4 compare the average Continental Dollar's present value with several measures of its purported depreciation. Between 1777 and 1779, depreciation closely tracks forecasted present value—they are within each other's confidence interval when reasonable alternative constructions and discount rates are considered. Therefore, between 1777 and 1779 time-discounting, namely rational bond pricing, and not depreciation fully explains the current value of the average Continental Dollar. Between mid-1775 and 1777, however, the depreciation measures are above the present value calculations. This is puzzling. Before 1777, either the marketplace did not understand time-discounting, patriotic fervor trumped economic interests, or these depreciation measures pre-1777 are suspect. The latter is likely.

The first reports of Continental Dollars trading below face value appeared before

¹⁷ *JCC* (v. 15, p. 1335; v. 16, p. 344; v. 19, p. 413).

¹⁸ Grubb (2008b).

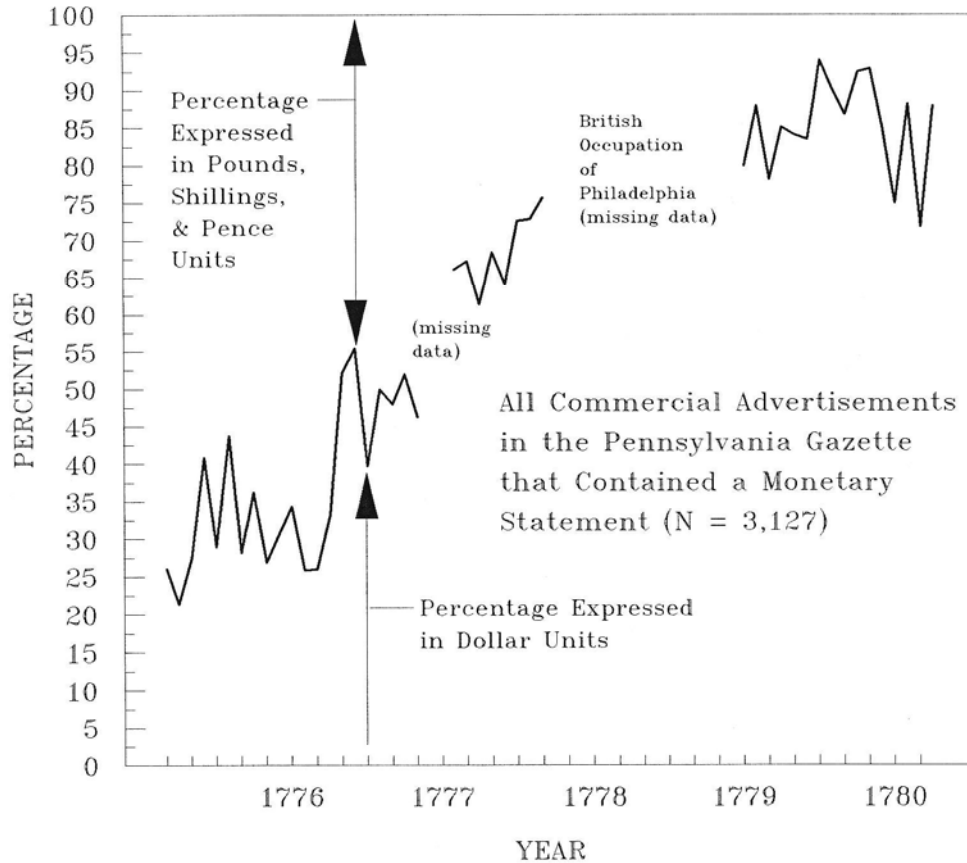


Figure 2 The Prevalent Unit of Account Used in Marketplace Commercial Transactions in Philadelphia, March 1775 through April 1780

Sources: *Pennsylvania Gazette*.

Notes: All commercial advertisements placed in the *Pennsylvania Gazette* were examined.

Congress in Philadelphia on 23 November 1775, long before it shows up in the conventional measures of depreciation reported in the literature. This event occurred immediately after the structural design of the Continental Dollar was first reported in Pennsylvania newspapers. After the public was told that Continental Dollars were zero-interest bearer bonds with defined maturity dates, they started to accept them below their face value. This "depreciation" was discussed in Congress and in the newspapers through 1776. As such, the conventional measures of depreciation understate the extent that Continental Dollars traded below their face value

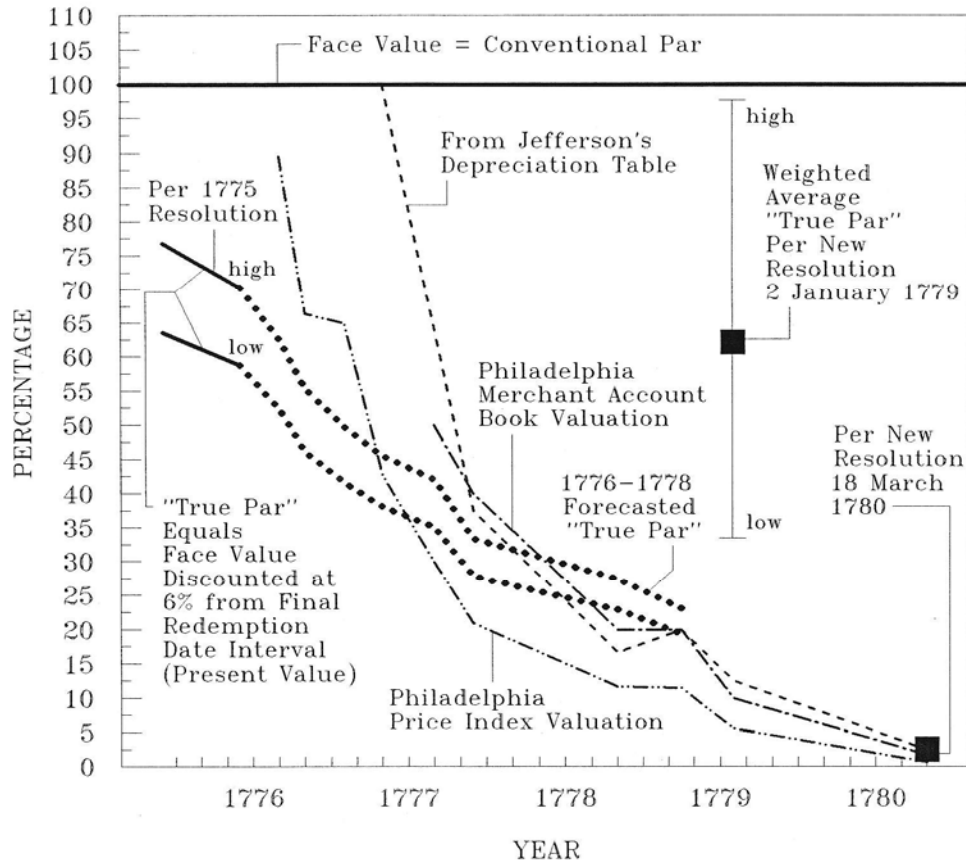


Figure 3 Value of All Continental Dollars Currently Outstanding, 1775-1780: "True Par" Versus Conventional Par (Forecast 1)

Sources: Tables 1 and 2; Figure 1.

Notes: The "True Par" present-value lines are for the cumulative emissions outstanding to date weighted by their dollar size. The high-low range comes from redemption intervals. For discussions of interest rates and legislated versus forecasted redemption dates, see Table 2 and the text.

before 1777.¹⁹

Congress reacted to these reports of depreciation by referring the issue to committees and publishing admonishments against such behavior. Through 1776, however, these admonishments only condemned the refusal to accept Continental Dollars, not its acceptance below face value. Benjamin Franklin was in Congress. He had long known that the present value of a zero-interest bearer bond was below its face value. He had argued in Congress, unsuccessfully, for the

¹⁹ JCC (v. 3, pp. 367-8, 424, 455; v. 4, pp. 49-50, 293-4, 381-3; v. 5, pp. 608, 724-8; v. 6, p. 1046); *Pennsylvania Gazette* (17 January; 17 and 24 April; 19 June 1776).

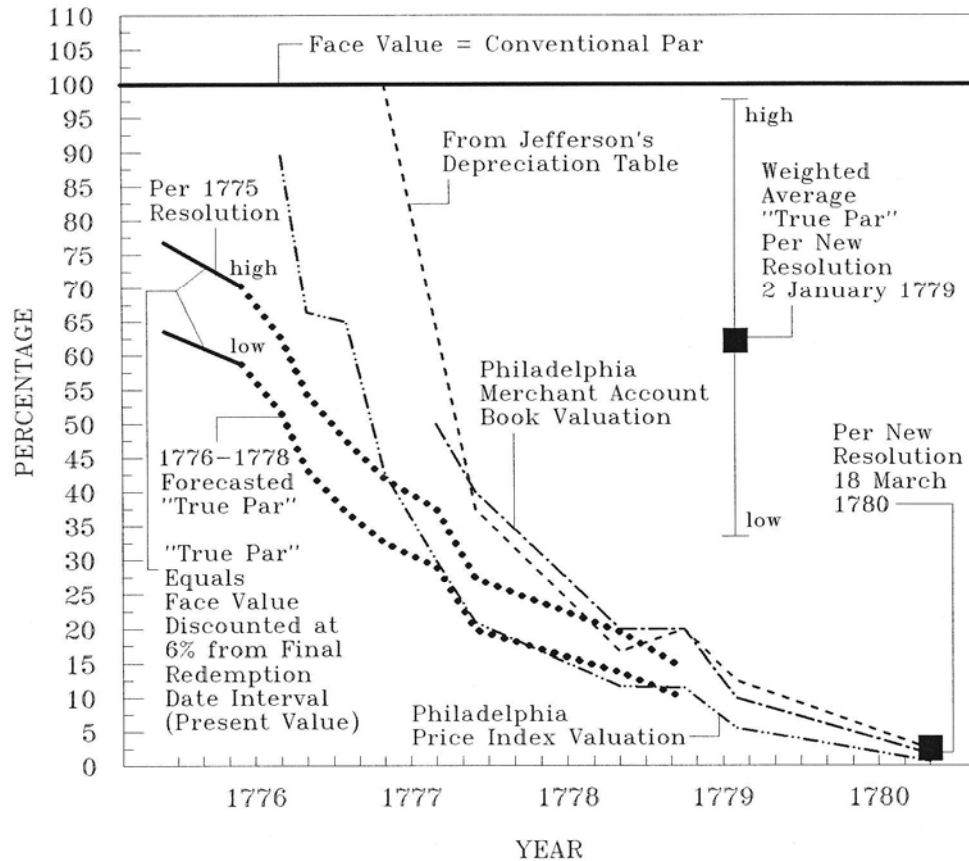


Figure 4 Value of All Continental Dollars Currently Outstanding, 1775-1780: "True Par" Versus Conventional Par (Forecast 2)

Sources: Tables 1 and 2; Figure 1.
 Notes: See the notes to Figure 3.

Continental Dollar to pay interest, because such would raise its present value to equal its face value in contemporaneous trades. As long as Franklin was in Congress, while some railed against depreciation as an evil and unpatriotic act, resolutions condemning depreciation, as opposed to just condemning non-acceptance, did not pass. Perhaps Franklin was able to convince some congressmen that time-discounting was not depreciation, at least through 1776.²⁰

The price index evidence in Table 2 and Figures 3 and 4 does not reflect market pricing

²⁰ See fn. 19; Labaree (1967, v. 11, pp. 7-18); Oberg (1992, v. 29, pp. 354-6). Congress appointed Franklin commissioner to France on 26 September 1776 (*JCC* v. 5, p. 827).

in Continental Dollars until after 1776. The price index comes from merchant account books. In these books, merchants converted market transactions from whatever media of exchange were used into a common unit of account, namely into pounds, shillings, and pence of Pennsylvania money. For transactions in dollars, merchants used a fixed conversion rate of \$1 = 7 shillings, 6 pence. Only when prices in the marketplace were typically transacted in dollars would the price index reflect the value of dollars in the marketplace rather than the value of some other media of exchange. Figure 2 shows that market prices before 1777 were not expressed in dollar units beyond that used prior to the first emission of Continental Dollars. As such, the price index is not reflecting movements in the value of Continental Dollars pre-1777. After 1776, dollar usage rose to dominate marketplace transactions. Thus, after 1776 the price index reflects movements in the value of Continental Dollars.²¹

Lastly, the depreciation tables under the Jefferson heading in Table 2 and Figures 3 and 4 were created well after the fact, mostly in the early 1780s. How they were created, upon what evidence there were based, and whether they were intended to measure the current value of Continental Dollars is seldom noted. Their purpose was to establish the principal to be repaid on congressional borrowings of Continental Dollars via loan office certificates. Was the principal to be repaid the present value at the time of borrowing or the face value? The first depreciation table was recorded in Congress on 28 June 1780. It computed "a progressive rate of depreciation...in geometrical proportion to the time" starting at face value and running to 18 March 1780. The starting point was when Congress first borrowed Continental Dollars—late

²¹ Bezanson (1951, pp. 1-11, 25, 332-42). John Adams indicated on 12 October 1775 that Continental Dollars were not yet in general circulation (*JCC* v. 3, p. 491). The evidence in Figure 2 comes from the same market, but is different than that used to construct the price index. That dollar statements in Figure 2 post-1776 are primarily referring to Continental Dollars can be inferred from the rise in the nominal sums offered for the same activities between early 1775 and post-1777. The Philadelphia Merchant Account Book Valuation of depreciation in Table 2 and Figures 3 and 4 uses a single account book with questionable assumptions about how to separate war effects from depreciation pre-1777.

1776 into early 1777. Thus, by construction, these depreciation tables overstate the present value of Continental Dollars before mid-1777.²²

The Collapse of Credible Fiscal Commitment

By 1778, Congress faced a dilemma. The redemption dates of new emissions, using either Forecast 1 or Forecast 2 in Table 2 and Figures 3 and 4, were so far in the future that new emissions had little current present-value. The redemption of new emissions could no longer be pushed successively into the future. Redemption had to be pulled closer to the present. Doing so would cause redemption intervals for prior and future emissions to overlap which, in turn, would necessitate capping total emissions to maintain fiscal credibility. In 1779 and 1780, Congress attempted to resolve this dilemma. In the process, their actions forced depreciation onto the Continental Dollar and precipitated the collapse of the monetary system.

On 2 January 1779 Congress changed redemption requirements for the Continental Dollar. All the structural procedures from 1775 were kept in place except the installment amounts and contiguous-year redemption interval.²³ In addition, all past and future emissions were to be treated equally, see Table 1 and Figure 1. The states were now to redeem 15 million in 1779 and an equal amount each year through 1797, the amount needed to exhaust the remainder.²⁴ While this resolution filled in the missing instructions for the eight preceding emissions, it altered the redemption instructions for the first two emissions passed by Congress in 1775.

²² Boyd (1954, v. 10, pp. 42-3); *JCC* (v. 5, pp. 845-6, 850; v. 6, pp. 949, 955-6; v. 7, pp. 36, 143, 225; v. 8, p. 578; v. 9, p. 955; v. 17, pp. 567-8); Oberg (1998, v. 34, pp. 231-2); *Pennsylvania Gazette* (19 July 1780). Some writers thought that approximately 30 million dollars were required to transact commerce (*JCC* v. 15, p. 1054; Webster 1969, p. 6). They assumed that no depreciation could occur until after that sum was exceeded. Continental Dollars did not exceed 30 million until May 1777. Jefferson's table shows depreciation only after May 1777. As such, he may have simply assumed that no depreciation was possible before that date.

²³ The specie redemption option for citizens at the Continental treasury was not mentioned in the 2 January 1779 resolution. However, Congress indicated that it was still operative on 14 June 1779 (*JCC* v. 14, p. 728).

²⁴ *JCC* (v. 13, pp. 20-1). The 2 and 14 January 1779 congressional resolutions on paper money were reprinted in the *Pennsylvania Gazette* on 27 January 1779.

Congress set a \$200 million limit for total net new emissions on 1 September 1779 and reached this limit on 29 November 1779.²⁵ Thus, by the end of 1779 the states were required to remit 10,277,778 Continental Dollars each year from 1780 through 1797 to the Continental treasury to be burned. Eighteen years times 10,277,778 plus 15,000,000 for 1779 equaled 200 million Continental Dollars. The tax implications of this change placed it beyond what was feasible, or historically acceptable, if Continental Dollars were taken at face value. The tax rate per capita per year for the 2 January 1779 redemption structure was \$6.60 for 1779 and then \$4.52 for 1780 falling continuously to \$2.63 by 1796 (due to population growth).²⁶

On 18 March 1780 Congress changed redemption requirements again. States were to redeem 15 million Continental Dollars each month over the next 13 months. Thirteen months times 15 million equaled 195 million or 97.5 percent of the Continental Dollars ever emitted. The remaining 5 million were due in the future from Georgia which, having been invaded, was temporarily exempt from sending remittances. The states were also allowed to substitute one Spanish silver dollar in lieu of 40 Continental Dollars when filling their quotas. The 18 March 1780 resolution did not remove the option citizens had to redeem their Continental Dollars directly at the Continental treasury for their face value in specie as stated in the 29 July and 26 December 1775 resolutions and in congressional discussions on 14 June 1779.²⁷ The tax implications of this change placed it well beyond what was feasible, or historically acceptable. If Continental Dollars were taken at face value, the tax rate per capita per year would be \$79.20 for 1780. If using the 40 to 1 specie substitution rate, it would still be \$1.98.

²⁵ Grubb (2008a); *JCC* (v. 14, pp. 1013-4; v. 15, pp. 1019, 1053, 1171, 1324).

²⁶ That the public and Congress were concerned about the fiscal credibility of these changes is revealed in the front-page editorial in the *Pennsylvania Gazette*, 19 May 1779, and in the address to the public by John Jay, President of Congress, 13 September 1779 (*JCC* v. 15, pp. 1051-62; *Pennsylvania Gazette*, 29 September 1779). See also Sumner (1968, v. 2, pp. 76-7).

²⁷ Ferguson, *et al.* (1973, v. 1, p. 194); *JCC* (v. 14, p. 728; v. 16, pp. 262-7). This act was reprinted in the *Pennsylvania Gazette* on 29 March 1780.

The 2 January 1779 and 18 March 1780 congressional resolutions had some good consequences. Congress reassured the public that the basic design of the Continental Dollar was what the public had been told in 1775. The Continental Dollar was a zero-interest bearer bond with fixed future redemption dates. It was to be redeemed through state taxes by those dates or exchanged by citizens at the national treasury for specie at its face value after those dates. By applying the same redemption interval to all Continental Dollars—past, present, and future—the 2 January 1779 and 18 March 1780 resolutions also solved the problem of Continental Dollars from different emissions trading at different present values in the marketplace.

Three bad consequences, however, came with the 2 January 1779 and 18 March 1780 resolutions. First, by changing the redemption dates of past emissions, Congress was passing ex post facto laws. This created the possibility that Congress could change the present value of its debt obligations at will, creating uncertainty and risk in holding these obligations. Second, while the redemption dates for the two 1775 emissions were spread over four-year windows, the redemption dates in the 2 January 1779 resolution were spread over a 19-year window. No mechanism to determine which Continental Dollar would get redeemed in which year was established. A four-year redemption window was a minor inconvenience. A 19-year window created substantial uncertainty and forecast error in calculating the present value of Continental Dollars. A Continental Dollar in early 1779 could be worth as much as 99 percent or as little as 34 percent of its face value, see Figures 3 and 4. This problem was solved by the 18 March 1780 resolution that required complete redemption over the next 13 months, but only by making the fiscal commitment to redemption at face value impossible.

Third, the 2 January 1779 and 18 March 1780 resolutions established redemption procedures that were not fiscally credible, see Table 2. To meet the redemption schedules

imposed on the states in 1779 and 1780, or the schedule the states actually did meet in the 1780s, tax rates per capita per year had to be well above what had been historically acceptable, and/or states had to acquire Continental Dollars at substantially depreciated values. The two years when the states remitted the most to the national treasury were 1781 and 1782, namely 53,690,923 and 24,506,561 Continental Dollars in face value, respectively.²⁸ The per capita per year tax rates needed to raise these two sums, if Continental Dollars were to be retired at face value, were 57.6 and 26.3 times higher than the average per capita per year tax rate of \$0.41 in the colonies for all taxes levied between 1770 and 1774. Alternatively, to hold the average per capita per year tax rate at \$0.41 solely for acquiring the Continental Dollars that actually were redeemed would entail acquiring Continental Dollars at depreciated rates, namely 57.6 Continental Dollars equal to \$1 in specie for 1781 and 26.3 Continental Dollars equal to \$1 in specie for 1782.

When states set the specie value of new taxes impossibly high then, barring tax revolts, citizens had to liquidate goods, land, and bonds (Continental Dollars) to acquire the specie needed to meet these new taxes, thereby driving down the specie price of goods, land, and bonds. As such, Continental Dollars would trade for specie at rates below their current present-value, namely at depreciated rates. The states could now accept Continental Dollars for tax payments at these depreciated rates rather than at their present value (at their face value for those reaching maturity). In the 1780s, the U.S. experienced deflation in the specie value of goods and land, as well as tax revolts related to this deflation.²⁹ State compliance with congressional changes in the redemption of Continental Dollars contributed to this post-war depression.

The 2 January 1779 and 18 March 1780 resolutions forced depreciation, as opposed to

²⁸ Grubb (2011).

²⁹ See Holton (2007). Alternatively, this outcome could be described as the new state taxes forcing citizens to discount Continental Dollars at rates well above the market rate of 6 percent which, in turn, reduced their current present-value below their true par value.

time-discounting, onto the Continental Dollar. The only way a state could redeem Continental Dollars in the amounts required by these resolution was to acquire them at depreciated values. A state could not effectively do this without enacting tax codes that violated the legal tender equivalence between specie and Continental Dollars in state law for paying state obligations. On 20 March 1780 Congress recommended that the states revoke the Continental Dollars' legal tender status in state law. From late 1780 through mid-1781 the states complied. The Continental Dollar monetary system collapsed shortly thereafter.³⁰

Ignorance and Confusion

Did Congress and the public understand how a zero-interest bearer bond with fixed future redemption dates would function as money? Did they comprehend time-discounting? Did they know why redemption intervals had to be fiscally credible? Benjamin Franklin knew. On 13 January 1764, in his longest surviving speech, Franklin explained to the Pennsylvania Assembly time-discounting and the role interest rates played when money had a bearer bond structure supported only by future redemption dates. On 13 February 1767, Franklin accurately described the de facto zero-interest bearer bond structure of the 1733-65 Maryland paper pound. In 1775, Franklin advised Congress that the Continental Dollar should pay interest if its present value was to equal its face value in contemporaneous transactions, advice Congress did not take.³¹

As shown in Figures 3 and 4, traders in the marketplace acted as if they knew. This outcome may not be that surprising given that there were ample precedents and numerous

³⁰ See *Laws of the State of Delaware* (1797, v. 2, pp. 718-9); *Acts of the Council and General Assembly of New-Jersey* (1784, p. 157); Hening (1969, v. 13, pp. 412-3); *JCC* (v. 16, p. 269); *Statutes at Large of Pennsylvania* (1904, v. 10, pp. 204-5, 228-9, 247-9, 337-44). Newspaper price currents, merchant account books, and George Washington's account book all stopped quoting prices in Continental Dollars in May of 1781 (Bezanson 1951, pp. 12, 344; Breck 1843, p. 16; Ferguson 1961, p. 66; Webster 1969, p. 502).

³¹ Oberg (1992, pp. 354-6); Labaree (1967, v. 11, pp. 7-18; 1970, v. 14, pp. 35-8). Pelatiah Webster also knew. In an essay published in the *Pennsylvania Evening Post*, 5 October 1775, he asked in reference to the Continental Dollar, "Why should the soldier...be paid in promises, which are not so good as money, if fulfilment is at a distance?" (Webster 1969, pp. 1-2).

contemporary examples of similar paper monies. The 1733-65 Maryland pound was a de facto zero-interest bearer bond. The Connecticut pound from 1755 through mid-1780, the Rhode Island pound from 1756 through 1782, the New Hampshire pound from 1760 through mid-1780, and the Massachusetts pound from mid-1775 through 1780 all had bearer bond structures with fixed future redemption dates—sometimes paying interest and sometimes not—often with the redemption dates and interest rates printed directly on the bills. On 18 March 1780 Congress asked the states to replace the Continental Dollar with the "Continental-State" Dollar—a state-specific paper money. Congress designed the Continental-State Dollar to be like the Continental Dollar except that it paid interest. Congress acted as if it had finally adopted Franklin's advice from 1775.³²

Finally, the language printed on the Continental Dollar differed from that printed on the paper monies issued before the revolution in New York, New Jersey, Pennsylvania, Delaware, and Virginia. Continental Dollars said on their face, "This bill *entitles the bearer to receive* [an amount in] Spanish milled dollars...according to the resolutions of Congress...." By contrast, colonial bills often said on their face, "This bill *shall pass current* for [an amount] within the Province of..."³³ Language mattered and was used carefully. People saw the difference. Wholesale ignorance and confusion seem hard to sustain given this evidence.

On the other hand, many congressmen who were present in July 1775 later spoke as if they did not understand time-discounting nor understood what they had created in 1775. After 1775, many new congressmen acted as if they were ignorant of what Congress had created in 1775, or acted as if they did not understand time-discounting and the reasons behind the 1775 structural design of the Continental Dollar. Only 22 percent of the congressmen who passed the 2

³² Grubb (2008c); *JCC* (v. 16, pp. 264-5); Newman (1997, pp. 99-110, 202-11, 233-40, 387-96).

³³ Newman (1997). Italics added.

January 1779 resolution, and only 11 percent who passed the 18 March 1780 resolution, were present in Congress in July 1775 when the structural design of the Continental Dollar was created. In addition, only 25 percent voting on the 18 March 1780 resolution had been present to vote on the 2 January 1779 resolution. Thus, ignorance, or a lack of institutional memory, may explain a lot of Congress' culpability in the collapse of the Continental Dollar.³⁴

The congressmen who were present in both July 1775 and either January 1779 or March 1780 were also those who had acted earlier as if they did not understand time-discounting and what a zero-interest bearer bond money entailed. The first congressional committee to investigate reports of depreciation was formed in November of 1775. It was comprised of John Jay, Benjamin Franklin, Samuel Adams, Thomas Johnson, George Wythe, Edward Rutledge, and Thomas Jefferson. This committee recognized that Continental Dollars were being accepted at below their face value, but the resolution and published announcement that was adopted did not explicitly condemn such. It only condemned the non-acceptance of Continental Dollars.³⁵

On 19 April 1776 a congressional committee was created to ascertain the comparative value of different silver and gold coins. The committee consisted of James Duane, George Wythe, John Adams, Roger Sherman, Joseph Hewes, Thomas Johnson, and William Whipple. Thomas Jefferson joined the committee on 24 July 1776. The committee's report, both on 22 May 1776 and again on 2 September 1776, went beyond its mandate. It offered resolutions that said holders of Continental Dollars were entitled to receive their face value in specie from the treasury at the future redemption dates appointed by Congress, but also said that Continental Dollars must pass current at their face value in specie in contemporaneous transactions. These congressmen did not see the contradiction in their report and so were acting as if they did not

³⁴ *JCC* (v. 2, pp. 161-2; v. 13, p. 23; v. 16, p. 267).

³⁵ See fn. 19.

comprehend time-discounting.³⁶

The committee's resolution was not acted on until after Franklin left for France. As long as Franklin was in Congress resolutions against depreciation did not pass. On 14 January 1777 Congress finally passed the committee's resolution condemning as enemies those who accepted Continental Dollars below their face value in specie in contemporaneous transactions. Of those congressmen voting on this resolution, only about a third had been present in July 1775 when the Continental Dollar's structural design was created. Looking forward, only 21 and 9 percent of those voting in January 1777 would still be present when the 2 January 1779 and 18 March 1780 resolutions were adopted, respectively. After 1776, the rhetoric surrounding the Continental Dollar slid toward the dominant contemporary view of fiat currencies. The Continental Dollar was increasingly viewed as just another fiat currency backed by contemporaneous taxes whose current value was determined by its quantity in excess of that needed to transaction current trade. This rhetoric became the accepted history of the Continental Dollar.³⁷

Conclusion

The history of the Continental Dollar shaped the debates and decisions at the 1787 Constitutional Convention regarding monetary powers in the new *U.S. Constitution*. On 16 August 1787 the Convention explicitly voted to remove the power to emit paper money, i.e. the Continental Dollar, from the list of constitutional powers granted to Congress—a power Congress had enjoyed under the *Articles of Confederation* and in the draft constitutions at the

³⁶ *JCC* (v. 4, pp. 294, 381-3; v. 5, pp. 608, 724-8).

³⁷ See fns. 2 and 36; *JCC* (v. 2, pp. 161-2; v. 6, p. 1046; v. 7, pp. 35-6; v. 9, pp. 953-8, 989; v. 16, p. 263). Congress' continuing ignorance about how the Continental Dollar was designed to work, and failure to comprehend time-discounting, is illustrated in John Jay's address to the public as President of Congress on 13 September 1779 (*JCC* v. 15, p. 1054; *Pennsylvania Gazette*, 29 September 1779). In 1780 and 1782, John Adams and Gouverneur Morris, respectively, revealed that they either did not remember or did not understand how the Continental Dollar that they had participated in creating in 1775 was designed to work (Ferguson, *et al.* 1978, v. 4, pp. 353-4; Lint 1996, v. 9, pp. 427-96). In 1781 and 1783, Robert Morris revealed that he did not know, or did not understand, the structural design of the Continental Dollar (Ferguson, *et al.* 1973, v. 1, pp. 149-52; 1995, v. 8, pp. 452-5). See also Oberg (1992, v. 29, pp. 354-6); Webster (1969, pp. 1-8).

Convention up to that point. The Convention, however, did not recount the history of the Continental Dollar or any specifics about Congress' paper-money policies. The delegates offered only general statements about "mischiefs" that caused "disgust" with paper money.³⁸

The analysis here suggests that those mischiefs may not have been what many founding fathers thought they were. Instead, they were occasioned, in part, by the failure of many of these same founding fathers to understand time-discounting and the zero-interest bearer bond structure of the Continental Dollar that they, or their peers, had created. The mischiefs that followed from this lack of understanding were the passage of ex post facto laws in 1779 and 1780 that changed the redemption dates of Continental Dollars, and hence their present value, in ways that were not fiscally credible in terms of retiring Continental Dollars at face value.

³⁸ Farrand (1966, v. 2, pp. 308-10).

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