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# Re-examination of the Theoretical and Historical Evidence Concerning Colonial New Jersey's Paper Money, 1709–1775: A Further Comment on Grubb

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[LINK TO ABSTRACT](#)

In Michener (2019a) in this journal, I pointed out several egregious econometric errors in Grubb (2016a), an article in the *Journal of Economic History* on New Jersey's colonial money. The present rejoinder is the latest of a lengthy series of comments I have authored or coauthored pointing out errors in articles Grubb has published concerning the monetary history of eighteenth-century America. I prefaced my most recent comment, Michener (2019a), with a long discussion of my motives, explaining how Grubb's mistaken notions, if allowed to stand unchallenged, would distort our understanding of the economic history of the era, including our understanding of the discontent that led to the American Revolution. Grubb (2020, 72), ignoring that lengthy discussion, countered with his own interpretation of my motives, suggesting that I am in the grip of some "unnatural, unseemly, and weirdly personal" obsession that somehow dates back more than 40 years, when, blissfully unaware of one another, we overlapped briefly as students at the University of Chicago.

Grubb prefaced his rebuttal by relating the history of our dispute, the "back story." Here is the back story from my perspective. For the last 15 years Grubb has dismissed my critiques, both publicly and privately, as no more than the ravings of

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a malcontent pursuing a vendetta. Grubb's network of friends and acquaintances in economic history is much more extensive than mine, and he has methodically exploited his standing in the profession to defame me. Until 2018, I toiled away struggling to counteract his rewriting of colonial history, but I eventually concluded that my approach up to 2018 was insufficient to bring about the necessary correction. Economists, I came to realize, were never going to immerse themselves in the eighteenth-century documents that would reveal that Grubb peddles something closer to fantasy than history. Accordingly, in Michener (2019a; b) I switched my focus to econometrics and wrote two comments highlighting the shoddiness of Grubb's empirical work, hoping that journal editors and his colleagues at the NBER, more skilled at parsing econometrics than colonial American history, might come to realize that Grubb was publishing nonsense with their imprimatur. To encourage others to re-examine Grubb's empirics, I included a [link](#) to the data and do files (Michener 2019a, 212).

Grubb (2020) hotly disputes many of the specific criticisms in Michener (2019a), and, although I shall eventually return to discuss some of them, I am reluctant to drag the reader into that briar patch just yet. Instead, I note that Grubb (2020, 76–77) carefully puts some distance between himself and his econometrics: the data set is short, the variables are measured with error, trustworthy standard errors are difficult to generate, and the econometric results were “ancillary to the core results,” namely, the agreement between the levels of APV and MEV. Indeed, he goes so far as to defend the decomposition model he estimates as an identity (*ibid.*, 77). The heart of Grubb (2016a), as I read Grubb's 2020 rebuttal, lies in the historical analysis and the theoretical model; hence, even if the reader finds fault with his econometrics, nothing substantive has been undermined. Taking this at face value, let me turn my attention to the deficiencies in Grubb's theoretical model and historical analysis.

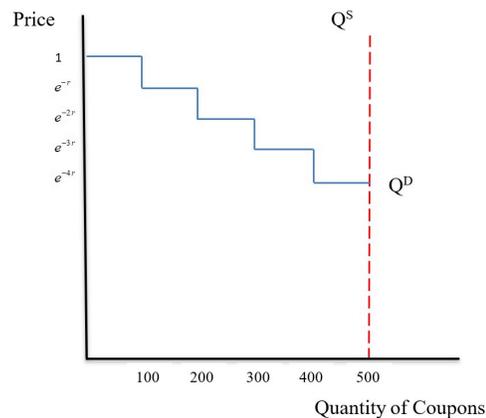
## **Grubb's theoretical measures and their weaknesses: APV**

In summarizing what he describes as a “promising new approach to understanding colonial paper money,” Grubb (2016b, 183) advocates “treating the paper money of most colonies as zero-coupon bonds rather than as fiat currency, and assuming its value is primarily determined by its asset present value.” Grubb introduces a measure he calls APV (Asset Present Value), which is computed by discounting the value at which colonial governments received their own paper money at the colonial treasury. Practically all the market value of colonial bills

of credit, he contends, can be explained as arising from the intrinsic value the bills possessed considered merely as ersatz discount bonds. Applying this to New Jersey, Grubb (2016a; b) computes the APV of New Jersey bills and then compares it to their MEV (Market Exchange Value). The econometric flaws in this comparison were the subject of my comment (Michener 2019a).

APV, Grubb's method of inferring the intrinsic value the bills possessed considered merely as discount bonds, is, moreover, theoretically flawed. The problem is most easily understood by computing APV for a simple hypothetical security, coupons, that are valued simply because they can be used to extinguish tax liabilities. In this example, the government levies a tax of \$100 a year in perpetuity, which may be paid in cash or in coupons. Each coupon you tender to the tax collector reduces your tax bill by a dollar; there is no other use for the coupons. Suppose there are 500 coupons in existence. What is the value of such a coupon in the first period? Grubb (2016a, 1221, 1224; 2016b, 168–170) infers its value in the following manner: One hundred coupons would be tendered in taxes in the first period, another hundred in the second, and so on until at the end of five years all the coupons have been redeemed. Because you do not know when any particular coupon will be presented, the expected payoff per coupon, discounted at the interest rate  $r$ , is  $APV = (1/5)(1 + e^{-r} + e^{-2r} + e^{-3r} + e^{-4r})$ .

My approach to inferring the value of a coupon in the first period begins with the demand curve for coupons. The derivation is straightforward. No one would pay more than one dollar for a coupon, but if you sold coupons for one dollar, you could sell as many as 100 coupons. At any price  $e^{-r} < p < 1$  you'd sell exactly 100 coupons. At a price of  $e^{-r}$  you could sell as many as 200 coupons, and at any price  $e^{-2r} < p < e^{-r}$  you'd sell exactly 200. At a price of  $e^{-2r}$  you could sell as many as 300 coupons. Once the price fell to  $e^{-3r}$  you could sell as many as 400 coupons, and so on. The demand and first period supply curves look like this:



**Figure 1.** Demand and first period supply curves

This analysis shows that the market value of one of these coupons in the first period would be  $e^{-4r}$ , not APV. Hence, APV overestimates the value coupons possessed as discount bonds. The demand curve can deliver further insights. At the beginning of the second period, the demand curve is the same, but the supply curve shifts in to 400, boosting the price to  $e^{-3r}$ . Similarly, at the beginning of the third period supply shifts in to 300 and the price of each coupon rises to  $e^{-2r}$ ; at the beginning of the fourth period, the price is  $e^{-r}$ , and in the fifth and final period, one. The coupons' value rises by the rate of interest each period and satisfies the terminal condition that price in the final period is one; the demand analysis reveals the coupons' value behaves precisely like the value of any other discount bond. To concede that such coupons would appreciate at the rate of interest would be utterly fatal to Grubb's argument. Grubb (2016b, 174–178) acknowledges as much when he touts the stability of APV as a virtue of his theory, on the grounds that it reconciles discounting with the observed stability in the value of colonial currencies.

Perhaps the greatest insight of neoclassical economics is that value is determined on the margin, and APV's conceptual flaw is that it violates this fundamental principle. Indeed, each of these hundred-coupon tranches corresponds precisely to one of Eugen Böhm-Bawerk's (1891, 149–153) famous sacks of corn, an early and classic illustration of marginal utility analysis. Böhm-Bawerk describes a farmer with 5 sacks of corn: "One sack he absolutely requires for the sustenance of his life till the next harvest. A second he requires to supplement this bare living to the extent of keeping himself hale and vigorous." The third sack is set aside "to feed poultry. A fourth sack he destines to the making of coarse spirits." The fifth sack serves only to feed "a number of parrots, whose antics amuse him." On a scale of importance, the farmer is said to assign a value of 10 to the sustenance of his life; 8 to the maintenance of his health, 6 to the improvement of his fare by adding meat, 4 to the enjoyment he derives from the liquor, and 1 to the amusement provided by the parrots. Should he lose a sack of corn, Böhm-Bawerk reasoned, the man would forgo the pleasure of keeping the parrots, and "he will rightly value a *single* sack of his stock according to this unimportant utility. And not only one sack, but every single sack; for, if the sacks are equal to one another, it will be all the same to our farmer whether he lose sack A or sack B, so long as, behind the one lost, there are still four other sacks for the satisfying of his more urgent wants." Grubb's APV logic, however, would value the five sacks of grain possessed by Böhm-Bawerk's farmer not at one, but rather at  $.20*(10+8+6+4+1) = 4.8$ .<sup>2</sup>

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2. In Michener (2019a, 192), citing an unpublished working paper, I casually mentioned that Grubb based APV on its average utility rather than its marginal utility, putting his theory on the wrong side of the

Ergo, APV, the theoretical linchpin of Grubb (2016a; b; 2018a), Celia and Grubb (2016), and Cutsail and Grubb (2019), does not measure the value these securities possessed considered as discount bonds. Without the linchpin, the wheels fall off Grubb's research agenda.

Without other problematic steps in computing APV, even the abovementioned flaw would not have made APV large enough to align New Jersey's APV with MEV as Grubb calculates it. To understand what else Grubb did to boost APV requires a more detailed investigation of APV. Grubb's calculated values of APV are more intricate than the example used above to illustrate the theoretical shortcomings of APV. Grubb's (2016a, 1224) general formula for APV is  $APV_i = \sum_{t=i}^T \left( \frac{RED_t}{M_i} \right) e^{-rt}$ , where  $M_i$  is the face value amount of New Jersey bills outstanding in year  $i$ ,  $r$ , is the interest rate (which Grubb takes to be either 6 or 8 percent),  $RED_t$  is the face value amount of New Jersey bills redeemed and retired from circulation each year, and  $RED_T$  is the amount in the last year of redemption that satisfies  $\sum_{t=i}^T (RED_t / M_i) = 1$ .

Therefore, APV is inherently forward-looking: Today's value of APV depends on the path of future redemptions stretching out into the future until all currently extant bills have been redeemed. Although the path of future redemptions envisioned in emitting acts was usually smooth and regular, as in my example, the actual path achieved was not. Tax and loan receipts earmarked to retire bills frequently fell short of expectations, unanticipated demands on the colonial treasury sometimes arose, and imperial reimbursements earmarked to retire bills created for military purposes sometimes failed to materialize. New Jersey's colonial legislature often altered taxes earmarked to retire bills, extended the periods of its bills, and rolled over redemption deficiencies into the next sum of bills emitted. Because decades might pass before New Jersey retired its current stock of bills, this incessant restructuring of redemption plans meant that future retirements were erratic and unpredictable.<sup>3</sup> If one considers bills of credit as

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marginalist revolution and inflating the purported value of bills of credit considered as a discount security. Grubb (2020, 73) responded that I "made that up" and accused me of committing "a fundamental error in microeconomic theory. [Michener] conflates average utility with the *average* of the marginal utilities and conflates marginal utility with the *marginal* of the marginal utilities." Is this anything more than a word salad? Grubb (2019, 402) is less obscure in an earlier rebuttal, however, where he says he "modeled the process as a random draw from a known distribution of payoffs" and that APV is "the average of the marginal utilities of the set of notes available at that point." By this logic, Grubb would clearly value the five sacks of grain possessed by Böhm-Bawerk's farmer not at one, but rather at  $.20 * (10 + 8 + 6 + 4 + 1) = 4.8$ .

3. Grubb (2015) takes a rosy view of New Jersey's success in redeeming its bills in a timely fashion but nevertheless accurately describes many instances where the colony reneged on or restructured its redemption plan. That actual retirements of bills ended up being erratic and unpredictable is not, I believe, a point in dispute.

discount bonds, they were discount bonds with random maturity dates that bond holders would have found exceedingly difficult to forecast.

In computing APV Grubb used realized future retirements to compute APV, as if the public had perfect foresight regarding them. The expectations problem admits to no easy solution, so I am not inclined to fault Grubb for assuming perfect foresight about future retirements. My quarrel is with his decision to silently abandon the perfect foresight assumption in the late colonial period when it mattered most. The value of colonial New Jersey's bills of credit, considered as discount securities, evaporated during the Revolution: They became little more than wastepaper (*The New Jersey Gazette*, 30 January 1786). By replicating the calculations, I determined that Grubb computed his late colonial values of APV on the counterfactual assumption that during the Revolution colonial New Jersey continued to retire their bills of credit according to the previously legislated timetable. Figure 2 (Grubb 2016a, 1223) reveals that Grubb's measured APV is generally under MEV in the late colonial period. Had Grubb applied his assumption of perfect foresight consistently, permitting the fate of New Jersey's bills of credit to be correctly foreseen, APV would have tumbled on the eve of the Revolution, throwing the alignment of APV and MEV seriously out of kilter.

Grubb created his own data series on the New Jersey money supply and redemptions, and he used his own data to compute APV. Both Fuhlbruegge (1937) and Brock (1992) concluded, based on New Jersey treasurers' reports, that on the eve of the Revolution New Jersey had fallen considerably behind schedule in retiring its bills, whereas Grubb's (2015, 34) revised data contradict this assertion and purport to show that New Jersey's retirements were precisely on schedule. By ignoring evidence of lagging retirements in the late colonial period, Grubb boosts APV. Nonetheless, despite the boost Grubb's revisionist data provide to APV, New Jersey's MEV usually exceeds APV in the late colonial period. Grubb's "corrections" to the money supply data hence play a significant role in aligning APV with MEV. Without the boost provided by his data revisions, the two measures would be more severely misaligned, suggesting that in "correcting" the data Grubb manipulated it to support his hypothesis.

The questionable nature of Grubb's "corrected" money supply data is most transparent in his treatment of the robbery of New Jersey's eastern treasury on 21 July 1768. The sum stolen and never recovered was materially important, amounting to roughly two years of revenue from the property taxes levied for the support of government. Grubb (2015, 27 n.13) dismisses the relevance of the robbery for his calculations, denying it influenced the local money supply, arguing that 91 percent of the money in the treasury was in pounds sterling, part of the recently received parliamentary donations to the colonies, and therefore that most if not all of what was stolen undoubtedly consisted of "sterling" and not New Jersey

bills of credit. This is demonstrably wrong; almost all the stolen money consisted of New Jersey bills of credit, bills that would have been retired but for the robbery. The treasurer described exactly what was stolen in an official affidavit submitted four days after the robbery (*NJ Archives*, 10:37–39).

Overlooking the affidavit would be a regrettable blunder, but Grubb's clumsy rationalization leads one to conjecture that the error was purposeful. The New Jersey treasury never possessed any cash in "sterling." New Jersey placed the sterling-denominated donations Parliament provided into a London account; New Jersey's treasurers drew on the account by selling bills of exchange on London (*NJ Laws*, 4:10). New Jersey's treasurers used proceeds from the sale of bills of exchange to retire bills of credit, temporarily freeing the populace from the taxes earmarked to retire them. *Grubb maintains that in 1765, three years before the robbery, the colony, having exhausted the last of its parliamentary donations, resumed retiring bills of credit with taxes* (Grubb 2016c, 155–156 Table 6, 156 n.c). Furthermore, Grubb (2016c, 144–146 Table 3, 146 n.b) credits the colony with receiving and applying the full value of the parliamentary donations, which is impossible to square with his statement in Grubb (2015, 27 n.13) that a portion of it had been lost in the robbery.<sup>4</sup>

Grubb's APV estimates required a final feat of legerdemain, empirically the most important of all. Colonial New Jersey never fully retired an existing emission before a new one was made.<sup>5</sup> Jersey bills designed to be retired at different dates, bills easily distinguished by their inscriptions, circulated alongside one another. To extend my coupon example, it is as if the original 500 coupons were printed on blue paper, and after two years passed an additional 500 coupons, printed on red paper, were introduced. This raises a host of potential complications. Did people anticipate that 500 new red coupons would appear before the blue coupons had been retired? Are the new red coupons and the blue coupons fully fungible and perfect substitutes for one another or are they two distinct securities potentially bearing different prices? Does the introduction of the red coupons affect the value of the blue ones, and if so, how?

Grubb treats changes in the money supply as perfectly foreseen, an assumption that would imply people saw the red coupons coming. I would not

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4. The treatment of parliamentary donations in Grubb (2016c) is also wrong. The eastern treasurer drew on the donations by selling bills of exchange on London, but he did not use all the proceeds to retire bills as Grubb says he did. Instead, he loaned out considerable sums of the proceeds to cronies, taking their bonds. Some of these loans were still outstanding in the 1770s. This is yet another reason that New Jersey's retirement of bills of credit lagged in the decade before the Revolution. Evidence that the treasurer loaned the colony's money to cronies is buried in the archives and is not generally known, making this a subtle error, unlike the stark contradiction between the account in Grubb (2015) and that in Grubb (2016c) of the parliamentary donations (Michener 2018, 24–26).

5. "Typically, colonies would authorize a new emission before the prior emission had been removed from circulation" Grubb (2016b, 174).

dispute this. That new emissions would occur before the previous ones had been completely retired was almost inevitable, just as it is inevitable today that whenever the federal debt ceiling binds, the U.S. government will raise it. Although the language of emitting acts suggests that the bills were not fungible—in terms of my example, that certain taxes could only be paid with blue coupons and others could only be paid with red coupons—Governor Franklin wrote a lengthy letter explaining that enforcing such a distinction was impossible, and that New Jersey’s treasurers accepted the bills indiscriminately (*NJ Archives*, 10:316–317). In terms of my example, the treasurers accepted red coupons in payment of blue coupon taxes and vice versa. Consequently, at the end of their stated term some blue coupons remained outstanding, red coupons having been retired in their place.

Fungibility is a difficult issue for Grubb to finesse. To dispute Franklin’s testimony and insist the bills were not fungible would mean bills of different emissions, my red and blue coupons, were distinct securities. If red coupons could only be used to pay red coupon taxes and blue coupons to pay blue coupon taxes, the coupons would possess different maturity dates and under Grubb’s hypothesis ought to have borne different prices, just as modern treasury bills with different maturity dates bear different prices. There is no evidence to support the proposition that New Jersey bills of different emissions—my blue and red coupons—possessed different values. Grubb tacitly agrees: His measures of APV or MEV are presented as measures for all New Jersey bills, with no distinction made between bills emitted on different dates. Because the bills/coupons were fungible and the infusion of red coupons displaced blue coupons in tax receipts, as Governor Franklin testified, the redemption of the original blue coupons would have dragged out over more than 5 years, which even by Grubb’s flawed logic would alter the distribution of payoffs of the blue coupons, reducing their value as discount bonds. Grubb, however, computes APV as if the fully anticipated creation of red coupons has no effect on either the retirement or value of blue coupons.

If the coupons are perfectly fungible, what effect *would* the infusion of red coupons have on the value of the existing blue coupons? If we adopt the perfect foresight assumption that underlies most of Grubb’s calculations, the answer can be worked out in various ways. One way is to use a supply and demand analysis but doing so is intricate. One must use backwards induction and then keep in mind that in the initial periods before the red coupons arrive, the demand curve shifts each period as the waiting time until their arrival shrinks. A more transparent demonstration comes from noting that the coupons are an exhaustible resource, and their value follows the well-known Hotelling rule (Hotelling 1931). The coupons’ value increases at the rate of interest subject to the terminal condition that the value in the final period is one. If it is known in advance that the red coupons will arrive before the blue coupons can be exhausted, the situation is precisely the

same as if 1,000 coupons had been created initially; hence, the anticipated arrival of 500 fungible red coupons in period three reduces the initial period value of blue coupons from  $e^{-4}$  to  $e^{-9}$ .

The Revolution upended the colonial government, consigning New Jersey's bills of credit to oblivion. If New Jersey bills had possessed no value as a medium of exchange, if they had had no value beyond the value they possessed as discount bonds accepted in lieu of taxes, their value would have been zero under the admittedly unrealistic assumption of perfect foresight. The conclusion follows from considering the bills as analogous to the coupons described above and applying the Hotelling rule. The terminal value of New Jersey's colonial currency was zero, and the discounted value of zero is zero.

Even if one hesitates to treat the Revolution and repudiation of New Jersey colonial currency as foreseen, no one thought in 1774 that the New Jersey treasurer would be retiring the last New Jersey bill anytime soon. In 1774, the colony passed a law creating a new loan office designed to loan out new bills for a twenty-year term (*NJ Laws*, 5:212–234). In early 1776 the loan office commenced making loans. Hence, chances were nil that New Jersey bills would all be retired before 1796. The present value of a discount bond, discounting at six percent over a twenty-year term, would be about 30 percent of its face value, a number that falls to 9 percent of its face value over a forty year term (that is, discounting back to 1756), and to under 3 percent of its face value over a sixty year term (that is, discounting back to 1736). If we consider New Jersey bills of credit as no more than a discount bond even that valuation is generous: It requires that New Jersey's colonial government not be overthrown, that the bills authorized in 1774 are retired on schedule, and that the bills authorized in 1774 would be the last bills the colony of New Jersey ever created. Even if the Revolution was entirely unforeseen, the value of New Jersey bills, considered merely as discount bonds, had to be a negligible fraction of their face value.

## **Grubb's theoretical measures and their weaknesses: MEV**

MEV, or market exchange value, is the value a bill of credit possessed in everyday transactions expressed as a percentage of the value at which it was received at the colonial treasury. In the late colonial period, it took 7 shillings and 6 pence in New Jersey bills of credit to purchase a Spanish silver dollar, but Grubb believes that New Jersey's treasury accepted New Jersey bills at a premium, treating each 6 shillings in bills as equivalent to a Spanish dollar. For purposes of illustration,

let us pretend this is true. MEV would have been  $100 \cdot 6 / 7.5 = 80$ ; that is, the value of New Jersey bills in everyday transactions would have been 80 percent of their value at the treasury. The difference between the value at the treasury and the value in ordinary transactions, 20 percent in this example, Grubb attributes to discounting. To understand why Grubb believes that the New Jersey's treasurers accepted New Jersey bills at a premium requires a discursion into colonial history.

Attempting to forestall deflation and acquire precious metals, the American colonies sporadically engaged in competitive devaluation by raising the nominal values of the specie coins circulating there. Queen Anne attempted to halt the practice by issuing a proclamation in 1704 that prohibited colonies from rating Spanish dollars at any rate above 6 s. Because Spanish dollars were officially rated in Great Britain at 4 s. 6 d. sterling, the par of exchange associated with rating dollars at 6 shillings was £133.33 proclamation = £100 sterling.<sup>6</sup> In the eyes of imperial authorities, “proclamation money” meant, by definition, money as defined by this rule.

The proclamation and a subsequent act of Parliament designed to enforce it were, for the most part, ignored and openly defied in the colonies. Pennsylvania, unlike other colonies, made an effort to revalue its currency to comply with Queen Anne's proclamation, and Pennsylvania's first paper money, issued in 1723, was ostensibly designed to circulate at that value (Brock 1975, 158–162).<sup>7</sup> Although Pennsylvania persisted in calling its paper money “proclamation money,” the pretense quickly wore thin. In 1755 Robert Hunter Morris, Pennsylvania's governor, confronted the Pennsylvania Assembly declaring “it is known to you, and every One, that *Spanish* Pieces of Eight [dollars] do now, and for a Number of Years have passed, and been current, at *Seven Shillings* and *Six-pence*, when that Act requires, that they should pass for *Six Shillings* only...from whence it appears, that tho' you call your Paper Bills Money according to Queen ANNE'S Proclamation,

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6. The imperial definition of “proclamation money” used here is consistent with previous scholarship but subtly different from the one used by Grubb (Davis 1900, 1:39–40; Nettels 1934, 242, 246; Brock 1975, 130–167; Ernst 1973, 23; McCusker 1978, 126; Hart 2005, 269). Grubb (2016c, 156 Table 6 notes) equates 1£NJ to \$3.4235, which would be at the rate of 5.842 shillings per dollar, instead of 6 shillings, the value set out explicitly in the text of Queen Anne's proclamation. Elsewhere, he appears to adopt the conventional value: Grubb (2015, 18 Figure 1) states that six shillings was the rate in New Jersey money for 0.875 ounces of silver, the weight of a full-bodied Spanish dollar. He concludes, however, that the par exchange rate implied by this valuation is 1.3275 to 1, whereas all previous scholarship and the understanding of the colonists was that the par implied by this valuation was  $1\frac{1}{3}$  to 1. It appears to this author that Grubb arrived at the latter conclusion by comparing silver weights without properly adjusting for the difference in purity of Spanish silver and sterling. The novelty of his redefinition is jarring, but the difference is too small to be important.

7. “Ostensibly” because Pennsylvania had overrated gold relative to silver and because Pennsylvania's paper money initially passed at a discount with respect to gold as well as silver (MacKinney 1931–1935, II:1490, III:1830–1831; McCusker 1978, 176; *A Dialogue* 1725, 1; Brock 1975, 161 n.67).

it is really not so, but Twenty-five *per Cent* worse” (MacKinney 1931–1935, 5:1345–1346).<sup>8</sup>

Pennsylvania issued its paper money, styled as proclamation money, in 1723, and a year later New Jersey, which had mostly retired its previous bills of credit, resorted to the printing press once again, creating its first land bank. New Jersey issued this money and all its subsequent paper money as Pennsylvania did, that is, ostensibly in compliance with the imperial standard. This accounts for the inscription on the bills to which Grubb assigns great significance; namely, that the bills should “pass current” (that is, be paid and received) at a rate such that only 6 s. in bills would be required to purchase a Spanish dollar (Newman 2008, 249–258).<sup>9</sup> As Pennsylvania’s proclamation money increasingly diverged from the imperial standard, however, the everyday meaning of the phrase “proclamation money” in New Jersey followed the *de facto* standard established by Pennsylvania, not the imperial standard. By 1750, New Jersey’s citizens used the phrase “proclamation money” to *signify* dollars at 7 s. 6 d., the rate at which Pennsylvania and New Jersey’s bills of credit passed in ordinary transactions.<sup>10</sup> Even Grubb (2015, 26 n.7) acknowledges that by the early 1750s 7 s. 6 d. was the “customary current value” of Jersey bills.

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8. In 1764 this sentiment was echoed by Ben Franklin. Speaking of Pennsylvania’s bills of credit, he said: “At present every Bill that I receive tells me a Lie, and would cheat me too if I was not too well acquainted with it. Thirty Shillings in our Bills, according to the Account they give of themselves should be worth five Dollars; and we find them worth but four” (Franklin 1967, 13).

9. The “pass current” language in the inscription was used for all bills issued after 1724. The bills issued in 1724 bore a slightly different inscription, one that stated they would be accepted “by the respective Treasurers, and the Commissioners of the several Loan-offices in the Province, in all public Payments, and for any [Fund] at any time in the Said Treasuries and Loan Offices.” (Newman 2008, 249–258). This wording is more congruent with Grubb’s hypothesis, but the 1724 bills were widely counterfeited and were exchanged in 1728 for new bills bearing the “pass current” inscription, omitting any reference to public payments.

10. This language can be found in various accounts of the Board of Proprietors of the Eastern Division, where dollars are received and paid at the rate of 7 s. 6 d. proclamation money (Lurie and Walroth 1985, III:188, 197, 273). In 1758, Governor Bernard, then Royal Governor of New Jersey, wrote the Board of Trade that pieces of eight [dollars] “cost 7 s. 6 d. proc.” (Bernard to the Board of Trade, 31 August 1758, CO 5/977, f. 185v). In 1760, New Jersey received a portion of a parliamentary donation in dollars, and the treasurer credited those dollars at 7 s. 6 d. each in proclamation money in the accounts he presented to the assembly (New Jersey Assembly 1760, 22). This valuation remained in place at the beginning of the Revolution. In 1775 New Jersey’s Revolutionary government authorized its own paper money, not printed until 1776, the face bearing sums proclaimed to be “proclamation money,” but lacking the traditional statement about its purported equivalence to so many pennyweight and grains of silver. A resolution passed in 1776 establishes the government’s intent, the resolution, adopted unanimously, declaring “that all payments and receipts be made in every part of this state in proclamation money of New-Jersey, at seven shillings and six-pence the dollar.” (Newman 2008, 259; New Jersey Convention 1776, 107). Although briefly interrupted by the Revolution, the practice of basing New Jersey pounds, shilling, and pence on dollars at 7 s. 6 d. reappeared after the cataclysmic wartime inflation (*New-Jersey Almanack* 1787).

That New Jersey's monetary system mirrored Pennsylvania's is unsurprising because they were really the *same* monetary system. With rare exceptions, New Jersey's proclamation bills of credit circulated in Pennsylvania interchangeably with Pennsylvania's own bills of credit from the moment they were issued (*NJ Archives*, 5:154–155, 417; *American Weekly Mercury*, 6 April 1727). Typically, New Jersey bills were paid and received in Pennsylvania on the same terms as Pennsylvania bills, and Pennsylvania bills were paid and received in New Jersey on the same terms as New Jersey bills.<sup>11</sup> It was because New Jersey bills were usually accepted on equal terms with Pennsylvania bills in Philadelphia that “the West Jersey exchange,” as Governor Shirley testified, “is constantly regulated by that of Philadelphia” (*NJ Archives*, 7:398). Indeed, in 1764, when Parliament demanded that each colony report on its currency, including annual prices of bills of exchange since 1749, New Jersey reported “Rates of Exchange at Philadelphia” (CO 323/19 fol. 38r).<sup>12</sup> Hence, there were two inconsistent definitions of “proclamation money” in colonial New Jersey: the imperial definition that said 6 s. in local money should purchase a dollar, and a local definition that treated proclamation money as money according to the common Pennsylvania/Jersey standard, by which (after 1750) 7 s. 6 d. would purchase a dollar.

The chief disagreement between Grubb and myself concerning his calculation of MEV arises from the two inconsistent meanings of the phrase “proclamation money.” New Jersey's bills of credit bore inscriptions that clearly indicated the bills *were supposed to pass current at the imperial standard*, but Grubb's predecessors, doubtless aware that the bills were not commonly paid and received according to the inscription on the bills, treated the inscription as nothing more than a statement of the colony's aspirations. Grubb (2015, 140), however, asserts the inscription established the bills' “specie equivalence for tax purposes,” anchoring their value

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11. A published example of Jersey bills being accepted at face value in ordinary commerce within Pennsylvania can be found in Michener and Wright (2006a, 36). Explicit instances of Pennsylvania bills passing in New Jersey can be found in Stephens (1968) and in Aaron Leaming's (1750–1777) diary. Leaming was a prosperous farmer in Cape May, New Jersey.

12. Occasional exceptions to this rule occurred during Jersey's land bank years. Payments to the New Jersey land bank had to be made in Jersey bills; therefore, for about six weeks around the time that payments fell due possessors of Jersey bills demanded a small premium for them (Morris 1993, 272–273; *JBOT*, 8:439). James Alexander suggested to a friend that Jersey bills would be accepted at a higher value “for six weeks after the 25<sup>th</sup> of March” (*Colden Papers*, III:100). The significance of the 25<sup>th</sup> of March is that the loan office received payments and made loans each spring, and annual payments officially fell due on 25 March (*NJ Laws*, 2:307, 431, 478). Douglass says that in 1738 New Jersey bills were at a 5 percent premium over Pennsylvania bills (Douglass 1740, 16). Once the New Jersey land bank closed in the early 1750s the only payments received by the New Jersey treasurers were tax payments. Taxes could be paid in money as it passed in West Jersey, which meant taxes could be paid in Pennsylvania money, and there was no longer a special demand for Jersey bills. Thereafter Jersey bills seem to have been always treated as equivalent to Pennsylvania's bills of credit in both Pennsylvania and New Jersey.

at redemption. The inscription, he insists, proves that the New Jersey treasurers accepted them according to their inscription, effectively redeeming them at an enhanced value. Because the Jersey treasurers accepted them at a premium, Grubb reasons, New Jersey's bills were not a fiat currency, as Federal Reserve notes are. The distinction, Grubb explains, is that "If you take a Federal Reserve note to the Fed and ask for its real non-money value, they will just give you another Federal Reserve note of equal denomination" (Grubb 2020, 74 n.3).

New Jersey's treasurers, however, did not honor the inscription on the bills. The only evidence Grubb cites to back his claim is the language of the inscription itself, which echoes the lip service paid to proclamation money in the acts emitting it. In 1767 Governor Bernard testified that New Jersey's treasurers provided bill holders no more satisfaction than the modern Fed does.

When I first came to America as Governor of New Jersey, I was placed amongst paper money the most creditable of any upon the continent, never depreciated, & accompanied with a sufficient quantity of silver specie for external trade. And yet thro' all this fair face the ill Consequences of these emissions were very apparent at no great distance. In the first place there was no obligation for redemption at a certain time, notwithstanding instructions to Governors & clauses of bills in pursuance thereof. For before any set of bills were redeemable another Set of bills were emitted with the usual clause of their being a general tender. They therefore were a tender at the treasury for the redemption of expired bills. In vain therefore did the possessor of bills read upon the face of them that he was entitled to a certain quantity of silver; When he applied for it, he might be told that by subsequent laws the silver was turned into paper; and that he would have no right to insist upon being paid in silver, whilst Any Emission of Bills remained unexpired. (Bernard 2013, 388–389)

Neither were New Jersey bills of credit treated as imperial proclamation money when tendered for taxes, despite the inscription printed on them. Indeed, in laying taxes on the populace, New Jersey tax laws adopted after 1750 specified that taxes were to be paid "in Money as it now passes in the Western Division of this colony," (*NJ Laws*, 3:219, 4:13) or (in 1772 and thereafter) in "Proclamation money of this colony" (*NJ Laws*, 5:118, 175, 304). The legislature adopted the most striking and sweeping of these acts in 1760, an act instructing the Treasurer "to receive all and every of the Taxes, hereafter to be raised and levied by virtue of all or any of the Laws of this colony, for levying the respective sinking Funds, in Money as it now passes, or as it may pass, in the Western Division of this Colony at the time of paying all or any of the said Taxes into the Treasury; any Law, Usage or Custom to the Contrary" (*NJ Laws*, 4:13). Douglass (1972/1752, 2:285), described how money passed in New Jersey's Western Division circa 1752:

“At present the West Jersey Money or Currency is in Value equal to that of the adjoining Province of Pennsylvania; the East-Jersey Currency is the same with the adjacent Province of New York; their respective Dealings being almost solely with the respective adjoining Provinces.” In Pennsylvania and West Jersey, Douglass wrote, the “Spanish Dollar passes for 7 s. 6 d. Currency,” whereas in New York a dollar is “8 s. Currency.”<sup>13</sup> In plain English, the law required New Jersey treasurers to treat each Spanish dollar as 7 shillings and 6 pence, not as 6 shillings, notwithstanding “any Law, Usage or Custom to the Contrary.”

A glimpse of the monies received in New Jersey taxes can be had in a letter written by the Eastern division treasurer in 1775. “A considerable part of the last year’s taxes,” he wrote, “[were] paid into the treasury in gold, silver, Pensilvania and Maryland money, which I lodg’d in the hands of different people, in whom I think I can confide, in order to gett chang’d into Jersey money” (Stevens 1968, 11 August 1775, reel 6). This constitutes additional evidence that the New Jersey treasury did not accept Jersey bills at a premium, because it is inconceivable that taxpayers would be so foolish as to pay a “considerable part” of their taxes in cash that did not receive the premium.

The most striking confirmation of how Jersey’s bills were valued at the treasury can be found in a controversy that developed in the late colonial period in New York. New Jersey bills circulated as a medium of exchange not only in Pennsylvania, but also in New York City, where “Jersey money passes...as current as N.Y.” (McCusker 1978, 159 n.102; Michener and Wright 2006a, 27–29). By 1750, the city’s merchants accepted each pound of Jersey’s (local) proclamation money for 1.08333 pounds of New York money, an arithmetically convenient advance corresponding to a premium of exactly 1 d. per shilling.<sup>14</sup> The 8 $\frac{1}{3}$  percent premium struck some New York merchants as excessive. New York’s monetary system was based on rating dollars at 8 s. each, whereas New Jersey’s local proclamation money was based on rating dollars at 7 s. 6 d. Basing the premium on the dollar par, which was common commercial practice, suggested the “correct” premium for New Jersey proclamation money in New York was 6 $\frac{2}{3}$  percent, and several members of New York’s Chamber of Commerce wanted to see the premium reduced to that figure. New York merchant William McAdam broached the matter to the Chamber of Commerce: “[W]as it for the interest of the Community,” he asked, “that Jersey paper Money should pass in this Province

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13. For further confirmation, see Pargellis 1969, 42.

14. Numerous conversions of New Jersey proclamation money to New York money at this rate of conversion, beginning in the late 1740s, can be found in Lurie and Walroth (1985). Moreover, tables showing the value in New York currency of various sums in New Jersey currency, calculated according to this rule, appeared in each edition of *Gaine’s New-York Pocket Almanack* published before 1774. For a specific example, see Hutchins 1772, 36–37.

*higher than it is taken for in the Treasury of the Province of New Jersey[?]*" He then introduced a motion that when members of the Chamber of Commerce "shall pay or receive any Jersey money they shall accept it on the same terms that it passes for in the Jersey Treasury, that is to say—A Bill of £6 Proclamation money for 16 Dollars...[etc.]" Because £6 = 120s., and 120/16 = 7.5, the New York Chamber of Commerce testified that New Jersey proclamation money *was taken at the New Jersey treasury at the rate of 7 s. 6 d. per dollar* (Stevens 1867, 151–152).

Although the New York Chamber of Commerce initially accepted McAdam's proposal, it divided the Chamber, many members resigning over the measure, the heat of the controversy testifying to how important New Jersey bills were as a medium of exchange in the city. Eventually so many members resigned that the Chamber relented. Proponents of the change then induced the New York assembly to pass an act for the same purpose (Michener and Wright 2006a, 13–14 n.3). The act, passed in 1774, began by stating that bills of credit issued in the neighboring colonies, for reasons of convenience, passed in New York as money, and, to the detriment of commerce, they often passed at a higher value than they were issued for by the issuing colony. It then decreed that "after the first Day of May next, No Person shall either pass, exchange, pay or receive any Bill of Credit of any of the Neighbouring Colonies for any Sum, or at any Rate more than the Sum payable therefore at the Treasury of that Colony in which the same was issued" (*NY Laws*, vol. 5, ch. 1654, 638–639). Although the act makes no specific mention of New Jersey, everyone understood that the act targeted Jersey bills. In *Gaine's New-York Pocket Almanack for 1775*, the ever-present table showing the value of New Jersey bills in New York is updated "agreeable to a Law of this Colony." The conversion used in the table applies a  $6\frac{2}{3}$  percent premium when converting New Jersey money to York money, again implying that Jersey bills were accepted at the Jersey treasury at 7 s. 6 d. (Hutchins 1774, 50).<sup>15</sup>

That New Jersey's treasurers accepted New Jersey bills at a premium was one cornerstone Grubb needed to bring MEV into alignment with his conceptually flawed APV, but by itself the supposed premium did not reduce MEV by enough to accomplish that goal. Dollars passed in New Jersey at 7 shillings and 6 pence. If the Jersey treasurers accepted them at 6 shillings each according to their inscription, MEV would have been 80, but even an MEV of 80 is inconsistent with Grubb's

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15. Other evidence confirms that New Jersey's treasurers used local proclamation money, not the imperial variant, in their accounts. When New Jersey's treasurer received a parliamentary donation partly in dollars, those dollars were recorded in the accounts at 7 s. 6 d. in proclamation money (New Jersey Assembly 1760, 22). Also, an account book of the Treasurer of the Western Division has survived, and a random slip of paper folded into the book records the details of how much was received from each of several towns in Gloucester County. An entry for "Gloster Township" mentions a dollar received at seven shillings sixpence (Smith 1762–1774).

computed APV. To align them, MEV had to be reduced even more. Instead of using the value at which dollars passed in New Jersey in calculating MEV, Grubb instead estimated the value of silver in New Jersey by using exchange rate data to infer what it would have cost to import silver from London. Inferring the price of silver in New Jersey from exchange rate data makes little sense because after 1750 Spanish silver dollars circulated in New Jersey at 7 shillings and 6 pence, which tells us the value of silver in New Jersey. Inferring the value of silver from the exchange rate data is treacherous both because exchange rate data are exceedingly sparse and because when exchange rates are between the specie import and export points there is no precise arbitrage condition that can be used to infer the price of silver.

Grubb's approach, however, permits him to whittle MEV down from 80 to a post-1750 average of about 74. When I made this point in Michener (2019a, 193), Grubb (2020, 73) accused me of inconsistency on the grounds that I argue elsewhere in my comment that exchange rate data must sometimes be adjusted, and that Grubb and I use very similar estimates of the cost of transporting specie. Grubb's objections obscure my fundamental point. If one uses the cost of transporting specie and an implicit arbitrage condition to infer the value of specie in New Jersey from the exchange rate, is it more sensible to *add* or *subtract* the cost of transporting specie? Grubb's approach only makes sense if New Jersey exchange rates on London were pegged at the specie import point, whereas it is notorious that specie more commonly flowed from New Jersey to London. Grubb estimates the price of silver by *adding* the cost of transporting specie from London to the exchange rate, whereas the direction of specie flows suggests that *subtracting* the cost of transporting specie to London from the exchange rate would better approximate the historical conditions. Adding rather than subtracting silver transportation costs is how Grubb reduces MEV.

Grubb (2020, 73) concludes his defense of MEV and APV by objecting that in Michener (2019a) I did "no recalculation [of MEV and APV] to show what [I] think the values should be or show whether such changes would alter the coincidence of APV and MEV levels." I do so now. New Jersey's treasurers accepted bills of credit in lieu of silver at precisely the same rate at which they passed in ordinary transactions, which means that MEV was 100. By contrast, the value the bills possessed as a discount security, which is what APV purports to measure, was zero under perfect foresight. Even had the Revolution been entirely unforeseen, the value Jersey bills possessed purely as discount bonds could never have exceeded 30 percent of their face value. This demolishes the coincidence of the bills' present value considered as discount bonds and their MEV, whose alignment Grubb (2016a) purports to display in figures 2 and 3, an alignment Grubb (2020, 76) declares to be "the core of [his] paper."

The fundamental question that Grubb (2016a) seeks to answer is whether

colonial bills of credit were being held chiefly as bonds or chiefly as a medium of exchange. He purports to find that their real asset present value accounted for over 80 percent of their value, leaving a residual of less than 20 percent remaining to be explained by their value as money (Grubb 2016a, 1231). Hence, Grubb concludes that the “moneyness” of colonial bills of credit was slight, and that they are best considered to be discount bonds. I believe Grubb’s asset present value seriously overestimates the value of bills of credit considered as discount bonds. But comparing MEV to APV, however measured, does not seem to me to be a sensible approach to the underlying issue. There are many modern hybrids of money and bonds, such as money market mutual funds and money market deposit accounts, where the same question has arisen: How should we measure the degree of “moneyness” of these hybrid assets? The most theoretically elegant answer to this question is found in the theory of Divisia monetary aggregates, where the degree of “moneyness” of a particular hybrid asset is determined by the interest foregone in holding the hybrid asset relative to the interest rate offered by bonds (Barnett, Offenbacher, and Spindt 1984). The foregone return from holding bills of credit in Pennsylvania, New York, and New Jersey was practically indistinguishable from the foregone return from holding specie. With a few inconsiderable exceptions, these bills of credit bore no interest, nor did they appreciate vis-à-vis specie, the universal money of the era. Judging by this standard, the answer is clear that colonial bills of credit were money, and this is true however one computes their real asset present value.

## **Grubb’s “corrections” to New Jersey’s exchange rates**

In Michener (2019a) I raised a series of objections to Grubb’s econometrics. I pointed out the spurious correlation that links APV to the per-capita money supply; I pointed out that Grubb includes deterministic time trends in many of his regressions, only to omit them from his key regressions, regressions whose results are entirely undone if they are included; I pointed out that a sizable fraction of Grubb’s observations used interpolated values of the dependent variable and explored the various ill consequences of using these interpolated observations. Grubb (2020) stridently objects to some of these criticisms, but his objections are misguided, as would be obvious to any competent econometrician who took the trouble to consider the matter. As a discipline, we are blessed with many competent econometricians, so there is no need to belabor these points. Economics, however, is not similarly well endowed with colonial historians. Therefore I see a need for

some additional comments pertaining to another key issue, namely, Grubb's "corrections" to New Jersey's exchange rates, "corrections" disputed by Michener (2019a, 198–205). The "correction" Grubb (2016a) made to John McCusker's 1741 exchange rate played a crucial role in his empirical results. Grubb (2020, 79–87) defends his corrections, attempting to reframe the issue in the title of his rejoinder to paint me as a champion of *uncorrected* data. The defense in Grubb (2020), to which I now turn, rests on ad hominem attacks, false accusations, and twisted quotations.

### The 1739 exchange rate

Because Lewis Morris (1852, 49) indicated in a letter written on 26 May 1739 that his salary of £1000 New Jersey money was worth only about £550 sterling, Grubb replaced McCusker's May 1739 exchange rate—170—with 181.8, derived from the ratio of 1000 to 550. Grubb (2020, 87) writes: "Michener is in effect repudiating basic mathematical theory...[by claiming] long division no longer holds (so that 1000 divided by 550 now equals 1.70)." This would make sense as a closing punch but for the fact that nowhere in Michener (2019a) did I affirm McCusker's 1739 rate or dispute Grubb's correction to it. My challenges were limited to Grubb's corrections to the 1741 and 1762 rates, as elaborated in a section titled "New Jersey's exchange rates in 1741 and 1762" (Michener 2019a, 198–208). It could hardly have been clearer. For better or worse all the regressions presented in Michener (2019a) use Grubb's 1739 exchange rate instead of McCusker's.

But I must say "for better or for worse" because there *are* good reasons to dismiss the citation Grubb relied upon, as perhaps McCusker dismissed it. In the same letter, Morris (1852, 48) says the chief justice's salary is "not 90£ sterling per ann[um]" and the second justice's salary is "about £24 sterling per ann[um]." We know the chief justice's salary was £150 New Jersey money and the second justice's salary was £40 New Jersey money (*NJ Laws*, 2:499). The ratios of 150/90 and 40/24 are both 1.67, considerably below 1.818 and close to McCusker's 1.70. The conversion ratios in Morris's 1739 letter are inconsistent with one another. Furthermore, in a report prepared in December 1739 the Assembly declared that New Jersey's exchange had been, until 1714, "at £50 per Cent advance and that from the Year 1714 the Exchange had gradually risen to £65, and within four months last part had risen to £70" (*NJ Archives*, 15:107).<sup>16</sup> These are numbers consistent with the conversion ratio of the justices' salaries, not the conversion

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16. Grubb (2020, 79) says that "The same error shows up in Richard Lester's book (1970/1939, 127). McCusker may have just copied Lester's long division error here for his entry for May 1739." Lester wrote only that New Jersey exchange in 1739 was 170, citing *this very report in the New Jersey Archives*. Lester never made the long division error Grubb attributes to him. Lester's book is not even among McCusker's sources.

ratio Grubb cites. Grubb is quick to accuse McCusker of arithmetic and transcription errors, but it is more likely that Morris made an arithmetic error in computing the sterling equivalent of his salary or that whoever transcribed Morris's handwritten letter copied the sterling value of Morris's salary incorrectly. In Michener (2019a) I held my peace because the issue was immaterial and because I could foresee Grubb's vitriol. I did not anticipate being attacked for something I did not mention!

### The 1762 exchange rate

Grubb (2020, 85–86) never addresses my extensive discussion of the 1762 exchange rate (Michener 2019a, 205–208), instead unjustly denigrating McCusker's scholarship. According to Grubb, McCusker relies on two published sources, Donald Kemmerer (1956, 131) and Joseph Sherwood (1851, 137), both of whom cite two exchange rates for 1762: 175 and 177.5. Kemmerer, Grubb writes, attributes the two rates to March 1762, whereas Sherwood did not reference a month. McCusker averaged the two rates and reported their average for March 1762. "Then," Grubb continues, "McCusker appears to have taken Sherwood's second rate [177.5], considered it an independent observation from that reported in Kemmerer, and arbitrarily placed that rate in September of 1762. As such, McCusker appears to be double counting the [ $\pounds$ 177.5 New Jersey =  $\pounds$ 100 sterling] rate, counting this single observation in both March and September of 1762." Grubb explains that he removed McCusker's September 1762 exchange rate because it was "an erroneous double counting."

Grubb neglects to mention that in addition to the two published sources McCusker also provided two *unpublished* sources. One of them was an "Account dated 9 Sept. 1762" in the Alexander papers at the New-York Historical Society, and this account, reproduced in Michener (2019a, 204–205), is unambiguously the source of the September exchange rate. The other, the "State of the Bills of credit in New Jersey," CO 323/19, fol. 38r., is a document in the British public record office prepared by New Jersey in response to a Parliamentary inquiry. It is the ur-source of the information found in both Kemmerer and Sherwood. A careful reading of Sherwood (1851, 137), especially in conjunction with the original "State of the Bills of credit," reveals that Sherwood did reference a month, and that month was March 1762. McCusker is innocent of the mistakes Grubb attributes to him.<sup>17</sup>

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17. McCusker is famous for his devotion to careful archival work, and it was because of that reputation that McCusker was selected to oversee the compilation of colonial data for the *Millennial Edition of Historical Statistics of the United States*.

## The 1741 exchange rate

The 1741 exchange rate is indisputably the most important to Grubb's results and to my critique. Grubb changes the 1741 value to a number that is a six standard-deviation outlier in his own regression (Michener 2019a, 200). As confusing as much of the debate between Grubb and me may be to outsiders, Grubb and I agree that the pivotal issue respecting the 1741 exchange rate is how to interpret statements such as "exchange is at 25 per cent," because this is how exchange rates are presented in Morris's key 1741 letter. McCusker and I contend this means exchange was at 25 per hundred over par, or that it took 125 pounds in New Jersey currency to purchase a bill of exchange for 100 pounds sterling. Grubb contends that "exchange is at 25 per cent" means New Jersey currency was worth only 25 percent of sterling, so that it took 400 pounds in New Jersey currency to purchase a bill of exchange for 100 pounds sterling. In Michener (2019a, 203–204 and particularly 204 n.21) I presented detailed evidence supporting my view, most of which Grubb (2020, 79–84) ignores.

Instead, Grubb (2020, 80) doubles down in his effort to besmirch McCusker. Grubb begins by asserting that McCusker made a transcription error in reporting the average exchange rate for 1741. But there was no transcription error. If Grubb had read McCusker (1978, 23–24) he would have discovered that McCusker gathered his data, averaged by quarters, and then computed an annual average by averaging the quarterly data, a detail I pointed out myself (Michener 2019a, 202 n.19). Grubb goes on to accuse McCusker of cribbing his January 1741 data from Kemmerer (1956, 119) while also copying it wrong! In making this accusation, Grubb ignores the fact that in Michener (2019a, 202) I verified McCusker's January 1741 exchange rate, which may be found in *NJ Archives* (vol. 15, p. 187). Moreover, by accusing McCusker of having copied data from Lester (1970/1939, 127) and Kemmerer (1956, 120), Grubb inadvertently draws attention to the fact that both Lester and Kemmerer interpreted the 1741 exchange rate data in the same way that McCusker and I do.

The bulk of Grubb's defense of his supposed correction of the 1741 exchange rate is a fanciful account of what Morris's letter of 16 August 1741 says. His argument proceeds thus: New Jersey had printed £2000 for outfitting and transporting colonial troops on an expedition against the Spaniards, but foreign expeditions "were funded in specie." Hence, Grubb continues, "New Jersey paper pounds had to be exchanged for specie," which was "acutely scarce due to wartime demand." The want of specie to fund the expedition, Grubb argues, caused an abrupt increase in the price of bills of exchange, an increase consistent with his corrected data.

That claim might sound plausible to someone unfamiliar with the history, but

it is simply untrue. Consider the timing. New Jersey emitted the £2000 in mid-1740, and New Jersey's troops had already disembarked by October 1740, which makes this an unpromising explanation for an exchange rate anomaly that occurred in the summer of 1741 (*NJ Archives*, 6:100–103). Moreover, on 1 January 1741, the New Jersey Council related what happened to exchange rates in the aftermath of the emission: “At the time of emitting the said £2000, the Course of Exchange with Great Britain was 160 p. cent and is now fallen to 150 p. cent or thereabouts” (*NJ Archives*, 15:187).<sup>18</sup>

In support of his analysis Grubb (2020, 83) quotes Morris (1852, 134) as saying that the unusual alteration in the exchange rate “is said to be chargeable to another account viz. the want of specie [specie scarcity caused by wartime demands]....” But the ellipsis and Grubb's bracketed insertion of “specie scarcity caused by wartime demands” distort Morris's meaning. Morris testified that *all forms of money*, both specie and paper money, were exceedingly scarce and that therefore it was difficult to convert bills of exchange into cash of any kind. This is what hides behind Grubb's ellipsis:

...is said to be chargeable to another account viz. the want of specie, & of a sufficient quantity of currency to supply [the] ordinary necessities of Jersey & Pensilvania at [that] time: for much provision being to be shipp'd for the troops and Elsewhere in the West Indies, bills of Exch[ange] would not purchase this unless chang'd into specie or bills of credit, both of w[hi]ch being scarce there was a necessity of Lowering bills in order to procure it...  
(Morris 1852, 134, my emphasis)

Morris discussed this dilemma in other letters as well. As Kemmerer noted, in August 1740 “Morris wrote Colonel Blakeney, adjutant-general of the King's troops in America, that he could not sell the British government bills of exchange for either specie or New Jersey money and so could not give the officers pay for the troops raised in the colony” (Kemmerer 1956, 120; Morris 1852, 104, 107). Instead of an abundance of paper money and a shortage of specie raising exchange rates, as Grubb maintains, a shortage of all forms of money, both specie and paper, led exchange rates to fall. This is exactly the conclusion of Anne Bezanson, Robert D. Gray, and Miriam Hussey (1935, 324–325) that I offered in Michener (2019a, 201–202).

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18. Moreover, that foreign expeditions “were funded in specie” is a specious claim, unsupported by any of Grubb's evidence. In 1759 General Amherst, planning the British expedition that culminated in the fall of Montreal, found himself without funds. He persuaded the New York Assembly to print £150,000 in New York currency, which the Assembly lent Amherst to prosecute the expedition. That the British expedition that conquered Canada was funded with colonial bills of credit certainly demonstrates that military expeditions outfitted in the colonies did not require specie (*NY Laws*, ch. 1087, 4:350–355; Broadhead 1855, 7:399–400).

Grubb (2020) in fact uses an ellipsis and inserted text to distort Morris's meaning twice in the same block quotation.<sup>19</sup> Grubb quotes Morris thusly:

...it seems plain to me that if a guinea [an English gold coin] was at any time before that current at 30 shillings in bills of credit [New Jersey paper pounds], that, when it was current at 5 pounds in y<sup>e</sup> same bills, it required 5 pounds to purchase that guinea which 30 shillings of the same currency or bills would have done before, w[hi]ch must make those bills (whatever nominal value was Impress'd upon them) of so much less reall value than they were before. (Morris 1852, 134, as quoted in Grubb 2020, 83)

Grubb (2020, 83 n.8) points to this passage as “smoking-gun evidence that Kemmerer, McCusker, and Michener are wrong in their transformation of the exchange rate statements made by Morris,” and he berates us for ignoring it. Grubb calculates that if a guinea—21 shillings sterling—passes at 5 pounds in local currency, it implies the sterling exchange rate is about 476 local pounds per hundred pounds sterling, a number Grubb describes as Morris's “initial ballpark estimate” of the New Jersey exchange rate in 1741. Grubb points out that this number is not far from the New Jersey exchange rate of 400 that he championed and that I dismissed as an implausible outlier (Michener 2019a, 202). But Grubb omitted the beginning of Morris's original passage, which reads:

*...if a guinea went at 5 pound, (w[hi]ch I think it did in New England,) it would purchase just as much as a New England paper currency of five pounds would do, so that (according to our Council) there would be no alteration of the currency, 5 pounds being still being 5 pounds;* but it seems plain to me that if a guinea was at any time before that current at 30 shillings in bills of credit, that, when it was current at 5 pounds in y<sup>e</sup> same bills, it required 5 pounds to purchase that guinea which 30 shillings of the same currency or bills would have done before, w[hi]ch must make those bills (whatever nominal value was Impress'd upon them) of so much less reall value than they were before. (Morris 1852, 134, my emphasis)

Morris *was not describing New Jersey, but rather New England*, and he was using New England *as the poster child for bad monetary behavior*.<sup>20</sup> After the phrase “bills of credit” Grubb inserts “[New Jersey paper pounds]” to mislead Grubb's reader into believing that Morris was describing New Jersey in a passage that does not pertain to New Jersey.

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19. Nor is this the first time Grubb has used an ellipsis and inserted text to distort meaning. See Michener and Wright 2006a, 13.

20. For what it is worth, McCusker (1978, 141) reports that in August 1741 the New England exchange rate was 550 pounds New England currency = 100 pounds sterling, so Morris's anecdotal evidence and Grubb's calculations do indeed provide an initial ballpark estimate for *New England*.

When he is not accusing Kemmerer, McCusker, or me of knavery or incompetence, Grubb (2020) continues to insist that “exchange is at 25 per cent” means that 400 pounds in local currency are required to purchase a bill for 100 pounds sterling. If Grubb believes this, then we need to ask (in the spirit of his rejoinder’s title) *why Farley Grubb insists on using uncorrected data*, because Grubb (2019b) applies his theory to colonial Virginia and uses McCusker’s exchange rates *without making any “corrections.”* If one consults the original sources that McCusker used to compile the Virginia exchange rates, we discover exactly the same issue—exchange rates such as “25 per cent” or “30 per cent” that McCusker (correctly, in my view) enters into his tables as 125 and 130 (Soltow 1965, 166–167; CO 323/19, fol. 51r.). If Grubb is sincere in his belief, why did he not “correct” the data he used in Grubb (2019b)? Why does Grubb alter McCusker’s data only when it is required to obtain the result he seeks?

## Conclusion

I wish to make two points in closing.

The first point relates to a proper understanding of colonial history. That faithful retirement of colonial bills of credit was the *sine qua non* that guaranteed their value is a myth. Faithful retirement of bills of credit was neither necessary nor sufficient for bills of credit to maintain their value. Colonial New York’s record of fiscal probity was abysmal, yet New York’s colonial currency did not depreciate (Michener 2015, 12–16). In the aftermath of the Revolution, the state of Pennsylvania attempted to create another land bank on the colonial model. Even though Pennsylvania emitted comparatively modest quantities of bills of credit, promised their prompt retirement, and then fulfilled those promises, the bills of credit nevertheless depreciated (Michener and Wright 2005, 686–690). The extreme measures Grubb must use to twist history, economic theory, and data to make a case for the central importance of New Jersey’s colonial redemption policies is a damning indictment of the theory. The spurious support Grubb lends to the redemption theory diverts attention from what actually sustained the value of colonial currencies, namely, the concomitant circulation of gold and silver monies at rated values established and honored by local merchants (Michener 1987; 2011; Michener and Wright 2006c). By belittling the critical role played by specie in the colonial money supply, Grubb and other advocates of redemption theories divert attention from issues critical to the economic and political history of the period. The important role specie played in the colonial money supply is what links British trade restrictions in the aftermath of the French and Indian War to the fraught economic and monetary conditions in the colonies during these years, a link that

helps explain colonial discontent with the empire.

The second point concerns standards for economic discourse more generally. Cambridge Core, the publishers of *JEH*, have **publicly committed** to maintaining **a conventional set of ethical standards**, standards I believe Grubb has violated. Grubb (2020), however, implicitly endorses a different standard. Grubb (2020, 72) berates me for submitting referee reports and comments critical of his many articles, and he points with satisfaction to the success he has had in suppressing my comments, including Michener (2019a), a version of which was originally submitted to the *JEH*, which rejected it after an exceedingly cursory review. Grubb (2020, 77) also defends his right to stonewall me on the method he used to obtain his 1741 and 1762 exchange rates. “I refused,” Grubb (2020, 77) writes, “and said I was not Michener’s research assistant. All the sources were published and were in Michener’s research library. I saw no reason to have to explain to Michener how [to] use a library, how to read English, and how to use his hand calculator to do long division.” He defends stonewalling me despite the fact that, by his own testimony, his interpretation of 1741 exchange rates was inconsistent with Lester’s, Kemmerer’s, and McCusker’s interpretation, making it altogether mysterious to me, and despite the fact that his original article did not include a page citation for the Sherwood passage used for his 1762 exchange rate (Grubb 2020, 85 n.10). Grubb (2020, 77) goes so far as to express dismay that the editor of this journal pressed him to reveal his sources, and then shared that information with me. Grubb (2020) seems to imply that proper academic inquiry precludes the questioning of Grubb’s own work. Is that a standard that any editor should endorse?

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