



*Econ Journal Watch,
Volume 3, Number 1,
January 2006, pp 4-44.*

Miscounting Money of Colonial America

RONALD W. MICHENER AND ROBERT E. WRIGHT*

A COMMENT ON: FARLEY W. GRUBB. 2004. THE CIRCULATING MEDIUM OF EXCHANGE IN COLONIAL PENNSYLVANIA, 1729-1775: NEW ESTIMATES OF MONETARY COMPOSITION, PERFORMANCE, AND ECONOMIC GROWTH. *EXPLORATIONS IN ECONOMIC HISTORY* 41:329-360.

[Abstract](#), [Keywords](#), [JEL Codes](#)

[TO THE READER: We relegate much material to appendices. The main text concludes less than half way through this PDF document.]

OVER THE LAST FEW YEARS, ECONOMIC HISTORIAN FARLEY Grubb has published a number of articles in leading journals that aim to rewrite the economic and political history of the United States in the second half of the eighteenth century. Grubb's revisionist views are based on a technique he introduced for determining the composition of the medium of exchange in early America. Applying his technique to the confederation period, he concludes that state-issued paper money (a.k.a. "bills of credit") was the preferred medium of exchange and disappeared only when it was banned by the Constitution (Grubb 2003, 2005a). From this he draws several highly revisionist conclusions: Confederation-era state-issued paper money had been successful; the public had shunned banknotes; and the Constitution's ban on state paper money was inserted against widespread opposition at the behest of bankers who wanted to eliminate competition. In the paper under consideration here, Grubb applies his technique to

* Michener: Department of Economics, University of Virginia. Wright: Department of Economics, Stern School of Business, NYU.

colonial Pennsylvania and derives a time series for the total money supply of colonial Pennsylvania (specie plus paper money). Since no other time series exists for the total money supply of any American colony, cliometricians inevitably will use it, though it has startling and far-reaching implications.

One implication concerns the debate over the adequacy of the colonial money supply. Most historians now argue that, for the most part, it was adequate.¹ However, the quantity of bills of credit outstanding in most colonies (particularly the Middle Colonies) was very modest. Grubb's series shows negligible amounts of specie in the circulation, so if his series is accepted, the implication is that the colonial money supply was seriously inadequate.²

Another profound implication concerns the validity of the quantity theory of money. R.C. West (1978) finds that in many American colonies, despite turbulent financial conditions, there was no correlation between the price level and the quantity of paper money in circulation. Most explanations of West's findings fall into one of three camps. The first takes West's finding as a convincing repudiation of the quantity theory (Smith 1985a, b; Wicker 1985). The second explains away the anomaly by pointing to the role that unobserved expectations can play in the demand for money (Calomiris 1988; Sumner 1993). The third camp attributes an important role to specie and rejects the assumption that the quantity of paper money outstanding proxies the money supply, arguing paper money was but one component, and sometimes a small component, of the total money supply (Michener 1987, 1988; Marcotte 1989; McCallum 1992; Brock 1992). One of the reasons that interpretations are so divergent is that, as McCallum (1992, 144) notes, "data on both stocks and flows of specie are extremely sparse." Debate participants spar vigorously over how best to parse the thin data. Smith (1985a; 1985b; 1988) argues that the specie stock was small compared to the quantity of paper money in circulation; Michener (1987; 1988; 2003) reaches the opposite conclusion.

Farley Grubb (2004, 2005b) aims to settle the matter with his data series. Paradoxically, Grubb, despite finding scarcely any specie in circulation, purports to vindicate the quantity theory. That vindication,

¹ McCusker and Menard (1985, 338) conclude that "the colonists' stock of money was adequate," and Perkins (1994, 54) concurs, noting that "there is little reason to believe that the population of British North America suffered much, if at all, from an inadequate money supply."

² This is the conclusion of Rousseau (2004). Rousseau simply ignores circulating specie, but Grubb's time series supports Rousseau's conclusion.

however, arises from Grubb's devotion to what Ziliak and McCloskey (2004) deride as "sign econometrics." Grubb finds statistically significant coefficients with the correct sign. Grubb's data, however, show the total per-capita money supply increasing by 386 percent between 1754 and 1759 with only an 11.4 percent increase in prices, and such data will inevitably reinvigorate critics of the quantity theory.

Grubb's Pennsylvania estimates also matter for the support they lend to his interpretation of the Confederation era and the Constitutional Convention. In working paper form, the Pennsylvania estimates were the "proof of concept" application justifying the use of his technique in the Confederation period. Moreover, Grubb relies on his Pennsylvania estimates to dismiss Rolnick, et. al. (1993), who, citing colonial precedents, attribute the Constitutional ban on state-issued paper money to a concern that the interstate circulation of state-issued paper money would tempt states to compete for seigniorage. Grubb argues that the colonial precedent is false, that colonial currencies did not circulate in adjoining colonies.

Were Grubb and his data correct, American history textbooks would have to be rewritten and the study of the early U.S. macroeconomy could leave its "statistical Dark Ages" and join the ranks of subjects susceptible to the gaze of "Science." We question Grubb's research for the simple reason that it is wrong. Grubb has discovered the economic history equivalent of phlogiston, black bile, or geocentrism. His work rests on the premise that he can discern the medium of exchange in certain types of contracts. We argue here that he cannot. We then contend with the many "epicycles," the many contortions of fact, logic, and theory that he must construct to support his fundamentally flawed view of the economic universe of eighteenth century America.

Grubb derives his estimates by tabulating rewards offered in the *Pennsylvania Gazette's* advertisements for runaway servants and slaves. The ads in question resemble those in Figure 1.

Figure 1: Pennsylvania runaway ads

A D V E R T I S E M E N T S .

RUN away from *Philadelphia* in *October* last a *Servant* Man of *Capt. Joseph Mackintosh*; his Name is *Will. Minneman*, a *Bircher* by Trade. He is a lean Man, pretty Tall, Long thin ill shaped Legs, something Pock-fretten, he is about 25 years of Age, & speaks broad *Scotch*. Whoever can take him up and bring him to *Andrew Bradford* in *Philadelphia*, or *William Bradford* in *New-York*, shall have *Four Pounds* Reward.

RUN away from the Forge at *Monacaunoy*, in the County of *Philadelphia*, a *Welshman* midle fiz'd about 21 Years of Age, of a clear Complexion, and a fresh Cullour; Full Faced, with hollow Eyes and bottle Nose short brown hair a little Curled; Full Shouldred, and when he Walks he stamps down his Feet; his name is *Thomas Fare*, but has gone some time by the name of *Thomas Price*.
Whosoever can Secure the said Person and gives notice thereof to *William Branson* in the Market place in *Philadelphia*, or to *William Coats* in the said City shall have *Forty Shillings* Reward and Reasonable Charges.

Source: *American Weekly Mercury*, 17 March 1720.

Grubb uses reward data to estimate the yearly ratio of specie to paper money transactions, combines that ratio with the known quantity of Pennsylvania paper money outstanding, and derives a time series for the colony's total money supply. The viability of this technique depends crucially on the meaning of "pounds," because 83.3 percent of Grubb's ads, like those reproduced in Figure 1, offered a reward in undesignated "pounds" or "shillings." Grubb infers that these rewards were always settled with paper money.

The resulting series is fundamentally flawed, however, because the medium of exchange mentioned in the advertisements cannot in most instances be ascertained. The inference that "pounds" rewards were settled in paper money is unwarranted because pound-denominated rewards

mentioned in the ads refer to Pennsylvania's unit of account, not its medium of exchange. In a sense, each colony had its own 'money'. But, as Charles M. Andrews (1918, 74) notes, a colony's so-called money "was not money at all, but only a method of reckoning values, a statement of the amount in shillings at which a Spanish dollar would be accepted in a given colony." In the same vein, John J. McCusker (1978, 3-6, 121) argues that the distinction was "an important one to remember, because goods were bought and sold by coin but books were kept and exchange transactions negotiated in moneys of account."

Media of exchange were several and included country produce, book account transfers, foreign coins (such as Spanish dollars, pistareens, or guineas), and paper money (including that of other colonies) (Andrew 1904; Michener 2003). The multiplicity of media of exchange was made viable by virtue of a local unit of account, "Pennsylvania pounds" in this instance. Colonists assigned foreign coins values in terms of the local unit of account, published those ratings in almanacs, and made economic calculations and agreements in those terms (see Figure 2).

Figure 2: Pennsylvania coin ratings, 1771

	Sterling			Philad.			N. York			Wt.	
	L.	s.	d.	L.	s.	d.	L.	s.	d.	dwt.	gr.
E ngl. Guinea, at	1	2	0	1	14	0	1	16	0	5	6
French ditto	1	2	0	1	13	6	1	15	0	5	6
Moidores	-	1	7	0	3	3	6	3	6	0	10
Johannes's	-	3	12	0	6	0	0	6	0	18	0
Half ditto	-	1	16	0	3	0	0	3	4	0	9
French milled Pistoles	0	16	6	1	6	6	1	8	0	4	4
Spanish ditto	-	0	16	0	1	7	0	1	9	0	4
Doublions	-	3	6	0	5	8	0	5	16	0	17
English Crowns	-	0	5	0	0	7	6	0	8	0	17
French ditto	-	0	5	0	0	7	6	0	8	0	17
Spanish Dollars	-	-	1	0	7	6	0	8	0	17	6
English Six-pence	-	0	0	6	0	0	9	0	0	9	0

Mod Sorts of Spanish Silver are sold in London by the Ounce, and often varies, but seldom or ever exceeds 5s. 5d. In Pennsylvania it sells for 2s. 6d. per Ounce---In Boston and Connecticut Pieces of 2 pifs for 6s. and Gold by Weight.

Source: *Father Abraham's pocket almanack.*

This article marks the second time that we have challenged Grubb's methods. The first exchange concerned the Constitutional period and appeared in the *American Economic Review*. It may be summarized as follows. Grubb (2003a, 2005a) counted the use of the terms "pounds," "dollars,"

“sterling,” and “guineas” in indentured servant transactions recorded in Philadelphia between 1785 and 1804. Practically all were recorded in “pounds” until the last years of the eighteenth century, from which Grubb concludes that Pennsylvania’s state-issued bills of credit remained the preeminent medium of exchange until driven from circulation by a Constitutional prohibition engineered by a cabal of profit-seeking bankers. Michener and Wright (2005) dispute these conclusions and object that “pounds” can not be equated with bills of credit. Indeed, many of Pennsylvania’s bills of credit were denominated in dollars, not pounds, and one emission was denominated in both. By 1794, a year in which all 200 servants’ contracts were recorded in pounds, there remained only \$0.06 per capita in Pennsylvania paper money outstanding, compared to estimates of the specie stock ranging from \$3.00 to \$7.77 per capita. Grubb (2005b) is unpersuaded; in his rejoinder he argues that participants chose their language deliberately in arms-length transactions between strangers such as servants’ contracts because these were binding contracts enforceable at law.

That is where our first exchange currently rests. The present article again criticizes Grubb for mistaking the unit of account for a specific medium of exchange, but directs the criticism to the particular historical material treated in Grubb’s article in *Explorations in Economic History* (2004), namely, the colonial period. Thus, the nature of the basic criticism is like that of the previous exchange, but the evidentiary dispute is different. We feel that the criticisms made here about the colonial period reinforce the conclusion that Grubb’s entire project is riddled with errors.

Grubb’s argument that his procedure must work in arm’s-length transactions between strangers is an excellent illustration, for Grubb (2004, 333) defends his use of runaway ads in the colonial era in precisely the same language: “Only the enforceable intention to pay the currencies advertised is relevant to the soundness of the measure of currency composition constructed here.” What evidence do we have that, as Grubb asserts, there was an “enforceable intention to pay the currencies advertised”? As Grubb concedes elsewhere (2004, 331), colonists ubiquitously used Pennsylvania “pounds” to signify unit-of-account money. This fact makes it plausible that courts interpreted ads promising “pounds” as a promise of payments in a form equaling the amount of “pounds” specified. Grubb presents neither statutes nor case law to support his contrary interpretation, and never acknowledges that all paper money issued by Pennsylvania before the mid-1760s was a legal tender at its face value even in contracts where specie was

explicitly promised.³ An ad's promise to pay specie was not legally enforceable during most of the colonial era.

FURTHER PROBLEMS

Readers may feel that an econometrician desperately in need of colonial money supply data could sensibly use Grubb's and that our alternative explanation, while plausible, is unproven. The aura of ambiguity, this section shows, is false. Grubb's estimates are wrong, and all that is needed to prove it is a detailed knowledge of the colonial economy and monetary system, much of which we have relegated to appendices and notes.

First, Grubb's method, applied to Pennsylvania's early history, yields obviously fallacious results. Grubb reports that 83.3 percent of the ads he studied resemble those in Figure 1, offering rewards in "pounds" or "shillings" with no further designation, which he contends record transactions in Pennsylvania bills of credit. The ads in Figure 1 date from 1720, a year when 29 out of 34 unique ads (85.3 percent) offered pounds and shillings, a figure quite similar to Grubb's finding. Yet *these* ads indisputably refer to Pennsylvania's unit of account money, not bills of credit, because the colony did not issue its first bills of credit until 1723.⁴ A reward of Pennsylvania "pounds" did not mean bills of credit in 1720. There is no reason to believe it meant bills of credit after 1723.

Second, Grubb asserts that two types of arms-length transactions, runaway ads and servants' contracts, can be used to infer the medium of

³ For Pennsylvania's legal tender provisions see Pennsylvania, Mitchell et al. 1896, vol. 3, c. 261, 329; vol. 4, c. 300, 103-4; *ibid.*, c. 353, 348-49; vol. 5, c. 363, 9; *ibid.*, c. 370, 48; *ibid.*, c. 402, 193; *ibid.*, c. 406, 210; *ibid.*, c. 412, 247; *ibid.*, c. 422, 299; *ibid.*, c. 423, 306; *ibid.*, c. 431, 349; *ibid.*, c. 437, 393; *ibid.*, c. 444, 431; vol. 6, c. 453, 18-19; *ibid.*, c. 513, 363. The last of these, passed in 1764, is the first to exempt quit rents. The Currency Act of 1764 prohibited new issues of legal tender paper money but did not nullify the legal tender status of existing issues; Pennsylvania's paper money retained its legal tender status until the issues extant in 1764 were retired.

⁴ The ads appearing in Figure 1 are from the *American Weekly Mercury*, 17 March 1720. In a survey of all the ads appearing in the *Weekly Mercury* during 1720, we discovered ads for a total of 50 servants, slaves, and prisoners. In the 34 unique ads offering rewards, one ad offered two guineas, one ad offered a pistole, and three ads made mention of the reward being in "current money." The other 29 ads offered sums in pounds, shillings, and pence.

exchange. When one reverses Grubb's procedure, however, and uses servants' contracts to estimate the colonial money supply or runaway ads to estimate the confederation money supply, one gets results that strikingly contradict his estimates. Servants' data like that used in Grubb (2003a, 2005a) are available only for 1771-1773 (Philadelphia Mayor 1773). The records for 1773 show 1,687 transactions recorded in undesignated pounds, shillings and pence, 8 in guineas, and 1 in sterling. (One garbled transaction is omitted.) Counting sterling as specie, Grubb's technique indicates 9 out of 1,696 transactions used specie. Yet among runaway ads in the same year, Grubb reports 64 out of 153 transactions in specie. Those point estimates ($9/1696 = .0053$ and $64/153 = .4183$) are wholly inconsistent. If one were to test the null hypothesis that the two point estimates are random samples from the same population, the result is a z-statistic in excess of 25 and a decisive rejection of the null. Michener and Wright (2005, online appendix) examine runaway ads in the confederation era and discover an overwhelming majority offered rewards in "dollars" even when indenture contracts recorded the same year are almost without exception in "pounds."

Third, did the transactions velocity of specie differ from the transactions velocity of paper money in early America? Grubb's (2004) procedure for estimating the specie stock from the relative frequency of specie transactions implicitly assumes the two velocities were the same. Yet for the Confederation era, when there was vastly more specie than paper circulating, Grubb (2005b, 1343) asserts paper money dominated in transactions because it circulated far more quickly than specie. Indeed, he maintains that in 1794 virtually all transactions were executed with just \$0.06 per capita of Pennsylvania's "well managed" paper money, despite the fact that there were several dollars per capita of banknotes and specie circulating (Michener and Wright 2005, 686). For 1 percent of the money supply to account for 99 percent of all transactions it would have to turn over approximately 10,000 times faster than the rest of the money supply. Although we doubt the dissimilarity was so great, we agree that specie probably circulated more slowly than paper money in early America; small denomination money tends to have a higher transactions velocity than large denomination money and the denominations of bills of credit were small compared to the coins in circulation (Hanson 1979, 1980).⁵ Inequality in

⁵ At its website, the Federal Reserve says that its large denomination notes last up to five times longer than small denomination notes, suggesting that the small denomination notes circulate up to five times faster.

transactions velocity would itself be sufficient to invalidate Grubb's (2004) estimates.

Fourth, Grubb's estimates do not agree with what scholars know about Pennsylvania's money supply in the late 1740s and early 1750s, the period for which our knowledge is richest. King George's war, which ended in 1748, presented the Middle colonies with extraordinary opportunities in trade and privateering that they eagerly exploited (Smith 1972 1:233). The result was that the Middle colonies enjoyed a relatively abundant specie stock in the immediate postwar years. Appendix 1 reproduces the evidence describing the abundance of specie during those years. The vast discrepancy between Grubb's estimate and the archival record means that one of them must be wrong.

Fifth, Grubb's estimates are inconsistent with what historians know about the paper money circulating in colonial America. Virtually all historians of colonial currency believe that bills of credit frequently circulated as a medium of exchange in neighboring colonies.⁶ Contemporary statements affirming their judgment abound. "Under the circumstances of America before the war," a Maryland resident wrote in 1787, "there was a mutual tacit consent that the paper of each colony should be received by its neighbours" (Hanson 1787, 24). In Grubb's (2004, 336-337) view, "If [the paper money] of the various colonies circulated freely in Pennsylvania, then some Maryland, New York, New Jersey, and Virginia pounds should have been offered as rewards by Pennsylvania residents for their runaways. But none of these other-colony currencies were so offered." Our view is that the absence of mention of those currencies is further proof that "pounds" in runaway ads refer to Pennsylvania's unit-of-account, not its medium of exchange. Grubb's reasoning, however, forces him to dismiss cross-colony circulation of bills as a mistaken notion based on "a couple isolated statements made by a few merchants and politicians" (2004, 336, fn. 5).

Dismissing cross-colony circulation of bills is absolutely essential to Grubb's agenda. Even if neighboring colonies' bills did not circulate within Pennsylvania, Grubb's inferential technique would fail if a significant fraction of Pennsylvania's paper money ever circulated *outside* Pennsylvania. Moreover Grubb (2004, 330, 339) uses his "discovery" of the absence of

⁶ Grubb (2004, 336, fn. 5) cites Michener (1987, 236, 244), Sachs (1957, 201), and Smith (1985a, 539) as examples of those who have believed in the cross-colony circulation of bills of credit. A fuller list would be longer and include the most prominent experts in the field: Ernst (1973, 248-249), Brock (1975, 86-89) and McCusker (1978, 169-170, 181, 193).

cross-colony circulation to dismiss Rolnick et. al.'s (1993) argument that seigniorage competition played a role in the Constitutional ban on state-issued paper money. Cognizant of the importance of persuading readers that no cross-colony circulation of bills occurred, Grubb defends the claim vigorously. "Philip Mazzei, in his 1782 *History of the Beginning, Progress, and End of Paper Money in the United States . . .*" writes Grubb (2004, 339), "concluded that state [colony] paper money circulated freely only within it." Grubb's editorial inclusion "[colony]" misleads because Mazzei referred to the Revolutionary, not the colonial, era. The quotation's full context is revealing.

[Congress's] money circulated throughout the States, for each State was obliged to redeem its own quota and stand surety for all the other States. The state paper money circulated freely only within it, and *the ease or difficulty with which it circulated in other states depended on the distance and trade between the state where it was spent and the state issuing it.* (Mazzei, Marchione et al. 1983, 1:326, emphasis added)

Grubb misrepresented the situation as well as the period because Mazzei suggested that state paper money circulated between neighboring states with strong commercial ties.⁷

In Appendix 2, we detail some of the extensive evidence showing that bills of credit circulated across colonial boundaries, so that the reader can make an independent determination whether it ought to be dismissed as "a couple isolated statements made by a few merchants and politicians".⁸

⁷ Grubb (2004, 339) also cites Jones (1980, 131-132). The passage cited is the one in which Jones tentatively concludes that the probate records recorded cash that was "largely in the form of current local money, in paper, of the particular province." The passage gives us little insight into Jones's position on this issue. If, as we believe, Delaware and New Jersey paper money were freely accepted as a medium of exchange in Pennsylvania, they would have been a part of Pennsylvania's "current local money." Only by reading the phrase "of the particular province" as equivalent to "issued by the particular province" can Jones be said to be denying cross-colony circulation. There is no reason to presume that was her intention.

⁸ In Appendix 2, we focus narrowly on evidence pertaining to Pennsylvania, but the cross-colony circulation of bills of credit is also well documented for other colonies. Philip Cuyler wrote Cornelius Cuyler (26 August 1756) from New York that "Jersey money passes here as current as N.Y." (McCusker 1978, 159, fn. 102). The value of New Jersey money as it passed in New York was tabulated in nearly every issue of New York's *Gaine's New Pocket Almanack*. The New York Chamber of Commerce became embroiled in a lively controversy over the premium accorded New Jersey money when tendered in New York (Stevens 1867, 143, 151-153, 160-161, 168, 185-186, 296). When it narrowly voted that the preference given New

Sixth, Grubb (2004, 340) “discovers” a highly implausible explosion in the use of Spanish silver dollars, observing that the proportion of ads offering rewards in “dollars” skyrocketed from the negligible levels prevailing before the end of the French and Indian War to nearly 50 percent of all ads by 1775. The explosion of Spanish silver dollars is implausible because Spanish silver was substantially undervalued in Pennsylvania relative to Portuguese gold, an undervaluation that contemporaries recognized and discussed. An increase in the usage of Spanish silver, would, in these circumstances, be a violation of Gresham’s Law. Appendix 3 documents this and suggests several reasons why “dollars” appear more frequently in runaway ads on the eve of the Revolution. As detailed there, the circulation within Pennsylvania of newly emitted Maryland bills of credit denominated in dollars may have played a role.

GRUBB AND THE HISTORICAL RECORD

With the exception of Pennsylvania in the late 1740s and early 1750s, evidence on the quantity of specie circulating in colonial America is sparse. Grubb (2004) adds little new, attempting to persuade the reader of the plausibility of his data series by relying heavily on the same evidence as Smith (1985a, 1985b, 1988). Contradictory evidence is ignored or slanted so that it superficially appears to support Grubb’s position.

For example, Grubb (2004, 342) quotes Benjamin Franklin to the effect that “Pennsylvania, before it made any paper money, was totally stripped of its gold and silver.” Chronic scarcity of specie in Pennsylvania before 1723 would increase the plausibility of Grubb’s estimates, which show little

Jersey money be rescinded, dissenting merchants advertised they would continue to accept New Jersey money on the old terms (*New York Gazette or Weekly Mercury*, 14 September 1772). The question was finally settled by statute in 1774 (New York 1894, 5:1654). In 1775 a group of New York merchants subscribed to a plan designed to give Connecticut’s bills of credit “a currency equal to those of the other neighbouring provinces” (*New York Journal, or General Advertiser*, 13 July 1775).

The “promiscuous circulation” of the bills of credit of the four New England provinces (Massachusetts, Connecticut, Rhode Island, and New Hampshire) in the several decades before 1750 is, if anything, even more notorious (Brock 1975, 35-36). Some hint of the extent of this circulation can be gleaned from Governor Shirley’s address to the Assembly, 9 February 1744 (Massachusetts House of Representatives 1919, 20:329-333).

specie in the colony before the French and Indian War. But specie was not chronically scarce in early Pennsylvania. In the late seventeenth century, it was plentiful (Watson and Hazard 1898, 75). An account from 1698 even declared that per capita silver circulation in Pennsylvania was more plentiful than in England (Thomas 1698, 329). Franklin arrived in Philadelphia as an apprentice printer in 1723, shortly before paper money was issued. He found the colony gripped by a serious depression, a liquidity crisis brought on by the collapse of the South Sea bubble in England. Given that he made the claim in a tract designed to persuade Parliament to repeal the Currency Act of 1764, Franklin's account is consistent with other surviving descriptions of the depression Pennsylvania experienced in 1721-23 (Lester 1938) and there is no reason to suppose he was describing a chronic state of affairs. Indeed, Franklin's use of the archaic version of the word stripped implies that Pennsylvania had specie that it subsequently lost.

In another instance, Grubb (2004, 342, fn. 12) writes that Alexander Hamilton "opined that specie comprised 27 percent of total currency (paper plus specie) in circulation before the Revolution." Here, Grubb is referring to Hamilton's statement (Morris, Ferguson et al. 1973, 1:35) that the money supply before the Revolution consisted of 30 million dollars, of which 8 million was specie. The implication that 22 million dollars in bills of credit were outstanding on the eve of the Revolution is absolutely incredible. Brock's estimates of the quantities of paper money outstanding—the ones Grubb relies on—reveal there could hardly have been 3 million dollars in bills of credit left outstanding in 1774 (Michener 2003). Nor is the basic observation sensitive to the exact year for which one does the calculation. Grubb, therefore, would have to dismiss the denominator of his "27 percent" calculation as inaccurate. The numerator ought to be equally troublesome for him because 8 million dollars of specie would mean that per-capita specie holdings were in excess of \$3. As probate evidence makes clear, per-capita money holdings in the middle colonies were considerably greater than in New England or the South; no scholar has ever doubted Pennsylvania, arguably the most commercially advanced colony on the continent, possessed more than its per-capita share of the colonial specie supply.⁹ Grubb points out that his percentage estimate aligns very well with Hamilton's if Hamilton was referring to a year between 1770 and 1772. Yet, according to Grubb, Pennsylvanians possessed only \$1.04 per capita in

⁹ Even Smith (1988), who, like Grubb, regards specie as a small fraction of the colonial money supply, declares that "Pennsylvania was probably the most specie-rich of the colonies."

specie in 1771. While the percentage estimates align well, the absolute amount of specie Grubb says was circulating was far less than Hamilton opined. Nonetheless, Grubb (like Smith (1985a, 537) before him) is content to compute the ratio and report it as supporting evidence.

Grubb (2004, 343) also cites Alice Hanson Jones, who conjectured that the money supply in 1774 was mostly paper. Jones, however, was extremely tentative in her conclusion. She wrote (1980, 130-132) that “The meaning of ‘cash’ as a financial asset is not entirely clear,” and that “whether the cash was in coin or paper was rarely stated.” Of the 38 percent of probated decedents in New Jersey, Delaware, and Pennsylvania whose estates included cash, only 0.2 percent specifically mentioned having coin. The infrequent mention of coin led Jones to believe “that the inventoried cash was largely in the form of current local money, in paper, of the particular province.” We believe Jones, like Grubb, was misled by “pounds”; in any event Jones’s findings do not support Grubb’s findings. Barely 0.5 percent of probated estates possessing cash mentioned gold or silver, yet Grubb concludes specie was 45 percent of the money supply in 1774.

Finally, in an attempt to discredit Michener (1987) and defend his own estimates, Grubb makes spurious adjustments to probate evidence. The evidence in question is due to Jones (1980), who infers the wealth of the living by examining samples of probate inventories from 1774 detailing the possessions of the recently deceased. The endeavor is, of course, fraught with difficulties. How ought one to correct for the fact that the deceased are disproportionately old or for the fact that not everyone’s estate was probated? Jones makes plausible assumptions to bridge the gaps, and the result, though not without its critics, is still the best evidence extant on colonial wealthholding. She (1980, 41, 128) concludes that the Middle colonies possessed £1,160,000 sterling in cash, which, when divided among a population of 640,695, yields an estimated per-capita cash-holding of £1.81 sterling. As argued in Michener (1987, 275), the quantity of paper money per-capita extant in the Middle colonies in 1774 was equivalent to only £0.58 sterling, so the remaining £1.23, or 68 percent of the total money supply, must have been specie.¹⁰

Grubb (2004, 343) disputes this conclusion, pointing out that Jones derives her estimates only from probated wealthholders, not all wealthholders, and arguing that non-probated wealthholders were probably

¹⁰ McCallum (1992, 152-153) uses a different technique to estimate the colonial money supply; his estimates are consistent with Jones’s.

poorer and less likely to hold cash. On the implicit assumption that non-probated wealthholders held no cash at all, Grubb reduces Jones's estimate of the total money supply by the fraction of non-probated wealthholders. Since probated wealthholders constituted just 63.1 percent of all wealthholders, Grubb concludes the actual per-capita money supply was but $(.631) \times (1.81) = \text{£}1.14$ sterling per capita. This adjustment by Grubb presumes that Jones imputed the same amount of wealth to non-probated wealthholders as she found for probated wealthholders. That presumption is simply erroneous. After detailing several reasons other than abject poverty that an estate might be settled without probate, Jones (1980, 349) concludes that those reasons "preclude the simple assumption that all non-probates had zero wealth." Her solution is to presume that the non-probated wealthholders possessed just one-quarter of the wealth of the probated wealthholders. Therefore, even if non-probated wealthholders held no cash at all, Grubb's adjustment seriously understates the colonial money supply.

This is not the only sleight of hand that Grubb performs in attempting to reconcile his estimate of the 1774 money supply to the probate evidence. Michener's estimate (1987, 275) of $\text{£}0.58$ sterling is for the Middle colonies taken as a whole. The per-capita quantity of Pennsylvania paper money extant in 1774 was considerably less than the average in the Middle colonies, amounting to only $\text{£}0.467$ sterling.¹¹ Even though Grubb insists that the quantity of paper money circulating in a colony was the quantity issued by that colony, and even though $\text{£}0.58$ sterling is inconsistent with the data contained in his own Table 1, Grubb uses $\text{£}0.58$ sterling as the quantity of paper money in circulation in Pennsylvania.

The fraction of specie in Pennsylvania's money supply implied by the probate evidence depends on whether the paper portion of the money supply is taken to be $\text{£}0.58$ or $\text{£}0.467$ sterling and the assumption one makes about the wealth of non-probates, as detailed in Table 1.

¹¹ Money supply and population data are those used by Grubb (2004, 335); the conversion to sterling uses an exchange rate from McCusker (1978, 186).

Table 1: Probate estimates of the Pennsylvania Money Supply in 1774

	Per-capita money supply in £ st.	% Specie, assuming £0.58 st. in paper.	% Specie, assuming £0.467 st. in paper.
Jones (Non-probate W = ¼ probate W)	1.81	68	74
Grubb (over adjustment)	1.14	49	59
Grubb (Nonprobate W=0)	1.58	63	70

Michener's estimate is the 68 percent in the middle column. Grubb's estimate is the 49 percent just below it, a number he finds reassuringly close to the 45 percent he derives from runaway ads. However, since Grubb steadfastly maintains that there was no cross-colony circulation of bills, he ought to adopt an estimate from the rightmost column. If Grubb's over adjustment for non-probated wealthholders is discarded, his assumptions lead inexorably to the conclusion that 70 percent or more of Pennsylvania's 1774 money supply consisted of specie, a figure quite different from the 45 percent he seeks to defend.

All the estimates in the table are probably too low because colonial probate inventories are notoriously incomplete. Two examples not involving money illustrate the general problem. In Jones's collection of inventories, over 20 percent of the estates did not include any clothes (Lindert 1981, 657). In an independent survey of Surry County, Virginia probate records, Anna Hawley (1989, 27-28) notes that only 34 percent of the estates listed hoes, despite the fact that the region's staple crops, corn and tobacco, had to be hoed several times a year.

In Jones's 1774 database an amazing 69 percent of all estates were devoid of money.¹² While the widespread use of credit made it possible to do without money in most transactions, it is likely some estates contained cash that does not appear in probate inventories. Peter Lindert (1981, 658) surmises that "cash was simply allocated informally among survivors even before probate took place." McCusker and Menard (1985, 338, fn. 14) concur, noting that "cash would have been one of the things most likely to have been distributed outside the usual probate proceedings." If Jones

¹² Sixty-nine percent of the inventories in the thirteen colonies, that is. For the middle colonies, the comparable percent is 55.6 percent, while for just New Jersey, Pennsylvania and Delaware, it is 62.0 percent (Jones 1980, Tables 5.3 and 5.6, 130, 140).

actually underestimates cash holdings in 1774, the implication would be that even more of the prewar money supply in the Middle colonies was specie.¹³

Jones's estimate of the total money supply in 1774 provides another perspective on the situation prevailing in Pennsylvania in the early 1750s. If Grubb is correct, Pennsylvania's total money supply, reduced to sterling terms, averaged only £0.39 sterling per capita for the years 1750-1754. If Pennsylvania possessed something in the neighborhood of £3 to £4 of specie for every pound of paper—Brock's opinion, discussed in Appendix 1—the implication would be that the total money supply for the years 1750-1754 averaged an amount in the range of £1.50 to £1.87 sterling per capita.¹⁴ Grubb's estimate implies a dramatic increase in per-capita real

¹³ Grubb (2004, 342, fn. 14) chides Michener for quoting Mazzei as having said of colonial America that "in 1773 . . . all transactions were made almost entirely in specie." Mazzei, Grubb asserts, was referring only to Massachusetts, a colony that returned to specie long before 1773. We disagree with Grubb's interpretation. Here is the disputed passage, so readers may judge for themselves. (Mazzei wrote these lines in 1782, and the "present war" refers to the Revolution.)

Mazzei began his essay, "History of the Beginning, Progress, and End of Paper Money in the United States," with two paragraphs arguing that the "American States" (no mention is made of Massachusetts here) never had an abundance of specie in colonial times because of their extremely unfavorable trade with England. Here is his next paragraph, verbatim.

Since for the above reason specie was often lacking, it had to be made up by bills of credit, that is, paper money. However, this was nothing new for the Americans at the beginning of the present war. They already knew from experience that too much paper causes it to depreciate, for during the previous war the American states, because of their voluntary and excessive zeal in helping England, had gone into debt for almost ten million pounds. As a consequence the paper money of the state of Massachusetts lost so much value that it lost up to 10/11 of its face value, so that 11 paper pounds had to be paid for what could be had for one of specie. But as the Americans had paid off the said debt before the Revolution, very little paper money had remained in circulation and had regained its full value. In 1773, the year disorders began, that is, ten years after the end of the previous war, all transactions were made almost entirely in specie, which, however, did not abound. (Mazzei, Marchione et al. 1983, 1:325)

¹⁴ The calculation yielding the range of £1.50 to £1.87 sterling neglects the possible cross-colony circulation of bills. If we compute the average per-capita paper money balances for New York, Pennsylvania, and New Jersey and reduce them to sterling, we find £0.50. If those colonies collectively had 3 or 4 times as much specie as paper, total money balances would have been in the range of £2.0 to £2.5 sterling. New York, however, had issued a disproportionate share of the total, and New York paper money did not circulate in

balances between the early 1750s and 1774, whereas Brock's implies the two eras had roughly comparable sterling money balances. In our opinion, Brock's scenario is the more plausible one.

CONCLUSION

"Dollars" in runaway ads cannot be taken to mean specie dollars; "pounds" cannot be taken to mean Pennsylvania bills of credit. Grubb's technique for inferring the quantity of specie that circulated in colonial Pennsylvania leads him to underestimate its importance, dramatically so in the years immediately before the French and Indian War. It is highly unlikely that Spanish dollars became increasingly prominent in Pennsylvania's money supply in the decade before the Revolution, although it is possible Maryland's paper dollars did. The time series that Grubb produces for the total money supply in colonial Pennsylvania is so thoroughly flawed that scholars ought to disregard it.

Pennsylvania. While New Jersey's paper money did circulate in Pennsylvania, New Jersey had relatively little paper money outstanding. For Pennsylvania's paper money balances in those years to have reached £0.50 would have required practically *all* of *both* Pennsylvania's and New Jersey's paper money to circulate in Pennsylvania, which is highly unlikely. The calculations are based on money supply data from Brock (1992), exchange rate data from McCusker (1978), and population data from United States Bureau of the Census (1975, 2:1168). Delaware is neglected in these calculations because of the absence of detailed data on her outstanding paper money balances. Its absence does not seriously bias the conclusions. Delaware's population and paper money outstanding were both approximately a quarter of Pennsylvania's, giving Delaware roughly the same amount of paper money per-capita as Pennsylvania (Brock 1975, 98, fn. 77).

**APPENDIX 1:
Pennsylvania's specie stock, 1749-1754**

Here we present archival evidence that Grubb has dramatically underestimated Pennsylvania's specie stock during these years, which, we believe, undermines the credibility of his estimates for other years as well. Grubb (2004, 334-5) estimates that between 1749 and 1754 specie comprised, on average, five percent of the money supply, £4,317 Pennsylvania pounds compared to a paper money supply averaging £83,500. But Brock (1975, 354) argues that "during King George's War the amount of specie in . . . [Pennsylvania] had increased until in 1749 there was more in circulation than at any previous time in the history of the province. There were at this time perhaps three or four pounds circulating in specie for every pound in paper." Brock's statement is based on ample evidence.

1. In 1749, a Massachusetts pamphleteer described New York and Pennsylvania's circumstances in this way:

At New-York, and Philadelphia Silver is their Medium, and mill'd Dollars pass current at a known determinate Rate, and other foreign Coins in proportion: Paper Bills are sometimes the Instrument in Payments, but the Proportion is small compar'd with the Silver. (Davis 1964, 4:387)

2. Pennsylvania's proprietary secretary, Richard Peters, wrote Pennsylvania's owners on 29 April 1750 to criticize an effort by the assembly to emit bills of credit when he remarked that:

The increase of the Currency by the vast Quantities of Gold and Silver brought into the Province by the Spanish & West India Trade is so very remarkable that one would have thought it cou'd not enter into the heads of any to make any addition to the Paper Currency, and yet the Members were no sooner got together but . . . they determin'd on a Bill to add £20,000 to the £80,000 now Current, so as to make the whole paper Currency amount to £100,000, and the reason assign'd for going into the Bill at this time is that all the Gold & Silver may very soon be

sent out of the Province, & that a scarcity of Money ensuing on a Plenty the People will be reduc'd to great hardships. I believe it is true that great quantities of Gold & Silver are daily going to Virginia & Maryland for Bills, & that as the Exchange is £72½ & in some few Instances I have heard £75 abundance will be Shipp'd off, but what then? There is at least £300,000 of Gold & Silver now Curr. The Havannah & St. Augustine Trade does now subsist & is likely to do so, & will be every three or four Months bringing in fresh Supplies. The West India Trade must always pour in Gold & the Bills of Jersey & Newcastle will always make some addition, so that it is thought by some of the most eminent merchants that notwithstanding the drains of Gold to Virginia & ~~Maryland~~ England there will still be enough to answer all the Purposes of a Currency. (Peters 1750)

3. The legislature's own pronouncements confirm Peters' assessment. An assembly committee in 1754 reported that in the previous twenty years Pennsylvania's foreign and domestic trade and population had tripled and the need for a medium of exchange had increased in proportion. Over that time, the quantity of paper money had not increased, and "our Foreign and Domestic Commerce could not have been carried on as it has been for some years past, had not the accidental Introduction of great Quantities of Silver and Gold, by the War, supplied the Deficiency of our Paper Currency for that Purpose." The committee went on to call for a new emission of paper money on the grounds that the quantity of gold and silver in circulation was diminishing and that the existing bills were scheduled for retirement (Franklin, Labaree et al. 1959, 5:194). In 1757, in reply to a message from the governor, the assembly remarked that in the early 1750s, "when we had but Eighty Thousand Pounds current in Bills of Credit, there was current in the Province at least Four Hundred Thousand Pounds of Gold and Silver" (Hoban and MacKinney 1931, 6:4522).

4. In 1753, the receiver of quit rents, Richard Hockley, wrote Thomas Penn expressing a skeptical attitude about the shortage of money then said to be prevailing:

The People are very pressing for an Emission of more money, P[er]haps their application may be though a little

unseasonable, however[.] If they must have it then twill not be granted until you come, and by Yourself[.] Our produce still continues very high and when brought to markt always finds purchasers frequently outbidding each other, which I think plainly proves there is not that scarcity as pretended, and full four fifths of the money rec[eive]d into your Office is Gold and Silver but chiefly the latter. (Hockley 1753)¹⁵

¹⁵ An earlier version of Grubb's paper dismissed Hockley's letter on the grounds that the proprietor's tenants were required to pay their quit rents in sterling, and therefore were under a contractual obligation to pay in specie. Hockey's comment that "four fifths of the money received ... is Gold and Silver," Grubb (2001, 35-6, fn. 11) concluded, is "patently unrepresentative of the ratio of specie to paper money circulating as a medium of exchange within the colony."

There was a longstanding dispute between the proprietor and the Assembly over the payment of quit rents and Grubb fails to recognize the role of Pennsylvania's legal tender laws in the controversy. When Pennsylvania first issued its bills of credit it made them a legal tender in the strongest terms.

The tender of the said bills for payment or discharging of any debt or debts, bargain, sale of lands, or other things, bonds, mortgages, specialties and contracts whatsoever, already made, or hereafter to be made, either for sterling money, silver money of America, dollars, or any other species of gold or silver, or any quantity of plate or gold, shall be as effectual in the law, to all intents and purposes, as if the current silver coin of this province had been offered and tendered for the discharge of the same or any part thereof. (Pennsylvania, Mitchell et al. 1896, 3:329)

The act further stated that bills of credit were to be taken as "proclamation money," which Queen Anne's Proclamation of 1704 set at four pounds proclamation money to three pounds sterling; by the 1730s the market exchange rate was substantially higher, roughly five Pennsylvania pounds for every three pounds sterling (McCusker 1978, 183-6). The legal tender act forced the proprietor to take Pennsylvania bills of credit valued *at the Proclamation rate* in fulfillment of sterling quit rent obligations. By paying in bills of credit, tenants saved and the proprietor lost approximately one Pennsylvania pound for every three pounds sterling in quit rents due. Beginning in 1732, the Proprietor tried to put an end to this practice by requiring new tenants to sign an agreement to pay their quit rents either in sterling money "or its value in Currency, regard being had to the rate of exchange between Philadelphia and London." Such an agreement, however, was an example of a "specialty," for which the bills had already been declared a tender. It is doubtful the courts enforced it. In 1739, the governor, in response to the proprietor's instructions, refused to consent to a re-emission of bills until the assembly acted to redress this grievance (*Pennsylvania Gazette*, 25 January 1739, 15 February 1739). The assembly responded by passing an act paying partial compensation to the proprietor for the losses he had sustained. In return, the bill stipulated that the proprietor would accept bills of credit "as then current" (i.e., at Proclamation rates)

The evidence strongly supports the conclusion that colonial Pennsylvania possessed at least £300,000 in specie in those years rather than the £4,317 that Grubb estimates.

APPENDIX 2:
Cross-Colony circulation of bills of credit:
The evidence for Pennsylvania

This appendix reviews the archival evidence showing that Pennsylvania bills of credit circulated outside Pennsylvania and that bills of other colonies circulated within Pennsylvania. The evidence also reveals that contemporaries understood and commented on seigniorage and that it was indeed a bone of contention in colonial times.

We begin with the circulation of Pennsylvania bills of credit in Maryland, particularly in the late 1750s and early 1760s. Understanding how Pennsylvania's bills became entrenched in Maryland requires some knowledge of the peculiarities of Maryland's own bills of credit. Uniquely, Maryland paper money was redeemable with fixed and certain quantities of specie in 1748 and 1764. Maryland carried out its 1748 redemption as promised and its redemption fund in London was more than adequate to meet the second payment, so its bills of credit, which had depreciated well below their par value, became an attractive investment security hoarded by those who wished to profit from their appreciation (Brock 1975, 422-423).

in payment of quit rents upon grants made before 1732, and that on grants made after 1732 payment would be made "according to the tenor of the grants" (Pennsylvania, Mitchell et al. 1896, vol. 4, 324). Since all grants made after 1732 included the provision that payment should be in sterling or its value in currency, the provision would have permitted payment in bills of credit at their actual value. However, the assembly did not amend its legal tender act. According to Hutson (1970, 431), the post-1732 tenants persisted in using the legal tender provisions to pay quit rents with overvalued bills of credit until the Privy Council intervened in 1760 (Franklin, Labaree et al. 1959, vol. 9, 150-1). Only under duress did Pennsylvania amend its legal tender provision in 1764 to exclude sterling rents due to the proprietor (Pennsylvania, Mitchell et al. 1896, vol. 6, 363). If Hockey's estimate is biased, it is likely to *understate* the ratio of specie to paper in circulation, since the legal tender acts clearly gave pre-1732 tenants an incentive to pay in bills of credit. If Hutson (1970) is correct, the incentive existed for all tenants.

Before 1764, Maryland bills of credit were at best an auxiliary medium of exchange, and the colony possessed parallel accounting systems, one based on specie or “hard currency” and one based on its bills of credit. In 1752 and 1753, Maryland’s courts and legislature cooperated to raise the rating of foreign coins so that they mostly agreed with the values prevailing in Pennsylvania, making Maryland’s “hard currency” system nearly indistinguishable from Pennsylvania’s monetary system. The dollar, the bellwether coin in colonial America, was thereafter rated at 7s. 6d. in Maryland, just as in Pennsylvania and New Jersey (McCusker 1978, 191-194; Brock 1975, 415-417). That condition provided impetus in Maryland for the use of specie and Pennsylvania and New Jersey bills of credit, especially when Maryland’s own bills of credit began disappearing from circulation in anticipation of their redemption (Gould 1915, 14-15).¹⁶ In January 1762, Henry Callister, an Eastern shore tobacco merchant and planter, wrote to a correspondent: “When I said currency, which does not imply Maryland [paper] money, of which there is hardly any current—I think I was yet more particular, for I spoke of money and exchange as current in Pennsylvania, which is our current money at present” (McCusker 1978, 193). On 10 December 1765, William Lux of Baltimore echoed that sentiment in a letter to Reese Meredith of Philadelphia: “My brother only mentioned to me to pay you £75 Curr. I cant tell which he meant but I imagined it be to Pen[n]sy[lvania] as we hardly ever deal for Mary[lan]d as there is a difference from 15 to 25 p. Ct. therefore all our Transactions are for such Current Money as is in Circulation” (Lux 1763-1769).

Other evidence confirms that many Pennsylvania bills of credit circulated in Maryland in those years. To protest the Stamp Act, the Currency Act, and various other imperial regulations, Philadelphia merchants in 1765 laid out their grievances in a memorial to London merchants. Objecting to the Currency Act, the Philadelphia merchants pointed out that Pennsylvania bills of credit outstanding had already shrunk from £600,000 to about £293,000 between 1760 and 1765 and were scheduled to continue diminishing at the rate of £30,000 per annum. “A great Part of the said Bills, now current,” they noted, “serve as a Medium of Trade for the neighboring Colonies of New-Jersey and Maryland, and particularly the last, which has received them, from a full Conviction of the Solidity of their Establishment, as well as from Necessity, having had no Currency of their own

¹⁶ The Leslie Brock papers at Alderman Library, Series II, box 3, contain Brock’s notes on Henry Callister’s papers. Brock records a letter from Henry Callister to Mr. White, dated July 22, 1760, in which Callister writes: “Pennsylvania and Jersey money . . . are current here.”

for some Years past, and without them, must have been greatly distressed in their commercial interest” (Merchants and Traders of Philadelphia 1765; for a similar petition, see Hoban and MacKinney 1931, 7:5826). John Dickinson concurred, writing in one of his pamphlets that “A great part of [Pennsylvania’s] bills now circulating, are passing in the neighbouring provinces” (Dickinson 1895, 219).

A letter in the *Maryland Gazette* of 15 September 1763 complained of the “inundation” of bills of credit from neighboring colonies that Maryland experienced in 1759 and went on to point out how impolitic it was to permit Maryland’s commercial rivals to profit from the circulation of their paper money within the colony. When Maryland drafted a report on its currency in 1764 in response to an inquiry from London, it reported its own paper money was almost entirely sunk “so that after the 29th of September next there will be no Paper Currency or Bills of Credit circulating in this Province except such as have been emitted in the Neighbouring Colonies and may for want of a sufficient Quantity of Specie in Circulation be brought in and paid away to the Inhabitants of this Province” (Browne, Hall et al. 1883, 32:95).

The account book of William Fitzhugh (1761-1764), a prominent merchant on Maryland’s western shore, shows the dangers of assuming that references to pounds means bills of credit issued by that colony. Fitzhugh’s extensive accounts contain many references to “pounds,” while Pennsylvania and Virginia money are scarcely mentioned. Grubb (2004, 337) interprets this as proof that Fitzhugh relied on Maryland paper money and that Pennsylvania and Virginia bills of credit rarely circulated in Maryland.¹⁷ But Grubb’s analysis overlooks the existence of Maryland’s parallel accounting systems—that for “hard currency” and that for Maryland bills of credit. Maryland’s original bills of credit were never widely accepted on Maryland’s western shore.¹⁸ An English traveler who visited Maryland in 1742 remarked that “The Maryland [paper] Money is generally pretty good, but of a low Value, and this, again, is not taken on the Western

¹⁷ Grubb makes this argument despite the fact that he observes in another context (2004, 331, fn. 2) that “merchant account books tend to record values in unit-of-account ‘money.’ They do not necessarily reflect the transfer of the physical currency itself.”

¹⁸ Grubb (2004, 337, fn. 6) cites a Philadelphia dry goods merchant’s advertisements, placed in 1747 and 1750 in the *Pennsylvania Gazette* and offering to exchange Maryland for Pennsylvania money, to show that colonial paper money did not circulate as a medium of exchange in neighboring colonies. Grubb is certainly correct that colonial paper money did not *always* circulate in neighboring colonies, and since this issue of Maryland money was not even circulating as a medium of exchange *on Maryland’s western shore*, it would be somewhat surprising to find it accepted *outside* Maryland.

Shore of Chesapeake, where only Gold and Silver is current” (Kimber 1998, 55). We do not have to conjecture that Fitzhugh used the “hard currency” system because his accounts clearly show it. By 1764 Maryland’s paper money had appreciated and was on the verge of being redeemed at its par value of £133.33 Maryland money for £100 sterling. Accordingly, it had nearly reached its par value in the marketplace (McCusker 1978, table 3.9). Maryland’s hard currency, being nearly indistinguishable from Pennsylvania’s, purchased sterling bills at approximately the same rate as in Philadelphia: £166.77 for £100 sterling, compared to £172.86 in Philadelphia (McCusker 1978, tables 3.7, 3.8). To verify which accounting system Fitzhugh used, one must compare his exchange transactions to those benchmarks, a comparison that verifies he indeed used the “hard currency” system.¹⁹ The near absence of annotations distinguishing between Maryland and Pennsylvania pounds is therefore easily explained: there was no need for Fitzhugh to distinguish between Maryland and Pennsylvania currency values unless he was proffered one of the few coins that bore a different rating in the two colonies.

Pennsylvania bills circulating in Maryland are only part of the story. Pennsylvania and New York bills of credit circulated in New Jersey, and those of New Jersey circulated in both Pennsylvania and New York. Although New Jersey emitted small quantities of bills beginning in 1709, by 1723 those initial emissions had largely been retired (Lester 1939). Meanwhile, both New York and Pennsylvania had begun issuing bills of credit. When New Jersey farmers took their produce to one of those colonies, as they often did, they were paid in New York and Pennsylvania paper currency, which then began to circulate in New Jersey, although it was not a legal tender there and was sometimes refused in payment. In 1724, James Alexander estimated that £20,000 of New York and Pennsylvania bills of credit circulated in New Jersey, 20 percent of all the paper money outstanding in those two colonies. Alexander computed that even at an annual interest rate of 5 percent, 3 percent below the common rate, New Jersey annually paid to her neighbors £1,000, which was more than the annual cost of New Jersey’s government. It was slavery, he declared, for any people to have to support their own government and that of their neighbors too. New Jersey needed an emission of legal tender paper money, he concluded, so they would not be forced to rely so heavily on New York and Pennsylvania bills (Whitehead, Ricord et al. 1880, 1st series,

¹⁹ McCusker (1978, table 3.8) derived many of his “hard currency” exchange rates from the Fitzhugh account books discussed here.

5:96. See also Governor Burnet to the Lords of Trade, 12 May 1724, Whitehead, Ricord et al. 1880, 1st series, 5:86-93).

New Jersey emancipated itself by getting its paper money to circulate in New York and Pennsylvania. The merchants of Perth Amboy, two years after the emission, signed a certificate attesting that New Jersey's paper money "Ever Since the Issuing thereof passed Current not only thro' all this province but also in the province of Pensilvania without any Scruple or discount thereon betwixt the Currency of Pennsylvania & of this province" (Whitehead, Ricord et al. 1880, 1st series, 5:154). Richard Partridge, New Jersey's agent, reported to the Board of Trade in September 1731 that New Jersey "situated between New York and Pensilvania and their paper money being currant in each, occasions the dispersing it through the whole and it's scarce a third part of it continues in their Province" (Partridge 1938).²⁰ In the mid-1730s the preamble of a law emitting more paper money stated that "the Bills of Credit of this Province have obtained a general Currency in our Neighboring Provinces, and by reason thereof great part of said Bills remain in the Hands of Persons residing in the said Provinces" (Whitehead, Ricord et al. 1880, 3rd Series, 2:474). In 1740, William Douglass (Davis 1964, 3:322) commented that "New-York bills not being current in Pensylvania, and Pensylvania Bills not being current in New-York; but Jersey Bills current in both, all Payments between New-York and Pensylvania are made in Jersey Bills." McCusker (1978, 170, fn. 124) provides several specific instances of New Jersey bills being so used. Douglass based his comments in part on a memorandum prepared for him by Alexander, who reported that "Philadelphia has always paid equal or more respect to New Jersey bills than their own and bills of Exchange being generally more plenty in Philadelphia than in New York great and many sums have been remitted in New Jersey money from New York to Philadelphia for purchasing bills of exchange there." Alexander also mentioned a specific reason New Jersey money was so widely used in Philadelphia.

Philadelphia markets are chiefly supplied with beef mutton and other eatables by the butchers going into New Jersey for the business of them where the people will hardly take

²⁰ Partridge's statement seems to echo that of Colonel Montgomerie, made in a letter dated 20 November 1730 (Whitehead, Ricord et al. 1880, 1st series, 5:289). Partridge made a very similar remark in a paper prepared for the Board of Trade 13 August 1735 (Whitehead, Ricord et al. 1880, 1st series, 5:418).

any money but their own, which occasions Jersey money to be given in Philadelphia before their own money and the butchers sometimes give an advance to get it. A Monmouth County man lately told me (tho I believed he spoke something at Large) that the Philadelphia Butchers brought at Least ten thousand pounds a year into his county for fatt Cattle all in Jersey money. (Alexander 1740)²¹

After passage of the Currency Act of 1751, the Board of Trade became increasingly hostile to legal tender paper money. In response, the New Jersey assembly argued that “as it is chiefly the merchants of New York and Philadelphia that give life to our trade, our money must consequently sometimes pass through their hands” (Whitehead, Ricord et al. 1880, 1st series, 8:15). If New Jersey’s money ceased to be a legal tender, even in New Jersey, while New York and Pennsylvania’s bills of credit remained a legal tender, it would, the assembly feared, undermine the credit of their money in New York and Philadelphia. Governor Bernard wrote the Lords of Trade on 31 August 1758 confessing that he had no good answer to this argument, and in so doing made the following comment: “They [members of the assembly] say that this Province having a continued intercourse with the two neighboring Provinces of New York and Pennsylvania it is quite necessary that their bills should be current in the counting houses of New York and Philadelphia, which at present they are and it is the greatest Test of their Credit. In like manner the bills of N. York and Pennsylvania are current within New Jersey” (Whitehead, Ricord et al. 1880, 1st series, 9:134).

If the combined testimony of the assembly, merchants, and royal governors is thought inadequate, consider that of Anglican clergyman Andrew Burnaby, who passed through New Jersey in 1759-60. “The paper currency of this colony [New Jersey],” Burnaby wrote, “is at about 70 per cent. discount, but in very good repute; and preferred by Pennsylvanians and New Yorkers to that of their own provinces” (Burnaby, Wilson et al. 1904, 110).

²¹ When Alexander’s note was written, Pennsylvania had only £80,000 of its own paper money in circulation; if the anecdotal account of Philadelphia butchers accumulating £10,000 of New Jersey currency is to be credited, it would amount to fully 1/8th of the Pennsylvania currency extant.

Maryland and New Jersey were not the only colonies sharing paper money with Pennsylvania. On 4 October 1768, the New York Chamber of Commerce officially sanctioned the use of Pennsylvania's bills of credit in New York, each 7.5 s. of Pennsylvania bills to be treated as equivalent to 8 s. in New York money, an advance that reflected the rating of the Spanish dollar in New York (8 s.) relative its rating in Pennsylvania (7 s. 6 d.) (Stevens 1867, 10, 11, 18).²² In addition, Delaware paper money “although without government sanction in Pennsylvania, was accepted by the merchants there” (Keith 1917, 2:673). Indeed, the merchants of Philadelphia advertised that they would work to abolish all distinctions between Delaware's bills of credit and Pennsylvania's and that they stood ready to accept one quarter of any money due to them in Delaware's bills. At the same time, the trustees of Pennsylvania's loan office also advertised their willingness to accept Delaware's bills for up to a quarter of the sum borrowers were obliged to repay (*Pennsylvania Gazette*, 4 April 1730). Twenty years later, Peters, in listing the reasons he felt a new emission of Pennsylvania bills of credit was unnecessary, wrote that “the Bills of Jersey & NewCastle [that is, Delaware] will always make some addition [to Pennsylvania's money supply]” (Peters 1750).

APPENDIX 3: The rise of dollars in Pennsylvania runaway ads

Grubb (2004, figure 1, 340) uncovers an interesting pattern in the runaway ads: The proportion of ads offering rewards in “dollars” skyrocketed in the late colonial period. Before 1760, the fraction of ads offering rewards in “dollars” was negligible; at the end of the French and Indian War, the fraction was still only about 5 percent. However, in the late 1760s and early 1770s, the fraction increased steadily, reaching nearly 50 percent of all ads by 1775. Pistoles (a Spanish gold coin), which had been mentioned in 5-10 percent of ads before 1760, appear less frequently after 1760. Grubb interprets “dollars” as literally as he does “pounds” and takes

²² Pennsylvania currency enjoyed a limited circulation in New York from a much earlier date—e.g. *New-York Gazette*, 8 May 1732. In July 1768, before the Chamber agreed to officially sanction the circulation of Pennsylvania bills of credit in New York, it first voted down a motion that would have “hereafter discouraged [it] from passing in this colony.”

this as evidence that Spanish silver dollars were playing a dramatically more important role as a medium of exchange in the late 1760s and early 1770s. We believe that Grubb has misinterpreted the meaning of “dollars,” although the pattern is nonetheless striking and calls for some kind of explanation.

Grubb attributes the phenomenon (in his view a greater use of silver) to an improved balance of trade in the late colonial period and to the fact (2004, 340) that in the New World, “the ratio of silver to gold produced rose by 75%” after 1760. This explanation is weak, at best. First, specie stocks were vastly larger than annual production, so it would take a long time for the change in flow to greatly influence the comparative size of the available stocks. Second, in runaway ads the ratio of dollars to pistoles (the gold coins Grubb finds mentioned in runaway ads) increased by well over 1,000 percent, not 75 percent.

As evidence of the improved balance of trade, Grubb (2004, 341) cites Altman’s estimates of the current account trade deficit of the colonies with England for 1771-1775. Much of this improvement, however, reflects political—not economic—developments. After Britain closed the port of Boston, the Continental Congress adopted a policy of nonimportation, effective 1 December 1774, a policy that doubtless had much to do with the improved trade deficit in 1771-1775. However, between fleeing Tories liquidating their estates and apprehensive British investors disinvesting in America, the net effect on the colonial specie supply was to diminish it, not enhance it.²³

Gresham’s law provides a convincing reason to believe that the greatly increased mention of “dollars” in runaway ads did not arise from an inflow of Spanish silver dollars. In London in the late colonial period the gold/silver price ratio was less than 15 to 1, as shown in the rightmost column of Table 2.

²³ According to Philip Mazzei, who resided in Virginia between 1773 and 1779, “The first step taken by the Americans toward alienation from England was when they agreed not to buy anything from her anymore, but because private individuals were generally and heavily indebted, exportation was allowed for a set period of time, and not only of merchandize, but of specie as well...with the result that before communication between the two countries was cut off, America was left almost entirely without hard money” (Mazzei, Marchione et al. 1983, vol. 1, 325-6).

Table 2: London Silver and Gold Prices

Year	London price in d. of an ounce of foreign coined silver	London price in d. of an ounce of foreign coined gold	Ratio of gold to silver prices
1767	64.95	953.4	14.68
1768	64.96	950.9	14.64
1769	65.68	963.2	14.67
1770	66.29	961.2	14.50
1771	66.11	958.8	14.50
1772	65.48	958.9	14.64
1773	62.81	936.8	14.91
1774	62.23	932.0	14.98
1775	63.50	930.0	14.65

Source: *The Course of Exchange*. Average of monthly observations taken from the middle of each month.

In Pennsylvania, the Spanish dollar passed current at a value of 7 s. 6 d. By the late 1760s, the most highly rated gold coins circulating in Pennsylvania (relative to their gold content) were the Portuguese Johannes (“joes”) and half Johannes (“half joes”), rated at £6 and £3 respectively. Had the weights in the almanac table accurately reflected the weights of joes and Spanish dollars as they circulated in Philadelphia, the gold/silver price ratio would have been 15.06.²⁴ In fact, half joes of just 9 dwt. were routinely paid and accepted without a discount in Philadelphia (*Pennsylvania Gazette*, 3 December 1767; Stevens 1867, 69). Once allowance is made for the circulation by tale of underweight half joes, the gold/silver price ratio becomes 15.33.²⁵

The point of those calculations is to demonstrate that Portuguese gold coins were overvalued relative to the Spanish dollar during the very period when the number of “dollars” appearing in runaway ads exploded.

²⁴ Seven shillings and six pence, Pennsylvania’s rating of the dollar, is equal to 90 pence. Seventeen pennyweight and 6 grains is 0.8625 ounces, making silver’s value $90/0.8625 = 104.35$ d. per ounce. A half joe, worth £3 = 720 d., and weighing 9 pennyweight and 4 grains = 0.4583 ounces, is gold at $720/0.4583 = 1571$ d. per ounce. Finally, $1571/104.35 = 15.06$.

²⁵ Nine pennyweight is 0.45 ounces, so a half joe of this weight would be gold at $720/0.45 = 1600$ d. per ounce, making the gold/silver price ratio $1600/104.35 = 15.33$. The dollars in circulation seem to actually have been slightly heavier than the value given in the almanac. Records of dollars remitted to London from Philadelphia in 1768 show the dollars sent had an average weight of 0.8675 ounces (Mildred and Roberts 1768).

Pennsylvanians should have retained joes and exported dollars, so it is impossible to reconcile Gresham's law with the sudden increase in "dollars" in runaway ads if the "dollars" were Spanish silver. A contemporary newspaper article penned by "Eugenio" (*Pennsylvania Gazette*, 3 December 1767) recognized this and criticized the high rating that merchants had bestowed on Joes. After calculations similar to those presented above, "Eugenio" concluded "if the present advanced Price continues, we must expect that every other Gold or Silver Coin will be as scarce as Ducats or Chequins [two particularly scarce and under-rated coins]." We know from the almanacs that Pennsylvania retained the high rating of joes that "Eugenio" protested.²⁶ Economic historians have long known that joes were flowing into the Middle colonies during this time, although they have generally failed to note the role that coin ratings played in the process (Lydon 1965).

Why, then, did more "dollars" appear in runaway ads? More precisely, why did Pennsylvanians find it increasingly convenient to use dollars as a unit of account?

Likely, there were several reasons for the change. First, reckoning in dollars became easier. Before 1760 the most commonly used gold coin in Pennsylvania was the pistole, rated at 27 shillings²⁷ or 3.6 dollars, a somewhat cumbersome number. But in 1767, when the ratings on joes and half joes were raised to £6 and £3 respectively, their values translated neatly to 16 and 8 dollars.

Second, colonial economic integration made it increasingly expedient to reckon in dollars, the one universally understood unit of account in British America. The Continental Congress and the new nation denominated its currency in dollars for that very reason. Local pounds, shillings, and pence were nettlesome for those who did business or traveled in colonies where different valuations ruled. Runaways often fled to other colonies, which might be why Pennsylvania runaway ads in the late colonial and early national period often offered rewards in dollars, while indentured servant contracts written at the same time were still being written in pounds.

²⁶ In 1775, the overvaluation of Johannes and half Johannes became an issue once again, when several merchants attempted to raise the value of other gold coins that were rated "under their value, in proportion to Half Johannes" so as to put them "as nearly on a footing as possible" (*Pennsylvania Gazette*, 15 February 1775).

²⁷ That pistoles were rated at 27 s. in the late colonial period is evident from almanacs, one of which is reproduced as Figure 2, page 5 above. Pistoles were so rated at least as early as 1742 (*Pennsylvania Gazette*, 16 September 1742).

Finally, it is possible that Pennsylvanians were led to make greater use of dollars as a unit of account by the more extensive circulation of a dollar-denominated medium of exchange. If so, that medium of exchange was not silver but Maryland paper money. Maryland's cash on deposit in the Bank of England, against which it issued paper money, enabled it to be the one colony that quickly hit on a successful formula for emitting paper money under the restrictions imposed by the Currency Act of 1764. As neighboring colonies were forced by the Currency Act to redeem and burn the currency they had emitted during the French and Indian War, Maryland emitted a quantity of notes denominated in dollars, not pounds (Newman 1986).

The first emission of this new dollar-denominated money was authorized by an act passed on 6 December 1766 (Browne, Hall et al. 1883, 61:264-275). The next day, Governor Sharpe wrote Lord Baltimore to assure him that Maryland actually had a larger sum on deposit in England than the total face value of all the bills to be issued and that he was confident the bills would meet with wide acceptance although they were not a legal tender. "I am told," Sharpe reported, "that One of the principal Merchants in Philadelphia who knows on what Foundation the bills are to be emitted has declared that he will make no Difference between those Bills & the number of Dollars to be therein mentioned" (Browne, Hall et al. 1883, 14:351-2). So well was the new money received that six months later Sharpe was already toying with the possibility of a further emission. If the ministry approved, Sharpe noted, Maryland would be indifferent to the restrictions embodied in the Currency Act of 1764. "I think it is for our Interest [the Currency Act] should remain in force," Sharpe opined, "since our Mercantile People have now money for the purposes of Trade while those in the neighbouring Colonies are stinted as it were for Want of a Circulating Medium & if necessity makes them receive & circulate our Money they must in fact pay us Interest for it as in that Case we are to them in the nature of Bankers" (Browne, Hall et al. 1883, 14:390-391). Between 1767 and 1775, the *Pennsylvania Gazette* specifically mentioned Maryland bills of credit in ads warning of the circulation of counterfeit notes, in ads reporting thefts, and in ads seeking the return of lost pocketbooks, which strongly suggests that Maryland bills did circulate to some extent as a medium of exchange in Pennsylvania, as Sharp had predicted they would.²⁸

²⁸ See *Pennsylvania Gazette*, various issues. For warnings about counterfeit notes, see 3 March 1768, 3 May 1770, 23 June 1773; for thefts, see 14 September 1769, 12 March 1772, 13 December 1775; for lost pocketbooks, see 12 March 1772, 9 July 1775, and 18 January 1775.

Moreover, Maryland money passed in Pennsylvania interchangeably with Spanish dollars in accord with the face value of the bills. The best evidence of this is *The Gentleman's and Citizen's Pocket Almanack for ... 1772*, a Philadelphia almanac that printed the following table.

Figure 3: Value of Maryland currency in Pennsylvania

The following Table shews the Value of the Bills of Credit of Maryland, as they are divided into different Parts of Dollars, in Pennsylvania Currency.

Maryland.	Pennsylvania.
Parts of a Dollar	l. s. d.
1 9th is	0 . 0 10
2 ditto	0 1 8
1 6th	0 1 3
1 3d	0 2 6
2 ditto	0 5 0
1 dollar	0 7 6
2 ditto	0 15 0
4 ditto	1 10 0
6 ditto	2 5 0
8 ditto	3 0 0

Source: *The Gentleman's and Citizen's Pocket-Almanack For...1772*.

Spanish dollars, it may be recalled, passed current in Pennsylvania at 7 s. 6 d., exactly like the Maryland dollars listed in the table above. The multiples and fractions of dollars in the table are all in this ratio. Moreover, the fact that this information was published in an *annual* publication

In addition, an ad placed 12 September 1771 mentions a Pennsylvania runaway who absconded with a ragged ninth of a dollar bill, Maryland money.

suggests the value of Maryland bills in terms of Pennsylvania money were not subject to day-to-day fluctuations.

A nice snapshot of Pennsylvania's money supply on the eve of the Revolution can be found in a letter from William Pollard to William Killen on 26 October 1773 (Pollard 1773). Killen, in Dover, Delaware, had remitted some money to Pollard, a Philadelphia merchant, but when Pollard counted it, he found the remittance a bit short, forcing Pollard to write and explain the difficulty.

I have duly rec'd your Favour by Mr. Thos. Rodney, but instead of £.54..7..6 there was only £.51..7..6 the particulars of which you have at Foot... my young Man counted the Money in Mr. Rodney's presence & Mr. Rodney also counted it but could make no more of it

1 Jersey Bill	£6	
2 Eight Dollars	6	
1 Pennsylvania bill	3	
2 Four Dollar	3	
1 One Dollar		7 6
11 Half Joe	33	
	£51 . . 7 . . 6	

There were no coins in "Eight Dollar" and "Four Dollar" denominations but Maryland bills of credit did come in them. Even "1 One Dollar" seems unnecessarily redundant to refer to a single Spanish dollar; it is likely all these referred to Maryland bills of credit, and "One Dollar," "Four Dollars," and "Eight Dollars" were their denominations. Note the predominance of Portuguese half joes, the presence of a "Jersey bill," and the comparative unimportance of Pennsylvania bills among the sum tendered. That transaction nicely illustrates how Pennsylvania pounds functioned as a unit of account. All the disparate media of exchange were reduced to a common unit of account, in this case Pennsylvania pounds, despite the fact that Pennsylvania bills of credit played a minor role in the transaction.

Maryland's dollar-denominated bills of credit, as certain as their security must have seemed, nonetheless met an unhappy end. During the Revolution, Maryland's deposits at the Bank of England were frozen pending settlement of other outstanding claims, and Maryland never

recovered the funds. Years after the Revolution, Maryland's colonial bills of credit still had not been redeemed, so a meeting of all the holders was held in Philadelphia "endeavouring to procure justice...to the holders of said bills of credit" (*Pennsylvania Gazette*, 27 October 1790). That it was found necessary to hold such a meeting in Philadelphia suggests that many of Maryland's bills of credit were in the possession of Pennsylvania residents.

Readers should keep in mind that in our view the medium of exchange cannot be inferred from the unit of account. So the discussion above emphatically should *not* be taken to mean that every mention of a "dollar" in late colonial Pennsylvania referred to Maryland's dollar-denominated bills of credit, but only that, without further information, it *could* have referred to them. References to "dollars" could also signify use of the dollar as a unit of account and hence simply be a means of accounting for a variety of other exchange media, including even *gold* coins.

REFERENCES

- Alexander, J.** 1740. Memorandum Concerning the Paper Money of the Province of New Jersey. Cadwallader Colden Papers, 1677-1832, New York Historical Society, Box 2, Political and Miscellaneous Papers.
- American Weekly Mercury.*** Philadelphia: Andrew Bradford.
- Andrew, A. P.** 1904. The End of the Mexican Dollar. *Quarterly Journal of Economics* 18(3): 3321-356.
- Andrews, C. M.** 1918. Current Lawful Money of New England. *American Historical Review* 24(1): 73-77.
- Baxter, W. T.** 1945. *The House of Hancock*. Cambridge: Harvard University Press.
- Brock, L. V.** 1975. *The Currency of the American Colonies, 1700-1764: A Study in Colonial Finance and Imperial Relations*. New York: Arno Press.
- Brock, L. V.** 1992. Colonial Currency, Prices & Exchange Rates. *Essays in History* 34:74-132.

- Brock, L. V.** Papers of Leslie Van Horne [Brock], 1600-1986. Special Collections, Alderman Library, University of Virginia.
- Browne, W. H., C. C. Hall, et al.** 1883. *Archives of Maryland*. Baltimore: Maryland Historical Society.
- Burnaby, A., R. R. Wilson, et al.** 1904. *Burnaby's Travels Through North America*; reprinted from the third edition of 1798. New York: A. Wessels Company.
- Calomiris, C. W.** 1988. Institutional Failure, Monetary Scarcity, and the Depreciation of the Continental. *Journal of Economic History* 48(1): 47-68.
- Course of Exchange, and other Things.*** London. Edited by John Castaing, et. al. Various issues.
- Davis, A. M.** 1964. *Colonial Currency Reprints, 1682-1751*. New York: A.M. Kelley Bookseller.
- Dickinson, J.** 1895. *The Late Regulations Respecting the British Colonies on the Continent of America, Considered. The Writings of John Dickinson*. P. L. Ford. Philadelphia: The Historical Society of Pennsylvania.
- Ernst, J. A.** 1973. *Money and Politics in America, 1755-1775*. Chapel Hill: University of North Carolina Press.
- Father Abraham's pocket almanack, for the year 1771; fitted to the use of Pennsylvania and the neighboring provinces.*** 1770. Philadelphia: John Dunlap.
- Franklin, B. and L. W. Labaree.** 1964. *The Autobiography of Benjamin Franklin*. New Haven: Yale University Press.
- Franklin, B., L. W. Labaree, et al.** 1959. *The Papers of Benjamin Franklin*. New Haven: Yale University Press.
- Gentlemen's and Citizen's Pocket-Almanack for the Year 1772. Fitted for the Use of Pennsylvania and the neighboring Provinces.*** 1771. Philadelphia: William Evitt.
- Gould, C. P.** 1915. *Money and Transportation in Maryland, 1720-1765*. Baltimore: John Hopkins University Press.
- Grubb, F. W.** 2001. The Circulating Medium of Exchange in Colonial Pennsylvania, 1729-1775: New Estimates of Monetary Composition

and Economic Growth. Working Paper, University of Delaware Department of Economics.

- Grubb, F. W.** 2003a. Creating the US Dollar Currency Union, 1748-1811: A Quest for Monetary Stability or a Usurpation of State Sovereignty for Personal Gain? *American Economic Review* 93(5): 1778-1798.
- Grubb, F. W.** 2003b. Two Theories of Money Reconciled: The Colonial Puzzle Revisited with New Evidence. *University of Delaware Working Paper*.
- Grubb, F. W.** 2004. The Circulating Medium of Exchange in Colonial Pennsylvania, 1729-1775: New Estimates of Monetary Composition, Performance, and Economic Growth. *Explorations in Economic History* 41(4): 329-360.
- Grubb, F. W.** 2005a. The Constitutional Creation of a Common Currency in the U.S., 1748-1811: Monetary Stabilization Versus Merchant Rent Seeking in Jurgen Nautz and Lars Jonung, eds., *Conflict Potentials in Monetary Unions*. Stuttgart: Steiner Verlag.
- Grubb, F. W.** 2005b. Creating the U.S. Dollar Currency Union: A Reply to Michener and Wright – Including a New View from Canada. *American Economic Review* 95(4): 1341-1348.
- Hanson, A. C.** 1787. *Remarks on the Proposed Plan of an Emission of Paper, and on the Means of Effecting it, Addressed to the Citizens of Maryland, by Aristides*. Annapolis, MD: Frederick Green.
- Hanson, J. R. II.** 1979. Money in the Colonial Economy: An Extension. *Economic Inquiry* 17(2): 281-286.
- Hanson, J. R. II.** 1980. Small Notes in the American Economy. *Explorations in Economic History* 17(4): 411-420.
- Hawley, A.** 1989. *The Meaning of Absence: Household Inventories in Surry County, Virginia, 1690-1715. Early American Probate Inventories. P. Benes*. Boston: Boston University Press.
- Hoban, C. F. and G. MacKinney,** eds. 1931. *Pennsylvania Archives* 8th series. Harrisburg, PA.
- Hockley, R.** 1753. Richard Hockley to T. Penn, 24 February 1753. Penn Official Correspondence, 1747-1771, HSP vol. 6: 17.

- Hutson, J.** 1970. Campaign for a Royal Province. *Pennsylvania Magazine of History and Biography* 94(4): 427-463.
- Jones, A. H.** 1980. *Wealth of a Nation to Be: The American Colonies on the Eve of the Revolution*. New York: Columbia University Press.
- Keith, C. P.** 1917. *Chronicles of Pennsylvania*. Philadelphia: Patterson & White Co.
- Kimber, E.** 1998. *Itinerant Observations in America*. Newark, N.J.: University of Delaware Press.
- Lester, R. A.** 1938. Currency Issues to Overcome Depressions in Pennsylvania, 1723 and 1729. *Journal of Political Economy* 46(3): 324-375.
- Lester, R. A.** 1939. Currency Issues to Overcome Depressions in Delaware, New Jersey, New York, and Maryland, 1715-37. *Journal of Political Economy* 47(2): 182-217.
- Lindert, P. H.** 1981. An Algorithm for Probate Sampling. *Journal of Interdisciplinary History* 11(4): 649-668.
- Lux, W.** 1763-1769. Letterbook. New York Historical Society.
- Lydon, J. G.** 1965. Fish and Flour for Gold: Southern Europe and the Colonial American Balance of Payments. *Business History Review* 39(2): 171-183.
- Marcotte, I. A.** (1989) Colonial South Carolina: A Quantity Theory Perspective. Ph.D. diss., University of South Carolina.
- Maryland Gazette.** Annapolis, MD: J. Green.
- Massachusetts House of Representatives.** 1919. *Journals of the House of Representatives of Massachusetts*. Boston: Wright and Potter Printing Co.
- Mazzei, F., M. Marchione, et al.** 1983. *Philip Mazzei: Selected Writings and Correspondence*. Prato, Italy: Cassa di Risparmi e Depositi di Prato Italy.
- McCallum, B.** 1992. Money and Prices in Colonial America: A New Test of Competing Theories. *Journal of Political Economy* 100(1):143-161.
- McCusker, J. J.** 1978. *Money and Exchange in Europe and America, 1600-1775*. Chapel Hill: University of North Carolina Press.

- McCusker, J. J. and R. R. Menard.** 1985. *The Economy of British America, 1607-1789*. Chapel Hill: North Carolina, University of North Carolina Press.
- Merchants and Traders of Philadelphia.** 1765. To the Merchants and Manufacturers of Great Britain. Philadelphia.
- Michener, R. W.** 1987. Fixed Exchange Rates and the Quantity Theory in Colonial America. *Carnegie-Rochester Conference Series on Public Policy* 27: 233-307.
- Michener, R. W.** 1988. Backing Theories and the Currencies of Eighteenth-Century America: A Comment. *Journal of Economic History* 48(3): 682-692.
- Michener, R. W.** 2003. Money in the American Colonies. EH.Net Encyclopedia. R. Whaples. [Link](#).
- Michener, R. W. and R. E. Wright.** 2005. State “Currencies” and the Transition to the U.S. Dollar: Clarifying Some Confusions. *American Economic Review* 95(3): 682-703.
- Michener, R. W. and R. E. Wright.** forthcoming. Development of the U.S. Monetary Union. *Financial History Review*.
- Mildred and Roberts.** 1768. Letters to Stephen Collins, 11 April 1768 and 14 May 1768. Stephen Collins and Sons Collection. Library of Congress.
- Morris, R., E. J. Ferguson, et al.** 1973. *The Papers of Robert Morris, 1781-1784*. Pittsburgh: University of Pittsburgh Press.
- Newman, E. P.** 1986. *The Earliest Money Using the Dollar as a Unit of Value. Perspectives in Numismatics: Studies Presented to the Chicago Coin Club*. Chicago: Ares Publishers, Inc.
- New York.** 1894. *The Colonial Laws of New York*. Albany: John B. Lyon, State printer.
- New-York Journal, or General Advertiser.*** New York: John Holt.
- New-York Gazette.*** New York: William Bradford.
- New York Gazette and the Weekly Mercury.*** New York: Hugh Gaines.

- Partridge, R.** 1938. Partridge to the Council of Trade. *Calendar of State Papers, America and West Indies - 1731*. C. Headlam. London: His Majesty's Stationery Office.
- Pennsylvania, J. T. Mitchell, et al.** 1896. *The Statutes at Large of Pennsylvania from 1682 to 1801*. Harrisburg: Clarence M. Busch State Printer of Pennsylvania.
- Pennsylvania Gazette***. Philadelphia, Pa.: B. Franklin and H. Meredith
- Perkins, E. J.** 1994. *American Public Finance and Financial Services 1700-1815*. Columbus: Ohio State University Press
- Peters, R.** 1750. Peters to "Honored Proprietaries," 29 April 1750. Peters Letterbook, 1747-1750. Historical Society of Pennsylvania.
- Philadelphia Mayor.** 1973. *Record of Indentures of Individuals Bound out as Apprentices, Servants, etc., and of German and Other Redemptioners in the Office of the Mayor of the City of Philadelphia, October 3, 1771, to October 5, 1773*. Baltimore: Genealogical Pub. Co.
- Pollard, W.** 1773. William Pollard to William Killen, 26 Oct. 1773. William Pollard Letterbook, 1772-1774. Historical Society of Pennsylvania.
- Plummer, W. C.** 1942. Consumer Credit in Colonial Philadelphia. *The Pennsylvania Magazine of History and Biography* 66(4): 385-409.
- Rolnick, A. J., B. D. Smith, and W. E. Weber.** 1993. In order to form a more perfect monetary union. *Quarterly Review, Federal Reserve Bank of Minneapolis* 17: 2-9.
- Rousseau, P. L.** 2004. A Common Currency: Early U. S. Monetary Policy and the Transition to the Dollar. NBER Working Paper 1072.
- Sachs, W. S.** 1957. The Business Outlook in the Northern Colonies, 1750-1775. Ph.D. diss., Columbia University.
- Smith, B. D.** 1985a. American Colonial Monetary Regimes: The Failure of the Quantity Theory and Some Evidence in Favor of an Alternate View. *Canadian Journal of Economics* 18(3): 531-565.
- Smith, B. D.** 1985b. Some Colonial Evidence on Two Theories of Money: Maryland and the Carolinas. *Journal of Political Economy* 93(6): 1178-1211.
- Smith, B. D.** 1988. The Relationship Between Money and Prices: Some Historical Evidence Reconsidered. *Quarterly Review* 12(3): 18-32.

- Smith, W. Jr.**, 1972. *The History of the Province of New-York*, (Michael Kammen, ed.), Two volumes. Harvard University Press: Cambridge, Massachusetts.
- Stevens, J. A. J.** 1867. *Colonial Records of the New York Chamber of Commerce, 1768-1784*. New York: John F. Trow & Co.
- Sumner, S.** 1993. Colonial Currency and the Quantity Theory of Money: A Critique of Smith's Interpretation. *Journal of Economic History* 53(1): 139-145.
- Thomas, G.** 1698. *An Historical and Geographical Account of Pensilvania and of West New-Jersey. Narratives of Early Pennsylvania West New Jersey and Delaware, 1630-1707*. A. C. Myers. New York: Charles Scribner's Sons.
- United States Bureau of the Census.** 1975. *Historical Statistics of the United States: Colonial Times to 1970*. Bicentennial Edition, Washington, D.C.: U.S. Government Printing Office.
- Watson, J. F. and W. P. Hazard.** 1898. *Annals of Philadelphia, and Pennsylvania, in the Olden Time*. Philadelphia: E.S. Stuart.
- West, R. C.** 1978. Money in the Colonial American Economy. *Economic Inquiry* 16(1): 1-15.
- Whitehead, W. A., F. W. Ricord, et al.** 1880. *Documents Relating to the Colonial History of the State of New Jersey, [1631-1776]*. Newark, N.J.: Printed at the Daily journal establishment [etc.].
- Wicker, E.** 1985. Colonial Monetary Standards Contrasted: Evidence from the Seven Years' War. *Journal of Economic History* 45(4): 869-884.
- Wright, R. E.** 2005. *The First Wall Street: Chestnut Street, Philadelphia, and the Birth of American Finance*. Chicago: University of Chicago Press.
- Ziliak, S. T., and D. N. McCloskey.** 2004. Size Matters: The Standard Error of Regressions in the *American Economic Review*. *Econ Journal Watch* 1(2): 331-358.

ABOUT THE AUTHORS

Ronald W. Michener is associate professor of economics at the University of Virginia and can be reached via e-mail at rwm3n@virginia.edu.

Robert E. Wright is clinical associate professor of economics at New York University's Stern School of Business, where he teaches business, economic, and financial history. He is the author or co-author of six books about the early American financial system, including *The First Wall Street* (Chicago University Press, 2005) and *Financial Founding Fathers* (Chicago University Press, 2006). An historian by training, he has edited or co-edited 16 volumes of primary source materials related to the history of corporate finance, corporate governance, and the U.S. national debt. He is also editor of Pickering & Chatto's financial history monograph series and can be reached via e-mail at rwright@stern.nyu.edu.

[GO TO REPLY BY FARLEY GRUBB](#)