Colonial Maryland’s Post-1764 Paper Money: A Reply to Ron Michener

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Ron Michener’s comment (2018) on “Non-Legal-Tender Paper Money: The Structure and Performance of Maryland’s Bills of Credit, 1767–1775” (Celia and Grubb 2016) does not concern our new approach to modeling colonial paper money or our new data reconstructions of colonial Maryland’s paper money accounts. Approximately 70 percent of Celia and Grubb (2016) is devoted to forensically reconstructing the paper money accounts of colonial Maryland from 1767 to 1775. Michener does not object to, or comment on, this part of our article. The data on colonial paper monies are sketchy, incomplete, and poorly documented. Celia and Grubb (2016) provides the first major data improvement in over a half-century to colonial Maryland’s paper money accounts. Kudos to my co-author James Celia, who was an undergraduate accounting major at the time, for doing the lion’s share of this forensic accounting data reconstruction.

Approximately 13 percent of Celia and Grubb (2016) is devoted to offering a new approach to modeling colonial paper monies. The model decomposes the current market trade value of the average bill in circulation into its expected real asset present value (APV) as a low risk asset, the risk discount on that asset (RD), and its liquidity premium or ‘moneyness’ value (LP). The liquidity premium (LP) is the transaction premium (TP) in subsequent publications of the model (Grubb 2016a; b). LP is the portion of the bill’s value that is fiat money. It is the willingness to pay extra—above the bill’s real asset present value—because the bill is more

1. University of Delaware, Newark, DE 19716. The views expressed herein are those of the author and do not necessarily reflect the views of the National Bureau of Economic Research.
2. Because paper monies were bills of credit, I will often refer to them as bills.
convenient to use to execute local trades compared with using the next-best barter alternative. This value depends, in part, on the user’s faith that subsequent traders will find the bill familiar and equally convenient, in opportunity cost terms, for executing future local trades. Michener does not object to, or comment on, this part of our article.

The dispute Michener presents is not over the model or the reconstruction of the monetary accounts, but over estimating within the model what portion of the market value of a bill was real asset value and what portion was liquidity premium. In other words, what portion of a bill was real barter asset, and what portion of a bill was fiat money? Michener’s comment boils down to two objections to our work. The first is over whether Maryland bills traded at a discount. The second is over the face-value exchange rate used in our calculations. I will treat these two objections in turn.

Michener’s first objection is over our claim that Maryland’s bills in circulation from 1767 into 1775 traded at a discount. Michener claims they did not trade at a discount, but traded at face value.3 His explanations for why they traded at face value are curious, incoherent, and contradictory. Michener assumes that colonial paper monies were pure fiat currencies, namely that government backing was lacking (Michener 2015). Thus, the cause could not have been backing. After 1765, colonial Maryland’s paper monies were not legal tender. Thus, the cause could not have been legal tender laws. Michener does not think the quantity of paper money influenced its value. Thus, the quantity of bills in circulation did not cause them to trade at face value. No explicit or recognizably established monopoly cartel of merchants, nor the government, enforced a fixed exchange rate at face value to specie monies on demand and, even if there were a secret cabal of merchants, there would be no rational maximizing reason for them to enforce such a fixed exchange rate. Thus, exchange rate mechanisms did not cause the bills to trade at face value. For Michener, therefore, Maryland’s paper money must have traded at face value because that is what people wished it to trade for. If people wished it to trade at some other value then it would trade at that other value. This is Michener’s “for whatever reason” justification for why he thinks bills traded at face value (2018,

3. Michener (2018) presents a handful of un-vetted anecdotal quotes and coin rating tables to justify his claim that Maryland’s paper money between 1767 and 1775 traded at face value. It is the same evidence he has presented before in his past publications. He also offers support for his claim from several secondary sources, but these sources rely on the same un-vetted anecdotal quotes as Michener uses. These anecdotal quotes and coin rating tables are typically statements about what the unit-of-account face value is, not about what the medium-of-exchange actual traded values are. As such, they have little bearing on whether bills actually traded at face value or at a discount. Michener has made a big stink in the past over scholars conflating statements about what the unit-of-account face value was with statements about what the medium-of-exchange traded values were (Michener and Wright 2005; 2006). He has conveniently forgotten that distinction here.
Michener’s wishful theory of monetary value is the same as using changes in tastes to explain why demand curves shift. Michener, however, offers another, contradictory explanation for why he thinks Maryland’s bills between 1767 and 1775 traded at face value. Michener points out that the Maryland government had issued bills in 1733 and had in 1765 successfully paid them off at face value in specie, as initially promised. Thus, Michener assumes the people of Maryland had faith, given that prior experience, that Maryland’s government would pay off in specie the bills issued in 1767–1774 at face value at the distant future dates designated in law for their payoff. Michener assumes that faith in the future face-value payoff caused Marylanders to accept the bills at face value whenever offered in trade, even long before the execution of the specie payoff. To get this outcome, Michener must assume that the paper money was a pure real barter asset and not a fiat currency, and that it traded at face value prior to its payoff because Marylanders placed no value on time. In effect, he is assuming that backing determines monetary value and that the colonists had no time preference, i.e., that the time-discount rate was zero. With a zero time-discount, certainty regarding face value in the future is equal to face value today.

Therefore, Michener is holding contradictory and incoherent theories about what determined the value of colonial Maryland’s paper money and is asserting dubious behaviors and preferences for Marylanders. For Michener, colonial Maryland’s paper money post-1767 is both a pure fiat money with its value determined by what people wish it to be and a pure real barter asset with colonists placing no value on time. Both of Michener’s views of what determined the value of paper money are dubious empirically and logically. Evidence indicates that time was not valueless to colonists. Interest rates on low-risk assets were between 5 and 8 percent. Relying on tastes to explain the value of money is not a falsifiable hypothesis and so not empirically operational (Stigler and Becker 1977). It is monetary ideology, not economic science.

The second objection Michener presents is over the face value used to calculate the market exchange value (MEV) as a percentage of that face value. Michener states that the face value of the bills converts to $1.6667 \text{£}_{\text{MD}} = 1 \text{£}_{\text{S}}$ ($\text{£}_{\text{MD}}$ = Maryland pounds; $\text{£}_{\text{S}}$ = pounds sterling). The actual face value on the bills, however, is not expressed in $\text{£}_{\text{MD}}$, but in Spanish silver dollars (Newman 2008, 171–173). We used $1.25 \text{£}_{\text{MD}} = 1 \text{£}_{\text{S}}$—why is explained below.

How much does Michener’s alternative face value matter? Suppose Michener is correct and the proper rate to use is $1.6667 \text{£}_{\text{MD}} = 1 \text{£}_{\text{S}}$. Reducing that amount by 7.09 percent to account for the time, transport, and transaction costs of getting the bills to London to be paid off in sterling and then the sterling shipped back to Maryland, reduces $1.6667$ to $1.5448$. The specie redemption value of the bills were only payable in London, so printed on the face of each bill (Newman 2008, 171–173).
Dividing 154.48 by the exchange values for 1767 to 1775 found in John J. McCusker (1978, 199), which are expressed per 100£, yields an average of 95.93. The adjusted market exchange value was approximately 96 percent of Michener’s face value.

I will use the best-guess 6 percent discount rate for estimating the expected average asset present-value of the bills (APV₆) from Celia and Grubb (2016, 1150) to illustrate the difference using Michener’s face value makes. Dividing the average APV₆ by 95.93 yields 61 percent. In other words, 61 percent of the market exchange value of Maryland bills in circulation during 1767–1775 was comprised of real barter asset value, leaving 39 percent of the bill’s value as comprised of liquidity premium (LP). By comparison, the results in Celia and Grubb (2016, 1151) for this case are that 81 percent of the market exchange value of Maryland bills was comprised of real barter asset value, leaving 19 percent of a bill’s value as comprised of liquidity premium. That is it. That is the entire difference. The majority of the bills’ value was still comprised of real barter asset value, i.e., backing—even when using the face value suggested by Michener. The fiat portion of the bills’ value is larger using Michener’s face-value number, but it still does not account for a majority of the bill’s value, let alone all of it. Michener’s warnings are much ado about so very little.

In addition, Michener’s alternative face value only leads to a constant or level shift. The variation over time in what influences the liquidity premium minus any risk discount (LP − RD) is unaffected. Table 1 shows that (LP − RD) was determined by the per capita bills in circulation and time. Table 1 uses the numbers from Celia and Grubb (2016). Using Michener’s alternative face value would only change the magnitudes of the constants in the regressions and not the correlation patterns found in the independent variables. The sample size in Table 1 is small, implying the results require caution. That said, the results are coherent and interesting.

**TABLE 1. Determinants of (LP − RD) at 8 and 6 percent discount rates**

<table>
<thead>
<tr>
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<th>Regression Equation</th>
<th>t-statistic</th>
<th>p-value</th>
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<td>(LP₈ − RD)</td>
<td>76.3 + 0.0824 MT/Pop − 0.0430 Year</td>
<td>15.1</td>
<td>0.0238</td>
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<tr>
<td></td>
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<td></td>
<td>0.0085</td>
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<tr>
<td>(LP₆ − RD)</td>
<td>69.5 + 0.0774 MT/Pop − 0.0393 Year</td>
<td>14.9</td>
<td>0.0236</td>
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<td></td>
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<td>0.0085</td>
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</tbody>
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Sources: Celia and Grubb (2016, 1150). The Maryland white population (Pop) is taken from Carter et al. (2006, 652), with linear interpolations used to fill in data for years between decades. Notes: MT = Maryland bills of credit currently outstanding measured at face value. From equation (2) and Table 6 in Celia and Grubb (2016, 1149–1150), [MEV − APV₆] = [LP − RD] and [MEV − APV₈] = [LP − RD]. Standard errors are in parentheses. The null hypothesis of no serial correlation cannot be rejected at the 5 percent level. Minitab Version 15 was used to run all regressions and generate all test statistics. *** indicates statistical significance above the 0.01 level. ** indicates statistical significance above the 0.05 level.
The results show that $\text{(LP − RD)}$ is negatively associated with time and positively associated with the amount of paper money outstanding per capita. One possible explanation for the negative trend, controlling for the per capita amount of bills in circulation, lies in the nature of these bills as zero-coupon bonds. The majority of the value of the bills was in their security to deliver their face value in real money in London on the date of redemption. The bills would be paid out of a sinking fund held in London that was administered by the colony’s government. In 1773, 1774, and particularly 1775, colonial sentiment regarding an imminent break with the mother country was rising. If Marylanders felt that the redemption of the 1767 bills via the sinking fund would not happen as promised if Maryland broke with Britain, then the current value of these bills would fall. The sinking fund, after all, would be in the hands of the enemy (Behrens 1923, 56–58, 88–94; Price 1977, 8, 24). This effect adds RD to the 1767 bills and so gives the appearance that the overall LP portion of Maryland’s paper money was shrinking over time.

The more interesting independent variable in Table 1 is the positive and statistically significant effect of the amount of paper money per capita in circulation on $\text{(LP − RD)}$. Placing more paper money in circulation increased the strain on executing redemptions as promised. As such, RD should not fall when the amounts of paper money in circulation are increased. Therefore, increases in LP, controlling for the secular trend, must account for the positive association between the amounts of paper money in circulation per capita and $\text{(LP − RD)}$.

The more paper money in circulation per capita, the more that paper money gained a ‘moneyness’ quality for which people were willing to pay. In other words, the portion of its value that was fiat money rather than real asset value increased as per capita circulation increased. More paper money in circulation per capita increased its familiarity and ubiquitous usage, which in turn led the public to treat this money increasingly less as a pure barter asset and more like a fiat currency. This process was accomplished by the public not time-discounting these bills as much when used in trade as they became more familiar in usage compared with what would be required if they were just non-money bonds, other things equal.

The positive association between paper money per capita and the liquidity premium is consistent with the colonies being under-monetized economies (Greene and Jellison 1961, 508; Rousseau 2006). Maryland’s effort to create a non-legal-tender paper currency with some fiat currency attributes out of tradable debt instruments was having some success in overcoming its under-monetized condition. Colonial Maryland’s paper money was beginning the transition from a commodity or asset money to a fiat currency. None of Michener’s machination alters these results from Table 1 and the conclusions that follow from them.

So why prefer our numbers to Michener’s numbers, especially given that the choice alters so very little? Why did we choose the numbers for face value
that we did to do our estimations? The answer involves how to deal with a messy data environment when testing the core hypothesis advanced. The hypothesis is that Maryland’s paper money should possess more liquidity premium (LP) than the paper monies of other colonies. In other words, the portion of the value of Maryland’s bills that is fiat money should be higher, and the portion of the value of Maryland’s bills that is real asset value should be lower, than those proportions for the paper monies of other colonies. Due to the space limitations of Celia and Grubb (2016), we did not fully explain this hypothesis. I correct that here.

Colonial Maryland was unique in its paper money emissions in that Maryland legislated singular redemption dates for each emission rather than multi-year redemption windows for each emission as was the case in other colonies. This feature made Maryland’s paper money a relatively less cumbersome medium of exchange, thus making it relatively more convenient to transact local trades compared with using the next-best barter alternative, which in turn should have relatively enhanced the liquidity premium attached to Maryland’s bills.

The other colonies, when enacting a new emission of paper money, would concurrently enact taxes or mortgage payments to redeem and remove that paper money from circulation that would span several years, e.g., a 12-year redemption window over which to remove all the new paper money emitted with an equal amount removed each year (Grubb 2015; 2016a; 2017). Colonies did this to maintain sustainable and reasonable per-year tax burdens on their citizens, thus establishing fiscal credibility for their public finance systems. Theses colonies, however, created no mechanism for determining which bills from a given emission were redeemable in which years within the designated multi-year redemption window. Structuring redemptions in this way created considerable variance in the realized value of a bill in a given year around the expected present value of the average bill in circulation.

For these colonies, in a given year, the realized value of any particular bill could vary from face value, if it was one of the bills actually redeemed that year, to the full discounted present value of the bill, if that particular bill ended up redeemed in the last year of the legislated multi-year redemption window (Grubb 2016a, 169). While citizens could calculate the expected present value of the average bill in circulation and adjust their behavior to that value, the variance in the per-year realized value around that expectation injected a lot of uncertainty into what a particular bill was worth in any given year. This uncertainty over bill value made for a relatively cumbersome medium of exchange. These colonies chose fiscal credibility over ease of usage when creating their paper money structures. The resulting liquidity premium portion of the paper money of these colonies was relatively small, being in the single digits, i.e., somewhere between 2 and 8 percent of the paper money’s market exchange value being comprised of liquidity premium.
or fiat money value, and the rest being comprised of real asset value (Cutsail and Grubb 2017; Grubb 2016b; c).

Maryland redeemed its bills using funds accumulated over time in a sinking fund filled using tobacco export taxes assessed in specie. The tax receipts purchased stock in the Bank of England. Maryland thereby avoided the fiscal credibility problem faced by other colonies that necessitated spreading local paper-money redemption taxes out over multi-year redemption windows per paper money emission. Maryland could and did legislate unique future dates when entire new emissions could and would be redeemed. Thus, there was no variance in the realized value of Maryland’s bills from a given emission around the expected present value of the average bill (Grubb 2016a, 169). This redemption process should have made Maryland’s bills a relatively less cumbersome medium of exchange compared with the bills in other colonies, because in any given year there was more certainty in the asset value of a given Maryland bill than that for bills in other colonies. As such, the hypothesis is that the liquidity premium portion of the market exchange value of Maryland bills should be higher than for the paper monies of other colonies, namely a proportion in excess of the single-digit percentages being fiat money calculated for other colonies.

Testing this hypothesis is difficult because the data for Maryland in this period are messy. Maryland’s paper money in 1767 to 1774 was denominated in Spanish silver dollars with a redemption payoff exchange rate of Spanish silver dollars to pound sterling printed on each bill (Newman 2008, 171–173). Yet the market exchange rate data in McCusker (1978, 199) is expressed as so many Maryland pounds needed to buy pounds sterling. There were no bills denominated in Maryland pounds in this period. Therefore, using the McCusker exchange rate

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4. In his comment, Michener argues “the public treated the bills as money, not as discount bonds. That the public did so should be obvious from the fact, which Celia and Grubb acknowledge, that the 1767 bills, the 1770 bills, and the 1774 bills all possessed an equal value. Because each cohort of bills possessed a different ‘maturity’ date, the equality of the values is inconsistent with the discount bond hypothesis” (2018, 159). Michener’s claim is a canard. He is deceiving the reader about the facts and misrepresenting what it is that we acknowledge. Nowhere do we say or does the evidence indicate that bills from different emissions possessed equal values. We explicitly incorporate differing expected asset present values by emission in our construction of the average expected asset present value for a random draw of bills in circulation (Celia and Grubb 2016, 1151). The McCusker (1978, 199) data does not distinguish exchange values by emission. This does not mean that traders did not so distinguish them, only that they did not so record such distinctions. One reason merchants did not record such disaggregated information in their account books may have been that countervailing LP values made the (APV + LP) value of each emission close enough to not make it relevant to record such differences, as explained in Celia and Grubb (2016, 1150). Alternatively, it could be that 18th century historical actors had little incentive given the transaction costs to record transactions in as much disaggregated detail as we 21st century researchers would have liked. To assert that because historical actors did not consider it relevant to record the details we want to see, that they did not behave as if such details mattered, is not methodologically sound (Friedman 1953).
data presents a value translation and evaluation problem. How does one turn Maryland bills denominated in Spanish silver dollars into Maryland pounds that do not exist as a physical currency? Clearly, room for error exists.

Second, the McCusker (1978, 199) data has dubious features that indicate some recording errors are present. The data are market exchange values, i.e., what it costs in Maryland to purchase a sterling bill of exchange payable in London in terms of Maryland pounds, or so that is what the data are claimed to be. Yet, two features of the data indicate that this is not always the case. First, 16 percent of the entries are exactly at Michener’s face-value amount of 1.6667 Maryland pounds per one pound sterling. That actual market exchange values would equal face values down to the fourth decimal place is doubtful. McCusker (1978) was engaged in a colossal task of compiling all exchange rates in colonial America and Europe. Haste in copying down numbers across a massive disparate set of loose documents and account books could have led McCusker occasionally to mistake a statement about what was face value for what was a trade or market exchange value. While rare, I have run across such conflations in the McCusker data for other colonies (Grubb 2016b, 1219–1221).

Second, 74 percent of the data in McCusker (1978, 199) for 1767–1775 are at values below Michener’s face value of 1.6667 Maryland pounds per one pound sterling. If 1.6667 was face value, then 74 percent of the observations indicate that the bills were trading at appreciated values. Such a condition would be the same as claiming that a negative nominal interest rate was operational. The analog would be if you had a U.S. savings bond with a $100 face value that would only pay the $100 in 20 years, but that someone offered you $120 today for it. That transaction would imply a negative nominal interest rate, or irrational, non-maximizing behavior. Clearly, something is problematic in this data.

Our suspicion is that McCusker occasionally recorded statements about face value rather than market exchange value, and that a substantial portion of the values McCusker recorded after 1767 were using the prior Queen Anne’s 1704 proclamation value from pre-1767 Maryland paper pounds in their bookkeeping accounts instead of the new paper money’s Spanish silver dollar value. This is the “old paper currency” referred to by McCusker (1978, 194) in his recording of post-1764 values.

We did not want to use this messy data in a way that would bias our estimate of the LP of Maryland’s bills to be higher than it actually was. We did not want our hypothesis of relatively higher LP for Maryland bills confirmed using data potentially biased in the direction of confirming it. Therefore, as is standard practice in applied work, we chose a worst-case data interpretation scenario, but one that was still plausible, in order to clearly bias the results against our hypothesis. The intent was to bias our results against finding a high LP so that when we did
find a relatively higher LP for Maryland bills compared with that found for other colonies’ paper monies we could be certain of confirming our hypothesis. McCusker (1978, 194) stated that the “old paper currency rate in Maryland stayed at the fixed ratio to hard currency of 1.25 to 1. At this ratio £100 Maryland currency equaled £125 Maryland hard currency from September 1764 on.” We used McCusker’s statement as our plausible but worst-case data interpretation scenario for what the real exchange-rate face values were.

By using 1.2500 rather than 1.6667 to one pound sterling as the unadjusted face value at redemption of Maryland’s bill for the period 1767–1775 relative to the exchange values listed in McCusker (1978, 199), we generate a biased-low LP estimate. Therefore, when we found that 19 percent of Maryland’s bills during 1767–1775 was comprised of LP, and that that percentage is considerably above the 2 to 8 percent found for the paper monies in other colonies, we could be confident that we have proven our hypothesis. Redemption structures mattered to the value of colonial bills of credit. All Michener has done is to say that we should have used a biased-high estimate of LP, namely one that would place the LP portion of the value of a Maryland bill in this period in the 39-percent rather than 19-percent range—much higher relative to other colonies than what we estimated. Thus, Michener has shown that redemption structures matter even more to the value of colonial bills of credit than our conservative estimate indicates.

References


