



EJW

ECON JOURNAL WATCH
Scholarly Comments on
Academic Economics

ECON JOURNAL WATCH 18(1)
March 2021: 79–94

Colonial New Jersey's Paper Money: A Reply to Michener Again, and Again, and Again

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[LINK TO ABSTRACT](#)

In the last issue of *Econ Journal Watch*, Ronald Michener (2020) published his seventh critical comment on my research. In my replies to his previous six comments, I demonstrate that Michener is misguided (see Grubb 2005; 2006a; b; 2018b; 2019b; 2020a). I will continue that demonstration here in my reply to his seventh comment. I will demonstrate that Michener does not understand basic microeconomic theory; that Michener does not understand rational expectations or how to make it operational; that Michener does not understand my model of monetary performance; that Michener does not understand how colonial New Jersey redeemed its paper money; and that Michener does not know how to evaluate quotation evidence. In summary, Michener thinks downward sloping marginal revenue curves are demand curves, thinks that rational expectations means you must be able to expect the unexpected, does not consider risk when evaluating an asset's present value, erroneously thinks that the redemption of colonial paper money was on demand, and considers antecedent and subsequent context irrelevant for evaluating quotation evidence.

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Michener does not understand basic microeconomic theory

In his Figure 1, Michener (2020, 307) draws a downward sloping marginal revenue curve and labels it a demand curve. Marginal revenue curves are not demand curves. Demand curves are average revenue curves. All economists know this. As such, Michener commits a fundamental error in microeconomic theory.

How do we know that what Michener draws in his Figure 1 and labels a demand curve is, in fact, a marginal revenue curve? In his Figure 1, Michener (2020, 307) uses an example of an asset package that yields a stream of payoffs into the future to illustrate his objection to how I calculate present value. To slightly simplify, Michener posits a package that has five \$100 bills in it. You get to randomly draw one bill out today from the package, and then randomly draw out another bill one year from now from the package, then randomly draw out another bill two years from now from the package, then randomly draw out another bill three years from now from the package, and finally you get to have the last bill in the package four years from now. You do not know which bill you will get each year, but you know that each bill has a face value of \$100.

What is the present value of this package—what I call the asset present value (APV)? What would you pay today for this package—your indifference price? In other words, what is its total revenue in present-value terms? It is $(\$100 + \$100e^{-r} + \$100e^{-2r} + \$100e^{-3r} + \$100e^{-4r})$, where r = the interest rate. This is basic finance. This total revenue in present-value terms is exactly the area under the curve Michener draws in his Figure 1 and erroneously labels a demand curve (Michener 2020, 307). If the area under a curve is total revenue then the curve must be a marginal revenue curve and not a demand curve, QED. This is basic calculus.

Demand curves measure the total revenue of an asset package in present-value terms by taking the present-value price of that package and multiplying that price by the relevant quantity, i.e., $(P * Q)$. The vertical axis is the present-value price (P) which is the price of an individual dollar in the package because the horizontal axis is measured in individual dollars (see Michener 2020, 307 Figure 1). The total revenue in present-value terms is a rectangular box under a demand curve at the relevant PQ point on the demand curve. What would be the present-value price of the above package of five \$100 bills? The face-value quantity supplied is \$500 in Michener's Figure 1 (ibid.). What would be the present-value price (P) on the demand curve at that quantity? By definition it would have to be $(P * (Q = \$500)) = \text{Total Revenue} = (\$100 + \$100e^{-r} + \$100e^{-2r} + \$100e^{-3r} + \$100e^{-4r})$. This reduces to $(P * \$500) = \$100 * (1 + e^{-r} + e^{-2r} + e^{-3r} + e^{-4r})$, which further reduces to $P = 1/5 * (1 + e^{-r} + e^{-2r} + e^{-3r} + e^{-4r})$. This is exactly the present-value

price that Michener reports (2020, 307) for my method of calculating the APV, namely the price of an individual bill in present-value terms in the package. Thus, Michener's example proves that I am pricing bills along a demand curve which is what Michener insists should be done (and which the pricing Michener advocates fails to do in his own example).²

While all economists know that downward sloping demand curves are average revenue curves and not marginal revenue curves, such knowledge may not resonate for my non-economist history and finance colleagues.³ For non-economists I will show Michener's error another way. If you followed Michener's advice and sold enough of the above packages of five \$100 bills today for the present-value price Michener's insists they should be sold for, you would be impoverished. For illustration's sake, suppose the interest rate, r , that you can both borrow and lend at, is 6 percent. In his Figure 1, Michener (2020, 307) sets the present-value price of the face value of the above \$500 package at e^{-4r} . At 6 percent that present value is $(\$500 * e^{(-4*0.06)}) = \393.31 . This is what Michener would have you sell the above \$500 face-value package for today (to be supposedly indifferent between keeping the package for yourself and selling it for \$393.31 today).

Suppose you followed Michener's advice and sold the above \$500 package for \$393.31 today, would you come out ahead or behind at the end of four years? You would take the \$393.31 today and invest it at 6 percent annual interest. After one year at 6 percent your initial \$393.31 would grow to \$416.91. By the next year the \$416.91 would grow to \$441.92. By the third year your sum would grow to \$468.44. And by the fourth and final year your sum would grow to \$496.55.

Now suppose you kept the package for yourself and invested the sums as

2. Michener (2020, 308) points out that as the quantity of bills from a given emission (when there is only one emission in existence) are redeemed over time their present value will rise, finally reaching face value (or 1 in his example) in the final year of redemption. He claims this fact is "utterly fatal to Grubb's argument." Michener says that Grubb (2016b, 174–178) acknowledges this utterly fatal aspect to his argument when "he touts the stability of APV as a virtue of his theory..." This is a bait and switch maneuver by Michener. While Michener's claim about the present-value path of bills is correct for an isolated and single emission when only that emission and no other emissions are in existence, such was not the case for New Jersey. New Jersey engaged in on-going and overlapping emissions throughout its history, and had legal tender laws that made the redemption of bills fungible across outstanding emissions (Grubb 2015; 2016a). Michener (2020, 309, 311–312) even acknowledges that New Jersey ran overlapping emissions. Michener fails to address how to calculate APV when emissions overlap and bills across emissions are fungible in redemption due to legal tender laws, whereas Grubb's (2016a; b) method does. The only "utterly fatal" outcome here is Michener's "utterly fatal" inability to model or even understand how New Jersey's complex emission and redemption structure worked.

3. Michener (2020, 308–309) justifies his approach by spouting "marginalist revolution." However, there is nothing in the marginalist revolution that says that downward sloping marginal revenue curves are demand curves. Michener (2020, 308–309) goes on to conflate his Figure 1 marginal revenue curve (which he erroneously labels as a demand curve) with being a marginal utility curve. Clearly Michener does not understand the marginalist revolution or basic microeconomic theory.

they came into your hands. What would you have at the end of four years? You take the package's first \$100 bill and invest it at 6 percent. Thus at the end of year one you now have \$206 from the package (\$100 gained initially + \$6 interest on that \$100 + \$100 from the end of year one's draw). In year two, this package has grown to \$318.36. In year three, this package has grown to \$437.46. By the fourth and final year this package has grown to \$563.71. Thus, your loss in selling this package of five \$100 bills for Michener's present-value price of \$393.31 is $(\$563.71 - \$496.55) = \$67.16$. If you sold enough of these packages at a loss of \$67 each, you would end up impoverished.

Now supposing you sell this package of five \$100 bills for 500 times the price Grubb calculates for a single dollar in the package, how will you fare? As shown above and as Michener (2020, 307) claims, Grubb's present-value price for a dollar in this package is $1/5 * (1 + e^{-r} + e^{-2r} + e^{-3r} + e^{-4r})$, which at 6 percent equals \$0.8901166. What you should sell the package for (its present value) is therefore $(\$0.8901166 * 500) = \445.06 (as opposed to Michener's price of \$393.31). If you take the \$445.06 today and invest it at 6 percent annual interest you will end up at the end of four years with approximately the same sum you would have if you had not sold the package but instead invested it yourself as described above. Under Grubb's pricing advice you would be indifferent between keeping and selling the package and so break even as opposed losing \$67 on every package you sold under Michener's pricing advice. This comparison shows that Michener is wrong and following his method will impoverish you, whereas following my method leaves you indifferent and so correctly measures the present value (the APV) of the package of bills.

No matter how the Michener example is set up, the same result occurs. Just to be thorough, and in anticipation of objections to the example I just used, I will give another example scenario that also matches Michener's (2020, 307) setup. Suppose you owe \$100 in taxes today and the same amount each year exactly one year apart for the next four years, for a total of \$500 face value in taxes owed over this period. You can pay your taxes each year in cash (dollars) or by using bills of credit designed as tax coupons and which are only usable as tax coupons. You have five \$100 tax coupons, for a total of \$500 face value in tax coupons. Each \$100 tax coupon has a designated year it can be used in, and in no other year. Each tax coupon in your package of five tax coupons is good for a different year across the five years you owe taxes. Thus, if you keep the package of five \$100 tax coupons, then you can pay all the taxes you owe today and over the next four years.

What would you sell this package of five \$100 tax coupons for today in cash? What is its present value? Having sold the package for cash, will you have enough cash to pay your tax bill today and over the next four years in cash? Again, suppose the interest rate, r , that you can both borrow and lend at, is 6 percent. In his Figure

1, Michener (2020, 307) sets the present-value price of the face value of the above \$500 tax coupon package at e^{-4r} . At 6 percent that present value is $(\$500 * e^{(-4*0.06)}) = \393.31 . This is what Michener would have you sell the above \$500 face-value tax coupon package for today (to be supposedly indifferent between keeping the package for yourself and selling it for \$393.31 cash today).

Suppose you followed Michener's advice and sold the above \$500 tax coupon package for \$393.31 cash today, would you come out ahead or behind at the end of four years? Could you pay all your taxes today and over the next four years with that cash? You would take the \$393.31 cash today, pay your \$100 tax bill today and invest the rest (\$293.31) at 6 percent annual interest. By next year (year one in Michener's example) at 6 percent your initial \$293.31 would grow to \$310.91. You would pay next year's \$100 tax bill in cash and be left with \$210.91 to invest for the following year. That \$210.91 would grow to \$223.96 by the start of year two. You would pay your \$100 tax bill for year two in cash and be left with \$123.56 to invest for the following year. That \$123.56 would grow to \$130.97 by the start of year three. You would pay your \$100 tax bill in cash for year three and be left with \$30.97 to invest for the following year. That \$30.97 would grow to \$32.83 by the start of year four. You owe your last \$100 tax bill in cash at the start of year four. But you do not have enough cash left. You are \$67.17 short. You are a tax delinquent. This is the same shortfall amount (\$67) generated by my prior asset-package present-value-calculation example. If you follow Michener's pricing advice the sheriff will show up and sell your property to pay back taxes or maybe put you in debtor's prison.

Now suppose you sell your five \$100 tax coupon package today for \$445.06 cash, namely the package's present value as Grubb calculates it (see above). Would you come out ahead or behind at the end of four years? Could you pay all your taxes today and over the next four years with that cash? You would take the \$445.06 cash today, pay your \$100 tax bill today and invest the rest (\$345.06) at 6 percent annual interest. By next year (year one in Michener's example) at 6 percent your initial \$345.06 would grow to \$365.76. You would pay next year's \$100 tax bill in cash and be left with \$265.76 to invest for the following year. That \$265.76 would grow to \$281.71 by the start of year two. You would pay your \$100 tax bill in cash for year two and be left with \$181.71 to invest for the following year. That \$181.71 would grow to \$192.61 by the start of year three. You would pay your \$100 tax bill in cash for year three and be left with \$92.61 to invest for the following year. That \$92.61 would grow to \$98.17 by the start of year four. You owe your last \$100 tax bill in cash at the start of year four. You are less than \$2 short, and so basically indifferent between keeping the tax coupon package and selling it today for the cash price Grubb calculates as its present value.

This second scenario yields the same outcome as the first example scenario

above. Thus, again, these comparisons show that Michener is wrong and following his method will impoverish you or turn you into a tax delinquent deadbeat, whereas following my method leaves you indifferent and so correctly measures the present value (the APV) of the package of bills or tax coupons.

Michener does not understand rational expectations

To estimate the present value of colonial bills of credit (their APVs), when they are hypothesized only to be zero-coupon bonds, requires knowing when these bills will be redeemed at face value. Some expectation or forecast of the path of future bill redemption has to be imputed to citizens. I use a rational expectations approach to impute the expected path of bill redemption. Michener (2020, 310–313) fails to grasp even the rudimentary aspects of this approach.⁴

Under this approach, citizens use all the information available to forecast the likely future. Regarding the path of future bill redemption, citizens knew the legislated plans for future redemption, they knew how, when, and why the legislature deviated from their planned redemption path in the past and so could forecast likely future deviations, citizens knew the likely chances of ongoing and renewed conflicts with native Americans and the French and how that affected bill emissions and redemptions, and so on.

Events citizens could not know in advance, by definition, would not factor into their forecast. Such events would only affect forecasts after the unpredictable event became manifest. Examples of unpredictable events would be future earthquakes, covid-19 pandemics, the American Revolution, and so on. Rational expectations separates predictable information from unpredictable information when considering how expectations are formed—using only information from the predictable or known set. Michener does not understand this.

Given the above discussion of the information citizens had, I constructed APV under the assumption that citizens correctly forecast the actual pre-1775 path of bill redemption. As a first pass, this is not a bad rendition of rational expectations when there are no unpredictable events, or when such events are minor. That said, this APV construction is still only a preliminary counterfactual measure as it abstracts from any potential risk discount (RD) that would correct and transform the APV measure into an actual risk-adjusted present-value forecast

4. Michener and I were both students of Robert Lucas Jr. at the University of Chicago at about the same time. Considering that fact leaves me dumbfounded as to Michener's lack of understanding of rational expectations.

(APV – RD)—something my model does that Michener does not consider (Grubb 2016a, 1217).

If an unpredictable event occurs, once it becomes manifest, it could then raise doubts about the legislature's ability to redeem bills in the future to the extent that the legislature actually did. That doubt would show up as a measurable positive risk discount in my model of monetary performance (Grubb 2016a, 1217). I find several episodes pre-1775 where there is a positive risk discount attached to New Jersey bills, and my model locates what the unpredictable events likely were that became manifest and so generated the risk adjustment to APV (see Grubb 2016a, 1223–1228). Michener does not understand this.

The American Revolution and the monetary havoc that ensued was an unpredictable event pre-1775. As such, you cannot use the actual redemption path of bills post-1775 as a pre-1775 forecast of the expected bill redemption path post-1775. To do so would be an error in the operational application of rational expectations. Instead, I use as my pre-1775 expectation of post-1775 bill redemption the bill-redemption path that would have been likely if there was no Revolution. Again, this accords with rational expectations methodology.

What Michener misses and what is so powerful about my modeling approach is it shows that, pre-1775, citizens actually did not expect the Revolution and the monetary havoc that ensued. If citizens had expected the Revolution and also expected that shortly after the Revolution started their bills would no longer be redeemed as they had been in the past and might even become worthless, then between 1770 and 1774 the market exchange value (MEV) of bills, what people currently paid for them in the marketplace, would have fallen well below my counterfactual asset present value (APV) measure, thus yielding a sizable risk discount, namely $(MEV - APV) < 0$. As Grubb (2016a, 1223, 1225) shows, there is no risk discount manifest in 1770–1774 given my APV construction, and so citizens must not have expected the Revolution and the monetary havoc that ensued.⁵

5. Michener often criticizes my research by advocating alternative approaches. He, however, never actually does what he advocates, even though he could easily do so, to see if his alternative approaches make sense. Using the actual redemption of bills post-Revolution as the expectation of what that redemption would be pre-1775 to construct APV in the early 1770s is one such example of an alternative approach advocated by Michener (2020, 310–313). What if Michener had actually applied his advocated alternative; what would he have discovered; what would he have to assume? The MEV in Figure 2 of Grubb (2016a, 1223) between 1770 and 1774 would not change as those data are observations. In that figure, the counterfactual APV as calculated using Michener's alternative approach would now be considerably lower than that shown by me using my approach. Michener's result would produce a very large transaction premium (TP), namely $(MEV - APV_{\text{Michener}}) \gg 0$, between 1770 and 1774, much larger than the small TP I find. In other words, Michener would have us believe that citizens were actually paying a massive amount over and above the bills' asset present value to acquire these bills in 1770–1774 even though citizens knew (according to Michener) that the bills would be near worthless after 1775. This behavior by citizens would be patently irrational. Thus, Michener's advocated alternative approach only makes sense if you assume that colonists

That citizens did not expect the Revolution and the monetary havoc that ensued can also be gleaned from the writings of the founding fathers and the Continental Congress (Smith 1976, vol. 1; *Journals of the Continental Congress*, vols. 1 and 2). In fact, the 1787 Constitutional Convention opened with a statement by Edmund Randolph that “the havoc of paper money had not been foreseen” by the creators of the Articles of Confederation (Farrand 1966, 1:18; Grubb 2006c, 50). Virtually no responsible scholar thinks that the actual monetary havoc that occurred after 1775 was predictable from the vantage point of the early 1770s.

Michener (2020, 310–313) makes the absurd inference that if pre-1775 bill redemption could be predicted then the bill redemption during the monetary havoc that ensued during the Revolution must also have been predictable. Therefore, the actual path of bill redemption post-1775 should be incorporated into the expectations formed pre-1775 that are used to construct the APV of bills pre-1775. Alternatively, his logic implies that if the Revolution and the monetary havoc that ensued could not be predicted, then nothing can be predicted. Michener’s failure to grasp that rational expectations separates futures into predictable futures, based on reasonably known information, and unpredictable futures shows he does not understand rational expectations, how to make it operational, or how it is used in my model of monetary performance.

“I pray thee, bear my former answer back”

—William Shakespeare, *Henry V*, Act 4, Scene 3

Most of the Michener (2020) rejoinder consists of him repeating claims he has already made numerous times in his past publications, in his past published comments on my research, and in his past referee reports on my research submissions. I have already answered those claims in my past published replies to his comments, and in my revisions to manuscripts that satisfied editors. I see no reason to engage in the childish game of simply restating ‘you are wrong,’ ‘no, you are wrong,’ back and forth, ad infinitum. Such is just an exercise in trying to have the last word, as though getting the last word somehow makes you right. So, I will simply reply to most of what Michener (2020) trots out again in his rejoinder with, “I pray thee, bear my former answer back.”

A few comments, however, should be made here. Michener’s (2020, 313–321) lengthy diatribe on how to calculate the market exchange value (MEV) of

were crazy irrational people. Michener’s colonial monetary models, if you can call them models, often rest on assuming that colonists were crazy irrational people (see Grubb 2006a, 54–60).

colonial New Jersey's paper money contains three errors that render his discussion both erroneous and irrelevant. The issue turns on establishing what the face value at redemption was for a New Jersey bills of credit. That face value in relation to the current market trade value is used to calculate the current market exchange value as a percentage of that face value (what I call MEV). First, as in his past commentaries, Michener often conflates the current exchange value (what the bills currently passed for) with the value at redemption (the bill's face value). That would be like conflating the current cash-in value of a U.S. savings bond with its face-value redemption amount at maturity. Second, Michener fails to note that the face value on the bills, its redemption value, was expressed on the face of each bill as being so much silver plate in penny-weight and grains of silver (Grubb 2015, 18; Newman 2008, 250–258). This by itself renders most of Michener's discussion on this issue irrelevant.

Third, Michener fails to understand the redemption structure used by New Jersey. Michener's (2020, 317) quotation of Governor Bernard in 1767 actually confirms the correctness of my approach, something Michener does not see. New Jersey set redemption windows for each emission that spanned a number of years. Once the amount or quota of redemptions for a given year was filled, the treasurer could refuse to redeem any more bills that year, in effect saying that the holder got there too late and the quota was filled and so the holder would have to return in a future year within the redemption window of years to redeem his bill. Add to that the facts that New Jersey had ongoing emissions with overlapping redemption windows of years and that legal tender laws made redemption among existing emission and their respective redemption windows fungible, and you get the outcome Governor Bernard describes. This does not mean that if you did get to the treasury in a year within the redemption window of years covered by that bill, and that year's redemption quota had not been filled yet, that you did not get face value or its equivalent for your bill. You did. This is all modelled and explained by me in great detail (Grubb 2015; 2016a; 2016b; 2016c). Michener does not consider this structure and, from what he says, does not understand it or how to model it. In short, Michener erroneously assumes that if you could not always get face value on demand then you never got face value for your bill.

The 1741 exchange rate debate and quotation interpretation

Michener asserts that I distorted the meaning of Governor Morris's August 16, 1741 letter to the Lords of Trade and so misled the reader because I did not

include everything from the letter in the quote but pared it down to make it easier for the reader to understand. Let me start by saying that nothing is hidden here. I encourage the reader to go read the entire letter (Morris 1852, 132–137), or for that matter all of Morris’s correspondence (Morris 1852), and decide for themselves who is misleading whom.

Michener (2020, 325–326) adds the clauses that immediately precede and immediately follow the portion I quoted (Grubb 2020a, 83) from Morris’s August 16, 1741 letter (Morris 1852, 132–137). He argues that adding that material alters the meaning of what I quoted to be what Michener claims it is and not what I use it to demonstrate. Michener’s additions are a tiny portion of what is in the respective paragraphs in Morris’ August 16, 1741 letter, and a very tiny portion of what is in Morris’ entire correspondence on the issue. Michener does not consider the material written that is antecedent and subsequent to the material he added to the quotation I used and so misses the context of that material, context that casts doubt on Michener’s interpretation of the material he added to the quote I used.⁶

The whole point of Governor Morris’s August 16, 1741 letter to the Lords of Trade was to explain the acute problems with New Jersey bills of credit. If that acute problem was that the £2,000 New Jersey pounds issued by the New Jersey assembly for the expedition against the Spanish bought far more troops and supplies than expected, namely if New Jersey bills of credit were trading way above par or way above what it had in the recent past (as Michener claims), there would have been no need or reason for Morris to write his letter in the first place. Everyone would have been happy, and the Lords of Trade would have needed no explanation of anything.

Morris, in his letter, is trying to explain to the Lords of Trade the difference between what the New Jersey assembly meant when the assembly asserted that they had made no alteration in the currency and what Morris thought was an alteration of New Jersey’s currency. The whole point of what “alteration in our currency” (Morris 1852, 133) meant, was in trying to explain what was behind its acute loss in value. If New Jersey’s paper money had acutely gained value, as Michener asserts, again there would have been no need for Morris’s discussion or letter. The New Jersey assembly considered the currency unaltered if its face value at redemption remained unaltered. Morris considered the currency altered if the current trade value changed. Much of Morris’s letter revolves around explaining the acute alteration in New Jersey’s paper money value as understood by Morris versus as understood by the assembly.

In Morris’s letter over several pages, up to the quotation that I used and

6. I have shown in the past that Michener manipulates meaning by ignoring context when trotting out quotation evidence as support for his views (see Grubb 2006a, 63–67; 2006b, 254–257).

that Michener augmented, Morris is talking only about New Jersey. He does not mention other colonies' bills of credit other than in the sentence that preceded the quotation I presented. Now let's look at what Morris was doing in that section of his letter. Morris is explaining to the Lords of Trade what he means, as opposed to what the New Jersey assembly means, by an "alteration in our currency." He uses New England as his example where no alteration in the currency occurred as he (Morris) understood it. Then he explains what an alteration in the currency was as he understood it where he was experiencing it (and in a falling-value direction not in a rising-value direction as Michener would have you believe). That he is referring to New Jersey bills and not New England bills in the rest of this paragraph is made clear from the antecedents earlier in this lengthy paragraph and then by what Morris subsequently talks about, and how he talked about it, immediately in the next paragraph. Michener is misleading the reader by throwing the phrase with "New England" in it just before the quotation I presented without giving the entire antecedent and subsequent material that reveals the true context of Morris's discussion. Michener implies that Morris is only talking about New England in this paragraph, which is patently untrue.

In fact, the end of the paragraph in question and the beginning of the next paragraph, namely what I presented, would be incoherent as Michener wants to present and interpret it. The end of the first paragraph quoted has paper money falling in value, whereas the start of the second paragraph, as Michener would have you interpret it, has paper money rising in value. This would make Morris's discussion of currency movements confused and incoherent. My interpretation makes Morris's discussion coherent and consistent.

Finally, Michener's addition to the end of my quotation again misleads the reader by not explaining what Morris is trying to explain to the Lords of Trade. Morris starts by setting out the assembly's explanation for the acute movement in the value of its paper money. The assembly thought that the demand for bills of exchange in New Jersey for exportation increased and that caused the value of paper money to fall, namely it took more paper money to buy a bill of exchange than previously. Because more people wanted to acquire and export bills of exchange, it bid up the paper money price of a bill of exchange. Bills of exchange are denominated in specie, and so paper money was falling in value relative to specie. Morris says, "They [the assembly] would not allow that there was any alteration in our currency, but that bills of exchange had got to a higher rate than they had been, and that the Exportation being Encreas'd, the course of Exchange had fallen to 50 pr cent, & that the Increase of the Exportation was the chief cause thereof" (Morris 1852, 133). Unless you think supply curves slope down and demand curves slope up (as Michener seems to), you cannot interpret the "fallen to 50 pr cent" as anything other than the value of paper money falling relative to

specie (bills of exchange).

Morris tries to offer a different explanation for the fall in the value of New Jersey paper money, and this is the “want of specie” which also means that it takes more paper money to buy a given amount of specie than it did previously, namely the value of paper money falls relative to specie (not rises as Michener thinks). Then Morris continues on to offer an incoherent set of conditions thereafter which is what Michener adds after where I stopped the quotation. Morris says that specie and paper money were both scarce and that no change in the export of bills of exchange occurred (what he goes on to say after Michener stops his quotation). You cannot explain the exchange rate movements Morris states in his letter with these three conditions only.

It is more coherent to interpret this portion of Morris’s quotation as saying that the demand for supplies and troops in New Jersey were increased by war requisitions and so prices in New Jersey rose temporarily making the value of paper money relative to specie fall. You cannot have both specie and paper money being (equally) scarce and also have the exchange rate between paper money and specie change dramatically, unless you abandon basic microeconomic theory (something Michener seems to frequently do). Given that the assembly explicitly issued new paper money, it seems likely that specie was relatively scarcer than paper money was scarce, thus explaining the exchange rate movements stated in Morris’s letter. Michener never addresses the logic or evaluates the possible coherent meanings in this portion of Morris’s statement.

Michener’s motivations

Michener (2019, 187–192) spills a lot of ink proclaiming his motivations for writing so many critical comments on my research. Michener (2020, 305) then complains that I did not address his motivation discussion in my reply (Grubb 2020a). Michener (2019, 187–192) claims that somehow my analysis of colonial paper money means you can no longer tell a coherent story about “the causes of the discontent that led to the American Revolution.” He insists that my analysis of colonial paper money must be dismissed or, I guess, there would be no reason for the colonists to be discontented enough to take up arms against England. He is not exactly clear, however, how this would be the case. He tells a rambling disjointed narrative that makes almost no mention of the role of colonial paper money, and no mention at all of my analysis of colonial paper money, in terms of what contributed to the discontent that justified Revolution. His discussion makes up in obfuscation what it lacks in style.

As such, Michener’s motivation claim is a sham. He does not explain how

my research is threatening to any reasons justifying the Revolution, let alone to the reasons he states. He just alludes to some mysterious threat without any analysis or investigation. In fact, there seems to be a total disconnect between Michener's discussion of the reasons justifying the Revolution and my analysis of colonial paper money, that is, no relationship at all.

As such, Michener's motivation discussion about what caused the discontent that justified the Revolution comes across not as any commentary on my research but only as a way for Michener to repeat and slip into the discourse his cherished myths that he has promulgated for over 30 years. Myths he just repeats over and over and over and over again without evaluating the totality of the evidence, without crafting any hypotheses, and without doing any hypothesis testing—he just asserts them as true. These myths include: (1) the colonies relied on specie as their domestic medium of exchange and money supply, (2) the current exchange rate in the marketplace between specie and paper bills of credit was somehow held constant, (3) the Currency Act of 1764 prevented new emissions of bills of credit, and (4) the bills of credit of each colony flowed willy-nilly across colonial borders (apparently without cost) so that colonial borders are monetarily meaningless. The evidence against these claims is substantial. Michener ignores that and simply repeats his assertions over and over again because he needs them to be true to support his personal monetary ideology. It is just another example of Michener trying to have the last word on a topic. That is all his motivation discussion is really up to.

Any reading of my canon of published research on colonial paper money reveals numerous colonial grievances against the British government for interfering in colonial monetary matters (most notably see Celia and Grubb 2016; Cut-sail and Grubb 2017; 2019; Grubb 2015; 2016a; b; c; 2017; 2018a; 2019a; 2020b). In fact, my research identifies with more clarity and with more exactitude what those episodes were that generated colonial grievances, more so than anything Michener has ever identified regarding colonial paper money. Therefore, Michener's motives for his crusade against me lay elsewhere. And with seven published critical comments on my research, it is clearly just that—a crusade, and an *ad hominem* crusade at that.

That said, I am loath to talk about someone else's motives because you cannot see what is inside someone else's head. All I can say is: observe his behaviors rather than listen to his justifications, and infer his motives as best you can from those behaviors. If Michener's complete correspondence with scholars and editors on the topic of colonial money were laid out for all to see, his motives might appear quite different from what Michener claims they are. In the end, however, Michener's motives do not matter. All that matters are sound arguments and verifiable evidence, not bluff and bluster wrapped in bombastic rhetoric.

Conclusion

I am flattered that Michener (2020, 306, 328) thinks I am so beloved in the profession that scholars and journal editors at prestigious universities would willingly compromise their professional integrity to shield me from Michener's machinations. This reply, along with my prior six replies, reveals that I hardly need shielding from Michener's attacks.

I am also flattered that Michener (2020, 327) thinks that I am such an incredible genius that I could figure out in advance how to artfully manipulate numerous different data series and numerous different measurement methods and then get all those manipulations to magically align in such a way as to achieve a preordained outcome, namely to yield a coincidence between the time paths of APV and MEV in both levels and movement in several colonies (Cutsail and Grubb 2017; Grubb 2016a; 2018a; 2020b). In other words, only a genius could pull off such a grand hoax showing that the present value of bills of credit when hypothesized to be zero-coupon and interest-bearing bonds closely tracked the bills' observed current market trade values when, as Michener claims, they do not. If Michener is correct, what would it take to alter all these data series and measurement methods to eliminate that non-coincidence in levels and movement? How would you start and how could it be done, especially in such a way that no one other than Michener could ferret out? Michener must believe I am an amazing genius.

Alternatively, if all my "errors" as identified by Michener (2020) were done by accident, say randomly, what would be the probability that all these random errors could make APV and MEV coincide when according to Michener they do not in fact coincide? If you take all of the errors that Michener alleges I commit and say they could have gone this way or that, multiply together the probabilities of these random errors yielding the coincidence between APV and MEV (when supposedly none in fact existed), then the probability of me producing the coincidence of APV and MEV outcome that I did would be minuscule—a highly improbable outcome.

Of course there is another explanation, and that is I did a reasonable job of data construction, correction, measurement, and estimation, and while there is always room for error in such empirical work, the overall impact of any errors is small. The coincidence between APV and MEV in numerous colonies is not an accidental outcome of poor research methods or a pre-planned hoax on the profession, but it is in fact a real outcome uncovered by applying a new model of colonial monetary performance.

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