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The Dollar Quiz: A Hands-On Approach to Monetary Debasement and Inflation

Tyler Watts
Ball State University

Abstract
The dollar quiz is a hands-on teaching tool designed to create an awareness of and curiosity about monetary debasement, and the subsequent inflation it enables, by looking at the historical evolution of the U.S. Dollar. Students are challenged to rank the current values of historical and modern one-dollar pieces. The class lecture and discussion following the quiz reveals the current value of each dollar, along with an account of some basic economics of monetary debasement and inflation. Instructors can employ this exercise simply as a means of demonstrating monetary debasement and the extent of U.S. dollar inflation, or as an introduction to a more detailed section on U.S. monetary history.

JEL Codes: A20, E31, E42
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I. Introduction

A recurrent theme in monetary history is the debasement of currency by the monetary authority. Debasement is typically sought as a means of inflationary finance—a surreptitious means of raising revenue without directly taxing the citizens or expanding government deficits. Debasement can result in direct seigniorage revenue for the sovereign, who re-mints the coinage at a lighter weight,[1] as well as an

[1] A king or prince with a monopoly on the mintage of his own local coin can, by periodic re-minting, secretly reduce the actual gold or silver content of the coin, allowing him to increase the money supply with a given stock of metal. As long as coins are valued by "tale" or count, rather than by weight of metal—which can come about either by custom or by legal tender laws—the sovereign will be able, by dint of being the first spender of the debased coins, to realize an increase in his own real purchasing power at the expense of later recipients of the coins. This process will eventually drive nominal prices (in terms of the devalued coin) up, as merchants discover the trick and react accordingly. Thus, while the long-run effect of debasement is typically a higher nominal price level (in proportion to the degree

increase in the monetary base, such as occurred when President Roosevelt devalued the U.S. dollar in terms of gold, from 23.22 gold grains per dollar ($20.67 per ounce) to 13.71 grains per dollar ($35/ounce) in 1934.[2] A commodity money such as the gold-standard U.S. dollar can only be debased so far, down to zero percent of the original commodity content; once this ultimate debasement occurs, it becomes a pure fiat money. While a fiat money cannot be debased in precisely the same sense as a commodity money can, its value can be diluted in a similar fashion by means of the printing press.

Carl Menger demonstrated clearly that money must start out as a commodity—a physical good that trades readily against all other goods (2007, 257 ff.). The most "saleable" (in modern jargon, most liquid) goods tend to become money-goods, and market competition among various money goods tends to result in those with superior monetary qualities of high value/weight ratio, durability, and divisibility—historically, gold and silver—displacing all others in commerce. All national currencies of our day thus ultimately trace their lineage back to some form of commodity money, a process Ludwig von Mises set out in his monetary regression theorem (1981, pp.129–31). The U.S. dollar, for instance, is a direct descendant of the Spanish dollar (denominated as *ocho Reales* or a "piece of eight"), a large silver coin, originally established in the late 15th century and changed very little thereafter.

The piece of eight, manufactured in Mexico and South America, circulated so widely in the North American colonies that, when it came time for the new U.S. government to set up the country's monetary standard, Congress deemed it appropriate to adopt the

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of debasement), the monetary monopolist can gain real purchasing power in the short run. Hence, continual debasement has historically been an appealing substitute for direct taxes or debt issuance as a means of government finance. Printing of fiat currency (i.e., a money unit that has been completely debased down to 0% precious metal) can have a similar effect. See Rothbard (2008, pp.10–13) for an excellent discussion of the economics of debasement.

[2] The infamous confiscation and devaluation of gold dollars by FDR in 1933–1934 resulted in a large seigniorage gain for the Federal Treasury: "The government's 'profit' of $2.8 billion from the revaluation of the gold was, by one pen-stroke, almost the equivalent of one year's ordinary tax revenues" (Timberlake, 1993, p.279). The corresponding increase of 69% in the nominal dollar quantity of the Fed's gold reserves, along with the massive panic-flight of European gold that the debasement helped stimulate, set the stage for a massive increase in the U.S. monetary base in subsequent years (Friedman and Schwartz, 1963, pp.462–83)

monetary standard represented by this ubiquitous and well-respected coin.[3] The U.S. Dollar, as initially defined by the Coinage Act of 1792, was in its metallic content identical to the Spanish dollar,[4] with a specified pure silver content of 371.25 grains. Spanish dollars continued to circulate at par with the U.S. Dollar up to 1857 (Nussbaum, 1937, pp.1059–61), and in the early days of the U.S. republic, Spanish coinage circulated widely, especially in frontier areas.

In order to expand the money supply in a land where "scarcity of money" was a constant complaint, Thomas Jefferson and Alexander Hamilton suggested the United States establish a bimetallic standard consisting of both silver and gold dollar pieces. U.S. dollars would be available in the form of either silver or gold coin; the size of the respective coins was determined by setting the government's "mint ratio"—the relative weights of the two metals that legally constitute a dollar—at the then-current market price of silver in terms of gold, or 15:1. Because the silver dollar was specified at 371.25 grains of pure silver, the gold dollar, then, was specified at one-fifteenth that amount, or 24.75 grains of pure gold. In other words, the silver dollar would contain 15 times as much metal as the gold dollar.

As is always the case with a legally fixed bimetallic monetary standard, the operation of Gresham's Law[5] ensured that, as soon as

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[3] In contrast to previous Spanish experience of massive, albeit gradual, debasement of the Dinar/Maravedi coinage of the 7th–15th centuries (Groseclose, 1976, pp.57–76), the silver Spanish Peso/Real coinage was not significantly debased during the entire Spanish colonial era, although its domestic copper coinage was debased substantially. Explanation lies in the fact that Spanish silver coins competed with other nations' coins for use in international trade, whereas copper circulated only locally and under legal tender laws; any debasement by the Spanish of the former would reduce their coins' competitiveness and market share, and hence mint revenues; debasement of the latter remained a viable source of seigniorage (Motomura, 1994). Of course, the prodigious silver output of Spanish mines in Mexico and Peru, with the corresponding large source of direct taxation revenue (the *quinto*, or "King's Fifth"), helped to obviate the need for seigniorage taxation, and hence the temptation towards debasement of the silver standard (Jordan, 2001).

[4] The precise weight of the Dollar was fixed on the basis of the average weight of a sample of circulating Spanish Dollars (Nussbaum, 1957, p.53).

[5] A good definition is supplied by Mises (1998, p.447): "Bad money, says Gresham's Law, drives good money out of the country. It would be more correct to say that the money which the government's decree has undervalued disappears from the market and the money which the decree has overvalued remains."

the current market price ratio of silver to gold deviated significantly from the legally fixed mint ratio, one metal would "chase" the other out of circulation. Thus the United States saw the export of its meager gold output, and a de facto silver standard, until 1834, when Congress finally got around to adjusting the mint ratio to 16:1, which was accomplished by a 6.3% debasement of the gold weight of the dollar, to 23.22 grains (Duckenfield, 2004, pp.164–65).

By the early 1850s, Gresham's Law was in action again, owing to the California gold bonanza. Congress once again adjusted the mint ratio to forestall the hoarding and export of small-change silver coins. In 1853, all silver coins except for the dollar were debased by 7%, which was actually an overcorrection designed to turn small change coins, or "subsidiary silver," into a form of token money and prevent further problems with hoarding (Yeoman, 2007, p.16). The silver dollar was not adjusted, but instead replaced by a gold one dollar coin. This de facto gold standard was entrenched by monetary legislation of 1873, which discontinued the silver dollar, and again in 1900 when the Gold Standard Act effectively made all U.S. paper money issues ultimately redeemable in gold coin.

The reaffirmation of the gold standard in the late 1800s was a remarkable feat in monetary history, as it represented an almost complete reversal of the common historical trend of gradual

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Consider this example of how Gresham's law works in practice: for simplicity, say the mint ratio is 2:1, so that 2 ounces of silver has the same monetary significance as 1 ounce of gold. The mint will exchange 2 units of silver for 1 unit of gold, or vice-versa. What if the market ratio falls by half, to 1:1? You can now "buy" 1 unit of gold for only 1 unit of silver in the market. A profit-maximizing strategy emerges if the government does not update the mint ratio: take 1 unit of silver to the *market* and get 1 unit of gold. Take that unit of gold to the *mint* and get 2 units of silver. "Rinse and repeat": 2 units silver ➔ market ➔ 2 units gold ➔ mint ➔ 4 units silver, and so on.

Result: silver is legally undervalued—the official, mint price is 1/2 unit gold, whereas the market price is 1 unit of gold. Gold is legally overvalued—the mint price is 2 units silver whereas market price is just 1 unit silver. People will use only gold in trade; all silver will be exchanged for gold in the market and will not flow to the mint to be coined. Existing silver coins, which are now worth twice their face value in the metals market, will be melted down and exchanged for gold, rather than being used in mercantile transactions.

This is precisely the phenomenon that occurred after the California gold bonanza, although the starting point of the mint ratio was different and the relative change in the market ratio was not as extreme.

debasement. Indeed, a significant step on the path toward debasement had been taken by the U.S. government in the midst of its struggle to pay the mounting costs of the Civil War. By the end of the war, the U.S. Treasury had issued $450 million in "greenbacks," a classic case of fiat-money inflationary finance. Owing to their legal tender status, the operation of Gresham's Law swiftly ensured that greenbacks would displace gold in payments. Banks suspended specie payments indefinitely at the first appearance of financial difficulties in late 1861. Gold, silver, and eventually even copper-nickel small change coins disappeared from circulation, as their metal values came to exceed face value in terms of swiftly depreciating greenbacks.[6]

After 14 years of painful deflation, greenbacks were made redeemable in gold coin as of January 1, 1879, and the U.S. was officially back on the gold standard. Several monetary reforms marked the period between the return to the gold standard and its eventual abandonment, most notably the creation of the National Banking System in 1863–1865 and the advent of the Federal Reserve in 1913. Although these institutional developments did not inherently instigate monetary debasement, they represented a departure from the sound-money mechanisms of the ideal, market-based gold standard.[7] Both National Banks and Federal Reserve Banks enjoyed the privilege of issuing currency. But institutional defects in National Banks' ability to both issue currency and redeem it for underlying gold (Selgin and White, 1994b), and the tendency of central banks, such as the Fed, to monopolize both gold reserves and banknote issuance, these institutions arguably weakened the economic connection between paper currency and the underlying gold it represents (Selgin, 2003).

The Federal Reserve's utter mishandling of monetary affairs during the banking panics of the early 1930s is well-known among economists. The Fed presided over a "great contraction" of the money supply that, along with other notable macroeconomic shocks, set the stage for the Great Depression (Friedman, 1979, pp.62–81; Timberlake, 1993, pp.266–274). This depression, as is characteristic

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[6] The disappearance of coin during the war years led to government issues of fractional currency notes with a face value of less than $1, and the expedients of postage stamp currency and private-issue "store card" bronze tokens as cheap stand-ins for small change. See Rothbard (2005, pp.123–32) for a discussion of the greenback episode.

[7] For a survey of the free-market monetary literature, see Selgin and White (1994a).

of recessions, featured a steep fall in commodity prices throughout the economy. Befuddled by years of monetary-policy ineptitude and the seeming failure of drastic fiscal measures to stimulate economic activity, the Roosevelt administration turned to the treacherous financial alchemy of debasement in a desperate attempt to "reflate" the economy.[8] Thus, in March 1933, FDR ended specie redemption of banknotes forever and began the confiscation of citizens' monetary gold. This was followed up by an eventual debasement of the (now-defunct) gold content of the dollar by 41%, to 13.71 grains in early 1934 (Duckenfield, 2004, pp.356–86).

Although gold coins and bullion disappeared from commerce—having been sequestered and stockpiled by the U.S. Treasury—the dollar retained for some years a tenuous link to its former gold basis. The Bretton Woods international monetary system was established by the Allied Powers in 1944 with the aim of stabilizing the exchange rates of these nations' currencies after the chaotic episodes of depression-era debasement/devaluation and wartime inflation. The Bretton Woods agreement allowed foreign central banks to redeem their holdings of dollars for gold at the 1934 rate of $35 per ounce. While American citizens could still redeem their paper money for silver,[9] the market price of silver in terms of the (now defunct) gold-standard dollar had fallen so low as to render even the silver dollar a fiat currency.[10] Thus, the monetary policy actions of 1933–1934 represented the real turning point in terms of the U.S. Dollar's transition from a commodity money to a fiat money.

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[8] The explicit inflationary intentions of the gold devaluation can be seen in this statement by Friedman and Schwartz (1963, p.465): "The [Thomas] amendment [to the Agricultural Adjustment Act], enacted into law on May 12 [1934], and explicitly directed at achieving a price rise through expansion of the money stock, contained a provision authorizing the President to reduce the gold content of the dollar to as low as 50 per cent of its former weight."

[9] The silver dollar, with corresponding U.S. Treasury-issued silver certificates, had been reintroduced in 1878 under the Bland-Allison Act, which required the U.S. Treasury to purchase and coin between $2 and $4 million of silver per month at the (now highly overvalued) old mint price of $1.29 per ounce. This act, along with the Sherman Silver Purchase Act of 1890 which replaced it, were designed to simultaneously mollify the silver mining interests of the western United States and the silver inflationists throughout the country (Timberlake, 1993, pp.166–70)

[10] From the 1870s silver bonanzas up until the mid-1960s, the market price of silver was consistently below its mint price of $1.29. This meant that a standard (371.25 grains) silver dollar contained less than $1 (in gold-standard terms) worth of silver, rendering it a fiat currency.

Shadows of the traditional, commodity-based dollar lasted into the 1960s, when commodity inflation finally drove the silver value of the silver dollar, and subsidiary coins, above face value in the late 1960s. Small change was "debased" to the now-familiar copper-nickel mixture. The last silver certificates were redeemed in 1968 (Friedberg and Friedberg, 2006, p.167). The final vestiges of the old standards were rent asunder on August 15, 1971, with President Nixon's infamous "closing of the gold window," in which he announced the cessation of gold redemption for foreign Central Banks' dollar holdings (Duckenfield, 2004, p.481). Since then, the U.S. dollar has been a purely fiat currency, with Federal Reserve Notes and token coins as our only forms of cash. Consequently, we have seen a five-fold increase in the price level, as measured by the CPI, since that time (Figure 1).

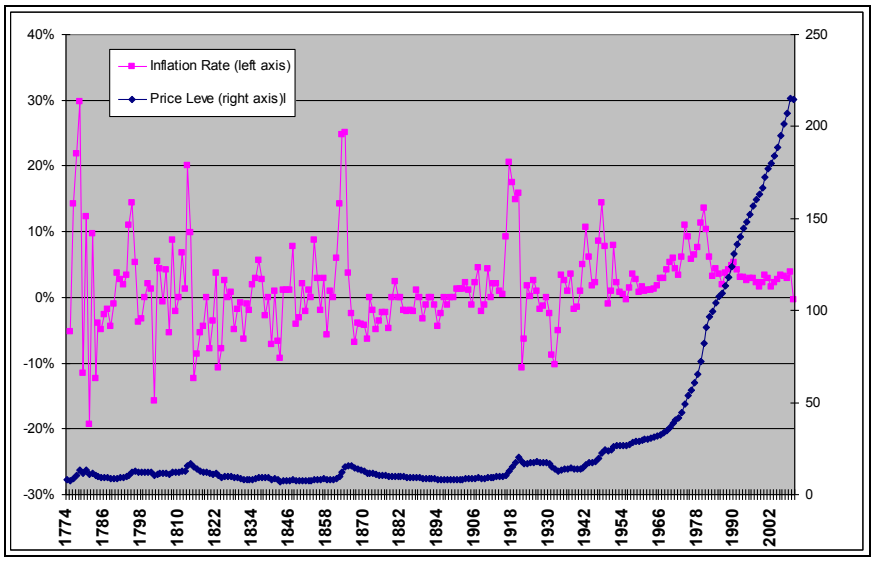

Figure 1: U.S. CPI, 1774–2009.
Source: http://www.measuringworth.com/uscpi/

As this brief historical sketch indicates, the debasement of the U.S. dollar was something of a gradual, step-by-step process, and was concluded relatively recently, given the dollar's long lineage back to 15th century Spain. Although they receive little attention in current economics literature and classroom instruction, these debasement-inflation processes are fundamental aspects of monetary economics. I have found the following in-class activity an effective means of

introducing these concepts to undergraduate students and stimulating intellectual curiosity about monetary debasement and the economics of inflation.

II. Procedure

I like to engage the students in this activity on the first day of the semester, in order to both shock the erstwhile ignorant students into awareness of and curiosity about debasement and inflation, and indicate that monetary economics can involve fun, beyond-the-book forms of learning. I begin by announcing a pop quiz. I hand the students a ready-made quiz blank with the question: "Suppose I [instructor] owe you [student] one dollar. On the table at the front of the classroom are five different U.S. dollars. Each dollar is legal tender, and none of them is uncommon for its type (there are no *absolutely* rare dollars on the table). You are to rank these dollars in order of your preference in settling the debt; in other words, indicate which dollar you would take first (highest preference), which you would take second, which you would want last (lowest preference). Each of the five dollars sits on a piece of paper that is labeled arbitrarily with a letter [for example, C, Q, F, X, T]. Indicate your choices by marking down the letter that corresponds with each dollar, numbering 1-5." The five dollars are as follows:[11]

- Current Federal Reserve Note $1 bill
- Current brass $1 coin, Sacagawea or Presidential series[12]
- Large Eisenhower $1 coin, minted from 1971–1978
- Standard silver $1 coin, minted from 1878–1935
- Standard gold $1 coin, minted from 1849–1889

[11] Silver and gold dollars are routinely available on eBay and at reputable coin dealers. Silver dollars suitable for this exercise (i.e., common, somewhat worn examples) can be purchased in the neighborhood of $20, whereas similar quality gold dollars can be found in the neighborhood of $75–$100. Eisenhower dollars are occasionally available at banks for face value; they sell online and in coin shops for approximately $1.50-$2 for a common, worn example. The entire kit, then, can be acquired in the range of $100-$150. The author would gladly assist any instructors in acquiring the necessary pieces for this exercise.

[12] Susan B. Anthony $1 coins, minted 1979–1981 and 1999, are very similar to the brass dollar coins and work equally well for purposes of the exercise.

I invite the students to approach the display (Figure 2) and carefully examine the dollars. Students are free to pick up and inspect the dollars—I provide a magnifying glass and a small digital scale to encourage a full inspection. I urge them to take their time and think carefully about the rankings. I also forbid discussion, lest one or two knowledgeable students preempt the revelation process the quiz entails. Because the students are typically quite uninformed about U.S. monetary history, I will nudge the students towards grasping the point of the exercise with the following hint: "Think value, not convenience."

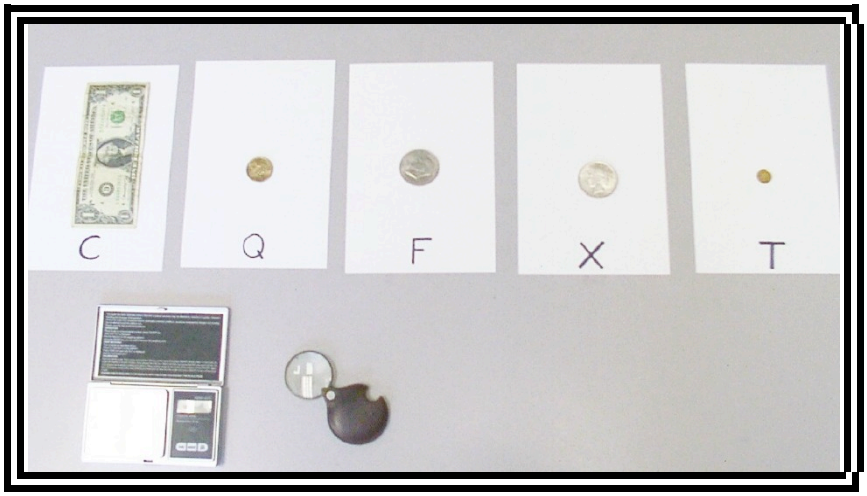

Figure 2: Quiz setup.

Once all the students have settled on their rankings, I collect the quizzes and reveal the answers on an overhead slide (Figure 3).

The answer key is based on the "melt value" of the dollars, which is the value of the metal content of each according to current spot market prices. The source for these melt values (indeed, the main inspiration for this very exercise) is www.coinflation.com, a website that lists and updates daily the metal value of all U.S. and Canadian coins.

III. Grading

There are many conceivable ways of grading this type of quiz. Here's how I have done it (but I encourage adaptation to suit particular instructors' needs). I give the quiz as strictly an extra credit

opportunity. I give students 2 points for each correct ranking, so the maximum score is 10. As a consolation for students who bomb the quiz, I give 1 point for having the gold and silver coins in the top two slots.

$1 Quiz answer key

Note: based on 10-22-10 closing prices:
Au: $1324.50/ troy oz.
Ag: $23.10/ troy oz.
Cu: $3.78/ lb
Zn: $1.13/ lb
Ni: $10.49/ lb

1. Gold dollar: **$64.06 (gold melt value)**
.04837 troy oz. pure gold

2. Standard silver dollar: **$17.87 (silver melt value)**
.77 troy oz pure silver

3. Copper/Nickel clad dollar (Eisenhower variety):
$1 face **($.22 Cu/Ni melt value)**

4. Brass dollar (Sacagawea or U.S. Presidents variety):
$1 face **($.07 brass melt value)**

5. Federal Reserve Note: $1 face **(no commodity value)**

Source: www.coinflation.com

Figure 3: Sample answer key.

IV. Lesson

In discussing the answers, I ask students what patterns and details they see in the values and the changes in the currency. I want them to recognize four important facts:

1. The historical pattern: the metal content of the dollar gets cheaper over time.
2. The gradual path of debasement; debasement is not a one-shot event, but a long-term, step-by-step process.
3. The extent of inflation of the U.S. Dollar that this represents (though, importantly, not a one-to-one correlation with CPI).

4. That debasement in the United States was not "completed" until a relatively short time ago (within their parents' lifetimes).

These points can be raised by engaging the class with discussion questions along these lines:

- What historical pattern do we see in the metallic value of the dollar?
- How long did total debasement of the U.S. dollar take? Why is it not done at once?
- How much has the dollar been inflated/price level increased since the major (1933–1934) debasement? How well does the price of gold/silver track the decline in PPM?
- What were the political reasons for debasement by FDR? Nixon? Lincoln? Congress? How did the 1834 and 1853 debasements differ from 20th century debasements?

V. Results and Reactions

I have employed this activity at the beginning of several Money and Banking classes over the past two years.[13] Students' overall performance indicated what I expected: most students knew little if anything about the history and evolution of the U.S. dollar. But I also believe the quiz went far toward its intended goal of creating an awareness of this evolution and piquing the students' curiosity about it. At the end of the discussion session following the quiz, I tell the students that the goal is basically to get them wondering about the economics of inflation.

Students have responded positively to this exercise. Very few of them had any prior knowledge about the original silver and gold standards of the U.S. dollar, and virtually none had seen or handled gold or silver U.S. coins before. Several students have told me that they enjoyed the quiz, especially the aspect of seeing and touching the old coins. In all, I believe the students found the quiz both interesting

[13] The first three versions of the quiz involved 10 choices, the five extra dollars being different combinations of copper, silver, and nickel coins, some of which had melt values greater than one dollar. I have since concluded that the quiz is much simpler and more effective using only one-dollar pieces and not combinations of different coins, hence the current version.

and enjoyable; it is a fun and intriguing way to engage the students at the beginning of the semester.

VI. Conclusion

Monetary debasement and the inflation it brings about are essential aspects of both monetary economics and monetary history. Indeed, inflation is among the key problems of monetary economics, as unexpected inflation, and erratic variations in the rate of inflation, bring about a host of economic distortions, from wealth redistributions to price confusion for entrepreneurs, investors, and savers. Any benefits from inflation, in the form of economic stimulus, are at best ephemeral and illusory; the costs from inflation, however, can be severe, in the form of wealth redistribution and widespread misallocation of capital that can set off a boom-bust macroeconomic cycle.[14] A brief survey of U.S. monetary history confirms that total debasement of a commodity money is the necessary genesis of the fiat money regimes we know today, and that the inflationary process of debasement opens the door to potentially unbounded fiat-money inflation and the potential for economic disaster. *Showing* monetary debasement, and the consequent inflation, in a tangible form, is an effective way of putting students into the proper frame of mind to understand these economic phenomena. I am pleased to share this activity and would be delighted to see other instructors and professors who see pedagogical value in this exercise employ it in their own courses. I welcome inquiries from instructors wishing to make use of the dollar quiz, and reports from those who do use it, or have used something similar already. I also encourage anyone who wishes to adapt the basic concept to suit his or her own needs and goals.

References

Duckenfield, Mark, ed. 2004. *The Monetary History of Gold: A Documentary History, 1660–1999*. London: Pickering and Chatto.

Friedberg, Arthur L., and Ira S. Friedberg. 2006. *Paper Money of the United States*. Clifton, NJ: The Coin and Currency Institute.

[14] For an introduction to such "monetary" business cycle theories, see Garrison (2001).

Friedman, Milton, and Rose D. Friedman. 1979. *Free to Choose: A Personal Statement*. New York: Avon.

Friedman, Milton, and Anna Jacobson Schwartz. 1963. *A Monetary History of the United States: 1867–1960*. Princeton: Princeton University Press.

Garrison, Roger. 2001. *Time and Money: The Macroeconomics of Capital Structure*. New York: Routledge.

Groseclose, Elgin. 1976. *Money and Man: A Survey of Monetary Experience*. Norman: University of Oklahoma Press

Jordan, Louis. 2001. "Spanish Silver." In *The Coins of Colonial and Early America*, http://www.coins.nd.edu/ColCoin/ColCoinIntros/Sp-Silver.intro.html.

Menger, Carl. 2007. *Principles of Economics*. Auburn, Alabama: Ludwig von Mises Institute. (Orig. pub. 1871.)

Mises, Ludwig von. 1981. *The Theory of Money and Credit*. Indianapolis: Liberty Fund. (Orig. pub. 1912.)

Mises, Ludwig von. 1998. *Human Action*. Auburn, AL: Ludwig von Mises Institute. (Orig. pub. 1949.)

Motomura, Akira. 1994. "The Best and Worst of Currencies: Seigniorage and Currency Policy in Spain, 1597–1650." *Journal of Economic History*, 54(1): 104–27.

Nussbaum, Arthur. 1937. "The Law of the Dollar." *Columbia Law Review*, 37(7): 1057–91.

Nussbaum, Arthur. 1957. *A History of the Dollar*. New York: Columbia University Press.

Rothbard, Murray N. 2005. *A History of Money and Banking in the United States: The Colonial Era to World War II*. Auburn, AL: Ludwig von Mises Institute.

Rothbard, Murray N. 2008. *The Mystery of Banking*. Auburn, AL: Ludwig von Mises Institute.

Selgin, George A. 2003. "Adaptive Learning and the Transition to Fiat Money." *Economic Journal*, 113: 147–65.

Selgin, George A., and Lawrence H. White. 1994a. "How Would the Invisible Hand Handle Money?" *Journal of Economic Literature*, 32: 1718–49.

Selgin, George A., and Lawrence H. White. 1994b. "Monetary Reform and the Redemption of National Bank Notes, 1863–1913." *Business History Review*, 68: 205–43.

Timberlake, Richard H. 1993. *Monetary Policy in the United States: An Intellectual and Institutional History*. Chicago: University of Chicago Press.

Yeoman, R. S. 2007. *A Guide Book of United States Coins*. 17th ed. Atlanta: Whitman Publishing Co.