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Factoring in Physicality and the Consumer

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**The Total Value of the \$1 Federal Reserve Note:
Factoring in Physicality and the Consumer**

Dr. Franklin Noll

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Abstract

Consumers are using cash less often. This is especially the case in high-value transactions. However, the \$1 Federal Reserve Note continues to hold its ground in the realm of micropayments, transactions having a value of less than \$5. Economists argue that the staying power of the \$1 bill is largely the result of there being no economically efficient electronic method of executing micropayments.

This paper argues that the reason for the continued existence of the \$1 Federal Reserve Note lies elsewhere—in the physical nature of the note. Economists see the note as merely a marker or token for purchasing power, which is continually declining. Based on this view, they logically predict the imminent death of the note. This view is simplistic as it does not consider the \$1 Federal Reserve Note as a thing in itself, as an object bearing a value all its own. As physical objects, notes carry economic, social, collectible, and symbolic values unrelated to what the note can buy.

Introduction

It is evident that consumers are decreasingly using cash in their transactions. Checks, automated clearing house technology, credit cards, and debit cards have increasingly replaced cash, especially in large value transactions. Small value transactions are still conducted primarily in cash but electronic payments are making inroads.¹

The last frontier of electronic payments is in the area of micropayments (payments of less than \$5), which are predominantly made with \$1 Federal Reserve Notes and minor coin. It seems self-evident to many economists that the demise of the \$1 Federal Reserve Note is only a matter of time as a cost-effective electronic form of micropayment should appear in the near future.² However, such predictions work on the assumption that a note is nothing more than a marker for a set amount of purchasing power, which in 2007 was \$.48.

This view is simplistic. It does not consider the \$1 Federal Reserve Note as a thing in itself, as an object bearing a value all its own. If we view the \$1 Federal Reserve Note from this perspective, we see that a note is worth more than simply its purchasing power. As physical objects, notes carry economic, social, collectible, and symbolic values unrelated to what the note can buy. As such, consumers will not blindly abandon the paper note for an electronic method in making micropayments simply because it is economically efficient in transactions. If consumers recognize the true value of their notes, the lifespan of the \$1 Federal Reserve Note will be extended well into the age of electronic micropayments.

The Values of Money

The \$1 Federal Reserve note has economic, social, and cultural value. The economic value of a note extends beyond its purchasing power. Other aspects of a note's economic value stem from the nature of the note itself. It provides what economists call utility or the ability to speed or facilitate a transaction. A bill is also anonymous (no monthly expense statements), finite (one cannot overspend), and accepted almost everywhere.³ Thus, in a micropayment, a note can prove more valuable than other payment options such as credit and debit cards.

In the social realm, a note's value can vary with its status in eye of its holder, its source, and its intended use. A note may have a special status because it is a birthday present or a memento, like the first dollar earned by a business that is tacked up on a wall. A widely held view is that a note is worth more than its economic value because it is seen as a collectible or rarity. Further, the origin of a note can make its value fluctuate.

¹ Geoffrey R. Gerdes, et al, "Trends in the Use of Payment Instruments in the United States," *Federal Reserve Bulletin* (Spring 2005): 180-201; Marianne Crowe, "Changing Payments Landscape: A Federal Reserve Bank Perspective," Treasury Management Association of New England Annual Conference, May 9, 2007; Paul W. Bauer and Daniel Littman, "Are Consumers Cashing Out?," *Economic Commentary*, Federal Reserve Bank of Cleveland, October 1, 2007.

² James C. McGrath, "Micropayments: The Final Frontier for Electronic Consumer Payments," Discussion Paper, Federal Reserve Bank of Philadelphia, June 2006.

³ Remarks by Alan Greenspan before the National Automated Clearinghouse Association Annual Meeting, April 10, 2000, 1-3; Bauer and Littman, 1.

“Honest” money is worth more than “dirty” money. Money won in the lottery may be worth more or less than money earned at one’s job or inherited from a loved one. Also, the purpose of a note can affect its value. Money set aside for the mortgage or a child’s education may be worth more than that set aside for a new car or vacation. So, when viewed as a social artifact, a note’s value varies considerably.⁴

Money, particularly the \$1 Federal Reserve Note, holds a cultural or symbolic value in addition to its economic and social ones. The note helps tie us together as Americans, connects us to our everyday world, and symbolizes the United States to ourselves and others. Uniform and commonplace throughout the country, the \$1 Federal Reserve Note unifies all regions and classes, binding us together in a collective identity.⁵ The everyday and intimate nature of the notes prompts us to see them as “extensions of ourselves,”⁶ connecting us “to the world of familiar things and popular culture.”⁷ They stand for that which is dependable and trustworthy; always close at hand and never changing in a rapidly changing world. The notes are also tangible acknowledgements of hard work and one’s worth. “To many, it is the embodiment of their life’s work.”⁸ Finally, the \$1 Federal Reserve Note is also a symbol of the United States, declaring on its face and back what the country is and stands for; and, overseas, it is a “symbol of America’s power and prestige.”⁹

Viewing the \$1 Federal Reserve Note as not just a proxy for purchasing power but as a concrete artifact of economic, social, and symbolic significance greatly expands the value of the note. In an attempt to quantify these values, we can express the value of a note through three elements: its economic value, its collectible value, and its symbolic value:

$$\text{Note Value} = \text{Economic Value} + \text{Collectible Value} + \text{Symbolic Value}$$

Collectible value considers those factors that stem from the world of currency collecting such as age, condition, and rarity. We use this instead of social value because collectability is the only component of social value that is rather consistent and quantifiable. Also, aspects of age, condition, and rarity factor into other areas of social value. For example, only notes in very good condition are given as gifts and a note is put on a business’s wall because it is rare—it was the first one earned. Otherwise, in the above equation, economic value refers to a note’s monetary worth and symbolic value considers the value of a note as a symbol of United States history, economic power, and culture. Let us explore each of these factors in turn.

⁴ Viviana A. Zelizer, *The Social Meaning of Money* (New York: Basic Books, 1994).

⁵ Heinz Tschlachler, “Dollar Bill” in Dennis R. Hall and Susan Hall, eds., *American Icons: An Encyclopedia of the People, Places, and Things that Have Shaped our Culture* (Westport, CT: Greenwood Press, 2006), 1: 208, 211.

⁶ John Schmeltzer, “The Dangers of Deep-Sixing Dollar Bills,” *Chicago Tribune*, May 12, 1995.

⁷ Tschlachler, 210.

⁸ Greenspan, 1.

⁹ Christopher Georges, “House Republicans, Believing Change is Due, Consider Plan to Insert Coin in Place of \$1 Bill,” *The Wall Street Journal*, April 18, 1995; Tschlachler, 210.

Economic Value

Economic value is the most familiar and straightforward factor involved in determining the overall worth of a \$1 Federal Reserve Note. It consists of the note's nominal value, its purchasing power, and its utility as compared to other forms of payment. From this sum is subtracted the cost of obtaining cash.

$$\text{Economic Value} = \text{Nominal Value} \times (\text{Purchasing Power} + \text{Utility} - \text{Cost})$$

Nominal value is the face value of the note or \$1. Purchasing power is determined using the Consumer Price Index (where \$1 could buy \$1 worth of goods in 1983) and the formula:

$$\text{Purchasing Power} = 1 / \text{CPI} \times 100$$

The CPI for 2007 is 207.34 with 1 / CPI equal to .0048. As a result, the purchasing power of the dollar is \$.48.

Utility is the economic advantage gained from using a \$1 Federal Reserve Note versus some other form of payment such as a \$1 coin or an electronic payment. There are various savings involved in using cash over \$1 coins and check, credit card, or debit card. Here utility is defined as the sum of the savings deriving from faster transaction processing speed, increased queue speed, and anonymity in transactions:

$$\text{Utility} = \text{Processing} + \text{Queue} + \text{Privacy}$$

Cash transactions occur faster than those involving \$1 coins, checks, or electronic forms of payment that require signatures or personal identification numbers.¹⁰ There are also times when an electronic transaction is not an option, either because it is not available (as in a vending machine transaction) or there is a technological breakdown, preventing the execution of an electronic transaction. Such scenarios give cash a definite economic advantage that can be estimated at \$.38 per transaction or \$.033 per dollar spent.¹¹

Faster transactions allow register queues to move faster, and consumers spend less time waiting to make a purchase. As time is money, the time saved translates into an average savings to the consumer per transaction of \$.14 or \$.012 per dollar spent.¹²

Besides processing and queuing time savings, cash is also used because it provides anonymity in transactions (there are no credit card statements), it forces budgeting of

¹⁰ As \$1 coins are not fully integrated into the small payments network, I have assumed their involvement in a transaction would slow it down to the same extent as if one were using an electronic payment not requiring a signature or personal identification number. Daniel D. Garcia-Swartz, Robert W. Hahn, and Anne Layne-Farrar, "The Move Toward a Cashless Society: A Closer Look at Payment Instrument Economics," *Review of Network Economics*, 5, 2 (June 2006): 185-87.

¹¹ This assumes a significant time savings. Imagine the time and hassle saved in buying a candy bar with a \$1 note versus writing a check. *Ibid.*, 187.

¹² Here and below, the value per transaction was divided by \$11.52 to get per dollar savings. *Ibid.*, 185.

expenditures (there is no borrowing involved), and it is accepted almost everywhere.¹³ One study has valued privacy alone as worth \$.12 per transaction or \$.01 per dollar spent.¹⁴

In total, the utility of the \$1 Federal Reserve Note over the \$1 coin, checks, and electronic transactions can conservatively be worth \$.64 per transaction or \$.055 per dollar.

$$\text{Utility} = \$.033 + \$.012 + \$.01 = \$.055$$

The cost of obtaining cash in general has been estimated using the cost of an ATM visit as ranging from \$.03 to \$.28 per transaction.¹⁵ However, as the \$1 Federal Reserve Note is received in change during a transaction, the cost of acquiring one is minimal. Therefore, we assume the cost to be \$.03 per transaction or \$.003 per dollar.

Putting this all together, the economic value of a common \$1 Federal Reserve Note, Series 2006, in perfect condition in 2007 (the last year reporting a CPI) would be worth:

$$\begin{aligned} \text{Economic Value} &= \text{Nominal Value} \times (\text{Purchasing Power} + \text{Utility} - \text{Cost}) \\ &= \$1.00 \times (\$.48 + \$.055 - \$.003) \\ &= \$.532 \end{aligned}$$

The net profit from using a \$1 Federal Reserve Note is \$.052 (Utility – Cost) per dollar, which, added to purchasing power, raises the economic value of a bill to 53 cents. In other words, the fact that a paper \$1 Federal Reserve Note is used instead of a coin, check, or electronic device in a transaction increases the value of each dollar used by around \$.05.

Collectible Value

Calculating the collectible value of a \$1 Federal Reserve Note involves considering the factors that currency collectors use to determine prices. Collectible prices for notes consist of a number of elements that can be expressed in this way:

$$\text{Collectible Value} = \text{Nominal Value} \times [\text{Rarity Factor} (\text{Condition Factor} \times \text{Age Factor})] + \text{Aesthetic Premium} + \text{Uniqueness Premium}$$

The collectible value of most notes is a product of three factors—rarity, condition, and age—plus two premiums: aesthetic and uniqueness. Let us look at the last elements first.

¹³ More reasons for using cash are listed in Brian Mantel, “Why Don’t Consumers Use Electronic Banking Products? Towards a Theory of Obstacles, Incentives, and Opportunities,” Emerging Payments Occasional Paper Series, Federal Reserve Bank of Chicago, September 2000.

¹⁴ *Ibid.*, 188.

¹⁵ *Ibid.*, 185-87.

The aesthetic premium refers to the amount added to the price of a collectible note because of its beauty or the historical significance of an image appearing on it. Usually, an aesthetic premium is seen among late-nineteenth and early-twentieth century, non-Federal Reserve Notes. Post-1929 Federal Reserve Notes tend to be uniform in appearance. For the purposes of this paper, the Aesthetic Premium = 0 because there is no notable difference in design between \$1 Federal Reserve Notes printed from 1963 to the present. It would be extremely unlikely to find a pre-1963 \$1 Federal Reserve Note in circulation.

The uniqueness premium occurs when a note is extremely rare in quantity (as in the case of an error note) or exceptional in some other way (the mode of production, a signature, and etc.). Such notes are quickly sequestered from the general circulation by collectors and are outside the bounds of this paper, which focuses on “regular,” more commonly found notes. For our purposes, the uniqueness premium is zero.

Looking at the other elements of collectible value, the factors of rarity, condition, and age, I used data from recent collector’s guides reporting prices of \$1 Federal Reserve Notes.¹⁶ They report prices by age, condition, and a category I will call rarity.

Rarity is a difficult concept and number to pin down. Exploring the data used, no relationship was found between the higher price paid for a note identified as rare or different and either the age of the note or the quantity produced (condition was not an issue). It only appears that notes bearing a higher price due to their recognized rarity were produced in lesser quantities than non-premium or common notes. Rare notes made up .7 to 30.5 percent of the total production of the series in which they appeared. For the collector, rarity must include another factor, besides quantity, which is undecipherable but may relate to capricious market forces in the numismatic community. Given this mystery, the only option was to calculate an average rarity multiplier, which ranged in value from .5 to 5.25. The median value was 1.5. This number multiplied by the other collectible value factors should result in the approximate collectible value of a “rare” \$1 Federal Reserve Note. A non-rare or common note would have a rarity factor of 1.

Determining the condition factor was a bit more straightforward. Currency collectors recognize seven condition-related grades from the barely acceptable in appearance or “good” to perfect condition or “uncirculated.”¹⁷

¹⁶ Arthur L. and Ira S. Friedberg, *The Official Red Book: A Guide Book of United States Paper Money* (Atlanta: Whitman Publishing, 2006), 72-76; Dean Oakes, et al., *Standard Guide to Small-Size U.S. Paper Money, 1928 to Date*, 5th ed., (Iola, WI: Krause Publications, 2004), 70-91.

¹⁷ Marc and Tom Hudgeons, *Official Blackbook Price Guide to United States Paper Money*, 34th ed. (New York: Crown Publishing Group, 2001), 57-58.

Condition	Grade	Abbreviation
Perfect	Uncirculated	UNC
Slightly Imperfect	Almost Uncirculated	AU
Minor Evidence of Circulation	Extremely Fine	EF
Average Evidence of Circulation	Very Fine	VF
Major Evidence of Circulation	Fine	F
Worn	Very Good	VG
Heavily Worn	Good	G

Based on the prices for very fine and uncirculated \$1 Federal Reserve Notes, very fine notes were worth 54% less than uncirculated ones. This is an 18% drop per grade. However, applying the drop consistently over all the grades resulted in a “good” note having a value 8% below zero. Yet, the 18% drop was close to the 16.7% drop calculated by dividing 100 by six grade drops. Also, as condition-related grades are notoriously fuzzy in the numismatic world, it seemed fair to use the 16.7% drop as a good approximation of what actually occurs in pricing decisions. Thus, the condition factor could be written in the form of this equation:

$$\text{Condition Factor} = 1 - .167 \times G$$

Here G is the number of grades below uncirculated and cannot have a value above six.

When we think of collectibles, the element of age is the most apparent indicator of worth or price. In effect, age is a sort of proxy for scarcity of supply—the older a note or coin, the fewer that are still extant and available for purchase. But, let us not confuse rarity, discussed above and based on the quantity of notes originally produced, with scarcity of supply. For example, in 1963, almost 88 million \$1 Federal Reserve Notes were produced for the Boston Federal Reserve Bank. Yet, it is anyone’s guess how many of those notes are still around or, in other words, the current supply of these notes. Rarity and age-induced scarcity are no doubt related, but they are not the same.

Using a data set of \$1 Federal Reserve Notes produced for the Boston Federal Reserve Bank from 1963 to 2003,¹⁸ a bivariate regression was used to determine the relationship between age and price. Actually, the two inputs were AGE = 2007 - date of production and PRICE DIFFERENCE = Price - Nominal Value. The result of the regression, with b = 0, was an age factor in the form of the following equation with an R² = .8676:

$$Y = 6 \times 10^{-5} X^3 - .0064 X^2 + .2516 X$$

Here X is the age of the note in years.

Let us now calculate the collectible value of our sample \$1 Federal Reserve Note used when calculating economic value above. The note is common (not rare), making the

¹⁸ Oakes, et al., 70-91.

Rarity Factor = 1. Being in perfect condition, the note is uncirculated. Therefore, in the condition factor equation, G = 0, resulting in the factor being equal to one. Our sample note is from Series 2006, making it one year old. Setting X = 1 in the age factor equation, gives us Y = .2453. Lastly, the aesthetic premium and the uniqueness premium both equal zero. Putting the numbers into our original equation results in the following:

$$\text{Collectible Value} = \text{Nominal Value} \times [\text{Rarity Factor} (\text{Condition Factor} \times \text{Age Factor})] + \text{Aesthetic Premium} + \text{Uniqueness Premium}$$

$$\text{Collectible Value} = \$1 \times [1 (1 \times .2453)] + 0 + 0 = \$.2453$$

Using this equation, we can also calculate the collectible value of all common notes (where the rarity factor is 1) for three years. As the average life of a \$1 Federal Reserve Note is 21 months, three years of calculations should be sufficient. Again, the aesthetic premium and the uniqueness premium are each equal to zero.

	Condition	UNC	AU	EF	VF	F	VG	G
Age								
1		0.25	0.20	0.16	0.12	0.08	0.04	0.00
2		0.48	0.40	0.32	0.24	0.16	0.08	0.00
3		0.70	0.58	0.47	0.35	0.23	0.12	0.00

In other words, a brand new note in perfect condition is worth almost 25 cents more than a heavily worn one. This collectible value reflects a social value. Would not a premium be paid for a perfect or almost perfect note if it was meant as a gift or a memento of a special occasion?

Symbolic Value

The Symbolic Value of a \$1 note refers to the worth assigned to it because of what it represents to us. A \$1 greenback could represent economic power, social stability, American-ness, and any number of other meanings. The image of the note has meaning and, thus, value to us. While no doubt the symbolic value of a \$1 Federal Reserve Note varies from individual to individual, in the aggregate it should be a constant value. One can only hypothesize that the value of the constant would change with some great crisis or cataclysm that would dramatically alter perceptions of the United States.

To quantify such a nebulous value, we must find a way to determine the worth of only the *image* of a \$1 Federal Reserve Note, separating out any economic or collectible values. Luckily, there are some notes that are sold primarily for their symbolic value. These are uncut sheets of a \$1 Federal Reserve Notes, available in sheets of 4, 8, 16, or 32 notes (depending on the issue). These sheets have a fairly constant value over

time; and, in the case of 32-subject sheets have a constant price no matter how old.¹⁹ The chart below of 2004 prices does not report spotty appearances of 8-subject sheets:

Series	Age in 2007	Subjects per Sheet	2004 Price per Sheet	2004 Price per Note	2007 Price per Sheet
1981	26	32	50.00	1.56	54.88
		16	27.50	1.72	30.18
		4	12.50	3.13	13.72
1981A	24	32	50.00	1.56	54.88
		16	27.50	1.72	30.18
		4	12.50	3.13	13.72
1985	22	32	50.00	1.56	54.88
		16	27.50	1.72	30.18
		4	12.50	3.12	13.72
1988	19	32	50.00	1.56	54.88
		16	27.50	1.72	30.18
		4	12.50	3.13	13.72
1995	12	32	50.00	1.56	54.88
		16	31.00	1.94	34.03
		4	15.00	3.75	16.46
2001	6	32	50.00	1.56	54.88
		16	31.00	1.94	34.03
		4	15.00	3.75	16.46
2003	4	32	50.00	1.56	54.88
		16	31.00	1.94	34.03
		4	15.00	3.75	16.46
2003A	2	32			55.00
		16			33.00
		4			-----
2006	1	32			55.00
		16			33.00
		4			15.50

This is an odd set of data. The 32-subject sheets have a constant price, independent of their age, while lower-number sheets decline in price as they age. All this is counter to what happens to single notes. Collectible value always increases over time because scarcity increases. Also, the data point out that smaller sheets are worth more per note than larger sheets.

Explaining these prices is a matter of conjecture, especially since the quantities of uncut sheets produced for sale are unknown, but the possible answers support the overriding symbolic value of the sheets. On the 16-subject and 4-subject sheets, prices per note on the sheet rise as the number of notes per sheet decreases for the simple reason that the sheets are smaller and more marketable. Few collectors want a 32-subject sheet

¹⁹ Data is from Arthur L. and Ira S. Friedberg, *Paper Money of the United States*, 17th ed. (Clifton, NJ: The Coin and Currency Institute, 2004), 293; Bureau of Engraving and Printing, The BEP Store, Uncut Currency, accessed October 27, 2008, <http://www.bep.treas.gov/store/section.cfm/69/83>.

because of its large size. The 16-subject and 4-subject sheets offer the novelty of an uncut currency sheet at the lowest price—the smaller the sheet, the higher the demand, and the higher the per note price.

The fact that the sheets of \$1 notes are seen more as collections of symbols rather than notes provides another explanation for their overall price depreciation. When considering the 16-subject and 4-subject sheets, the newer sheets are worth more than the older ones. This occurs because the sheets are not seen to contain individual collectible notes, which would cause the price to rise with age. Instead, the sheets are viewed as differently-sized collections of symbols—a different type of collectible. In the market for these sheets, people would rather have a new one than an old one. And, as the market in sheets is really only active in 16-subject and 4-subject sheets, the price depreciation only affects them and not the 32-subject sheets.

As the uncut currency sheet is not seen as much as a collection of notes, representing purchasing power or collectible value, but as a collection of symbols, the images that appear on its surface are a major component in the sheet's value. These images have been constant over the last 27 years. As a consequence, the value of the symbols has remained constant. This is seen in the constancy of the 32-subject sheet prices when we adjust prices for inflation and add in current prices. Correcting for rounding errors, the price of all the sheets, regardless of age, is about \$55.00. This supports the idea that the symbolic value of the notes is constant not just across time but across sheet sizes. The symbolic value of notes on a 4-subject sheet is the same as those on a 16-subject or 32-subject sheet.

However, the price of an uncut currency sheet is not simply equivalent to its symbolic value. Ultimately, the sheet can be cut apart into individual notes, converting a collection of images into a collection of collectible notes with monetary value. The value of the individual notes must be stripped away from the price of the sheet to leave only the worth of the symbols on the sheet.

The price of a sheet should look like this:

$$\text{PRICE}_{\text{SHEET}} = \text{NUM} \times \text{NOMINAL VALUE} + \text{NUM} \times \text{COLLECTIBLE VALUE} + \text{NUM} \times \text{SYMBOLIC VALUE} + S$$

Here PRICE is the price of an uncut currency sheet, NUM is the number of notes on a sheet, and NOMINAL VALUE and COLLECTIBLE VALUE are the same as defined above. In other words, the price of an uncut currency sheet is the sum of the combined nominal value of the notes when separate, the combined collectible value of the notes when separate, the combined symbolic value of the notes, and a premium added for the novelty of being a sheet of uncut currency (what I'll call "sheetness" or S). This sense of novelty or "uncut-ness" is the same for all sizes of uncut currency sheets, making S a constant.

With the symbolic value of each note and sheetness constants, we can use the equation above to solve for the symbolic value of a note by setting the equation for a 16-subject sheet equal to that of a 32-subject sheet. Solving the equations for S:

$$S = \text{PRICE}_{16} - 16 \times \text{NOMINAL VALUE} - 16 \times \text{COLLECTIBLE VALUE} - 16 \times \text{SYMBOLIC VALUE}$$

and

$$S = \text{PRICE}_{32} - 32 \times \text{NOMINAL VALUE} - 32 \times \text{COLLECTIBLE VALUE} - 32 \times \text{SYMBOLIC VALUE}$$

Setting the equation for a 16-subject sheet equal to that of a 32-subject sheet gives us:

$$\text{PRICE}_{16} - 16 \times \text{NOMINAL VALUE} - 16 \times \text{COLLECTIBLE VALUE} - 16 \times \text{SYMBOLIC VALUE} = \text{PRICE}_{32} - 32 \times \text{NOMINAL VALUE} - 32 \times \text{COLLECTIBLE VALUE} - 32 \times \text{SYMBOLIC VALUE}$$

As a first step to determining the values of the variables, we average the inflation-adjusted prices of all 16-subject sheets and all 32-subject sheets. This results in a $\text{PRICE}_{16} = \$32.09$ and $\text{PRICE}_{32} = \$54.91$. Also, as always, $\text{NOMINAL VALUE} = \$1.00$.

In calculating the collectible value, we need to determine rarity, condition, and age. (As above, the aesthetic and uniqueness premiums are zero.) The rarity factor will be 1.5 because the notes, if actually separated, are rare as they come from a previously uncut sheet. The notes will be in uncirculated condition; and, according to the price list, all uncut currency sheets are basically treated as being of the same age, and it appears that the age is one year. (An age of zero makes very little sense as the notes would have no collectible value if separated.) Placing these values into the collectible value equation results in:

$$\text{Collectible Value} = \text{Nominal Value} \times [\text{Rarity Factor} (\text{Condition Factor} \times \text{Age Factor})] + \text{Aesthetic Premium} + \text{Uniqueness Premium}$$

$$\text{Collectible Value} = \$1 \times [1.5 (1 \times .2453)] + 0 + 0 = \$.36795$$

Filling in our numbers, we can solve for the symbolic value of a note:

$$\$32.09 - \$16 - 16 \times \$.36795 - 16 \times \text{SYMBOLIC VALUE} = \$54.91 - \$32 - 32 \times \$.36795 - 32 \times \text{SYMBOLIC VALUE}$$

$$\$10.2028 - 16 \times \text{SYMBOLIC VALUE} = \$11.1356 - 32 \times \text{SYMBOLIC VALUE}$$

$$16 \times \text{SYMBOLIC VALUE} = \$.9328$$

SYMBOLIC VALUE = \$.0583

In sum, this means that we are willing to pay about 6 cents for the image that appears on a \$1 Federal Reserve Note because of its meaning and symbolic value to us.

Total Value of a \$1 Federal Reserve Note

We have now reviewed all the components making up the value of a \$1 Federal Reserve Note, bringing us back to our initial equation. Inserting the values for a common, one-year old note in uncirculated condition, we get:

$$\begin{aligned}\text{Value} &= \text{Economic Value} + \text{Collectible Value} + \text{Symbolic Value} \\ &= \$.532 + \$.2453 + \$.0583 \\ &= \$.8356\end{aligned}$$

The actual value of a \$1 Federal Reserve Note is not just its purchasing power of \$.48 but \$.84. In actuality, a note is worth \$.36 more than usually considered. This increased value, stemming from the note being an object, may help to explain the longevity of the note in the face of calls to replace it and the challenge of alternate forms of payment.

Conclusion

The \$1 Federal Reserve Note is more valuable to us than is usually believed or calculated by economists because the latter fail to view the note as having value as a physical artifact. The paper note itself has value beyond its role as a marker or token for purchasing power. The concrete properties of the \$1 Federal Reserve Note give it economic utility, speeding-up transactions and adding economic value. The physical nature of the note also makes it a medium of social exchange and a collectible. Lastly, the images on the note, its distinctive color, and its mere being give the \$1 Federal Reserve Note cultural and symbolic value. Together, the values attached to the physical nature of a note can add a total of 36 cents to its worth.