

Federal Reserve Bank of Cleveland

The Fate of One-Dollar Coins in the U.S.

by Sébastien Lotz and Guillaume Rocheteau

In 1997, the U.S. Dollar Coin Act authorized the introduction of a new dollar coin, and in January 2000, the coin was released to the public. The new coin, called the golden (Sacagawea) dollar because of its color, aimed to replace another one-dollar coin introduced in 1979, the Susan B. Anthony dollar, and, ultimately, the one-dollar bill. The Anthony and golden dollar coins have several characteristics in common: Their size, weight, and electromagnetic properties are the same, and both coins portray famous women in U.S. history. These coins also share the same fate: They have both failed to circulate widely in retail transactions.

Two attempts to introduce a one-dollar coin in just 25 years suggest there must be some strong motivation for having a one-dollar coin. What is it? And if there are good reasons for having a one-dollar coin, why has it failed to circulate in the United States, when coins with similar purchasing power circulate successfully in other countries?

■ The Coin–Note Frontier

The most commonly cited economic rationale for introducing dollar coins is the potential for cost savings. Savings are possible because the cost of maintaining one-dollar bills in circulation is far greater than the cost of servicing coins. While dollar coins are more costly to produce, they last much longer than dollar bills.

This trade-off between the initial production cost and durability comes into play when selecting the most cost-efficient material to represent a particular denomination. Longer-lasting materials are costly, and resources are wasted if a denomination is made out of something more durable than it needs to be. The durability of an object depends also on the frequency with which it changes

hands, what economists call its *velocity*. Since paper money has a low production cost but is less durable than metallic money, it is well suited for large denominations that do not circulate frequently. In contrast, coins, which cost more to produce, are better suited for small denominations that have a high velocity and are subject to greater wear.

In most countries, the stock of currency is composed of both coins and notes (paper or, as in Australia, polymer money). But countries differ in where they set their coin–note frontier, the denomination at which the system switches from coins to notes. Because inflation constantly erodes the purchasing power of the units of money, the frontier between small and large denominations should change over time. Other countries—Japan, the United Kingdom, and Canada, among others¹—have changed their frontiers, but the United States has not. This is illustrated in figure 1, where the coin–note frontier for the United States seems out of line compared to those of other countries. In fact, among the developed countries shown in figure 1, the United States is the country whose largest coin has the smallest purchasing power. The difference is even more striking when one considers that the figure includes the one-dollar coin, but the highest denomination coin circulating widely in the United States is in fact the quarter.

■ Potential Cost Savings

The higher coin–note frontiers of most other developed countries suggest that the United States might have something to gain by moving its frontier. That gain is cost savings, which by most reckonings are fairly substantial.

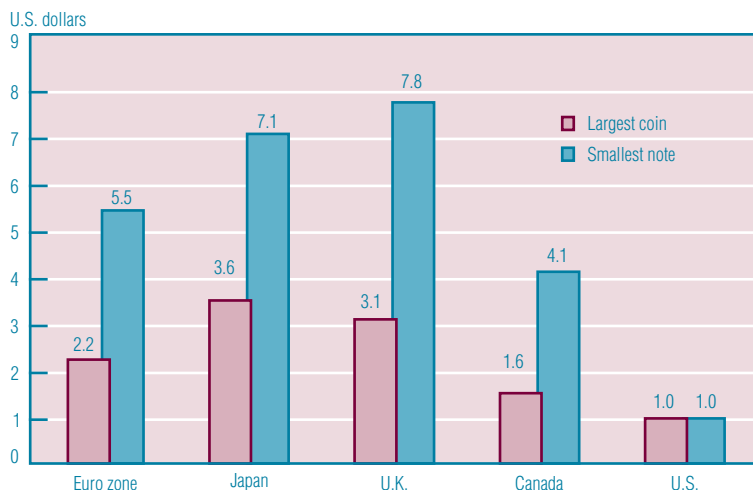
To get an idea of where the savings come from, we can first consider the reduction in annual production costs that would be achieved by substituting an equal number

The United States has introduced two one-dollar coins in the past 25 years, both of which have not circulated widely. Many other countries have replaced lower-denomination notes with coins and have achieved wide circulation and cost savings. Lessons from those countries suggest that achieving widespread use of a dollar coin is much harder if the note is allowed to remain in circulation.

of coins for notes. As mentioned earlier, coins cost more to produce but last longer, so for every \$100 kept in circulation, estimates suggest that \$1.82 would be saved by switching to coins. (For details, see the sidebar.) But substituting coins for notes would likely require more coins than notes, since many will sit idle in vending machines. In addition, analysts predict the use of two-dollar notes would increase slightly if the one-dollar note were removed completely from circulation. Adjusting the estimated savings for these details lowers the projected savings to \$1.34 for each 100 notes originally in circulation. Keep in mind such savings are significant when one considers the number of one-dollar notes in circulation, which was about eight billion at the end of 2003, according to Treasury estimates (Treasury Bulletin, 2004)².

Yet another factor that plays into future cost savings is seigniorage revenue, which comes from the difference between the face value of a coin or note and its production costs (See the sidebar). A final area in which further savings may result is processing, which refers to examining the existing stock of coins and bills and removing unfit or counterfeit pieces from circulation. The cost to the Federal Reserve of processing

FIGURE 1 THE COIN–NOTE FRONTIER



NOTE: The comparison was made using purchasing power parities; see OECD 2004.

coins, which can be weighed, is smaller than the cost of processing notes, which must be counted and individually verified.

Overall annual budgetary savings—including production and processing costs, seigniorage revenue, start-up, and advertising cost—have been estimated at more than \$450 million (Kelley, 1995) to more than \$500 million (GAO, 2000; 2002). With such savings, it is easy to see why the United States has twice introduced dollar coins.

■ The Difficulty of Launching a New Coin

Of course, these cost savings can't be realized unless the one-dollar coin is accepted and circulates widely. Several obstacles make it difficult to achieve wide acceptance of a new coin. While the savings are attractive, adopting the coin also means increased costs—both tangible and psychological—for businesses and consumers.

For example, the banking industry, which pays to store, sort, and wrap coins, would incur higher costs if coins replaced one-dollar bills. Armored carriers generally charge retailers more to transport coins because they weigh more. Vending machines might have to be retooled and cash registers updated.

Coins should be attractive to consumers and businesses because they are more convenient to use in vending machines and for small cash transactions. But the public still seems to prefer dollar bills. This might be because accepting a new coin bears a psychological cost associ-

ated with a change in habits. The cost is exacerbated when there is confusion between the new coin and existing coins, as was the case with the Susan B. Anthony dollar and the quarter. Additionally, surveys show that people consider coins heavier to carry than notes, as well as bulky and awkward (GAO, 1993). The Kennedy half-dollar and the Eisenhower dollar, for example, did not circulate very widely because of their relatively large size and weight (see Caskey and St. Laurent, 1994).

Economic theories emphasize strategic interactions between the public, businesses, and banks to explain the difficulty of launching a new coin. Businesses will not order dollar coins or upgrade vending machines until they see the public using them; the public is unlikely to use coins until there are enough places available where it prefers to use them; and banks are reluctant to invest in new equipment to handle coins until there is wide demand for them. These behaviors reflect the presence of *network externalities*, which arise when the gain from adopting a new technology depends on how many people in the economy have adopted it. Fax machines, credit cards, and DVD players are other obvious examples of cases involving this type of externality (for further explanation, see Osterberg and Thomson in the recommended reading). The presence of network externalities means that even though a change may bring benefits to all parties (here, businesses and consumers), it may not be achieved because all parties need to act in order for the benefits to be realized. Because each party stands to lose if it

acts and the other doesn't, it is risky to make the change unilaterally (For a game-theoretic explanation, see www.clevelandfed.org/research/Com2004/index.cfm#1015).

Because wide circulation of the dollar involves network externalities, an opportunity exists for the government to intervene. In effect, it could help both parties adopt the coin simultaneously by easing the transition to a dollar coin. Several measures are possible. For example, an informational campaign can make people aware of the benefits of using the new coin, which might make them more inclined to use it. The public may not recognize the benefits initially because it won't experience them until widespread acceptance of the coin has been achieved. In addition, since the major benefit of coins comes from cost savings that the public is unlikely to discern on a daily basis, education on this point might be effective. The public sector could also make the switch itself (through government agencies, for instance) in order to trigger the adoption of the coin by the private sector. For this strategy to work, the size of the public sector must be large enough. The government can also ask big players in the market, such as major retailers, to help introduce the new coin.

These strategies have been tried, however, so far with little success. Past public information campaigns have been effective in making the public aware of the new coin, so it is not clear that more should be done in terms of informing the public (GAO, 2002). And when the golden dollar was introduced, Wal-Mart stores were among the first to distribute it.

To encourage people to use the dollar coin, the Presidential One-Dollar Coin Act of 2004, recently submitted to the House of Representatives, proposes to launch a new series of one-dollar golden coins portraying former U.S. presidents ("presidential dollars") in 2006. Given past experiences, this new coin is more likely to be successful as a collector's item than as a medium of exchange unless something extraordinary is done to overcome the public's preference for notes.

Another strategy the government has at its disposal is more radical but is likely to succeed in making the coin circulate. This is to withdraw the competing bills. While a gradual transition may be desirable to reduce the psychological

Calculating the Potential Savings of the One-Dollar Coin

To get an idea of what's involved in estimating the savings the government could achieve if the public switched to a dollar coin, we will compare the annual production cost for keeping 100 one-dollar notes in circulation with the cost of keeping one-dollar coins in circulation.

First, figure the savings achieved by substituting the same number of coins for notes. Because a one-dollar note lasts approximately 1.8 years, about 56 of every 100 one-dollar notes have to be replaced each year.¹ At a production cost of 4 cents a note, the annual cost of keeping 100 one-dollar notes in circulation is then \$2.22.² A one-dollar coin lasts 30 years on average (it can last up to 50 years according to some estimates) and costs 12 cents to produce (GAO, 2002). Therefore, the annual cost of maintaining 100 one-dollar coins in circulation would be 40 cents. The lower cost for coins means the government could save \$1.82 for every 100 notes, if it substituted coins for dollar bills.

Then, adjust for the fact that more coins will be needed than notes. The first calculation assumes that the demand for different denominations is fixed. But the experiences of foreign countries have shown that the demand for coins is *different* from the demand for notes. According to a 1990 study by the General Accounting Office (now renamed Government Accountability Office), if the one-dollar note were removed from circulation, 25 percent of the one-dollar note demand would be absorbed by two-dollar notes, which currently do not circulate very widely. The remaining 75 percent would be replaced by coins, but at a ratio of one to two: each dollar note would be replaced by two one-dollar coins. In our example then, 100 one-dollar notes would be replaced by 12.5 two-dollar notes and 150 one-dollar coins. Assuming the two-dollar note would cost the same to produce and last as long as the one-dollar note, the cost of maintaining 12.5 two-dollar notes and 150 one-dollar coins in circulation would be 88 cents. Therefore, under this assumption, the annual production cost savings of a coin-note substitution would be close to \$1.34 per hundred one-dollar notes initially in circulation.

Next, figure revenue gains from seigniorage. Given that 75 percent of the one-dollar notes would be replaced by one-dollar coins according to a ratio of one to two, the cost savings calculated above omit the seigniorage revenue that would be generated by the 75 additional coins. The seigniorage revenue per coin is 88 cents (for a similar calculation, see Kelley, 1995).

Now, add in savings from reduced processing costs seigniorage revenue, and subtract increased costs. Switching to coins would involve some costs to the government as well, such as start-up and advertising costs and an increase in the Bureau of Engraving and Printing's production costs due to lower production volume.

1. The estimates for the life expectancy of a note range from 1.4 years (GAO, 1990) to 1.8 years (Federal Reserve System). Parke and Liu (2003) show that the average lifespan of one-dollar notes has increased about 20 percent during the last decade, thanks to improvements during the mid-1990s in the paper used for currency.
2. In 2000, the GAO estimated the production cost of a note at 3.5 cents and the production cost of a coin at 11.5 cents.

cost associated with the change in habits, it may also make the public less likely to initiate the conversion, especially since the failure of the Anthony dollar raised public skepticism about the chance a new coin has of circulating widely (Caskey and St. Laurent, 1994).

■ Foreign Experiences

Many countries have introduced new coins to replace existing notes—Australia introduced a one-dollar coin in 1984 and a two-dollar coin in 1988; Canada a one-dollar coin in 1987 and a two-dollar coin in 1996; France a five-franc coin in 1970 and a ten-franc coin in 1975; the United Kingdom a one-pound coin in 1983, and so on. In all cases, the new coins were introduced to reduce overall production and processing costs. The public's resistance to the new coins lasted from between three months and two years. Ultimately, the success of the new coin was conditional on the decision to withdraw the notes. As an example, the French public accepted the new ten-franc coin only after the ten-franc note was withdrawn (GAO, 1995).

The experiences of the Susan B.

Anthony dollar and the Canadian "loonie" dollar are of particular interest since both have influenced the way the golden dollar was introduced in the United States. The physical properties of the Anthony dollar had been carefully planned to allow the coins to be easily used in vending machines.

However, the public found it hard to distinguish the new coin from the quarter, and did not readily accept it. Production was first stopped in 1982, three years after the coin's first release. Canada successfully introduced the "loonie" dollar in July 1987. Even though the Canadian dollar is the same size as the Anthony dollar, it is colored gold and has a distinctive eleven-sided outer edge. Moreover, Canada stopped issuing the equivalent dollar note in June 1989. The public resisted the coin initially, but three years after the note was withdrawn, only 18 percent disapproved the coin, according to a public opinion survey (GAO, 1993).

From these different experiences, the GAO (1990, p.24) drew the following lessons: There must be a public awareness campaign; government must expect initial public resistance and be strong in

its conversion campaign; sufficient coins must be made available; coins must have a distinct appearance; and notes must be eliminated.

Despite the Canadian experience and the lessons learned, when the golden dollar was introduced, the U.S. Dollar Coin Act directed that the dollar note remain in circulation. The importance of considering convenience and the needs of the public, along with cost, in the decision to remove the dollar notes from circulation was likely the reason (Kelley, 1995). Additionally, the co-existence of the Susan B. Anthony dollar and the Sacagawea golden dollar has been an obstacle to wider circulation of the golden dollar (U.S. Senate, 2002). In particular, many businesses are unwilling to obtain commingled golden dollar coins and Susan B. Anthony coins. This suggests that withdrawing the old one-dollar coin could boost the demand for the new one.

Legislators must weigh the potential for cost savings against the preferences and needs of the public when they consider their options for achieving the adoption of the dollar coin. Over time, the most

cost-efficient coin–note frontier moves higher, and the cost savings of a switch to dollar coins grows. It might be time to reconsider the trade-off between savings and initial public discomfort.

■ Footnotes

1. Italy and Austria asked about the possibility of introducing one and two euro banknotes, but the European Central Bank concluded that the negative aspects would outweigh the positive ones.

2. This number does not include the one-dollar notes on hand at the Federal Reserve or the Bureau of Engraving and Printing. Also, some one-dollar notes are used in foreign countries. These countries might decrease their use of dollars if notes are replaced by coins (GAO, 2000).

■ Recommended Reading

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Sébastien Lotz is an assistant professor at the Université Paris 2, ermes, and Guillaume Rocheteau is an economist at the Federal Reserve Bank of Cleveland.

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**Federal Reserve Bank of Cleveland
Research Department
P.O. Box 6387
Cleveland, OH 44101**

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