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The Tale of Gresham's Law

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Gresham's law, which says that bad money tends to drive good money out of circulation, may account for many nations' episodes of money troubles, as far back as ancient Athens. This Commentary discusses the two main explanations for Gresham's law and suggests some circumstances in which the law does not apply.

It is often difficult to explain why a particular commodity or currency becomes a medium of exchange. The common wisdom is that currencies with good properties—high intrinsic value, low storage cost, or low inflation—are more likely to circulate than those with bad properties. This is illustrated by the phenomenon of dollarization, in which the currencies of high-inflation countries tend to be partially abandoned in favor of sounder currencies like the U.S. dollar.

But good currencies have not always been preferred to bad ones. Monetary history includes plenty of incidents in which monies with good intrinsic properties are displaced by monies with inferior properties. For example, Aristophanes' (450–385 B.C.E.) play, *The Frogs*, refers to an episode in which the government of Athens, facing a shortage of silver, decided to supplement its silver coins with copper. As a result, silver coins ceased to circulate and were replaced by copper ones. The Middle Ages also furnishes many examples. In 1295, Philip the Fair, king of France, decided to mint new silver pennies that contained less metal than similar coins that were circulating in two adjacent territories, Burgundy and Flanders. Both territories soon substituted the light coins minted in France for their heavier domestic ones. More recently, the U.S. Coinage Act of 1965 replaced the old silver quarters with "sandwich" coins made of a silver–nickel alloy. The pre-1965 silver coins were quickly withdrawn from circulation, leaving only the inferior new quarters.

The observation that bad money drives out good money, usually called Gresham's law, has become one of the more famous maxims in economics and has been used to account for many episodes of monetary disorder. This *Economic Commentary* examines the history and the economic foundations of Gresham's law and identifies two explanations for the law. The first relies on government intervention in currency exchange rates. The second relies on the presence of asymmetries of information—the fact that two parties in a trade rarely share the same information. The *Commentary* concludes by discussing the relevance of Gresham's law for understanding today's multiple-currency economies.

The Origin of Gresham's Law

The phrase "Gresham's law" appeared in Henry D. Macleod's 1858 book, *Elements of Political Economy*. Macleod (1821–1902) unveiled "a great and fundamental law of the currency" by which "a bad and debased currency [that is, a currency with a lower intrinsic value] is the cause of the disappearance of the good money." He named it Gresham's law after reading a letter to Queen Elizabeth from Thomas Gresham (1519–79), an English merchant working as the Crown's financial representative in Antwerp. Gresham attributed the disappearance of gold from the kingdom to the debasement initiated by Henry VIII, which reduced the metallic content of coins "from six ounces fine to three ounces fine [of gold] […] which was the occasion that all your fine gold went out of your realm." As noted by Fetter (1932), "it requires considerable ingenuity to draw from Gresham's modest statement [...] a universal law that bad money drives out good money."

As a matter of fact, Thomas Gresham did not invent the law bearing his name. Statements related to the phenomenon that "bad money drives out good money" occur in several Medieval and Renaissance writings, from scholars like Hostiensis (ca.1200–71), Oresme (1320–82) and Copernicus (1473–1543), and from mint officials like Henri Poullain (1612). As we have just seen, Aristophanes, in the 5th century B.C.E., had already anticipated the mechanism. And it was the British economist, Stanley Jevons, who originated the expression "bad money drives out good money" in his 1875 book, *Money and the Mechanism of Exchange*, even though Henri Poullain's conclusion in 1612 that "[b]ad specie smothers and drives out good specie" came very close!

Legal Restrictions and Gresham's Law

MacLeod explained the phenomenon that he called Gresham's law on the basis of government intervention in monetary affairs. In an anonymous pamphlet written in 1696, he says that "[w]hen two sorts of Coins are current in the same nation, of like Value by denomination, but not intrinsically, that which has the least Value will be current, and the other as much as possible hoarded." In other words, if two coins have a one-to-one exchange rate, the coin with the lower content of the valuable commodity—the

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bad money—will drive out or replace the coin with the higher content of the valuable commodity—the good money.

Consider an example: An economy is based on a monometallic silver system, with a type of silver coin named coin A. Suppose the government introduces a new coin, coin B, which contains only 90 percent as much silver as coin A. There is free and unlimited coinage of both A and B. According to their intrinsic content, the market ratio between the two is 1/0.90 = 1.11 coins of type B for each coin of type A. Suppose further that the government ordains that both coins will have the same denomination, $1, for example, such that one A coin must buy the same amount of goods as one B coin. In this situation, an individual would gain by taking type A coins out of circulation, melting them, and having the metal recoined as a larger number of type B coins.

This is the story behind Gresham's law: Underweight or bad money drives out full-weight or good money whenever there is a fixed exchange rate between the two. To trigger the arbitrage mechanism just described—reminting good coins as a larger number of bad coins—the legal ratio must be enforced by the government. This can be illustrated by the fate of two good coins in two different periods: the thirteenth century gold florin in Italy and the silver écu during the French Revolution. In 1252, Florence started to mint a gold coin of high intrinsic value, the florin, which became very popular among merchants. The city's authorities never tried to impose an unrealistic value on the gold coin, and agents were virtually free to price the florin and other coins. The florin remained in circulation and Gresham's law did not operate. By contrast, during the French Revolution, the government introduced paper notes, called assignats, and threatened to impose a death sentence on anyone who would not trade them according to their face values. Consequently, assignats displaced silver écus (and gold coins as well), as predicted by Gresham's law. (In principle, the assignats were backed by goods confiscated from the Church. However, 45 billion French pounds of assignats were issued between 1790 and 1796, whereas the sale of goods from the Church is estimated to have been worth two to three billion French pounds at most.)

The government itself could also implement the fixed exchange rate by directly trading bad coins for good, that is, by asking the mint, where coins are struck, to stand ready to buy and sell coins at their declared legal value. However, such a liberal coinage policy is not sustainable because it would ultimately lead to the ruin of the mint: Individuals with B coins—the lighter ones—would buy A coins directly from the mint, melt them, and have the metal recoined as B coins. The mint would lose the difference on every trade. Accordingly, it is very difficult to find examples of such a policy in monetary history. (Even in a bimetallic system, in which the legal price of gold and silver at the mint created an implicit legal ratio between the two metals, mints did not trade gold for silver themselves at this legal ratio. For example, from 1792 until 1834, the U.S. dollar was defined as 24.75 grams of gold and 371.25 grams of pure silver, creating a fixed relative price of 15 grams of silver for one gram of gold. U.S. mints accepted gold and silver in bars to be coined at these official prices but did not change gold into silver.)

Still, governments may not always have had enough power to impose unrealistic exchange rates, especially for extended periods. For instance, in 1577, France's Cour des Monnaies, which was in charge of supervising mint policy, admitted that: "[y]our Majesty has been forced to increase the rate of the coins, to accommodate the price that your people gave to them of its own authority." (Sargent and Velde, p. 200.) Thus, legal constraints provide only a partial explanation for the activation of Gresham's law. We now consider an alternative explanation based on imperfect information.

Asymmetric Information and Gresham's Law

According to the previous explanation, bad money drives out good when the two monies are traded at a fixed (and "incorrect") exchange rate. This can happen when the government introduces legal tender laws to constrain people to trade different coins at par. There is, however, another circumstance under which different coins can circulate at the same price: when it is difficult to tell one coin from another.

Going back to our example of the A and B coins, suppose that the two differ only in their metallic contents: Coin B still contains only 90 percent of the silver in coin A, but now both of them have the same imprint and the same shape. An individual who is offered a coin may not know whether it is a type A or a type B, unless he is a coin expert. Situations in which agents face difficulties in recognizing coins could arise for many reasons: Imperfect coinage techniques, wear and tear, clipping (shaving small pieces of metal from the rim), hidden debasement, and counterfeiting. When it is difficult to verify a coin's intrinsic quality, A and B tend to be traded at the same price. In this case, coin A will be undervalued and coin B will be overvalued. Such situations can be illustrated by a historical example: In the early 1390s, the Duchess of Brabant in Belgium decided to have a new mint set up near the mint of her rival, the Count of Flanders. This new mint was charged with producing coins identical to the Count's, but with slightly less metal. Simon La Faucille, the Count's monetary officer, declared that "the difference [between the Count's coin and the Duchess's] is so subtle that simple people will take and already take your penny for as much as the previous one which is worth two esterlins more." (An esterlin corresponded to 1/160 of a marc weight. The marc was a standardized quantity of silver.)

Imperfect information about the quality of coins can affect the behavior of individuals in a number of different ways. An individual who holds a good coin, and knows that he does, has an incentive to hold on to it until he meets a merchant who can recognize its true quality. Imperfect recognizability can also affect the behavior of coin producers. In the Middle Ages, mint masters were in charge of producing the quantity and quality of coins specified by the sovereign. Though controlled, mint masters might have been tempted to produce low-quality coins and pocket the difference between the required and actual quality of a coin. Indeed, bad coins were cheaper to produce but they could be passed off to uninformed individuals as good coins. Money experts, such as moneychangers, also had an incentive to engage in opportunistic trading in this system. Experts could sort out the heavier coins, use the lighter ones for payments, then melt the heavy coins and recoin them as light coins, keeping the difference as a profit. This kind of operation, called billonnage, was widespread

in Europe at times when differences between coins were hard to detect. Some moneychangers were also caught clipping coins.

There are various accounts of moneychangers' role in the activation of Gresham's law based on asymmetries of information. Hostiensis, a prominent medieval jurist, wrote that: "Money is defrauded by changers who weigh coins one by one and keep the heavier ones have them melted, and allow the other ones to pass." Another example of experts' role in activating Gresham's law comes from Copernicus (1473–1543) who, commenting in 1526 on the monetary reform carried out by the king of Poland, wrote that "[g]oldsmiths and those specialized in precious metals take advantage of our misfortune. They sort out ancient coins, melt them, and then sell the silver, always receiving from inexperienced persons more silver with the same amount of money. When older coins have almost disappeared, they choose the best from the rest and just leave the worst currencies." Moneychangers were often blamed for activities that ultimately contributed to bad coins' crowding out good ones.

Gresham's Law Today

When it comes to modern fiat money systems, Gresham's law has lost most of its grip, because the two explanations underlying the law hinge on features specific to the commodity money system. It is actually the imperfect recognizability of metal coins that explains why agents with good coins preferred to wait for sellers able to recognize them, and why money experts sorted out the better coins. It is also because money was made of precious fungible metals like gold and silver that good, undervalued coins could be melted and recoined as lighter ones. But modern fiat systems do away with these two important ingredients: The intrinsic value of coins, bills, and deposits is zero, and good currencies cannot be melted.

Still, there remains one factor that can put Gresham's law into play today: government interference in the circulation of currencies. In high-inflation countries, when agents are free to choose their medium of exchange, the high-inflation currency tends to be displaced by the low-inflation currency. This phenomenon, known as dollarization, is the natural outcome in a currency market with no imperfection. When the government raises the cost of using the low-inflation currency, however, agents will be reluctant to use it in transactions and will keep it as a store of value. For instance, legal restrictions on the use of U.S. dollars in countries like Cuba and the former republics of the U.S.S.R have generated an outcome that resembles Gresham's law. In all these countries, people could be punished for using dollars: Dollars could be confiscated and individuals could be fined. In accordance with Gresham's law, legal restrictions raise the cost of using dollars and keep bad (domestic) currency circulating widely in these countries.

Conclusion

Gresham's law says bad money tends to drive good money out of circulation. We have shown that this proposition may account for a number of historical episodes. We have also presented the two main explanations for Gresham's law: One is based on government intervention in exchange rate determination, and a second is based on imperfect information about the quality of coins. These two explanations suggest the following qualifications of the law: Bad money drives out good money when there is a fixed exchange rate between the two or when it is difficult to distinguish between them. In the absence of such market imperfections, good and bad monies will both circulate and be priced according to their quality.

The evolution of monetary systems toward the use of fiat currencies has decreased the relevance of Gresham's law considerably. Still, legal restrictions can reduce the velocity of the low-inflation currency, as indicated by Gresham's law.

Recommended Reading

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