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Gresham's law in corporate finance

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Executive summary

Gresham's law in corporate finance

by **Gordon S. Roberts**, CIBC Professor of Financial Services, Schulich School of Business, York University

Gresham's law: bad money drives out good appears applicable in modern day corporate finance. This article shows that where demand for a specific type of financing causes it to become overvalued, it becomes the financing mechanism of choice, as was the case during the Internet boom of the 1990s, where overvalued equities became the preferred method of payment for acquisitions. Consequently, this article helps us improve our understanding of corporate financing choices in both crisis and non-crisis times and highlights what regulators and investors should look out for when appraising and monitoring acquisitions.

Gresham's law in corporate finance

Gordon S. Roberts

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Abstract

Financing patterns in corporate takeovers and private equity deals over the last twenty years demonstrate the widespread application of Rolnick and Weber's (1986) extension of one of the most venerable principles of monetary economics: Gresham's law. Two currencies, corporate securities (bad money) and cash (good money) circulate together with the former playing the dominant role of par money in times when investors exhibit irrational enthusiasm. Heightened social pressure in the form of herding combined with greater uncertainty about the degree and duration of the overvaluation of securities jointly play the role of transactions costs creating a preference for payment in the par money and most deals are financed with equity or debt securities rather than cash. To illustrate, overvalued bank loans were the most common form of financing in the credit bubble up to 2008 while stock deals predominated in takeover financing during the Internet bubble period of the late 1990s. Normal markets, not characterized by irrational enthusiasm, display the use of both corporate securities and cash in funding takeovers with cash deals (good money) enjoying a premium in the form of more favorable stock market reaction. The analysis provides useful insights for both monetary economists and researchers in corporate finance. For the former, it brings a fresh currency to the interpretation and extension of Gresham's law relating the classic debate to contemporary, as opposed to historical, events. For the latter, the lesson is that principles of monetary economics can enhance understanding of corporate financing choices.

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Introduction

Gresham's law is widely known: "Bad money drives out the good." An historical review traces examples back to ancient Greece [Bernholz (2011)]. In its original form, in order to hold, the law requires a key assumption: a legal tender law mandating equal valuation of good and bad money. Less widely known, however, is that, in the absence of a legal tender law, but with fixed transactions costs associated with paying a premium on undervalued currency (or exacting a discount on overvalued money), bad and good money can co-exist with one playing the role of the dominant, par money [Rolnick and Weber (1986); Selgin, (1996)]. Good money is not driven out but circulates at a premium (or bad money at a discount) as shown in the historical examples provided in Rolnick and Weber. When transactions costs become large, par money dominates. These insights have valuable applications beyond currency valuation.

In corporate finance, two "currencies" exist: cash and corporate securities. Securities can be either overvalued (bad money) or undervalued (good money) in the presence of investor irrationality. When this occurs there are two effects of interest. First, transactions occur in par money which may be either bad or good depending on whether the market is in a bubble period. Firms issue overvalued securities (bad money) creating value distortions for shareholders [Baker and Wurgler (2012)]. Issuance of overvalued mortgage-backed securities by investment banks contributed to the recent financial crisis [Baker and Wurgler (2012), Romero (2012)]. After the resulting stock market plunge, many companies announced share buyback programs using cash (good money). Transactions costs in the form of difficulty in determining the degree of over or undervaluation result in the majority of transactions moving to the par currency. Second, in normal markets, good and bad money may coexist with good money trading at a premium. For example, takeover offers are for either cash or shares. Overvalued firms use stock offers (bad money) while undervalued firm with growth options unrecognized by the market use cash (good money) and benefit from a premium in the form of a more favorable share price reaction [Savor and Lu (2008)].

This analysis provides a perspective on corporate finance placing current research in an historical and conceptual context. Doing so generates new evidence for Rolnick and Weber's and Selgin's clarifications of Gresham's law by demonstrating their application

outside the realm of currency valuation. To achieve these goals, the paper restates the traditional version of the law and examines the relevant aspects of the debate in the context of currency applications. We then turn to relevant cases in corporate finance, including the recent financial crisis.

Understanding the law

Gresham's law is one of the more venerable principles of economics and finance: Macleod (1858) coined the term referencing a letter written by Sir Thomas Gresham to Queen Elizabeth I in 1558. Historical evidence demonstrates that the principle was understood widely considerably earlier. This long lineage notwithstanding, the law and its application have engendered considerable debate among modern economists. Selgin (1996) restates Gresham's law as follows: "the proposition that, when an official fixed equivalence is imposed on two economically distinct monies (for example, silver coins of different weight), the "bad" (relatively less valuable) money will drive the "good" (relatively more valuable) one out of circulation (p638)".

According to Selgin (2003), the term Gresham's law was coined by Macleod in 1858 although an earlier Victorian economist reproduced the famous quote from Gresham's letter to Queen Elizabeth I: "good and bad coin cannot circulate together" [Burgon, (1839)]. Sir Thomas Gresham made this remark in his role as a prominent merchant and the royal representative in Antwerp shortly after Elizabeth became queen. On taking the throne, she inherited a debased currency resulting from previous monarchs' policy of reducing the amount of silver in coins.² Strict legal tender laws were in force prohibiting exchange of coins at anything other than their face values. Purchasers paid their bills in "bad" (debased) coins and sellers quoted prices in these coins, resulting in inflation. "Good" coins with higher silver content were removed from circulation and either hoarded, exported to jurisdictions not subject to the legal tender law where they could circulate at a premium, "sweated" and reminted privately by moneychangers with superior information on their value, or returned to the mint at higher values [Dutu (2004, 2005)]. In short, "bad" money drove out the "good." This ended in 1560 when the Queen "decided" the debased coins, officially devaluing them. At the same time new money was issued with higher silver content and declared legal tender.

² This historical discussion is drawn principally from Selgin (1996).

Selgin (1996) interprets this example of the operation of Gresham's law in the context of a Prisoner's Dilemma. In the absence of a legal tender law, sellers can choose whether to request payment in "good" or "bad" money and set prices accordingly. When the law makes this illegal, sellers cannot discount "bad" money due to the fear that buyers might report them to the authorities. Similarly, a seller who insisted on payment in "good" money only would risk being forced to accept "bad" at face value. The result is a "bad" money equilibrium.

Although the interpretation in terms of the Prisoner's Dilemma is a modern one, understanding of the basic principle underlying Gresham's law goes back to ancient times. Aristophanes' play, *The Frogs*, written around 400 B.C. contrasts "sterling pieces, all of pure Athenian mold" with "the worthless pinchbeck coins of yesterday, vilest die and basest metal [which] now we always use instead" [quoted in Bernholz (2011)]. Further evidence that Gresham's law operated in ancient times comes from the study of coin hoards uncovered by modern archaeologists. Dating the approximate time that the hoards were buried, researchers established that the majority of the hoards consisted of older coins of greater value [Bolin (1958) as cited in Mundell (1998)].

Removing the legal tender law

The discussion above highlights the importance of legal tender regulations to the operation of Gresham's law. In the absence of such rules (*laissez-faire* exchange) Rolnick and Weber (1986) show that the outcome depends on the cost of non-par exchange, which involves evaluating coins and maintaining current information on the rate of exchange. When exchange is costless (or nearly so), both "good" and "bad" money can circulate and prices can be posted in either. When sellers price their goods and services in terms of "good" money, they will accept "bad" money at a discount. Conversely, with pricing in "bad" money, "good" money commands a premium. In contrast, when the costs of exchange are significant, buyers and sellers minimize these costs by transacting only in par money. In this case, par money (which could be either "good" or "bad") will drive out non-par money. Selgin (1996) terms this statement, Rolnick and Weber's Law. The costs of exchange reflect societal preferences and information asymmetry on the exchange rate and as these costs increase, the amount of non-par money in circulation declines.

The conclusions of Rolnick and Weber differ from Gresham's law in two important respects. First, it is possible that two types of money can circulate together. Second, when par money drives out non-par, the par money can be either "good" or "bad" depending on which is more popular and therefore lower cost. As clarified by Selgin, Rolnick and Weber err when they claim that their analysis contradicts Gresham's law. More correctly, they extend the analysis to cases which cannot be explained by Gresham's law because no legal tender law existed.

A case highly relevant to our present day application in corporate finance occurred in the U.S. during and after the Civil War. In 1862, the U.S. government (the North) suspended payments in gold and silver and issued greenbacks, its first paper currency, to finance the war. This effectively set aside the legal tender law under which the two types of money were equivalent. At the time it was far from clear that the North would win the war and resume the issue of gold and silver coins and as a result, the greenbacks traded at a discount to specie (gold), priced as low as 40 cents on the dollar. As Rolnick and Weber state, "specie was the undervalued money and greenbacks were the overvalued money." The overvalued (bad) paper currency became the par money throughout most of the northern states largely because banknotes were already widely accepted and hence lower cost. Gold coins were hoarded or had limited circulation at a premium. The exception occurred in California where gold coins were the most popular form of payment and greenbacks only rarely circulated.³ According to Greenfield and Rockoff (1995): "...Social pressure to use gold, a major export, proved insurmountable. California had shown a preference for hard money even before the War. The [state] constitution, written in 1849, prohibited paper money. A few private banks had issued notes, defying the law, but these notes had difficulty swimming against the tide of public opinion. Greenback inflation, of course, did nothing to warm Californians toward paper money. Social preferences became private costs. Debtors who tried repaying in greenbacks found themselves denounced for "greenbacking," their names published in the newspapers."

³ Greenfield and Rockoff (1995) show that the circulation of non-par currency during the U.S. Civil War was more limited than envisaged by Rolnick and Weber. Selgin (1996) points out that this is consistent with Rolnick and Weber's Law but suggests that the costs of circulation for non-par money was more substantial than they believed.

The case demonstrates the working of Rolnick and Weber's extension of Gresham's law. In the East, the dominance of greenbacks (bad money) as par money accompanied by the highly restricted circulation of gold coins, approximated the situation predicted by Gresham's law. In California, "social pressure" to pay in gold (good money) supported its role as par money and suppressed the circulation of greenbacks.

Two currencies in corporate financing

In corporate finance, two "currencies" exist: cash and equity.⁴ Equity can be either overvalued (bad money) or undervalued (good money) in the presence of investor irrationality. One form of irrationality is investor tastes, which can explain share mispricing in the presence of limits to arbitrage [Baker (2009)]. In this vein, Greenwood and Hanson (2009) explain over – and undervaluation in terms of factor mispricing which "may fluctuate due to time-varying investor enthusiasm for different themes such as 'internet' or 'small stocks.'" They identify the characteristics of firms (share price, distress status, industry, size, profitability and payout policy) and link them to net equity issuance (new shares minus repurchases). Characteristics of net issuers predict future returns – positive net issuance is associated with negative future abnormal returns while net repurchasers enjoy positive abnormal returns in future.

Enthusiasm can occur either at the industry or firm level. In the case of an industry bubble, share issues are used to finance takeovers in industries whose characteristics generate investor enthusiasm. Managers of overvalued acquirers seek to purchase hard assets with shares and when they succeed, wealth transfers from target to acquirer's shareholders [Schleifer and Vishny (2003)].

In the parlance of Rolnick and Weber's extension of Gresham's law, shares become the par money for takeovers in these industries and, since shares are overvalued in a bubble, the par currency is bad money in this case. As in the case of gold versus greenbacks discussed earlier, social pressure to "follow the herd" and invest in popular stocks works to create demand for par money shares. In their paper modeling herd behavior by investors, Scharstein and Stein [(1990), page 465] give the

example of investor thinking leading up to the crash of October 1987: "The consensus among professional money managers was that price levels were too high – the market was, in their opinion, more likely to go down rather than up. However, few money managers were eager to sell their equity holdings. If the market did continue to go up, they were afraid of being perceived as lone fools for missing out on the ride. On the other hand, in the more likely event of a market decline, there would be comfort in numbers – how bad could they look if everybody else had suffered the same fate?"

The greater the investor enthusiasm and as a result, the bigger the bubble, the greater the percentage of transactions financed by stock. When investor enthusiasm for an industry wanes and the bubble bursts, net stock issuance becomes negative with share buybacks predominant. The number of takeovers declines and any that are made are likely to be financed with cash.

Savor and Lu [(2009), Figure 1] document "the equity-financed merger wave occurring in the second half of the 1990s." They track U.S. mergers from 1978 through 2003 and show that the number of merger bids increased dramatically above historical levels in 1994 and remained elevated through 2000. In these years, roughly corresponding to the Internet bubble, the majority of bids were financed with stock, in contrast to roughly half in the non-bubble years, prior to 1990 and after 2001.

Investor enthusiasm for a "new paradigm" creates a form of social pressure to conform. During the Internet bubble, those reluctant to invest in untried companies were scorned as "failing to understand the new paradigm," not unlike the disdain directed at those accused of "greenbacking" in California in the 1860s. As a substitute for investor enthusiasm, high transactions costs in the form of uncertainty about the degree of overvaluation provide an alternative explanation for the preponderance of overvalued shares as the par currency for takeovers during a bubble. As explained above and illustrated with the example of uncertainty over which side would win the U.S. Civil War, such high costs restrict the use of the non-par currency, cash in this case.

In the absence of a bubble, this effect can also occur at the firm level with some firms in an industry being overvalued and others undervalued. In this case, investor enthusiasm and uncertainty about the degree of overvaluation (transactions costs) are

4 The analysis here focuses on equity securities. The next section considers debt.

more moderate and as a result both types of takeover financing are observed. As observed by Greenwood and Hanson (2009) and discussed earlier, overvalued firms issue shares to make an acquisition. Undervalued firms possessing growth options unobserved by investors make cash acquisitions. Such firms benefit from more favorable stock price reaction to the takeover announcement as the use of cash is seen as a signal that the acquirer's management believes its shares are undervalued.

Two currencies in financial intermediation

The discussion to this point has focused on the role of corporations as issuers of overvalued equity, but the same principles apply to financial intermediaries issuing overvalued debt.⁵ During the credit bubble prior to 2008, commercial and investment banks capitalized on investor enthusiasm for overpriced debt. While the best known example of that period was securitized subprime mortgages, there was also a large market providing financing for private equity deals directly related to our discussion above on corporate takeovers. As with the use of overpriced securities in corporate acquisitions, investor enthusiasm for debt of seemingly low risk kept the market going. This was coupled with difficulty in determining how long the bubble would last. Charles Prince, then CEO of Citigroup, was referring to the market for private equity financing in his well-known quote as is clear when the context is provided [Nakamoto and Wighton (2007)]: "Chuck Prince on Monday dismissed fears that the music was about to stop for the cheap credit-fuelled buy-out boom, saying Citigroup was "still dancing." The Citigroup chief executive told the Financial Times that the party would end at some point but there was so much liquidity it would not be disrupted by the turmoil in the U.S. subprime mortgage market.

He denied that Citigroup, one of the biggest providers of finance to private equity deals, was pulling back. "When the music stops, in terms of liquidity, things will be complicated. But as long as the music is playing, you've got to get up and dance. We're still dancing."

When banks like Citigroup provided debt financing for private equity deals, they catered to investor enthusiasm and evidence suggests that the financing was overpriced. Bank-affiliated deals

in which the private equity fund was an arm of the bank benefited from more favorable financing terms than did deals of similar ex-ante risk sponsored by outside private equity funds. Further, when the deals sponsored by banks occurred at credit market peaks, the ex-post risk measured by subsequent debt downgrades was higher [Fang et al. (2012)].

Conclusions

The realm of corporate takeovers and private equity deals demonstrates the widespread application of Rolnick and Weber's (1986) extension of Gresham's law. Two currencies, corporate securities (bad money) and cash (good money) circulate together with the former playing the dominant role of par money in times when investors exhibit irrational enthusiasm. Heightened social pressure in the form of herding combined with greater uncertainty about the degree and duration of the overvaluation of securities jointly play the role of transactions costs, creating a preference for payment in the par money and most deals are financed with equity or debt securities rather than cash. As examples, during the Internet bubble period of the late 1990s, stock deals predominated while in the credit bubble of 2007, overvalued bank loans were the most common form of financing. Normal markets, not characterized by irrational enthusiasm, display the use of both corporate securities and cash in funding takeovers with cash deals (good money), enjoying a premium in the form of more favorable stock market reaction.

The analysis provides useful insights for both monetary economists and researchers in corporate finance. For the former, it brings a fresh currency to the interpretation and extension of Gresham's law relating the classic debate to contemporary events. For the latter, the lesson is that principles of monetary economics can enhance understanding of corporate financing choices in both crisis and non-crisis times.

⁵ The discussion here draws on Baker and Wurgler (2012).

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