PRIVATE MONEY, SETTLEMENT, AND DISCOUNT: A COMMENT

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Abstract

Temzelides and Williamson present a model of private currency issuance to study the effect of clearing arrangements on the prices at which private currencies trade, on the volume of exchange, and on welfare. Their findings hinge on three factors: the location of the issuers relative to the area in which their currencies circulate, whether there is an arrangement for clearing nonlocally issued currencies, and whether agents are fully informed about the quality of the currencies. This paper finds that the Temzelides-Williamson model provides valuable insights about historical experiences with private paper monies, but it raises more questions than it answers regarding electronic currencies. The model can, however, serve as a useful point of departure for further research.

Ted Temzelides and Stephen Williamson have produced an intriguing paper on private money systems that is motivated both by historical experience and by the recent resurgence of private issuance. Evidence from the United States and elsewhere indicates that in the past clearing arrangements promoted the circulation of privately issued notes and eliminated discounting in regions served by the arrangements. Where clearing arrangements were absent, notes traded at par only in areas near their place of issuance. Eventually, most private currencies ceased circulating, largely because of regulatory prohibitions.[1] Those regulations are no longer in place, and thanks to recent advances in electronic technology, private currencies are now rapidly being introduced.

To study private money systems, the authors work with a two-sector, random-matching model with spatial separation that possesses equilibria in which privately issued currencies circulate. In the banking sector, any agent can issue indivisible units of currency that can be carried into the search sector and exchanged there for goods. While in the search sector, each agent will want to consume goods some fraction of the time. Agents can produce goods that others wish to consume, and they engage in production when matched with an agent who wants to consume their good. The matching process can bring together agents from any locations, and the probabilities of various matches are exogenous. Trade involves exchanges of goods for privately issued currency because there are no other means of payment (e.g., no government-issued fiat currency) in the economy. Goods can also be produced in the banking sector, but there they can only be invested to back currencies.

Using this model, the authors study the effect of clearing arrangements on the prices at which private currencies trade, on the volume of exchange, and on welfare. Three distinctions

[1] Traveler's cheques are a notable exception.

are critical to the analysis: location, clearing, and information. The location distinction arises because the privately issued currencies are distinguishable by their place of origin relative to the locations of the agents. From an agent's perspective, a currency can be classified as locally or nonlocally issued. For the purposes of the analysis, location can also be interpreted broadly, as a proxy for knowledge about the issuer or for low redemption costs.

Redemption costs are associated with the authors' second distinction—that between environments with and without clearing arrangements. Clearing matters because the authors assume agents can redeem a currency only at the issuer's location and cannot travel to distant issuers' locations to redeem. They also assume that if a clearing arrangement, such as a clearinghouse, exists, then agents can interact with and redeem nonlocal currencies through the clearinghouse.

The third distinction critical for the analysis is whether the environment has full or private information about the quality of private currencies. A currency's quality is tied to the return on the investments that the issuer holds as backing. The authors take the full-information environment to be one in which everyone backs their currencies to the same extent with the same assets. In the private-information environment, in contrast, agents know the quality of local currencies but not nonlocal currencies.

The authors' findings hinge on these three distinctions. When there is full information about currency quality, the authors find that clearing reduces discounts on nonlocal notes and increases the volume of notes in circulation, thus increasing welfare. With private information, however, clearing can promote the circulation of low-quality notes and can increase discounts on nonlocal notes. Thus, clearing does not necessarily increase welfare. These results seem to match the historical episodes well in that they predict fairly well the differences in observed

outcomes with and without clearing mechanisms.

If the authors' only aim was to explain the historical episodes, then they could simply be congratulated because their model can be viewed as a success on that dimension. But they aim for their work to have relevance to today's experiences with private monies. Since the private monies now proliferating are primarily electronic in form, it is necessary to consider what role the distinctions critical to their results play in the outcomes observed with electronic monies. The remainder of this commentary briefly describes the private electronic monies issued in recent years and assesses whether the results of the Temzelides-Williamson model are applicable to these new monies.

Private Monies Today

Each of the private electronic monies introduced in recent years falls into one of four categories: electronic tokens, barter-exchange currencies, digital cash, and stored value.[2] Some of these monies have been introduced more successfully than others.

Electronic tokens, also known as reward or loyalty currencies, are perhaps the most rapidly growing of today's private currencies. They are issued to merchants, who in turn distribute them to customers as rewards for specified actions, such as a purchase or the completion of an online survey. Frequent-flyer miles, S&H Greenpoints (the electronic version of the paper S&H Green Stamps—the first reward currency, introduced in 1896), beenz, ClickMiles, cyberdollars, and a host of other currencies fall into this category. Some of these currencies are transferable.

Barter-exchange currencies are a second type of privately issued currency. These

[2] The summary that follows may not be all-inclusive.

currencies are just trade credits that allow barter systems to overcome the double-coincidence-of-wants problem. They exist today in paper and electronic form and are becoming increasingly common. The Ithaca Hours, introduced in 1991 for use by the barter group in Ithaca, New York, was the first such currency in paper form. The Universal Currency of the International Reciprocal Trade Association (the trade association of barter organizations) is an example of an electronic barter-exchange currency that is facilitating bartering via the Internet.

A few years ago, attempts were made to introduce digital cash—digital alternatives to paper notes and metallic coins for use on the Internet. Digital-cash products typically required consumers and merchants to load and use issuer-supplied software that could convert monetary value in bank accounts into digital cash, and vice versa, and transfer that value electronically across participants' accounts. Attempts to introduce digital cash failed because of the high cost to potential users and the low benefit due to low merchant participation.

Also during the past few years, there have been attempts in the United States and elsewhere to introduce stored value.[3] Stored value is monetary value carried on a plastic card with a magnetic stripe or microchip. Value can be read to or from the card and can be issued for limited or general use. Limited-use cards include the copy cards, phone cards, and transit cards commonly used today. General-use cards allow holders to use stored value for purchases anywhere the cards are accepted. MasterCard and Visa both have initiatives to introduce general-use stored value and have had several unsuccessful trial introductions in the United States. In Europe, however, stored-value cards are already used extensively. The difference between the United States and Europe is partly due to government initiatives to encourage acceptance in Europe, and partly due to the lower telecommunications costs and government-

[3] Schreft (1997) discusses stored value and its implications in greater detail.

mandated consumer protections that make credit cards a more desirable means of payment in the United States.

Reality Meets the Temzelides-Williamson Model

Of the private monies introduced in the past few years, digital cash and general-use stored value are probably the ones closest to the monies in the Temzelides-Williamson model. Evaluating the model's relevance to today's electronic money thus requires considering the implications for electronic money of the location, clearing, and information distinctions on which the model's results hinge.

Location. To consider the role of location, one must determine what it means for an electronic money to be local. From one perspective, physical distance is meaningless for electronic monies because the technology for producing, accepting, and redeeming the monies involves a marginal cost of approximately zero. This makes all issuers local for practical purposes and all monies likely to be available and acceptable everywhere without discounting, other things equal. The local-nonlocal distinction is thus immaterial for electronic monies, at least from this perspective.

On closer inspection, however, an alternative interpretation becomes apparent. Perhaps only agents with the equipment and software necessary to communicate with each other can accept and redeem electronic money at very low cost. Without such technology, acceptance and redemption are impossible. Under this interpretation, local circulation refers to circulation within an issuer's network, while nonlocal circulation refers to circulation within the networks of some other issuers. This type of nonlocal circulation of private electronic monies would require

technological standardization like that which allows email to be read across computer systems. An electronic clearinghouse is one way of achieving such standardization since each network could simply invest in the single technology for communicating with the clearinghouse.

This alternative interpretation is consistent with observations about actual electronic monies. With electronic tokens and barter-exchange currencies, the cost of joining networks is low. Often, an agent need only open an account online to join. At most, merchants might have to load some software. Consequently, these electronic money networks are growing rapidly, and the rapid growth itself is increasing the benefits of membership because of the positive network externality. The introductions of various electronic tokens and barter-exchange currencies have been relatively successful as a result.

The situation has been different with digital cash and general-use stored value. Merchants and often customers must have the appropriate software and hardware to exchange these electronic monies. The high cost of holding, accepting, and redeeming these currencies has hindered network growth and kept issuers from achieving the level of participation needed for a successful product launch.

This alternative interpretation has implications for the applicability of the Temzelides-Williamson paper to electronic money. The paper assumes that all matches occur randomly, with the odds of a meeting between any two agents determined exogenously. The alternative interpretation, however, seems to require endogenous network formation. This suggests that an intentional-matching model—one in which agents choose the set of agents with which they can trade—would be more consistent with the network formation critical for electronic money. Within the network, matches might be modeled as intentional on the part of consumers but random from the perspective of merchants. The pioneering work of Corbae, Temzelides, and

Wright (2000) with intentional-matching models has already shown that such models can yield different results than random-matching models.

Clearing. In practice, digital cash and general-use stored value have been redeemable for government-issued fiat currency or bank deposits denominated in the fiat currency. These electronic monies are thus more like deposits than currency and require clearing, typically through the banking system. In the model, however, redemption and clearing occur in terms of goods for the simple reason that the model abstracts from government-issued fiat currency. Previous research suggests that adding government-issued fiat currency to make the model more realistic could change the results. Consequently, while the model's predictions match the historical evidence well, they do not match today's experience with electronic monies.

Full versus Private Information. In the United States today there are no regulations requiring issuers to back their electronic monies. As of yet, there is no evidence a private-information problem with digital cash or general-use stored value because their usage has been minimal. There is, however, evidence of a private-information problem associated with phone cards, which are a type of limited-use stored value. One study of the phone cards of 70 issuers found that 53% of the cards were worthless (Mitchell 1996). The primary reason was that issuers had never paid the phone-service providers for the service sold to customers, so the service providers deactivated the cards. This is a clear example of fraudulent issuance on a large scale, and it suggests that the private-information case probably is the more relevant one.

In conclusion, the Temzelides-Williamson model provides valuable insights about historical experiences with private paper monies, but it raises more questions than it answers regarding electronic monies. The model can, however, serve as a useful point of departure for

further research. A welcome addition to the literature on electronic money would be a version of the model with private information, intentional matching, and promised redemption in a government-issued fiat currency that circulates along with the private monies.

References

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