The Optimal Design of Payment Systems

Vision Statement

The Optimal Design of Payment Systems group, which is supported by CFSP, seeks to examine possible payment and transfer technologies that could be used in developing countries where banking and transportation infrastructure is limited. These technologies could also be used to overcome physical separations in time and space that can make trade and economic development difficult. A primary workshop focus is on how low-cost electronic transfer and record keeping can allow poor households to gain entry to the larger payments and financial systems. The workshop also goes beyond this first level of analysis to explore the implications of multiple private means of payment, the coexistence of private and public means of payment, the overall optimal design of payments systems, and the regulation of financial systems. Given that regulatory regimes have been weak historically in developing countries, there are natural concerns about the stability and reliability of payment systems that need to be addressed.

The overall goal of the workshop on the Optimal Design of Payments is to encourage payments systems that greatly expand access to the financial system for poor people; to make sure these systems are secure and robust; to offer recommendations for a potentially improved, efficient overall design of payments systems; and to integrate that design with optimal monetary policy and ideal regulation of financial systems.

We start from the perspective that because of differences in comparative advantage, households are better off when they can trade goods than when they are self-sufficient. Relatedly, households with different occupations, or living in different parts of a country, face different time profiles of receipts and expenditures. Thus, they can benefit from inter-temporal trade, e.g., borrowing and lending, and suffer if the financial instruments to do so are limited. Given the presence of idiosyncratic and regional shocks, households can also benefit from insurance. Even simple one-way transfers, such as remittances among family members from urban to rural areas, can be enormously beneficial.

However, when agents want to trade, earn credits, pay premia, or transfer value, they generally face problems that make trade and transfers difficult. In many countries, payment and record keeping systems are quite limited, and these limitations are more likely to happen when markets are thin and underdeveloped, when agents face great physical separation from one another, and when there are sharp periodic or seasonal movements in income and/or large shocks. All of these are characteristics of less developed countries.

There are many ways in which the problems related to trade and transfers can be overcome. The most prevalent is the use of a governmentally provided medium of exchange. Throughout most of history, this has been in the form of commodity money, gold or silver coins, or claims to such. More recently, this has been in the form of fiat money, though the ability to transfer value, and
the willingness of households to do so, depends on maintaining a relatively low and predictable rate of inflation. The track record on that in developing countries is not good.

However, there is no reason why the medium of exchange has to be governmentally provided. Privately provided media of exchange could do so. Notes and deposits of private banking organizations have been used as means of payment for several centuries. Further, there is no reason why media of exchange have to have a physical representation. All that is required is recordkeeping technology that allows for reliable tracking of the transfer of wealth from the buyer to the seller. Reserve balances at central banks and credit card networks are examples of these types of electronic transfers.

Note, however, that bank notes and credit card networks go beyond simple value transfer. A bank typically lends out deposits with only fractional reserves and so it does not have inventory to honor all claims instantaneously. Credit card users owe actual payment only periodically, at the end of a billing cycle. To be reliable, then, households and those running businesses have to have confidence that the buyer actually has, or will have, the wealth to transfer. This is a particular concern in developing countries. There are many ways that verifying the wealth of buyers has been done in the past. Required bank reserves are one example. Certified checks and bankers’ acceptances are two other historical examples. Still another example is the hold that banks put on checks before they become “good funds.” To obviate the problem, one can move toward debit cards and real time gross settlement clearing systems. Although electronic transfers would seem to make this possible, in practice, instantaneous clearing is difficult to achieve, especially when cash or verified securities are on the other end of a transaction.

In fact, it may not be optimal for “final settlement” to take place at the same time that a good is transferred from the seller to the buyer or, likewise, when a security is transferred from the buyer to the seller. Net clearing systems allow participating parties to be out of balance for periods of time. However periodic, net clearing does generally require some type of collateral and overdraft provisions to help provide confidence that the payment will ultimately be made. Related, agents providing electronic means of payment, e-money, typically need either to rebalance inventory of currency or e-money or to otherwise get credit from a local distributor. More generally, trade can also take place through private equity or credit arrangements, not only in the short but also longer term. Again, this requires that contracts and promises to pay be enforceable, which in turn requires safe, stable and reliable legal structures to be in place. Indeed, at a larger, country scale, the Central Bank or government can underwrite promises implicitly, as with lender of last resort facilities or, explicitly, as with deposit insurance. When in place, these mechanisms should be viewed as part of actual payment systems.

The Optimal Design of Payment Systems group proposes to pursue these topics from several standpoints:

- What possible payments technologies could be used in less developed countries? Cell phone payments systems are one possibility, and M-PESA in Kenya is one example of this. We intend to look at what technologies have been used historically when some developed nations were at lesser stages of development. This will be useful in providing insights to problems and remedies and possible alternative methods.
• Can multiple, competing means of private payment be sustained as an equilibrium? Related to this, we intend to examine the whole issue of multiple monies and optimal currency areas.

• How might the possibility of electronic trade open up possibilities of expanding the types of financial instruments available in an economy? Can building on the platform of payments ease access to credit, insurance and other financial services?

• How can payment system systems be modeled and economic environments be delineated so that final settlement ideally takes place later than the transfer of goods from seller to buyer or the transfer of value from buyer to seller? Most of the literature on media of exchange assumes real time gross settlement. However, in some environments, there can be efficiency gains from net settlement systems that utilize either periodic net settlement or some type of private credit or equity arrangement. It would also be useful to have a better understanding of such systems that worked in the past or are working today. For example, we will look at how clearinghouses worked in the U.S. in the past and also how they are working in OECD countries today. The workshop will examine the extent to which net settlement systems and private credit systems might have advantages and how they could be adapted for less developed countries.

• What are the monetary policy implications of private means of payment systems? The workshop will review models of private means of payment that have multiple equilibria, one of which is a “bad” equilibrium in which the media of exchange is not valued or in which there is a “run” on the issuer. The goal is to examine whether some type of reserve requirement, lender of last resort facility or “deposit insurance” could be welfare-improving by eliminating the bad equilibrium without creating moral hazard problems. We will review and contribute to the literature on “narrow banks,” separating payments from intermediation. We will review models of optimal monetary policy in economies that also have credit and private means of payment. If electronic payments do not drive out fiat money, then we are faced with a set of questions: When should monetary authority provide more outside liquidity to the system, if at all? How does the optimal monetary policy change as electronic transfers spread throughout various aspects of the payments system?

Making progress on answering these important payment systems questions is the primary focus of the Optimal Design of Payments workshop. We encourage those interested in tracking our progress to visit the Consortium on Financial Systems and Poverty website at www.cfsp.org.