

Introduction to the symposium

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This symposium grew out of a conference on “Payment Systems in a Changing Financial Environment” held at the Federal Reserve Bank of New York in October 2009. The conference brought together academics and central bankers to discuss issues related to the design of payment and settlement systems as well as challenges raised by recent innovations in financial markets. Each of the five articles in the symposium presents a theoretical study of one such issue currently facing policy makers. Our hope is that presenting these articles together will both illustrate the broad scope of current research on payments systems and encourage further work on these topics and related issues in the economics of payments.

The first paper, “Pricing of Payment Cards, Competition, and Efficiency” by Bolt and Schmiedel, focuses on retail payments networks. The authors study the effects of competition between different payment cards, partly motivated by the perceived risk that the Single Euro Payments Area (SEPA) initiative may decrease competition by driving out existing national payment-card schemes. They construct a model in which consumers and heterogeneous, profit-maximizing merchants decide whether to transact using cash or using a fee-based card network. They first study an economy with a monopoly payment card scheme. Not surprisingly, the monopoly card provider sets fees higher than the socially efficient level, which results in an inefficiently low level of card usage. The paper then studies two different types of card competition: one where markets are segmented (debit vs. credit) and another where they are integrated (debit vs. debit). They find that while market segmentation again leads to user fees

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that are higher than the socially-efficient level, it may nevertheless be optimal because it allows for a more efficient mix of payments activity. Their analysis illustrates how a tradeoff may arise between the benefits of competition and those from having access to a wide variety of payment services, and they conclude there may be a role for “thoughtful regulatory initiatives” to ease this tradeoff.

The remaining four papers address issues related to wholesale payment and settlement systems, which are often, but not always, operated by a central bank. “Central Bank Haircut Policy” by Chapman, Chiu, and Molico studies how a central bank should provide liquidity to its wholesale payments system. In particular, the authors focus on how the central bank’s policy for setting the “haircut” (that is, the difference between the value of the collateral and the amount of the loan) should differ from that in private-sector transactions. Private parties generally choose the haircut in a collateralized loan based solely on how much the value of the collateral may change over the life of the loan, aiming to limiting the lender’s potential losses in the event of default. A central bank would also like to limit its potential losses, but, in addition, wants to encourage the efficient functioning of the payments system. The authors construct a model that illustrates how the central bank’s haircut policy influences the actions of market participants and highlights a tradeoff that arises. Agents in the model allocate their portfolio between cash, which can be used for payments, and a risky, illiquid asset that cannot. Agents whose payment needs end up exceeding their cash holdings can borrow from the central bank’s intraday facility by posting the risky asset as collateral. A lower haircut helps promote efficiency in this setting by relaxing agents’ liquidity constraints. However, such a policy also makes holding the risky asset more attractive and thus changes agents’ equilibrium portfolio choices. It also increases the central bank’s exposure to losses, which can lead to higher inflation and further distort portfolio choices. The authors show how the optimal haircut policy balances these competing concerns and discuss how the features of this policy depend on the central bank’s ability to direct lending to those agents with true liquidity needs.

The next paper, “Liquidity-Saving Mechanisms in Collateral-Based RTGS Payment Systems” by Jurgilas and Martin, takes the central bank’s policy for providing liquidity as given and examines another possible way to improve the efficiency payments. In a payment system based on real-time gross settlement (RTGS), participants may have an incentive to delay sending payments in the hope of that they will first receive some payments and thus avoid having to draw down their account balance. When all participants choose to delay, however, the strategy is self-defeating as no one receives any incoming payments. The paper examines the impact of introducing a liquidity-saving mechanism (LSM), which nets offsetting payment requests and thus allows some payments to be made without requiring participants to use funds from their accounts. The introduction of an LSM changes the incentives of participants in non-trivial ways. Previous work has shown that such a mechanism can actually reduce welfare when participants who overdraw their account are charged a fee, as was the case for Fedwire (operated by the Federal Reserve) prior to 2011. This paper considers an environment in which participants can freely borrow against collateral that they pledge to the payment system at the beginning of the session, as is the case for TARGET 2 (operated by the European Central Bank) and CHAPS (by the Bank of England). In contrast to the earlier work, the authors show that introducing an LSM always

implements the efficient allocation in this environment. A key difference lies in the timing of choices: in a fee-based system, a participant's liquidity costs are determined by her decision of whether to send or delay payments, while in a collateral-based system this cost is determined at the beginning of the session and is effectively sunk when timing decisions are made. In this latter setting, the presence of an LSM never discourages a participant from sending a payment early in the session. This analysis suggests that LSMs may be an effective way to promote efficient outcomes in large-value payment systems.

"Interlinkages between Payment and Securities Settlement Systems" by Mills and Husain studies the relationship between the systems for wholesale payments and securities settlement. In particular, the authors aim to understand how a disruption in one of these systems might affect the functioning of the other. They construct a model in which participants act to minimize the total cost of making their funds and securities transfers. The funds transfer system is operated by the central bank and the system for transferring securities may be operated by either the central bank or a separate entity. The two systems are directly linked in the sense that the money required to settle a securities transaction is sent via the funds transfer system, but they may also be indirectly linked through the behavior of participants. The authors consider three possible arrangements: (i) the funds and securities systems are both operated by the central bank and participants use the same account for both types of transfers, (ii) the securities system is operated by a separate entity and participants have separate accounts, but a securities transfer automatically generates a corresponding funds transfer in real time, and (iii) the systems are operated separately and the securities system nets the corresponding payments (much like a liquidity-saving mechanism) so that only the residual amounts are sent over the funds transfer system. In principle, these three arrangements represent varying degrees of integration between the two systems. The authors show, however, that the equilibrium behavior of participants is the same under all three arrangements. In particular, participants choose the same timing strategy for sending payments and securities in each case and a disruption in one system is thus transmitted to the other system in the same way. The authors conclude that the design of the systems themselves is more important than the way in which the two systems are linked.

The final paper, "Private Payment Systems, Collateral, and Interest Rates" by Kahn, studies the impact of private arrangements that compete with the central bank's payment system. Central banks typically implement monetary policy by changing the quantity of reserves supplied to banking system and/or changing the interest rates at which banks can borrow and deposit these reserves. Banks hold these reserves, in part, to make payments over the central bank's payment system. Private arrangements for making large-value, wholesale payments have become increasingly common in recent decades, raising the question of whether these systems may undermine a central bank's ability to conduct monetary policy. The author constructs a baseline model in which all payments for transactions are made using a public payments system operated by the central bank. By setting the collateral requirements and interest rate spreads associated with this system, the central bank can influence the portfolio choices and trading activities of participants, thus affecting the level of real economic activity. The author then introduces a competing private system through which agents can make payments. This

system has a fixed collateral requirement that can be thought of as being determined by competitive conditions. The central bank is still able to determine the general price level in this setting, but its ability to affect real economic activity is now limited. In the simplest version of the model, the existence of a private system places an upper bound on the central bank's ability to tighten policy; beyond this point, agents simply move their activity to the private system. More generally, the author emphasizes that the central bank must take into account the fact that its actions will change the way in which agents divide their activity between public and private payments systems.

We are grateful to the authors of these five articles as well as to the conference discussants, participants, and the many referees who helped make this symposium possible. We hope these papers will help inform current policy debates as well as promote additional research on the many interesting and challenging issues in the economics of payments.