

# Chicago Fed Letter

## The growth of person-to-person electronic payments

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Credit cards, debit cards, and ACH have increased the share of electronic payments both at point-of-sale locations and for bill payments. Although the adoption of electronic payments in the consumer-to-consumer payments setting has lagged behind these other areas, online person-to-person payment systems have recently been reporting strong growth. This article analyzes the growth of online P2P payments, the problems and opportunities faced by payment providers, and the future of electronic C2C payments.

**Recent** payment innovations at the point of sale and for bill payments are showing significant increases in consumer adoption. The National Automated Clearing House Association (NACHA) reports that the use of automated clearing house (ACH) services for direct payments increased by almost 20% in 2001.

Meanwhile, a recent Federal Reserve study found that use of electronic payments, such as debit cards and credit cards, is growing significantly.<sup>1</sup> Yet, many electronic payment innovations have failed to gain adoption for consumer-to-consumer (C2C) payments. In addition, according to a recent Federal Reserve study, C2C check payments account for

11% of overall check volume and 22% of consumer check volume.<sup>2</sup> Cash transactions remain one of the most frequently used form of payment, and money transfer systems continue to grow. Tower Group estimates that nearly 33 billion C2C payments occurred in the U.S. during 2000, the vast majority of which were paper-based payments.<sup>3</sup> The recent emergence of what is commonly referred to as online person-to-person (P2P) payments represents a potential vehicle through

which paper-based C2C payments can be reduced. This article reviews the emergence of online P2P payments, their structure, business models, and factors contributing to their success.

Here, I use “C2C transactions” to refer to all payments that occur between two consumers. I use “online P2P transactions” to describe transactions involving the use of e-mail to make payments over the Internet. As figure 1 illustrates, many online P2P transactions are actually consumer-to-business payments.

### Online P2P payments

The majority of online P2P payments occur through the following process. The sender of the funds must either sign up for the online P2P payment service or carry an existing account. Depending upon the P2P service, the funds may be withdrawn from a credit card, bank account, and/or previous balance. The funds are then transferred to the receiver’s account, and an e-mail is sent to the receiver. The receiver of the funds must sign up for the service or have an existing account. The P2P service disburses the funds out of the receiver’s account through a variety of avenues—including an ACH payment, a check payment, an ATM withdrawal or debit

1. Online P2P payment volumes, 2001

	Celent	Tower	PayPal
	(- - - - - percent - - - - -)		
Online auctions	55.0	95.0	66.9
Small business	15.0		21.0
Consumer-to-consumer	15.0	5.0	7.6
International	5.0		4.5
Other (e.g., gambling)	10.0		

SOURCES: Bezard (2001), Robertson (2001), PayPal 2001 10-k Prospectus, and author’s analysis.

card purchase, or a credit to a credit card account—or retains the funds.<sup>4</sup>

Most services charge the receiver a variable fee depending on various factors, including how the payment was funded and credit history. The receiver might also pay a fee to receive a check.

Given the volume of money transfers and increased cross-border transactions via the Internet, many systems have begun to provide international payments, using credit card networks, checks, and local payment clearing houses.

### ***Differentiating among services***

The primary differences among P2P services lie in their target markets, fees, and ownership structures (see figure 2). Most services charge the entity receiving the funds. However, one provider charges the sender, while another allows the sender and receiver to negotiate fees.

Most providers actively target the online auction market. Still, others pointedly state they intend to focus on small businesses and money transfers. These differences may prove critical as providers develop their pricing schemes and additional services.

Finally, the ownership structures of these services vary considerably. While most are non-bank payment providers or e-commerce companies, some are banks.

### ***Current usage***

Much of the media attention directed at online P2P payment networks arises from the networks' association with the growth of online auctions. Thus far, the vast majority of online P2P transactions have taken place through online auctions (see figure 1). The use of checks to complete transactions at eBay decreased from about 80% in late 1999 to 50% at the end of 2001, though the aggregate number of checks written has increased from 51.8 million in 1999 to 105.7 million in 2001.<sup>5</sup> Tower Group estimates nearly 100 million online P2P transactions in the U.S. in 2001, growing to four billion in 2005.<sup>6</sup>

### **Online P2P payments versus e-money**

Why have online P2P payments succeeded, while e-cash and stored value initiatives have not? The following are

two plausible reasons: 1) P2P payments were developed to meet a clear demand from both consumers and merchants; and 2) P2P providers leveraged past payment innovations and existing networks rather than building entirely new ones.

Consumers and merchants needed a quick, secure means of delivering payments at online auctions. P2P offered consumers a convenient and fast means of payment, as well as lucrative incentives.<sup>7</sup> Furthermore, online P2P payments expand the seller's ability to accept credit cards without relying on a merchant banking relationship. As such, online P2P payments simultaneously meet the demands of both consumers and merchants in the online auction environment.

Electronic money, on the other hand, was developed to reduce the costs of handling cash for merchants and banks. However, these applications failed to demonstrate a compelling reason for consumers to adopt a new means of payment. This became clear during several high-profile tests of "smart cards" in New York and at the Atlanta Olympics. As the tests progressed, very few consumers continued to use the cards after spending the promotional dollar amount. After a 15-month run in New York, pilot participants spent an average of \$1 per month per card.<sup>8</sup>

Furthermore, online P2P providers built their product on the shoulders of existing payment networks. Online P2P payments are simply traditional payments through a more convenient, online channel. The clearing and settling of funds takes place through traditional methods, while the P2P provider offers an additional layer of customer service and convenience.

Past research has found that new payment innovations can overcome network effects and the high costs of establishing a network by building off past payment infrastructure.<sup>9</sup> For example, signature-based debit cards overcame several challenges by leveraging the credit card networks. While P2P providers have made ample use of existing payment networks, stored value and e-cash applications attempted to build entirely new ones.

## **Business implications of online P2P**

### ***Fraud issues***

Fraud remains a critical issue for online P2P providers, because they assume responsibility for any chargebacks from fraudulent transactions. In mid-2000, a group of Russian hackers began laundering cash from stolen credit cards using online P2P payment systems.<sup>10</sup> Their efforts forced some P2P providers to leave the market.

Roberds (1998) has determined effective fraud rates for credit cards at 0.15%, cash at less than 0.10%, checks at 0.02%, and debit cards at 0.01%.<sup>11</sup> PayPal has reported fraud rates of around 0.66% in 2001. However, credit card fraud rates for Internet purchases are significantly higher—an estimated 2.50%.<sup>12</sup>

P2P providers use several different approaches to decrease fraud. Some banks restrict the use of the service to their customers. In addition, most providers verify customers' bank accounts by making small deposits to the customer's bank account. The customer then reports the amounts to the provider. This method uses the banks' security features and confirms the identity of users. Most providers also establish spending limits on accounts, while monitoring them for suspicious activity.

### ***Revenue generation***

Online P2P providers originally derived the majority of their revenues from float. Today, transaction fees account for the vast majority of revenue. The typical per-transaction fee is around 2% of the transaction plus \$0.30 (see figure 2). While this fee is slightly lower than those associated with credit cards and offline debit cards, it is significantly higher than fees for other forms of payment, such as PIN-based debit cards, checks, ACH, and cash. Because these fees have only recently been applied to a wide audience, it is not yet clear how users will react.

### ***Per-transaction costs***

Initially, the vast majority of online P2P payments were funded with credit cards. Recently, this number has decreased as several providers have implemented a tiered pricing structured around how the payment is funded. This issue is

## 2. Differentiating P2P payment systems

P2P system	Inter-national		Who pays fee?		Target market			Owner	Typical domestic fees <sup>b</sup>
	Yes	No	Receiver	Sender	Auction	Money transfer	Small business		
Paypal	X		X		X	X	X	Private	2.2%–2.9% + \$0.30
Billpoint	X		X		X			eBay	0.75%–2.5% + \$0.35
C2it	X		NA	NA	X	X	X	Citibank	Free
MoneyZap		X	X				X	Western Union	\$1.00
PayDirect	X		X	X	X	X		Yahoo	2.2%–2.5% + \$0.30
eMoneyMail		X	X			X		Providian	Not disclosed
CertaPay		X		X		X	X	Bank One Private	Set by individual banks

<sup>a</sup>As of Q1:2002; <sup>b</sup>as of January 22, 2002.

NOTE: NA indicates not available.

SOURCES: Company websites and author's analysis.

critical given that an account funded via ACH costs a provider \$0.03 to \$0.05. Conversely, credit card payments typically cost a provider 1.9% of the transaction plus \$0.15.<sup>13</sup> Credit cards do provide liquidity to some consumers who might not otherwise use these services; however, for other customers, online P2P providers are working to decrease the percentage of payments funded with credit cards.

### Regulatory concerns

Currently, several payment providers operate outside the jurisdiction of most banking regulators and do not consider themselves a bank or savings institution—though a few providers have applied for money transmitter licenses from several states.<sup>14</sup> However, this could change in the future.<sup>15</sup> Having to qualify as banks or money transmitters and obey the laws/regulations applicable to such businesses might increase the costs incurred by these providers. At the same time, this might also increase consumer confidence in these institutions.

### Future of P2P payments

Electronic payment providers have had little success with C2C payments. The partial success experienced by e-money initiatives is limited mainly to closed-loop environments. Similarly, only a small minority of online P2P payments can be characterized as C2C. Next, I offer three reasons why electronic payments have failed to capture the C2C market.

First, technology limitations have hampered the adoption of electronic C2C payments. While online P2P payments

make remote C2C transactions convenient, only about 50% of U.S. households have Internet access. An even smaller percentage of households access the Internet via mobile devices, making face-to-face C2C transactions—such as splitting a bill at a restaurant—very difficult and inconvenient.<sup>16</sup> While the U.S. is a leader in the adoption of computers and the Internet, it lags behind other industrialized countries in the adoption of mobile technology. Until Internet access via mobile devices becomes ubiquitous and consumers feel comfortable with the technology, it appears cash and checks will continue to dominate face-to-face transactions.

Second, most consumers find few problems with the use of cash and checks. Mantel and McHugh (2001) point out that emerging forms of payment may need to be significantly better than existing forms of payment for consumers to switch their habits. As such, electronic C2C payment instruments may need to exhibit significant value-added features and incentives above those offered by current payment instruments.

Third, providers of electronic C2C payments face a large obstacle in implementing fees for these transactions. Since many consumers do not face explicit per-check fees and there is no explicit per-transaction cost to consumers for a cash transaction, consumers are not accustomed to paying fees for C2C transactions. Consequently, electronic C2C providers will find it difficult to derive significant profits from these transactions. However, some payment

providers have successfully charged consumers for C2C transactions. Several online P2P providers currently charge for their services. Yet, most providers only charge for consumer-to-business payments, with very few charges for C2C transactions.

### International

money transfer businesses have also been successful in implementing fees for C2C transactions. However, these services add two critical value-added features. First, they vastly improve the speed at which the funds are sent. Second, recipients without bank accounts can send and retrieve funds from these services. As such, these services extend the payment system to a segment of consumers that may not be served adequately by the existing payment infrastructure.

Lastly, the financial services industry has experienced great success at indirectly implementing fees on retail payment instruments and bundling services. For example, by bundling the cost of check services into their monthly fees for accounts, some banks have indirectly passed on the cost of these services

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to consumers. In the case of ATMs, banks have successfully implemented fees for the electronic version of a previously free service (i.e., the use of bank tellers).<sup>17</sup> Furthermore, several banks are bundling electronic banking and bill payment services for one fee.

As such, banks appear to be well positioned to play an active role in this market by bundling online P2P payments with other retail services. Nonetheless, many banks that entered this field have stopped offering these services.<sup>18</sup>

## Conclusion

During the past two years, electronic C2C payments have attracted the attention of the payments and banking sectors. The seemingly unlimited potential and current growth rates invoke forecasts of exponential growth for these systems. Furthermore, electronic C2C payments present a fertile area for a movement away from paper-based payments.

However, limited ground has been gained in shifting C2C transactions to electronic form. Online P2P payments

have found initial success in the online auction environment, but only a small share of online P2P payments are actually conducted between two consumers.

In the next few decades, technology will likely develop that will make electronic C2C payments more accessible, convenient, and inexpensive. However, payment providers are likely to continue to struggle to find the right combination of fees and incentives that will drive consumer adoption and profitability.

<sup>1</sup> See Federal Reserve System (2001), "Fed announces results of study of the payments system: First authoritative study in 20 years," press release, November 14.

<sup>2</sup> Due to difficulty distinguishing between consumers and small businesses, the study was unable to classify 14.5% of the total check volume, indicating that C2C check volume might be over- or under-estimated.

<sup>3</sup> Elizabeth Robertson (2001), "Internet opportunity? The potential of the evolving person-to-person payment market," Tower Group Research, report, January.

<sup>4</sup> Kenneth Kuttner and James McAndrews (2001), "Personal on-line payments," *Economic Policy Review*, Federal Reserve Bank of New York, December, pp. 35–50.

<sup>5</sup> Steve Bills (2001), "Billpoint CEO to banks: We could use help," *American Banker*, December 14, p. 18. The total number of checks written on eBay was calculated by assuming 50% of all listings were completed as transactions. See also, Cheryl Wilson (2000), "The new colors of money for on-line transactions," *The Red Herring*, October.

<sup>6</sup> See Robertson (2001). Celent forecasts three billion email-based payments in 2001 and 37 billion in 2003. See Gwenn Bezdard (2001), "P2P goes pay anyone: An overview

of email payments," Celent Communications, research report, May 10. The methodology used for these studies is not made public; therefore, we cannot verify the accuracy of these statistics and note that they should be interpreted with caution.

<sup>7</sup> PayPal initially offered consumers \$10 for signing up and \$10 for each referral. It has scaled back these incentives, but Citibank now offers similar incentives for its c2it service.

<sup>8</sup> Leo Van Hove, (2001), "The New York smart card trial in perspective: A research note," *International Journal of Electronic Commerce*, Vol. 5, No. 2, Winter.

<sup>9</sup> See Brian Mantel and Tim McHugh (2001), "Competition and innovation in the consumer e-payments market? Considering the demand, supply, and public policy issues," Federal Reserve Bank of Chicago, Emerging Payments, occasional working paper series, No. EPS-2001-4, December.

<sup>10</sup> Deborah Bach (2001), "PayPal's IPO filing strikes many as ill-timed," *American Banker*, October 2, Vol. 167, No. 189, p. 1.

<sup>11</sup> William Roberds (1998), "The impact of fraud on new methods of retail payments," *Quarterly Review*, Federal Reserve Bank of Atlanta, First Quarter, pp. 42–52.

<sup>12</sup> Ralph Wilson (2001), "Review: PayPal," *Web Marketing Today*, No. 101, July 9.

<sup>13</sup> These costs are based on PayPal estimates.

<sup>14</sup> The FDIC recently wrote an Advisory Letter stating that consumers' funds held by PayPal in non-interest-bearing accounts were eligible for pass-through deposit insurance but declined to comment on the status of PayPal as a bank. The New York Banking Department has also ruled that PayPal is not engaging in illegal banking activities, though PayPal was encouraged to apply for a money transmitter license.

<sup>15</sup> See Kuttner and McAndrews (2001) for a discussion.

<sup>16</sup> According to www.epaynews.com, there were 19 million wireless Web users in the U.S. in 1999. According to the International Telecommunications Union, there were 110 million mobile phone subscribers in 2000.

<sup>17</sup> However, ATMs might add a level of convenience (such as not waiting in line at the teller) that is more valuable to consumers than the surcharge.

<sup>18</sup> Deborah Bach (2002), "B of A latest to drop plan for P-to-P payments," *American Banker*, March 12, p. 1.