

Trends in Consumer Payments Systems

Xavier Tamayo, Luis Jimenez and Shawn P. Flynn¹
Pitney Bowes

July 2005

The explosion of “payment media” has given consumers much more choice (e.g., credit cards, debit cards, electronic bill payments on the Internet, automatic funds transfer, etc.). What systems will dominate consumer payment systems in the future and how will mail volume be affected?

The payments systems in the U.S. and Europe have been evolving for decades. In particular, the banking and retail industries have been eager to incorporate new systems almost as quickly as they were developed and this has greatly facilitated consumer payments. This explosion of “payment media” has given customers much more choice and provided operational efficiencies to banks and retailers. Press reports and even some studies have fueled a now generally accepted belief that the Internet alone is the major cause for the recent changes in the mix of payment methods. Our approach has been to review recent developments in the payments system more comprehensively so we can use this information to assess the impact of these trends on mail volumes as part of our broad electronic substitution studies. We have, therefore, scanned and assembled the best of the recent studies we could find and analyzed their data in a variety of ways to discern objectively what is happening.

Summary Findings and Conclusions

- The absolute number of payment transactions in the U.S. grew from 38.3 billion in 1979 to 71.5 billion in 2000. However, the use of checks and cash has started to decline for a number of reasons. New payment options are easier to use, more convenient (e.g., anytime, any device, to anyone) and more cost efficient than paper checks. In addition, the share of paper-based systems (cash and checks) has declined from 90% in 1995 to 47% in 2003.
- To explore the impact of the declining share of checks on the mail we must separate the use of checks at the ‘point-of-sale’ from ‘mailed checks’. The decline in check payments is mainly expected to occur at the point-of-sale; hence, mailed checks are likely to be affected to a much lesser extent. What has replaced checks? Credit cards and debit cards. This shift has been made possible by the increasing comfort that users and consumers exhibit with new payment instruments. However, cash is clearly the dominant instrument in terms of consumer comfort and perceived speed. In addition to perceiving electronic payments to be

¹ The authors are members of the Corporate Strategy Group at Pitney Bowes. Xavier Tamayo is Manager, Strategy Projects. Luis Jimenez is Senior Vice President and Chief Strategy Officer. Shawn Flynn is Senior Mail & Messaging Analyst.

speedier than traditional payment methods, consumers have also become significantly more comfortable with their use. Lastly, consumers no longer perceive checks to be as speedy as they once did, and their comfort level with the medium has remained stagnant.

- Newer payment options are not always replacing older mechanisms one for one; multiple payment options are coexisting and some are taking market share from others. The share of electronic instruments in the total “payments pie” is increasing and will expand at the expense of the other payment mechanisms. Checks continue to play a significant role in the U.S. payment systems, particularly where electronic payments are not well suited to fully meet consumer or business needs. Finally, banks can earn billions of dollars annually from the “float” associated with check processing and penalties from bounced checks, and thus have a disincentive to migrate all customers to an electronic system.
- Why have paper-based mechanisms subsisted? Surveys suggest the following reasons: familiarity, convenience, ease of access, simplicity, hands-on control of payment, easy peer-to-peer (P2P) and small business payments, consumer control over float, robustness and flexibility. These factors give consumers a sense of control, which they are not ready to relinquish. Furthermore, in an electronic system there are many dependencies along the payment chain (e.g., computer ownership, Internet access, bank/biller relationship). Checks are almost universally accepted: all you need is the checkbook and a pen.
- Exploring the changing nature of payment systems from an international perspective is more difficult as data is not as easily accessible as in the U.S. However, countries can be categorized into two groups. In countries such as Belgium, Germany, Italy, Netherlands, Sweden and Switzerland, “credit transfer” is (or used to be until recently) the preferred instrument. In contrast, in Canada, France, U.K. and the U.S. there is a less prevalent or non-existent share of credit transfers and a more significant reliance on the check as a payment method. European consumers have, for the most part, been more accustomed to the benefits from choosing among several payment mechanisms and are thus more adept at shifting payment mechanisms quicker. Checks are an “anomaly” in several countries, like Austria, Denmark, Finland and Switzerland, where posts are required to provide retail payment counters for non-electronic consumers.
- The main driver of change will be the introduction of new payment methods by financial institutions, retailers and billers; plastic payments cards will dominate consumer payments, with cash and checks declining but not disappearing, at least over the next two decades. U.S. mail volume will not be affected by the currently perceived decline in check volumes due to direct debit, except to the extent that electronic bill payment increases much more significantly than it has in the past.

Past history should not be ignored when judging the potential pace of acceptance of new payments methods or the realization of the intended effects of new payments technologies. For example, it took a quarter of a century for debit and credit payment cards to increase from 16% to 73% of U.S. households by 2004. A major enabler of this growth was the acceptance of ATMs by consumers and the commitment from banks to compete for customers by providing them with the convenience of ATMs, despite an estimated loss of \$250 per month per machine.

But ATMs have failed to reduce the number of tellers or bank branches as originally promised. Since 1985, branches have increased by 29% and tellers by 11%.

We conclude in this study that the payments system is transitioning in an evolutionary fashion, not in a revolutionary one, and that some effects, such as check decline, are attributable primarily to causes other than the Internet. While the Internet remains a main driver in the substitution of electronic payments for consumer checks, it has not yet had a substantial effect in the reduction in checks and its longer-term effect will most likely continue to be gradual.

1. Overview

The payments systems in the U.S. and Europe have been evolving for decades. In particular, the banking and retail industries have been eager to incorporate new systems almost as quickly as they were developed and this has greatly facilitated consumer payments. As a result, electronic funds transfer methods previously in use primarily among businesses have proliferated into the consumer sector. The use of credit and debit cards at the point-of-sale (POS), electronic bill payment on the Internet, and other automated funds transfer methods have been replacing cash and checks in the U.S. In some countries in Europe consumers no longer use checks.

This explosion of “payment media” has given customers much more choice and provided operational efficiencies to banks and retailers. Press reports and even some studies have fueled a now generally accepted belief that the Internet alone is the major cause for the recent changes in the mix of payment methods. But the predictions of a “cashless” and “checkless” society have roots in the late 60s and early 70s, much farther back than the “birth” of the Internet in the early 90s. Even then, serious studies of these societal changes received less public attention than aggressive forecasts of rapidly changing habits that were reported in the press (Mateer, 1969 and Arthur D. Little, 1974).

Our approach has been to review recent developments in the payments system more comprehensively so we can use this information to assess the impact of these trends on mail volumes as part of our broad electronic substitution studies. We have, therefore, scanned and assembled the best of the recent studies we could find and analyzed their data in a variety of ways to discern objectively what is happening. Thus, we do not begin by taking for granted what seems to be two popular assumptions often repeated in the press: (1) that the Internet alone is responsible for all changes in payments, and (2) that checks are declining simply because of increased electronic bill payment.

2. Growth of Consumer Payments in the U.S.

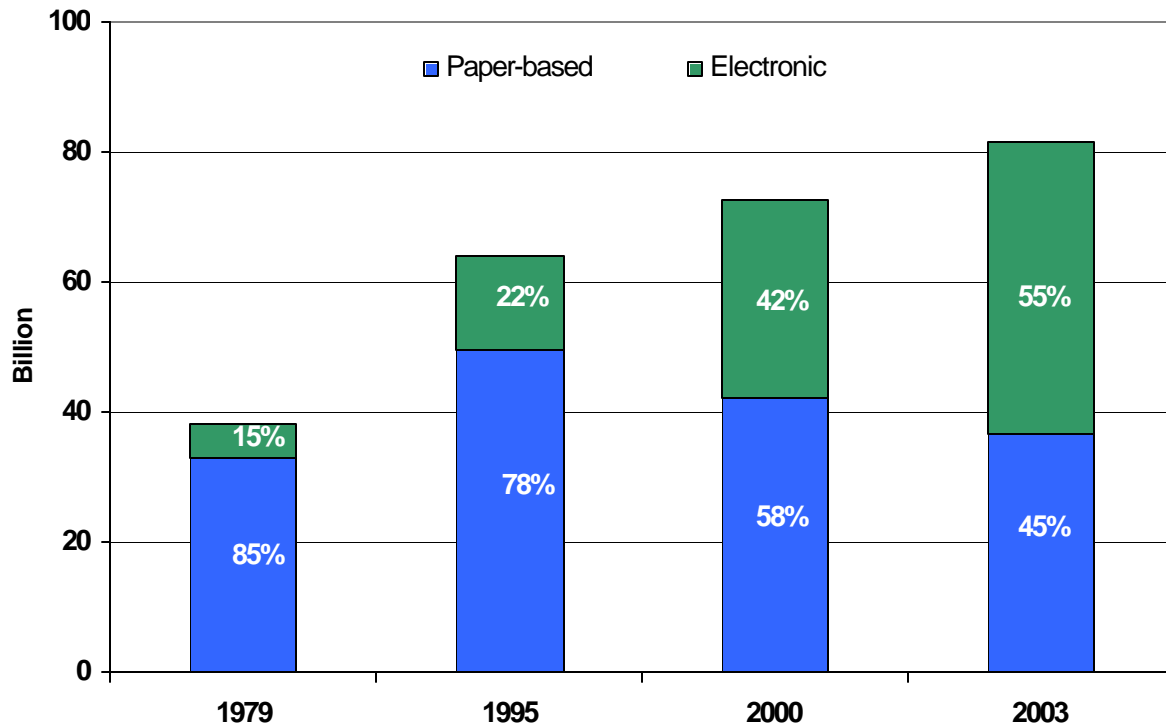
In aggregate, the absolute number of payment transactions in the U.S. has grown from 38.3 billion in 1979 to 71.5 billion in 2000 (Gerdes & Walton, August 2002); however, the shares of some of the traditional mechanisms, such as checks and cash, have started to decline due to a number of reasons. First, users have grown more comfortable with the new technologies. Second, the financial industry has strived to incorporate enough enticing features to make the new payment options more convenient for users -- anytime, any device, to anyone. Third, the financial sector has an inherent motivation to aggressively commit to and push these new mechanisms, which are by nature more efficient: handling an online payment costs 10 cents, roughly one-third that of processing a paper check (Park, May 2004).

The question of why the total number of payment transactions has grown over the last years can be answered by considering the drivers of such growth. Over the last 15 years, the number of households has increased by 24% to 107 million in 2003. What’s more, the dynamic business environment has spurred the creation of “new” services, which generate bills and/or invoices that must be paid. Take the telecommunications industry for instance: consumers and businesses

receive Internet, long distance, local and wireless services generating four or five bills for what was once covered by just one (Bruce, 2002).

3. The Decline of Cash and Checks

Figure 1. Breakout of Payment Media Type on Non-Cash Payments



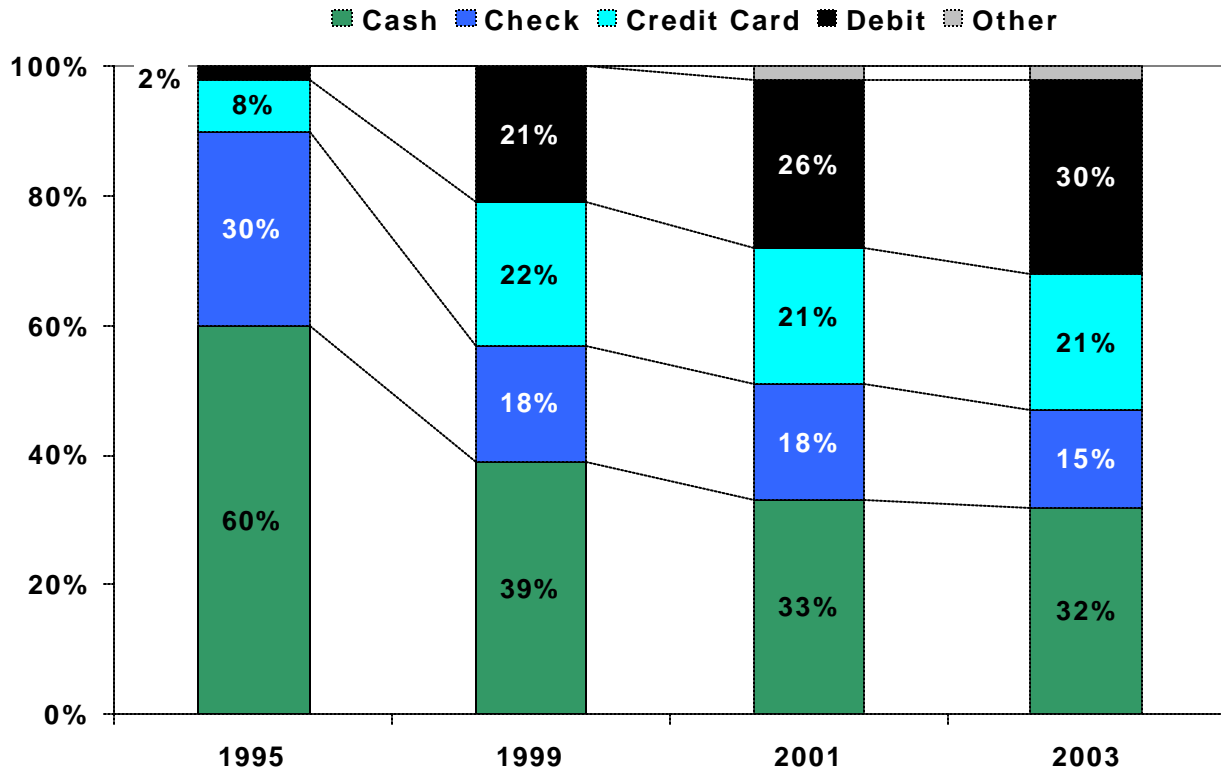
Source: Federal Reserve Board (2004)

Paper-based payment instruments include cash, consumer checks, commercial checks, official checks, traveler checks and money orders. Their historical dominance is now being challenged by electronic payment mechanisms. Figure 1 represents a historical view of the portion of checks among the total retail non-cash payments.

According to the Federal Reserve Board estimates, U.S. check transactions grew from 32.8 billion checks paid in 1979 to 49.5 billion in 1995, then declined to 36.7 billion in 2003 (Gerdes & Walton, 2002; Federal Reserve, 2004). The payment system, however, began transitioning earlier than the 1990s when corporations started to implement initiatives such as automated deposit of payroll and consumers increasingly grew accustomed to credit and debit payments. In terms of monetary value, checks paid in 1979 accounted for \$49.6 trillion versus \$39.3 trillion in 2003. Companies involved in the checking business have been required to respond to this trend, as evidenced by Deluxe Corp, the biggest check printing company, which is in the process of closing 3 of its 13 printing plants (Print Solutions Magazine, 2004). Another example is the diversification effort undertaken by AirNet Systems, which derives 70% of their revenues from flying checks; the company is now moving into other spaces such as passenger charters and express shipments in the medical industry (Park, 2004).

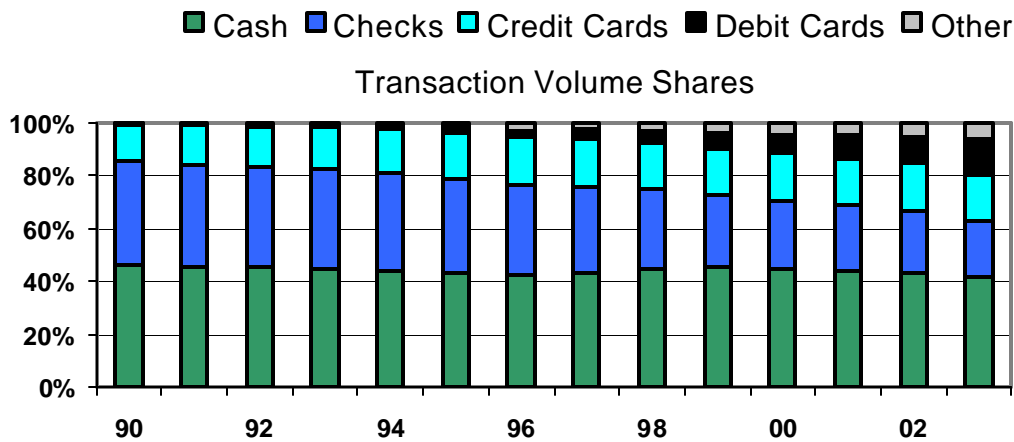
Industry specialists consider that 60-70% of the total check universe corresponds to consumer checks. As seen in Figure 2, Dove Consulting reports that the share of paper-based systems (cash and checks) has declined from 90% in 1995 to 47% in 2003.

Figure 2. In-Store (Point of Sale) Payment Mix

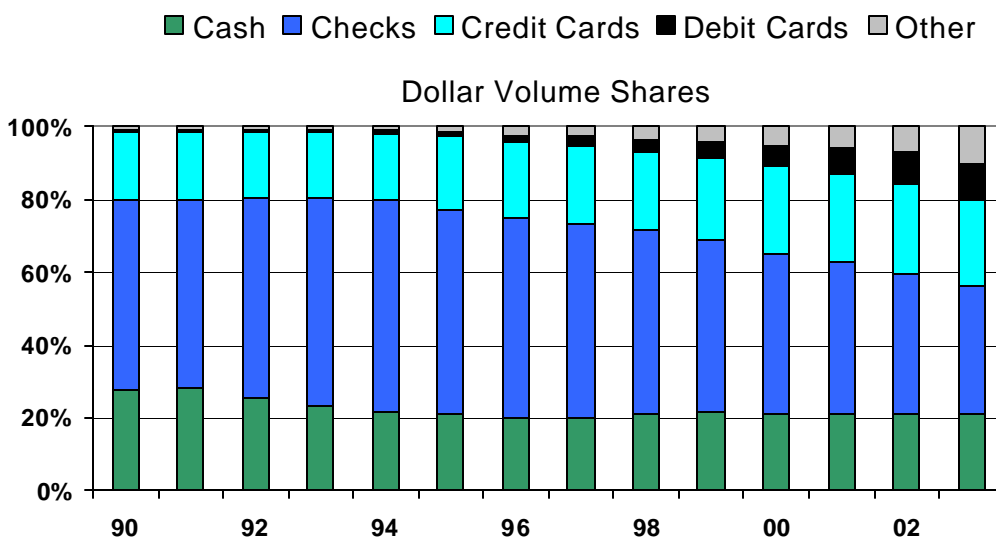


Source: Dove Consulting (2003-2004)

The figure for 1995, however, might be seen as questionable if one believes that both cash and checks could not have declined so drastically in just 4 years. To investigate this trend we looked at Nilson's assessment of the consumer payments preference study of April 2002 (supplemented with data from December 2004). Directionally, the change in the shares of various payment methods is the same. That is the only sound conclusion we can extract, for little is known about Nilson's methodology. Figures 3 and 4 portray the changing shares in both volume of transactions and dollar value.

Figure 3. Payment Instruments Share by Transaction Volume

Source: The Nilson Report (2002, 2004)

Figure 4. Payment Instruments Share by Dollar Volume

Source: The Nilson Report (2002, 2004)

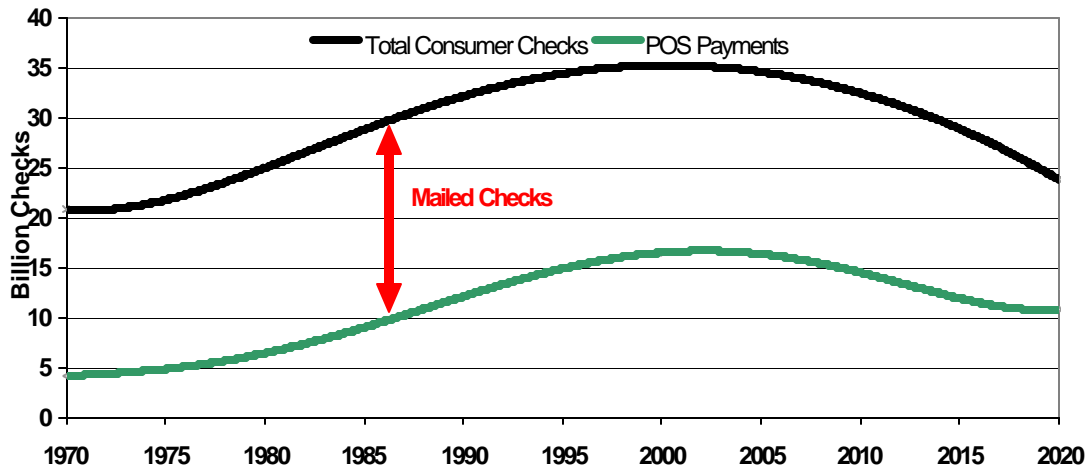
To interpret appropriately the impact on mail of the changing shares in checks requires a deeper understanding of what is included in “checks.”

The check shares graphed above correspond to the sum of “Direct Checks”, “Official Checks” and “Travelers Checks.” Direct checks entail checks written at the point of sale or mailed to pay for goods or services.

To explore the impact of this obviously declining share of the checks on the mail we must separate the use of checks at the point of sale from mailed checks. In Figure 5 the difference between consumer checks and checks written at the point of sale represent the portion of mailed checks. This projection from Nilson suggests that the decline in check payments is mainly expected to occur at the point-of-sale; hence, mailed checks are likely to be affected to a much lesser extent (Nilson, 2002). According to the USPS Household Diary Study, checks mailed by consumers total 10.8 billion mail pieces annually, or 73% of all household payments (USPS,

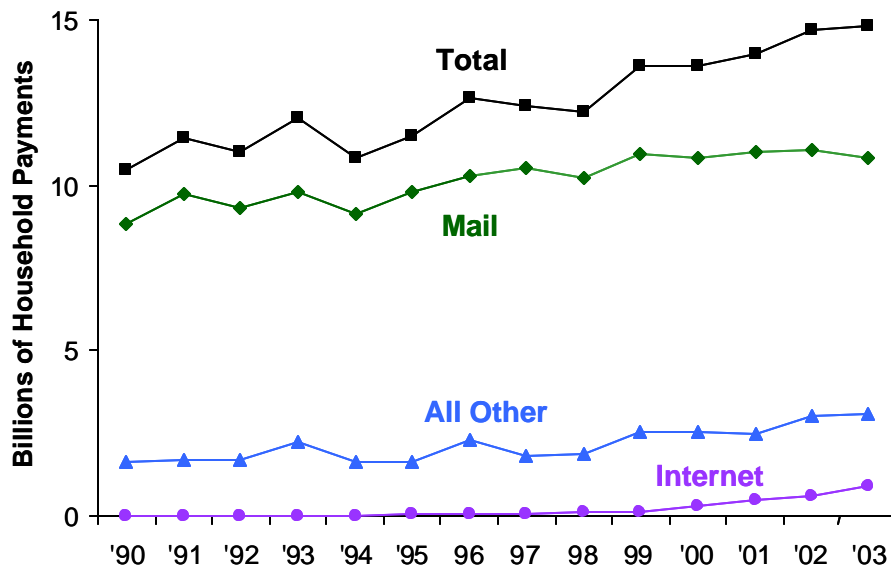
2003). However, this percentage has been declining in recent years from 84% in 1998 (Figure 6) (Flynn, 2005).

Figure 5. Total Consumer Checks = POS Payments + Mailed Checks



Source: The Nilson Report (2002, 2004)

Figure 6. Total Number of Bills Paid by Households



All other includes payment methods such as in-person, telephone and automatic deductions.

Source: U.S. Postal Service Household Diary Studies via Pitney Bowes Analysis

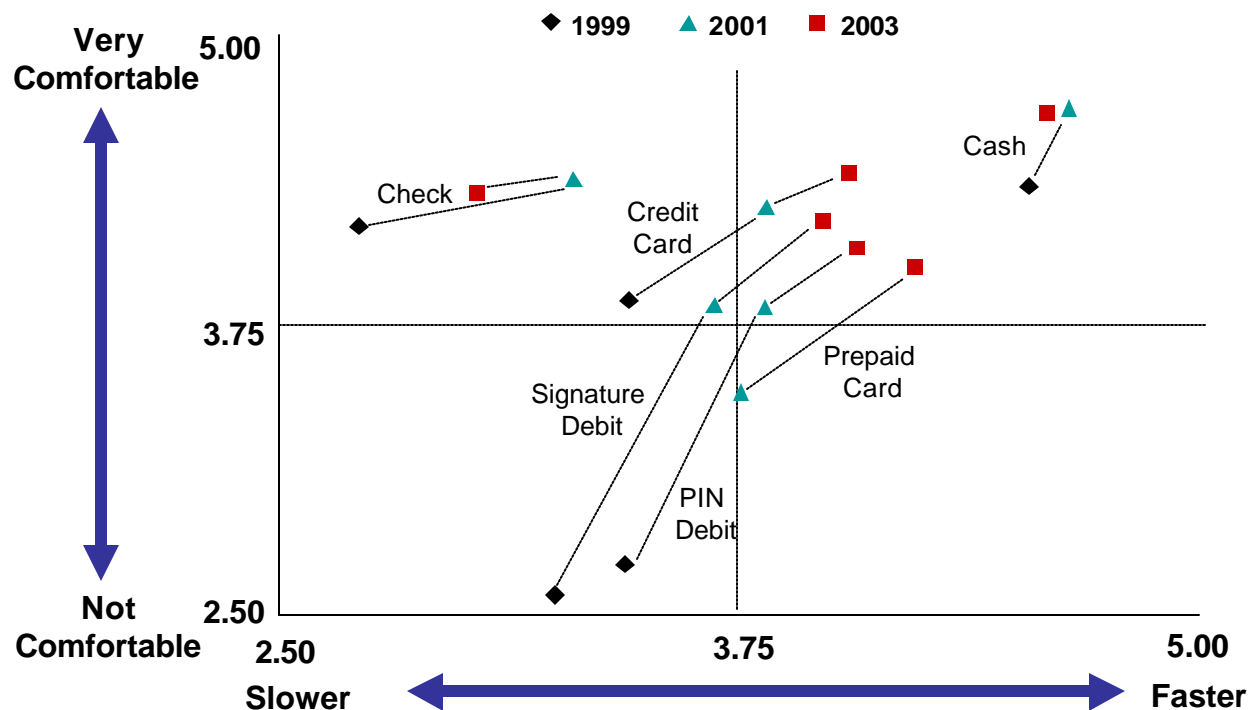
4. Attitudes Toward Payment Methods

The last question is then, what has replaced checks? By looking at the combination of graphs above we see that credit cards have experienced some growth over the last few years. But the payment instrument that has shown a significant uptake is the debit card. Cash registers at establishments have been getting fewer checks and less cash and more providers have offered debit cards as a tool to their customers. Supermarkets, convenience stores and gas stations have been a major driver in the explosion of debit transactions, not to mention the lure experienced by consumers to use more plastic and reap the benefits of reward and incentives programs offered by the industry participants.

Interestingly, this shift has only been made possible by the increasing comfort that users and consumers exhibit with new payment instruments as shown in Figure 7. Here, cash is clearly the dominant instrument in terms of consumer comfort and perceived speed. However, in recent years, consumers have also become significantly more comfortable with electronic payments along with perceiving an increase in their apparent speed. Lastly, and corroborating the point just made, Dove (2003-2004) reports that consumers have remained stagnant in terms of their comfort with checks but now feel that the perceived speed of checks has decreased.

Newer options are not replacing older mechanisms one for one; in fact, they are having a dual effect of substitution and complementarity². As a result, multiple payment options are coexisting and some are taking market share from others.

Figure 7. Consumers' Perceived Speed of and Comfort With Payment Instruments



Source: Dove Consulting (2003-2004)

² For a discussion of how new technologies often complement old ones, see "Substitution Patterns," Nader and Jimenez, 2005.

According to Dove (2003-2004), the share of electronic instruments in the total payments “pie” is increasing and will expand at the expense of the other payment mechanisms. Checks continue to play a significant role in the U.S. payment systems however, particularly when electronic payments are not well suited for fully meeting consumer or business needs. U.S. authorities have generally relied on market forces to provide new payment products and services. In this environment the fact that checks are still widely used suggests either that checks are an efficient means of payment for many purposes relative to alternatives, or that barriers to innovation are inhibiting the total dominance of the newly developed alternatives. According to The Ascent Group (Not listed in the References) in an August 2004 study, “participating companies indicated that their customers still prefer to pay by mail,” and that “Internet payment was only used by 6% of consumers” (Flynn, 2005).

Even businesses continue to rely on checks for payment purposes, especially small and middle market organizations.³ According to Leon Majors of ESP Consulting, more than eight-in-ten of these companies continue to use paper only billing and payment systems for business-to-business transactions (Majors, 2005).

Why have paper-based mechanisms subsisted? Surveys suggest that the underlying reasons why checks and paper-based mechanisms prevail include the following:

- Consumers are more familiar with checks and find in them convenience and ease of access.
- Checks and cash provide users with a simple, hands-on control of the payment.
- Checks and cash allow for easy peer-to-peer (P2P) payments and payments to small businesses.
- Checks provide the user with control over the float due to delayed payment, as opposed to nearly-instant fund withdrawals when using direct debit or electronic bill payment.
- No other mechanism, electronic or paper, is as robust and as flexible, nor can it provide the same mix of attributes as the paper-based check in terms of its affordances: write, reconcile, receive the check back as proof of payment, and store the record in lasting and inexpensive hardcopy.
- Perceived privacy and security benefits, especially when compared with electronic alternatives (Flynn, 2005).

These factors give consumers a sense of control, which they are not ready to relinquish.⁴ Furthermore, in an electronic system there are many dependencies along the payment chain. Requirements include computer ownership, Internet access and a bank/biller relationship to establish a functionally equivalent payment chain. This chain of interdependencies poses hurdles, restrictions and inhibitions at each step. The consumer involvement in clearing those

³ Defined as companies with less than \$100MM in annual revenue.

⁴ For a comprehensive discussion see “Consumer Preferences for Communications Media,” Szeto and Jimenez, 2005.

hurdles is very significant and cumbersome in contrast with the established checking infrastructure, which is transparent to the user. From the user's point of view, checks are not dependent on such restrictions and limitations. Checks are almost universally accepted for consumers with good financial standing, and they are a cheap form of documentary evidence of a transaction. And you don't need a computer, an Internet connection: you just need the checkbook and a pen. Industries that have been successful in converting customers to online payments still process nearly 70% to 80% of bill payments as checks, and small businesses have barely moved in adopting electronic alternatives. Banks have also done a good job in reducing the costs associated with check processing, and have a disincentive to migrate all customers to an electronic system – banks currently earn billions of dollars from the “float” associated with check processing and penalties from bounced checks. Estimates suggest that retail checking account fee revenues alone generate \$4.2 billion annually (Celent Communications, 2004). According to industry experts, the U.S. banking system will be processing more than 20 billion checks per year in the next decade (Majors, 2004).

5. International Perspective

An attempt to explore the changing nature of the payment systems in other countries proved difficult, as data is not necessarily available in the same fashion as that of the U.S. Nevertheless, we have found that the Bank for International Settlements (BIS) makes an effort to compare countries in terms of the settlement mechanisms of their central banks.

Some definitions are needed before we interpret the data. BIS reports:

- “Credit transfer” is a payment order or possibly a sequence of payment orders made for the purpose of placing funds at the disposal of the beneficiary. Money orders are included under credit transfers.
- “Direct debits” are pre-authorized debit of the payer's account by the payee.
- “Cards” include credit, debit, delayed debit and other cards payments such as retailer cards and prepaid cards.
- “Checks” entail travelers' checks, euro checks and bankers' drafts. Commercial bills are included if funds transfers can be made on the basis of these, without using another medium.

Countries could be categorized in two groups. Switzerland, Sweden, Germany, Belgium, Netherlands and Italy constitute the first group for which the common theme is that “credit transfer” is (or used to be) the preferred instrument. The second group of countries composed of Canada, France, U.K. and the U.S. shows a less prevalent, or non-existent, share of credit transfers and a more significant reliance on the check as a payment method⁵.

⁵ See Appendix 1 for graphical representations.

For both groups though, the underlying conclusion is that cards and direct debit are increasing their share at the expense of checks and credit transfers. The main difference between countries of North America and Europe stems from the fact that consumers in Europe have, for the most part, been more used to the benefits from choosing among more payment mechanisms and are more adept at shifting payment mechanisms quicker.

In our dialogue with European posts we have found that checks are rather an “anomaly” in several countries, including Austria, Denmark, Finland and Switzerland (see Table 1 below). Counter payments pose a problem for the governments in that consumers who have no electronic payments methods require instead a retail service that, often, the post is mandated to provide. Thus, enabling these consumers electronically makes good policy sense as it can reduce the cost of physically staffed retail services, with no consequence for mail volumes.

Table 1. Check Use as a Percentage of Total Cashless Payment Transactions

	1998	1999	2000	2001	2002
Finland ⁶	0.3%	0.1%	0.1%	0.1%	0.1%
Sweden	0.4%	0.3%	0.2%	0.2%	0.1%
Netherlands ⁷	1.9%	1.0%	0.5%	0.2%	0.0%
Austria	2.8%	2.1%	1.3%	1.0%	0.7%
Luxembourg	2.8%	2.2%	1.7%	1.1%	0.7%
Germany	4.2%	3.8%	3.3%	2.6%	1.2%
Belgium	7.0%	5.7%	5.0%	3.8%	1.7%
Denmark	9.6%	7.8%	6.7%	5.5%	4.5%
Spain ⁸	12.9%	10.7%	8.9%	7.3%	6.0%
Euro area ⁹	20.9%	18.7%	17.0%	15.4%	14.5%
EU ¹⁰	22.6%	20.3%	18.4%	16.6%	15.4%
Greece ¹¹	N/A	N/A	21.5%	22.8%	20.2%
Italy	28.3%	25.2%	21.7%	19.3%	17.2%
United Kingdom	31.7%	28.8%	26.1%	23.5%	21.0%
Portugal ¹²	39.8%	34.1%	29.0%	27.1%	24.1%
France	44.1%	40.1%	37.9%	35.4%	34.2%
Ireland	56.6%	49.2%	41.3%	30.1%	26.3%

Source: PB analysis of European Central Bank (2004)

Some of the most detailed consumer surveys on invoicing and payment preferences have been conducted by Finland Post (Elkelä, 2004 a-c) and are reviewed in more detail in other papers (Flynn, 2005 and Szeto, 2005). In summary, they indicate that consumers prefer to receive paper invoices but are increasingly willing to migrate to payments over the Internet. This is not

⁶ The figures for payments by credit/debit cards include payments by cards with a delayed debit function.

⁷ The figures for payments by credit/debit cards include payments by cards with a delayed debit function

⁸ This table does not include data relating to bills of exchange, traveler’s checks and other documents.

⁹ Total excluding countries for which data are not available. Following its entry to the euro area, the figures for 2001 onwards include Greece.

¹⁰ Total excluding countries for which data are not available.

¹¹ All checks for which the acquiring bank is different from the issuing bank.

¹² This table does not include data related to bills of exchange.

surprising, because there is an obvious advantage for consumers to migrate to Internet payment from either in-person payments at the counter or from credit transfers where the consumer today has little control over when the payment is deducted. What is interesting, though, is that consumers are not keen on using mobile phones to receive or pay invoices, despite the promotion of such capabilities by mobile service providers.

6. Prognosis

Although our aim is not to offer quantitative forecasts, we have little doubt that the payments systems will continue to evolve significantly over time. This evolution will be gradual. The main driver of change will be the introduction of new payments methods by financial institutions, retailers and billers. These new methods, to be successful, must (1) leverage technological advances that provide cost advantages and convenience, and (2) capitalize on consumers' growing acceptance of new methods.

We believe that past history should not be ignored when judging the potential pace of acceptance of future payments methods or the realization of the intended effects of new payments technologies. We might note, for example, that it has taken about a quarter of a century for payment cards (debit or credit) to reach from 16% of U.S. households in 1970 to 73% in 2004 (Sapsford, 2004). Within that time span, the average number of cards held per household increased from 0.6 in 1971 to 7.8 in 2003. A major enabler of this growth has been the acceptance of ATMs by consumers and the commitment from banks to compete for customers by providing them with the convenience of ATMs, despite an estimated loss of \$250 per month per machine (Florian, 2004). But ATMs have failed to reduce the number of tellers or bank branches as originally promised. Since 1985, branches have increased by 29% and tellers by 11%, according to the FDIC (Dove Consulting, 2003-2004). As a result, the originally intended effects of the technology on society did not materialize as expected, although other benefits were gleaned by various stakeholders: convenience for consumers, competitiveness for banks, and productivity and cost savings for retailers.

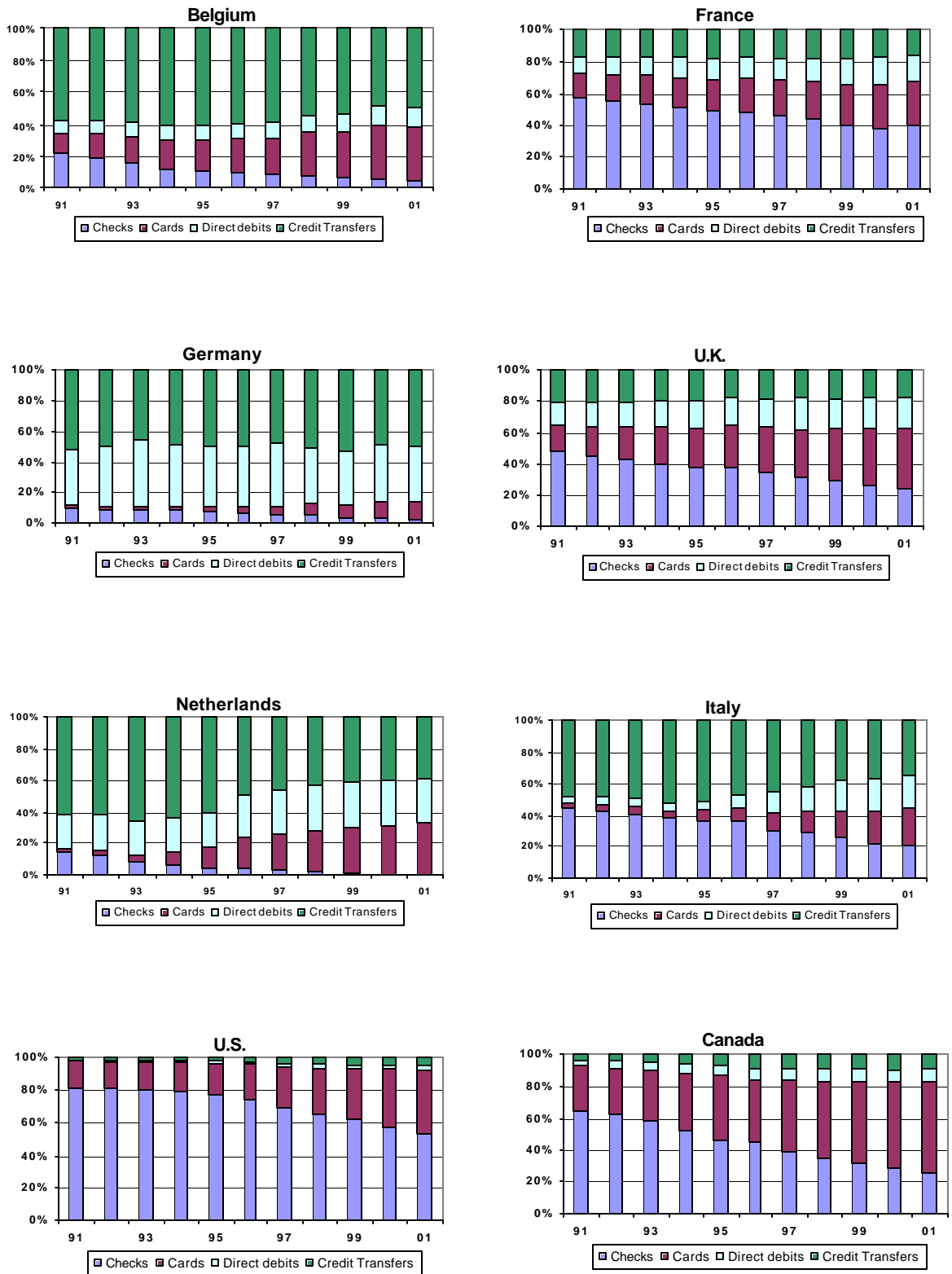
The trend toward greater card usage at retail at the expense of checks and cash is now inexorable. As Figure 2 has shown, there was a 10% share shift in favor of cards over checks and cash in just 4 years from 1999 to 2003. However, according to the Federal Reserve, roughly 26 million households still do not have bank accounts (Austin Business Journal, 2004). It is likely that these individuals will have difficulty in obtaining payment cards. A recent trend is for employers to issue "payroll cards" that can be used as debit cards wherever some credit cards are accepted. This will help push penetration to higher levels. What will be the impact for mail? With greater card penetration will come more bills and statements and also more solicitations by mail. For example, solicitations for shopper rewards to cardholders increased from 811 million in 2002 to 1.27 billion in 2003 (Sapsford, 2004).

The concept of a unique identifier for all purchases has long been proposed, although it has met with raised eyebrows from consumers and privacy advocates. A major barrier is also the practical difficulty of securing agreements on standards among the members of a complex network of thousands of banks and millions of retailers. We are probably decades away from the

vision of consumers being identified at retail through biometric methods, such as fingerprint and eye scanners (Sapsford, 2004). Further, the introduction of a unique identifying number that ties all payments cards together in a national system would similarly require a long, drawn-out period of negotiations among parties and retooling of systems.

We conclude that plastic payments cards will dominate consumer payments, with cash and checks declining but not disappearing, at least over the next two decades. Mail volume will not be affected by the currently perceived decline in check volumes due to direct debit, except to the extent that electronic bill payment increases much more significantly than it has in the past (Flynn, 2005).

Appendix 1. Shift in Payment Mechanisms Across Countries



Source: Bank for International Settlements

Appendix 2. Number and Rate of Growth of Retail Non-Cash Payments

Type of payment	Number (billions)			Growth (percent, annual rate)		
	1979	1995	2000	1979-95	1995-2000	1979-2000
Check	32.8	49.5	42.5	2.6	-3.0	1.2
Retail electronic payments	5.5	14.7	28.9	6.3	14.6	8.2
Debit card0	1.4	8.3	...	41.8	...
<i>Credit card</i>						
General-purpose	1.5	7.8	12.3	10.9	9.5	10.5
Private-label	3.8	2.6	2.7	-2.3	.9	-1.6
Retail ACH2	2.8	5.6	19.0	15.1	18.0
Total	38.3	64.2	71.5	3.3	2.2	3.0

Source: Federal Reserve Board: The use of checks and other non-cash payment instruments in the U.S.

References¹³:

Arthur D. Little (1974): "The Less Cash, Less Check Society."

Ascent Group, Inc. (2004): "Billing & Payment Profiles & Best Practices," August.

Austin Business Journal (2004): "In Depth: Central Texas Money Guide," by Jason W. Meeker, accessed at <http://www.bizjournals.com/austin/stories/2004/08/23/focus1.html?t=printable> on 07/13/05.

Bank for International Settlements (BIS): Accessed at www.bis.org.

Bruce, L. (2002): "Cards Keep Gaining Ground, But Cash and Checks are Still King," February 12 accessed at <http://www.bankrate.com/brm/news/cc/20020212a.asp>.

Celent Communications (2004): "The Future of Check Processing in the U.S" October

Dove Consulting (2003-2004): "Study of Consumer Payments Preference."

Elkelä, K. (2004a): "Invoices and consumer," Finland Post Corporation.

Elkelä, K. (2004b): "Senders and recipients of the invoices," Finland Post presentation at the Pitney Bowes Roundtable on Electronic Substitution, Cork, Ireland, June 1-2, 2004.

Elkelä, K. (2004c): "Paper or Electronic? Desired and Undesired Reception Channels for Direct Marketing," Finland Post, address at the 12th Conference on Postal Delivery and Economics, Rutgers University, Center for Research in Regulated Industries, Cork, Ireland, June 2-5, 2004.

European Central Bank (2004): "Payment and securities settlement systems in the European Union Addendum incorporating 2002 figures (Blue Book, April 2004)," accessed at <http://www.ecb.int/paym/market/blue/html/index.en.html>.

Federal Reserve (2004): "The 2004 Federal Reserve Payments Study: Analysis of Non-cash Payments Trends in the United States: 2000 – 2003," December.

Florian, E. (2004): "The Money Machines," July 26, accessed at <http://www.fortune.com/fortune/fortune500/articles/0,15114,662142-1,00.html>.

Flynn, S. (2005): "Bill Presentment & Payment: Electronic vs. Mail," A Pitney Bowes Background Paper for the Project "Electronic Substitution for Mail: Models and Results, Myth and Reality," www.postinsight.pb.com

Gerdes, G.R., and Walton, J.K. (2002): "The Use of Checks and Other Non-Cash Payment Instruments in the United States," Federal Reserve Bulletin, August.

Jimenez, L. (2004): "Electronic Substitution for Mail: Models and Results, Myth and Reality," Pitney Bowes, address at the 12th Conference on Postal Delivery and Economics, Rutgers University, Center for Research in Regulated Industries, Cork, Ireland, June 2-5, 2004.

Majors, L. (2004): "What's the Big Deal with Check 21," October.

Majors, L. (2005): March 22, 2005 Presentation at National Postal Forum, Nashville, TN.

¹³ A number of references below allude to the Pitney Bowes Background Papers for the project "Electronic Substitution for Mail: Models and Results, Myth and Reality." They will be published at www.postinsight.pb.com as their final versions become available to the public. The authors have benefited from reviewing drafts in progress for each of the papers cited.

Mateer, W.H. (1969): "The Checkless Society, Its Cost Implications for the Firm," MSU Business Studies.

Nader, F. and Jimenez, L. (2005): "Substitution Patterns," A Pitney Bowes Background Paper for the project "Electronic Substitution for Mail: Models and Results, Myth and Reality", www.postinsight.pb.com

The Nilson Report (2002): Issue #761, April 2002.

The Nilson Report (2004): Issue #823, December 2004.

Park, A. (2004): "Checks Check Out," accessed at http://www.businessweek.com/magazine/content/04_19/b3882606.htm

Print Solutions Magazine (2004): Print Solutions Magazine accessed at <http://formmag.com/news.html>, May 2004.

Sapsford, J. (2004): Wall Street Journal "As Cash Fades, America Becomes a Plastic Nation," July 28.

Szeto, C. and Jimenez, L. (2005): "Consumer Preferences for Communication Media." Pitney Bowes Background Paper for the project "Electronic Substitution for Mail: Models and Results, Myth and Reality", www.postinsight.pb.com

United States Postal Service (USPS) (2003): The Household Diary Study: Mail Use & Attitudes in PFY 2002.