

The 2007 Federal Reserve Payments Study

Noncash Payment Trends in the United States: 2003 – 2006



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1 Executive Summary

The *2007 Federal Reserve Payments Study* is part of an ongoing effort by the Federal Reserve System to measure trends in noncash payments in the United States. The study estimated the number and value of payments by check, debit card (both signature and PIN), credit card, automated clearing house (ACH), and electronic benefits transfer (EBT).¹ The study also estimated the number and value of ATM withdrawals.

The number of noncash payments was 93.3 billion in 2006, with a value of \$75.8 trillion. The number of noncash payments in the United States increased at an annual rate of 4.6 percent since 2003 (exhibit 1).

Exhibit 1: Number of Noncash Payments

	2003	2006	CAGR*
Total (billions)	81.4	93.3	4.6%
Checks (paid)	37.3	30.6	-6.4%
Debit card	15.6	25.3	17.5%
<i>Signature</i>	<i>10.3</i>	<i>16.0</i>	<i>15.8%</i>
<i>PIN</i>	<i>5.3</i>	<i>9.4</i>	<i>20.6%</i>
Credit card	19.0	21.7	4.6%
ACH	8.8	14.6	18.6%
EBT	0.8	1.1	10.0%

Figures may not add due to rounding.

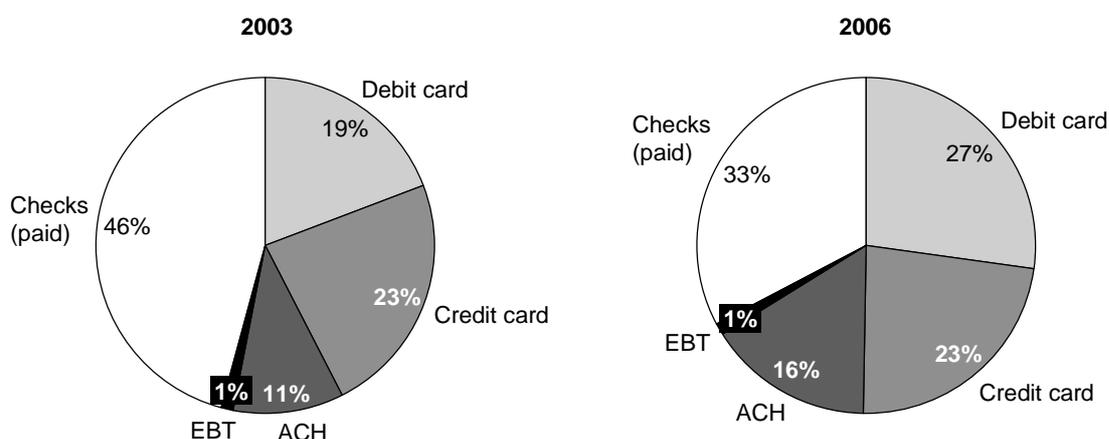
*CAGR is the compound annual growth rate.

Electronic payments now exceed two-thirds of all noncash payments (exhibit 2). Some of the increase in the use of electronic payments was due to changes in financial behavior of consumers and businesses, particularly payment instrument choice. For example, electronic payments are being used more frequently in transactions where checks or cash may have been

¹ Signature debit card payments are made like credit card payments, but use funds from transaction deposit accounts. PIN debit card payments also use funds from transaction deposit accounts and typically require the entry of the same personal identification number (PIN) used to access automated teller machines (ATMs).

used in the past. Many other factors, such as growth in economic activity and population, may have contributed to the increase in electronic payments.

Exhibit 2: Distribution of the Number of Noncash Payments



While the use of all other major payment instruments increased, the number of checks paid decreased 6.4 percent per year. The number of checks written also continued to decrease, albeit at a somewhat slower pace (4.1 percent) than checks paid.² In addition, the check collection process is becoming increasingly electronic.

Although the value of debit card payments is still less than half the value of credit card payments, the number of debit card payments now exceeds that of credit cards. Payments by debit card and ACH increased at the highest rates.

This report reflects the efforts of hundreds of organizations across the industry. Some estimates are from the 2007 *Depository Institutions Payments Study* and are based on responses to surveys sent to a nationally representative, stratified random sample of depository institutions (DIs). Other estimates are from the 2007 *Electronic Payments Study* and are based on data provided by payment networks and card issuers that process most of the electronic payments in the United States. See section 4.1 for a description of the studies.

² The difference between checks written and checks paid is equal to the number of checks converted to ACH payments.

2 Summary of Findings

Overall, the number of noncash payments in the United States increased 4.6 percent per year since 2003, a somewhat faster pace than the previous three-year period (4.0 percent).³ By comparison, constant dollar gross domestic product and personal consumption expenditure increased by 3.2 and 3.3 percent, respectively, during the 2003-2006 period. Dollar value of noncash payments increased 3.9 percent per year.

2.1 CHECK PAYMENTS

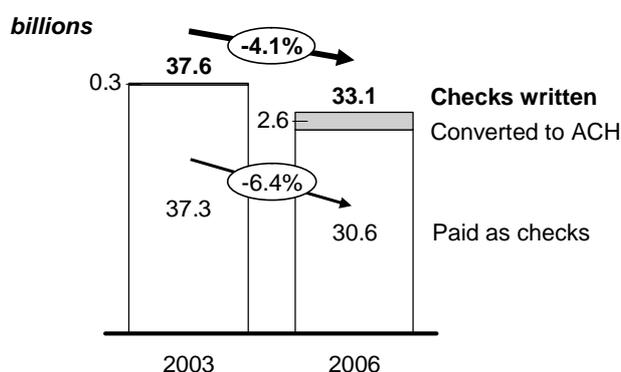
The annual number of checks paid in 2006 is estimated to have been 30.6 billion, for a value of \$41.7 trillion.⁴ The number of checks paid decreased 6.4 percent per year between 2003 and 2006, for a total decrease of 6.7 billion checks by the end of the period.⁵ Because of the increased use of the ACH to convert checks by billers and merchants, the number of checks paid differs from the number of checks written (exhibit 3).⁶ The number of checks written decreased 4.1 percent per year.

³ In this report, estimates of noncash payments exclude payments made using large-value funds transfer systems.

⁴ The estimated value of checks paid in 2003 was revised upward to \$41.1 trillion from \$39.3 trillion; the estimated number of checks paid in 2003 was revised upward to 37.3 from 36.7.

⁵ Checks paid include those cleared as original paper checks or substitute checks or via electronic check presentment or image exchange but exclude checks converted to other forms of payment, such as ACH, for clearing and settlement.

⁶ By agreement, consumer checks can be converted into electronic payments by merchants at the point of sale or by billers that receive check remittances. Some checks counted as written are used as source documents to initiate electronic payments at the point of sale. Electronic payments originating as checks now represent about 8 percent of all checks written. Alternative methods of converting checks exist, but compared to ACH conversion, their use is insignificant.

Exhibit 3: Number of Checks Written, Paid, and Converted to ACH

Figures may not add due to rounding.

The average value of checks paid increased from \$1,104 in 2003 to \$1,366 in 2006. In addition to the effects of inflation, this increase reflects the conversion to ACH payments of consumer checks, which are typically of smaller value than business checks.⁷ In particular, converted consumer checks averaged \$267 in 2006 while all checks written averaged \$1,280. The increase in average value also reflects the increasing use of alternative payment types and changes in the financial behavior of consumers and businesses.

2.1.1 Checks Cleared Electronically

Over the past three years, there have been significant changes in the way checks are cleared. These changes are increasing the efficiency of the check clearing system for interbank checks—those drawn on a different depository institution than the one at which they were deposited. At the time of the survey, about 40 percent of all interbank checks involved the replacement of the original paper check with electronic payment information in the collection process.⁸

⁷ In constant 2006 dollars, average value of checks paid in 2003 was \$1,209.

⁸ The depository institution survey collected information from March and April 2007. Based on industry data on the rapidly increasing use of electronic collection during 2006 and 2007, these percentages likely overstate the use of electronic collection in 2006 but understate its current use. The estimate includes substitute checks, which are checks that were converted to images during processing but reconverted to paper for presentment to the paying depository institution.

2.1.2 Checks Returned Unpaid

From 2003 to 2006, the number of checks returned unpaid decreased at the same rate as checks paid (6.4 percent per year). Thus, the ratio of checks returned to checks paid (0.5 percent) was unchanged. The value of returned checks *increased* 8.0 percent per year during the same period, and the ratio of returned checks to paid checks by value increased from 0.3 percent to 0.4 percent. The average value of returned checks increased from \$731 to \$1,124.

2.1.3 On-Ups Checks

From 2003 to 2006, the number of on-us checks—checks that are deposited or cashed at the same depository institution on which they are drawn—decreased from 8.2 billion in 2003 to 6.1 billion in 2006. The proportion of on-us checks also decreased, from 22.1 percent of paid checks in 2003 to 19.9 percent in 2006.

2.1.4 Checks Paid by Type of Depository Institution

In 2006, commercial banks paid 82.3 percent of checks by number and 93.5 percent by value. Credit unions and savings institutions paid 8.9 percent and 7.5 percent by number and 2.1 percent and 3.7 percent by value, respectively. From 2003 to 2006, the number of checks paid by credit unions decreased most rapidly (13.2 percent per year), followed by savings institutions (7.9 percent per year) (exhibit 4). The larger relative decreases at credit unions and savings institutions can be accounted for by the increased use of debit cards by consumers. Credit unions, and to a lesser extent savings institutions, have a higher proportion of consumers in their account base than do commercial banks.

Exhibit 4: Checks Paid by Type of Depository Institution

	2003			2006			CAGR (%)	
	Number (billions)	Value (trillions)	Avg Value	Number (billions)	Value (trillions)	Avg Value	Number	Value
Total	37.3	\$41.1	\$1,104	30.6	\$41.7	\$1,366	-6.4	0.5
Commercial banks	29.7	\$38.4	\$1,293	25.2	\$39.0	\$1,551	-5.4	0.6
Credit unions	4.2	\$0.9	\$219	2.7	\$0.9	\$326	-13.2	-1.0
Savings institutions	3.0	\$1.5	\$511	2.3	\$1.6	\$675	-7.9	1.0
Postal money orders	0.2	*	\$146	0.2	*	\$164	-4.8	-1.2
U.S. Treasury checks	0.3	\$0.3	\$1,154	0.2	\$0.2	\$1,203	-10.4	-9.1

Figures may not add due to rounding.

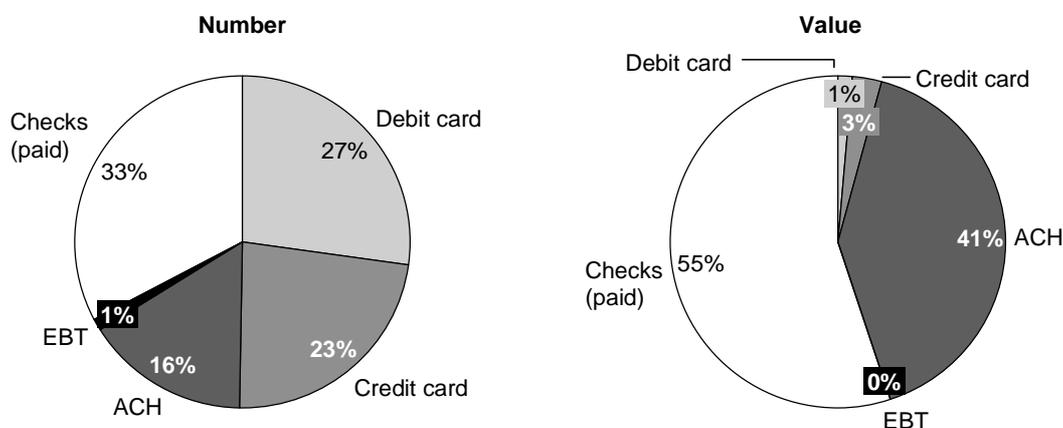
*The value of postal money orders was \$29 billion in 2003 and \$28 billion in 2006.

2.2 ELECTRONIC PAYMENTS

Electronic payments now comprise over two-thirds of all noncash payments by number, but less than half by value (exhibit 5). The number of electronic payments grew 12.4 percent per year from 2003 to 2006. The proportion of electronic payments in noncash payments increased from 54.2 percent to 67.2 percent over the same period. The value of electronic payments increased 8.9 percent per year, growing from 39.1 percent of noncash payments in 2003 to 45.0 percent in 2006.

Payments made by debit, credit, or EBT cards were over half (51.6 percent) of all noncash payments in 2006 but only 4.1 percent of the value. In contrast, ACH payments were only 15.6 percent of noncash payments but 40.8 percent of value.

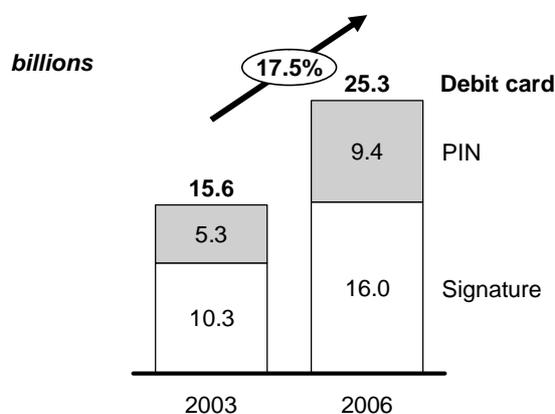
Exhibit 5: Distribution of the Number and Value of Noncash Payments in 2006



2.2.1 Debit Card Payments

The number of debit card payments now exceeds the number of credit card payments. Debit card payments increased 17.5 percent per year from 2003 to 2006 (exhibit 6). PIN debit payments increased more rapidly (20.6 percent per year) than signature debit payments (15.8 percent per year). The total increase in signature debit payments per year (5.7 billion) exceeded the total increase in PIN debit payments (4.0 billion).

Exhibit 6: Number of Debit Card Payments by Type



Figures may not add due to rounding.

For both types of debit card payments, the average value per transaction decreased from 2003 to 2006.⁹ In constant dollars, the average value of signature debit payments decreased 4.3 percent per year, while the average PIN debit payment decreased 3.9 percent. In 2006, 27.1 percent of noncash payments were made using debit cards (1.3 percent by value).

2.2.2 Credit Card Payments

The number of credit card payments increased at the lowest rate of any electronic payments instrument (4.6 percent per year).¹⁰ There were 21.7 billion credit card payments in 2006, 2.8 billion more than in 2003. By value, credit card payments totaled \$2.1 trillion in 2006. In 2006, 23.3 percent of noncash payments were made using credit cards (2.8 percent by value).

⁹ The estimate of the value of PIN debit card payments excludes a portion estimated to have been returned to the customer as cash.

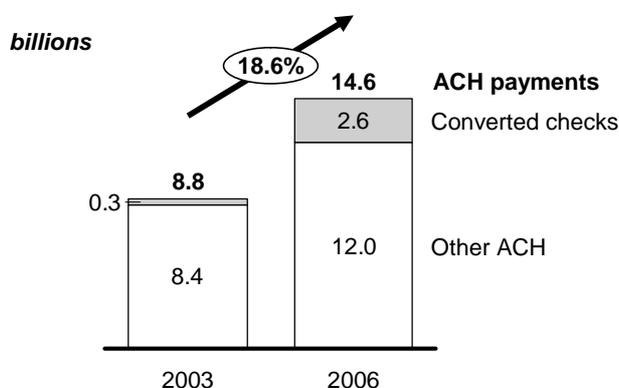
¹⁰ Credit cards include both general purpose and private-label cards.

2.2.3 ACH Payments

The number of ACH payments increased 18.6 percent per year from 2003 to 2006. In 2006, 15.6 percent of noncash payments were ACH payments (40.8 percent by value). ACH payments in 2006 exceeded those in 2003 by 5.8 billion.

Of these additional payments, 38.4 percent were checks converted to ACH. The number of converted checks in 2006 (2.6 billion) was over eight times the number in 2003 (0.3 billion) (exhibit 7). Converted checks now represent 17.6 percent of ACH payments.

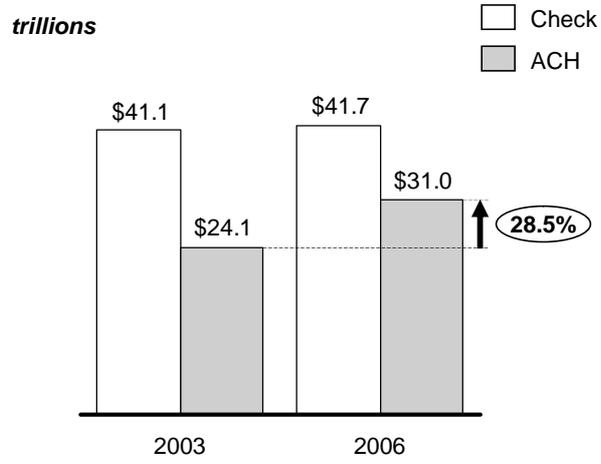
Exhibit 7: Number of ACH Payments



Figures may not add due to rounding.

ACH payments totaled \$31.0 trillion dollars in 2006, accounting for 90.8 percent of the value of all electronic payments. The value of ACH payments in 2006 was \$6.9 trillion larger than in 2003, while total value of noncash payments was \$8.3 trillion larger in 2006 than in 2003. Thus, the increase in ACH payments was 83.1 percent of the overall increase. ACH values in 2006 were 28.5 percent greater than in 2003 (exhibit 8).

Exhibit 8: Value of Checks Paid and ACH Payments



2.3 ATM WITHDRAWALS

There were 5.8 billion ATM withdrawals in 2006, with a value of \$578 billion. ATM withdrawals decreased 0.4 percent per year by number but increased 5.2 percent per year by dollar value since 2003. The average ATM withdrawal increased from \$85 to \$99. In constant dollars, the average value increased 2.4 percent per year.

ATMs are not the only source for cash, and many factors may have contributed to the increase in the absolute value of cash withdrawn from ATMs. The number or value of cash withdrawals are not necessarily proportional to the number or value of cash payments. Thus, these estimates do not measure the number or value of cash payments.

3 Conclusion

In 2006, electronic payments comprised over two-thirds of all noncash payments in the United States. Debit card payments now exceed credit card payments. Card payments alone comprised over half of all noncash payments. The number of check payments continued to decrease and did so at a more rapid rate than the previous three-year period. Moreover, check clearing is increasingly electronic.

The Federal Reserve System wishes to thank the hundreds of organizations and perhaps thousands of individuals who contributed to the estimates discussed in this report. We recognize that studies such as these shift resources from other important initiatives. We appreciate the commitment of time and energy by all who were involved. Their efforts have provided tremendous benefit to the industry.

– Donald L. Kohn, Vice Chairman, Federal Reserve Board of Governors

4 Appendix

4.1 ABOUT THE STUDY

As in the previous studies, the current study included two data collection efforts to estimate the annual number and value of significant types of noncash payments in the United States for 2006. Estimates of check payments and ATM withdrawals were based on findings from the *Depository Institutions Payments Study* (2007 DI study). Electronic payments volume estimates were based on findings from the *Electronic Payments Study* (2007 EP study) and supplemented by the 2007 DI study.

The research methods used in 2007 are similar to those used in 2004 and 2001. Some 2003 estimates have been revised to reflect new information and ensure consistency with the 2006 estimates.

Detailed reports of the methodology and findings of each study will be made available on www.frbservices.org.

4.1.1 Depository Institutions Payments Study

The *Depository Institutions Payments Study* collected the number and value of different types of payments from deposit accounts at a representative, random sample of depository institutions for March and April of 2007. Global Concepts, a subsidiary of McKinsey & Company, and its subcontractor, ICR, assisted the Federal Reserve with the study.

A stratified random sample of 2,700 depository institutions in the United States was drawn. The largest depository institutions were sampled at a higher rate in an effort to count as many transactions as possible and estimate as few as possible. The sample included commercial banks, savings institutions, and credit unions. A total of 1,437 depository institutions provided data for the survey.

Although the survey period was March and April, 2007, unless otherwise noted, the estimates were annualized and reported as 2006 estimates. This approach allowed for comparison to the

data on electronic payments. Readers may wish to consult the more detailed report of findings for additional information on the study's methods and results.

4.1.2 Electronic Payments Study

The *Electronic Payments Study* estimated the number and value of electronic payments in the United States for calendar year 2006. Data were collected by surveying payment networks and card issuers. Of the 73 organizations asked to participate, 65 of the largest organizations provided data. Dove Consulting, a division of Hitachi Consulting, assisted the Federal Reserve with the study.

Survey forms were distributed to the payment organizations that process, clear, and settle electronic payments in the United States to collect data for the calendar year 2006. The survey data were collected during February through September, 2007. Respondents to this study collectively accounted for an estimated 99.8 percent of the electronic transactions and 99.9 percent of the electronic payments value in the United States.

4.2 TABULAR RESULTS

	2003			2006			Total change (2003-2006)		CAGR(%)	
	Number	Value	Avg	Number	Value	Avg	Number	Value	Number	Value
Total noncash payments	81.4	67.6	830	93.3	75.8	813	11.9	8.3	4.6	3.9
Checks (paid)¹	37.3	41.1	1,104	30.6	41.7	1,366	-6.7	0.6	-6.4	0.5
U.S. Treasury checks	0.3	0.3	1,154	0.2	0.2	1,203	-0.1	-0.1	-10.4	-9.1
Postal money orders	0.2	*	146	0.2	*	164	0.0	*	-4.8	-1.2
Commercial checks¹	36.8	40.8	1,108	30.2	41.5	1,373	-6.6	0.7	-6.4	0.5
On-us	8.2	12.1	1,464	6.1	12.0	1,973	-2.2	-0.1	-9.7	-0.2
Reserve Bank	15.3			10.2			-5.1		-12.7	
Returns	0.2	0.1	731	0.2	0.2	1,124	0.0	0.0	-6.4	8.0
Reserve Bank	0.1			0.1			0.0		-9.3	
Electronic payments	44.1	26.4	599	62.7	34.1	544	18.6	7.7	12.4	8.9
ACH	8.8	24.1	2,754	14.6	31.0	2,122	5.8	6.9	18.6	8.7
Debits	4.2	11.9	2,849	8.6	13.3	1,535	4.5	1.4	27.5	3.8
Credits	4.6	12.2	2,668	5.9	17.7	2,974	1.4	5.5	9.1	13.1
Debit card	15.6	0.6	40	25.3	1.0	39	9.7	0.4	17.5	16.0
Signature	10.3	0.4	42	16.0	0.6	40	5.7	0.2	15.8	14.3
PIN	5.3	0.2	38	9.4	0.3	37	4.0	0.1	20.6	19.5
Credit card	19.0	1.7	89	21.7	2.1	98	2.8	0.4	4.6	8.2
EBT	0.8	*	26	1.1	*	27	0.3	*	10.0	11.1
ATM cash withdrawals	5.9	0.5	85	5.8	0.6	99	-0.1	0.1	-0.4	5.2
On-us	3.5	0.3	88	3.6	0.4	106	0.1	0.1	0.6	6.9
Checks (written)²	37.6	41.2	1,096	33.1	42.4	1,280	-4.5	1.2	-4.1	1.0
Checks converted to ACH	0.3	0.1	187	2.6	0.7	267	2.2	0.6	98.7	123.7
Memo:³										
Real GDP		10.3			11.3			1.0		3.2
Real PCE		7.3			8.0			0.7		3.3
Population		291.1			299.8			8.7		1.0
Relative Value of \$1										
GDP implicit price deflator		1.10			1.00			-0.1		-3.0
CPI		1.08			1.00			-0.1		-2.7

Numbers in billions. Values in trillions of USD. Figures may not add due to rounding. CAGR is the compound annual growth rate.

¹ Nominal values of checks (paid) and commercial checks increased (displayed in the table). However, in constant dollars the values of both checks (paid) and commercial checks showed a growth rate of -2.5 percent per year.

² Includes the use of checks as source documents to initiate electronic payments.

³ These figures, provided for comparison, obtained from U.S. Department of Commerce, BEA as of October 31, 2007.

* Too small to be displayed. The value of postal money orders was \$29 billion in 2003 and \$28 billion in 2006, a decrease of \$1 billion. The value of EBT payments was \$22 billion in 2003 and \$30 billion in 2006, an increase of \$8 billion.