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Payment and Settlement Systems Department

Bank of Japan

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Abstract

The Bank of Japan has collected data on the use of electronic money for fiscal 2008 (April 2008-March 2009), as it did for fiscal 2007. The volume and value of transactions settled using electronic money continued to increase even after fiscal 2007, which is often referred to as the "year of the tipping point" for electronic money services in Japan. The total number of cards with electronic money functionality exceeded 100 million in January 2009. The venues for making payments with major brands of electronic money have been expanding nationwide. These developments suggest that electronic money is gradually strengthening its position as a retail payment instrument with the potential of further growth in the future.

The value of electronic money outstanding, however, remained considerably smaller than the value of cash in circulation or of money stock as a whole. Electronic money services do not yet seem to have had a large impact on the overall payment system or the financial system. Nevertheless, it is worthwhile to continue to observe developments in this area, including how the role of electronic money evolves in retail payments in Japan.

I. Trends in the Use of Electronic Money during Fiscal 2008

A. Electronic Money Services Surveyed[1]

For fiscal 2008 (April 2008-March 2009), the Bank collected data from eight major brands of electronic money:[2] the six brands surveyed in the previous report[3] (Edy, Suica, ICOCA, PASMO, nanaco, and WAON) and two new ones (SUGOCA[4] and Kitaca[5]). Since electronic money services of SUGOCA and Kitaca started in March 2009, the very last month of fiscal 2008, continuity of the data from the previous report is basically maintained.

B. Number of Cards and Terminals: More than 100 Million Cards Have Been Issued

During fiscal 2008, the total number of cards (including mobile phones) with electronic money functionality continued to increase. After reaching 100 million in January 2009, it recorded 105.03 million at the end of March 2009 (a year-on-year increase of 30.3 percent; Chart 1). Of this total, the number of mobile phones with electronic money functionality, after reaching 10 million in June 2008, recorded 12.05 million at the end of March 2009.

Chart 1 Number of Electronic Money Cards and Terminals

	Number of cards issued (millions)	Of which: mobile phones	Number of terminals (thousands)
2007 Sep.	66.49	7.67	247
Oct.	68.97	7.93	277
Nov.	71.20	8.15	281
Dec.	73.26	8.47	287
2008 Jan.	75.48	8.83	291
Feb.	78.00	9.03	295
Mar.	80.61	9.42	358
Apr.	83.63	9.69	364
May	85.74	9.90	367
June	87.61	10.11	371
July	89.52	10.30	374
Aug.	91.43	10.59	387
Sep.	93.08	10.78	393
Oct.	94.97	10.95	412
Nov.	97.03	11.16	437
Dec.	98.85	11.37	448
2009 Jan.	100.64	11.57	455
Feb.	102.57	11.79	472
Mar.	105.03 (+30.3%)	12.05 (+27.9%)	480 (+34.1%)

Notes: 1. End of each month.
2. The figures in parentheses are the year-on-year rate of change.

The number of terminals installed at retail stores and other locations grew and exceeded 480,000 at the end of March 2009. A distinctive feature of developments in fiscal 2008 was that retailer companies, which initially focused on the use of their electronic money services within their group companies, promoted use outside their group. Another feature was that, in October 2008, the vending machine industry started to install vending machines that accept multiple brands of electronic money. As a result of these developments, the venues for making payments with electronic money have been expanding steadily.

C. Volume and Value of Transactions: Annual Value Increased by about 40 Percent

In fiscal 2008, the total volume and value of transactions settled using electronic money recorded 1.116 billion transactions and 817.2 billion yen, respectively, both increasing by about 40 percent (37.8 percent in volume and 45.0 percent in value) from the previous fiscal year (charts 2 and 3).

The average value per transaction, dividing the total value by the total volume, was 732 yen for fiscal 2008, somewhat larger than in the previous fiscal year (an annual increase of 5.2 percent). Two major factors affected the average value during fiscal 2008. The first was that from July 2008, many electronic money service providers ceased providing services for bill payment at convenience stores, the average value of which was relatively large.[6] And the second was a growing number of merchant outlets accepting electronic money, notably those of mass retailers. As a result of these factors, the pace of increase in the average value per transaction temporarily slowed markedly in July, but then started to accelerate again, with the effects of the second factor more than offsetting those of the first one.

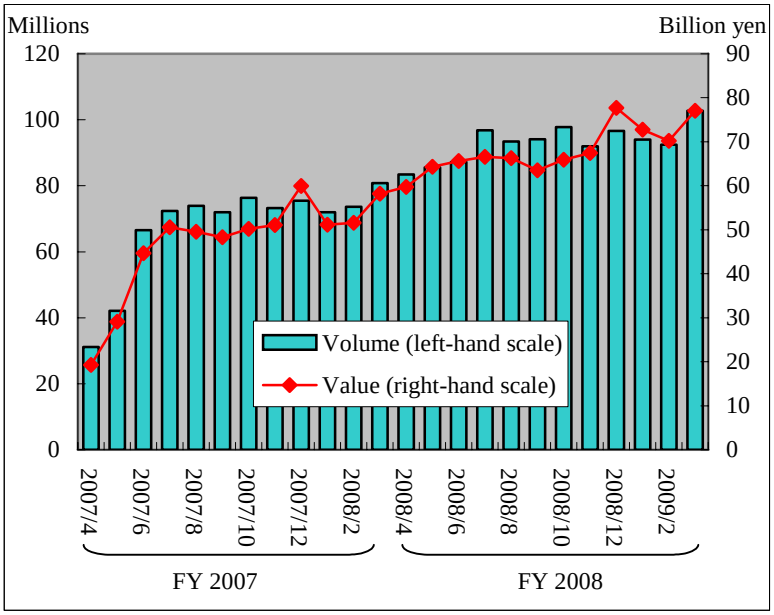
In March 2009, the monthly average volume and value of transactions per card was 0.98 times and about 734 yen, respectively. These figures are calculated by dividing the total volume and value of transactions settled using electronic money by the total number of cards (including mobile phones) with electronic money functionality. It should be noted that, although precise estimation is difficult, figures would be several times higher if only active cards are taken into account.

Chart 2 Volume and Value of Transactions Settled Using Electronic Money

	Volume of transactions (millions)		Value of transactions (billion yen)		Value per transaction (yen)	
Fiscal 2007	810	(n.a.)	563.6	(n.a.)	696	(n.a.)
Fiscal 2008	1,116	(+37.8%)	817.2	(+45.0%)	732	(+5.2%)
2007 Q2	140		93.1		666	
Q3	218		148.4		680	
Q4	225		161.2		716	
2008 Q1	226		160.9		710	
Q2	256	(+83%)	189.7	(+100%)	741	(+11.2%)
Q3	284	(+30%)	196.4	(+32%)	691	(+1.6%)
Q4	286	(+27%)	211.1	(+31%)	737	(+2.9%)
2009 Q1	289	(+28%)	220.0	(+37%)	761	(+7.0%)
2007 Apr.	31		19.3		621	
May	42		29.1		692	
June	67		44.7		671	
July	72		50.6		699	
Aug.	74		49.5		670	
Sep.	72		48.3		671	
Oct.	76		50.2		657	
Nov.	73		51.1		698	
Dec.	75		59.9		794	
2008 Jan.	72		51.1		711	
Feb.	74		51.6		700	
Mar.	81		58.2		720	
Apr.	83	(+170%)	59.7	(+210%)	716	(+15.4%)
May	86	(+100%)	64.3	(+120%)	752	(+8.7%)
June	87	(+31%)	65.7	(+47%)	753	(+12.1%)
July	97	(+34%)	66.6	(+32%)	688	(-1.6%)
Aug.	93	(+26%)	66.3	(+34%)	709	(+5.8%)
Sep.	94	(+31%)	63.5	(+32%)	675	(+0.7%)
Oct.	98	(+28%)	65.9	(+31%)	674	(+2.6%)
Nov.	92	(+26%)	67.5	(+32%)	734	(+5.2%)
Dec.	97	(+28%)	77.7	(+30%)	804	(+1.2%)
2009 Jan.	94	(+31%)	72.7	(+42%)	774	(+8.9%)
Feb.	92	(+26%)	70.2	(+36%)	759	(+8.5%)
Mar.	103	(+27%)	77.1	(+32%)	750	(+4.1%)

Notes: 1. Total for the period.
2. The figures in parentheses are the year-on-year rate of change.
3. Since figures are rounded, they may not add up to the total.

Chart 3　Trends in Volume and Value of Transactions Settled Using Electronic Money



D.　Electronic Money Value Outstanding: 91.2 Billion Yen at the End of March 2009

At the end of March 2009, the value of electronic money outstanding was 91.2 billion yen, a year-on-year increase of 18.0 percent (Chart 4). The average value outstanding per card was 868 yen, a year-on-year decrease of 9.2 percent. The decrease in the value per card likely occurred because the ratio of inactive cards rose in parallel with an increase in the total number of cards issued. This average value, therefore, does not provide clear evidence of changes in the average value outstanding per active card.

Chart 4　Value of Electronic Money Outstanding

	Value outstanding (billion yen)		Average value outstanding per card (yen)	
2007 Sep.	64.3		967	
2008 Mar.	77.1		957	
Sep.	83.1	(+29.3%)	893	(-7.7%)
2009 Mar.	91.2	(+18.0%)	868	(-9.2%)

Notes: 1. End of each period.
2. The figures in parentheses are the year-on-year rate of change.

II. Comparison with Other Retail Payment Instruments

A. Value Outstanding: Impact on the Overall Payment System or the Financial System Remained Small

Chart 5 compares the value of electronic money outstanding with the value of cash in circulation. At the end of March 2009, the value of electronic money outstanding was 2.02 percent of the total value of coins in circulation, 0.12 percent of the total value of banknotes in circulation, and 0.11 percent of the total value of cash (coins and banknotes) in circulation. This was also about 0.009 percent of the total value of money stock outstanding (M3), which includes deposit money at private banks. These figures show that the value of electronic money outstanding remained considerably smaller than the value of cash in circulation or of money stock as a whole, although its proportion to either was increasing moderately. In other words, electronic money services do not yet seem to have had a large impact on the overall payment system or the financial system.

Chart 5 Percentage of Electronic Money Compared with the Value of Cash in Circulation and Money Stock

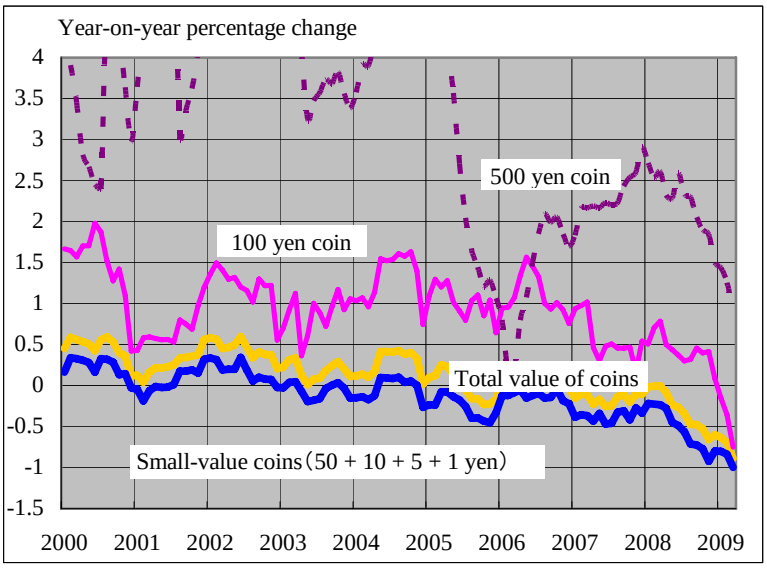
Percent

	Coins	Banknotes	Total cash in circulation	Money stock (M3)
2007 Sep.	1.43	0.08	0.08	0.006
2008 Mar.	1.70	0.10	0.10	0.007
Sep.	1.83	0.11	0.10	0.008
2009 Mar.	2.02	0.12	0.11	0.009

Note: End of each period.

In relation to cash in circulation, to which electronic money is often considered an alternative, the decrease in the volume of coins in circulation accelerated during fiscal 2008 (Chart 6). The decrease in demand for coins basically reflected developments in nominal private consumption, especially the decline in sales of goods and services since autumn 2008. It is also possible, however, that the recent increase in the use of electronic money had some impact on demand for coins.[7]

Chart 6　Volume of Coins in Circulation



B. Volume and Value of Transactions: Total Value of Electronic Money Transactions Exceeded That of Debit Cards

When comparing the data for electronic money with those for credit cards and debit cards, the same observations as a year earlier can be made: (1) the total volume of transactions settled using electronic money has far surpassed that of debit cards, although it cannot compete with that of credit cards; and (2) the value per transaction for electronic money is considerably smaller than that for credit cards and debit cards (Chart 7).

A distinctive event in fiscal 2008 was that the annual total transaction value of electronic money exceeded that of debit cards for the first time. This reflected a much faster rate of growth in the transaction volume of electronic money compared with that of debit cards.

As for credit cards, a new type of service using contactless chip cards, which does not require authorization by signature or PIN and thus enables users to make payments quickly, has become widely available in recent years. Since they are used in a way similar to prepaid electronic money, contactless credit cards are sometimes referred to as "post-pay electronic money" (not included in the category of "electronic money" in this report). The total number of users of contactless credit cards, or the number of such cards issued, is estimated, using data published by credit card providers, to be more than 15 million. The

number of terminals that accept this type of payment instrument is estimated to be 0.6 million, exceeding the number of terminals that accept electronic money. Industry experts suggest that contactless credit cards are increasingly used for a broader range of payments, including for smaller-value payments. However, detailed data on actual usage are not made available, and it is unclear to what extent these cards have penetrated the retail payment market.

Chart 7 Use of Retail Payment Instruments[1]

	Electronic money	Debit cards (J-debit)	Credit cards	Cash withdrawal from ATMs[2]
	Fiscal 2008	Fiscal 2008	Fiscal 2006	Fiscal 2007
Number of cards issued (millions)	105 (+30.3)	410[3] (n.a.)	293 (+1.0)	456[4] (n.a.)
Total volume of transactions settled (millions)	1,116 (+37.8)	12.6 (+7.7)	4,547 (n.a.)	420 (-2.3)
Total value of transactions settled (billion yen)	817 (+45.0)	769 (+0.8)	34,770 (+8.1)	21,370 (-11.1)
Value per transaction (yen)	732 (+5.2)	61,000 (-7.6)	7,600 (n.a.)	51,000 (-8.9)
Number of terminals (thousands)	480 (+34.1)	330 (+10.0)	1,550 (+12.7)	140 (+0.0)

Notes: 1. The figures in parentheses are the year-on-year rate of change in percent.
2. The figure excludes "on-us" cash withdrawals (internal transactions within a financial institution).
3. The figure at the end of December 2008.
4. The figure at the end of March 2007.

Sources: Japan Debit Card Promotion Association; BIS, "Statistics on Payment and Settlement Systems in Selected Countries."

III. Conclusion

Both the total volume and value of transactions settled using chip-based electronic money continue to increase even after fiscal 2007, which is often referred to as the "year of the tipping point" for electronic money services in Japan. The venues for making payments with chip-based electronic money have been expanding nationwide, owing to new electronic money services provided by regional transportation companies, their enhanced

interoperability with other services, and the promotion by retailer companies of the use of their electronic money services nationwide.

Amid the expanding use of electronic money, competition among electronic money service providers is intensifying. They have been broadening the range of merchants that accept their cards and promoting more frequent use of their services by launching sales campaigns and offering incentives such as reward points. Some electronic money service providers regard their electronic money as a marketing tool, and this suggests that providers' business strategies will greatly affect whether electronic money will grow to become a standard retail payment instrument.

Besides chip-based electronic money, developments in which are described in this report, server-based electronic money has also been undergoing changes. Use of server-based electronic money was previously limited largely to purchases of digital contents, and as a result the range of users was also limited. However, major Japanese companies that manage online shopping malls successively started server-based electronic money services. These services are currently available only within the relevant online shopping malls but allow users to pay up to around 100,000 yen per transaction, far beyond the value range in which chip-based electronic money is usually used. The future role of server-based electronic money as a retail payment instrument also warrants attention.

With regard to the legal framework, the Payment Services Act was enacted in June 2009, establishing a legal framework for prepaid payment instruments and for funds transfer services provided by entities other than banks. Under the Act, providers of not only paper-based or chip-based prepaid payment instruments but also providers of server-based prepaid payment instruments are subject to regulation, including the requirement to secure an amount equal to or larger than half of the outstanding value in the form of either (1) deposit with the Legal Affairs Bureau; (2) guarantee from banks or other eligible institutions; or (3) trust. It is hoped that electronic money, including the server-based form of it, will show sound development under the new legal framework.

The Bank will continue to monitor and analyze developments in electronic money services.

[1] In general, "electronic money" refers to a stored-value or prepaid electronic payment instrument for multipurpose use, which requires users to "load" a certain value before using it. Electronic money can be further categorized into two types. One is a chip-based type, in which the value is recorded on the integrated circuit (IC) chip embedded in devices such as plastic cards and mobile phones. In this type, the loaded value is managed on a self-contained operating system and application software. The other is a server-based type. This type does not require any physical device, and typically the value is recorded and managed centrally on the computer server of an electronic money service provider. Recently, a new type of credit card service using contactless chip cards has also become available. This service does not require authorization by signature or personal identification number (PIN), thus enabling users to make payments quickly. Since they are used in a way similar to prepaid electronic money, contactless credit cards are sometimes referred to as "post-pay electronic money." However, unless otherwise noted, the term "electronic money" in this report refers to chip-based prepaid electronic money.

[2] As for cards issued by transportation companies (Suica, ICOCA, PASMO, SUGOCA, and Kitaca), transaction volume and value do not include those for fare collections (i.e., only the volume and value used for shopping are included in the data). However, the amount of value outstanding includes value that can potentially be used to pay for transportation fares.

The monthly figures for WAON are for a one-month period ending on the 20th of each month. The figures for the other brands are for each calendar month. For interoperable cards (Suica, PASMO, ICOCA, and Kitaca), each service provider reported the data collected from its member merchants. As for PASMO, as the total number of cards issued has excluded the number of returned cards since March 2008, its recent data are inconsistent with the data up to February 2008.

[3] See *Recent Developments in Electronic Money in Japan* (October 2008), which is available at the Bank's web site (http://www.boj.or.jp/en/index.htm).

[4] SUGOCA is a chip-based fare card with electronic money functionality issued by Kyushu Railway Company since March 1, 2009. It is scheduled to become interoperable with other electronic money services, such as Suica of East Japan Railway Company, by spring 2010.

[5] Kitaca is a chip-based fare card with electronic money functionality issued by Hokkaido Railway Company since March 14, 2009. It has been interoperable with other electronic money services, such as Suica of East Japan Railway Company, since the outset of its electronic money service.

[6] The following has been cited as the reason why electronic money service providers have inhibited users from paying bills using electronic money at convenience stores: until June 2008, some users of the service often earned reward points on credit cards by using credit cards to load electronic money value and then using the value to pay bills at convenience stores. Since this type of use had been unintended by electronic money service providers and increased the amount of fees that the providers have to pay to finance the rewards, the providers have stopped offering the service.

[7] The downward trend in the growth rate of the volume of coins in circulation can be attributed to a combination of the following factors: (1) developments in nominal private consumption, especially the decline in sales of goods and services since autumn 2008; (2) changes in the circulation pattern of coins, influenced by the increasing use of cash collection services by financial institutions; (3) decrease in the use of odd retail prices, triggered by the requirement to display tax-inclusive prices

since April 2004; (4) introduction of charges for money exchange services at financial institutions; and (5) increase in the use of electronic retail payment instruments including electronic money.