

E-Money

Definition by ECB:

Electronic money is broadly defined as an electronic store of monetary value on a technical device that may be widely used for making payments to undertakings other than the issuer without necessarily involving bank accounts in the transactions, but acting as a **prepaid** bearer instrument.

E-money products are defined as "stored-value" or "prepaid" products in which a record of the funds or "value" available to a consumer is stored on an electronic device in the consumer's possession.

In contrast to the many existing single-purpose prepaid card schemes (such as those offered by telephone companies), e-money products are intended to be used as a **general, multipurpose means of payment**. For this reason, using internet to make a credit card payment or to transmit instructions to make funds transfers between bank accounts are regarded as *access products* or *electronic payment systems*, rather than as electronic money.

The Basel Committee (1998) further divides types of electronic money into the categories of electronic purses (hardware or card based) and digital cash (software, network based).

Who will issue e-money? In theory, e-money can be issued by commercial banks or even any institutions, as long as their own "money" will be widely accepted. A e-money can become a medium of exchange when it is widely accepted. When a certain e-money (issued by Bank X) is widely accepted, it is a private money, which a balance-sheet liability of the issuers (recall our discussion on banknotes issued by commercial banks).

Card-based products are being designed to facilitate **small-value payments** in face-to-face retail transactions and would therefore constitute a close substitute for banknotes and coin. An interesting question is whether there would be a particular incentive to switch to e-money products in countries which rely relatively more on cash as a means of payment, as may be the case in a number of emerging market economies. In particular, if the cost of installing transaction devices for e-money, small vendors may not have incentives to accept e-money. While the efficiency gains

to be reaped by e-money products may seem to be larger in cash-based economies, it may be that, if the schemes are used primarily for small-value transactions, they will have a major impact only on coins and small-denomination banknotes and thus will have only a small effect on the total value of cash holdings.

Banknotes and coin in circulation (1994)

Countries	As a percentage of GDP	As a percentage of central bank liabilities	As a percentage of deposits ¹	Memo item: Deposits as a percentage of GDP ¹
Belgium	5.2	42.0	37.1	14.0
Canada	3.5	86.7	78.9	4.4
France	3.4	37.7	17.8	19.2
Germany	6.8	63.4	42.0	16.2
Italy	5.9	27.9	19.1	30.7
Japan	8.8	84.5	37.0	23.6
Netherlands	6.3	43.0	33.4	18.8
Sweden	4.5	25.2
Switzerland	7.8	42.9	44.1	17.9
United Kingdom	2.8	69.8	4.8	58.8
United States	5.2	84.1	44.7	11.6
Australia	4.1	54.5	30.3	13.6
Austria	5.9	43.1	60.2	9.8
Brazil	2.5	8.9	69.9	3.6
Bulgaria	7.4	16.0	105.1	7.0
China	16.6	41.4	58.8	28.3
Croatia	3.2	34.7	67.1	4.8
Czech Republic	8.1	20.8	27.2	29.7
Denmark	3.1	17.4	11.8	26.2
Estonia	10.4	45.6	96.4	10.8
Finland	2.1	14.8	7.5	28.3
Greece	7.3	13.3	104.7	6.9
Hong Kong	6.7	16.6	57.7	11.6
Hungary	9.4	10.2	87.6	10.8
Iceland	1.1	7.3	15.5	7.0
India	10.0	52.3	133.4	7.5
Ireland	4.8	36.4	59.2	8.1
Korea	4.3	19.7	67.0	6.4
Latvia	10.4	43.2	154.3	6.8
Lithuania	8.3	55.6	124.3	6.7
Mexico	3.7	27.1	57.1	6.4
Norway	4.3	20.9	11.7	36.2
Poland	5.8	23.2	80.9	7.2
Portugal	5.5	17.6	26.8	20.4
Romania	4.6	18.3	105.1	4.3
Russia	5.6	23.8	105.8	5.3
Saudi Arabia	10.0	22.1 ²	53.2	18.8
Singapore	8.7	13.7	67.3	12.9
Slovakia	6.4	13.8	29.6	21.5
Slovenia	2.6	19.8	51.3	5.1
South Africa	2.8	3.6	15.0	18.9
Spain	11.1	49.3	33.2	33.4
Turkey	2.6	13.4	81.0	3.2

Source: BIS (1996)

台灣中央銀行通貨發行額/負債比率(單位：新台幣百萬元)

End of the Year	Currency Issued	Liabilities of the Central Bank	Nominal GDP	Currency/Liabilities (%)	Currency/GDP (%)
1997	694,452	3,057,885	8610139	22.71	8.07
1998	806,939	3,721,075	9238472	21.69	8.73
1999	708,580	3,623,700	9640893	19.55	7.35
2000	692,912	4,285,906	10032004	16.17	6.91
2001	698,460	5,605,471	9862183	12.46	7.08
2002	785,164	6,943,785	10293346	11.31	7.63
2003	856,951	7,689,614	10519574	11.14	8.15
2004	922,910	8,211,931	11065548	11.24	8.34
2005	959,792	8,362,295	11454727	11.48	8.38
2006	961,715	8,311,300	11917597	11.57	8.07
2007	1,054,290	8,981,377	12635768	11.74	8.34

Comparisons of seigniorage and central bank expenses (1994)

Country	Seigniorage ¹ (as a percentage of GDP)	Central bank operating expenses (as a percentage of GDP)	Percentage decline in seigniorage before break-even point is reached ²	Seigniorage reduction ³ (as a percentage of GDP)		
				if prepaid cards eliminate all banknote denominations up to US\$ 25 ⁴	if every individual carries a prepaid card with US\$ 100 ⁴ of e-money	if prepaid cards eliminate all cash payments up to US\$ 25 ⁴
Belgium	0.44	0.17	62	0.05	0.03	0.05
Canada	0.31	0.03	91	0.15	0.05	0.13
France	0.28	0.13	54	0.08	0.03	0.07
Germany	0.52	0.07	86	0.06	0.03	0.06
Italy	0.65	0.06	91	0.05	0.06	0.09
Japan	0.42	0.06	85	0.06	0.01	0.04
Netherlands	0.46	0.06	87	0.06	0.03	0.05
Sweden	0.48	0.04	92	0.10	0.04	0.16
Switzerland	0.45	0.05	88	0.05	0.01	0.05
United Kingdom	0.28	0.03	89	0.14	0.05	0.10
United States ...	0.43	0.03	93	0.14	0.03	0.09

Source: BIS (1996)

The development of e-money raises a number of interrelated policy issues of potential concern to central banks and other public authorities. Those of particular relevance to central banks relate to their oversight function for payment systems, counterfeiting, seigniorage, and the conduct of monetary policy.

1. Payment systems

Virtually all e-money schemes under development will need inter-institution *clearing and settlement* arrangements. Many e-money schemes plan to use existing interbank arrangements. Operators and overseers of interbank clearing and settlement systems need to ensure that such systems are sufficiently robust in terms of institutional and operational arrangements, risk management and settlement procedures.

2. Counterfeiting

3. Seigniorage and Issuers

Since banknotes in circulation represent non-interest-bearing central bank liabilities, a substitution of e-money for cash would lead to a corresponding decline in central bank asset holdings and the interest earned on these assets that constitutes *central bank seigniorage* revenue. Even a moderate loss of seigniorage could be of concern to some governments, particularly in countries with large budget deficits.

Thus, legal issues of particular relevance to central banks include whether e-money schemes infringe on the monopoly of the central banks in issuing bank notes, which is usually protected by legislation, and whether a central bank could, under existing legislation, issue e-money itself.

4. Monetary policy

The impact of e-money on the size of central bank balance sheets depends on the extent that e-money substitutes for cash. Since cash is a large or the largest component of central bank liabilities in many countries, a very extensive spread of e-money could shrink central bank balance sheets significantly. The issue is at what point this shrinkage might begin to adversely affect monetary policy implementation.

Another question is how the definition of money will be changed. Should e-money be included in M1? How will this affect the monetary aggregates?