

Making electronic money legal tender: pros & cons

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Abstract

Should governments make electronic money legal tender at some point in the future? The monetary authorities of Singapore are convinced they should, and have aired their vision "to establish an electronic legal tender system by 2008". This paper presents a comprehensive overview of the arguments in favour of making electronic money legal tender, as well as the arguments against such a decision. The planned Singapore Electronic Legal Tender (SELT) system is also used as a stepping stone to study the ramifications of a more extreme scenario in which traditional cash is completely abolished - a cashless society, in other words.

1. Introduction

In a recent article, Drehmann, Goodhart and Krueger (2002) argue that when it comes to electronic money, "the real public policy issue for the immediate future" is the following: "If the private sector (unaided) attempt to introduce an e-money payment system is, as we have sought to demonstrate, faltering badly, should the public sector step in to revive this exercise?" ². This paper analyses in depth one possible form of government intervention in support of e-money. It has been inspired by news bulletins that popped up on the Internet in the course of December 2000 carrying variants of the following message: "Electronic money will be made legal tender in Singapore by the year 2008 and every merchant on the island republic will be required to accept it from customers" ³.

The paper has a descriptive and an analytical part. The descriptive part introduces the Singapore Electronic Legal Tender (SELT) system (Section 2), and points out that giving e-money the same legal status as traditional cash can mean different things depending on the country and depending on the scenario followed (Section 3). The analytical part of the paper tries to present a comprehensive list of the pros and cons of the SELT system, as well as those of a more extreme

¹ Assistant Professor of Economics, Vrije Universiteit Brussel and Postdoctoral Fellow of the Fund for Scientific Research Flanders. Home page: <<http://cfec.vub.ac.be/cfec/leo.htm>>. I have benefited greatly from conversations with Low Siang Kok, Director (Quality) at the Board of Commissioners of Currency, Singapore, and with Enoch Ch'ng, Monetary Authority of Singapore..

² Van Hove (2003a) shows that after the introduction of the euro a number of European e-purse schemes have started doing increasingly well.

³ Creed, A., "E-money to be made legal tender in Singapore", *Newsbytes*, December 26, 2000.

scenario in which traditional cash is completely abolished. Section 4 sums up the arguments in favour; Section 5 does the same for the counter-arguments. Section 6 concludes.

2. The case of Singapore

As mentioned in the introduction, in December 2000 several news reports made mention of a 'decision' by the Board of Commissioners of Currency, Singapore (BCCS) to make electronic money legal tender by the year 2008 - the BCCS being the statutory board that at that time had the sole right to issue currency notes and coins in Singapore⁴. Apparently, the local *Straits Times* was the first to run the story⁵, and news agencies around the world picked it up. For quite some time these news bulletins were the only source of information available. The only official statement on the matter could be found on the old BCCS web site which stated, under the heading "Our Vision": "To be a premier currency-issuing authority that provides a world-class currency service, and to establish an electronic legal tender system by 2008"⁶.

It was only after the presentation by BCCS director Low Siang Kok at the OECD Future of Money Forum in Luxembourg in July 2001 (Low, 2002) that it became clear that the news reports misrepresented the BCCS's true intentions on a number of points. Most importantly, the news reports gave the impression that by 2008 merchants in Singapore would be *obliged* ("legally required") to accept electronic money as payment⁷. However, as is explained in more detail under 3.1., in reality merchants will *not* be coerced into accepting electronic money. They will remain free to set payment conditions.

The news reports were also unclear about whether it is the intention of the BCCS to completely abolish traditional cash once e-money has been made legal tender. At the OECD Future of Money Forum, however, Mr Low stated that as long as there is demand, the BCCS will continue to issue cash. On the other hand, the news reports were correct on other points. Concerning the form of the electronic money, Mr Low was quoted saying: "We envision that the money will be in the form of electronic pulses stored in smart chips embedded in mobile phones, personal digital assistants (PDAs), cars and other forms of electronic wallets"⁸. Another news report also mentioned wrist watches⁹. In any case, it is clear that the SELT system is concerned with electronic money in a narrow sense, excluding credit or debit cards¹⁰.

⁴ In January 2002, the Government of Singapore announced that it had decided to merge the BCCS with the Monetary Authority of Singapore. by March 2003 (Source: Ministry of Finance, press release, January 23, 2002).

⁵ Source: Low, I., "E-money to be legal tender here by 2008", *The Straits Times*, December 19, 2000.

⁶ The statement also appears on p. 3 of the 2000 Annual Report of the BCCS.

⁷ Source: Marican, N., "E-money ... as good as cash by 2008?", *Singapore.CNET.com*, December 19, 2000 <<http://www.singapore.cnet.com/news/singapore/story/0,2000027481,10033213-1,00.htm>>.

⁸ Source: Low, I., "E-money to be legal tender here by 2008", *The Straits Times*, December 19, 2000 <http://it.asia1.com.sg/newsdaily/news001_20001219.html>.

⁹ Source: "Electronic money: the new legal tender", *ZDNet Asia*, December 19, 2000 <<http://www.zdnetasia.com/news/dailynews/story/0,2000010021,20166979-1,00.htm>>.

¹⁰ I refer to the definition used in the ECB's 1998 *Report on Electronic Money*: "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 transaction, but acting as a prepaid bearer instrument" (ECB, 1998, p. 7).

As for the timing, the BCCS has set the 2008 start-up date to "give merchants and banks around the country the time to prepare for such a nationwide system" ¹¹. In an interview with AFP, Mr Low emphasised that even this timing is flexible, and that the phasing out of notes and coins will only proceed at a pace Singaporeans are comfortable with ¹². Mr Low reportedly said: "Public acceptance is an important criteria. We will allow the public to dictate the pace of change. [...] Surveys will certainly be in place to see if people are comfortable in general to use legal tender in an electronic form". If the majority showed reluctance to accept the system, extensive education to raise public awareness of the merits of cash-free living would probably be introduced, according to the same source.

On a more concrete level, Mr Low was quoted saying that the BCCS was "talking to the Network for Electronic Transfers, Singapore (NETS) which already has a partial infrastructure in place for an electronic legal-tender system. NETS' system is partial because even though it's fairly widespread, not everyone uses it" . NETS is Singapore's national ATM and debit card processor owned by 7 local banks. NETS also operates the CashCard electronic purse scheme that was launched in 1996 ¹³.

Finally, let me stress that the plans of the BCCS must be seen against the backdrop of active government involvement. Officials are seeking to transform the island republic into a regional IT and e-commerce hub. Ever since the mid-1990s, Singapore has also aimed to be a showcase for smart card technology. The national e-purse system has been in place since 1996, and the CashCard can be used to shop on the Internet and to pay road tolls. As early as 1999, there were also plans for a state-of-the-art contactless mass transit card (Rolfe, 1999, p. 25). All this makes it understandable why David Chan of Visa International stated in 1999: "On a scale of 1 to 10, I would rate Singapore a 10 as a hotbed for stored value activity" (Yang, 1999). And Singapore has continued to be at the forefront of smart card technology. In the summer of 2002, the Singapore government announced trials with wireless payments using smart cards and infrared technology, "as one of the first countries in the world together with South Korea and Japan" (Rolfe, 2002).

3. Possible scenarios

This definition covers both card-based products (electronic purses) and software-based products (electronic cash for use on the Internet).

¹¹ Source: Creed, A., "E-money to be made legal tender in Singapore", *Newsbytes*, December 26, 2000 <<http://www.newsbytes.com/news/00/159783.html>>.

¹² Source: "Singapore aims to be cashless society", *China Daily Information*, December 19, 2000 <<http://www.chinadaily.net/cover/storydb/2000/12/19/wb-4cash.c19.html>>.

¹³ See <<http://epso.jrc.es/purses.html>> for more information on the Cash Card (and electronic purses in general).

As is shown in the extended version of this paper (Van Hove, 2003b), if a central bank wants to play a leadership role in the local development of electronic money, it obviously has a range of options: it can issue e-money itself (Finland), it can participate in an operator (South Korea and perhaps Kyrgyzstan), it can impose standards for private initiatives (India), it can play a co-ordinative and supportive role in an industry-led standardization process (South Korea again), etc. Making electronic money legal tender is potentially the most extreme option available. However, here too, several scenarios are possible depending on (1) the precise content of the legal tender concept, (2) who issues the electronic money: the central bank itself and/or private issuers, (3) the degree of interoperability between the various schemes, and (4) the status of traditional cash.

3.1. There is legal tender and legal tender

The concept 'legal tender' as it exists today - for traditional cash - can differ significantly from country to country. The Committee on Payment and Settlement Systems (1999, p. 3) of the BIS notes that "in most countries legislation or regulation requires currency to be accepted as payment for all types of transactions, subject possibly to minimum denomination limits". In some countries, however, even though currency may be defined as legal tender, "this might only compel the government to accept currency for payment or all government and private parties to accept currency for the discharge of debts, but may not compel private vendors to accept currency as payment for all transactions" (ibid.).

According to Margreet Wenting of the Ministry of Finance, the Netherlands is an example of the latter situation: a merchant can indicate that he does not accept cash without acting in contravention of the law¹⁴. The same is true for the United States: "The question of legal tender is irrelevant to retail transactions ... because consumers are negotiating an exchange, not repaying an existing debt" (CBO, 1996). In Norway too, retailers have the law on their side if they demand electronic payment (Brooks, 1997, p. 8). According to Aris Kaloudis of the Norges Bank, there have been "several decisions issued by the Norwegian Ministry of Justice which make it clear that the claim of legal tender should always be practiced with caution. In some circumstances it is reasonable not to compel private vendors to accept legal tender if the payment can be settled by other payment instruments without unreasonable inconvenience for the payee"¹⁵. In Austria, the central bank act explicitly allows for this possibility. Article 61 of the Federal Act on the Oesterreichische Nationalbank as amended by Federal Act BGBl. Part I No. 60/1998, which entered into force on 1 January 2002 reads: "(2) The banknotes referred to in paragraph 1 must be accepted at their full nominal value without restriction, *unless a liability is to be met by an otherwise specified means of payment*" (emphasis added). In other words, it is possible to opt for a means of payment other than cash on a contractual basis. As Gerd Grum and Thomas Wagner of the OeNB have pointed out to

¹⁴ Source: Wenting, M., personal e-mail, May 11, 2001.

¹⁵ Source: Kaloudis, A., personal e-mail, June 20, 2001.

me, there are for example no legal restrictions on the use of vending machines that do not accept cash. If a consumer wants to use such a vending machine, "he must be willing to tacitly agree to [a non-cash] payment mode" ¹⁶. Note that out of an estimated 2,000 vending machines that accepted the local Quick purse in the summer of 2001, some 300 did not accept cash. And some 35% of the Austrian public payphones required the use of a prepaid telephone card.

Denmark, on the other hand, is a country where the ability of customers to pay with notes and coins is more rigorously protected. Under the Danish Payment Card Act of 1984 (and 1992), services requiring the use of a card are subject to strict regulation (Schauss, 1988, p. 72). Specifically, §18 of the Act stipulates that "The payment creditor shall accept payment in cash within normal business hours in settlement of payment obligations which could be entered into and fulfilled by means of a payment card" (Poulet and Vandenberghe, 1988, p. 368).

Similarly, when transposed to e-money, different interpretations of the concept 'legal tender' can in principle be imagined. In the case of Singapore, the implications of the *current* concept of legal tender are as follows: "(a) Currency notes and coins issued by the Board are legal tender for the purpose of discharging debt or paying for goods and services where the method of payment has not been previously stipulated. [...] (c) Providers of goods and services in the market are free to set conditions upon which they will supply goods and services. If a merchant stipulates that he will supply a service only if payment is made electronically, he can refuse the service if payment is offered by some other method" (Low, 2002, p. 147). Judging from conversations with Mr Low, an adapted version of point (c) will also hold for electronic money once it has been made legal tender. That is, merchants will have the right to refuse to accept e-money. Note that in the absence of a statutory obligation to accept, there may still be a positive impact on the uptake of e-money: government issuance and/or the decision to make it legal tender might enhance consumer's confidence in the new payment method (CBO, 1996).

3.2. Certification vs. issuance

As Costa and De Grauwe (2001) point out, making electronic money legal tender need not imply that the central bank issues e-money itself. Costa and De Grauwe envisage a system where the central bank certifies the quality of the issue of private money (both traditional private money such as bank deposits, and electronic money). In such a system, "if a firm has enough assets, which allow for money issuing, the central bank will 'print' its 'logo' on this money ¹⁷, assuring the underlying quality of the asset. The central bank will therefore perform a rating activity, which will give legal tender characteristics to private money, including e-money" (o.c., p. 11). Note that

¹⁶ Source: Grum, G. and Th. Wagner, personal e-mail, July 4, 2001.

¹⁷ If the electronic money takes the form of electronic coins (unlike in the current generation of e-purses, which only have 'simple' counters), the central bank can digitally sign the tokens.

if the legal tender concept is 'absolute' (meaning that legal tender must be accepted as payment for all types of transactions, cf. supra) and if there are several e-money schemes in the country, these will obviously have to be (made) interoperable. Forcing merchants to accept different types of e-money for which they would need separate terminals would be absurd.

The alternative to certification is that the central bank acts as an issuer itself. Here too, several options are possible. At one end of the spectrum, the central bank could keep control over the entire process; that is, it could issue both the units of monetary value and the cards, it could do the processing, etc. At the other end, it could restrict its role to the issuance of the units of value themselves, leaving the technical and application-related aspects of issuance to various operators, which would procure the units of value from the central bank, just as cash is obtained today (Friederich, 1997).

In this respect, it is interesting to point out that European central banks have always explicitly reserved the option of issuing electronic money themselves (o.c.), as did the European Monetary Institute (the pre-cursor of the ECB), and at the later stage the European Central Bank itself:

"..., in the long run, it can not be excluded that circumstances might develop which could lead EU central banks to issue prepaid cards themselves" (Working Group on EU Payment Systems, 1994).

"The ECB will continue to monitor developments in the field of electronic money and to reassess its effects on monetary policy and the integrity of payment systems, and may have to define new policy conclusions, including, if necessary, the issuance of electronic money by the ESCB itself (ECB, 1998, p. 3).

Interestingly, in the most recent version of the CPSS *Survey of Electronic Money Developments* (CPSS, 2001), central banks seem to have been asked whether they envisage issuing electronic money themselves. All 15 central banks that mention it state that they have no intention of doing so. However, 10 out of these 15 qualify their statement in order to keep the option open for the future. Most do this by including terms such as "at present", "for now", etc. Others do it more explicitly. The Bank of Greece, for example, states that its stance "will depend upon the long-term effects of e-money on seigniorage revenues" (o.c., p. 36-37). The Bundesbank for its part "believes that the option of issuing e-money itself should be kept open as a sort of 'last resort'" (o.c., p. 32).

Which of the two options - certification or issuance - is to be preferred? Peter Ledingham of the Reserve Bank of New Zealand points out that "..., Reserve Bank provision of currency under a statutory monopoly is seen as a useful public service, and one which provides a basis on which other payment arrangements and contracts must ultimately rest" (1994, p. 347). Building on this, one could argue that the central bank should at all times provide the general public with a 'life-buoy' in case something goes wrong with privately provided electronic money (loss of confidence,

abuse of monopoly position resulting in prohibitive charges, etc.) - a function that is today performed by traditional cash. On the other hand, the rating and supervision activity performed by the central bank should help to prevent such mishaps. One could also argue that - in the absence of traditional cash and in the absence of central bank e-money - cardholders losing confidence in privately provided electronic money could always convert their balances into bank deposits of some kind. However, in this scenario payments by means of electronic money would come to a grinding halt in case of a generalized run (and other electronic means of payment may be unable to cater for the low-value segment of the market). In the presence of electronic money provided by the central bank, cardholders could simply switch to this form, provided that private issuers are obliged to redeem their electronic money value in official electronic money, at par, upon request. Note that the EU Directives on Electronic Money contain the requirement that electronic money balances be redeemable for government issued currency on demand (Vereecken, 2001).

On balance, it is not easy to determine in which direction – central bank issuance vs. certification - the scales are tipping. In Singapore, the monetary authorities plan to issue electronic money themselves rather than just certifying it. The BCCS has explicitly rejected a proposal by Professor Lu Ding of the National University of Singapore to install a system of competitive issue of electronic money by commercial banks (Low, 2002, p. 153). In the proposed system, the BCCS would only "play the role of a regulator to regulate, set standards and act as an underwriter of electronic money" (ibidem). The proposal also required "the Government to bail out banks which fail".

3.3. Competition issues

The relation between privately and publicly provided e-money could take different forms. Suppose, first of all, that the official e-money is introduced alongside its private counterparts. This might reduce the attractiveness of the private schemes, some of which might disappear. Indeed, as the Working Group on EU Payment Systems (1994) observes, it could "be argued that central banks would have an unfair advantage over other issuers because of the zero credit risk nature of an electronic purse issued by the central bank".

As pointed out by Friederich (1997), the central banks could also exercise a monopoly on the issuance of electronic money, forcing private issuers to procure legal tender from the central bank, just as is the case for traditional cash today. As a result, the float that previously went to the private operators would go entirely to the central bank. This is the scenario envisaged by the BCCS. The BCCS is planning to take over the CashCard scheme (compensating them for the infrastructure already set up) and to subsequently build on it, "through enhancement and extension" (Low, 2002, p. 150). The BCCS will be the only 'originator' of SELT and "each bank will draw

SELT in S\$ value from BCCS and SELT will be loaded remotely into the bank's designated computer" (o.c., p. 150-151).

3.4. Whither traditional cash?

A final dimension relates to the status of traditional cash. In principle, there are three options: (1) currency keeps its current status - implying that it remains legal tender, but now together with electronic money, (2) the central bank still issues currency but it loses its status as legal tender¹⁸, or (3) currency is abolished altogether.

In Singapore, the BCCS will apparently go for the first option¹⁹. This is somewhat surprising as it would in a sense defeat the very purpose of making e-money legal tender. As is pointed out below, an electronic legal tender system is seen as a way of keeping the rising costs of handling physical cash down. As Birch (1999) argues, "it could be that the apparently extreme option 3 is the only realistic means to open up the benefits to society as a whole (there is an analogy here with the turning off of analogue TV spectrum in the next century)".

3.5. An extreme scenario as benchmark

So, clearly, different types of electronic legal tender systems can be imagined. In the following Sections, I try to present a comprehensive list of the pros and cons of the SELT system as it is apparently envisaged. However, it seemed an interesting intellectual exercise to also study the ramifications of a more extreme hypothetical scenario in which traditional cash is completely abolished. The characteristics of this 'benchmark scenario' can be summarized as follows: (1) legal tender must be accepted as payment for all types of transactions²⁰, (2) the central bank issues electronic money, (3) it does so *alongside* existing private providers, and (4) cash is abolished.

4. Arguments in favour

This Section looks at the arguments in favour of an electronic legal tender system, c.q. the more extreme scenario, from the point of view of society as a whole. The following Section covers the counter-arguments. The main argument in favour of making e-money legal tender is that it would increase the overall efficiency of a country's payment system. The following sub-sections try to underpin this by means of a three-step argument. Successively it is argued (1) that the social cost of electronic money is in all probability lower than that of traditional cash, (2) that currency is not

¹⁸ Cf. Mantel (2000, p. 30): "..., influencing incentives could also mean downgrading the value of some current payment product's attributes to make newer forms of payments relatively more valuable". The removal of the payment guarantee of the Euro cheque as of January 1, 2002 is an excellent example.

¹⁹ In a reply to a parliamentary question, the Monetary Authority of Singapore (MAS) stated in February 2001: "Today only currency notes are legal tender. As cashless forms of payment become more widespread, the Board of Commissioners of Currency, Singapore (BCCS) is looking into the need to legislate for electronic payments to *also* be accepted as legal tender" (my emphasis) <<http://www.mas.gov.sg/>>.

²⁰ Referring amongst other things to legal-tender laws and public receivability provisions, Cohen (2000) points out that "coercion has long been a part of every government's arsenal in monetary affairs".

going to disappear of itself in the foreseeable future, and (3) that electronic money can use a helping hand in its competition with this entrenched competitor. In short, it is argued that e-money both deserves and needs promoting.

4.1. The social cost of cash

All available estimates indicate that the social cost of cash is very substantial (Van Hove, 2002a; Humphrey et al., 2003). A 1993 study by the Boston Consulting Group, for example, put it at UKP 4.5 billion annually for the UK - which is equivalent to 0.75% of GDP. Concerning Belgium, in 1995 the Kredietbank (now KBC) estimated the social cost of cash at 25 to 40 billion BEF (0.35%-0.56% of GDP). A 1999 brochure published by the Belgian Bankers Association restates this estimate for Belgium and complements it with estimates (of unclear origin) for France, Germany, Spain, and the UK – all of which lie in the 0.5%-0.6% range (BVB, 1999, p. 19). In a more recent study, De Grauwe et al. (1999) find that the total resource cost of operating the cash system in Belgium amounts to BEF 68 billion, or 0.745% of GDP. The corresponding figure for the card-based system is only 0.11% of GDP. Given this, many economists seem to agree that considerable social savings could be reaped by encouraging the use of more efficient electronic payment systems and by discouraging the use of cash (Van Hove, 2002a, 2002b; Humphrey et al., 2003). ten Raa and Shestalova (2001a) estimate that in the Netherlands the difference between the social cost of cash and that of debit card payment (respectively NLG 1.36 and NLG 0.73 per NLG 100 in turnover) amounts to some 0.5% of turnover.

Note that increased efficiency is clearly one of the goals, if not the main goal, of the electronic legal tender system in Singapore. Mr Low was quoted commenting that "electronic tender is a way of keeping the rising costs of handling physical cash down"²¹. Low (2002, p. 148) cites a 1998 survey by the Asian Bankers Journal according to which it cost the economy S\$656 million (some USD 360 million) to support local currency in circulation, not counting "an annual expenditure of some S\$ 50 million incurred by the BCCS to manage the currency issue function". According to the same source, the cost of handling cash is projected to exceed S\$ 1 billion by 2006.

In the extreme scenario where cash is abolished, the social cost of cash would by definition disappear altogether. If cash is not abolished, as will be the case in Singapore, part of the potential cost savings would remain unrealised, particularly so because the cash distribution system involves a number of fixed costs.

²¹ Source: "Electronic money: the new legal tender", *ZDNet Asia*, December 19, 2000 <<http://www.zdnetasia.com/news/dailynews/story/0,2000010021,20166979-1,00.htm>>.

4.2. The underground economy

It is no secret that a substantial part of the currency stock is not used for everyday, legal transactions (Van Hove and Vuchelen, 1996). In Belgium, for example, only some 43% of the currency circulation would, in 1991, have been in active use in the above-ground economy (Van Hove, 1997). The remainder would either have been used for transactions in the underground economy, or would have been used as a store of value - with a distinct possibility that a large part of these hoards consists of profits from tax evasion or criminal activities. It is rather questionable - to say the least - whether central banks should continue to provide the means for such purposes. And this particularly so since the situation will only aggravate as the use of currency in the above-ground economy drops due to the increased use of electronic means of payment. Note that the Working Group on EU Payment Systems (1994, p. 10) was already of this opinion: "A negative aspect of the large-scale use of electronic purses, in combination with the widespread use of debit and credit cards, might be that, in the long run, the use of banknotes could be limited mainly to transactions in the underground economy, *for which purposes central banks may wish to avoid providing the means*" (italics added).

It is also worth stressing that in view of the anonymity it provides, currency will in all probability not die a natural death. As long as central banks continue to issue bank notes, the public will keep using them for reasons of privacy - both legal and illegal - since electronic means of payment do not provide an alternative in this respect. In other words, bank notes will most probably never disappear unless central banks actually decide to stop issuing them²². Interestingly, such a decision might result in a windfall for the government, as the experience of Iceland - where payment by card is reportedly more popular than anywhere else - has shown²³.

Obviously, underground activity would not disappear completely. In the absence of currency, those engaged in such activities would probably start using substitutes (such as foreign currency). However, the abolishment of currency would substantially raise the cost of doing illegal business.

4.3. A competition between networks: size matters

It is by now well known that payment instruments are subject to so-called network externalities (Van Hove, 1999). As more people use a certain payment instrument, more merchants are induced to accept it. This in turn increases its value for consumers. It is therefore essential to think of the competition between e-money and currency as a competition between networks (Van Hove, 1998).

²² Cf. also Goodhart (2000, p. 14): "The one circumstance where one might, indeed, expect information technology to bring an end to the use of national currency would be when an (authoritarian) government might prescribe that all transactions must go through an electronic device".

²³ Source: Phillips, R., "Icelanders play their cards right", *Sunday Express*, April 16, 2000.

Since consumer adoption depends to a large extent on the size of the network, e-purses are clearly going against an entrenched competitor, as currency is - by law - accepted (almost) *everywhere*, including - unlike most e-purses - in person-to-person payments. Clearly, if the newer payment technology has a significantly higher quality, this can compensate in part for the disadvantage in network size. Still, the latter is an important handicap because, as McAndrews (1995) puts it, "in payment systems, as with local telephone service, consumers demand 'universal service'". Making electronic money legal tender in an absolute sense would obviously overcome these acceptance problems at a blow. In the case of Singapore, however, the legal tender concept would not be absolute so that the positive influence of the decision, if any, will have to follow other channels (see below).

Another reason why electronic money can use a helping hand from the government is that a classic weapon in the rivalry between two networks - the price - is not easily available in this particular case. In principle, e-purse operators could compensate for the network disadvantage by charging a lower price. However, in most countries the public has been spared the real cost of cash usage. That is, the direct charges faced by consumers when using currency, if any, do not cover the full cost. Hence, consumers (mistakenly) think of currency as being free. And this makes it very difficult for e-purses to gain ground. Put pithily, under current circumstances e-money is not getting a fair chance (Van Hove, 2002a). The only possibility to compensate for the network disadvantage is to charge negative prices; that is, to pay consumers for using e-money. Some e-purse operators have done this: during the Mondex/Visa Cash trial in New York selected account holders received cards loaded with \$5 to \$20 of their bank's money (Van Hove, 2001). And interestingly, the BCCS in Singapore is seriously contemplating taking a measure that also goes in that direction; that is, they are contemplating paying interest on unspent e-money balances (Low, 2002, p. 149). This would clearly improve the competitive position of e-money.

5. Arguments against

5.1. Migration costs

As noted above, in my extreme scenario - the central bank issues electronic money alongside private operators and the legal tender concept is absolute - the technologies of all operators will have to be made interoperable. Depending on the technology chosen by the central bank, this standardisation can entail substantial migration costs for (some of) the private schemes and for the merchants participating in these schemes. In order not to endanger the envisaged efficiency gains, the central bank therefore might want to take these migration costs into consideration when making its decision and, when possible, opt for a solution that builds on the existing infrastructure.

In the case of Singapore, it looks like the technology choice has already been made. There is the government's decree that the only way to pay tolls on highways leading into the city center is with the local CashCard purse (Davis, 2000). Moreover, where payments for government services can be made on-line, it is by CashCard. And the BCCS is talking to NETS, the operator of the CashCard scheme - with the aim of leveraging on their infrastructure.

The migration costs related to an *absolute* electronic legal tender system would not be limited to existing schemes and merchants. Merchants who are not currently accepting e-purses would also be affected, as would private citizens. Indeed, whereas anyone can accept cash, accepting money stored on a card requires special equipment (CBO, 1996). Kokkola and Pauli (1994, p. 12) see this as a major impediment: "Accepting payments made using electronic cash requires a special reading device. It is therefore difficult to imagine that electronic cash would entail a statutory obligation to accept it in settlement of a debt".

Particularly P2P payments are a problem here. Currently only the Mondex card has such a feature. The Singaporean CashCard currently does not allow for P2P payments, nor do all other e-purses. In order to be able to do away with traditional cash, the technology would thus have to be adapted and citizens would have to be equipped with an electronic wallet of some sort. Perhaps mobile phones could offer a solution here. P2P transfers via mobile phones is a feature that has been announced for the Mondex e-purse since 1997 (Mondex International, 1997).

Another question is whether merchants who currently accept debit and/or credit cards but no e-purses should be forced to accept electronic money. In the Mondex/Visa Cash trial in New York, many merchants who already accepted credit cards dropped out (even though they did not have to pay anything) because they quickly found out that their average ticket was just too high to make e-purses sufficiently useful (Van Hove, 2001). Forcing such merchants to accept electronic money could imply forcing them to make a sizeable investment for a limited number of payments. On the other hand, in the absence of currency, the alternative would be to use the debit or credit card network for transaction amounts that perhaps cannot be handled cost-effectively. A final note is that it is not clear to what extent the SELT plans include Internet merchants.

5.2. Social exclusion

While everyone can use cash, this is not the case for electronic money. In many schemes, e-purses are linked to bank accounts and low-income consumers may not have such an account. They may also be unable to master the technology. This could eventually result in their exclusion from mainstream society.

However, this is a problem that will have to be tackled with or without an electronic legal tender system. In the UK, for example, a report by the Demos think-tank urged the Labour government to subsidise the switch from hard cash to electronic money to prevent sections of society getting "locked in the cash economy"²⁴. Under the policy proposal, poorer citizens could be given e-cash cards for free. In many countries the ability to pay with notes and coins is indeed increasingly curtailed. In Belgium, for example, only 30% of the public payphones still accepted cash in April 2001, compared to 45% in April 1999²⁵. This is because telephone operator Belgacom has been replacing coin-accepting payphones with newer models, many of which only accept Belgacom's Telecard and the local Proton e-purse. In the Netherlands, a number of municipalities saw the introduction of the euro as the perfect moment to start collecting parking fees electronically and to do away with cash payment and the associated vandalism (De Nederlandsche Bank, 2001, p. 26). As of 2002, the use of Chipknip - as the national e-purse is named - has become compulsory at all parking meters in the cities of Rotterdam and Nijmegen, and in Purmerend²⁶. As was set out under 3.1., the Netherlands does not have a strict legal tender regime. Still the Dutch government has had to prepare a specific statutory regulation to make the 'chip-only' collection of parking fees possible (De Nederlandsche Bank, 2001, p. 26). This is because it is seen as a collection of a tax, for which payment in currency can in principle not legally be refused. The new government decree did impose an important precondition, namely that sufficient sales points are in place where the public can use cash to buy a disposable e-purse that is not linked to any bank account - sometimes called a 'white card'. In this way consumers who do not have a Dutch banking account, including tourists, can also use the parking meters. The same is true for people who are concerned about their privacy, for that matter.

In Singapore, the BCCS is apparently aware of the potential social exclusion problem. As emphasized in Section 2, the timing of the introduction of the legal tender system is flexible. Mr Low was also quoted saying that "[The] system must reach every level and every strata of society. Otherwise, the electronic money will not be legal tender"²⁷.

There are several ways in which governments could try to stave off the danger of social exclusion. In Belgium, banks have agreed to provide basic banking services to everyone at an affordable price. One might envisage that such 'basic accounts' would include an e-purse. Another option would be for governments to provide (selected) citizens with an EBT card similar to the ones used in the U.S. or with a national ID card *cum* e-purse. In Asia, several such projects are on the stocks. Malaysia, for example, launched its Government Multipurpose Card in April 2001 and plans to cover the nation of 22 million within three to six years. The card combines national ID with

²⁴ Source: Hirst, C., "Labour urged to help the poor switch to e-money", *The Independent*, March 11, 2001.

²⁵ Source: own calculations based on data provided by Belgacom.

²⁶ De Nederlandsche Bank, *Quarterly Bulletin*, March 2002, p. 25.

²⁷ Source: Marican, N., "E-money ... as good as cash by 2008?", *Singapore.CNET.com*, December 19, 2000 <<http://www.singapore.cnet.com/news/singapore/story/0,2000027481,10033213-1,00.htm>>.

driver's license, passport and health applications. In addition, cardholders can load an optional e-purse (Balaban, 2001). This example shows that piggybacking on other smart card projects may be a low-cost way to put an e-purse in the hands of people who might be left unserved by banks. However, as argued in the previous sub-section this is not enough to enable people to make P2P transfers.

5.3. Government intervention

As was set out earlier, making electronic money legal tender implies that the central bank makes a technology choice. A classic theoretical argument against such government intervention is that the 'social planner' may lack the necessary knowledge to make an adequate choice: "An inferior or premature system would produce a socially suboptimal outcome by crowding out the demand for an optimal market system, and thereby would vastly reduce welfare" (Gowrisankaran, p. 10). Similar arguments have been raised against making electronic money legal tender:

"At the moment, ..., central banks are not interested in exercising a monopoly on issuance because they first want to wait and see to what extent e-money penetrates the market, because they do not wish to signal any desire to hamper the market's innovatory diversity ... " (Friederich, 1997, p. 16).

"With regard to the question of whether the [Hong Kong Monetary Authority] should look into the feasibility of participating in the issue of e-payment instruments, it is undesirable at present, since it might have the effect of stifling private sector initiatives"(CPSS, 2001, p. 40).

Concerning Singapore, one could argue that the local market for e-purses is mature, even though usage of the CashCard outside of the Electronic Road Pricing scheme - where it is compulsory - is still low (Davis, 2000). After all, the CashCard has been available since 1996, it is owned by 7 local banks, and it was quick to link up with the international CEPS standard - which in the meantime has been endorsed by more than 95 percent of the world's e-purse programmes. On the other hand, on the Internet e-purses are clearly not the only possible means of payment for low-value transactions. However, as mentioned above, it is not clear whether the plans of the BCCS include Internet merchants.

5.4. Privacy

Privacy, which following Kahn et al. (2000, p. 24) can be defined as "the ability to conceal information", is another important issue. In the terminology of Kahn et al. (o.c., p. 21), declaring a form of e-money legal tender so that it must be accepted by merchants 'defines an information revelation regime'. Kahn et al. examine the case where electronic money is "the electronic equivalent of currency" (ibid.). Hence, "the availability of e-money would define an information

revelation regime by assigning to the consumer the sole right to information revelation" (ibid.; my emphasis). Goodhart (2000, p. 19) clearly has a different type of electronic money in mind: "... electronic money does not have the characteristics of currency. It is not anonymous, and it is not legal tender. Given these special characteristics, the demise of currency at the hands of information technology will not happen, at least not unless an authoritarian government should decree that it must happen. ... such a prospect would terrify anyone with the slightest concern for liberty and freedom among people ...". However, the Orwellian nightmare envisaged by Goodhart need not happen. The nice thing about e-money is that it can be programmed. It should therefore be possible to strike a balance between the privacy concerns of the population and the law enforcement needs of the authorities ²⁸.

5.5. Security

As Kokkola and Pauli (1994, p. 12) point out, "the statutory obligation to accept imposes especially heavy demands on the legal safeguards of the individual. The recipient must be able to rely on the authenticity of money. It must be possible to define unambiguous verification methods. This is difficult when we are talking about money in an immaterial, electronic form". Counterfeit electronic value is indeed indistinguishable from 'real' electronic value, in particular to the public. As a result, security breaches must be avoided as they would undermine public confidence. Private electronic money schemes obviously face the same challenge. However, given that in a cashless society an electronic legal tender system must allow for person-to-person payments (cf. 5.1) and may need to allow for a certain degree of anonymity (cf. 5.4), an electronic legal tender system may require more sophisticated (and thus perhaps more expensive) solutions.

In the extreme scenario, the technical reliability of the e-money system is of paramount importance, since cash is no longer available as a fall-back option in case something goes wrong. Concerns about the so-called continuity of payment systems have clearly increased after the 9/11 events (Monks, 2003).

7. Conclusion

Table 1 tries to summarize the main pros and cons of the two scenarios studied. Items in bold indicate that the advantage or disadvantage carries more weight in the extreme scenario compared to the SELT plans. It is not easy to come up with a hard conclusion on SELT, particularly so because there is still some uncertainty concerning a number of modalities. However, given that the legal tender concept will in all probability not be absolute, changing the legal status of e-money will in itself have only little impact and will not solve the acceptance problems e-money currently

²⁸ Balaban (2001) claims that many Asian governments are "more insulated from public opinion, and, therefore, privacy concerns, than their Western counterparts".

faces. Any positive influence on the uptake of e-money will have to come from the interest that might be paid on unspent SELT, or from the explicit government support of the new means of payment. As a result, a sizeable part of the potential social savings stemming from a reduced use of traditional cash will remain unrealized. Given that traditional cash would still be issued alongside e-money, the introduction of SELT will also not deal a blow to the underground economy.

Table 1 – Overview of pros and cons

SELT		extreme scenario	
+	-	+	-
<ul style="list-style-type: none"> • 'negative fees' provide stimulus for e-money • social cost of cash lower 	<ul style="list-style-type: none"> • migration costs • social exclusion • privacy • security 	<ul style="list-style-type: none"> • acceptance problems solved • social cost of cash eliminated • blow dealt to underground economy 	<ul style="list-style-type: none"> • migration costs • social exclusion • privacy • security

The more extreme scenario developed in this paper would, by definition, score better in these two respects: the social cost of cash would disappear altogether and the life of those active in the underground economy would become more difficult. But then all of the cons also loom larger compared to the more prudent scenario envisaged in Singapore. Weighing the pros and the cons is not easy, particularly not because their importance may differ from country to country: how efficient is the current payment infrastructure?, how important is traditional currency?, how large is the underground economy?, what is the degree of penetration of electronic money?, are the e-money schemes interoperable?, how compact is the society?, what is the level of education of the population?, etc. On the whole, however, my impression is that the potential efficiency gains are substantial (cf. the social cost of cash and the underground economy), while many of the potential problems (social exclusion, privacy concerns, etc.) can in principle be managed - if not now, then perhaps in the near future (providing everyone with a low-cost P2P device).

However, an important consideration is whether similar efficiency gains could not be obtained in another way (without resorting to the drastic decision of making e-money legal tender in an absolute way), and whether such an alternative approach could not avoid some of the drawbacks of the electronic legal tender system. As Charles Goodhart notes: "What is most important is the general acceptance of a means of payment. The legal imposition of legal tender is simply a means of bolstering such acceptability. That status may be neither necessary nor sufficient to achieve such general acceptability" (2000, note 20, p. 16). This is why I would like to end this paper with

some food for thought. For example, could not (the prospect of) the abolition of traditional cash be sufficient? The central bank could set a date in the not so distant future at which it would stop issuing currency. The central bank could leave it to market forces to come up with solutions, and play a corrective role when and if needed. Or it could provide an alternative itself. To avoid uncertainty, the government could perhaps make certain electronic means of payments legal tender in dealings with the government. Alternatively, perhaps encouraging or compelling banks to resort to direct costing for their means of payment would go a long way in promoting the efficiency of the payment infrastructure (Van Hove, 2002a, 2002b)²⁹. Explicit transaction-based (as opposed to account-based) pricing would make visible the real costs of payment services and would motivate consumers to switch to the least expensive. This policy could even be combined with the first option. Clearly, there are no easy answers, but it is my conviction that we should start to envisage a world without traditional cash, and that it is therefore time to start thinking about just how this move towards the long-awaited cashless society should be brought about.

²⁹ It would, however, be of little help in reducing the size of the underground economy since the gains to be reaped from underground activity would remain larger than the cost related to cash payments.

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