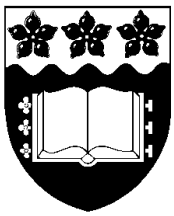
View metadata, citation and similar papers at core.ac.uk

brought to you by CORE

provided by Research Papers in Economics



University of Wollongong
Department of Economics
Working Paper Series 1998

Regulatory Issues in Electronic Money: A Legal-Economics Analysis

Boon-Chye Lee

and

Olujoke Longe-Akindemowo

WP 98-2

REGULATORY ISSUES IN ELECTRONIC MONEY: A LEGAL-ECONOMICS ANALYSIS

Boon-Chye Lee

Department of Economics
University of Wollongong

and

Olujoke Longe-Akindemowo

Faculty of Law
University of Western Sydney, Nepean

Presented to the 1st Berlin Internet Economics Workshop, Berlin, Germany,
24-25 October, 1997

Department of Economics
University of Wollongong
Working Paper Series WP 98-2
ISSN 1321-9774
ISBN 0 86418 575 8

ABSTRACT

In this paper we examine regulatory issues relating to electronic money. The discussion proceeds along three main lines. Firstly, the focus of attention on the potential risks to the financial system is typically on the systemic risk arising from the payments system. Since issuers of electronic money automatically become part of the payments system, we consider if the arguments relating to systemic risk originating in the payments system apply in the case of electronic money. Secondly, we examine the sharp divergence in regulatory approaches between the US and the EU, and suggest that a useful way of reconciling this divergence is to note the existence of a tradeoff between the efficiency of the financial system and the amount of risk assumed by the public sector. This means that there is not necessarily a "correct" answer to the question of the desirability of regulation. Thirdly, technological advances and financial innovations have made it easier for firms to engage in regulatory arbitrage. Competitive pressures may have encouraged financial centres to engage in competitive deregulation, resulting in a less than socially optimal level of regulation overall. It is therefore important that national authorities coordinate and harmonise their regulatory policies.

1 INTRODUCTION

In recent years, the trend worldwide has been towards the relaxation or removal of outmoded regulations and a focus on financial market efficiency through greater competition. Technological innovations in the financial markets have produced services and products that pose challenges to financial market regulators. A prime example of this is in the area of payments services. There is little doubt that as part of the drive towards greater efficiency the world is moving towards less cumbersome media of exchange and more efficient means of transferring money, and specifically towards the development of products commonly referred to as “electronic money” or “digital money”. At the same time, this drive must be tempered by the need to maintain system integrity and soundness. At some stage a tradeoff between system efficiency and riskiness will become operative, and it is a matter of judgment whether we have reached that stage.

In this paper we look at regulatory issues relating to electronic money. Specifically, we consider whether the rationale for financial regulation can or should be extended to electronic money. A divergence of views between the US and the European Union is immediately apparent, and we look into the implications of this.

The structure of the paper is as follows. In the following sections we will look at the question of regulation from both an economics and a legal perspective. We begin by discussing the two main types of electronic money in section 2. This provides the context against which an overview of the economic case for the regulation of financial markets may be given in section 3. The economic rationale for financial regulation is based on a two-fold argument, containing the threat of systemic risk and consumer

protection. In section 4 we evaluate from a legal perspective the "general business of banking", an approach which is based on the systemic risk argument, before moving on to consider more explicitly issues relating to the regulation of electronic money in section 5. Our concluding remarks are made in section 6.

2 ELECTRONIC MONEY

Electronic financial transaction systems have been distinguished according to whether they involve the transfer of account balances, incorporate electronic cheques, utilise secure value counters, or are token-based.[1] The first two are in essence systems involving only electronically-communicated *instructions* about the transfer or payment of funds. The latter two categories more closely approximate what we might term 'electronic money', which is the focus of our paper.

In general, two basic versions of electronic money systems may be identified: general-purpose value stored on card-based media (general-purpose stored-value cards, or SVCs) and network money. We discuss stored-value cards and network money in turn.

2.1 Stored-Value Cards

Stored-value cards (SVCs), or pre-paid cards, are sometimes referred to as 'electronic purses'. Most commonly, stored-value cards are used to provide secure counters of value which may be progressively reduced in exchange for goods and services, although there are systems in which the digital value stored on the cards take the form of denominated tokens that are transferable between system users. We focus our attention on

1 Furche and Wrightson (1996), at pp. 25-33.

general-purpose cards whose stored value may be exchanged for a wide range of goods and services, in contrast to more limited-use cards such as telephone cards and travel cards. Obviously there is no clear-cut demarcation line between these two extreme cases. Instead, a spectrum of cards can be envisaged ranging from single-purpose cards to general-purpose ones. The presence of network externalities means that general-purpose cards are more desirable from the point of view of users and that this is the probable direction which will be taken in the evolution of this particular payment method.[2]

The value balance stored in SVCs is 'spendable' by the card holder because the system incorporates previously agreed arrangements between the card issuer and participating retailers. This balance is evidence of the card holder's entitlement to value which has been purchased by a pre-payment to the card issuer. As a result of previously agreed arrangements between the card issuer and participating retailers, the latter agree to extend goods or services in exchange for the transfer of an appropriate amount of value from the cardholder's card. The value data transferred from the cardholder to the retailer in exchange for the commodities provided is what will enable the retailer to claim reimbursement from the card issuer. Reimbursement generally involves the retailer downloading or otherwise resubmitting to the card issuer the value data received from the cardholder.

The balance on the card may be accessed, adjusted and updated either on-line or off-line, but the latter is the preferred option as it is cheaper. Off-line operations presently assume that

2 Stored-value cards may be incorporated as part of what are popularly known as "smart cards", cards with an embedded microchip capable of storing data not all of which is necessarily financial in nature, such as medical records. However, it is not the smart card *per se* which interests us, but that aspect of smart cards which constitutes a form of payment medium, i.e., the stored-value aspect of these cards.

the hardware utilised (cards, terminals, wallets) is tamper-proof, and that the risks implicit in off-line operations have been reduced to an acceptably low level. Though transactions are often inflexible in that they permit only transfers to a supplying retailer, off-line systems may permit peer-to-peer transfers.

2.2 Network Money

We use the term 'network money' to refer to those electronic impulses that are employed as value, and that may be stored on a computer hard disk. Network money systems are software-based, and envisage the exchange of electric impulses as the end, not merely the means of a transaction. Although present protocols incorporate single-use tokens and occasional or eventual references to an issuing/validating financial institution, network money transactions envisage the eventual exchange of value without the need for such reference. Protocols incorporating multiple-use tokens will thus permit peer-to-peer transactions.

The risk of double spending in these software-based systems is controlled by the use of single-use tokens and on-line verification of their currency. Transactions can be made anonymous for the spender of the coin (the customer) by the use of 'blinding' technology. This enables the customer to scramble a self-generated coin in such a way that its serial number is temporarily obscured when the coin is submitted to the financial institution for validation. The validated coin can subsequently be unscrambled before being spent by the customer. Details of the underlying sale transaction need not be included in the data making up the token.

It is likely that network money will continue to evolve towards multiple-use token-based systems. The portability and/or (in)violability of the media upon which such value could be

stored would, however, also raise many security issues[3] as would the possible location of substantial amounts of value outside conventional financial domains.

3 ECONOMIC CONSIDERATIONS CONCERNING FINANCIAL REGULATION

In this section we examine the economic arguments justifying regulation in financial markets. Following Breyer and MacAvoy (1987), we use the term 'regulation' to refer to governmental actions, which are typically grounded in statute, to grant or condition the rights of firms to provide goods and services in particular areas of economic enterprise with the purpose of preventing decisions by private agents that would take insufficient account of the 'public interest'.

There are two main categories of regulation arising from this definition, both of which are based on the recognition that there may exist factors which prevent the efficient pricing of goods and services in the financial sector. Both rely on the presence of some form of market failure which may necessitate governmental intervention. The first category of regulation is designed to address the presence of third-party, or spillover, effects in the form of systemic risk. The second is designed to protect the interests of the consumers of financial products and services.[4] The discussion which follows is summarised in Figure 1.

3 Such as unauthorised duplication, multiple spending, and the irrecoverable destruction of the storage media with value.

4 In the first case, the "public interest" may be associated with alleviating the problem of spillover effects; in the second case, it is directly associated with the protection of consumers.

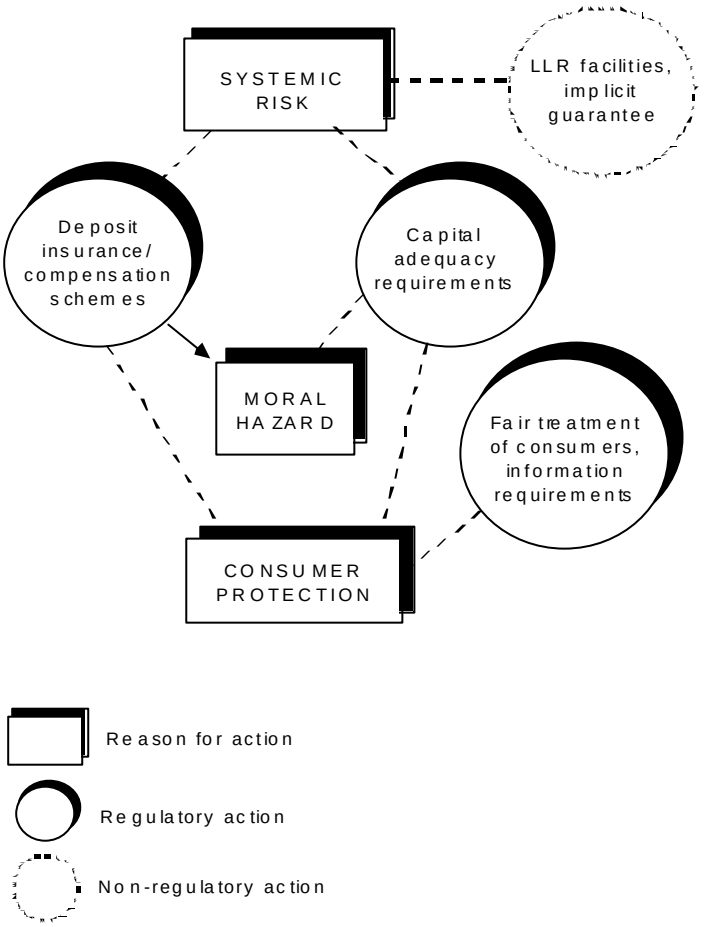


Figure 1: Official Intervention in Financial Markets

3.1 Systemic Risk

The most commonly identified externality in financial markets is the spillover effect of the failure of a financial institution — by which we refer to banks and other deposit-taking institutions — on to the real economy. The exact nature of this externality, commonly referred to as 'systemic risk', is not well understood,

but it is the most potentially serious externality in financial markets.

Systemic risk arising generally from the role and position in the payments system of the financial institutions is of particular concern to regulatory authorities. It is argued that maintaining the integrity of the payments system provides a compelling reason for the regulation of financial institutions.[5] According to Borio and Van den Bergh (1993):

> Payment arrangements represent the connective tissue of all financial and real economic activity, as it is the ability to settle transactions, and confidence that the counterparties will do likewise, that underpins it. Inevitably, therefore, payments arrangements can be a key channel for the transmission of shocks across institutions and markets even when they are not the original source.[6]

In general, payments system participants are exposed to two types of risks: credit risks and liquidity risks. *Credit risk* is essentially the risk of loss on the outstanding claims on participants in a transaction. The parties to a transaction will generally include the counterparties to the transaction, the issuer of the settlement medium (in other words, the payment intermediary, typically a bank), and the delivery intermediaries,[7] if any. Credit risk is realised when any of the participants accepts a remittance of funds that the remitter does not possess (i.e., defaults on their part of the contract).

---

5 See, for example, Hoenig (1997).

6 Borio and Van den Bergh (1993, pp. 31-32).

7 These are the intermediaries in charge of delivering the good being bought and sold. For example, in the case of the sale and purchase of financial securities, the delivery intermediary might be the securities depository handling the exchange of title.

Liquidity risk is the risk of the unavailability of the settlement medium when it is due. Liquidity risk is realised when the account of a participant in the transaction turns to deficit in the short term, and when the participant's plan for remaining liquid fails and it cannot raise the needed funds to remain liquid at short notice.

Borio and Van den Bergh (1993) distinguish between credit risk and liquidity risk as follows: credit risk refers to the possibility of an actual loss, whereas liquidity risk refers to the possibility of a cash-flow shortfall. Both types of risk can give rise to a systemic crisis (Oritani, 1991). A systemic crisis can be brought about when the credit or liquidity risk involving only the parties in a transaction spills over and affects other participants in the payments system. For example, the failure of one financial institution could trigger a run on other financial institutions which are fundamentally sound financially. Similarly, chain reaction effects can also arise from a single financial institution's liquidity crisis.

One description of how a systemic crisis could come about is provided by O'Driscoll (1988):

> The mechanism for this domino effect may be either direct or indirect. It is direct if, for example, the failed bank served as a correspondent bank for other banks, and their losses lead to their insolvency. The mechanism is indirect if the first bank's failure causes fearful depositors to withdraw their funds from other solvent but illiquid institutions. This 'contagion' effect involves a classic banking panic, in which widespread depositor runs on banks occur. In this case, the payments mechanism itself is threatened. If a contagion effect exists, it would be a prime example of the possible third-party effects of a bank failure.[8]

8 O'Driscoll (1988, pp. 661-662).

In such an event, the effects of the collapse of an individual financial institution would be multiplied many times over. In either case, the business of banking is recognised as a form of public good whose benefits are enjoyed by the community at large; the failure of the banking system, it is argued, would have effects far beyond those felt immediately within the banking / financial industry.

There is another dimension to systemic risk which derives from the ability of firms to conduct their business in different jurisdictions, viz., cross-border spillover effects. That is, a systemic crisis originating in the payments system of a single country could spark a chain reaction that spills over to participants in payments systems in other parts of the world.

Two types of regulation are associated with attempts to minimise the threat of a systemic crisis: arrangements to insure the deposits of consumers of deposit-taking institutions or otherwise compensate them for losses suffered in the event of failure of a financial institution; and capital adequacy requirements designed to minimise the risk of institutional insolvency. In both cases, the need to alleviate the threat of a systemic crisis is closely related to the protection of investors' deposits.

The protection of consumers' deposits gives rise to the well-known moral hazard problem: if consumers' deposits are insured against loss, there is little incentive for them to require the financial institutions to take proper precautions in their investment activities, and little incentive for the financial institutions to do so; as a result, the level of risk-taking by these institutions will be higher than is socially optimal.

The moral hazard problem in turn necessitates regulation in the form of prudential constraints on their behaviour.[9] These typically take the form of capital adequacy requirements. Prudential regulations in the form of capital adequacy requirements, then, fulfil a three-fold function: they ensure a minimum amount of capital to back up the liabilities of financial institutions, providing a cushion in the event of institutional failure; they provide investors with greater confidence in the soundness of the financial institutions; and they alleviate the moral hazard problem by forcing the financial institutions to internalise to a greater extent than otherwise might be the case the effects of their risk-taking activities.

Regulation, however, is not the only way of dealing with the threat of a systemic crisis. The role of the central bank in providing lender-of-last-resort facilities is recognised to be an important way of reducing this threat. In addition, instead of an explicit guarantee of consumers' deposits in the form of a deposit insurance scheme, there may be an implicit understanding that the authorities will not allow the 'larger' financial institutions to fail.

The mainstream view of financial regulation outlined above, however, is by no means universally accepted within economics. In particular, the free banking school rejects the need for any form of financial regulation, arguing that there is nothing distinctive about money that would justify making it an exception to the general rule that free trade is best (see, for example, Dowd, 1996; Selgin and White, 1994). An intermediate position is taken by Benston and Kaufman (1995, 1996). With the free banking school, they argue that there is little evidence that the financial system is

9 See Edwards and Mishkin (1995, pp. 40-41) for a discussion of how capital adequacy requirements can ameliorate the moral hazard problem while doing away with the need to restrict the activities of the financial institutions.

inherently unstable and subject to contagion effects and, furthermore, that since firms in the financial sector are no different from firms in any other industry, there is no justification for consumer protection regulations. However, they argue in favour of capital adequacy requirements to counter the moral hazard problems arising from a government-funded deposit insurance system, which they regard as an evil whose existence must be dealt with.

On the other hand, as Dale (1996) notes, it is overwhelmingly the case that the regulators of the major industrial countries accept the reality of systemic risk. Indeed, while the issue remains unsettled, the very possibility (however remote) of a contagion effect in the financial sector can be argued to warrant regulatory measures in the financial sector because of the huge potential costs involved.

3.2 Consumer Protection

As outlined above, the threat of a systemic crisis arising from a generalised panic run on financial institutions gives rise to a perceived need to protect the deposits of consumers to alleviate this threat. Financial markets are prone to another form of market failure, viz., the inadequate supply of information relating to financial products being offered to consumers. This form of market failure may arise from the fact that the financial state of affairs of financial institutions, with their networks of interconnected financial ties and investments, is not readily discernible to the average consumer; it may also arise from the complicated nature of some financial products. In the case of electronic money services, the problem is particularly acute. The sophisticated state of the technology, the location of the industry at the junction of economics, cryptography, law, and computer technology, makes it particularly difficult for most people to

grasp the entirety of the product being offered. In this area, appropriate regulatory action may take the form of market practice regulations (such as a requirement to provide information about a product or service or laws against insider trading) that are designed to ensure that consumers are treated fairly. There is little dispute that such forms of regulation are desirable.

In summary, the economic case for financial regulation has traditionally rested on the need to contain systemic risk and on the need for consumer protection. Furthermore, regulations aimed at containing systemic risk tend to have an institutional or prudential focus, such as those relating to financial institutions and the prudential requirements applying to them; consumer protection regulations, on the other hand, tend to have a product focus aimed at setting standards of conduct in the markets for the relevant products and services (Edey, 1996).

4 LEGAL CONSIDERATIONS CONCERNING FINANCIAL REGULATION

Jurisprudential theory recognises that the maintenance of social order by means of rules and sanctions is a key function of the law. The prevention of or control of activities capable of threatening the financial system thus constitutes the meeting point for the lawyer and the economist on the issue of financial regulation. Economic theories and policies prompting the regulation of the financial system are effected and enforced by means of legal rules which of course are formulated in legal terms and subject to legal interpretation. Policies based on economic formulae are often supported and enforced directly or indirectly by means of legal enactments, the words or tenor of which ideally reflect those policies.

In common law systems such as the Australian legal system, the doctrine of the rule of law plays a fundamental role. This requires *inter alia* that standards against which intended actions may be compared must be provided by the law. Jurisprudence, which is the philosophy of law, has long recognised that the setting of standards is one of the fundamental functions of the law; the rules of statutory interpretation also presume, for the sake of the flexibility and responsiveness of the law, that regulation may be extended to new risks or phenomena on the basis of analogies, because the express mention of every possible subject in advance is impossible.

This makes definitions and conceptual similarities very significant to the common law lawyer — definitions are crucially relied upon for the determination of the scope of a concept, and the extension of regulation applicable to such a concept to a newer concept is regarded as justified in certain circumstances. The drawing of analogies between electronic money, and that which is commonly regarded as money thus bears a particular significance for the lawyer. To the lawyer, it is conceivable that arguments for or against the extension of regulation or regulatory objectives may derive in part from analogies drawn from their (dis)similarities. In evaluating whether an activity or other phenomenon ought to be made subject to regulation, the legal analyst will examine that activity for similarities shared in common with other activities already the subject of regulation. Novel features not possessed by already regulated activities will also be of interest as they may argue for or against the extension of regulation to that activity.

Where financial regulation is concerned, attention is focused on the scope of the 'general business of banking'. The categorisation of an activity as falling within this description has legal consequences: for example, the carrying on of the business of banking by an unlicensed entity is typically an offence or, where

authorised, is accompanied by extensive regulation.[10] The rationale derives from the economic concept of systemic risk, particularly contagion risk, which was discussed in the previous section. It is a widely-held belief that contagion risk is highest among deposit-taking institutions like banks.[11]

The scope of the general business of banking varies according to jurisdiction. In Australia, the concept is given a relatively narrow scope: thus, the taking of deposits, the lending of money, and the repayment of money are restricted activities. The operation of current accounts and cheque accounts have tended to be regarded as merely incidental means by which the core functions might be accomplished[12] — the taking of deposits rather than the operation of particular accounts has thus been regarded as central. This conception of the general business of banking is broader in Europe. In England, for example, the Australian conception was considered dated and the banking functions of collecting cheques for customers, paying of cheques drawn on the

10 A distinction is made in Australia between 'the general business of banking' which is restricted to banks, and 'banking business' which may be permitted to non-banks with permission. An individual (incorporated or unincorporated) wishing to carry on 'banking business' may thus be exempted from most banking regulations while being allowed to conduct limited banking functions. Financial institutions involved in the provision of payment services typically obtain exemptions where the applicable legislation permits. See, for example, ss.8, 11 Banking Act 1959 (Australia).

11 See, for example, Financial System Inquiry (1996, p. 96).

12 See *Commissioners of the State Savings Bank of Victoria v Permewan, Writh & Co Ltd* (1914) 19 CLR 457, where the Australian High Court determined the essential features of banking business to be the taking of deposits, the advantageous use of such deposited funds, and the repayment of those funds as and when agreed with the depositor. This definition was affirmed fifty years later in *Australian Independent Distributors Ltd v Winter* (1964) 112 CLR 443 despite the adoption of a broader concept in other jurisdictions such as England.

bank itself, and operating current accounts, treated as fundamental.[13] In Germany, the business of banking is defined under statute to include deposit taking, lending business, and guarantee business, among others.[14]

The question of what is or ought to be exclusive banking business is a politically sensitive issue that may be influenced by policy, competition concerns, or consumer protection concerns, to name a few. Because the definitive section of the German Banking Act had been interpreted in such a way that stored value cards might be excluded, regulators, anxious to secure and maintain central bank control over the emerging technology, added new sections which specifically include the issue of prepaid cards and network money within its ambit.[15] In Australia, in contrast, the issue of stored value by entities other than licensed Deposit Taking Institutions has not been prohibited, although it has been indicated that such entities may be required to hold collateral against unsettled claims or meet other requirements deemed necessary in open systems.[16] Policy statements made by US regulators revealing that prepaid cards will probably not be regarded as deposits for the purposes of the Federal Deposit Insurance Act save in limited circumstances[17] reflect the desire of regulators there to avoid the disruption of the development of the technology.

---

13 See *United Dominions Trust Ltd v Kirkwood* [1966] 2 QB 431.

14 See s.1 of the German Banking Act.

15 See Friederich (1997) at pp.12-15.

16 See Financial System Inquiry (1997, pp.402-404).

17 See Smith and Wilson (1997, p.1116, 1117) quoting FDIC General Counsel's Opinion No.8, Stored Value Cards, 61 Fed Reg. 40,490 (1996), which considers the case of funds held by insured depository institutions, and concluding that stored-value cards will be regarded as deposits where the funds remain in the consumer's account until a vendor demands payment, but not, for instance, where the funds are held temporarily for a third party, or received or held by a third party.

A closed electronic purse system is one where the card issuer, directly or indirectly, provides all commodities purchasable by means of card. Although the line of demarcation is not presently fixed, it may be said that a system is open where the card issuer is distinct and independent from the provider(s) of commodities which may be purchased by means of the card. Irrespective of whether a system is regarded as involving the taking of deposits or not, it may be that its arrangement as an open system triggers regulatory measures. The scrutiny and compliance burdens associated with such regulation may mean that banks or financial institutions alone will be permitted to issue value, with the participation of nonbank financial institution (NBFI) developers being limited to system establishment, development and maintenance. Regulator attitudes to this issue have been discussed above.

5 THE REGULATION OF ELECTRONIC MONEY

From the foregoing, it seems clear that some minimum level of regulation of electronic money is required. The question is, what form should the regulation take, and when should it be applied? While consumer protection concerns provide reasonably clear answers to these questions, we can offer no definitive answers from the systemic risk perspective. Nonetheless we are able to make some observations that may serve to guide the way the questions are approached.

As a preliminary to our discussion, we note that clarity with regard to the legal rights and obligations of participants in the new payments services is a prerequisite here, as in all other markets, for the efficient development of the market. The relative novelty of electronic stored value products and payments services raises concerns that there may be uncertainty about the legal rights and obligations of participants in these products, and about

the enforceability of contracts surrounding them.[18] As Borio and Van den Bergh (1993) note in the context of the payments system generally:

> The lack of clarity in the legal framework can be a source of risk in its own right to the extent that it creates uncertainty about, or leads to incorrect perceptions of, exposures to potential losses... As a result, the actual risks run could be significantly higher than assumed.

It may be the case that the market itself will evolve some convention allocating these rights and obligations among its participants, or it may be that the government will have to take a more active role in the process. However, the actual allocation of legal rights and obligations is not as important as the fact that *some* unambiguous allocation is made (Coase, 1960). This allocation of rights and obligations does not fall within our definition of regulatory action since, by and large, there are no resulting third-party effects. We take it as given that a clear allocation of rights will be achieved. At the same time, the manner in which disputes between participants in the new payments technology are resolved will shape the way electronic payments and money will evolve. To the extent that regulatory imperatives are conditioned by the latter, we will need to take the allocation of rights and obligations between parties into account.

On the question of the regulation of electronic money, we note that issuers of electronic money automatically become part of the payments system regardless of their status as banking institutions or otherwise. Therefore we will have to consider if the arguments relating to systemic risk originating in the payments system apply in the case of electronic money. If so, we will also have to take into account the added dimension of cross-border spillover effects.

---

18 Patrikis (1997) discusses, *inter alia*, some of these issues.

Our judgment is that at the current stage of development and usage of electronic money products, payments risk is likely to be minimal because the medium is used at the retail rather than wholesale level. This is likely to continue to be the case in the foreseeable future. The implications are two-fold. First, the absolute size of total payments involved will be small compared, for example, to the amounts involved in interbank wholesale transfers. Second, as currently used, electronic money media predominantly take the form of *prepaid value* and hence all payments are ultimately fully backed by deposits.[19] Both these situations could change, of course, but this simply means that developments in electronic money, as in financial markets generally, will have to be continually monitored.

However, if the use of electronic money becomes widespread, the failure of a large electronic money issuer or of its system could seriously jeopardise the payments system. The failure of any participant in the payments system, as noted earlier, could have a disruptive impact on the economy, depending on the size of the participant and its credit and payments system links. The impact of the failure of an issuer of electronic money would depend not just on its size but also on the degree to which the use of electronic money had become entrenched in the spending habits of consumers.

In addition, if the integrity of electronic money systems comes under threat, the effect could be catastrophic. Electronic money may be inherently more subject to fraud and counterfeiting than traditional forms of money. Friederich (1997) notes that:

19 Solomon (1991) makes a similar point: "Payments risk may be one [example of a negative externality] but this seems less of a problem at retail rather than wholesale since money cashing is backed by deposits; we do not see any potential 'unwind' situation or systemic risk… The situation at retail is unlikely to lead to any rapid-fire payments shocks." (at p. 180)

> [The integrity of] e-money systems … is primarily a product of the resilience to counterfeiting, the security and the reliability of the technology employed as well as the creditworthiness and liquidity of the issuers. Whereas the latter can be adequately covered by general banking supervision — assuming that the issuers are banks — assessing the risks of counterfeiting and the systems' technical and organisational stability poses a new challenge to central banks.

He goes on to paint a nightmare scenario in which electronic money issuers could be faced with failure, with serious ramifications:

> [I]n the event of massive forgeries, the issuer will find himself facing claims which he cannot dismiss because he has no way of differentiating between forgeries and genuine units of value. Once e-money products are then no longer accepted, the distribution of products and services via vending machines and similar equipment as well as retail sales would come to a halt. Owing to the preceding substitution of e-money for cash, it is possible that insufficient banknotes and coins might be available at short notice.[20]

At the same time, the need for security in electronic money products is widely recognised to be a crucial aspect of these products if they are to gain wide acceptability among the retail public. A task force on the security of electronic money established by the central banks of the G-10 countries into the security of electronic money recently declared itself "impressed with the amount of research that has been undertaken and resources that have been expended on the security of electronic money products."[21] However, while it concluded that the security measures that have been developed so far "should provide a high degree of security for electronic money products in their initial

20 Friederich (1997, p. 10).
21 Bank for International Settlements (1996, p. 26).

stages" it implicitly acknowledged the need for ongoing research "as the resources and capabilities available to both suppliers and potential attackers of these systems increase".[22] The problem of fraud and counterfeiting, however, is not one whose solution is to be found in regulation.[23] We merely note its existence and pass on.

There has been much debate over the question of whether issuers of electronic money should be required to have the status of banks. To do so would bring electronic money issuers under the regulatory oversight of the banking authorities. A sharp divergence of approach on this issue is immediately apparent in the official positions taken by the European Union and the United States. The close analogies drawn between the activities of the issuers of stored value cards and deposit taking under the laws of some member states of the European Union led to the recommendation in a 1994 report to the European Monetary Institute that only banks should be allowed to issue multi-purpose prepaid cards (Working Group on EU Payment Systems, 1994). The Report notes that every such card scheme by definition involves the taking of deposits by the issuer, and that therefore the right to issue electronic purses should be restricted to banks in order, *inter alia*, to protect the integrity of the retail payments system and to protect consumers against the consequences of the

22 Bank for International Settlements, *op. cit*., p. 26.

23 That is to say, it is a problem best addressed by individual operators and providers, perhaps working cooperatively to develop and agree on a standardised set of protocols, by ensuring that security safeguards are built into their systems. As an official of the U.S. Office of the Comptroller of the Currency states: "Our stored-value guidance … emphasizes that transactions must be secure, but it does not specify particular security measures that must be taken" (Kamihachi, 1997). In addition, ceilings on the amounts that can be held on electronic money storage devices can help limit the potential losses suffered by users. This may well be a measure that will be taken by providers without the need for regulation, in order to enhance the attractiveness of their product.

failure of the issuers. This recommendation is to be extended to include network money.[24]

By contrast, US officials have adopted a wait-and-see approach,[25] wary of introducing regulations that might stifle innovation in the market.[26] A selection of quotations will suffice to illustrate this point:

> On behalf of the entire Board, I want to state clearly at the outset that the Federal Reserve has not the slightest desire to inhibit the evolution of this emerging industry by regulation, nor to constrain its growth. On the contrary, the Board has and will continue to encourage innovations in payments technologies that benefit consumers and businesses.[27]

> The development of electronic money clearly gives rise to important and legitimate areas of government concern… At the same time, government must be ever mindful not to unnecessarily impede free market developments.[28]

> As financial systems become more complex, detailed rules and standards have become both burdensome and ineffective, if not counterproductive. If we wish to foster financial innovation, we must be careful not to impose rules that inhibit it. I am especially

---

24 Friederich (1997, at p. 14) has declared that "network money systems … are to be subject to the full set of banking supervision requirements."

25 Kamihachi (1997) provides an illuminating account of the approach taken by a U.S. supervisory authority in offering guidance to providers and in monitoring developments in the market.

26 The Reserve Bank of New Zealand also appears to have taken a similar stance. See Ledingham (1996).

27 Blinder (1995).

28 Ludwig (1995).

> concerned that we do not attempt to impede unduly our newest innovation, electronic money.[29]

One way of resolving the apparent conflict between the US and the EU approaches is to recognise that there is a tradeoff between the efficiency of the financial system and the amount of risk assumed by the public sector.[30] To the extent that regulatory differences between countries exist at any point in time, they will reflect national perceptions and judgments regarding risk and efficiency, and national preferences on the risk-efficiency spectrum at that particular time.[31] This means that there is not necessarily a 'correct' answer to the question of the appropriate degree of regulation. Furthermore, the question of timing is relevant. While current dollar amounts of payments being settled by means of electronic money are 'small'[32] and hence the effects of any disruptions arising from them are unlikely to pose a systemic threat, if the use of electronic money becomes widespread, it is likely that the US authorities may at some point decide that a greater degree of regulatory action is appropriate.[33]

Another issue of relevance to electronic money is the fact that technological advances and financial innovations in recent years have made it much easier for firms to engage in regulatory arbitrage: if financial regulation is too restrictive in one jurisdiction, both providers and users of financial services can simply move to a less restrictive (and less costly) jurisdiction.

---

29 Greenspan (1996).

30 See Folkerts-Landau (1990) and Simpson (1991) on this point.

31 Some authors also draw attention to institutional factors. See Folkerts-Landau (1990) and Lelieveldt (1997). Indeed, the institutional structure of a country's financial system may well be a factor in the way risk and efficiency are regarded.

32 Gilbert (1996).

33 See Gilbert (1996).

There are a number of issues pertaining to this. First, although some degree of regulatory protection is valued by firms, competitive pressures may have resulted in financial centres engaging in competitive deregulation (Folkerts-Landau, 1990). The existence of a Prisoners' Dilemma situation leads to the possibility that the outcome could be a "lowest-common-denominator" approach to financial regulation as authorities compete to have firms locate within their jurisdictions, resulting in a less than socially optimal level of regulation overall.

Second, regulatory arbitrage means that it is often possible for firms located both within and without a relatively strict jurisdiction to manoeuvre around regulations by using the services of financial institutions located in more lax jurisdictions, thereby undermining the intentions of the authorities in the stricter jurisdiction. There is also the possibility of illegal activities in lax jurisdictions spilling over into stricter ones. As Herring & Litan (1995, p. 6) observe, "[a]nother way in which countries can suffer from unwelcome financial spillovers is through money-laundering activities that facilitate criminal enterprise. Countries that permit such activities reduce the costs of criminal enterprise that can affect or be conducted within other countries".

Third, it has been argued that the EU restrictions on the issue of prepaid cards to banks, particularly if extended to apply also to network money, will place European developers of electronic money at a competitive disadvantage *vis-a-vis* US ones (Grigg, 1997). The official European response[34] to these concerns is essentially to reject the argument that technical innovation will be impaired on the grounds that the restriction to banks concerns only the *issue* of electronic money, whereas the continuing technical research and development is not similarly restricted to

34 As expressed, for example, by van der Wielen (1997) and Friederich (1997).

banks. There is nothing which prevents a partnership between system operators and banks. Furthermore, they point out that there is nothing to prevent a system operator from applying for a banking licence.

The first two (and possibly the third) of these issues point to a clear need for the harmonisation or coordination of regulatory policies. In this regard, national authorities will have to find a balance between national autonomy and coordination with other regulatory authorities. Since the economic case for international policy coordination is based on the presence of cross-border spillover effects,[35] this fact could be used as a point of reference in determining the boundaries of coordination efforts on regulation. Herring and Litan (1995), in fact, have argued that measures aimed at consumer protection rather than systemic stability should be directed by national preferences, while international coordination efforts should be directed towards issues of global systemic significance.

This raises the question of whether the regulatory framework should be focused on the organisation of markets rather than institutions (Herring and Litan, 1995; Financial System Inquiry, 1996). Consumer protection regulations are primarily product- or market-focused, while systemic stability regulations tend to be institution-focused (Edey, 1996). The latter follows directly from the nature of systemic risk, which is understood to be triggered by institutional insolvency. However, one of the features of financial markets today is the increasing blurring of distinctions between different types of financial institutions, and even between financial institutions and firms that are not primarily associated with financial products and services. In this regard, the rapidly evolving nature of electronic money products may mean that

35 See, for example, Oudiz and Sachs (1984), Branson *et al*. (1990), and Currie (1990).

regulations that are too narrowly focused on the features of existing products will be rendered obsolete very quickly. The issue of product focus versus institution focus is a complex one, however, and we will not pursue it further in this paper.

6 SUMMARY

We conclude by summarising the key points of our paper. Maintaining the soundness of the financial system is a matter of concern to both economists and lawyers although they may approach questions regarding regulation from slightly different perspectives. The lawyer may seek answers through an examination of the justification of the extension of relevant concepts (such as the business of banking). Conclusions that the issue of electronic money involves the taking of deposits may seem to justify some regulation, but there is a need for caution against the imposition of undue control and in the drawing of comparisons between concepts.

From an economist's viewpoint, the focus of attention on the potential risks to the financial system has typically been on the systemic risk arising from the payments system. The first observation to be made is that issuers of electronic money automatically become part of the payments system regardless of their status as banking institutions or otherwise. Therefore we will have to consider if the arguments relating to systemic risk originating in the payments system apply in the case of electronic money. If so, we will also have to take into account the added dimension of cross-border spillover effects. We conclude that at the current stage of development and usage of electronic money products, payments risk is likely to be minimal because the medium is used at the retail rather than wholesale level. However, if the use of electronic money becomes widespread, the failure of a large electronic money issuer or of its system would

seriously jeopardise the payments system. Concerns about systemic risk would then come significantly into play. In addition, systemic risk originating in one part of a domestic financial system could easily spread to other financial centres because of the international nature of electronic money. This international dimension to systemic risk should be taken account of explicitly in considering the need for regulation and the form that regulation should take.

Second, we note that a sharp divergence in regulatory approaches between the US and the EU is immediately apparent to even the casual observer. A useful way of reconciling this divergence is to note the existence of a tradeoff between the efficiency of the financial system and the amount of risk assumed by the public sector. To the extent that regulatory differences between countries exist, they will reflect national perceptions and judgments regarding risk and efficiency, and national preferences on the risk-efficiency spectrum. This in turn will determine the content and weight accorded policy considerations. This means that there is not necessarily a 'correct' answer to the question of the desirability of regulation. The issue of the appropriate timing of regulatory action is also relevant.

Third, technological advances and financial innovations in recent years have made it much easier for firms to engage in regulatory arbitrage: if financial regulation is too restrictive in one jurisdiction, both providers and users of financial services can simply move to a less restrictive (and less costly) jurisdiction. Although some degree of regulatory protection is valued by firms, competitive pressures may have resulted in financial centres engaging in competitive deregulation. This could lead to a 'lowest-common-denominator' approach to financial regulation as authorities compete to have firms locate within their jurisdictions, resulting in a less than socially optimal level of regulation overall.

There are important implications for both the domestic and international financial systems. These include the following: (1) firms engaging in regulatory arbitrage means that it is important for different national authorities to coordinate and harmonise their regulatory policies, in order to avoid not just the risks inherent in competitive deregulation, but also the danger of lax rules in one country having an adverse effect on the ability of other countries to enforce financial regulations and to deal with fraudulent transactions; furthermore, to the extent that regulatory laxity represents a higher level of risk, the possibility of systemic spillover effects on other, more conservatively regulated, jurisdictions is something that needs to be taken into account; (2) to the extent that differences between Europe and the US persist, this may confer a competitive advantage to US firms which are able to innovate more quickly and move their operations into Europe; if they do this rapidly enough and are able to penetrate the European market sufficiently, the European firms may never catch up. This has obvious implications for industry policy.

REFERENCES

Bank for International Settlements (1996), "Security of Electronic Money", Report by the Committee on Payment and Settlement Systems, August.

Benston, G. and G. Kaufman (1995), "Is the Banking and Payments System Fragile?" *Journal of Financial Services Research*, Vol. 9, 209-240.

Benston, G. and G. Kaufman (1996), "The Appropriate Role of Bank Regulation", *The Economic Journal*, Vol. 106, May, 688-697.

Blinder, Alan S. (1995), Statement by the Vice Chairman of the Board of Governors of the US Federal Reserve System before the Subcommittee on Domestic and International Monetary Policy of the Committee on Banking and Financial Services, US House of Representatives, October.

Borio, C.E.V. and P. Van den Bergh (1993), "The Nature and Management of Payment System Risks: An International Perspective", BIS Economic Papers No. 36, February, Bank for International Settlements.

Branson, W.H., J.A. Frenkel and M. Goldstein (eds.) (1990), *International Policy Coordination and Exchange Rate Fluctuations*, University of Chicago Press.

Breyer, Stephen and Paul W. MacAvoy (1987), "Regulation and Deregulation", *The New Palgrave: A Dictionary of Economics*, Macmillan.

Coase, Ronald (1960), "The Problem of Social Cost", *Journal of Law and Economics*, Vol. 3, October, 1-44.

Currie, David (1990), "International Policy Coordination", in D.T. Llewellyn and C. Milner (eds.), *Current Issues in International Monetary Economics*, Macmillan, 125-148.

Dale, Richard (1996), "Regulating the New Financial Markets", in Malcolm Edey (ed.), *The Future of the Financial System*, Proceedings of a Conference, Reserve Bank of Australia, 215-245.

Dowd, Kevin (1996), "The Case for Financial Laissez-faire", *The Economic Journal*, Vol. 106, May, 679-687.

Edey, Malcolm (1996), "Introduction", in Malcolm Edey (ed.), *The Future of the Financial System*, Proceedings of a Conference, Reserve Bank of Australia, 1-5.

Edwards, Franklin R. and Frederic S. Mishkin (1995), "The Decline of Traditional Banking: Implications for Financial Stability and Regulatory Policy", Federal Reserve Bank of New York *Economic Policy Review*, July, 27-45.

Financial System Inquiry (FSI) (1996), *Discussion Paper*, Canberra: Australian Government Publishing Service, November.

Financial System Inquiry (FSI) (1997), *Final Report*, Canberra: Australian Government Publishing Service, March.

Folkerts-Landau, David (1990), "The Case for International Coordination of Financial Policy", in W.H. Branson, J.A. Frenkel and M. Goldstein (eds.), *International Policy Coordination and Exchange Rate Fluctuations*, University of Chicago Press, 279-303.

Friederich, Hans-Jurgen (1997), "Electronic Money — A European Position", Keynote address by the Head of Payments, Deutsche Bundesbank, to the Second Australian Computer Money Day, Sydney, April 17.

Furche, Andreas and Graham Wrightson (1996), *Computer Money: A Systematic Overview of Payment Systems*, Heidelberg: Dpunk.

Gilbert, R. Alton (1996), "Financial Regulation in the Information Age", delivered to the Cato Institute's 14th Annual Monetary Conference, May.

Grigg, Ian (1997), "Critique on the 1994 EU Report on Prepaid Cards", *Journal of Internet Banking and Commerce*, Vol. 2 No. 2, March.

Greenspan, Alan (1996), Remarks by the Chairman of the Federal Reserve Board to the U.S. Treasury Conference on Electronic Money and Banking: The Role of Government, Washington, DC, September.

Herring, Richard J. and Robert E. Litan (1995), *Financial Regulation in the Global Economy*, Washington, D.C.: The Brookings Institution.

Hoenig, Thomas M. (1996), "Rethinking Financial Regulation", Federal Reserve Bank of Kansas City *Economic Review*, Second Quarter.

Hoenig, Thomas M. (1997), "Bank Regulation: Asking the Right Questions", Federal Reserve Bank of Kansas City *Economic Review*, First Quarter.

Kamihachi, James (1997), "Supervisory Issues in Electronic Money", Remarks by the Senior Deputy Comptroller for Economics and Policy Analysis, U.S. Office of the Comptroller of the Currency, at an *American Banker* conference on Future Money, June 11.

Ledingham, Peter (1996), "The Policy Implications of Electronic Payments", presented to the 'Consumer Payments Systems' Conference, Auckland, 20th May.

Lelieveldt, Simon L. (1997), "How to Regulate Electronic Cash: An Overview of Regulatory Issues and Strategies", *The American University Law Review*, Vol. 46 No. 4, April, 1163-1175.

Ludwig, Eugene A. (1995), Testimony of the Comptroller of the Currency before the Subcommittee on Domestic and International Monetary Policy of the Committee on Banking and Financial Services of the US House of Representatives, October.

O'Driscoll, Gerald P., Jr. (1988), "Deposit Insurance in Theory and Practice", *Cato Journal*, Vol. 7 No. 3, Winter, 661-675.

Oritani, Yoshiharu (1991), "Globalization of Payment Network and Risks", in E.H. Solomon (ed.), *Electronic Money Flows: The Molding of a New Financial Order*, Boston: Kluwer Academic Publishers, 115-125.

Oudiz, Gilles and Jeffrey Sachs (1984), "Macroeconomic Policy Coordination Among the Industrial Economies", *Brookings Papers on Economic Activity*, 1, 1-64.

Patrikis, Ernest T. (1997), "Regulatory Issues — A U.S. Perspective", Federal Reserve Bank of New York, January.

Selgin, George A. and Lawrence H. White (1994), "How Would the Invisible Hand Handle Money?" *Journal of Economic Literature*, Vol. XXXII, December, 1718-1749.

Simpson, Thomas D. (1991), "Trends in Global Securities Markets", in E.H. Solomon (ed.), *Electronic Money Flows: The Molding of a New Financial Order*, Boston: Kluwer Academic Publishers, 127-141.

Smith, Brian and Ramsey Wilson (1997), "How Best to Guide the Evolution of Electronic Currency Law", *The American University Law Review* Vol 46, April 1105-1130.

Solomon, Elinor Harris (1991), "Conflicts: Banks, Consumers, and the Law", in E.H. Solomon (ed.), *Electronic Money Flows: The Molding of a New Financial Order*, Boston: Kluwer Academic Publishers, 157-185.

Van der Wielen, Henny (1997), "Electronic Money: A European Perspective", delivered to the Seminar on Electronic Money hosted by the Bank of England, London, 4th February.

Working Group on EU Payment Systems (1994), *Report to the Council of The European Monetary Institute on Prepaid Cards*, May.