Economic Issues Associated with Access to Electronic Payments Systems*

by

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Abstract:

This paper provides an economic analysis of the competition issues arising from access to the electronic payments system. Such concerns were raised in the Wallis Report and in particular in an ACCC Draft Determination on the Australian Payments Clearing Association (1997). We draw on existing US economic literature to explain the theory of network effects, which has been used there for analysing payment systems (and other networks, especially in information technology markets). Three levels of analysis of access to the electronic payments system are distinguished – access to settlement, voluntary industry associations, and payment system facilities. Throughout the article the ACCC Draft Determination is discussed and a critique provided.

1 Introduction

On 20 August 1997 the Australian Competition and Consumer Commission (the ACCC) issued a draft determination (the Draft Determination) on three applications made by the Australian Payments Clearing Association (APCA) on 6 September 1996 and 22 May 1997.

Those applications sought authorisation by the ACCC for exemption from section 45 of the *Trade Practices Act* (1975) (the TPA) for APCA's regulations for the Consumer Electronic Clearing System (CECS). Although APCA's regulations dealing with other payments clearing systems had previously been authorised, in the case of the electronic payments system, authorisation was withheld.

Before the Draft Determination was released the *Financial System Inquiry Final Report* (the Wallis Report) appeared. It contained recommendations for opening up

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the settlements system and advised that the ACCC review interchange pricing arrangements for possible trade practices violations. These events motivate this paper. Over the next few years there will be many legal changes to the way the payments system is regulated in Australia. As such, it is timely to discuss the economics underlying any resulting regulatory debates.

The payments system has always been a critical part of the financial system. It allows financial institutions to exchange funds and information with one another, obviating the need for the direct use of a monetary fiat for this purpose.

The Draft Determination and the Wallis Report have brought to light a concern in some policy circles about access to the payments system that could be inhibiting competition in the financial services sector. In this paper, we review the economic issues surrounding access to the payments system. Some of these issues are somewhat complex and the economic literature is not fully determinative. Our contribution is to separate and classify the distinct economic issues surrounding access to the electronic payments system and in so doing aid in putting future policy debates in this area into a coherent framework.

The outline of the paper is as follows. It falls into two distinct halves. The first half (sections 2 to 4) outlines the detailed legal and institutional arrangements governing the payments system in Australia. The remainder and heart of the paper (section 5 to 9) then outlines the economic issues concerning access to the payments system.

Section 2 outlines the institutional structure of the payments system in Australia and its operation. Section 3 then briefly reviews the policy background. Section 4 summarises the main objections and recommendations contained in the Draft Determination, while section 5 establishes the basic economic framework that will be used to analyse the economics of access to the payments system in the following three sections. Section 6 explains access to settlement, section 7 access to voluntary organisations and section 8 access to the services provided by the electronic networks of financial institutions. Section 9 concludes with a critique of the ACCC Draft Determination.

2 The Institutional Structure

2.1 The payments system

The payments system forms an important subset of the financial services sector of the economy. A payment is the transfer of value via a financial asset from one person to another, usually in return for some good or service received in a transaction. Among the numerous methods of making payment are cash, credit card, EFTPOS debit, cheque and direct debit.

The payments system is the overall institutional structure enabling and regulating transfers of value. Until recently, the number and type of institution permitted to participate in the payments system was heavily regulated. Direct participation in the payments system was the preserve of the leading banks.

The main reason for tight regulation of the payment system was the need to ensure systemic stability in the financial system.[1] This was achieved by requiring banks to settle outstanding amounts between them via Exchange Settlement Accounts (ESAs) held with the Reserve Bank. Following the Commonwealth Government's commitment to implementing the recommendations of the Wallis Report, the institutional arrangements governing the payments system are in a state of flux. The predominant characteristic of the financial services industry in general, and of the payments system in particular, is rapid technological change and product innovation, which means that dynamic issues are paramount in any economic analysis.

2.2 Clearing and settlement

Transferring value amongst financial institutions involves both the movement of funds among institutions and the communication of information regarding the nature of those funds. The former function is termed settlement while the latter is termed clearing.

When settling transfers, financial institutions do not move funds from account to account but net funds from institution to institution. While settlement can occur directly among financial institutions, the Reserve Bank provides a regulating role. In particular, if an institution satisfies certain prudential requirements it can hold an Exchange Settlement Accounts (ESAs) with the Reserve Bank. Each of the four national domestic banks has an account, and the building societies and credit unions each collectively have an account (via special service providers). Settlement is then made via adjustments to ESAs. The advantage for institutions settling this way is that they receive greater assurance of the financial stability of participating institutions.

Clearing involves the transfer of information between financial institutions. For instance, a payee institution wishes to receive information that the payor institution has regarding particular accounts that should be debited.

2.3 APCA

APCA was formed to coordinate clearing of payments among member financial institutions. Part of that coordinating role involves establishing standards for the different payment clearing systems. Standards refers to the arrangements either made by the participants or imposed by regulatory bodies in a payment system to ensure that there is sufficient procedural and technological consistency between participants to allow the effective cross-institutional exchange of payment obligations. APCA is *not* involved in clearing or processing payments – that is done by member financial institutions themselves.

APCA currently coordinates four types of clearing systems:

- Australian Paper Clearing System (APCS)
- Bulk Electronic Clearing System (BECS)

[1] See Wallis Report chapter 9.

- Consumer Electronic Clearing System (CECS)
- High Value Clearing System (HVCS)

The regulations and procedures of the first two were authorised under the ACCC's predecessor - APCS in September 1993 and BECS in October 1994. The HVCS regulations were recently granted authorisation by the ACCC also. CECS's regulations and procedures are the subject of the ACCC's Draft Determination. mentioned in the introduction. APCA is a limited liability company incorporated in 1992 (limited by shares and guarantee). APCA's Memorandum and Articles of Association were authorised by the predecessor to the ACCC in September 1993. Its shareholders comprise banks, building societies and credit unions. Institutions which are not banks, building societies or credit unions, but which nonetheless participate in one or more of the clearing systems supervised by APCA, may become non-shareholding members.

The Board manages the business of the company, establishes committees to oversee the operation of each clearing system (the Management Committees), and must adopt the regulations (and amendments to regulations) for each clearing system formulated by the Management Committees.

The standards relating to each system are the responsibility of each Management Committee.

2.4 What is CECS?

The Consumer Electronic Clearing System (CECS) is the combined regulations and procedures developed by the Management Committee of APCA responsible for overseeing the consumer electronics payments system. They were modeled on previous clearing systems developed by APCA for which authorisations had already been granted.

The CECS Management Committee is responsible for the effective operation and management of CECS (including technical and efficiency standards), for the operating procedures and policy, and for the supervision of the observance by CECS members of the regulations and manual.

The CECS regulations provide that the Management Committee has the power to determine practices, procedures, standards and specifications relating to all aspects of the clearing cycle. The CECS manual contains the Acquirer/Issuer EFTPOS Interchange operations procedures.

With regard to interchange fees, the manual states that the rate is to be agreed from time to time bilaterally between institutions.

2.5 What is the consumer electronic payments system?

Electronic payments are made via electronic signals linked directly to deposit or credit accounts. The types of electronic payments include:

- EFTPOS direct debit
- ATM withdrawal
- Credit card
- Smart card (still in pilot stage)

EFTPOS is an electronic payments system that allows purchasers to make electronic payments, or withdraw cash, from nominated bank accounts to the trading accounts of retailers at the point of transaction. Automatic Teller Machines (ATMs) provide customers with the opportunity to withdraw cash, make account inquiries or transfer funds between accounts. The CECS regulations and standards deal only with these two types of electronic payments. When smart cards become viable they can be included in CECS. Credit cards are not included in CECS.

Access to these networks is provided by a card encoded with the customer's information. The customer uses this card, in conjunction with a pin number, to make transactions. To validate the purchase, the information is verified via an on-line link to a processing centre which checks to ensure sufficient funds are available.

2.6 Participants

There are five main participants of this payment system, including:

- ***Card Issuers:*** these are financial institutions which provide customers with a card to enable them to withdraw funds or make payments. Card issuers include all banks and the majority of building societies and credit unions.

  American Express, Diners Club and some large retailers also issue cards but these can only be used with merchants that are customers of the card issuer. Card issuers have bilateral contracts with many Merchant Acquirers for access to almost all EFTPOS facilities;

- ***Merchant Acquirers:*** these are financial institutions of the merchants, they can also be Card Issuers. They provide the merchant with the infrastructure to undertake the transaction, make payments to the merchant and forward transactions to the card issuers for settlement;

- ***Payment Service Bureaux:*** these companies provide transaction services for a range of participants - they receive the transaction information from the Merchant Acquirer and process the transactions on behalf of the card issuer;[2]

[2] An example of a Payment Service Bureau is Cashcard that processes the financial transactions on behalf of Building Societies and Credit Unions.

- ***Merchants:*** Except in the case of the largest merchants, the merchant acquirer installs the infrastructure to enable card holders to purchase goods, services and to obtain cash. The transaction information is forwarded to the Merchant Acquirer who credits the merchant's nominated account with the transaction amount. To gain access to the EFTPOS network retailers must enter a Merchant agreement with a Merchant Acquirer. This contract links the retailer's trading account (which is maintained by the Merchant Acquirer) to the Merchant Acquirer's EFTPOS payment system; and

- ***Cardholders:*** are consumers who agreed to the conditions governing the use of the card - they agree to provide access to their cheque, savings or credit account for debiting purposes.

2.7 Access arrangements

The process of obtaining access to the networks is summarised below:

- access to the ATM and EFTPOS network is organised through bilateral and unilateral interchange agreements between financial institutions;[3]

- interchange agreements enable a card issued by one bank to be used to pay a merchant whose banking services are provided by another bank or to transact at another bank's ATM;

- interchange fees are payable by Card Issuers to Merchant Acquirers in respect of ATM and EFTPOS debit card transactions; and

- Merchant Acquirers and merchants negotiate fees as part of the Merchant Agreement for use of the equipment and installation, communication landlines, servicing, system utilisation and management fees.[4] These fees can take the form of a per unit transaction charge; however, in general, the relative bargaining strength of the merchant and the Merchant Acquirer will determine the terms and conditions of the agreement.[5]

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3 The bilateral (and unilateral) agreements for EFTPOS access are complete. This is not the case for ATM contracts - not all cards can be used at every ATM.

4 Note that merchant acquiring appears to be becoming an increasingly competitive market. Acquiring services are increasingly becoming unbundled from other banking services such as transaction banking and funding.

5 Some larger merchants own their own terminals and other equipment, so that they pay reduced or even zero merchant fees. Indeed, in some instances, merchant acquirers even pass on interchange fees to merchants to compensate them for their investment in hardware, software, communications, fall back systems, staff and customer training.

3 Impact of the Wallis Report

Integral to an institution's ability to enter and compete in financial services – in particular, banking services – is the terms and arrangements whereby it participates in the payments system. This is an issue of access and was recognised as critical to competition by the Wallis Report. That report recommended measures to liberalise access to numerous aspects of the payments system. It also advised that some regulatory oversight be given to interchange fees, which are the prices charged by financial institutions among themselves for payments system services.

Recently, the Federal government acted on the recommendations of the Wallis Report and introduced financial sector reform legislation. The main change that the new legislation will bring to the current payments regime is the establishment of a Payments System Board (PSB) within the Reserve Bank. The PSB is intended to operate as the policy making board of the Reserve Bank in relation to payment matters. Its main responsibility will be to ensure that the Reserve Bank's powers are used to improve the efficiency of the payments system, to promote competition in the market for payment services and to control risk in the financial system.

Under the proposed legislation, the Reserve Bank will be given new powers to regulate the payments system. The Reserve Bank will have the authority to:

- impose access regimes,
- make standards, and
- arbitrate disputes

for any payment system it designates. The Reserve Bank may designate a payments system if the Bank considers designation to be in the public interest. When determining the public interest the PSB should have regard to:

- the desirability of financial safety,
- efficiency, and
- competition in the payments system.

To be in the public interest, the Reserve Bank's actions should not materially cause or contribute to increased risk in the financial system.[6]

4 The ACCC's Draft Determination

The ACCC's Draft Determination denying APCA's applications for authorisation of the CECS rules determined that those rules as they stood were "substantially incomplete in terms of the standards and procedures necessary to facilitate the effective

[6] Payment Systems (Regulation) Bill 1998.

clearing and settlement of debit card transactions generated within the ATM and EFTPOS networks."[7] This incompleteness was with respect to the twin issues of access to APCA and access to the networks of the members of APCA.

4.1 Access to APCA

With regard to access to APCA and CECS, the main objections were to the fact that

- any standards and procedures agreed to by APCA were voluntary; and
- the absence of such standards for participation in the EFTPOS network as an acquirer.

This second point was seen as anti-competitive because of the ability of powerful incumbent acquirers to delay negotiation of interchange agreements with an entering acquirer even where the new acquirer proposes to install EFTPOS machines identical to the incumbent's.

Nonetheless, the ACCC stated that, if the following recommendations were carried out by APCA, the CECS rules might gain authorisation:

- mandate the proposed standards and procedures relevant to participation in the EFTPOS network as an issuer;
- introduce mandatory interchange standards and procedures relevant to participation in the EFTPOS network as an acquirer;
- mandate interchange standards and procedures for both issuers and acquirers for participation in the ATM network;
- APCA should have responsibility for compliance with these mandatory interchange standards and procedures;
- APCA should provide a forum in which EFTPOS participants not members of CECS can consult with members of CECS; and
- CECS membership criteria be amended to remove requirements that members be subject to prudential supervision.

4.2 Access to networks

With regard to access to the ATM and EFTPOS network and facilities, the ACCC determined that:

- APCA should include a requirement in its standards and procedures that interchange fees be based on efficient pricing principles; and

[7] See page 59 of the Draft Determination.

- APCA should conduct independent audits of interchange fee arrangements to ensure they conform with efficient pricing principles.

5 A Basic Analytical Framework

The remainder of this paper is devoted to analysing the economics behind access to the payments system. In order to accomplish that, we first outline a basic economic framework for analysis.

5.1 A preliminary analysis

As can be seen from the previous sections, the payments system comprises a complex and perhaps confusing web of institutional arrangements. That web is also in a state of transition and flux. Confusion about institutional linkages can lead to the linking of issues that logically should remain distinct. To gain headway in the analysis of access[8] to the payments system it is necessary first to make the following tripartite division:

- Access to settlement
- Access to voluntary industry associations
- Access to services provided by the network

The **economic** issues surrounding the regulation of access on each of these three fronts are distinct. Therefore, in any analysis of this general area each should be considered separately. This we do in the following three sections of this article. To a degree, a part of the apparent confusion in the ACCC's Draft Determination lies in the mixing of these distinct issues.[9]

5.2 An economic framework for analysis

In economics, interventionist government policy might be justified if there are market failures. These failures lie in three broad categories:

- *Information asymmetries*: it might be difficult for participants in the market to observe important information regarding the quality of the service they are purchasing.
- *Externalities*: when private agents take actions that neglect certain social benefits and costs.

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[8] Much of the confusion in this area lies in the fact that the term 'access' has a variety of meanings, and it is not always clear which particular meaning is intended when the word is used. Thus the word access has an everyday meaning, a technical legal meaning (eg., Part IIIA of the TPA) and a use in economics in the context of natural monopoly regulation and efficient pricing.

[9] Section 4 above shows how the ACCC had no hesitancy in bundling these issues.

- *Market power*: when there is insufficient competition in a market to constrain prices.

If one of these situations is found to exist, a case for government intervention might arise, provided that the benefits of intervention exceed any costs associated with it.

With this standard economic framework established, we proceed in the following three sections to analyse the economic issues and policy responses that might follow from such an analysis. We deal first with access to settlement, then with access to APCA and finally with access to the network services.

6 Access to settlement

6.1 Uncertainty and asymmetric information

This section discusses briefly the economic rationale underlying Reserve Bank regulation of settlement. One problem that arises in payments systems is the issue of risk bearing. In credit transactions, an acquirer has to be sure an issuer is of good standing to settle any debts. In debit transactions, this problem is faced by the issuer.

In an ideal world, institutions that settle among each other would like to know exactly the status of each other. In the real world, however, such knowledge is never certain. Uncertainty is risk and must be compensated for. Even more, information on the status of institutions is asymmetric – each institution knows its own status with (near) certainty of course but must take investigative steps to secure knowledge of another's status. These 'search costs' must also be compensated for.[10]

If it is well known that the issuer or acquirer is of good standing, these risks are reduced. Otherwise, institutions incur costs that must be compensated if anyone is to deal with the unknown issuer or acquirer.

These are the transactions costs inherent in the operation of the payments system. They reduce efficiency. In an extreme case, such costs might be prohibitive and deter worthwhile transactions from occurring.[11]

6.2 The Reserve Bank

In Australia, the problem of ascertaining the good standing of participants in the payments system is resolved by mandating settlement through the Reserve Bank. The Reserve Bank acts as an independent monitor of the riskiness of participants - in effect, certifying their good standing.

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[10] This is just another example of Akerlof's problem of the market for lemons (referring to used cars). The problem, basically stated, is with respect to uncertainty about the status of the other party. See G. Akerlof "The Market for Lemons," *Quarterly Journal of Economics* 84 (1970), 488-500.

[11] See M. Dewatripont and J. Tirole (1994), *The Prudential Supervision of Banks*, MIT Press: Cambridge (MA).

This reduces, though it does not eliminate, the problem of uncertainty with respect to good standing. For issuers or acquirers without ESAs, informational uncertainty and asymmetry must be resolved by other means, such as signalling their good reputation through their behavioural pattern in other areas of the financial system.

The prudential criteria for obtaining an ESA are set by the Reserve Bank. This is a form of barrier to entry. The higher the criteria, the harder to enter. To reduce transaction costs owing to an environment of endemic uncertainty the Reserve Bank thus acts as a gatekeeper to the settlement system. The anti-competitive effect of such a regulatory regime is outweighed by the benefit of systemic stability of the payment system and of a low-cost settlement system. Whether there might be less dramatically anti-competitive methods of addressing the problem of information asymmetry and systemic stability of the payments system is a matter for government policy.

The legislation currently before Parliament implementing the recommendations of the Wallis Report will have the effect of loosening the criteria for maintaining an ESA with the Reserve Bank.[12]

Under its current constitution a criterion for membership on APCA's Board is the holding of an ESA. To the extent that the membership of APCA and CECS deliberately mirrors the group hitherto privileged with the right to hold an ESA, such membership may likewise need to be broadened to match any broadening in the membership of ESA holders. This was recognised by the ACCC in the Draft Determination. Those aspects of the Draft Determination requiring the broadening of the membership criteria for APCA have thus probably been superseded by legislative developments.[13]

7 Access to Voluntary Organisations

This section describes an economic rationale for the existence of APCA and CECS. Network effects explain why participants in the payments system voluntarily agree to form themselves into an organisation like APCA. Such an organisation creates risks that the participants might act in an anti-competitive way.

7.1 What is an electronic network

Electronic services networks (ESNs) are connections of computer and telecommunications components into an integrated network used to process transactions.

Other examples of ESNs are airline computer bookings through travel agents, real estate agents list-and-search databases and internet sales. Economic reasoning applying to non-electronic type networks (such as gas pipelines and railroads) cannot

[12] See *Financial Sector Reform (Amendments and Transitional Provisions) Bill 1998*.

[13] Assuming that the electronic payments system eventually becomes 'designated' by the Reserve Bank.

be translated without modification to ESNs.[14] This is because the nature of ESNs means that they are generally more flexible and responsive to change than more physically fixed networks.[15] In particular this means that regulatory and institutional responses appropriate for, say, access to gas pipelines may not be appropriate for, say, internet sales.

7.2 What are network effects?

Networks arise due to the desire of network participants to take advantage of the benefits associated with agglomeration. These benefits are known as network effects. Although the terminology in this relatively new area of economics is not yet completely settled, it can be established that these effects arise because of:[16]

- *Demand Side Economies of Scale* effects: [17] certain products become more valuable (to the consumer of the product) the more people use the system (eg., telephone and fax networks);

- *Demand Complements* effects: [18] products offered by different networks are more valuable to the consumer when combined. (Such goods are called demand complements - eg., computer hardware and software).

A network might arise because of either one of these reasons or both. Both reasons are present in the case of electronic payments.

Firms may develop their own networks with the size of each network dependant on a firm's capacity to capture scale economies in network development. However, beyond a certain size private network owners may still benefit by linking the different individually owned networks into one large network.

An example of networks where scope for gains due to network effects arises is telephone networks. The value of the telephone to a recipient of one

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14 Economists draw a distinction between 'one-way' and 'two (or multi) - way' networks, the first applying to traditional essential facility infrastructure and the second applying more to the ESNs considered in this section. This distinction between one-way and two-way access was introduced by N. Economides and L.J. White (1994), "One-Way Networks, Two-Way Networks, Compatibility, and Public Policy," *mimeo.*, New York University. They were motivated primarily by a distinction between issues in telecommunications and energy.

15 See chapter 1 in Guerin-Calvert and Wildman (1991) *Electronic Services Networks*

16 The following two effects have also come to be known in the literature as 'direct' and 'indirect' network effects respectively. There exists also some confusion between the terminology network effects and network externalities. An excellent summary of this literature is the collection of articles in the Spring 1994 issue of the *Journal of Economic Perspectives*.

17 See M. Katz and C. Shapiro (1986) "Technology adoption in the presence of network externalities," *Journal of Political Economy* 94, 822-841.

18 See N. Economides (1989) "Desirability of compatibility in the absence of network externalities," *American Economic Review* 67, 297-308. Economides calls them network complementarities, which he distinguishes from network effects (a label he reserves for the first category).

telecommunications company is increased when he is able to accept calls from a caller with another company (and vice versa).[19]

7.3 The payments system and network effects.

The network externality effects in consumer electronic payments include both the categories mentioned in the previous section.

7.3.1 Demand side economies of scale

Methods of payment must have widespread acceptability to gain general favour among customers and merchants in transactions. This is true both in terms of confidence in the payments system and transaction convenience (compare, for example, the lower transaction costs of legal tender compared with barter).

If the debit card of an issuer is only acceptable as payment by a limited number of merchants, the value of the card to the customer as a means of payment is diminished. A customer, seeking the convenience of lower transaction costs when making payment, will generally prefer another card (or even another method of payment) with greater acceptability. A card with limited acceptability is then at a competitive disadvantage with respect to cards with greater coverage. Similarly, merchants will be less like to undertake the transactions costs in accepting a card if it has insufficient customer coverage.

Because at the initial stage of the development of a new payment technology this reasoning applies to all card issuers, the incentive exists to ensure mutual compatibility across networks from the beginning. [20]

Once a new form of payment is established, however, and a new participant wishes to gain entry to the complete network, the incentives to coordinate are no longer symmetric between incumbents and potential entrants, and incentives can arise leading incumbents to resist new entry.

There may be a number of reasons for this. First, the optimum size for a network has been reached, so that the network benefits to incumbents of further entry is outweighed by the erosion of rents necessary to recover the costs of technology innovation and adoption. Second, entry is not costless. Networks exist partly to economise on the cost of coordination, but this is eroded by free entry that can make coordination more difficult.

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19 This is an example of the first type of network effect.

20 This argument assumes relative equality of market power among the main players. This was largely true of the four national domestic banks at the time when EFTPOS technology was first being adopted. Where one or more players have a disproportionate amount of market power compared with the remaining firms in the industry, the analysis becomes slightly more complicated. Large firms with economies of scale and the capacity to develop and invest in new technology may be reluctant to enter network arrangements which facilitate the spread of such a system even where network externalities exist.

7.3.2 Demand complements effect

If networks provide different but complementary goods, benefits to the consumer can arise by combining networks. In the case of electronic payments, the complementary networks involved in a payment transaction are the network of the customer's card issuer and the network of the merchant's acquirer. The two goods involved are the debit card and the EFTPOS terminal - the value of each good is enhanced by association with the other.

7.4 The economic benefits of a voluntary organisation

Networks can be linked in a number of ways. In the case of Australia's electronic payments system, networks[21] are linked via a web of commercially negotiated bilateral and unilateral contracts among network owners.

The benefits of a voluntary organisation like APCA is in its ability to coordinate standards for the combined networks to ensure the component networks in the combined system operate compatibly.[22] In a field like electronic payments which is driven by frequent technology improvements, technological compatibility across networks is necessary to ensure that gains from network (complements) effects are fully captured.

Hence coordination is needed at the technology adoption phase of setting up individual networks. A decentralised process of standards adoption may lead to incompatibility and thus no gains from standardisation. The existence of a voluntary organisation is a reflection of the high value participants place on consistency.

If there is no coordination at this early stage:

- A standard might still eventually emerge but it may be inferior to one achievable through pro-active coordination; [23] and
- There are increased costs of eventually obtaining mutual compatibility among individual networks compared with *ab initio* coordination. [24]

These are dynamic economic issues dealing with the technology adoption phase of investment decisions. Although APCA was initially formed to agree on clearing standards, using APCA as a forum for coordinating standards avoids institutional

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21 Acquirer and Issuer networks. Many financial institutions comprise both types of networks. Some large merchants maintain their own network of EFTPOS terminals.

22 The absence of coordination could also result in an increased risk of network destabilisation, loss of reliability, loss of reputation of the system and hence a loss in overall value.

23 See Katz and Shapiro (1994) *Systems Competition and Network Effects* Journal of Economic Perspectives 8(2), 93-115 and Besen and Farrell (1994) *Choosing how to compete: Strategies and Tactics in Standardisation* Journal of Economic Perspectives 8(2), 117-131. However this view of persistent inferior technology is disputed by some. See for example Liebowitz and Margolis (1990) *The Fable of the Keys* Journal of Law and Economics, 33, 1-26.

24 A 'sunk costs' argument. See Matutes and Regibeau (1988) *Mix and Match: Product Compatibility without Network Externalities* Rand Journal of Economics 19, 221-34.

duplication. APCA can be regarded as a low-cost mechanism for information exchange and technology standards setting in an area where decentralised markets may not operate effectively.[25]

7.5 Possible economic problems with voluntary organisation

When network effects are present, cooperation is often beneficial to both the firms involved and consumers of compound products comprised of demand complements. Nonetheless, competition issues might still be relevant in two main instances:

- Competition within networks;
- Competition with firms outside the network.

7.5.1 Intra-network competition

With respect to the first, cooperation within a network can create problems when firms also compete with each other in the network. While the network exists to supply demand complements, the network also usually includes demand substitutes.

Consider the following very simple example. [26] Firms in the meat and bread industries can get together to supply vending machines with their product. A consumer selects the type of bread and type of meat he or she wants and receives a sandwich after payment. Bread and meat are complements in the final compound good consumed but the different types of bread and meat in the machine are substitutes and compete with each other.

In the case of banking, banks form a coalition to roll out the network that ensures coordinated coverage of the electronic payments system. However, the cards that utilise the network are of course in competition.

Although there exists a theoretical possibility that cooperation among firms supplying substitutes within a network could diminish price benefits to consumers and inhibit technological improvements, in practice this would appear to be extremely unlikely.[27] Whether this is true in any particular instance would need to be investigated.

7.5.2 Inter-network competition

With respect to APCA the second type of competition mentioned above is of greater immediate relevance, given the concern expressed in the ACCC's Draft Determination about the effect of non-compulsory standards and interchange fees on access by outside parties such as American Express. Voluntary associations established for one reason (to capture gains from network effects) may provide a convenient forum and

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25 There were no references to any of these benefits in the Draft Determination, in spite of 'benefit to the public' being a criterion in the ACCC's decision making process.

26 This example is from chapter 6 in Guerin-Calvert and Wildman (1991) *Electronic Services Networks*.

27 Collusive outcomes are difficult to implement in highly uncertain technological environments. Hence, we doubt that this will be a key problem in this case.

disguise for obtaining cooperation on deliberately anti-competitive matters with respect to firms outside the network.

This possibility may be increased in the technologically fast-changing financial services industry where consumers increasingly demand the convenience of bundled services.[28] In theory one can imagine standards being set with a view to excluding outsiders, or for maximising incompatibility with an outsider's private network or infrastructure. Standards by definition have some exclusionary effect. The issue in each instance would be whether standards are being set to foster the cost effectiveness of the network or to assist in shoring up market power. From a practical policy point of view however the likelihood of such collusion and its sustainability over time would be as small as in any other context.

It is also possible to imagine an industry structure where no one firm has the size fully to exploit all the gains available through network effects[29], but where a subset of firms in the industry can. If the remaining firms are unable to combine to exploit network effects at a comparable scale, then the first network of firms will have managed to acquire a 'permanent' competitive advantage.[30] Of course, this 'permanent' advantage is only with respect to the services provided by the network. With time, competing networks offering substitute services would develop (the way road networks by-pass rail networks and so on).

Exclusion is inherent in the notion of standards-setting. So exclusion from networks need not be *per se* socially detrimental. Exclusion can be justified where: [31]

- It is necessary to ensure the quality of network services
- Excluded firms constrain the prices of firms using the network
- The supra-competitive profits produced by exclusionary practices are necessary to induce firms to undertake the risky investments required to develop networks in the first place.

Whether any of these issues obtain in any particular network must be determined on a case-by-case basis. This last point of protecting investment decisions however is particularly important in the consumer electronic payments system, where the network infrastructure was developed as a result of private decision-making and risk-taking. The ubiquity of ATMs and the EFTPOS network makes it perhaps difficult to appreciate the risk that was involved in their development in the early eighties. There

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28 The realisation on the part of financial institutions of this consumer preference appears to be driving some of them (traditionally not part of the payments system) to become payment system participants. Demand complementarity of financial services (or 'convergence') appears to be one of the main forces for change and innovation in the financial services industry (as in the IT sector).

29 Such a situation is called 'tipping' in the literature, and although it is a demand side effect and not a supply side, is often talked about in analogy to natural monopolies. See, for example, M.L. Katz and C. Shapiro, "Antitrust in Software Markets," paper presented at the Progress and Freedom Foundation conference, *Competition, Convergence and the Microsoft Monopoly*, 5th February, 1998.

30 See Guerin-Calvert and Wildman (1991) *Electronic Services Networks* at p.17.

31 See Guerin-Calvert and Wildman (1991) *Electronic Services Networks* at p.19.

was no guarantee that EFTPOS would take off and achieve near universal acceptability, just as there is no guarantee now that smart cards, currently in developmental stage, will gain universal acceptance. Any attempt to impose 'efficient' pricing rules on bank's interchange fees would run the risk that future investment would be inhibited.

7.6 Policy approaches to network effects

The anti-competitive concerns surrounding voluntary standards setting institutions applies to many voluntary organisations in otherwise competitive markets. This is the reason APCA's articles of association required authorisation from the ACCC.

With regard to possible anti-competitive concerns of networks *per se*, there is no uniformity within the literature. Most networks will comprise demand complements and demand substitutes. The former leads to cooperation and the latter might lead to competitive concerns.

There is no simple and all-encompassing policy approach when dealing with network effects – each ESN must be analysed with regard to its own facts, with close attention paid to institutional arrangements.

Depending on the specifics of any particular case, there are four main policy/institutional responses to the phenomenon of network effects and the need for standards coordination. These are:

- Direct government regulation;
- Joint venture;
- Voluntary industry associations; and
- Market forces.

It can be seen that this list of institutional arrangement is in decreasing order of formal collective control over participants.

7.6.1 Voluntary associations - APCA

On the specific issue of standards coordination APCA is an example of the third arrangement.[32] When such an institutional arrangement is preferred, other questions emerge, such as:

- How broad should the membership be?
- What should the constitution of the association look like, or how should formal power be distributed?

[32] An example of a joint venture is to be found in the Canadian system.

- What restrictions should be placed on exclusion, that is, does the association have formal authority and commitment to actually restrict or regulate members' behaviour?

These are all issues relating to the form the association's articles and memorandum of association should have, and whether such form should be mandatorily imposed as a type of government regulation or left to the members to agree on (subject to general ACCC supervision).[33]

The form of the rules of the association impinge on the issue of outsider access to the association (and possibly the network, though not in the case of APCA and CECS, where these two issues are distinct). [34]

They also impact on institutional efficiency: the greater the number of participants in decision-making, the more cumbersome the institution. If an institutional structure cannot provide efficient, responsive and timely outcomes for its members, then alternatives will develop in its stead. There is always an inherent tension between inclusiveness and deliberative efficiency in voting institutions.

On capturing the benefits from network effects which do not touch on standards and technology adoption, it should be emphasised that the electronic payments system is an example of the fourth institutional response, namely, a market forces approach. APCA has no role or influence in the property rights and contractual relationships inhering in the electronic payments system.[35] Even on standards coordination the voluntariness of membership in APCA (and therefore the right to exit) leads to a fall-back (and possibly *de facto*) market forces approach.

The ACCC's Draft Determination will possibly eventually be superseded by the new PSB, which will have the power to set mandatory standards for the payments system.[36] This is an example of the first institutional arrangement. A risk with mandated standards however is that in a technologically fast-changing industry they are less flexible to changing environments and can lead to inhibition of investment and distorted investment decisions.

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33 The economic analysis of these issues involves social choice theory.

34 Some voting rules effectively require unanimity among insiders, so that even one insider has a veto power which prevents access to the entire system - they may exercise that veto for reasons other than price (eg., fear of competition in other market segments).

35 APCA's constitution would need to be changed in order to carry out the type of regulatory pricing control proposed by the ACCC in its Draft Determination, because its current constitution does not contemplate such interference in members commercial transactions and property rights.

36 See the *Payments Systems (Regulations) Bill 1998*, section 18.

8 Access to electronic networks in the electronic payments system.

This section analyses the economics surrounding the issue of outsider access to the services provided by the different ESNs in the electronic payments system, especially the ATM and EFTPOS networks.

8.1 Access to EFTPOS and ATM services

Section 2.5 described how the EFTPOS and ATM networks are owned by the participating financial institutions in the payments system, and that access to each other's networks is negotiated by means of bilateral interchange agreements among institutions. An outside party wishing to access the services of an interlocked network would need to reach individual bilateral agreements with each incumbent.

If access to another's network is acquired, the services provided by that network include the use of physical infrastructure such as terminals and communication lines, use of software and other information technology resources, and the use of personnel in the form of the network owner's Helpdesk staff.

8.2 Interchange fees in perfect competition

Anyone wishing to gain access to an incumbent's network must enter negotiations with the owner of the network. Such an agreement would be likely to contain a negotiated amount (the interchange fee) for the use of the network's facilities. [37]

The 'high' level of these fees, and the fact that they had not declined since the late eighties, led the ACCC to recommend in its Draft Determination that APCA include in its standards and procedures a requirement that interchange fees be based on efficient pricing principles and that APCA conduct independent audits of such fees to ensure that they conform with such principles. [38]

The difficulty with this notion is that it is not immediately apparent what the efficient price for interchange is and how far current pricing arrangements are likely to deviate from this efficient outcome.

What is Perfect Competition?

The usual approach to calculating efficient prices is to consider what might occur if the industry were characterised by perfect competition.

Perfect competition is a situation in which the providers of banking and electronic payments services are many in number and there are no entry barriers (which imposes

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[37] In the United States interchange fees are set by collective agreement at a uniform rate. An institutional preference by participants for multilateral rather than bilateral agreements can be interpreted as an attempt to reduce the transaction costs involved in multiple bilateral negotiation.

[38] See the Draft Determination, page 32.

strict constraints on prices incumbents might charge). Firms in such an industry cannot, in the long-term, set prices above short-run marginal or incremental cost. This would invite entry and dissipate any short-term profits.

The main reason for examining perfect competition is that in that case the level of interchange fees is irrelevant to the prices customers and merchants will pay in the goods market. In addition, the level of interchange fees has no allocative effect. The study of interchange fees in perfect competition therefore aids in understanding the role of interchange fees in the market, whether perfect or not.

An Example

To see why the level of interchange fee is irrelevant in perfect competition, consider the following example[39].

A typical transaction is shown in Figure 1 below. In that transaction, a perfectly competitive market in the sold good establishes an equilibrium price of $99 which both buyer and seller take as given. In this ideal world transaction costs are zero. The supply and demand diagram for the market with zero transaction costs is shown in Figure 2.

Figure 1: Simple Transaction in Goods Market

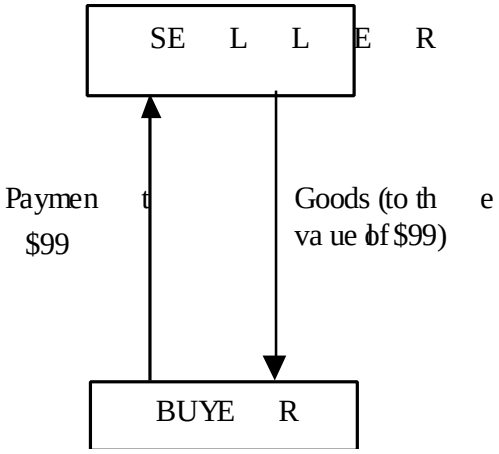
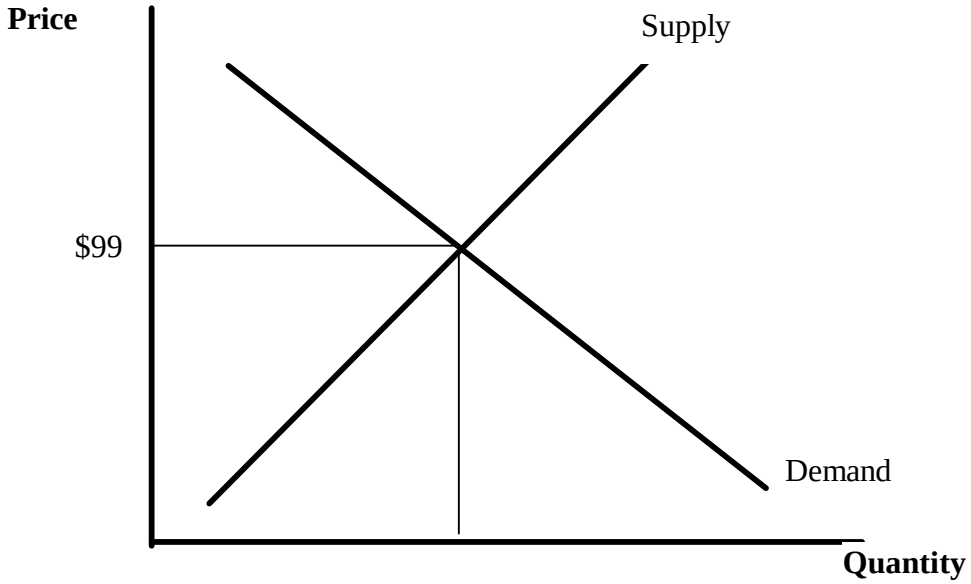


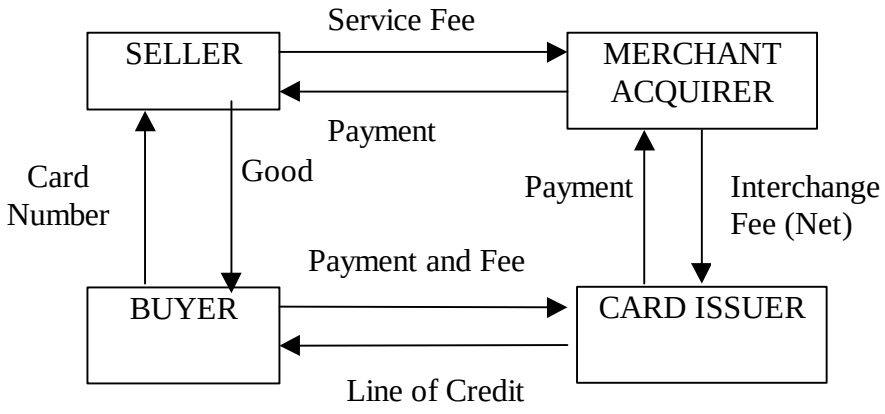
Figure 2: Supply and Demand Diagram for Goods Market

[39] Adapted from Carlton and Frankel (1995) *The Antitrust Economics of Credit Card Networks* Antitrust Law Journal 63, 643-668. Carlton and Frankel's example was for credit cards. For



Buyers and/or sellers can use the services of financial intermediaries (credit cards, debit cards, cheques) to facilitate payment. This addition is shown in Figure 3. Those services are provided at a cost for which the financial intermediary needs to be compensated. In the context of a simple transaction these costs can be regarded as transaction costs.

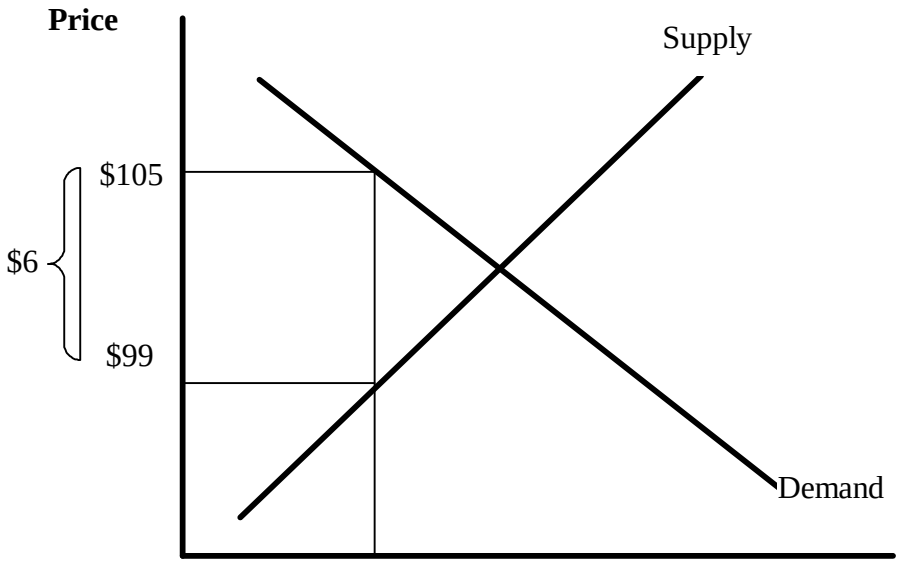
Figure 3: Simple Transaction with Financial Intermediation



similar reasoning applied to ATM networks see Salop (1990) *Deregulating Self-Regulated Shared ATM Networks* Economics of Innovation and Technology 1, 85-96.

With transaction costs introduced, a wedge emerges between the price the merchant receives and the price the buyer pays in an analysis akin to that of the incidence of unit taxation under perfect competition. This wedge is shown in Figure 4.

Figure 4: Supply and Demand Diagram for Goods Market with Transaction Costs



Assume for simplicity that the cost of providing the payment service to seller is $6 for the acquirer only.[40] Then total transaction costs are $6, which is the size of the price gap in Figure 4. If there are no interchange agreements between acquirers and issuers, then acquirers will be forced to recover any outstanding costs by directly charging their clients, who will pass the full cost on to consumers.

Now assume that interchange agreements are permitted. If acquirers can still recover any outstanding costs directly from their clients, and if prices in the goods market adjust perfectly to reflect cost changes, then the level of any transfer between financial intermediaries (and in particular from issuers to acquirers such as occurs with interchange fees in EFTPOS) will have no bearing on the prices faced by buyers and sellers in the transaction.

To see this, suppose the interchange fee is $5. Then the acquirer, who seeks to recover $6, will charge the merchant the remaining $1 cost as a merchant fee. In perfect competition the merchant will pass this on to customers by marking up the price of the good by $1 to $100. The issuer will pass on the cost of the interchange fee by charging the cardholder $5 for the use of the card, which will be shown on the card's transaction account.

In this case, the consumer has effectively paid $105 for the good ($100 for the marked up good plus the $5 charge from his or her bank), the merchant received $99 ($100 minus $1 in merchant fees), the issuer nothing and the acquirer $6.

[40] That is, we are ignoring the issuer's costs.

Now suppose the interchange fee rose to $6, then the merchant acquirer would not need to recover any costs from its client. The merchant's costs have therefore declined (by $1), and under perfect competition, the benefits of this cost reduction are passed onto consumers in the form of a price reduction to $99. But now the card holder receives a $6 fee on his or her transaction account. In this case, the merchant still receives $99, the acquirer $6, the issuer nothing and the cardholder has still paid (effectively) $105 for the good ($99 for the good plus $6 in card fees).

If the interchange fee continues to rise above $6 (the amount needed by the acquirer to recover its costs), then, assuming perfect competition in the acquiring market, competition between acquirers for retail customers will lead to banks offering monetary kick-backs or other financial inducements to keep their retail clients from changing bankers. These monetary inducements in turn, due to perfect competition in the retail market, will lead merchants to reduce their price. The effective price paid by consumers will always be $105 and the effective price received by merchants will always be $99, regardless of the level of interchange fee.

The lesson from these examples is that prices faced by merchants and buyers reflect costs only, and hence are efficient.

Summary

There are many prices that impact on consumers' use of payments services such as EFTPOS. Sophisticated consumers will take into account any fees deducted from their accounts or associated with card use. They will also consider the price of any product they are purchasing using electronic methods.

As the consumer is the ultimate recipient of value from electronic payments services, under competitive conditions the consumer will bear the marginal or incremental costs of his or her usage of the network. Competition will drive the *overall price* of electronic payments services to the marginal or incremental cost associated with a consumer's use. For the consumer, that overall price will be the sum of interchange fees that merchants pass on to consumers and any direct charges a card issuer or merchant acquirer might levy directly on the consumer.[41]

The preceding analysis leads to the conclusion that the level of the interchange fee does not matter for efficiency reasons under perfect competition. Other fees and prices will adjust to offset any additional costs an interchange fee imposes on acquirers (if it is low or negative) or issuers (if it is high and positive). As the incidence of the overall price for using electronic payment is on consumers, then the precise composition of

[41] In a recent article Alan Frankel argues that where merchants are unable to pass on payments system costs to consumers, the potential for monopolisation by payments system operators exists (see A.S. Frankel, "Monopoly and Competition in the Supply and Exchange of Money," *Antitrust Law Journal*, 66, 1998, pp.313-361). His argument hinges, however, on the inability of merchants to charge consumers different prices based on their payment method. In Australia, such constraints do not exist and merchants are free to discriminate among different consumers.

that overall price (the combination of fees and price mark ups) – and in particular, the level of the interchange fee – does not matter.

Regulating interchange fees only, which is but one part of the pricing system in consumer electronic payments, may not address the ACCC's concerns about the inefficiency of prices in this area, since other charges will adjust to counteract any imposed movements in interchange fees.

8.3 The interchange fee under imperfect competition

The preceding analysis shows that in perfect competition interchange fees have no allocative effect. However if the ATM and EFTPOS networks are not perfectly competitive or nearly so, then an assessment of the role of the interchange fees becomes more complex.

In an imperfectly competitive market, the interchange fee will affect firm profits and consumer perceptions. That is, they *will* have an allocative effect. Contrary to the perfectly competitive case, the value of using electronic payments services is not borne solely by consumers – issuers and acquirers benefit as well in the form of higher profits. A change in the level of interchange fee will change the amount and distribution of profits between industry participants. It will influence firm incentives to invest and compete in the provision of electronic payments services.

8.4 Pricing models

Current legislation before the parliament will establish a PSB with the power to impose an access regime on participants within the payments system. The nature of any such regime is not specified in the legislation, but presumably will be in terms similar to that found in Part IIIA and XIA of the TPA, involving negotiation in the shadow of compulsory arbitration. Some pricing rule will need to be developed to enable the PSB to arrive at a mandated price that balances the competing interests in the payments system.

The previous section showed that, when markets are imperfect, the level of interchange fee affects firm profits, and thus the incentives facing firms wishing to invest in new electronic payment system technology platforms. Nonetheless, the ACCC fears that such fees may be too high, thus reducing competition in the market.[42]

Any regulatory pricing rule for interchange fees therefore will need to embody the following two competing principles:

- promotion of efficiency through competition, and
- protecting investment decisions.

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[42] The ACCC relied heavily in its assessment of interchange fees on a 1995 report of the Prices Surveillance Authority, PSA Report No 65, 30 June 1995.

To promote the first objective, usage of network services should be charged at marginal or incremental cost. However, this will ensure only static allocative efficiency (providing other services of banks and merchants are competitive). Dynamic efficiency considerations mean that a more sophisticated approach to access pricing is required.

Dynamic access pricing is relatively underdeveloped in the literature.[43] As well as marginal or incremental cost pricing, satisfaction of the second objective above usually involves including a fixed component in the price.[44] This is to ensure that appropriate incentives for participants to invest in new infrastructure are generated.[45]

The main issue for analysis is at what level to set this fixed component of price. If the fixed component is too high, then some potential users of the networks will not use them, or will wastefully duplicate the existing networks with one of their own. If the fee is set too low, then socially optimal future investment will not be achieved, either in terms of the timing or of the amount of investment.

To establish an optimal regulatory pricing rule for the ATM and/or EFTPOS networks, where imperfect competition is likely to obtain, will require difficult and complex game theory modelling. There is a real risk, due to the paucity of economic literature in this area of optimal dynamic pricing principles, that the PSB will impose a price regime insensitive to the particular circumstances of the ATM and EFTPOS networks.

9 Conclusion: Critique of the Draft Determination

The ACCC's recommendations in the Draft Determination to APCA do not clearly distinguish between the three facets of access. In our opinion, this has led to some confusion and inconsistencies in their recommendations. We wish to highlight those here along with our conclusions.

The ACCC made statements that indicated their views on all three issues with regard to access.

1. *Access to settlement*: the ACCC viewed access to settlement as an issue primarily associated with prudential requirements rather than competition per se. This attitude was consistent with the ideas presented in this paper.

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43 For a regulator there exists also the problem of time inconsistency. In static economic theory, sunk costs are irrelevant to future decision making. Sunk costs are those fixed costs the value of which cannot be recovered if the enterprise ceases. However, when a firm first makes an investment decision, they hope to obtain a return on the investment sufficient to cover all their costs, including their fixed costs. If a regulator comes in at a later stage and adjusts the return on the investment using the reasoning that, at the time of regulation, sunk costs no longer matter, then *future* investment decisions will be affected - not just the future decisions of the firm under regulation, but those of other firms which fear regulation down the track. The failure of a regulator to assess pricing issues from the time when the investment decision was first made is known as the problem of time inconsistency.

44 Various pricing rules exist in the natural monopoly literature which contain both a marginal cost aspect and a fixed aspect, such as a two-part or other non-linear tariff.

45 See J.S. Gans and P.L. Williams (1998) *Efficient Investment Pricing Rules and Access Regulation*, Melbourne Business School Working Papers.

2. *Access to APCA*: the ACCC was concerned that, when payments system participants did not have a voice in APCA, there may be some anti-competitive implications. In particular, there was concern that standards agreed upon by incumbents might not suit entrants and that such agreements may raise entry barriers. The Draft Determination does not address at all issues of coordination economies arising from standard setting. Nonetheless, they do conclude that APCA's membership be relatively unrestricted to all payments system participants (and not based on ESA holding) and that standards reached be mandatory. The ACCC was also concerned about the incomplete nature of the current CECS rules.

3. *Access to Facilities*: the ACCC was concerned that interchange fees might be set in such a way to raise rivals' entry costs. It then made an unprecedented recommendation: that APCA set and audit interchange fees on 'efficient pricing' principles.

While we agree that the ACCC's assessment of access to settlement was based on appropriate considerations and is primarily a prudential rather than competitive issue, there is cause for legitimate concern about its analysis of the other two access issues.

In particular, it would appear that the ACCC confounded the issues involved in access to APCA and access to facilities. In so doing, they moved away from the main issue of the determination – the authorisation of APCA. Recall that APCA is a voluntary organisation that sets standards for clearing. In order to clear funds, one does not require a voice in APCA or membership of it. Therefore APCA's role is merely one of coordinating standards. As discussed in this report: there can be substantial public benefits to such coordination in an industry.

These public benefits must be offset by two potential competitive concerns:

1. *Exclusion*: the standards agreed upon may be such that entrant or non-participant costs are raised to the detriment of competition in payments system services.

2. *Collusion*: the voluntary organisation being a meeting and arrangement between competitors may lead to some form of price collusion.

Each of these concerns was the reason why an authorisation of APCA was sought. This makes all the more puzzling the ACCC's recommendations.

First, in terms of the exclusionary concern, the ACCC, in advocating wider membership (to those without an ESA and who are not even providers of payments system services per se) would appear to have addressed this point. However, the ACCC also adopted the additional restrictions that (1) standards be mandatory and (2) that the rules be complete prior to authorisation. These additional restrictions are peculiar in that they neither reduce exclusion nor facilitate the public benefits from coordination. Participants have an incentive to coordinate on an agreed upon standard. The extent to which they do not agree may reflect the fact that the standard chosen is a poor one. To allow for the evolution of standards, it helps if participants have an option to 'go it alone.' That facilitates experimentation and innovation. By making standards mandatory, this benefit is lost. The same is true of incompleteness. The rules of a coordinating organisation – when it is operating efficiently – are necessarily

incomplete. Once again, this allows members to propose alternative structures in the face of changed circumstances. So to ask for completeness is to stifle the innovative aspect of a voluntary industry organisation.

Second, in terms of the collusive concern, the ACCC makes the surprising recommendation of private regulation of interchange fees. It is difficult to know what to make of this. The collusive concern is just that the members of APCA might discuss pricing, but the ACCC's determination recommends that as a formality. Had APCA proposed this themselves, at another time, it might itself have raised serious trade practices concerns.

In our opinion, the ACCC have, by arguing for regulated pricing, confounded the issue of APCA's operation with the issue of access to facilities. These facilities are not owned by APCA but by APCA's members. APCA had no previous role in pricing and regulation on this dimension. The issue of pricing is, and always has been, an issue of access to facilities. When considering APCA, pricing should be – of competitive necessity – as far away from the concerns of that organisation as possible, let alone regulated by it.

If the ACCC is concerned about access to facilities (and no serious analysis or grounds was given in the Draft Determination), this should be a separate issue treated under existing provision in the *Trade Practices Act* or newer pieces of legislation. Recall from section 7 that in that circumstance, the key competitive issues are the existence of monopoly power over a necessary input into some downstream service. No analysis of monopoly power or the relevant markets is provided in the Draft Determination. Indeed, given that there are multiple providers of access to payment system facilities, it is not clear that such an analysis would be tenable, and therefore that regulation would be warranted in this case.