

The Future of Clearing and Settlement in Australia: *A Discussion Paper*

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March 2000

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Facilities to clear and settle trades in securities and derivatives (often known as clearing houses) are an important part of Australia's financial infrastructure. Maintaining their levels of safety and efficiency at world standards is critical to ensuring Australia's future as a centre for global services in the Asia-Pacific region.

During the 1990s, systems in Australia and abroad concentrated attention on improving safety standards in line with recommendations by the G30. More recently, significant changes have aimed at improving the efficiency of clearing and settlement arrangements abroad. There have also been a number of developments in Australia over the past year – attempts at integration, changes in shareholdings, and reviews by users of their settlement needs.

Against that background, the Reserve Bank, in December 1999, held a meeting of stakeholders in Australia's five clearing and settlement systems - for Commonwealth Government debt, other debt, equities, options and futures - to discuss options for ensuring that Australia's clearing and settlement arrangements remain competitive.

That meeting commissioned a Working Group made up of representatives of Austraclear Limited, Australian Stock Exchange Ltd, Sydney Futures Exchange Ltd and the Reserve Bank of Australia to prepare a paper analysing the options available to owners and users to maintain competitiveness. This paper is the result of that work. It analyses a number of ways in which Australia's clearing and settlement systems might evolve over the next few years and draws out the implications of some of the possible developments. The paper does not make recommendations.

The subject of clearing and settlement is technical and often obscure, even to those expert in the dynamics of the markets they serve. For this reason, the paper first sets out the role of clearing and settlement systems, emphasising the functional distinctions between a clearing and settlement system and its associated trading arrangements. This distinction can be easily blurred, because in Australia, in contrast to some important markets overseas, clearing and settlement systems are often owned by the exchanges. The following section sets out the main costs associated with clearing and settlement. The paper then outlines some of the pressures already facing the existing systems, before exploring the options and identifying some questions that need to be addressed by the industry.

I. CURRENT ARRANGEMENTS

There are five separate systems for clearing and settlement of securities and derivatives in Australia.

Debt instruments

The Reserve Bank Information and Transfer System (RITS) settles around 750 trades in Commonwealth Government securities (CGS), totalling around \$14 billion each day. It is owned and operated by the Reserve Bank.

The Austraclear System settles around 3,500 trades in other debt instruments, such as semi-government and corporate debt securities, each day with a total value of around \$21 billion. Austraclear is an unlisted company whose main shareholders are the Australia and New Zealand Banking Group Limited, Commonwealth Bank of Australia, National Australia Bank Limited, Westpac Banking Corporation, St. George Bank Limited, Macquarie Bank Limited, the Australian Stock Exchange Ltd (ASX) and Computershare Registry Services Pty Ltd.

Equities and warrants

The Clearing House Electronic Subregister System (CHESS) settled around 41,000 trades each day in 1999 with a total value of just over \$1 billion. CHESS is owned by the ASX, a listed company whose five largest shareholders together hold around 10 per cent of capital.

Options and futures

The Sydney Futures Exchange Clearing House (SFECH) makes around 45 settlement payments each day (these are net payments to its members) totalling around \$26 million.¹ (This figure is low in comparison to the values of physical securities settled due to the effect of novation and netting.) The SFECH is owned by the Sydney Futures Exchange (SFE), which is a mutual owned by its members.

The Options Clearing House (OCH) makes around 65 settlement payments per day with an average value of \$21 million. The OCH is owned by the ASX.

Table 1 sets out the ownership details for each of the four organisations involved in clearing and settlement.

Table 1: Ownership structures

	RITS	Austraclear	CHESS/OCH	SFECH
Government/Private	Reserve Bank	Private	Private	Private
Type	Statutory authority	Unlisted co.	Publicly listed co.	Mutual (4 classes)
Number of shareholders/owners	1	47	Around 15 000	Floor: 28 Associate: 114 Locals: 67 Temporary locals: 146
Shareholding Limitations	n/a	Maximum 20%	Maximum 5%	n/a
Largest 10 own:	n/a	92%	16%	n/a ^(a)

(a) Under demutualisation proposals, floor members would hold 68.5 per cent; associate members 7.4 per cent; locals 18.5 per cent; and temporary locals 5.6 per cent. If demutualisation proceeds, this implies that the top 10 shareholders would initially account for around 24 per cent of the SFE.

Clearing and settlement arrangements are currently organised as a series of “segmented silos” (Figure 1), with each facility serving a separate asset class. In the case of equities, options and futures, the clearing and settlement system is owned by the trading system. The ASX owns the trading system for equities and Australian Stock Exchange Settlement and Transfer Corporation Pty Ltd (ASTC), which is a subsidiary of the ASX, owns the CHESS system in which they are cleared and settled; CHESS in turn has links to company registries. The ASX also operates the trading system for options and the OCH. The SFE owns the trading facilities for futures transactions and the SFECH. The silos are not as clear for CGS and other fixed interest markets since trading is over-the-counter (OTC) rather than through an exchange; however, the clearing and settlement facilities in RITS and Austraclear are separate, as are the registry facilities owned by the Reserve Bank and Austraclear.

Each clearing and settlement system deals with a separate range of instruments and there has been no direct competition between them; no two clearing houses currently compete to clear and settle trades that arise in any one market. There has been limited competition between the ASX and the SFE for trading in low exercise price options (LEPOs) but the effect has been that the competition is really between bundled trading, clearing and settlement services. Once

¹ In derivatives markets, it is important to distinguish settlement values from actual turnover. With margin settlement, the value of settlements each day can be substantially smaller than the nominal values traded. For example, the SFE’s average daily turnover is \$40.6 billion, but this results in average settlement values of only \$26 million. A similar comparison applies for OCH.

the trades are finalised in the trading system, they follow automatically to the clearing and settlement system owned by that exchange.

Figure 1: Trading, clearing and settlement

Instrument	CGS	Other Debt	Equities	Options	Futures
Trading	OTC	OTC	ASX	ASX	SFE
Matching/ Confirmation	RITS	Austraclear	ASX/CHESS	ASX/OCH	SFE/SFECH
Novation			TNSC ^(a)	OCH	SFECH
Clearing	RITS	Austraclear	CHESS	OCH	SFECH
Settlement	RITS	Austraclear	CHESS	OCH	SFECH
Registry	RBA	Austraclear Computershare National Registries RBA Others	Issuers CHESS Computershare National Registries Perpetual Others		

(a) Trades between brokers are novated to Transfer Netting Service Clearing Pty Ltd (TNSC) which then becomes the central counterparty; TNSC is owned by the ASTC which also owns CHESS.

There are a number of historical reasons why no competition has emerged between the systems:

- Each system developed to serve the needs of a particular market. Most were established on a mutual or quasi-mutual basis with the aim of servicing the particular market's participants and not with a view to competing for other business. For instance, systems for settling equities, options and futures are each owned by the exchanges whose trades they settle.
- The *Commonwealth Inscribed Stock Act* and the *Bills of Exchange Act* currently require transfers of the securities held in RITS and Austraclear to be made in writing. Although the legal details differ, both systems overcome this problem by constructing legal arrangements under which they hold the relevant stock in their names (in the case of RITS in the Reserve Bank's name) and participants actually trade rights to claim securities from the holder. Systems wanting to compete for this clearing and settlement business would need to go to the expense of constructing such arrangements and would need to convince participants of the certainty of their title to stock lodged under them. Appendix A discusses these issues in more detail.
- CHESS is the only approved Securities Clearing House (SCH) under s779B of the Corporations Law, however the latest draft amendments proposed in Corporate Law Economic Reform Program (CLERP) will remove this monopoly and provide for more than one clearing house.
- The costs to users of establishing technical linkages which are required to use a system are a barrier to switching between systems. To reduce costs and improve efficiency

within each “silo”, clearing houses have been closely integrated with exchanges, but this also makes switching harder. At present there are four quite separate communications linkages and interfaces:

- Austraclear and RITS members use a proprietary terminal-based network; Austraclear also has some “host-to-host” linkages. Preparations are underway to provide access via SWIFT by mid 2001;
- brokers and other participants communicate with the ASX through “host-to-host” computer links;
- OCH members link to a separate ASX proprietary network which is also the communications network for derivatives and equities trading; and
- SFECH members communicate with the SFECH using a proprietary “point-to-point” messaging system.

The Business Functions

Business functions undertaken by the systems have a good deal in common but there are also some important differences. (There are, of course, considerable differences in technical and procedural detail.) It is important to identify the common and different business functions if judgements are to be made about sharing infrastructure or merging functions in order to share overheads and reduce costs. The analysis which follows deliberately focuses on business functions and abstracts from the legal and technical means by which they are carried out. It does so in order to give a longer-term focus and to avoid analysis which is locked into current technical arrangements. To put the roles of the clearing and settlement systems into context, the following paragraphs outline the key steps involved from trade through to final settlement. Appendix B provides greater detail on the processes involved in each system.

Trade

Trades are conducted in terms of market practices and conventions, or the rules of an exchange. In OTC markets, trading is done through recorded telephone conversations or computerised broker matching systems, and in exchange-traded markets through computerised trading systems. Trades in exchange-traded markets are directly routed from trading systems into each respective clearing and settlement system.

Matching/Confirmation

Each system provides some form of matching/confirmation. In exchange-traded systems, initial matching is performed at the trade level, and thus occurs before the trade reaches the clearing and settlement system. Subsequent confirmation of trades is also provided to broker members by each clearing and settlement system prior to commencement of the clearing process and brokers can match with their clients in the system in preparation for settlement.

In OTC trades, counterparties agree on trade details, but this is done through bilateral confirmation and not in the RITS or Austraclear systems themselves. However, a formal matching process takes place as soon as the parties enter details into the systems. Transactions proceed to clearing and settlement only if the details entered by both sides match.

Novation

In the equity and derivatives markets, trades are “novated”. The original trade between two counterparties is split into two separate trades, with the clearing and settlement system substituted as a counterparty to every trade. As a result, counterparties’ exposures to one

another are extinguished and replaced by exposures to a central counterparty. This facilitates multilateral netting and provides the basis for counterparty risk guarantees.²

Clearing

Each system calculates participants' obligations to deliver securities or make payments. The system may operate on a gross settlement basis (Austraclear and RITS), or on a net settlement basis (CHES, OCH and SFECH) where net obligations arising from trades and open contracts are calculated at the end of the day.

Each system also performs various checks as part of the clearing process. In Austraclear and RITS, transactions are tested in real time against cash limits and securities holdings, whereas in CHES net obligations are tested against securities holdings and brokers' net payments must be authorised by their bankers. In OCH and SFECH, initial margins and intraday margin calls provide collateral against the obligations arising from price movements in the underlying asset (open contracts on the OCH and SFECH are marked-to-market at least once per day).

Settlement

Settlement of securities transactions (debt and equities) takes place through the transfer of title to the security ("delivery") and a corresponding funds transfer ("payment"). Austraclear and RITS provide irrevocable transfer of title to securities against simultaneous payment on a transaction by transaction basis throughout the day (often described as a Model 1 DVP system). CHES settles all the day's transactions at a single point in time, with transfers of title and the associated payments netted and processed in a single batch (this is a Model 3 DVP system).

In derivatives transactions, "settlement" refers to the settlement of net obligations arising from premiums, initial margins or variation margins, and involves payment of margins to and from the clearing and settlement system. Settlement payments to and from the OCH are by RTGS, direct entry or cheque. Settlement payments to and from the SFECH are by RTGS, to and from its Exchange Settlement Account at the Reserve Bank. In a small percentage of cases, at expiry of the contract or exercise of the option, there is delivery of the underlying security or commodity against payment.

Registry

Austraclear and RITS have associated registries, and CHES operates a subregister for approved securities. Clearing and settlement in CHES involves an electronic transfer of ownership in the CHES subregister. Clearing and settlement in Austraclear and RITS does not result in registry changes; instead, electronic records of entitlement to securities are recorded.

Common Features

There are a number of common functions undertaken by the systems. All the systems provide:

- *communication linkages*. All systems provide links to their members and to the banks that settle payments on behalf of members. Systems settling securities operate part of the register or have links to registries;

² While these general functions are performed in all cases, there are important differences in procedures and legal obligations. These are set out in Appendix C.

- *matching/confirmation* services. Systems accepting trade details from exchanges have relatively automated systems, while those associated with OTC markets match trade details entered by the parties before proceeding;
- *clearing* services, that is the calculation of participants' obligations to make payments, or deliver securities and, in most cases, testing for the availability of funds and securities in preparation for settlement of the transaction; and
- *settlement* services in which obligations are settled by delivering securities and making payments or by making margin payments.

Certain functions are relevant only to some systems:

- only CHES, OCH and SFECH provide counterparty risk guarantees by novating trades to a *central counterparty*. This function raises a number of prudential issues for these systems that do not arise for RITS and Austraclear because they do not become a central counterparty. The stability of the central counterparty is critical to all members of the system. The central counterparty can limit its exposures to participants by accurate and timely margin calls and by monitoring participants' prudential standing. It can also ensure that the system design is sound (eg a DVP mechanism for transfer of title). If problems do arise, the strength of its balance sheet and guarantees from its members will be important;
- *liquidity management* is not performed by the Austraclear and RITS systems, but can be an important function for clearing and settlement systems which act as a central counterparty to transactions which are settled on a RTGS basis; and
- only RITS, Austraclear and CHES have *asset holding* functions and thus links to the relevant registries.

This analysis suggests that there are two main types of settlement systems:

- those that involve the *transfer of title* to a financial asset in exchange for funds - ie systems that settle trades in debt, equities and other assets (Austraclear, RITS and CHES); and
- those that calculate *margin requirements* to adjust the risks arising from market changes affecting options and futures contracts ie OCH and SFECH.

While CHES, OCH and SFECH all take on the role of central counterparty, there are differences in the risks this role involves. In particular, CHES acts as a central counterparty for 3 days from trade to settlement of each transaction. This stands in contrast to the counterparty role of the OCH and the SFECH which may last for several months over the life of the contract – over this longer time period, risks are managed by intra-day margining and capital based trading limits.

Figure 2 shows some of the key features of clearing and settlement systems.

Figure 2: Key features

	RITS	Austraclear	CHESS	OCH	SFECH
Trade	n/a	n/a	ASX	ASX	SFE
Matching					
Novation	n/a	n/a			
Clearing					
Settlement					
Registry				n/a	n/a

Shaded cells indicate functions relevant to the system

II. COSTS

Discussion of the costs of clearing and settlement is often rather narrowly focused on the costs of operating the central facility and the charges it levies on members to recover them. Such a focus, however, fails to recognise that participants' internal costs can be equally, and are often more, important. Such costs include internal communication and processing systems, which have to be aligned with the demands of the clearing and settlement systems to which they are linked. Multiple interfaces can be costly, especially if control of settlement processing is centralised in financial institutions, but they may not matter much for institutions whose business is concentrated in only a few sectors. Liquidity costs may be even more important, especially for settlement of high-value trades, if institutions need to maintain separate pools of liquidity to settle transactions in different systems.

Costs of operating the central facility

These costs include the recording and reconciliation of transactions, operation of computer and system networks, back-up arrangements, other system costs and the usual range of overhead costs. The relative importance of hardware and software costs has changed over recent years - for systems with relatively small transaction volumes, advances in technology have reduced the relative importance of hardware costs.

The systems recoup these costs variously by participation, transaction and communication fees levied on participants. These charges primarily cover the processing costs of the system itself, but may also contribute towards guarantee arrangements or risk management services.

Table 2 presents some data on Australia's clearing and settlement systems and the fee revenue they recoup from their members.

Table 2: Clearing and settlement: value, volume, assets and revenue (1998/99)

	RITS	Austraclear	CHESS	OCH ^(a)	SFECH ^(a)
Value of Transactions	\$3 500 bn ^(b)	\$5 200 bn	\$286 bn	\$91 bn	\$10 183 bn
Number of Transactions	189 000 ^(b)	871 397	8 294 000	9 042 000 ^(c)	30 251 000 ^(c)
Assets Held/Open Interest	\$80 bn	\$231 bn	\$374 bn	\$10 bn	\$118 bn
Total Transaction Revenue	\$4 mn	\$12.3 mn	\$35.4 mn	\$24.8 mn ^(d)	\$59 mn ^(d)

(a) The OCH and SFECH data represent the notional values traded. They are not comparable with cash market values.

(b) Excludes intraday repurchase transactions with the Reserve Bank.

(c) These are the number of contracts traded, which is the key revenue driver.

(d) OCH and SFECH levy a single charge per contract for both trading and settlement, so again this figure is not just clearing and settlement activity.

Users' costs

Both direct and indirect users of clearing and settlement systems - traders, brokers and banks - face a number of other costs associated with transactions in addition to the explicit charges levied by the central facilities. These costs include processing, communications, information systems, training and development costs. Some organisations have focused on technologies such as straight-through processing (STP), which streamline processing across the various layers in a system, in an attempt to reduce these costs.

We have not attempted to measure users' costs. They are difficult to isolate, and to do so and make industry estimates is beyond the scope of this paper. Nevertheless we believe they are substantial and should be recognised in any discussion involving clearing and settlement systems.

Liquidity costs

Liquidity costs, which are the costs involved in ensuring that sufficient funds and securities are available for settlement, can be substantial. They include both earnings foregone where funds or securities are reserved for liquidity purposes, and the management costs associated with forecasting liquidity needs and allocating funds and securities accordingly. These costs are faced by participants in the system and by some clearing and settlement systems which act as a central counterparty.

In Austraclear and RITS, settlement is on a real-time gross basis and the average transaction size is large, so a participant's liquidity management takes place in real time and involves large dollar values. In contrast, CHES, OCH and SFECH settle on a net basis, so liquidity is managed according to expected net obligations at the settlement time of each system. The net amounts settled in these systems are relatively small, significantly reducing liquidity costs. Nevertheless, consolidated positions against a single central counterparty or cross-margining between separate options and futures systems or cross-collateralisation between systems could further reduce liquidity costs, particularly for some of the larger traders. Some systems have widened the range of securities which may be lodged as collateral in a system, and have allowed users to source collateral from other systems, allowing more flexible liquidity management.

III. DRIVERS FOR CHANGE

Clearing and settlement arrangements in Australia have been relatively stable for several years but significant pressures for change have emerged more recently.

Domestic business pressures

Clearing and settlement service providers face pressures to improve services and reduce costs. In response, technology has been used to reduce costs but market segmentation across the five systems limits the scope to reduce duplication in systems and overhead costs. The demutualisation of the ASX has freed up capital and increased emphasis on shareholder returns; this will encourage a search for new sources of revenue. The proposed demutualisation of the SFE should have similar effects.

International developments

These domestic developments are taking place against a backdrop of increasing change overseas. There is increasing competition between exchanges while opportunities are being explored to consolidate the back office functions of clearing and settlement. At the national level, Switzerland and Denmark have had single clearing and settlement systems for most instruments for some years. The United Kingdom and Germany have recently consolidated their domestic systems and Canada, Finland and France are moving in that direction. The

introduction of the euro has increased pressure to extract cross-border efficiencies in Europe. Appendix D summarises arrangements in a number of countries.

Technology

Technological advances have increased convergence between domestic and international markets, thereby increasing competition. This is most evident in moves towards universal straight-through processing being supported by SWIFT, the Global Straight-Through Processing Association (GSTPA) and other bodies. There is no technological reason why clearing and settlement services need to be provided in any specific geographic location, though there may be significant legal and regulatory requirements to be dealt with. This is particularly relevant given the small volume of transactions in Australia which could easily be handled in some of the world's larger systems.

User demands

Operators of clearing and settlement systems face significant challenges meeting the varying demands made by users of the system. Demands vary particularly between wholesale and retail groups. For instance, while most users want simpler, standardised interfaces, each may place a different premium on such service improvements. A large wholesale user may be prepared to invest significant resources in implementing substantial changes, while for a smaller retail user, the costs associated with such a change may outweigh any benefits. Other user demands are centred on lower processing costs, extra functionality, accommodating increasing retail participation, more effective use of liquidity and a greater degree of risk control. Some users also want customised functionality, which places strains on system costs. In the past, users have been the owners of privately-operated systems and have been able to directly influence their development. This one-to-one relationship is breaking down, and new relationships are evolving between users and suppliers of clearing and settlement services.

Legal environment

Any changes to clearing and settlement services will take place in an environment of considerable legislative change. The Commonwealth Government's CLERP 6 initiatives, as well as other legislative amendments, are expected to remove existing legal impediments to competition in the industry. Amendments to the *Commonwealth Inscribed Stock Act* (CIS Act) and the *Bills of Exchange Act* will permit the electronic transfer of title to CGS, and negotiable instruments such as bank bills, promissory notes and certificates of deposit. This will remove the need for the legal arrangements currently employed by RITS and Austraclear to provide electronic clearing and settlement. The Government anticipates that these amendments will be implemented in 2001. The focus on increasing competition is underlined by the emphasis in CLERP 6 on replacing institutional regulation with functional regulation (eg removing the legislative provisions specific to CHESSE, and replacing them with a general approval process for securities clearing and settlement systems).

Policy environment

As noted above, there has been no effective competition between the five settlement systems because they clear and settle different instruments. Nevertheless, the attitude of the Australian Competition and Consumer Commission (ACCC) to mergers between systems will be critical to the extent that the ACCC views these changes as influencing the potential for competition in the industry.

The Reserve Bank currently has responsibility for the implementation of monetary policy, and the stability of the financial system. As part of CLERP, the Commonwealth Government has released draft legislation that will give the Bank's Payments System Board responsibility for regulation of securities clearing and settlement systems where these are important to the

stability and integrity of the payments system. The powers of the Australian Securities and Investments Commission (ASIC) and the responsible Minister in relation to regulation of clearing and settlement will also be more clearly defined.

The Commonwealth Government, through the Regulatory Advisory Committee and Australian Centre for Global Finance, has identified clearing and settlement services as important to the promotion of Australia as a regional financial centre, and is closely monitoring developments.

IV. OPTIONS

This section outlines two approaches to improving the efficiency of Australia's clearing and settlement systems:

- at one end of the spectrum is the approach that focuses on removing impediments to competition between existing providers of clearing and settlement systems and letting market developments take their course. Some possible outcomes are described and their consequences analysed; and
- at the other end, a “clean sheet” approach draws on the analysis above to outline ways in which the necessary business functions could be combined at minimum ongoing resource cost. In doing so, it helps to provide a benchmark against which alternative outcomes can be assessed.

1. Remove Impediments to Competition

One approach to promoting efficiency of securities clearing and settlement arrangements is simply to remove all legal impediments to competition between the existing systems with a view to encouraging competition.

In many respects, contestability in the provision of securities settlement services requires the equivalent of “number portability” that is seen as the key to telecommunications competition. If a telecommunications user is unable to “move” their number cheaply and quickly from one service provider to another, then the incumbent gains a substantial advantage due to high switching costs. Contestability in clearing and settlement requires that systems compete for settlement of trades from different sources - rather than settling only trades in particular instruments or from particular streams. For instance, the extent to which this occurs will depend to a large degree on the ease with which securities holdings can be moved and the instructions to change ownership of those securities re-routed without high switching costs.

A number of changes to the law, formal business rules and the regulatory environment that will remove long-standing impediments to competition are already in train:

- amendments to the CIS Act and the *Bills of Exchange Act* will make it easier for organisations to clear and settle CGS and other negotiable securities electronically;
- in the last reauthorisation of CHES by the ACCC, a condition was that the SCH business rules be amended to make it clear that ASX trades could be settled outside CHES (although bilateral settlement has always been available outside CHES). The rules were also amended to allow DVP settlement services to be provided for transactions other than those occurring on the ASX. These changes allow trades made on one exchange to be settled in a clearing and settlement system not owned by that exchange; and
- the focus of CLERP reflected in the draft Financial Services Reform Bill is on increasing competition by removing specific institutional regulation and replacing it with functional regulation, which might be performed by a range of institutions.

Establishment of common message standards, communication protocols and interfaces to all clearing and settlement systems could also increase contestability of settlement services by making it easier for users to choose between systems (ie the ability of users to move their business to another system is a threat to the existing provider). Current arrangements make it difficult for systems to compete for settlement business. Adoption of common standards and interfaces would have two principal effects. It would:

- provide a platform for increased contestability between clearing and settlement systems in relation to prices and services; and
- offer users of several systems potential for reduced network, interface and back-office processing costs.

While the longer-term benefits of standardising communication links could be substantial, the difficulty of achieving them in a competitive environment should not be underestimated. All clearing and settlement systems may not see advantages in standardisation and the content of the messages they are exchanging with their users varies widely. A large proportion of the initial development and implementation costs will need to be borne directly by the clearing and settlement systems while the longer-term benefits will accrue to users who will have a range of views about the benefits. Benefits will accrue principally to larger users settling trades in a number of systems rather than those that are smaller or more specialised. The international dimension will also be important. Users may be reluctant to invest in systems changes that run ahead of international standards - indeed, investment in purely domestic standards makes little long term sense. At the same time, implementing international communication standards makes settlement of domestic trades more contestable by foreign clearing and settlement systems.

On the demand side, new sources of transactions - exchanges and electronic communication networks (ECNs) which match buyers and sellers - which are not already tied to particular clearing and settlement systems through ownership links, will be seeking to access settlement arrangements, and clearing and settlement systems will be competing to supply them. Although all clearing and settlement systems aim to operate profitably, as suppliers of clearing and settlement services demutualise, their emphasis will shift more towards a focus on shareholder returns rather than passively clearing and settling only trades routed to them from their parent exchange.

A stylised model of competition

It would be possible to analyse a number of combinations of systems clearing and settling different proportions of the debt, equity, options and futures business.

Most of the relevant issues can be drawn out by analysis of a stylised market characterised by competition between two systems for the clearing and settlement of securities involving transfer of title.³ (Similar issues arise in analysis of competition between say SFECH and OCH for the clearing and settlement of futures and options.)

The analysis assumes that each system attempts to maximise its profits. To do so, it focuses on market share of traditional business since this maximises revenue and, because the industry is characterised by relatively high fixed costs and low marginal transaction costs, it helps to lower average transaction costs.

³ This section does not purport to represent the business intentions of the owners of clearing and settlement systems, but considers stylised scenarios to examine the extent to which competition might transpire.

One system is assumed to be based on the existing CHESS system for clearing and settlement of equities and the other on the Austraclear system for settlement of debt securities. Initially the systems would continue as separate silos, with Austraclear accepting trades from the OTC market and CHESS from the ASX. Competition between them would require Austraclear to settle equities trades (which is possible following changes to the CHESS business rules) and CHESS to settle debt trades (which will be made easier by changes to the CIS Act and the *Bills of Exchange Act*).

While the formal impediments to competition have been largely removed, effective competition for equities settlements would also require:

- Austraclear to attract transactions, which could be done in a number of ways. It could focus on attracting off-exchange equities trades. For it to compete for settlement of exchange-traded transactions would require the ASX to modify its SEATS system to deliver specified transactions to Austraclear for settlement, and Austraclear to modify its system to automatically accept them. Alternatively, Austraclear could link to an alternative trading system;
- Austraclear to arrange a central counterparty (with related guarantee arrangements) to accept novated trades or provide settlement without the guarantee arrangements;
- Austraclear to establish links to company registries to mirror transactions in its system; and
- market participants and the competing systems to establish conventions and procedures for dealing with the additional complexities that would arise in instances where parties to the trade nominated different systems for settlement.

Similarly, although CHESS would not need to establish a central counterparty to settle debt trades, it would need to:

- modify its system to accept debt trades from SEATS or from the OTC market (perhaps through a proprietary interface or through SWIFT);
- treat such trades as not novated and provide links to settle them on a RTGS basis (as is proposed for large-value equities); and
- agree with Austraclear and market participants on conventions and procedures for dealing with the additional complexities that would arise in instances where parties to the trade nominated different systems for settlement.

Most importantly, for competition to emerge, banks and investment banks which are the main holders of debt would have to nominate CHESS rather than Austraclear for settlement and brokers and their major domestic and offshore institutional clients would have to nominate Austraclear rather than CHESS for settlement.

For vigorous competition to emerge, all these prerequisites would need to be met, though the credible threat of competition could be important. Competition would quickly become one-sided if only one of the competitors could compete effectively for the other's business. And if neither could mount a credible bid for the other's business, there would be no advances on today's arrangements which see clearing and settlement functions confined to separate silos.

If no effective competition emerged, there would be no implications for users' liquidity costs. If competition did emerge, costs of liquidity management could actually rise. Users could find two separate liquidity pools forming and that it became more difficult to locate securities for delivery if securities borrowing and repo arrangements became segregated in the two

systems. These difficulties could be overcome, but to do so would require seamless links between the systems and to registries.

Outcomes of competition

For competition, or the threat of competition, between clearing and settlement systems to yield long-term benefits to users, it must be capable of being sustained over the long run. This can only be assured if all clearing and settlement system operators have dealt successfully with a number of issues:

- participants are used to dealing with only one system for each instrument. It is possible that stock holders will be prepared to move only if they are convinced that there will be a wholesale shift of stock from one system to another. Should this occur, the other system would need to develop a strategy for retaining and servicing its remaining stock holders; and
- although the volumes of turnover in some Australian systems have increased sharply recently, they are still relatively low by world standards. If these transactions were split across two systems, both would have to deal with the resulting limited scope for spreading overheads across transaction volumes, keeping their cost structures relatively high.

If competition between systems proves to be viable in the long run, they will place pressure on each other to keep costs low and pass the benefits on to users in terms of lower explicit charges. Considerable duplication of functions would however remain, exposing both competitors to the risk that more efficient offshore suppliers could underprice them.

But it is also important to consider how things might pan out if one system proves to be clearly superior to the other. At least four outcomes seem possible:

- the stronger domestic competitor takes over the weaker. Some of the infrastructure and skills base of the weaker competitor might be reused. This outcome would probably require the explicit consent of the ACCC. It may, however, be precluded by restrictions on ownership;
- the stronger domestic competitor simply wins the business from the weaker, as stock holders transfer their holdings. There is no obvious role for the ACCC since there is no corporate takeover. But on current ownership structures, clearing and settlement functions would be dominated by a system owned by a particular group - either the banks that own Austraclear or the shareholders of the ASX. The system's ownership and governance would not reflect the interests of many of its significant users. At least one group of users would feel disenfranchised;
- a foreign clearing and settlement system could buy out an existing domestic system and develop it into the dominant system, though ownership restrictions may make this difficult; and
- a foreign clearing and settlement system could provide services to Australian traders using its offshore facilities and take all the business from competing domestic systems, or from a single domestic system.

This analysis has focused on competition between two existing systems for each other's core business. While this is useful for considering the issues and barriers, competition could develop in many other ways. Existing players and new entrants could seek niche opportunities which arise as markets change, develop and proliferate, as technology creates new processing methods, and as market users demand new or specialised functionality and services. Over time, niche competitors can challenge the core business of traditional

providers, forcing them to review their services, functionality and pricing in order to remain competitive.

2. A Clean Sheet

This approach sets out ways in which the necessary back-office functions of clearing and settlement could be carried out to minimise resource costs. The approach deliberately abstracts from two difficult questions that would need to be addressed if it were to be pursued further:

- How can users and regulators ensure that systems not subject to direct domestic competition (or the credible threat of competition) are operated efficiently, and that this is reflected in pricing to users?
- How could such arrangements be established, given the initial starting point in which existing owners (and users through their internal systems) have substantial investment, and what would be the cost of transition?

The analysis in Section I concluded that there are two basic types of clearing and settlement systems - those that transfer title in exchange for funds and those that calculate margin obligations. There is a high degree of commonality in the business functions performed in each of these two systems but not as much commonality across these two systems.

Systems that transfer title

Systems that transfer title need to:

- accept instructions from the buyer and seller confirming the details of the stock to be settled from each trade;
- check that each seller has the stock to deliver and that the buyer has sufficient funds available to pay;
- establish a DVP settlement mechanism that ensures that the seller delivers and the payer pays if, and only if, the counterparty also performs;
- confirm to the users that the transaction has settled; and
- notify relevant registries so that records can be updated.

The common nature of these functions suggests that they could be efficiently carried out under a single structure, with common business rules, message standards, communication linkages, hardware platforms and software providing broadly similar functions. This is not to deny that there are differences between debt and equity settlements and related depository functions (for instance current equity practice involves novation to a central counterparty and clearing and settlement systems for equities typically perform a range of corporate actions that are not relevant to debt securities but which can be complex and costly to administer) but the core functions are very similar. Some countries have systems arranged along these lines eg the UK, Germany, Canada and the international central securities depositories (Euroclear and Clearstream) both settle debt and equity transactions from a wide range of sources.

This is an industry characterised by relatively high fixed costs (system design, management, and facilities management), relatively low marginal transaction costs and increasingly fewer constraints on increasing processing capacity. As a result, a single system to settle trades involving transfer of title has the potential to have lower resource costs than a number of separate systems that cannot share overhead and operations costs.

Systems for margining

Similarly, there is a high degree of commonality in core business functions performed in the clearing and settlement system for both options and futures. They both:

- accept and match instructions confirming each trade;
- act as a central counterparty to each trade;
- calculate users' net obligations in light of relevant market movements; and
- make payments to and receive payments from members in settlement of net obligations to the clearing and settlement system.

Again this suggests that the systems need similar business, technical and financial skills, arrangements to monitor the prudential standing of the members to whom they are exposed, message formats and communication systems, systems to calculate net obligations and arrangements to make and receive payments. A single system clearing and settling options and futures appears to have the potential for lower average costs per transaction than two systems that cannot share the infrastructure costs of providing essentially similar services. There would also be liquidity savings to users settling both types of transactions, since positions in both instruments against a single counterparty would be automatically netted, lowering net payment obligations.

A single system

While the case for unified systems performing virtually homogeneous tasks is relatively easy to make in principle - ie a unified system transferring title and a separate unified system settling margin adjustments - the issues involved in assessing the case for a single system settling all transactions are somewhat more complex. This is because some functions are not common and some "parallel processing" would still be necessary, limiting scope for spreading costs. For instance, the DVP mechanism in a system transferring title has no application to margin payments and the novation arrangements for margin payments have no role in settlement of debt trades.

However, there are a number of common functions across the two types of systems and the question of whether a single system would have a lower cost structure than two depends largely on the extent to which they can be shared and their importance in determining overall costs. They include:

- message standards and communication linkages (though message content will depend on the type of transaction being settled);
- matching and confirmation functions; and
- clearing functions (though they are significantly different for title and margin systems).

Other important questions relate to the potential for the systems to share costs of system operations, backup, business rules and legal infrastructure, management and governance.

Potential savings to users of several systems from dealing with only one clearing and settlement entity could be considerable. They could standardise and automate back-office processing and would be able to deal with only one legal entity and set of business rules. A single system with a single central counterparty (for trades in equities, futures and options) would significantly simplify users' liquidity management and reduce their costs, because positions against the central counterparty in different instruments would be offset. With all stock accessed through the same system, pledging of collateral would also be simplified. Larger users whose business was spread widely across all the relevant markets could have the

most to gain. Those operating exclusively or principally in one sector might find that costs outweigh benefits.

The “clean sheet” approach suggests that there could be substantial economies from separate unified systems clearing and settling trades involving transfer of title and margin adjustments. Further potential economies may arise from a single system, particularly when users’ internal and liquidity costs are recognised. This approach has identified potential benefits. In doing so, it provides somewhat of a long-term benchmark, but as noted above, it has not attempted to analyse the costs of transition, or address the problem of ensuring that potential efficiencies are realised and passed on to users. Further, the benefits and costs would not fall equally on all market users; a particular rationalisation proposal might be highly desirable for some, but strongly opposed by others.

Quo Vadis?

This paper does not recommend any particular course of action but it does lead to some key questions that need to be considered by system owners, users and policy makers.

The course on which the industry is currently embarked is to remove impediments to competition and let the market outcome take its course. The analysis above suggests three possible outcomes:

- No effective competition eventuates and clearing and settlement of debt and equities remain separate. However, the threat of competition may be a sufficient driver for systems to improve efficiency. The difficult question is judging the credibility of the threat.
- Effective competition emerges and continues indefinitely. In this case the policy is a success and users should expect lower explicit charges from systems.
- A single system emerges from competition, owned either by domestic or foreign interests. This outcome has many of the economic characteristics of the clean sheet outcome, in particular, potential for maximum economies of scale. But it has some disadvantages and leaves some important questions unanswered, perhaps to be dealt with by regulators. Some users may feel disenfranchised and left with considerably less influence on clearing and settlement arrangements than they presently do as owners.

Whichever way things emerge, there is a sense of urgency, especially if Australian interests are to play a longer-term role in this part of the financial system. Users of Australian systems, their owners and policy makers will all need to address four questions:

- What is the likely outcome if events unfold with current policy settings aimed at removing impediments to competition?
- Is the most likely outcome acceptable?
- If not, what outcome would be better and why?
- What is necessary to produce this superior outcome?

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APPENDIX A: LEGAL ASPECTS OF CLEARING AND SETTLEMENT SYSTEMS

Australia has five clearing and settlement systems – Austraclear, CHESS, OCH, RITS and SFECH. Each employs differing methods of clearing and settling their respective securities and derivatives. This structure has evolved partly as a result of historical factors, but also partly due to certain legal reasons. This attachment outlines some of the legal issues in the clearing and settlement process of each system, and considers the impact of these issues on competition in the provision of clearing and settlement services.

Austraclear

Austraclear transfers and settles private sector and semi-government debt securities. It does not act as a central counterparty to trades settled across its system.

Transfer of Securities

A transfer in Austraclear first requires that the relevant securities be lodged with Austraclear. A distinction is drawn between paper, non-paper and dematerialised securities.⁴

Paper

Once paper securities have been lodged with the system, they are recorded in the member's security record and are held by Austraclear as bailee for the owner,⁵ which is defined in the regulations as the member in whose security record the security appears. Bailment is where one person takes possession of another's property without the transfer of any legal or beneficial title. These arrangements effectively confer legal ownership on the owner (as recorded by Austraclear) by means of constructive possession, and therefore also permit subsequent transfer of legal ownership through changes to members' security records by Austraclear (this is termed constructive delivery).

Non-paper

Non-paper securities are also recorded in the member's security record after lodgment, but are held by Austraclear as nominee for the owner.⁶ When acting as nominee, Austraclear holds legal title, but the owner holds a beneficial interest in the security, which may be transferred to other members.

Dematerialised securities

The *Bills of Exchange Act* prevents the creation, holding and transfer of negotiable debt instruments covered by it (eg bills of exchange and promissory notes) via electronic means.

The concepts of physical delivery and indorsement contained in the *Bills of Exchange Act* do not lend themselves to electronic transactions. Austraclear has overcome these difficulties by defining the rights and obligations of its members by contract so that the outcomes have a similar legal effect as negotiability. Austraclear members can lodge and transfer

⁴ Paper securities held in Austraclear include bank accepted bills of exchange, promissory notes and certificates of deposit. Non-paper securities include registered debt securities and certain trust interests equivalent to debt. Dematerialised securities in Austraclear are interests functionally equivalent to lodged paper securities but for which Austraclear has "synthesised" the characteristics of negotiability.

⁵ Austraclear Regulation 7.9.

⁶ Austraclear Regulation 8.4.

dematerialised securities,⁷ with good title held by the owner if the transfer was in good faith for value and without notice of any existing claims.⁸

When making a transfer, each member must include in the terms of the transfer an agreement to indorse the paper or dematerialised security, after which Austraclear may record the transfer in each member's security record.⁹ This agreement to indorse is incorporated into the keystrokes required to record the transfer. The regulations state that any member agreeing to indorse attracts the same liabilities as if the indorsement actually took place.¹⁰ Further, each member by virtue of their membership appoints Austraclear as an agent to physically indorse paper or dematerialised securities as necessary.¹¹ This suggests that the agreement to indorse represents a binding contract that may be relied upon by the owner should indorsement by the member (as distinct from Austraclear acting as their agent) be required at a later stage.

Legal Basis

Austraclear's members and participating banks are bound to each other and to Austraclear through contractual agreements with Austraclear. The regulations provide that the regulations are a valid binding and enforceable contract between each and every member, participating bank and Austraclear.¹²

The regulations also provide that the rights and obligations of members and participating banks are to be construed in accordance with the law in force and enforceable in New South Wales.¹³

Legislative Protection

The Payments System Board of the Reserve Bank has given approval to the Austraclear System as an "approved RTGS system" under the *Payment Systems and Netting Act*. This ensures the irrevocability of completed Austraclear transactions by removing the potential for the "zero hour rule" to be applied in the event of a member's insolvency. In addition, Austraclear and its members are protected under the same Act through the multilateral netting arrangement in its operating rules being an "approved multilateral netting arrangement", for occasions when it operates in "fallback" mode.

Regulation

Austraclear is essentially subject to self-regulation (via its Regulations and Operating Manual). Enactment of legislation to give effect to the CLERP reforms will change existing arrangements for regulation of securities settlement systems, with the Minister and the Australian Securities and Investments Commission (ASIC) generally responsible for securities clearing and settlement. The Minister may also declare that the Payments System

⁷ Austraclear Regulation 8A.8.

⁸ Austraclear Regulations 8B.1.

⁹ Austraclear Regulations 12.3 and 12.4.

¹⁰ Austraclear Regulations 12.3(c) and 12.4(c).

¹¹ Austraclear Regulations 12.5.

¹² Austraclear Regulation 23.3.

¹³ Austraclear Regulation 23.5.

Board of the Reserve Bank will have responsibility for those systems which are declared to be of systemic importance to the payments system.¹⁴

CHESS¹⁵

CHESS clears and settles securities obligations arising from trading in SEATS,¹⁶ and is the approved Securities Clearing House (SCH) under s779B of the Corporations Law.¹⁷ This allows legal title to equities to be transferred electronically. The SCH Business Rules also allow for settlement of non-ASX transactions in CHESS. However, settlement of these transactions is not within the protection of the National Guarantee Fund (NGF – discussed below), which only extends to ASX transactions.

The ASX has also outlined a proposal for retail trading of CGS on SEATS, with clearing and settlement through CHESS. At present the *Commonwealth Inscribed Stock Act* does not permit electronic transfer of legal title to CGS, so the ASX has proposed a system of transfer based on CHESS Depositary Interests (CDIs), which represent beneficial title over CGS.

Transfer of Securities

Valid electronic transfer of securities in CHESS is performed by virtue of provisions in the Corporations Law and the SCH Business Rules.¹⁸ The Corporations Law essentially recognises the SCH Business Rules as authoritative in determining whether a transfer falls within the scope of those Rules – termed an “SCH-regulated transfer”. The Corporations Law then states that such transfers are “proper SCH transfers” and are deemed to meet all formal transfer requirements if made in accordance with the SCH Business Rules. The Corporations Law also recognises the electronic recording of information in CHESS subregisters, and transfers in electronic form if made in accordance with the SCH Business Rules.

A key feature of CHESS is novation. Broker-broker trades are novated to the Transfer Netting Service Clearing (TNSC - a subsidiary of the ASX Settlement and Transfer Corporation (ASTC), which operates the SCH). This is deemed to occur immediately upon matching of bids and offers in SEATS. The novation interposes the clearing house as the central counterparty to all trades, and thereby reduces the credit risks faced by counterparties, as well as allowing for netting. However, brokers may agree that a particular trade is to be excluded from netting and novation.

Once netting of all obligations has occurred, final transfer of legal title to securities takes place when securities are deducted from the transferor’s account (Rules 6.2.3 and 7.29.2).

In the event of a broker having insufficient securities to meet its obligations, the ASTC cancels sufficient transactions to remove the deficiency, and reschedules the settlement for the

¹⁴ Exposure draft of the Financial Services Reform Bill 2000, proposed section 820C (the CLERP 6 legislation).

¹⁵ See generally: ASX Settlement and Transfer Corporation Pty Ltd. *Legal Issues in CHESS Phase 1*. April 1997.

¹⁶ Securities cleared and settled in CHESS include equities, warrants, units of listed unit trusts, units of some foreign securities, preference shares, unsecured notes, convertible notes and company issued options.

¹⁷ ASX Settlement and Transfer Corporation Pty Ltd. *Legal Issues in CHESS Phase 1*. April 1997. p 7.

¹⁸ ASX Settlement and Transfer Corporation Pty Ltd. *CHESS: An overview*. 7th edn. November 1999. p 20.

next business day. Participants responsible for the failure incur administrative fees (as well as make up for any differences in market value).

Where a participant has insufficient funds for a net transaction resulting from novation, the TNSC may (up to a limit of \$10 million), call upon its “At Call” facility to fund the payments shortfall. The “At Call” facility is secured by the TNSC’s right of recoupment against the NGF.

National Guarantee Fund

The NGF protects brokers, their clients, and the TNSC from certain types of losses. In general these include failure by the broker to provide funds or securities, failure by the broker or TNSC to meet their net obligations, and losses arising from unauthorised transfers or insolvency of the broker.

Legal Basis

The SCH Business Rules are enforceable under the Corporations Law for the benefit of all CHESS participants. The Rules themselves have the effect of a contract between SCH and all CHESS participants (Rule 1.5.2 and s779F of the Corporations Law stipulate this). The SCH will also compensate members and issuers where loss is caused by certain actions of the SCH, but liability is excluded in certain circumstances (Rules 1.10-1.13). Further, brokers and NBPs indemnify others in terms of the accuracy of their messages and their authority to transfer securities, and also have a general duty of care towards other participants (Rules 9.16, 10.15, 10.17).

Legislative Protection

CHESS has been given recognition as a netting market under the *Payment Systems and Netting Act*. This provides certainty that CHESS’s netting arrangements are not open to challenge should a participant undergo external administration.

Regulation

ASIC has regulatory responsibility for CHESS under the Corporations Law. In addition to formal regulatory oversight, CHESS also undertakes extensive self-regulation, which is largely based on compliance with its Business Rules. This is consistent with the Corporations Law’s formal recognition of these Rules.

OCH

Clearing and Settlement of Obligations

The OCH clears and settles obligations arising from the ASX’s Derivatives Trading Facility (DTF). These relate to all ASX-traded options, excluding warrants (which are settled in CHESS). Transfers of actual securities do not occur in the OCH, since DTF transactions relate to derivatives, which are instruments whose value is derived from some underlying asset or security.

OCH’s operations are governed by the ASX Business Rules. These Rules provide for the registration and novation of contracts (known as Market Contracts) executed on the DTF between organisations which have been admitted as ASX derivatives trading participants. An organisation may be both a trading participant and a clearing participant, or it may be a trading participant only, in which case it will need to contract with a clearing participant to clear on its behalf. Derivatives clearing participants are organisations which have been

admitted by ASX as such. The ASX must be satisfied that clearing participants have adequate facilities, procedures, personnel and financial resources.

Under the ASX Business Rules, a Market Contract is discharged and replaced by legal novation with two Open Contracts on the same terms. One Open Contract is between the selling clearing participant and OCH as buyer, and the other Open Contract is between the buying clearing participant and OCH as seller. Each of these Open Contracts is on a principal-to-principal basis between the novated parties. This enables OCH to perform a single net settlement with each clearing participant on a daily basis as a result of activity (new Open Contracts, close out and exercise) from the previous day.

In the event that a clearing participant's obligations to OCH exceed OCH's obligations to the clearing participant, section 954N of the Corporations Law provides OCH with the ability to claim the net shortfall from the National Guarantee Fund (and vice versa if OCH was to fail to meet its net obligations to a Clearing Participant).

Legal Basis

ASX Business Rules govern the operations of OCH. Under section 772A of the Corporations Law, those rules have effect as a contract under seal between the exchange and each clearing participant and between each clearing participant and each other clearing participant. In addition the court can order compliance with, or enforcement of, the rules under section 777.

Legislative Protection

Unlike SCH, OCH is not separately recognised under the Corporations Law (although it is recognised under Corporations Law Regulation 7.3.02, 7.4.07 and 7.4.08 and the Regulations to the *Superannuation Industry (Supervision) Act*).

OCH has been given recognition as a netting market under the *Payment Systems and Netting Act*. This provides certainty that OCH's netting arrangements are not open to challenge by a liquidator of a clearing participant.

Regulation

OCH has wide powers under the Rules to act if OCH considers a clearing participant's ability to meet its obligations to OCH is compromised. In a clearing participant default, the Rules enable OCH to apply cash or to realise non-cash cover and apply it against losses arising from a clearing participant default.

OCH is also subject to regulation by ASIC in its general role as administrator of the Corporations Law.

RITS

RITS provides clearing and settlement for obligations arising from transactions in CGS (Treasury bonds, Treasury notes and Treasury indexed bonds issued as capital-indexed bonds and Treasury adjustable rate bonds).

Transfer of Securities¹⁹

Commonwealth Government securities lodged into RITS by members are held in a "pool account" in the name of the Reserve Bank of Australia at the Registry of Inscribed Stock in

¹⁹ This description is taken principally from the RITS Information Paper, section 3.4.

Sydney. The Reserve Bank maintains records of persons entitled to the delivery of these securities.

Legal and beneficial ownership of securities lodged into the system pass to the Reserve Bank at the time of lodgment. In return, the Reserve Bank grants to the member a legal right (technically known as a legal “chose in action”). This right entitles the member, at any time when the relevant securities are not subject to a mortgage or bank mortgage in the system, to direct the Reserve Bank to deliver to it securities of a specified description and face value which are clear of encumbrances. A member does not have a proprietary interest in any particular securities; securities of the same description are fungible.

The reasons for developing the system in this manner include: (i) to avoid having to produce a written record of each transfer (as would be required by section 23C of the *Conveyancing Act* (NSW), and similar legislation, if members retained a beneficial interest in the securities); (ii) the advantages of fungibility; (iii) the ease of administration; and (iv) greater certainty in ensuring each transferee receives good title to securities when a transfer is completed.

A transfer of a chose in action is effected, from a legal point of view, by the novation (as opposed to an assignment) of the chose in action from the transferor member to the transferee. In these circumstances, it is unnecessary for a written record to be created and the transferee will acquire the securities free from any prior interest of which the transferee has no notice. Choses in action may also be mortgaged. A mortgage is noted in the system as a superior chose in action in favour of the lender of funds. The system does not permit choses in action that are mortgaged to another member to be transferred.

Choses in action held by banks are recognised by the Australian Prudential Regulation Authority (APRA) for capital adequacy purposes and regulated institutions’ liquidity management strategies.

Legal Basis

The RITS Regulations operate as a binding contract between each and every member, participating bank, bank and SSP and the Reserve Bank.²⁰

The RITS Regulations provide that rights of members and participating banks are enforceable only in New South Wales. Accordingly, the securities will be situated in New South Wales for stamp duty and most other purposes.

The New South Wales Office of State Revenue has ruled that transfers of choses in action in the manner contemplated by the RITS Regulations will not attract stamp duty. Members are advised to seek their own advice on liability for stamp duty on mortgages of securities (other than for bank mortgages). The system provides for notification of such mortgages rather than their creation.

Legislative Protection

The Payments System Board of the Reserve Bank has given approval to RITS as an “approved RTGS system” under the *Payment Systems and Netting Act*. This ensures the irrevocability of completed RITS transactions by removing the potential for the “zero hour rule” to be applied in the event of a member’s insolvency.

²⁰ RITS Regulation 2.3.

Regulation

RITS is essentially subject to self-regulation (via its Regulations and Operating Procedures). However, the CLERP reforms will provide for regulation of securities settlement systems, with the Minister and ASIC generally responsible for securities clearing and settlement, and the Reserve Bank responsible for those systems which are declared to be of systemic importance to the payments system.²¹

SFECH²²

The SFECH clears and settles obligations arising from the trading of futures and options contracts on the SFE.

Clearing and Settlement of Obligations

Electronic transfers in SFECH do not require specific legal recognition as only futures and options contracts are traded, rather than actual securities. As with the OCH, the key legal issue in the clearing and settlement process is the novation of trades. Novation occurs once the trade has been registered. The effect of novation is to create two new contracts from the original trade with the SFECH as counterparty to both. The SFECH takes legal responsibility for performance of contracts at this point.

Once a trade has been registered, the SFECH uses initial margins, daily settlement amounts, and the option of intraday margin calls to protect against significant price movements. The SFECH also requires members to have a minimum Net Tangible Asset (NTA) backing of at least \$A5 million, the amount of which determines the position limits imposed on members. Monitoring of client positions is also undertaken.

Generally, the SFECH Rules allow it to take a wide variety of actions to protect the clearing system and client funds. In addition, the process of novation means that the SFECH becomes the counterparty to any contract made, thereby guaranteeing performance despite the default of the initial counterparty. However, this guarantee does not extend to clients of clearing members, whose funds may be used to meet the obligations of their clearing member should default by another client of that clearing member occur. This situation arises as the SFECH does not recognise individual client-member relationships, but rather assesses the obligations of the clearing member as a whole.

Legal Basis

The SFECH is approved as a “clearing house for a futures exchange” under s1131 of the Corporations Law.²³ The Law also recognises the business rules of any approved futures clearing house under s1121, and allows court orders to comply with these rules under s1140. The SFECH Rules bind members upon granting of membership, with applicants lodging undertakings to abide by the Clearing By-Laws.²⁴

²¹ See note 14.

²² See generally: Sydney Futures Exchange Clearing House Pty Ltd. *Clearing and Integrity of Sydney Futures Exchange*. March 1998.

²³ Sydney Futures Exchange Clearing House Pty Ltd. *Clearing and Integrity of Sydney Futures Exchange*. March 1998. p 9.

²⁴ SFE Business Rules, By-Law 4.2(c).

Legislative Protection

The SFECH is approved as a netting market under the *Payment Systems and Netting Act*. This provides certainty that SFECH's netting arrangements are not open to challenge by a liquidator of the Clearing Participant.

Regulation

ASIC has regulatory responsibility for the SFECH under the Corporations Law. The Corporations Law also recognises the self-regulatory role of the SFECH by assigning to it a responsibility as a futures clearing house "to ensure an orderly and fair market for dealings in futures contracts."²⁵

Legal Impediments to Competition

This section sets out some of the legal impediments to greater competition in securities clearing and settlement in Australia. It also describes some of the efforts to remove these impediments.

Commonwealth Inscribed Stock (CIS) Act

The CIS Act applies to Commonwealth Government securities (CGS) (eg Treasury Bonds, Treasury Notes). These are book-entry securities lodged in the Reserve Bank's Registry of Inscribed Stock. The CIS Act requires transfers of legal title in CGS to be settled using a paper-based system, thereby preventing electronic transfer of legal title.

At present, settlement in RITS takes place via a chose in action. Amendments to the CIS Act will permit the electronic transfer of legal title to CGS, making it easier for other clearing and settlement systems to compete with RITS. The timetable for these amendments is yet to be finalised, with the earliest date for implementation appearing to be early 2001.

Bills of Exchange Act

The *Bills of Exchange Act* applies to negotiable instruments (eg promissory notes and bills of exchange). A key characteristic of negotiability is that instruments are transferred by physical delivery (or indorsement followed by delivery). This raises significant hurdles to the electronic transfer of title to these instruments. It is also a barrier to entry for potential competitors since automating the process of indorsement and delivery would also allow for the possibility of transferring these instruments electronically between competing clearing and settlement systems.

The aim of amendments to this Act is to give holders of electronic certificates of deposit, promissory notes and bills of exchange the same rights and obligations as the holders of paper-based versions. This will give electronically created and traded instruments the characteristics (and benefits) of negotiability.

Austraclear has introduced a legal device along the lines of the "chose in action" described above in order to implement its dematerialisation reforms, creating rights and obligations between Austraclear members that are essentially equivalent to negotiability. However, the industry is nevertheless keen for legislative reform to occur. Changes to the *Bills of Exchange Act* are not expected until early 2001.

²⁵ Corporations Law, s1137. This duty also applies to the SFE as a futures exchange.

Corporations Law

Distinction between securities and futures

The Corporations Law makes a distinction between securities and futures, based on historical reasons. Financial innovation has tended to blur this distinction between securities and futures and the CLERP 6 discussion paper noted that the legal distinction “inhibits competition between market providers and creates barriers to entry.”

The CLERP reforms will remove this distinction and introduce a new definition of “financial product”, which will apply as broadly as possible. The intention is for the CLERP reforms to be implemented by January 2001.

Securities Clearing House (SCH) approval

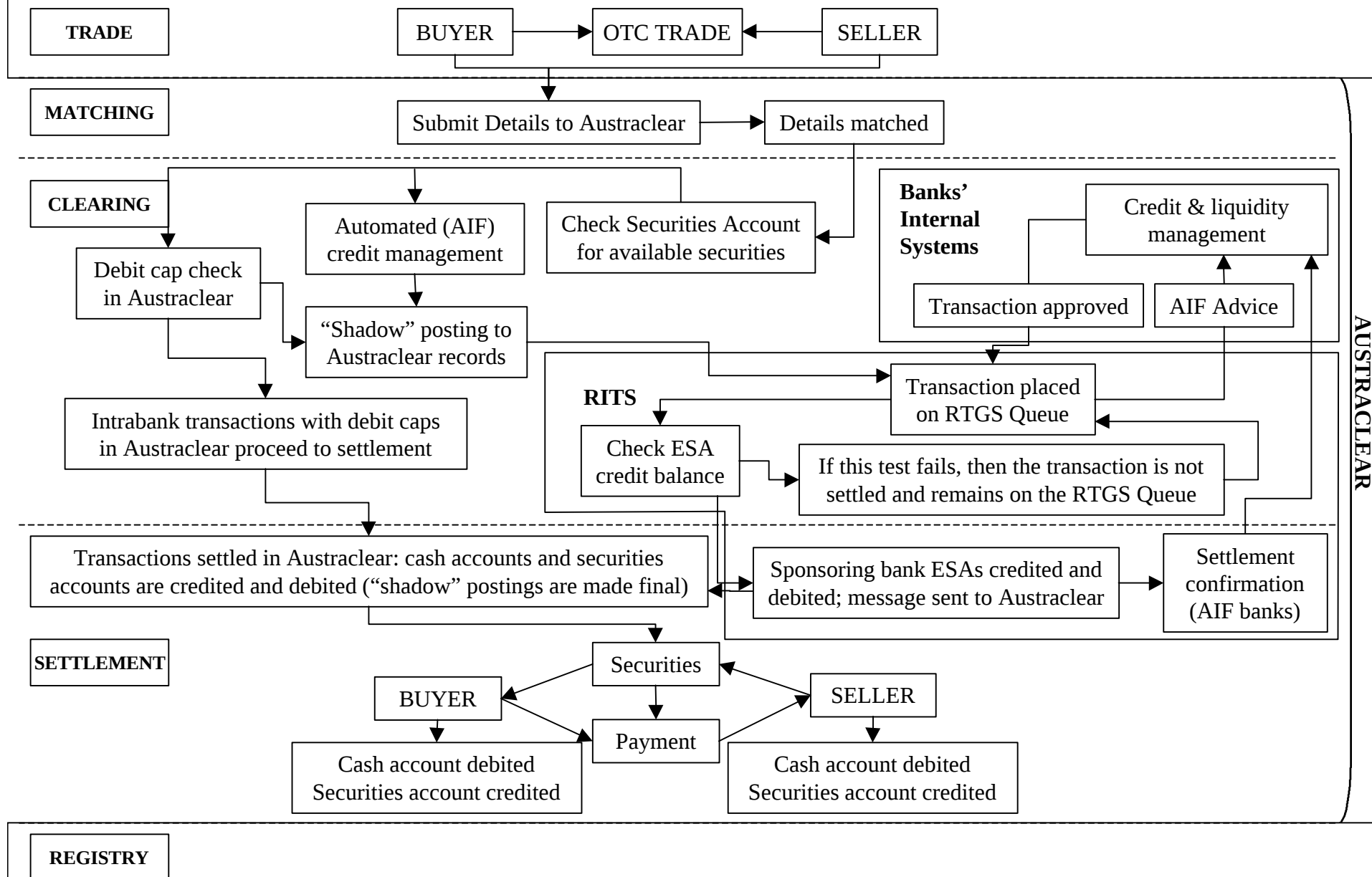
CHESS is the approved Securities Clearing House (SCH) under s779B of the Corporations Law. This approval allows legal title to equities to be transferred electronically in this system. Other systems wishing to transfer title to equities would need to do so via paper-based means.

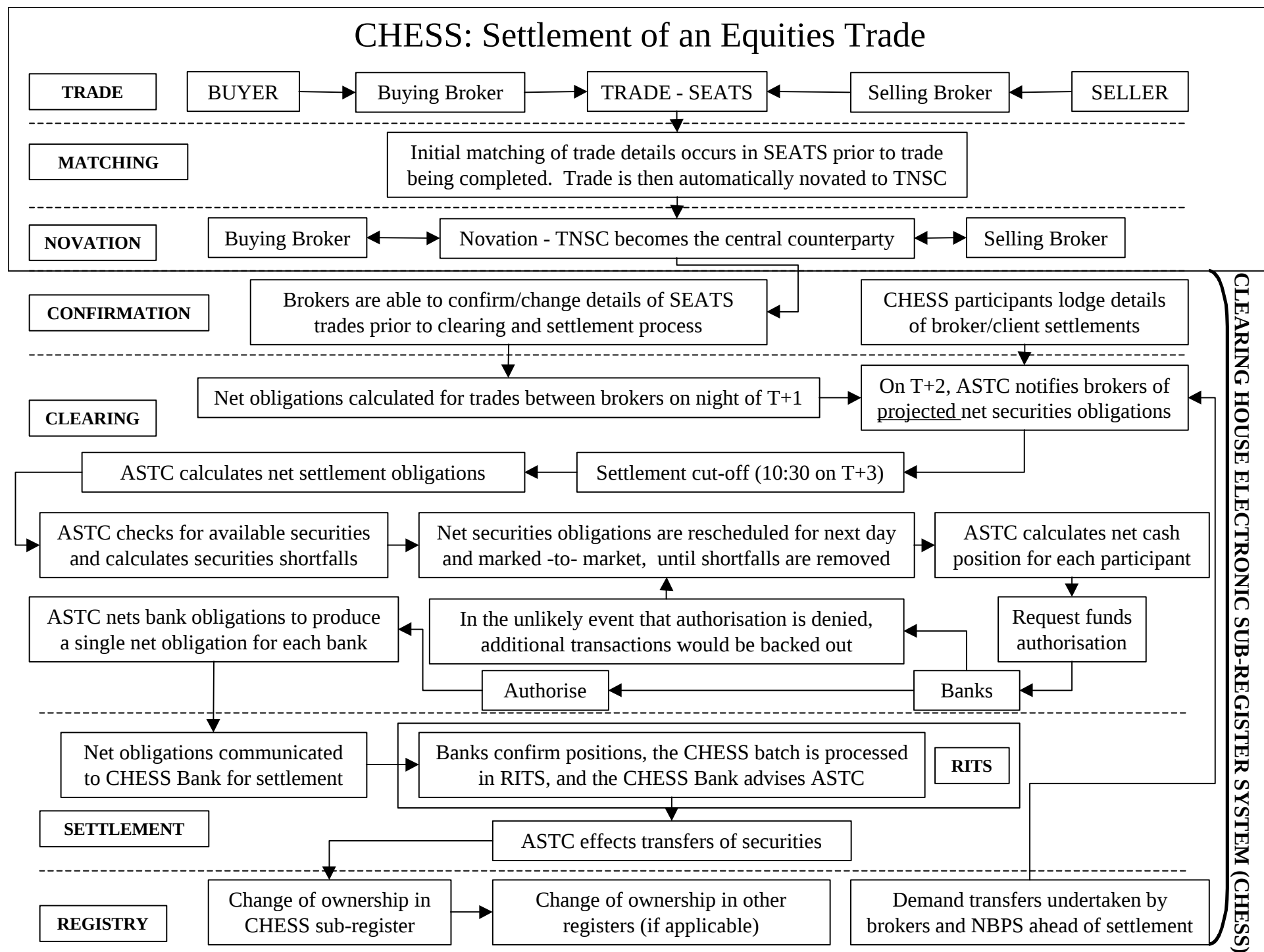
This will be addressed by the CLERP reforms, which will allow the approval of more than one securities clearing house. CLERP envisages the possibility of a number of competing clearing and settlement facilities. Approval and licensing of new facilities will be the responsibility of the Minister and ASIC. Currently, there is no similar restriction on the number of approved futures clearing houses: the Minister can approve more than one.

APPENDIX B: DESCRIPTIVE FLOW CHARTS

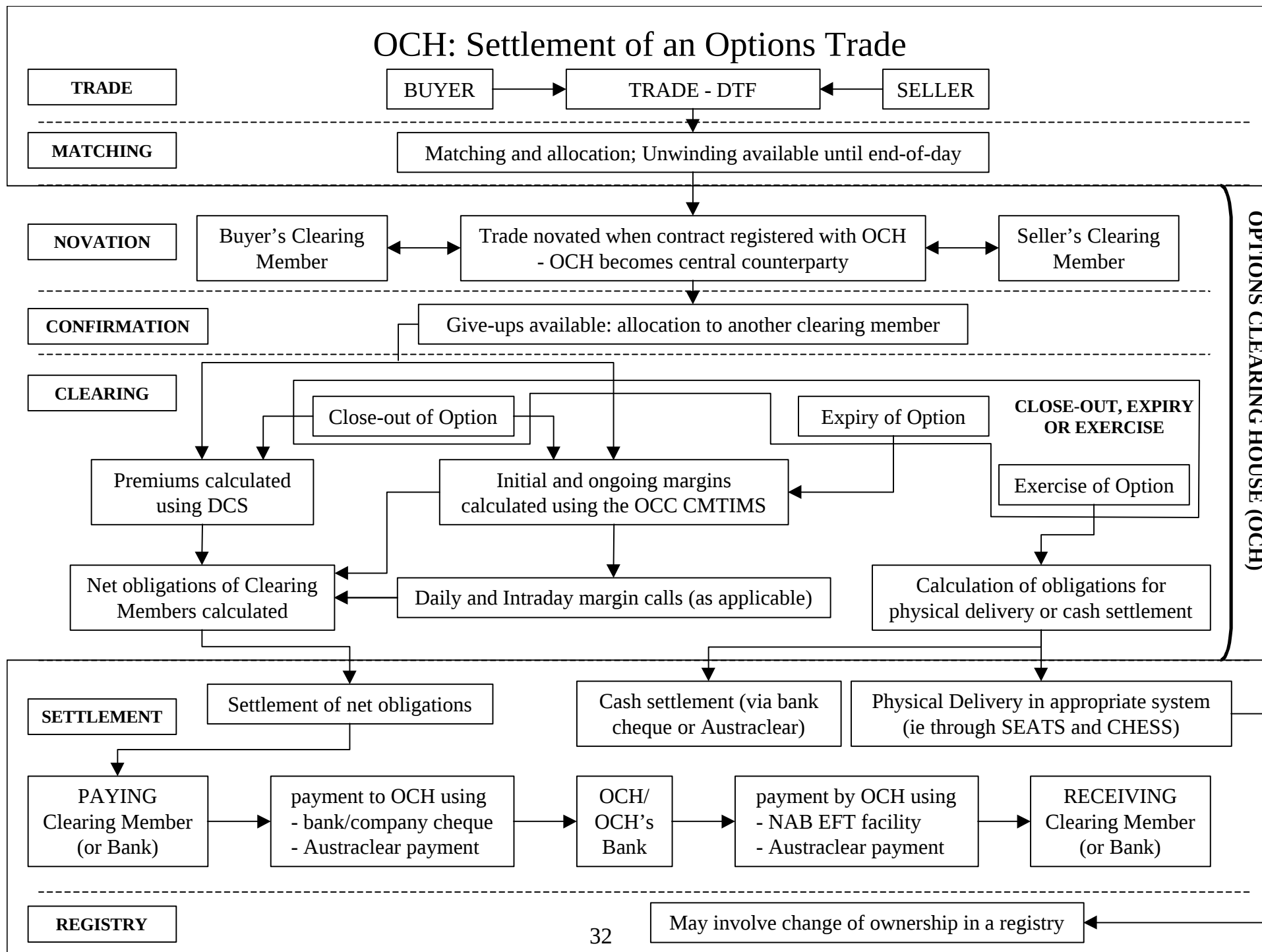
- 1. Austraclear**
- 2. Clearing House Electronic Subregister System (CHESS)**
- 3. Options Clearing House (OCH)**
- 4. Reserve Bank Information and Transfer System (RITS)**
- 5. Sydney Futures Exchange Clearing House (SFECH)**

Austraclear: Settlement of a Debt Securities Trade

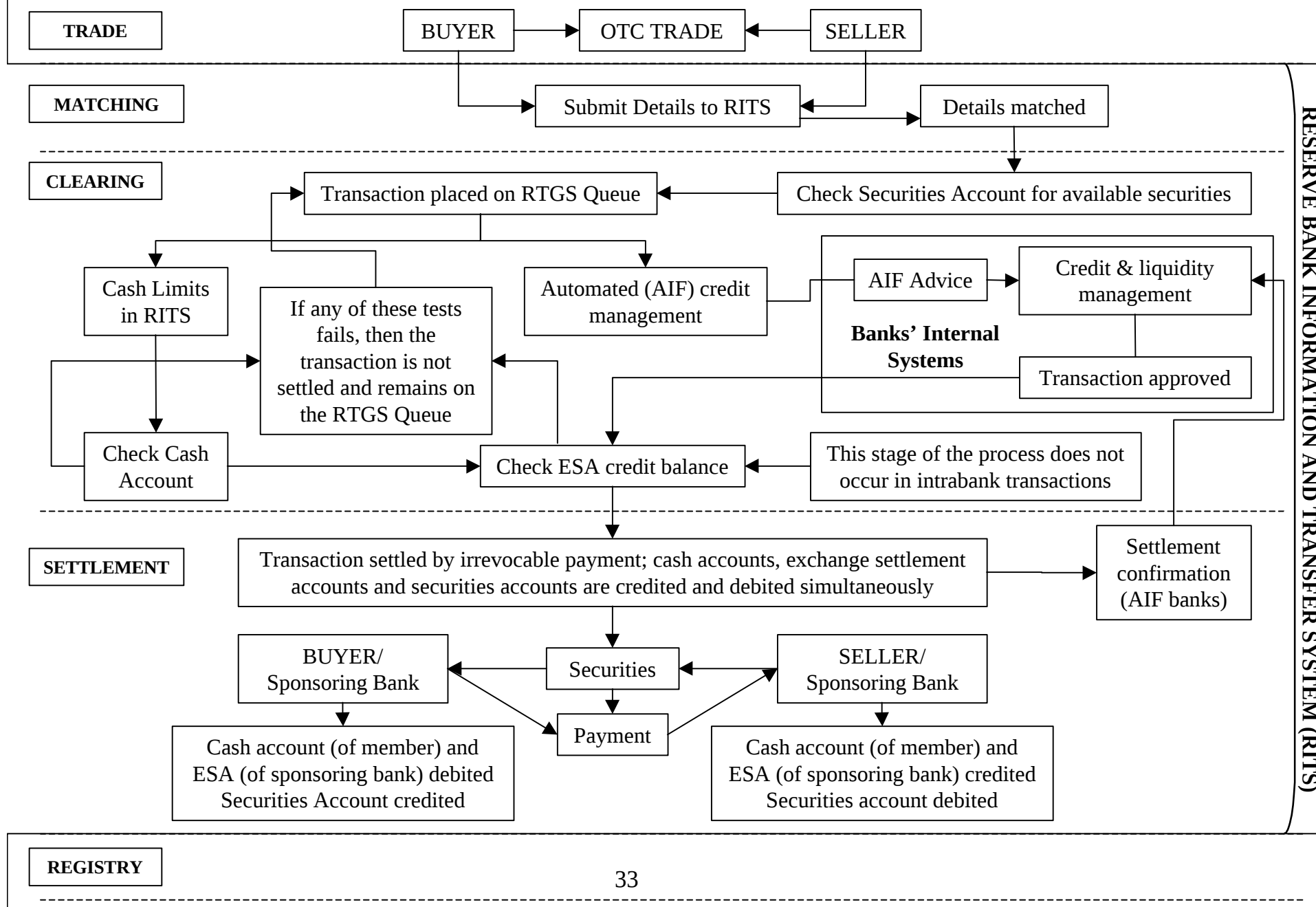




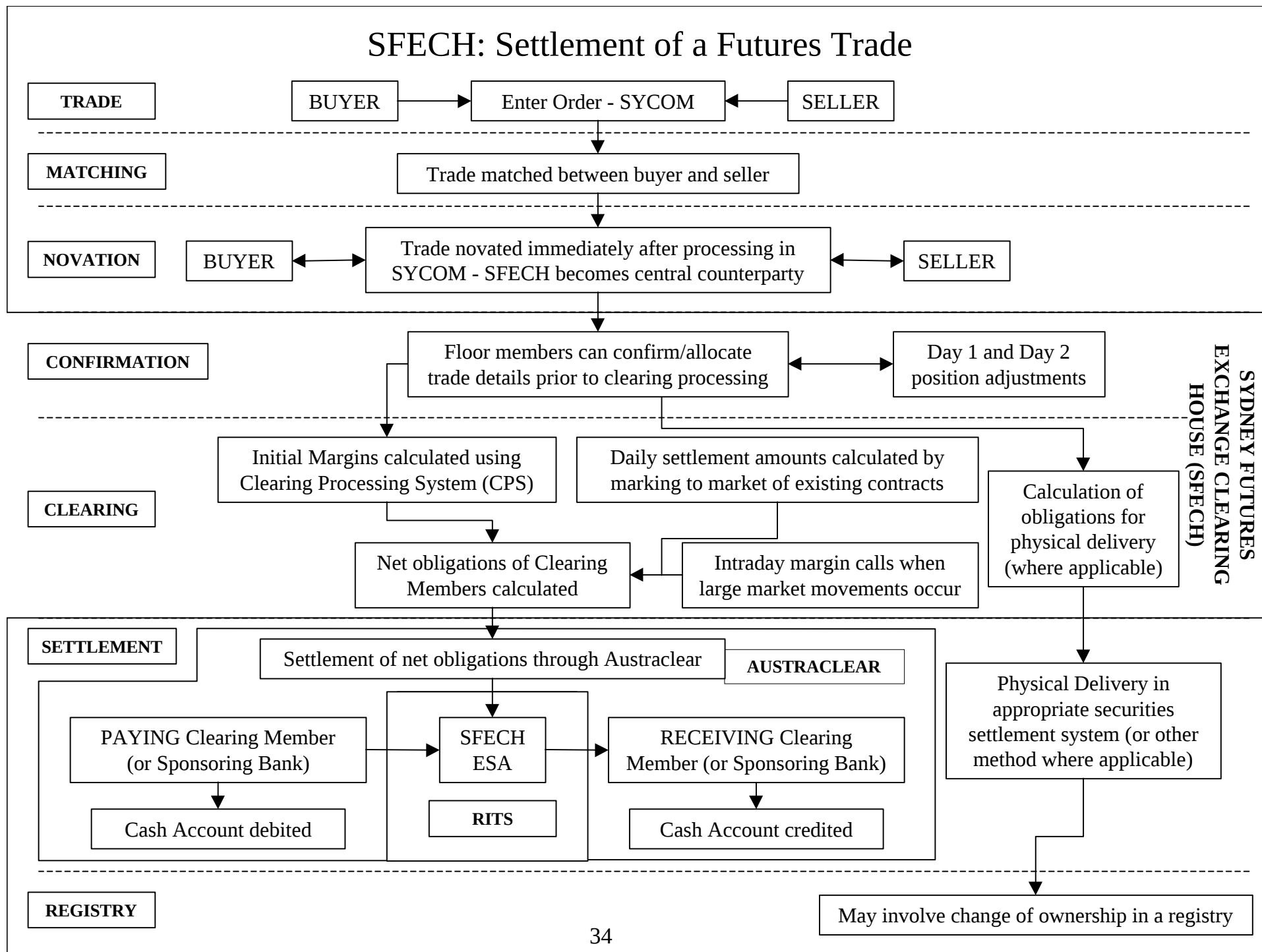
OCH: Settlement of an Options Trade



RITS: Settlement of a CGS Trade



SFECH: Settlement of a Futures Trade



APPENDIX C: FEATURES OF CLEARING AND SETTLEMENT SYSTEMS

- 1. Asset Holdings**
- 2. Risk Management**
- 3. Liquidity Management**
- 4. Communications and Links to Other Systems**

1. Asset Holdings

Name of system	RITS	Austraclear	CHESS	SFECH	OCH
Principal assets held	Commonwealth Government securities (CGS).	Private sector and state government debt securities.	Equities, warrants, company options and corporate debt securities.	Open positions in futures, futures options and equity options (listed at NZFOE).	Open positions in exchange-traded options over equities and indexes.
Where are the assets held?	Registry of Inscribed Stock, Reserve Bank Head Office, Sydney.	Austraclear and other registries.	Assets are held in a CHESS subregister operated by ASX, or an issuer sponsored subregister operated by an issuer registrar.	Brokers' in-house and client segregated accounts within SFECH systems.	In individual client accounts within OCH's Derivatives Clearing System (DCS).

Name of system	RITS	Austraclear	CHES	SFECH	OCH
Who holds title to the assets and in what form (legal or beneficial title)?	Securities lodged in RITS are held in the name of the Reserve Bank of Australia in the Registry of Inscribed Stock. The Reserve Bank maintains records of persons entitled to the delivery of these securities. The Reserve Bank holds legal and beneficial title to securities settled in RITS. Members hold the legal right (known as a chose in action) to delivery of securities to which they are entitled. A transfer of securities in RITS is a transfer of this legal right.	Distinction between paper, non-paper and dematerialised securities—see below.	For CHES Approved Securities (CAS), the owner of securities, as recorded in the CHES subregister or issuer sponsored subregister, holds legal title. For CHES Depositary Interests (CDIs), beneficial title is held in CHES, with legal title being held by CHES Depositary Nominees Pty Ltd (CDN).	Open positions are held in brokers' in-house or client accounts.	Open positions are held in individual client accounts in the name of the legal owner.

Name of system	RITS	Austraclear	CHES	SFECH	OCH
In what form are the assets held (paper-based or electronic)?	Records of legal ownership of CGS are held in electronic form by the Registry of Inscribed Stock. RITS maintains records of persons entitled to the delivery of securities held in the Reserve Bank's "RITS Pool Account" at the Registry of Inscribed Stock.	Securities lodged in the Austraclear System may be in physical, dematerialised or registered form. In accordance with the Austraclear rules: (a) Austraclear holds a Paper Security (ie negotiable instrument) as bailee for the Member who owns the Paper Security. (b) Austraclear holds a Non-Paper Security (ie registered securities) as nominee for the Member who owns the Non-Paper Security. (c) A Dematerialised Security (eg Electronic Bank Accepted Bill of Exchange or Electronic Certificate of Deposit) is a chose in action held by a Member which gives rights and imposes obligations on the holder of a similar legal effect to the negotiable instrument it purports to represent.	CAS are held in dematerialised form in both the CHES and issuer sponsored subregisters. CDIs are also held in dematerialised form, although there may be physical certificates held by CDN for underlying securities. 38	Open positions recorded in electronic form.	Open positions recorded in electronic form.

Name of system	RITS	Austraclear	CHES	SFECH	OCH
Is physical delivery available?	The transfer process in RITS does not provide for physical delivery of securities. However, securities in the system which are free of encumbrance (ie not mortgaged) may be uplifted to the Registry in the member's own name using a Transfer and Acceptance Form. In doing so members are exercising their legal right to physical delivery.	Members can take physical delivery of Paper Securities (eg bills of exchange, promissory notes and certificates of deposit) and, in limited circumstances, certificates in respect of Non-Paper securities. Members also have the right to take physical delivery of Dematerialised Securities.	No. CHES Approved Securities are fully dematerialised, however these securities may be moved from the CHES subregister to the issuer sponsored subregister upon request. CDIs can be converted into the underlying security (which is capable of physical delivery) by application to the registrar or transfer agent.	Upon the expiry of an open deliverable futures contract, delivery occurs via CHES for Deliverable Share Futures, and Austraclear for 90 Day Bank Accepted Bill futures contracts. These arrangements also apply to some exercised equity options traded on the New Zealand Futures and Options Exchange.	Upon exercise of a deliverable equity option, delivery of underlying securities occurs through CHES.
Can assets be moved to other systems (local or international)?	No. At present only RITS supports the electronic transfer of an interest in CGS by means of a legal right to delivery. Legislative provisions require transfers of legal title to CGS to be completed using a paper-based system, so the electronic transfer of legal title performed in other systems is not available.	Securities cannot be directly moved from Austraclear to any other securities clearing and settlement system.	CAS can be moved electronically between a CHES subregister and an issuer sponsored subregister. CDIs can be converted to securities on the underlying register.	No.	No.

Name of system	RITS	Austraclear	CHES	SFECH	OCH
What information on holdings is reported?	Members may request reports on their securities balances, completed transfers, outstanding (not yet matched or settled) transfers and any mortgages to which they are a party.	Members may request reports on their securities balances, completed transfers, outstanding (not yet matched or settled) transfers and any recorded encumbrances to which they are a party.	Sponsoring Participants can obtain full holding and transaction details on request. Owners of securities receive holding statements each month or more frequently on request. Listed entities may obtain details of holding movements on a daily basis.	SFECH Members can obtain full client and house account details and transaction history on request.	Clearing participants can obtain full client account details and transaction history on request.
How are reports delivered (electronic or otherwise, in real time or at end of day)?	Reports are available in real time upon member request, and are delivered in electronic format to members' terminals. These reports are also available in a paper-based form.	Reports are delivered electronically to members' internal systems, and are available on a real-time and end-of-day basis. Custom queries may also be conducted in real time.	The sponsoring participant for each holding may access information on a real-time basis.	Batch reports at start of day, and real-time <i>ad hoc</i> enquiries.	Batch reports at start of day, and real-time <i>ad hoc</i> enquiries.

2. Risk Management

Name of system	RITS	Austraclear	CHESS	SFECH	OCH
Novation to a central counterparty?	No. RITS is not a counterparty or principal to transactions between its Members. Accordingly it does not maintain guarantees or a guarantee fund in the event of failures.	No. Austraclear is not a counterparty or principal to transactions between its Members. Accordingly it does not maintain guarantees or a guarantee fund in the event of failures.	Yes. ASX market transactions are novated immediately after trade to the central counterparty, TNSC.	Yes. Novation occurs once the trade has been registered, with two new contracts created with the SFECH as counterparty to both. SFECH takes legal responsibility for performance of contracts at this point.	Yes. OCH is principal to all transactions it clears. Following registration of a market contract, an open contract is created with OCH as the buyer to the seller and the seller to the buyer.
Netting	No.	No.	Yes. Multilateral netting of all transactions occurs on a daily basis. Settlement of the resulting net payment position and net positions in each security occurs at around 12:30 pm.	Yes. Multilateral netting of all transactions occurs on a daily basis, with net obligations advised to members by 7.00 am on the following day, and payment required by 10.30 am.	Yes. OCH nets payment obligations for settlement with participants.

Name of system	RITS	Austraclear	CHESS	SFECH	OCH
Active risk management	Real-time checks against members' cash and securities balances, and participating banks' Exchange Settlement (ES) account balances.	Real-time checks against members' cash and securities balances, and participating banks' ES account balances.	Active monitoring of compliance with ASX Capital Adequacy Requirements. In the event of a default on securities obligations, obligations are marked to market, deferred to the following day and penalties applied. Default on payment obligations would result in immediate suspension of the participant, deferral of transactions and recalculation of net obligations. Brokers, clients and the central counterparty, TNSC, may in some circumstances claim compensation for any remaining shortfalls from the National Guarantee Fund (NGF). The NGF was valued at \$139 million at mid 1999.	Initial margins, daily settlement amounts, and the option of intraday margin calls are used to protect against significant price movements. Capital Based Position Limits (CBPLs) are imposed on clearing members to limit exposure relative to Net Tangible Assets (NTAs). The SFECH and its members also contribute towards a \$A150 million financial guarantee, which may be called upon by either party (but not clients) in the event of losses arising from the default of a participant.	Premiums and mark-to-market calls are used to protect against significant price movements. OCH can set limits on the ratio of the total margin liability of a clearing member against its liquid capital. Securities held by OCH as collateral are valued daily against the closing price of the security. Brokers, clients and the central counterparty, OCH, may in some circumstances claim compensation for any shortfalls from the NGF. This is similar to the protection available in CHESS.

Name of system	RITS	Austraclear	CHESS	SFECH	OCH
Membership criteria	Members must be eligible to hold Commonwealth Government inscribed stock and must have the banking facilities required to operate in the system. Participating banks must have an ES account.	All participating banks must be licensed by APRA, and must have an ES account.	Broker participants must meet ASX Capital Adequacy Requirements.	Members must hold minimum Net Tangible Asset backing of at least \$A5 million.	As for CHESS.
Delivery versus payment	DVP Model 1	DVP Model 1	DVP Model 3. Introducing DVP Model 1 for high-value equity transactions.	DVP for deliverable contracts. Delivery occurs in Austraclear, CHESS or the SFE Delivery System (for deliverable wool and wheat futures contracts).	For options exercise, as for CHESS.
Client credit risk management	Participating banks manage credit exposure to client members by: - setting credit limits on client members' accounts within RITS; or - checking the credit status of individual payments against internal systems via the Automated Information Facility (AIF).	Participating banks manage credit exposure to client members by: - setting credit limits on client members' accounts within Austraclear; or - checking the credit status of individual payments against internal systems via the Automated Information Facility (AIF).	Participants are responsible for making arrangements with their Payments Provider to authorise net payment obligations. Payments Providers may impose credit limits on participants, and may elect not to authorise net payment obligations.	Positions of members and major clients monitored by the SFECH.	Positions monitored by OCH.

Name of system	RITS	Austraclear	CHESS	SFECH	OCH
Third party clearing	No.	No.	Yes. Current arrangements permit a trading participant to nominate a single default participant to clear on its behalf. The clearing participant takes responsibility for settlement once trades are novated.	Yes. SFE members must specify a clearing member of the SFECH to clear and settle their trades. They may also nominate specific clearing members for settlement of certain trades.	Yes. Registered Independent Options Traders and Trading Only Participants do not undertake clearing functions so must nominate a clearing member to clear on their behalf. Clients may also nominate specific clearing members for settlement of certain trades, in which case positions are allocated (“given up”) between Clearing Participants on day T prior to registration.

3. Liquidity Management

Name of system	RITS	Austraclear	CHES	SFECH	OCH
Cash liquidity	Cash liquidity is managed by regular monitoring of balances. Bank participants may obtain additional funds in exchange for CGS, or securities issued in Australia by state or territory governments, by entering into a repurchase agreement with the Reserve Bank.	Cash liquidity is managed by regular monitoring of balances. Bank participants may obtain additional funds in exchange for CGS, or securities issued in Australia by state or territory governments, by entering into a repurchase agreement with the Reserve Bank.	Banks manage cash liquidity on behalf of participants, and provide daily authorisations of net payment obligations. Participants can obtain reports of settlement obligations to help ensure that sufficient securities and funds are available on settlement day.	Cash liquidity can be obtained by the SFECH from various sources: (a) SFECH members, who pay in before SFECH pays out; (b) an intraday overdraft with a commercial bank; and (c) realisation of money market positions.	Participants manage their cash liquidity using standard bank facilities. OCH manages its cash liquidity using intraday banking facilities, such as overdraft facilities, and the 11 am money market.
Securities liquidity	Transfers are not authorised for settlement unless the selling member holds the relevant securities.	Transfers are not authorised for settlement unless the selling member holds the relevant securities.	Each participant manages securities liquidity on a daily basis including by using securities lending facilities available in the market.	N/A. An offsetting contract may be entered into, to avoid delivery requirements. Liquidity management of underlying securities is undertaken in other systems.	N/A An offsetting contract may be entered into, to avoid delivery requirements. Liquidity management of underlying securities is undertaken in other systems

Name of system	RITS	Austraclear	CHESS	SFECH	OCH
Use of collateral?	No, but see Cash liquidity.	No, but see Cash liquidity.	No. CHESS does not utilise collateral to limit or mitigate risks.	Yes. Members can lodge the following securities as collateral to meet initial margin requirements: - selected AUD and NZD equities - AUD government securities - USD Treasury Bills USD, JPY, HKD and Euro cash may also be lodged as collateral.	Yes. Clearing members are able to lodge approved non-cash cover for their margin liability to OCH, principally CHESS Approved Securities.

4. Communications and Links to Other Systems

Name of system	RITS	Austraclear	CHESS	SFECH	OCH
Communications services	Users access RITS via the Austraclear National Network Infrastructure (ANNI) (using RITS terminals).	Users access Austraclear via the Austraclear National Network Infrastructure (ANNI) (using Austraclear terminals).	Users access CHESS via the Telstra Austpac packet switched network.	Access is via the SFE Trade Allocation and Confirmation System (STACS), which uses a proprietary communications network managed by the SFECH.	Users access OCH via a proprietary network which covers both trading and clearing.
Users	Banks, custodians, nominees, fund managers and other CGS traders (140 in total).	Around 480 of Austraclear's 607 members are connected to the system. Members which are not directly connected are largely trusts.	All CHESS users – brokers, institutional investors, custodians, share registries and banks.	STACS currently has 38 users, including both clearing and non-clearing members of the SFE and NZFOE.	All OCH users.
Connection options	Dial-up and various forms of leased line access.	Dial-up and various forms of leased line access.	X.25 leased circuit connection, or X.32 dial-up connection.	Leased line only. Point-to-point.	Leased line only.
Security and authentication	ANNI – line encryption available, dial-up authentication. SWIFT – line encryption, data authentication, bilateral key exchanges, SWIFT trusted third party.	ANNI – line encryption available, dial-up authentication. SWIFT – line encryption, data authentication, bilateral key exchanges, SWIFT trusted third party.	The CHESS messaging protocol requires messages to be encrypted, and subject to message authentication checking.	Security and authentication arrangements are handled by proprietary protocols.	Proprietary security arrangements.

Name of system	RITS	Austraclear	CHESS	SFECH	OCH
Links to domestic or overseas clearing and settlement systems (for transfer of title or payment of margin obligations)	Link to Hong Kong Central Moneymarkets Unit (CMU) via the Hong Kong Monetary Authority's membership of RITS.	Link to Hong Kong Central Moneymarkets Unit (CMU) via the Hong Kong Monetary Authority's membership of Austraclear. Austraclear is a member of Clearstream and Euroclear, and may hold ownership of Australian dollar Eurosecurities within these systems on behalf of its members. Interests in these securities may then be transferred within Austraclear.	None.	Settlement of AUD and NZD margin and delivery payments performed through Austraclear and Austraclear NZ. Transfer of CGS performed through RITS.	CHESS holds collateral lodged by clearing members on behalf of OCH. Some margin payments are settled through Austraclear.

APPENDIX D: ARRANGEMENTS IN OVERSEAS COUNTRIES

Country	Systems/Institutions	Ownership	Explanatory Notes
Belgium	NBB Clearing	National Bank of Belgium (NBB)	Clears and settles government and some other debt securities.
	BXS - CIK	Brussels Exchanges (BXS)	Settles private sector debt and equity securities. Brussels Exchanges (BXS) was formed by merger of the Brussels Stock Exchange, the Belgium Futures and Options Exchange (BELFOX) and CIK (the Belgian CSD).
	BXS Clearing	Brussels Exchanges (BXS)	Acts as the central counterparty for all exchange-traded securities and derivatives transactions.
Canada	Canadian Depository for Securities (CDS)	Financial sector participants	Clears and settles debt and equity securities.
	Canadian Derivatives Clearing Corporation (CDCC)	Montreal Exchange (ME) and Toronto Stock Exchange (TSE)	Clears and settles derivatives traded on the ME, the TSE and the Toronto Futures Exchange. Acts as a central counterparty to these transactions.
Denmark	Danish Securities Centre (VP)	Private statutory entity	Clears and settles debt and equity securities.
	FUTOP Clearing Centre	Copenhagen Stock Exchange (CSE) - owned by members and issuers	Clears and settles derivatives transactions. CSE acts as a central counterparty for exchange-traded derivatives transactions.
Europe	Euroclear	Euroclear Co-operative (participants hold shares)	Provides clearing and settlement for internationally traded debt and equity securities. Euroclear has formed an alliance with France's Clearnet and Sicovam.
	Clearstream	Deutsche Borse (owned by banks, brokers and others) and Cedel International (owned by a range of global financial institutions)	Clearing and settlement service for domestic and cross-border bonds and equities transactions (previously known as the European Clearing House (ECH)).
	European Securities Clearing Corporation (ESCC)	London Clearing House (LCH), Government Securities Clearing Corporation (GSCC) and Euroclear.	Provides clearing and settlement services for European government debt securities.
	Eurex Clearing	Deutsche Borse and the Swiss Exchange (SWX).	Clearing of exchange-traded derivatives, open to all European derivatives exchanges. It is the central counterparty to all contracts traded on the German and Swiss derivatives exchanges and performs calculation and posting of margin obligations. A variety of options on selected Finnish and Nordic stocks are also settled.

Country	Systems/Institutions	Ownership	Explanatory Notes
Finland	Finnish Central Securities Depository Ltd (APK)	Central bank, banks, brokers, issuers and Finnish Government	Provides clearing and settlement services for equities and debt securities, but acts as a central counterparty only for equity transactions.
	Helsinki Securities and Derivatives Exchange Clearing House	Helsinki Exchanges (HEX)	Provides clearing services for all exchange-traded derivatives and acts as a central counterparty to these transactions.
France	Sicovam - RGV	Banks, central bank and ParisBourse	Provides settlement services for debt and equity securities transactions through its Relit Grand Vitesse (RGV) system.
	Clearnet	ParisBourse	Provides clearing services and acts as a central counterparty for exchange-traded securities and derivatives transactions. The system also acts as a central counterparty for some OTC government bond transactions. Clearnet and Sicovam have formed an alliance with Euroclear.
Germany	Clearstream	Deutsche Borse and Cedel International	Provides all clearing and settlement facilities for debt and equity transactions.
	Eurex Clearing (see above)	Deutsche Borse and the Swiss Exchange (SWX).	Clears and settles exchange-traded derivatives transactions.
Hong Kong	Central Money Markets Unit (CMU)	Hong Kong Monetary Authority (HKMA)	Clears and settles public and private sector debt securities.
	Hong Kong Securities Clearing Company (HKSCC)	Stock Exchange of Hong Kong (SEHK)	Clears and settles equity trades conducted on the SEHK and acts as a central counterparty to these trades.
	Stock Exchange of Hong Kong Options Clearing House (SEOCH)	Stock Exchange of Hong Kong (SEHK)	Clears and settles derivatives contracts traded on the SEHK, and acts as a central counterparty to these transactions.
	Hong Kong Futures Exchange Clearing Corporation (HKCC)	Hong Kong Futures Exchange (HKFE)	Clears and settles derivatives contracts traded on the HKFE and acts as a central counterparty to these transactions. The Hong Kong Government has announced the planned merger of the SEOCH and HKCC and their parent exchanges to form a single holding company, Hong Kong Exchanges and Clearing Ltd (HKEC).

Country	Systems/Institutions	Ownership	Explanatory Notes
Japan	BOJ-NET	Bank of Japan	Clears and settles Japanese Government bonds.
	JBNNet	Japan Bond Settlement Network Co	Clears and settles semi-government and private debt securities.
	Japan Securities Depository Centre (JASDEC)	A foundation	Clears and settles equities transactions.
	Japan Securities Clearing Corporation (JSCC)	Tokyo Stock Exchange (TSE)	Provides custody service for paper securities for JASDEC. The TSE acts as central counterparty to all trades conducted on the TSE.
	Clearing houses of futures and options exchanges (various)	Various	Clearing and settlement of futures and options is separately provided for by each exchange. For example, clearing and settlement for derivatives traded on Tokyo International Financial Futures Exchange (TIFFE) takes place through an in-house clearing system provided by TIFFE, which acts as a central counterparty to each trade.
Netherlands	Amsterdam Exchanges (AEX) Clearing and Depository	Amsterdam Exchanges (AEX)	Performs clearing functions for exchange transactions in shares, bonds and derivatives, and acts as a central counterparty for all transactions settled on a net basis.
	Dutch Central Securities Depository (NECIGEF)	Amsterdam Exchanges (AEX)	Clears and settles over-the-counter debt and equity transactions.
New Zealand	Austraclear New Zealand System	Reserve Bank of New Zealand (RBNZ)	Clears and settles all debt and equities transactions between wholesale participants and their brokers.
	FASTER	New Zealand Stock Exchange (NZSE)	Clears and settles broker-broker transactions completed on the NZSE. The exchange does not act as a central counterparty.
	Sydney Futures Exchange Clearing House (SFECH)	Sydney Futures Exchange (SFE)	Clears and settles all transactions on the New Zealand Futures and Options Exchange (NZFOE), and acts as a central counterparty to these transactions.
Norway	Norwegian Central Securities Depository (VPS)	Statutory entity	Settles debt and equity securities transactions.
	Norwegian Futures and Options Clearing House (NOS)	Listed company, owned mainly by financial sector participants	Clears and settles all exchange-traded and some over-the-counter derivatives. Also settles some securities trades.

Country	Systems/Institutions	Ownership	Explanatory Notes
Singapore	MAS Electronic Payment System (MEPS)	Monetary Authority of Singapore (MAS)	Clears and settles Singapore Government debt securities.
	Central Depository Pty Ltd (CDP)	Singapore Exchange (SGX)	Clears and settles other debt securities and equities.
	Singapore Exchange Derivatives Clearing Ltd (SEDC)	Singapore Exchange (SGX)	Clears and settles exchange-traded derivatives transactions.
Sweden	Swedish Central Securities Depository (VPC)	Jointly owned by the Swedish Government and the financial sector	Settles debt and equity securities transactions.
	OM Stockholm Exchange	OM Group (listed company)	Clears and settles exchange-traded equities, bonds, and derivatives. Acts as a central counterparty to these transactions.
United Kingdom	CREST	CRESTCo - owned by London and Irish Stock Exchanges, banks and brokers	Clears and settles all debt and equity (as a transition measure, some functions are still performed under contract by the Bank of England). CREST does not act as a central counterparty.
	London Clearing House (LCH)	75% owned by members, 25% owned by exchanges (LIFFE, LME and IPE)	Clears and settles trades from various exchanges, and acts as a central counterparty.

Country	Systems/Institutions	Ownership	Explanatory Notes
United States	Fedwire	Federal Reserve Banks	Clears and settles US Government debt securities.
	Government Securities Clearing Corporation (GSCC)	Owned by participant firms	Provides clearing and settlement services for US Government debt securities.
	Depository Trust Company (DTC)	Depository Trust & Clearing Corporation (DTCC) - owned by participants	Provides for book-entry settlement of over 90% of the equities, corporate and municipal bonds, money market instruments, and mortgage-backed securities issues listed in the U.S.
	National Securities Clearing Corporation (NSCC)	Depository Trust & Clearing Corporation (DTCC)	Provides clearing and settlement services for equities, bonds, mutual funds and insurance and acts as central counterparty to exchange-traded transactions.
	Emerging Markets Clearing Corporation (EMCC)	Owned by participant firms	Provides trade matching, clearance, settlement and risk management services for emerging markets debt instruments.
	Clearing systems of futures and options exchanges (various)	Various	Futures and Options exchanges in the US generally operate their own clearing and central counterparty arrangements - eg the Board of Trade Clearing Corporation (BOTCC), CME Clearing House. The Options Clearing Corporation (OCC) is the clearing facility for all U.S. exchange-listed securities options.

APPENDIX E: SECURITIES SETTLEMENTS GLOSSARY AND ABBREVIATIONS

Australian institutions and terminology

ACCC: Australian Competition and Consumer Commission.

AIF: Automated Information Facility. Automated message service used by banks to assist with credit and liquidity management.

APRA: Australian Prudential Regulation Authority.

ASIC: Australian Securities and Investments Commission.

ASTC: Australian Stock Exchange Settlement and Transfer Corporation Pty Ltd. ASX subsidiary which is approved as the SCH and operates CHES.

ASX: Australian Stock Exchange.

CBPL: Capital Based Position Limits. Limits imposed by the SFECH on clearing members' initial margin liabilities based on each member's holdings of net tangible assets (NTAs).

CDIs: CHES Depositary Interests. An instrument developed by the ASX for holding interests in securities in uncertificated form, allowing electronic transfer and settlement.

CDN: CHES Depositary Nominees Pty Ltd. ASTC subsidiary providing depositary service for some forms of CDIs.

CGS: Commonwealth Government securities.

CHES: Clearing House Electronic Subregister System.

CHES Bank: A bank appointed by ASTC to act as the intermediary bank in respect of CHES settlement payment obligations between payment facility providers, and to administer the CHES payment provider user group within RITS.

CMTIMS: Clearing Member Theoretical Intermarket Margining System. Calculates daily and intraday margins in OCH.

CPS: Clearing Processing System. Calculates initial margins in SFECH.

DCS: ASX Derivatives Clearing System.

DTF: Derivatives Trading Facility. ASX's derivatives trading system.

Exchange Settlement (ES) account: a settlement account held at the Reserve Bank to settle obligations arising from the clearing of payments.

FAST: Flexible Accelerated Securities Transfer. System providing for optional dematerialisation of equities.

FINTRACS: Financial Transactions Recording and Clearance System. Austraclear securities settlement system.

NBP: Non-broker Participant (in ASX).

NGF: National Guarantee Fund. Protects ASX brokers, their clients and the TNSC from losses arising from the default, negligence, unauthorised behaviour or insolvency of a broker or in some circumstances the TNSC.

NTA: Net Tangible Assets. Minimum financial backing required of SFECH members, currently set at \$A5 million.

OGH: Options Clearing House Pty Ltd.

PSB: Payments System Board.

RITS: Reserve Bank Information and Transfer System.

RTGS: Real-time Gross Settlement.

SCH: Securities Clearing House. The approved securities clearing house under the Corporations Law.

SEATS: Stock Exchange Automated Trading System. ASX equities and warrants trading system.

SFE: Sydney Futures Exchange.

SFECH: Sydney Futures Exchange Clearing House Pty Ltd.

SYCOM: Sydney Computerised Overnight Market. SFE trading system.

TNSC: Transfer Netting Service Clearing Pty Ltd. ASTC subsidiary to which ASX broker-broker trades are novated.

General terminology²⁶

Batch: the transmission or processing of a group of payment orders and/or securities transfer instructions as a set, at discrete intervals of time.

Beneficial ownership/interest: the entitlement to receive some or all of the benefits of ownership of a security or other financial instrument (eg income, voting rights, power to transfer). Beneficial ownership is usually distinguished from “legal ownership” of a security or financial instrument. See legal ownership.

Bilateral net settlement system: a settlement system in which participants’ bilateral net settlement positions are settled between every bilateral combination of participants. See also net credit or debit position.

Bilateral netting: an arrangement between two parties to net their bilateral obligations. The obligations covered by the arrangement may arise from financial contracts, transfers or both. See netting, multilateral netting, net settlement.

Bill of exchange: a written order from one party (the drawer) to another (the drawee) to pay a specified sum on demand or on a specified date to the drawer or to a third party specified by the drawer. Widely used to finance trade as negotiable securities and, when discounted with a financial institution, to obtain credit.

Book-entry system: an accounting system that permits the transfer of claims (eg securities) without the physical movement of paper documents or certificates. See also dematerialisation, immobilisation.

Capital risk: see principal risk.

Caps: for risk management purposes, the quantitative limits placed on the positions (debit or credit positions, which may be either net or gross) that participants in a funds or securities transfer system can incur during the business day. Caps may be set by participants on credit extended bilaterally to other participants in a system, eg bilateral credit limits, or by the system operator or by the body governing the transfer system on the aggregate net debit a participant may incur on the system, eg sender net debit limits. Sender net debit limits may be either collateralised or uncollateralised.

Central securities depository (CSD): a facility for holding securities which enables securities transactions to be processed by book entry. Physical securities may be immobilised by the depository or securities may be dematerialised (ie so that they exist only as electronic records). The CSD is often, but not always, the entity which records changes in title to securities upon the finalisation of a transaction in a clearing and settlement system (ie it acts as a registry). In addition, a central securities depository may also incorporate comparison, clearing and settlement functions. See international central securities depository.

Certificate: physical document which evidences an ownership claim in, indebtedness of, or other outstanding financial obligations of the issuer.

Clearing/Clearance: clearing is the process of transmitting, reconciling and in some cases confirming payment orders or security transfer instructions prior to settlement, possibly including netting of instructions and the establishment of final positions for settlement. In the context of securities markets this process is often referred to as clearance.

Clearing and settlement system (or clearing house): a central location or central processing mechanism through which financial institutions agree to exchange payment instructions or other financial obligations (eg securities). The institutions settle for items exchanged at a designated time based on the rules and procedures of the clearing house. In some cases, the clearing house may assume

²⁶ Adapted from:

Bank for International Settlements. *Payment Systems in Australia*. Basel, June 1999, Second revised edition.
Bank for International Settlements. *Cross-Border Securities Settlements*. Basel, March 1995.

significant counterparty, financial or risk management responsibilities for the clearing system. See clearing/clearance, clearing system procedures.

Comparison: see matching.

Confirmation: a particular connotation of this widely used term is the process whereby a market participant notifies its counterparties or customers of the details of a trade and, typically, allows them time to affirm or to question the trade.

Counterparty: the opposite party to a financial transaction, such as a securities trade or swap agreement.

Credit risk/exposure: the risk that a counterparty will not settle an obligation for full value, either when due or at any time thereafter. Credit risk is generally defined to include replacement cost risk and principal risk.

Custodian: An entity, often a bank, that safekeeps and administers securities for its customers and that may provide various other services, including clearance and settlement, cash management, foreign exchange and securities lending.

Custody: the safekeeping and administration of securities and financial instruments on behalf of others.

Daylight credit (or daylight overdraft, daylight exposure, intraday credit): credit extended for a period of less than one business day; in a credit transfer system with end-of-day final settlement, daylight credit is tacitly extended by a receiving institution if it accepts and acts on a payment order even though it will not receive final funds until the end of the business day.

Debit caps: see caps.

Default: failure to complete a funds or securities transfer according to its terms for reasons that are not technical or temporary, usually as a result of bankruptcy. Default is usually distinguished from a “failed transaction”.

Delivery: final transfer of a security or financial instrument.

Delivery versus payment system (or DVP, delivery against payment): a mechanism in an exchange-for-value settlement system that ensures that the final transfer of one asset occurs if and only if the final transfer of (an)other asset(s) occurs. Assets could include monetary assets (such as foreign exchange), securities or other financial instruments. See final transfer.

Dematerialisation: the elimination of physical certificates or documents of title which represent ownership of securities so that securities exist only as accounting records.

DVP: See delivery versus payment system.

Final (finality): irrevocable and unconditional.

Final settlement: settlement which is irrevocable and unconditional.

Final transfer: an irrevocable and unconditional transfer which effects a discharge of the obligation to make the transfer. The terms “delivery” and “payment” are each defined to include a final transfer.

Gridlock: a situation that can arise in a funds or securities transfer system in which the failure of some transfer instructions to be executed (because the necessary funds or securities balances are unavailable) prevents a substantial number of other instructions from other participants from being executed. See also failed transaction, queuing, systemic risk.

Gross settlement system: a transfer system in which the settlement of funds or securities transfers occurs individually on an order-by-order basis according to the rules and procedures of the system, ie without netting debits against credits. See real-time gross settlement.

Haircut: the difference between the market value of a security and its collateral value. Haircuts are taken by a lender of funds in order to protect the lender, should the need arise to liquidate the collateral, from losses owing to declines in the market value of the security. See margin.

Immobilisation: Placement of certificated securities and financial instruments in a central securities depository to facilitate book-entry transfers.

International central securities depository (ICSD): A central securities depository that settles trades in international securities and in various domestic securities, usually through direct or indirect (through local agents) links to local CSDs.

Irrevocable and unconditional transfer: a transfer which cannot be revoked by the transferor and is unconditional.

Issuer: the entity which is obligated on a security or other financial instrument. For example, a corporation or government having the authority to issue and sell a security; a bank that approves a letter of credit.

Legal ownership: recognition in law as the owner of a security or other financial instrument.

Legal risk: The risk of loss because of the unexpected application of a law or regulation or because a contract cannot be enforced.

Liquidity risk: the risk that a counterparty (or participant in a settlement system) will not settle an obligation for full value when due. Liquidity risk does not imply that a counterparty or participant is insolvent since it may be able to settle the required debit obligations at some unspecified time thereafter.

Margin: margin has at least two meanings. In the futures/commodity markets, margin is a good faith deposit (of money, securities or other financial instruments) required by the futures clearing system to assure performance. In the equities markets, margin is a sum of money deposited by a customer when borrowing money from a broker to purchase shares. The money deposited with the broker is the difference between the purchase value of the shares and the collateral value of the shares. See haircut.

Marking to market: the practice of revaluing securities and financial instruments using current market prices. In some cases unsettled contracts to purchase and sell securities are marked to market and the counterparty with an as yet unrealised loss on the contract is required to transfer funds or securities equal to the value of the loss to the other counterparty.

Matching (or comparison checking): the process used by market participants before settlement of a transaction to ensure that they agree with respect to the terms of the transaction.

Multilateral net settlement position: the sum of the value of all the transfers a participant in a net settlement system has received during a certain period of time less the value of the transfers made by the participant to all other participants. If the sum is positive, the participant is in a multilateral net credit position; if the sum is negative, the participant is in a multilateral net debit position.

Multilateral net settlement system: a settlement system in which each settling participant settles (typically by means of a single payment or receipt) the multilateral net settlement position which results from the transfers made and received by it, for its own account and on behalf of its customers or non-settling participants for which it is acting. See multilateral netting, multilateral net settlement position, settling participant and direct participant.

Multilateral netting: an arrangement among three or more parties to net their obligations. The obligations covered by the arrangement may arise from financial contracts, transfers or both. The multilateral netting of payment obligations normally takes place in the context of a multilateral net settlement system. See bilateral netting, multilateral net settlement position, multilateral net settlement system.

Net credit or debit position: a participant's net credit or net debit position in a netting system is the sum of the value of all the transfers it has received up to a particular point in time less the value of all transfers it has sent. If the difference is positive, the participant is in a net credit position; if the difference is negative, the participant is in a net debit position. The net credit or net debit position at settlement time is called the net settlement position. These net positions may be calculated on a bilateral or multilateral basis.

Net settlement: the settlement of a number of obligations or transfers between or among counterparties on a net basis. See netting.

Netting: an agreed offsetting of positions or obligations by trading partners or participants. The netting reduces a large number of individual positions or obligations to a smaller number of obligations or positions. Netting may take several forms which have varying degrees of legal enforceability in the event of default of one of the parties. See also bilateral and multilateral netting, novation.

Nominee: a person or entity named by another to act on his behalf.

Novation: satisfaction and discharge of existing contractual obligations by means of their replacement by new obligations (whose effect, for example, is to replace gross with net payment obligations). The parties to the new obligations may be the same as to the existing obligations or, in the context of some clearing house arrangements, there may additionally be substitution of parties.

Principal risk: the credit risk that a party will lose the full value involved in a transaction. In the settlement process, this term is typically associated with exchange-for-value transactions when there is a lag between the final settlement of the various legs of a transaction (ie the absence of delivery versus payment). See credit risk.

Queuing: a risk management arrangement whereby transfer orders are held pending by the originator/deliverer or by the system until sufficient cover is available in the originator's/deliverer's clearing account or under the limits set against the payer; in some cases, cover may include unused credit lines or available collateral. See also caps.

Real-time gross settlement (RTGS): a gross settlement system in which processing and settlement take place in real time (continuously).

Real-time transmission, processing or settlement: the transmission, processing or settlement of a funds or securities transfer instruction on an individual basis at the time it is initiated.

Registration: the listing of ownership of securities in the records of the issuer or its transfer agent/registrar.

Replacement cost risk: the risk that a counterparty to an outstanding transaction for completion at a future date will fail to perform on the settlement date. This failure may leave the solvent party with an unhedged or open market position or deny the solvent party unrealised gains on the position. The resulting exposure is the cost of replacing, at current market prices, the original transaction. See also credit risk.

Repurchase agreement (repo): A contract to sell and subsequently repurchase securities at a specified date and price.

Settlement: an act that discharges obligations in respect of funds or securities transfers between two or more parties. See gross and net settlement system, net settlement, final settlement.

Settlement finality: see final settlement.

Settlement risk: general term used to designate the risk that settlement in a transfer system will not take place as expected. This risk may comprise both credit and liquidity risk.

S.W.I.F.T. (Society for Worldwide Interbank Financial Telecommunication): a cooperative organisation created and owned by banks that operates a network which facilitates the exchange of payment and other financial messages between financial institutions (including broker-dealers and securities companies) throughout the world. A S.W.I.F.T. payment message is an instruction to transfer funds; the exchange of funds (settlement) subsequently takes place over a payment system or through correspondent banking relationships.

Systemic risk: the risk that the failure of one participant in a transfer system, or in financial markets generally, to meet its required obligations will cause other participants or financial institutions to be unable to meet their obligations (including settlement obligations in a transfer system) when due. Such a failure may cause significant liquidity or credit problems and, as a result, might threaten the stability of financial markets.

Transfer: operationally, the sending (or movement) of funds or securities or of a right relating to funds or securities from one party to another party by (1) conveyance of physical instruments/money; (2) accounting entries on the books of a financial intermediary; or (3) accounting entries processed through a funds and/or securities transfer system. The act of transfer affects the legal rights of the transferor, transferee and possibly third parties in relation to the money balance, security or other financial instrument being transferred.

Variation margin (or mark-to-market payments): the amount which is paid by a counterparty to reduce replacement cost exposures resulting from changes in market prices, following the revaluation of securities or financial instruments that are the subject of unsettled trades.