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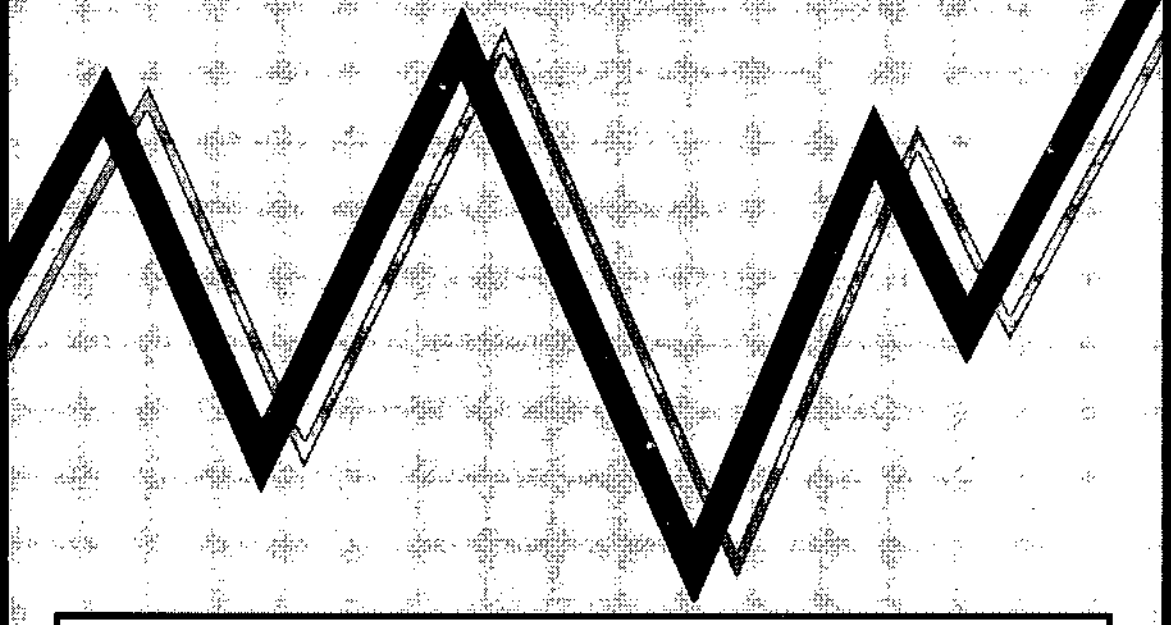

IMPLEMENTATION OF MONETARY POLICY IN AUSTRALIA

By

Katherine J Avram

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IMPLEMENTATION OF MONETARY POLICY IN AUSTRALIA

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ABSTRACT

This paper presents a detailed analysis of how changes in the supply of reserves are used by the Reserve Bank of Australia to influence interest rates and the Australian money supply. Prior to the financial deregulation of the 1980s the primary methods of implementing monetary policy in Australia were through direct controls over bank lending and interest rates, and through varying the reserve requirements imposed on banks. By varying the reserve requirements, the monetary authorities were able to change the size of the credit multiplier. This method is no longer used. In Australia monetary policy is now implemented by controlling the supply of reserves for clearing purposes. Required reserves are not necessary for the operation of this system.

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INTRODUCTION

This paper presents a detailed analysis of how changes in the supply of reserves are used by the Reserve Bank of Australia (RBA) to influence interest rates and the Australian 8money supply, that is, to implement monetary policy. This system relies on the RBA's monopoly of the supply of reserves. These reserves are used for settlement of transactions amongst banks, and transactions between banks (and their customers) and the RBA (and its customers). The RBA regulates the supply of reserves through its trading in the official market with authorised short-term money market dealers.

DEVELOPMENT OF AUSTRALIA'S CURRENT OPERATING PROCEDURES[1]

Monetary Policy

Monetary policy is government policy aimed at influencing the cost and availability of loanable funds.

In Australia, monetary policy is *"an instrument of macroeconomic policy administered by the Reserve Bank of Australia in consultation with the Australian Treasury."*[2] Monetary policy is manipulated with a view to influencing a sequence of proximate and intermediate targets, eventually affecting economic activity. Proximate and intermediate targets include a range of market interest rates and monetary aggregates, with the distinction between types of targets depending on how quickly the targeted variable responds to the use of the policy instrument. Typically, proximate targets relate to short-term interest rates.

Currently procedures for implementing monetary policy rely heavily on central bank intervention in financial markets to influence the availability and price of reserves of the banking system. These reserves are liabilities of the central bank. A banking system requires reserves for clearing purposes, for meeting central bank imposed reserve requirements, and to meet the economy's transactions requirements for currency.

Approximately 80% of reserves in Australia comprise currency held by the public, the balance being made up almost entirely of bank non-callable deposits. *"Poole (1970) has demonstrated that when the money demand function is relatively stable it is better to control the money stock, otherwise the interest rate is superior."*[3] Since the Australian public's demand for currency varies widely[4] it would appear that an interest rate target would be appropriate. Accordingly the RBA now targets short-term interest rates by controlling the supply of reserves for clearing purposes. A change in interest rates affects the demand for credit and thus the total quantity of financial intermediation is also affected.

The credit multiplier relationship between required reserves and bank deposits is no longer of concern. In fact it is the RBA's policy *"to meet the public's demand for currency automatically and in full."*[5]

Currently the authorised dealers are the main conduit for the transmission of central bank monetary policy to the Australian finance sector.

However prior to the financial deregulation of the 1980s, monetary policy in Australia was conducted through direct controls over bank lending and bank interest rates, and through

the Statutory Reserve Deposit, which was a variable reserve requirement. The banks played a major role as intermediaries in medium and long-term borrowed funds but the opportunities for investing short-term funds were severely limited.

Using the UK system as a model, the RBA authorised a small group of dealers, with the primary objective of encouraging the development of a short-term money market in Australia. Essentially authorised dealers were to accept short-term deposits for investment in Commonwealth Government Securities. Initial authorisations were made in 1959.

During the 1960s and 1970s Australia's financial markets expanded rapidly. In particular, money market corporations grew from total assets of $24 million in 1960 to $6,640 million in 1980, this represents an annual growth in excess of 30% per annum. Over the same period the banks grew by approximately 11% per annum.[6]

Today, money and capital markets offer a wide range of funding options, and a major role is played by numerous non-bank financial institutions. In response to these changes, the authorities now use a more market oriented approach to the implementation of monetary policy. Direct controls over banks have been replaced by a system which relies heavily on the RBA managing the cost and availability of reserves on a daily basis.

The main instrument of monetary policy is RBA open market operations, that is, its trading in short-term government securities.[7] The authorised dealers play a pivotal role in this system as the vast majority of the RBA's trading is conducted with them.[8]

Origins of the Official Short Term Money Market[9]

Prior to the establishment of the authorised dealers, trading in the Australian short-term money market was extremely thin, prospective short term investors had few choices. An investor with excess short-term funds had three alternatives, he could :

- purchase short-term notes and debentures issued by finance companies, but these carried substantial credit risk;
- purchase Treasury bills, but these were in limited supply and moreover they carried unattractive interest rates;
- purchase Treasury bonds which were nearing maturity, but again their supply was not always sufficient to meet the market's requirements.

The trading banks were Australia's major financial intermediaries, but they were only able to offer interest on funds deposited for a minimum of three months, and interest rates were regulated.

In response to the demand for secure short term investments a *"buy-back"* market developed. The dealers in this market were stockbrokers who offered to sell government securities together with a commitment to repurchase those securities on a fixed date at a fixed price, thus effectively giving the investor a secured short term investment. However the broker was taking on liquidity risk since he normally relied on new deposits to fund the repurchase. If liquidity was in short supply deposit rates could rise substantially or the broker could be forced to raise funds by selling the securities at a capital loss. This liquidity risk constrained the growth of the buy-back market and hindered the efficient intermediation of short term funds.

Brokers involved in the buy-back market suggested that the RBA should provide lender of last resort facilities to the market. The RBA agreed to provide such facilities to authorised dealers who would also be subject to RBA regulations.

The Commonwealth Bank of Australia's Annual Report for 1960, when referring to the establishment of the authorised dealers, stated *"the aims were mainly to contribute to the soundness of what was becoming a significant investment medium for holders of substantial amounts of short term funds, and to assist in the development of a wider and more active market for short term Government securities... Although the market also offers opportunities of extending somewhat the Bank's scope for open market operations, further time is needed for firm appraisal of eventual possibilities in this field"* (Commonwealth Bank of Australia [1960]).

Thus the authorised dealers were initially established to provide opportunities for short-term investment, and to promote an active market in money market securities.
In February 1959 the Central Bank Division of the Commonwealth Bank of Australia authorised the first four dealers; additional dealers were authorised in March, August and October 1959, and two more in September 1960. The number of authorised dealers was to remain at nine until 1989. Following a number of withdrawals, mergers and new accreditations there were eight authorised dealers in April, 1993.(See Appendix 1.)

The Current Role of the Authorised Dealers

The authorised dealers raise deposit funds which they then invest in securities. RBA regulations require that a substantial proportion of an authorised dealer's assets comprise

Commonwealth Government securities.[10] Authorised dealers do not make loans.

On average over 70% of dealers' assets are funded by deposits from the banking sector. Banks are encouraged to hold funds with the authorised dealers because these funds earn interest and can be used by the banks as reserves for cash settlement purposes. Appendix 2 lists authorised dealers' liabilities.

As part of their relationship with the RBA the authorised dealers are the main counterparties for RBA open market operations and are required to make a market[11] in short-term Commonwealth securities and in repurchase agreements based on these securities. They have become the main conduit for the transmission of RBA monetary policy.

Current Regulatory Requirements Affecting Authorised Dealers[12]

The relationship between the RBA and the authorised dealers involves a range of prudential constraints imposed on the dealers, and a corresponding range of privileges.

One of the privileges offered the authorised dealers is the line of credit facility extended by the RBA.[13] This is based on end-of-day repurchase agreements, they are usually made available for seven days.[14]

It is the authorised dealer's decision to draw on these repurchase agreements, but it is understood, between the parties, that they will only do so after all reasonable efforts have been made to obtain the funds in the market. The interest rate is set by the RBA and is a penal rate. This facility underpins the liquidity of the authorised dealers, but is not intended

to imply that the RBA takes responsibility for the solvency of individual dealers.

The RBA also provides a lodgement facility for the authorised dealers. When dealers lodge securities with the RBA, they are issued with a form acknowledging the lodgement. The dealers then deliver these forms to lenders as security against funds taken as deposits. This system avoids the need to transfer stock. Rapid interstate transfer of funds is facilitated through the clearing accounts held by dealers at the RBA.

The RBA allows the authorised dealers a *"daylight overdraft"*, that is the dealers may go into debit in their accounts with the RBA during the day. However, any shortfall must be covered by the end of the day. The size of this overdraft depends on the level of a dealer's total borrowings. The RBA will also issue acknowledgement forms in excess of holdings, within the daylight overdraft.

The authorised dealers have almost exclusive access to the RBA when trading in government securities of less than one year to maturity. However on days when the RBA is buying, banks may ask the RBA to sell them securities that have less than three months to maturity.

The authorised dealers are constrained in that, generally the ownership of a dealer must be acceptable to the RBA. In particular, an owner may not have a substantial interest in more than one dealer company[15], and the RBA limits bank ownership of authorised dealers, at most a bank may be permitted to hold 75% of the equity in an authorised dealer. In general it is required that

- authorised dealers be independent legal entities and be separately capitalised,

- authorised dealers' transactions with related entities (parties owning 12.5% or more of the equity of an authorised dealer) be carried out at arm's length and not represent a disproportionate source of funding or turnover
- authorised dealers provide an impartial service to all participants in the money market.[16]

There is no constraint imposed by the RBA, on foreign ownership of authorised dealers. Authorised dealers are required to have a minimum of $10 million in capital which is defined to include paid-up capital, share premium reserves and retained earnings. In addition, dealers must satisfy a gearing requirement that aggregate risk-weighted assets must not exceed thirty-three times shareholders' funds. Subordinated loans may be approved as a temporary means of supplementing base capital for these purposes. Adjustments are made in the calculation of risk-weighted assets to include some off-balance sheet exposures including repurchase agreements, forward commitments and derivative products.[17]

Assets are risk-weighted according to maturity, shortest maturities having lowest weights. This weighting reflects market risk. That is, the longer the period to maturity, the larger the capital loss incurred by a given rise in interest rates.

Dealers are restricted to holding assets which are highly liquid and have low credit risk. Commonwealth Government securities, bank bills and certificates of deposit, and marketable securities issued by major public authorities fulfil these requirements. A dealer must hold at least 50% of its gearing limit (calculated according to the authorised dealer's gearing requirement) in Commonwealth Government securities.

The authorised dealers are also required to report to the RBA extensively, much of it on a daily basis. "*Contacts between the RBA and the individual dealer companies are close and frequent.*"[18]

THE IMPLEMENTATION OF RBA POLICY

The RBA trades with the authorised dealers for two reasons. First the RBA seeks to manage liquidity, that is, to smooth out those fluctuations in interest rates that would otherwise occur due to temporary changes in money market liquidity. Secondly, the RBA trades with authorised dealers for monetary policy purposes. That is, the RBA seeks to bring about changes in interest rates and thereby influence savings and expenditure decisions, inflation and economic activity.[19]

Exchange Settlement Accounts

A bank's daily liquidity needs crystalise in two main forms :

(a) Currency Needs : The appropriate amount of currency is achieved through the purchase or sale of currency from/to the RBA, this has an immediate (same day) effect on the bank's balance in its exchange settlement account.

(b) Cheque Clearances : The net outcome of cheques payable to and drawn on the bank and its customers, and which were processed by the clearing house during the previous day, results in either a net credit or a net debit which accrues to the bank's exchange settlement account at the beginning of the day.

Both of these transactions will affect the banks' *exchange settlement accounts* (ESAs). Each bank has an ESA with the RBA and, while an individual bank's ESA may be positive or negative at the start of the day, the RBA requires that the balance be non-negative by the close of the day. Moreover, since interest is not paid on credit balances each bank has a strong incentive to minimise its ESA balances. The authorised dealers hold similar *clearing accounts* with the RBA.

In addition transactions which result in credits or debits to banks' ESAs on any one day include the following.

(1) Settlements for RBA foreign exchange transactions with banks; a purchase of foreign exchange by the RBA would involve a credit to the bank's ESA.

(2) Commonwealth loan interest payable to a bank results in a credit.

(3) Settlements by banks for Treasury notes and bonds won at tender result in debits.

(4) RBA redemptions of Commonwealth Government Securities held by banks result in credits.

(5) Changes in banks' non-callable deposits;[20] additions to (withdrawals from) these accounts result in a debit (credit) to the ESA, while payment of interest results in a credit.

(6) Rediscounting of Treasury notes and the sale of short term Treasury bonds result in credits.

To the extent that ESA debits of one bank[21] are matched by credits of other banks (reflecting cheques written by customers of the first bank in favour of customers of the other banks) interbank trading (which has same day settlement) can be used by individual banks

to move toward a zero ESA balance. However, while interbank trading occurs regularly, it rarely results in a zero ESA balance for all banks because of additions and withdrawals to the system as a whole due to amounts payable to, or receivable from, the RBA or its customers - primarily the Commonwealth Government.

Where the RBA and its customers are net receivers of funds, the system will be in deficit. Where the RBA and its customers are net payers of funds, the system will be in surplus.

The System Position

On any one day the system as a whole may be either in surplus or in deficit. The initial impact will be on the interbank market. If there is a system deficit then there will be more prospective borrowers than lenders so there will be upward pressure on the interbank interest rate; conversely, if there is a system surplus, there will be more prospective lenders than borrowers and there will be a downward pressure on the interbank interest rate.

The authorised dealers have a unique position in the Australian money market in that (apart from the RBA, and other clearing banks) they are the only institutions which can supply and accept same day funds from the banks. All other funds transfers are via cheque and hence will not arrive until the next day. Therefore if, after interbank trading, a bank has surplus *exchange settlement* (ES) funds it will typically transfer these funds to an overnight deposit account with an authorised dealer. In this way the funds can be transferred on the same day to an interest earning account. The interest rate paid by authorised dealers on overnight deposits by banks is known as the *"official cash rate"*. Conversely if a bank has a debit in its ESA, this is typically funded by a same day transfer of funds out of its deposit

with an authorised dealer.

The desired level of a bank's deposits with the authorised dealers will reflect the volatility of their need for ES funds and the revenue loss imposed by keeping funds in relatively low interest earning accounts. This decision is a fundamental component of bank liquidity management.

When bank deposits with authorised dealers increase, the dealers are in a position to increase their assets, that is, to bid for more securities in the unofficial market, thereby putting upward pressure on prices and downward pressure on yields. Alternatively dealers may respond by lowering deposit rates in order to reduce non-bank deposits. In practice the response will usually be a combination of these responses. When bank deposits with authorised dealers decrease the procedure will be reversed and asset yields and deposit rates will tend to rise.

Thus the system surplus or deficit is passed on from the banks to the authorised dealers' balance sheets. A surplus will result in new deposits, the official cash rate will therefore tend to fall, and authorised dealers will be able to acquire more assets thereby putting downward pressure on unofficial market rates. A deficit will result in withdrawals, the official cash rate will therefore tend to rise, and the authorised dealers would need either to raise more deposits or to dispose of some of their assets thereby putting upward pressure on unofficial cash rates. Arbitrage will ensure that the interbank rate and the official cash rate move together.

System Liquidity Management

RBA liquidity management policy is designed to prevent these pressures from reaching the unofficial market. In essence if there is, for example, a system surplus of $200 million then the RBA would offer to sell $200 million of Treasury notes or repurchase agreements to the authorised dealers. This negates the need for the authorised dealers to go to the unofficial market to balance their assets and liabilities. Similarly if there is a system deficit the RBA would offer to buy an appropriate amount of securities from the authorised dealers. Transactions between the RBA and the authorised dealers are settled on a same day basis.

In the process of paying (being paid by) the authorised dealers for these securities the RBA will credit (debit) their clearing accounts thereby creating an equilibrium in ES funds.[22]

In practice, liquidity management is not a day-by-day process, instead it requires continuous monitoring, including constant updating of projections as to future ES positions. The RBA routinely models the system up to six weeks ahead.[23] Banks will also make projections for their own ES funds positions. If for example, they anticipate a deficit, they will plan ahead for this so the upward pressure on interest rates is likely to occur ahead of the actual deficit. This outcome is particularly likely if all banks have similar projections. Thus, in this case, the RBA should also take action before the event. This highlights the extreme sensitivity of money markets to expectations regarding interest rates .

This process is further complicated by the weekly Treasury note tender. Where banks and authorised dealers have won securities at this tender they are required to pay the RBA within

one week. However, the choice of the specific day is left to the purchasers to determine.

Policy Implementation

Where the RBA wishes to engineer a change in interest rates it structures its open market operations so that the opening system deficit or surplus *plus* RBA trading generates the desired **overall system position**. When the RBA wants to decrease interest rates it will engineer an overall system surplus, and when it wants to increase interest rates it will engineer an overall deficit. This will have the effect of putting the official market into disequilibrium, and the authorised dealers will then go to the unofficial market to balance their assets and liabilities.

An Overall System Deficit

Typically the banking system will begin the day with either a system deficit or surplus. A bank may eliminate a deficit through the rediscount facility, that is by selling Treasury notes to the RBA at the published rediscount rate, but this is avoided wherever possible as the discount rate is a penalty rate. Accordingly, the banks seek to maintain a liquidity buffer in the form of deposits with the authorised dealers. The level of this buffer will reflect the opportunity cost of investing funds in this relatively low return form as opposed to the potential cost of being forced to acquire reserves via the discount window. Thus the banks will normally transfer a deficit or surplus from their ESAs to the authorised dealers' clearing accounts at the RBA.

The authorised dealers will tend to use the rediscount facility if the cash rate rises above the rediscount rate. Alternatively they may use the lender of last resort facility and sell

repurchase agreements to the RBA. These are the *"safety valves"* of the system, they place a ceiling on the official cash rate.

The Authorised Dealers' Response

At approximately 9.30 am each business day, the RBA announces its dealing intentions which, as market makers, the authorised dealers are required to accommodate. The combined effect of the system position and RBA trading will be an overall surplus or deficit which will appear in the dealers' clearing accounts at the RBA. The dealers are not permitted to end the day with their clearing accounts in deficit,[24] and they do not wish to leave these accounts in surplus as these funds earn no interest.

The dealers are, however, in the unique position of being able to use the surplus funds immediately or, where there is a deficit, the RBA will accept uncleared funds to balance the account.

By definition, uncleared funds have not actually been transferred so, by accepting these funds in settlement of a deficit the RBA is effectively lending the value of these funds to the authorised dealers until the next day when the cheques will have been processed through the clearing house.[25]

So, to balance a deficit in their clearing accounts the authorised dealers must raise additional deposits from the non-bank sector, this will place upward pressure on market interest rates.

Since authorised dealers must acquire the cheque funds at market interest rates this implies that they can effectively borrow reserves overnight at the current market rate. The value of cheques deposited but not yet cleared is called the *"float"*.

These cheques, deposited with the RBA, will contribute negatively to the next day's system cash position. Effectively the authorised dealers can borrow tomorrow's ES funds to settle today's deficit. This is known as the *"spillover"*.[26]

The Spillover Effect Next Day

If the RBA allows a system deficit to occur on the following day then the process will simply repeat itself with a further tightening of interest rates. This effect will continue until the RBA makes a permanent addition to reserves to fund the initial deficit. This process is illustrated in Appendix 3. The effect of a system imbalance is akin to the opening of a flood-gate, because so long as a deficit is left in the market, funds will flow out of the system, bank deposits with authorised dealers and bank liabilities will shrink by the amount of that deficit each day that the deficit remains.[27]

As a result of this cumulative flow process market interest rates will rise thereby affecting interest sensitive components of expenditure, prices and intermediaries' balance sheets. The upward pressure on interest rates will only be removed when the system moves out of a deficit position.

An Overall System Surplus

The process works in reverse if the overall system position is a surplus : the banks would deposit the surplus funds in their accounts with the authorised dealers, the dealers would then be able to purchase more securities, or repay deposits. The dealers' payments would be by cheque which would be given immediate value by the banks in which they were deposited (see footnote 19), and the dealers would immediately begin to earn a yield on their newly acquired securities, or alternatively cease to pay interest on the refunded deposits.

On the following day these cheques would appear as credits in the banks' exchange settlement accounts and the process would repeat itself until the surplus was eliminated, either by RBA sales of securities or by other transactions which remove funds from the system.

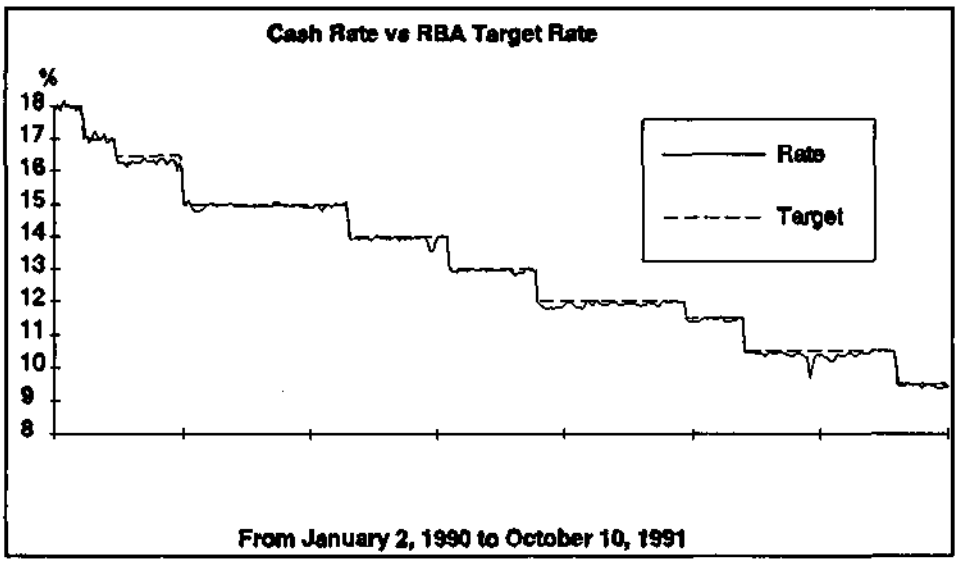
Notice in this case as long as the surplus remains in the market, funds will flow into the system, bank deposits with the authorised dealers and bank liabilities will increase by the amount of the surplus each day that the surplus remains. Naturally the effect of this pressure is to exert a downward pressure on interest rates.

In practice, the RBA manipulates the system position on a daily basis so this flow process is only permitted to take effect if it is consistent with RBA policy for that day.

The Announcement Effect

The RBA also makes use of a strong announcement effect. When the RBA desires a change in the level of interest rates it now has a policy of announcing the size of this desired

change, informing the market that it intends to deal with this target change in view. The market has been extremely rapid to respond to these announcements. This is illustrated in Graph 1. In practice, the market responds immediately to RBA announcements regarding their target cash rate.



Graph 1 Cash rate vs RBA target rate Source : RBA Bulletin (various)

The RBA derives its power over Australian interest rates from its monopoly over the supply of reserves. Reserves may be defined as RBA liabilities consisting of the banks' non-callable deposits, currency on issue (largely held by the non bank public for transactions purposes), the banks' exchange settlement accounts and the authorised dealers' clearing accounts.

In Australia demand for reserves is assured by legal restrictions which give the RBA a monopoly over the issue of currency and which require banks to use reserves to settle debts amongst themselves, and between themselves (or their customers) and the RBA (or its

customers).

DIAGRAMMATIC ANALYSIS

The objective of banks and authorised dealers is to maintain zero balances in their exchange settlement accounts and clearing accounts respectively[28] since the RBA requires that all bank exchange settlement accounts and authorised dealers' clearing accounts be non-negative by the end of the day. Additionally, provided the cash rate is positive, the institutions will not wish to hold positive balances in these accounts with the RBA.[29]

The system demand for reserves will be the net effect of :

(a) the system position[30]

(b) RBA open market operations, mainly dealing with authorised dealers

(c) settlements for outstanding Treasury notes by banks and authorised dealers. These settlements must be made within a week of the tender, thus on the last day of this week demand for reserves will be totally inelastic, on other days settlement may be made depending on current and expected interest costs and liquidity.

Diagram 1 below shows a totally inelastic demand curve, this applies where there are no outstanding Treasury notes or where it is the last day of the settlement week. This diagram illustrates a positive demand for reserves due to an overall system deficit.

The supply to meet this demand will be a combination of the following.

(a) The float. The cost of these funds depends on the unofficial market's willingness to

deposit funds with the authorised dealers. This is represented by the upward sloping segment of the supply curve in the diagram below. This item may be positive or negative.

(b) Borrowing from the RBA. Authorised dealers borrow from the RBA in its role as lender of last resort by the sale of repurchase agreements to the RBA.

(c) Rediscounting Treasury notes. Authorised dealers or possibly the banks may rediscount Treasury notes with the RBA.

Diagram 1 below represents the market for system reserves on one day. Reserves are measured on the horizontal axis and the cost of accessing reserves via the float (the official cash rate) is measured on the vertical axis. It is assumed that the supply curve is stable from day to day, but the demand curve will usually shift each day in response to the overall system position.[31] This illustrates a situation where the previous day's closing cash rate was $i_{c,}$, and there is now an overall system deficit, as a result the cash rate moves up to i'. The rediscount rate, i_o, is shown as corresponding to a ceiling on the cash rate, this is because it is assumed that if the cash rate threatens to exceed the rediscount rate then the authorised dealers, and perhaps the banks, would acquire reserves by rediscounting Treasury Notes.

The system demand for reserves will be highly interest inelastic since in the absence of non-zero balances in their accounts with the RBA, the banks and the authorised dealers are forced by RBA regulation to fund any system deficit regardless of the level of interest rates, and unless interest rates fall to zero, they will wish to dispose of any system surplus.

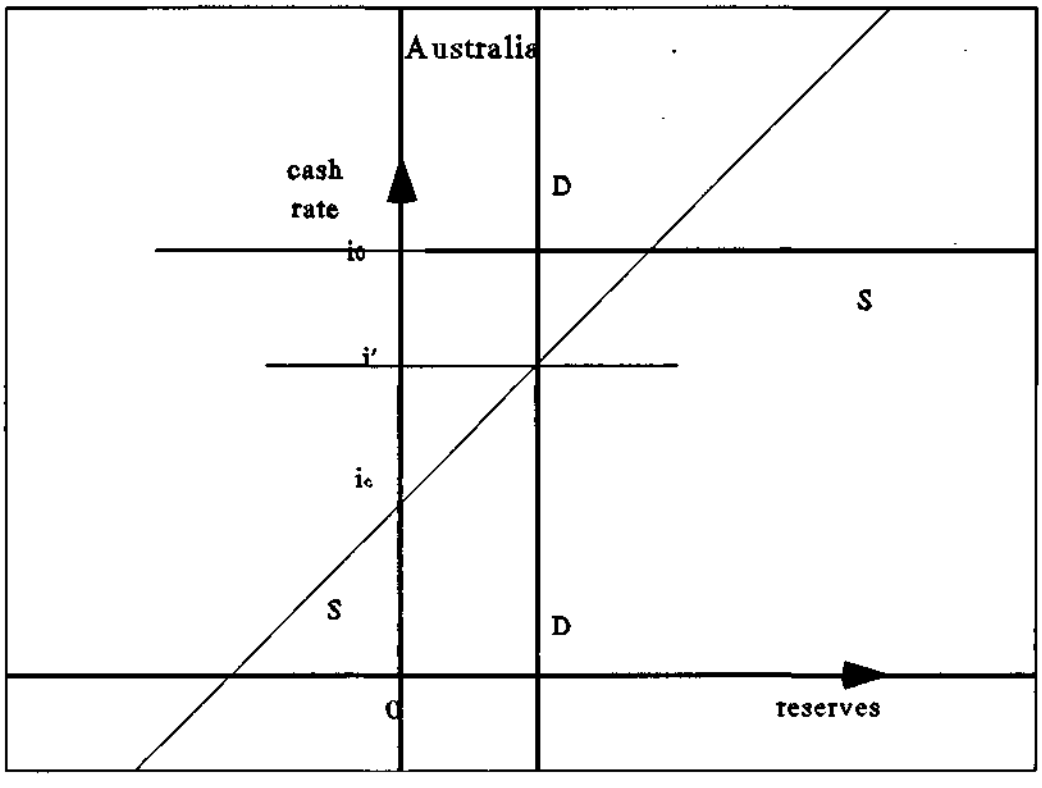


Diagram 1 Australia - No outstanding Treasury Notes[32]

Legend for diagram 1

i_0 = rediscount rate/repo rate
i_c = previous day's closing cash rate
i' = new cash rate
D = demand for reserves
S = supply of reserves

UNIQUE ASPECTS OF THE AUSTRALIAN SYSTEM

Thus the distinguishing features of the Australian system are an official market formed by the RBA, the banks and the authorised dealers, and the use of the float as a mechanism to bring about balance between the supply and demand for reserves. The RBA dominates this market on the demand side of the market through its own trading. On the supply side, the RBA defines an interest rate ceiling related to the rates at which it will rediscount Treasury

notes and lend to the authorised dealers. However the supply side of the cash market is usually determined by the market-determined cash rate which allows the market to retain the role of allocating funds amongst competing uses.

A further aspect of this system is that the banks are free to operate their liquidity management policies in response to their own perceptions of the risk-return trade-off and its implications for their shareholders. The RBA is able to support the liquidity of the system without intervening in individual bank's liquidity targets.

Alternative systems typically involve either *excess reserves* or *borrowed reserves.* In both cases the central bank imposes non-market interest rates. In an excess reserves system the central bank prescribes a target level of reserves and then determines what level of interest rates it will pay. In a borrowed reserves system the central bank sets a below market borrowing rate and then manipulates the actual amount that banks are able to borrow.

In addition these systems usually impose their requirements on average over a specified time period. Generally banks are less constrained at the beginning of the averaging period than towards the end. Moreover *"it is important for the central bank of a small open economy sensitive to movements in the exchange rate to have tight control over short-term interest rates rather than an averaging system or a system which allows market rates to adjust to policy changes over a period of one or two weeks."*[33]

By contrast, the Australian system allows reserves to be supplied via the float at current market rates. This system exploits the distinction between *same day funds* and *next day funds.*

A further advantage of this day's delay is that it improves the RBA's ability to estimate the system's need for reserves, thereby allowing it to be more precise with its own transactions and avoiding the need for averaging.

The role of the authorised dealers allows the RBA to manage system liquidity without directly intervening in individual banks' liquidity management strategies. The RBA supervises bank liquidity from a prudential point of view, and there would appear to be a potential for conflict if two objectives were to be pursued using the same operational target. While prudent bank management requires each bank to maintain an adequate level of liquid reserves, implementation of monetary policy is more immediately effective if there is high liquidity risk. In the Australian system, any deficit requires an immediate response since there are no reserves available to absorb the deficit, any surplus will also elicit a rapid response since there is a strong revenue incentive to switch out of a zero return investment. The smaller the liquidity buffer, the more sensitive the system will be to a change in the supply of reserves.

Thus with a system focussed on a small group of authorised dealers, the RBA can influence financial markets with relatively small volumes of transactions in a small but fundamental segment of the financial market. Logistically, this makes the implementation of monetary policy much simpler and potentially more efficient.

An alternative would be for the RBA to deal directly with the banks. In addition to the potential conflict discussed in the preceding paragraphs, this would also pose the problem of whether to include all banks or to select a favoured few. Moreover the degree of concentration in the Australian banking sector suggests the possibility that dominant banks

may be able to exert some monopoly power in the market for exchange settlement funds if the current role of the authorised dealers were to be abolished.

THE FUTURE OF THE AUSTRALIAN SYSTEM

Thus the authorised dealers make a positive contribution to the current Australian system of implementing monetary policy however, there are a number of factors which may influence the future role of the authorised dealers in the Australian system.

The profitability of the authorised dealers is adversely affected when there is a negative yield curve, this reflects the intermediary role of the authorised dealers in accepting short-term deposits for investment in longer term assets. Thus the authorised dealers are subject to a substantial level of interest rate risk, which is unavoidable if they are to comply with RBA constraints on their activities. If the RBA wishes to maintain this system, reduced constraints and/or subsidies may be required. In fact recent changes to RBA regulation of authorised dealers have relaxed ownership constraints, and reduced limits on the composition of dealers balance sheet assets and on their off-balance sheet activities.[34]

The system of overnight cheque clearance involves a settlement risk which would be reduced by replacing it with a real-time clearing system. The current importance of the dealers relates to the system of same day/next day funds and the pre-eminence of Commonwealth securities in RBA trading. Technological developments now mean that it is feasible to have a system with immediate cheque clearing, this would bring with it increased efficiency in that interest payments on overnight funds would be obviated, dishonoured

cheques would be dealt with more quickly and settlement risk would be reduced. Furthermore, the increasing sophistication of financial markets has meant that central banks have a wide range of alternative instruments in which to trade. If the RBA takes advantage of these instruments (as it already has to a limited extent) this would reduce the relevance of the authorised dealers in their current form.

Lastly, the system of authorised dealers places intermediaries between the RBA and the banks. The cost of these intermediaries is reflected in Australian interest rates. The future of the authorised dealers must depend on the size of these costs relative to the benefits of the system.

CONCLUSION

The current system of implementing monetary policy in Australia appears to have advantages in that it directly targets interest rates, has a minimum of intervention in market allocation of funds and does not conflict with prudential regulation of banks. However, there are costs associated with this system and modifications may be desirable in the future to meet developments in Australian financial markets.

APPENDIX 1

Authorised Short-Term Money Market Dealers as at April 1993

(1) Australian Gilt Discount Limited, N.S.W.

(2) Colonial Mutual Discount Company Limited, N.S.W.

(3) CS First Boston Australia Discount Limited, Victoria

(4) F.R. Australian Discount Limited, A.C.T.

(5) Potter Warburg Discount Limited, Victoria

(6) Rothschild Australia Discount Limited, N.S.W.

(7) Schroders Australia Discount Limited, N.S.W.

(8) Short Term Discount Limited, N.S.W.

Source : RBA Press Release, Authorised Money Market Dealers, 20 April 1993.

APPENDIX 2

Authorised Money Market Dealers - Liabilities to Banks

At end of Month (1992/93)	Borrowings from banks $ million	Total Assets
August	3 427	3 866
September	2 655	3 249
October	3 062	3 514
November	2 003	2 736
December	3 593	4 202
January	2 727	3 465
February	3 253	4 106
March	2 879	4 078
April	2 708	4 377
May	2 610	4 044
June	4 548	5 887
July	3 087	4 162

Source: Reserve Bank Bulletin October 1993 Table C.3.

APPENDIX 3

The Effect of an Overall System Deficit on Bank Balance Sheets[35]

The purpose of this appendix is to illustrate the effect of an overall system deficit of $x. Balance sheets show the changes as they affect the banks, the authorised dealers (ADs) and the RBA over a three day time horizon.

It is assumed that the only source of imbalance is the initial overall system deficit, and that the RBA brings the system back into equilibrium by purchasing $x of Treasury notes from the ADs on the third day.

At each stage changes to the balance sheets will be written in italics.

Day 1 Stage 1

Non banks, who are customers of the clearing banks, draw cheques to the value of $x payable to the Commonwealth Government (for example, tax payments). These cheques are processed by the Clearing House and appear as a deficit of $x in the banks' Exchange Settlement Accounts (ESA) at the beginning of day 1.

Cumulative Balance Sheet Changes[36]

Clearing Banks		Authorised Dealers		Reserve Bank of Australia	
Liabilities	Assets	Liabilities	Assets	Liabilities	Assets
Customer Deposits -$x	*ESA* -$x			*Gov't Account* +$x	
				ESA -$x	
-$x	-$x	$0	$0	$0	$0

Day 1 Stage 2

The clearing banks eliminate the deficit in their exchange settlement accounts (ESA) by withdrawing funds from their deposits with the ADs.

Clearing Banks		Authorised Dealers		Reserve Bank of Australia	
Liabilities	Assets	Liabilities	Assets	Liabilities	Assets
Customer Deposits -$x	*ESA* *$0*	*Deposits from Banks* -$x	*Clearing a/c at RBA* -$x	Gov't Account +$x	
	Deposits at ADs -$x			*ESA* *$0*	
				Clearing a/c of ADs -$x	
-$x	-$x	-$x	-$x	$0	$0

Day 1 Stage 3

The authorised dealers either sell assets valued at $x to non-banks or raise deposits valued at $x from the non-banks.[37] These funds are transferred via cheques drawn on the clearing banks. The funds do not pass through the clearing system until the next day. However, on receipt of the cheques, the RBA is willing to regard the ADs' clearing accounts as balanced. Implicitly, the RBA is lending the $x to the ADs overnight at zero interest.

Clearing Banks		Authorised Dealers		Reserve Bank of Australia	
Liabilities	Assets	Liabilities	Assets	Liabilities	Assets
Customer Deposits -$x	ESA $0	Deposits from Banks -$x	*Clearing a/c at RBA* *$0*	Gov't Account +$x	*Implicit loan to ADs* *+$x*
	Deposits at ADs -$x	*Implicit loan from RBA* *+$x*		ESA $0	
				Clearing a/c of ADs *$0*	
-$x	-$x	$0	$0	+$x	+$x

At the end of day 1, the clearing bank's balance sheets have shrunk by $x and their deposits with the ADs have also been reduced by $x.[38]

DAY 2

Day 2 Stage 1

Assuming that the net in and out of the government account on day 2 is zero, then the sources and uses of exchange settlement funds will be equal except for the *"spillover"* effect of the $x of funds raised by the ADs to balance their clearing accounts. That is, the $x deficit from day 1 will be pushed forward into day 2.

Day 2 Stage 1

The cheques drawn by non-banks on Day 1 Stage 3 pass through the clearing house overnight. At the beginning of Day 2 they are credited to the ADs' clearing accounts and appear as a deficit of $x in the banks' ESA.

Clearing Banks		Authorised Dealers		Reserve Bank of Australia	
Liabilities	Assets	Liabilities	Assets	Liabilities	Assets
Customer Deposits -*$2x*	*ESA* -*$x*	Deposits from Banks -$x	Clearing a/c at RBA $0	Gov't Account +$x	*Implicit loan to ADs* *$0*
	Deposits at ADs -$x	*Implicit loan from RBA* *$0*		*ESA* -*$x*	
		Deposits by non banks +*$x*		Clearing a/c of ADs $0	
-$2x	-$2x	$0	$0	+$0	+$0

Day 2 Stage 2

The clearing banks eliminate the deficit in their exchange settlement accounts (ESA) by withdrawing funds from their deposits with the ADs.

Clearing Banks		Authorised Dealers		Reserve Bank of Australia	
Liabilities	Assets	Liabilities	Assets	Liabilities	Assets
Customer Deposits -$2x	*ESA* *$0*	*Deposits from Banks* *-$2x*	*Clearing a/c at RBA* *-$x*	Gov't Account +$x	Implicit loan to ADs $0
	Deposits at ADs *-$2x*	Implicit loan from RBA $0		*ESA* *$0*	
		Deposits by non banks +$x		*Clearing a/c of ADs* *-$x*	
-$2x	-$2x	-$x	-$x	$0	$0

Day 2 Stage 3

The authorised dealers either sell assets valued at $x to non-banks or raise deposits valued at $x from the non-banks.[39] These funds are transferred via cheques drawn on the clearing banks. The funds do not pass through the clearing system until the next day. However, on receipt of the cheques, the RBA is willing to regard the ADs' clearing accounts as balanced. Implicitly, the RBA is lending the $x to the ADs overnight at zero interest.

Clearing Banks		Authorised Dealers		Reserve Bank of Australia	
Liabilities	Assets	Liabilities	Assets	Liabilities	Assets
Customer Deposits -$2x	ESA $0	Deposits from Banks -$2x	*Clearing a/c at RBA* *$0*	Gov't Account +$x	*Implicit loan to ADs* *+$x*
	Deposits at ADs -$2x	*Implicit loan from RBA* *+$x*		ESA $0	
		Deposits by non banks +$x		*Clearing a/c of ADs* *$0*	
-$2x	-$2x	$0	$0	+$x	+$x

At the end of day 2, the clearing banks' balance sheet has shrunk by $2x and their deposits with the ADs have also been reduced by $2x.[40]

DAY 3

As with Day 2, assume that the *"spillover"* is the only net influence on exchange settlement funds. But it is also assumed in this example that on Day 3 the RBA will equilibrate the system by purchasing Treasury notes from the ADs.

Day 3 Stage 1

The cheques drawn on Day 2 Stage 3 pass through the clearing system and appear as a deficit of $x in the banks' ESA.

Clearing Banks		Authorised Dealers		Reserve Bank of Australia	
Liabilities	Assets	Liabilities	Assets	Liabilities	Assets
Customer Deposits *-$3x*	*ESA* *-$x*	Deposits from Banks -$2x	Clearing a/c at RBA $0	Gov't Account +$x	*Implicit loan to ADs* *$0*
	Deposits at ADs -$2x	*Implicit loan from RBA* *$0*		*ESA* *-$x*	
		Deposits by non banks *+$2x*		Clearing a/c of ADs $0	
-$3x	-$3x	$0	$0	+$0	+$0

Day 3 Stage 2

The clearing banks eliminate the deficit in their ESAs by withdrawing funds from their deposits with the ADs.

Clearing Banks		Authorised Dealers		Reserve Bank of Australia	
Liabilities	Assets	Liabilities	Assets	Liabilities	Assets
Customer Deposits -$3x	*ESA* *$0*	*Deposits from Banks* *-$3x*	*Clearing a/c at RBA* *-$x*	Gov't Account +$x	Implicit loan to ADs $0
	Deposits at ADs *-$3x*	Implicit loan from RBA $0		*ESA* *$0*	
		Deposits by non banks +$2x		*Clearing a/c of ADs* *-$x*	
2-$3x	-$3x	-$x	-$x	$0	$0

Day 3 Stage 3

The RBA purchases $x of Treasury notes from the ADs, the funds are transferred directly to the ADs' clearing accounts.

Clearing Banks		Authorised Dealers		Reserve Bank of Australia	
Liabilities	Assets	Liabilities	Assets	Liabilities	Assets
Customer Deposits -$3x	ESA $0	Deposits from Banks -$3x	*Clearing a/c at RBA* *$0*	Gov't Account +$x	Implicit loan to ADs $0
	Deposits at ADs -$3x	Implicit loan from RBA $0	*T/Note holdings* *-$x*	ESA $0	*T/Note holdings* *+$x*
		Deposits by non banks +$2x		*Clearing a/c of ADs* *$0*	
-$3x	-$3x	-$x	-$x	+$x	+$x

At the end of day 3, the clearing bank's balance sheets have shrunk by $3x and their deposits with the ADs have shrunk by $3x.

CONCLUSION

Thus a $x deficit in the overall system will open a gate through which funds will flow at the rate of $x per day until the RBA acts to supply the exchange settlement funds[41] and permanently clear the deficit. For example, if the $x deficit were left in the system for 2 days and cleared during day 3, this cumulative flow effect would result in the clearing banks balance sheets shrinking by $3x.

Initially, this will involve the banks deposits with the ADs being below desired levels and therefore a further adjustment will occur as banks rearrange their asset portfolios to reduce the dollar value of loans and return their deposits with the ADs to the desired level.

The crucial elements in this system are as follows.

(a) The RBA's requirement that ESAs and AD clearing accounts be balanced at the end of each day.

(b) Secondary effects on bank lending due to the combined effects of the higher official cash rate and their desired level of deposits with ADs as defined by the bank's own liquidity management policy.

(c) If the RBA had wished to neutralise the effect of the $x deficit, it would have had to anticipate the deficit by selling Treasury notes on Day O.

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AUTHORISED SHORT-TERM MONEY MARKET DEALERS AS AT APRIL 1992

(1) Colonial Mutual Discount Company Ltd, originally Delfin Discount Company Pty Ltd.

(2) FBA (Discount) Ltd, originally United Discount Company of Australia Pty Ltd.

(3) F. R. Australian Discount Ltd, originally Capel Court Securities Pty Ltd.

(4) Potter Warburg Discount Ltd, originally Discount Corporation of Australia.

(5) Rothschild Australia Discount Ltd.

(6) Schroders Australia Discount Ltd.

(7) Short Term Discount Ltd, originally City Discount Pty Ltd.

ACCREDITATION OF AUTHORISED SHORT-TERM MONEY MARKET DEALERS

(1) All-States Discount Pty Ltd, accredited in September 1960. (Surrendered accreditation in April 1992 when it merged with Short Term Discount Limited.)

(2) Discount Corporation of Australia Pty Ltd, accredited in March 1959.

(3) United Discount Company of Australia Pty Ltd, accredited in February 1959.

(4) Capel Court Securities Pty Ltd, accredited in February 1959.

(5) Delfin Discount Company Pty Ltd, accredited in February 1959.

(6) First Federation Discount Company Pty Ltd, accredited in August 1959. (Authorisation revoked in April 1989).

(7) National Discount Corporation Ltd, accredited in October 1959. (Surrendered accreditation in April 1991).

(8) Short Term Acceptances Limited, accredited in February 1959. (Surrendered accreditation in September 1990).

(9) City Discount Pty Ltd, accredited in September 1960 .

(10) Rothschild Australia Discount Ltd, accredited in July 1990.

(11) Schroders Australia Discount Ltd, accredited in July 1990.

(12) Australian Gilt Discount Limited, N.S.W. **accredited April 1993.?**

(13) Colonial Mutual Discount Company Limited, N.S.W. **accredited April 1993.?**

(14) CS First Boston Australia Discount Limited, Victoria, **accredited April 1993.?**

(15) F. R. Australian Discount Limited, A.C.T. **accredited April 1993 ?**

(16) Potter Warburg Discount Limited, N.S.W. **accredited April 1993 ?**

(17) Short Term Discount Limited, N.S.W. originally City Discount Limited **accredited Pre 1992 ?**

NOTE ALL BOLDED STATEMENTS ARE UNVERIFIED

ENDNOTES

1. The main sources of material for this section are Reserve Bank of Australia (1986), (1987), (1990a).

2. Harper (1988b p. 62).

3. Grenville (1990, p. 8).

4. ibid.

5. ibid.

6. Moore et al (1988, pp 20-21).

7. On occasion the RBA may use other instruments for example, it may accept interest bearing deposits instead of selling securities; alternatively, it may use foreign currency swaps instead of repurchase agreements. See Reserve Bank of Australia (1990a p. 12).

8. The authorised dealers are also referred to as the "*official market*".

9. The main sources for this section are Council of Authorised Money Market Dealers (1985), Allan (1977) and Rose (1969).

10. See RBA Press Release No 90-05, 9 Feb 1990.

11. That is, stand ready to buy or sell securities.

12. Material for this section is largeley drawn from Reserve BAnk of Australia (1991).

13. See Allan and Valentine (1978) for a model of the relationships between last resort borrowing, deposit rates and portfolio decisions of authorised dealers. These authors use monthly data from September 1962 to June 1975.

14. Although they may be for shorter periods, extensions would normally be at pental rates.

15. Until April 1993 banks were not allowed to be direct shareholders in dealer companies and could only hold, indirectly, up to 12.5% of a dealer company.

16. See RBA Press Release No 93-06, 27 April 1993.

17. For details see RBA Note for the Press 13 Feb 1987 RBA Bulletin (March 1987 pp 18-19).

18. Reserve Bank of Australia (1991a p. 23).

19. Reserve Bank of Australia (1990a p. 9).

20. Non-callable deposits are held by each bank at the RBA. It is and RBA requirement that each bank hold a non-callable deposit equivalent to 1% of its total liabilities less shareholders' funds.

21. The debit bank will pay interest to the credit banks reflecting the fact that the credit banks will have paid their customers interest on the cheque funds for theh preceeding day.

22. The desired level of bank deposits with dealers will now be slightly smaller since the banks' balance sheets have been reduced by the customer withdrawals whihc initially led to the deficit.

23. Private communication with RBA represnetative, 9.12.1991.

24. As of July 1993 this requirement will be amended to require all payments cleared during a day to be settled by 9 a.m. the following day, rather than by the end of the folowing day. See Reforming the Australian Payments System. Reserve BAnk of Australia, *Bulletin*. April 1993. Page 37.

25. The banks offer a simillar privelege to their custoemrs in that fudns deposited by cheque earn interest from the time of the deposit rather than from the date of clearing. Where the cheque is drawn on another bank there is an interbank payment of interest to the bank receiving the deposit.

26. Private communications with RBA representative, December 9, 1991.

27. Presumably banks would respond to the dwindling balances in their accounts with the authorised dealers by disposing of other assets and using the funds to replenish their deposits with the authorised dealers. Taken to the extreme the process would end when bank assets fell to zero.

28. Banks in Australia are required to maintain non-callable deposits (NCDs) with the RBA. Each bank is required to maintain a balance in its NCD equal to one per cent of its total liabilities invested in Australian dollar assets less shareholders' funds. [Carew (1991 pp 87-88] Thus these deposits do not vary apart from a montly adjustment in line with the previous month's balance sheet growth.

29. This does not mean that individuial banks have a zero liquidity buffer, as part of their liquidity management policy each bank will target a desired level of deposits with the authorised dealers. However while these deposits represent access to exhcnage settlements funds for the banks, they are not reserves for the system as a whole.

30. The system position, or money market cash position is calcualted and announced daily at approximately nine-thirty am by the RBA. This figure includes:
    (1) the RbA's net overnight settlement position with the other banks
    (2) any RBA transactions in foreign exchange due to be settled (usually arranged two days prior)
    (3) transactions in notes and coins, these may not be known precisely but can be accurately estimated as they follow a very regular pattern

(4) payments to banks and authorised dealers of Commonwealth loan interest and maturing Treasury notes and bonds
(5) maturing interest bearing deposits of banks at the RBA
(6) lodgements and repayments of non-callable deposits, and interest payments thereon
(7) reversals of repurchase agreements previously undertaken with authorised dealers.

[RBA December 1990 pp. 14-15]

31. Carmichael and Harper (1991) have extended this diagram to allow for the optional settlement of outstainding Treasury notes depending on the cash rate. If the cash rate is below the rate of Treasury notes won at tender then it is assumed that settlement will be made. The effect on the diagram is to put a "step" in the demand curve. In this way unsettled Treasury notes tend to put something of a floor (on the daily cash rate) at the tender rate.

32. Derived from Carmichael and Harper (1991).

33. Bank for International Settlements (1986).

34. Reserve Bank of Australia (1991a)

35. Througout this example it is assumed that the only transactions which affect on bank exchange settlement accounts are payments to and from the Commonwealth Governement and transactions between banks and the Authorised Dealers.

36. Following Carmichael and Harper (1991).

37. In this example, it is assured that the funds are raised by deposits from non banks.

38. The official cash rate will have risen reflecting the dealers need to attract more funds.

39. In this example, it is assumed that the funds are raised by deposits from non banks.

40. The official cash rate will have risen again reflecting the dealers need to attract more funds.

41. By, say, repurchasing Treasusry notes from the ADs.