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# COST-EFFECTIVENESS OF POLYMER CURRENCY NOTES – AUSTRALIA'S EXPERIENCE

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# COST-EFFECTIVENESS OF POLYMER CURRENCY NOTES – AUSTRALIA'S EXPERIENCE

## Introduction

The initial benefits that the Reserve Bank of Australia (RBA) perceived from Australia's adoption of polymer notes were:

- greatly reduced counterfeiting activity;
- increased durability and, hence, lower orders for new notes from our note printer.

These benefits are very much of direct interest to the note issuer.

A second wave of benefits that also emerged were:

- the positive public reaction to cleaner and more hygienic notes;
- environmental gains over the life cycle of notes;
- improved machine processing efficiencies.

To a large extent these are benefits of interest to the community generally.

A third wave of benefits has arisen from polymer notes being a facilitator for further changes that may not otherwise have happened. Because of the greater durability and confidence in the security of polymer notes, the RBA believed that it did not need to check notes for authenticity and fitness as frequently as it had done in the past with paper notes to keep circulation clean and free of counterfeits. As a result, the RBA has been able to significantly scale back its note processing activities. The reduced note processing task has also facilitated changes to the role played by the RBA in the distribution of cash, leading to a reduction in the socially wasteful excessive amount of churn and cross-shipping of notes. These efficiencies have reduced costs for the RBA and commercial banks thus adding to the overall benefits from the move to polymer.

This paper expands on these various benefits.

## Increased Confidence in the Security of Notes

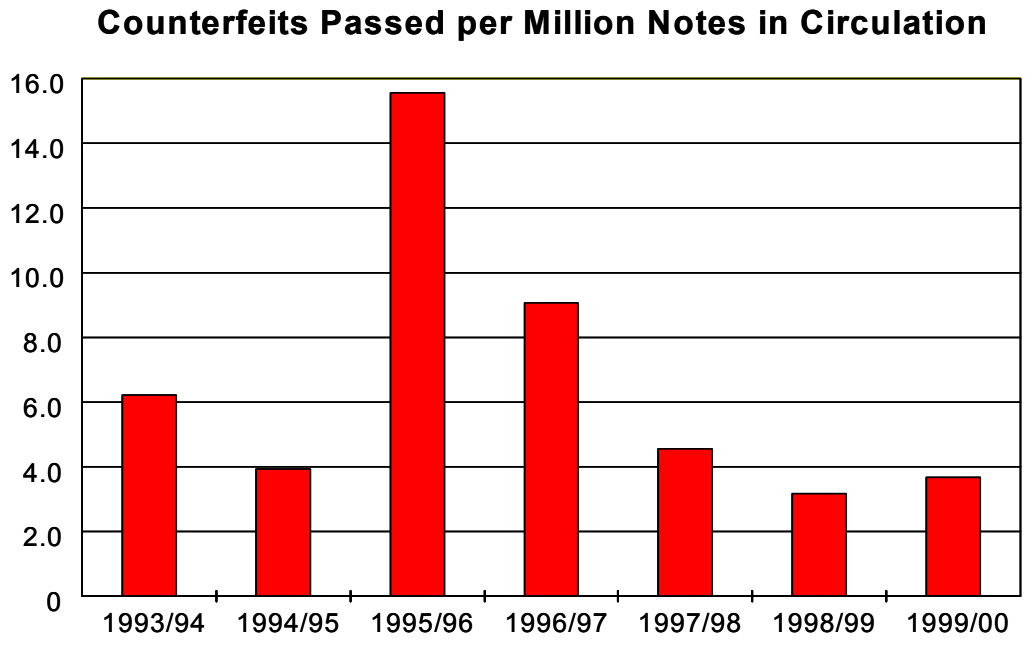
The ability to control the transparency of polymer substrates has resulted in new, yet conceptually simple and effective security features. The most obvious feature is the clear window(s). A window can be used with other elements in notes to create self-authenticating features whereby the clear window becomes a device for verifying another feature in the note. For example:

- in Australia's recently released Federation $5 note, the window contains a screen for identifying a hidden '5' in the background offset print. This feature is based around Joh. Enschedé's μ-SAM® feature. New Zealand has also used this feature in one of its notes;

- in Brazil's 10 Reais note, the window incorporates a filter for a pair of metameric inks printed elsewhere in the note's design. This feature has also been used by Romania.

These examples show another significant advantage of polymer. That is, the close integration of substrate features with traditional print or add-on features. Many features are unique to polymer.

We are not saying, nor have we ever said, that it is impossible to counterfeit polymer notes. How we see polymer notes helping is by making it more difficult, time consuming and costly to make counterfeits. Even with the most basic of polymer security features, Australia's counterfeiting rate has declined significantly as illustrated in the graph below. Polymer is very effective in the fight against the casual counterfeiter. As a consequence of the low level of counterfeiting, the Australian Federal Police who are responsible for counterfeit investigations have disbanded the specialist Currency Squads and diverted these resources to other areas of investigation.




Looking at the last PacRim statistical database it shows that the counterfeiting rates of most other PacRim countries have increased in the late 1990s while Australia's has decreased. We believe that if Australia had not moved to polymer its counterfeiting rate would have been much higher.

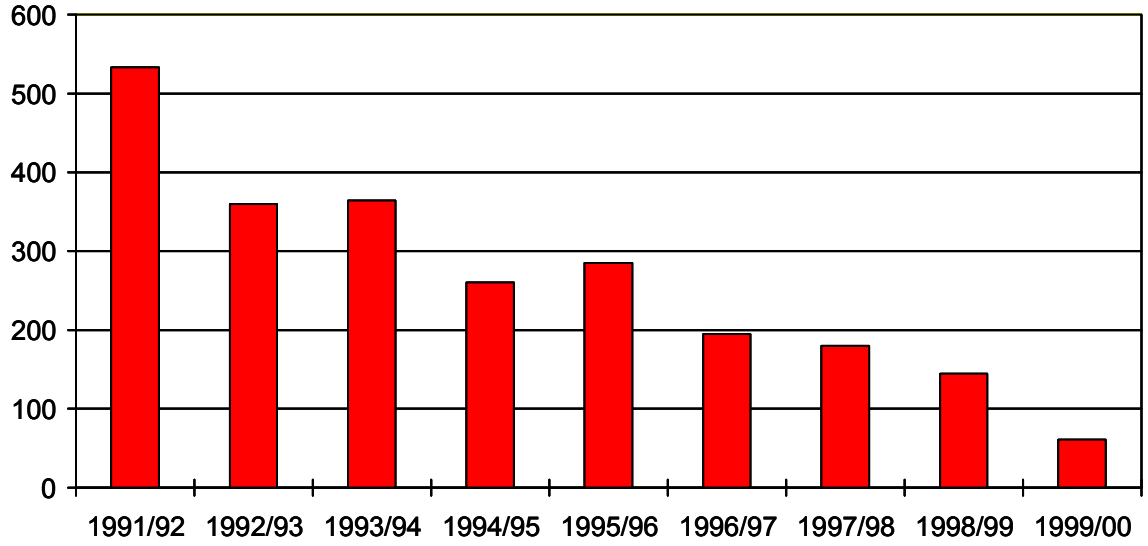
## Durability and Cleanliness

Australia moved to polymer substrate to improve the security of its banknotes. In addition to achieving improved security, polymer notes quickly proved to be significantly more durable and cost effective than paper notes. In Australia, we have experienced a quadrupling of the average life of our low denomination notes,

with the lower production requirements more than offsetting the higher costs of production of polymer notes.

Our higher denomination polymer notes have not been in circulation long enough to be precise about their longevity, but indications are that we will see a similarly impressive performance.

**Australian Note Production Volumes**
**(Millions of note pieces)**




The graph of production volumes shows the impact of longer life on our orders for new notes from our note printer. (The graph excludes production of Y2K contingency stocks.) Also, and importantly, the benefits of added durability are achieved relatively quickly. (See the paper *Life of Polymer Notes – A Study* presented elsewhere at this conference for more details on the extended life achieved with the move to polymer.) As far as the next three to five years are concerned, we expect our note production requirements will stabilise at around 100-150 mpc per annum.

The public's appreciation of the cleanliness of polymer notes was initially foreshadowed in a survey of public acceptance and performance commissioned by the RBA following the trial of polymer note technology in 1988/89. The results indicated that:

- 88% of those surveyed perceived a major advantage of polymer notes was their resistance to damage;

- 87% appreciated the notes' cleanliness.

Our subsequent experience has reinforced to us the appreciation the public, and in particular the group we call professional cash handlers, has for the cleanliness aspects of polymer notes.

## Environmental

Increasingly, producers are having to take greater responsibility for the environmental impact of their product over the full life cycle of the product. The public is also coming to value attempts by producers to reduce the environmental impact of their products. We believe polymer notes offer advantages in this regard. In particular:

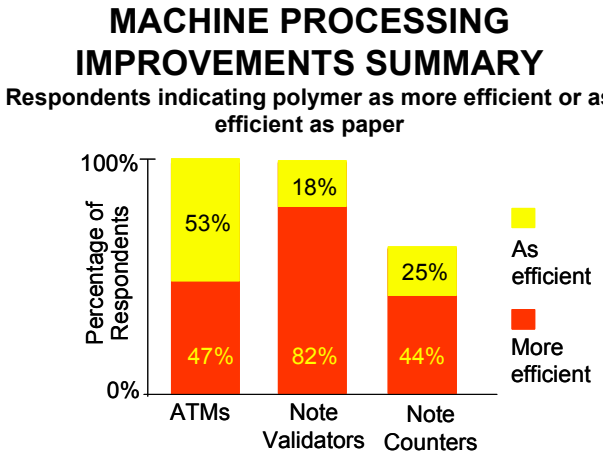
- polymer substrate is less polluting and more energy efficient in production; and
- polymer notes are recyclable at the end of their useful life.

In Australia, all unfit polymer notes are being recycled. Previously, unfit paper notes were burnt or added to land fill.

## Functionality

Polymer notes have now been in circulation in Australia for over nine years. The simple story is that they work well in all climatic conditions. For manual processing, there are slight handling differences between polymer and paper notes. This may require some flexibility on the part of cash handlers but it is not a major issue. We found in Australia that people adjusted very quickly. We now find that when we ask professional cash handlers if they want to go back to paper notes, they overwhelmingly say no.

A survey of users and suppliers of machines that process notes confirmed that polymer notes are better for machine processing than paper notes. The extent of improvement can also be significant. The types of machines involved in the survey included note counters, note acceptors/validators, and note dispensers (eg ATMs).

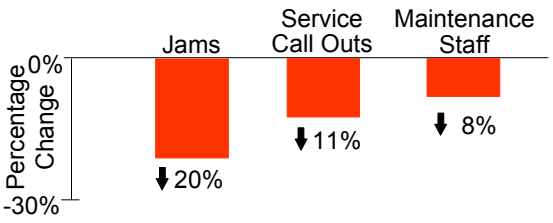


Relative to paper notes polymer notes perform better because:

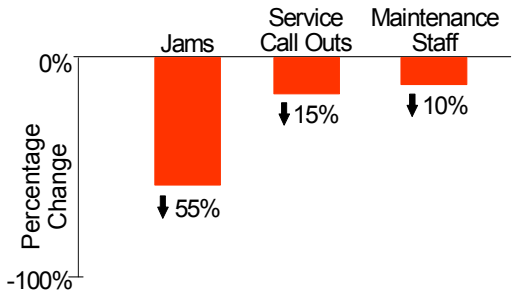
- polymer notes are, on average, of better quality;
- polymer notes deposit less ink and dirt on transport belts and sensors;
- polymer notes create less dust;
- polymer notes feed and count better because polymer notes are stiffer.

The improvements are reflected in a variety of ways, including less jams, fewer service call outs, and reduced maintenance staff.

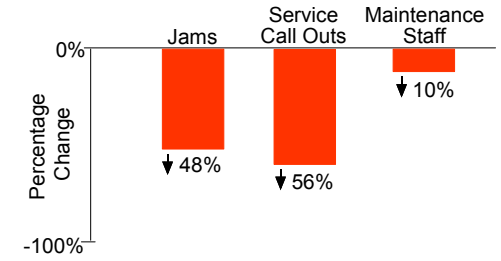
**ATMs: AVERAGE DECLINE IN SERVICING REQUIREMENTS**




**NOTE VALIDATORS: AVERAGE DECLINE IN SERVICING REQUIREMENTS**




**NOTE COUNTERS:AVERAGE DECLINE IN SERVICING REQUIREMENTS**




## Re-engineering of Note Processing and Distribution Arrangements

The note issue functions of the RBA include the issue of notes, the processing of notes returned from circulation for authentication and quality-control purposes, and general oversight of cash distribution arrangements. Over recent years, significant changes have occurred to these activities. To a large extent, these changes have occurred as a consequence of the move to polymer currency notes. Because of their greater security and durability, we believe that polymer notes do

not need to be checked for authenticity and note quality fitness as frequently as in the past to keep the circulation clean and free of counterfeits. As such, the RBA has been able to significantly scale back its note processing activities to such an extent that over recent years the RBA's branch-based cash operations in Sydney, Melbourne, Brisbane, Adelaide, Perth, Canberra, Hobart and Darwin have all closed, with all of the RBA's note processing function having now been centralised at the new National Note Processing Centre (NNPC) located at Note Printing Australia Limited.

This reduced note processing role by the RBA has also facilitated a much-reduced role for the RBA in the distribution of notes and coin in the community. The excessive amount of churn and cross-shipping of notes that was occurring previously has been significantly reduced.

Clearly, this re-engineering of the RBA's note processing and distribution operations has brought about significant cost savings to the Bank. Including the NNPC staffing complement, the total number of staff employed by the RBA in note processing and distribution operations is now of the order of 41 people; in the mid 1980s about 650 staff were employed in this activity at the RBA branches around Australia.

In late 2000 it was recognised that even further changes could be introduced to achieve additional efficiencies in cash distribution and inventory management. At the time of writing these latest changes have yet to be implemented but the main feature of these changes is that, from end July 2001, commercial banks will progressively assume ownership of the working stocks of currency notes and coin currently owned by the RBA but held externally in 'Note Pools'. Prior to July 2001, the RBA had external holdings of notes and coin that could be accessed daily by banks through their cash-in-transit companies without the need to come into the RBA's buildings. The new arrangements will require those banks who need the stocks for their ongoing business to also own them. Some banks are net receivers of cash and others are net payers. Previously, no direct links had arisen between these parties, and the RBA considers that such links were unlikely to develop as long as it continued to provide depository facilities through its ownership of external stocks of currency notes and coin.

These latest changes should provide further opportunities for the recirculation of currency between the various participants. A high quality and durable banknote is of great value under such arrangements. A further feature of the new arrangements is that in return for being compensated by the RBA for additional holding costs that will result from taking ownership of the working stocks, banks are to ensure that notes are appropriately sorted into those which are fit or unfit for reissue, according to standards set by the RBA.

This re-engineering has delivered considerable cost savings and has enabled the RBA, commercial banks and cash-in-transit companies in Australia to introduce efficiencies into processing and distribution arrangements. With the changes already made and those to be implemented later in 2001, a sound platform has been established for participants to seek further efficiencies in note processing and currency distribution and inventory management.

## Conclusion

The above overview shows that the move to polymer notes has been very good for the RBA and for the community generally. The benefits are broad based and recognisable by the public. All this makes the future of polymer notes in Australia look very positive.