CAN MUTUALS COMPETE ON COMMERCIAL BANK TERMS?
Sharpening the regulatory focus

Promoted by the Treasurer’s December 2010 announcement promoting the growth of the credit unions and building societies (CUBS) as a ‘fifth pillar’ of banking, this study investigates the relative financial efficiency of banks and CUBS. Based on the efficiency measure we use, we find that: banks are more efficient than CUBS; efficiency fell during the GFC; efficiency and profitability ratios are not highly correlated; and there is no strong evidence that economies of scale explain efficiency differences.

The Australian Federal Government has proposed re-regulation of the finance sector in order to address the reduction in competition following the global financial crisis (GFC) in 2007–08. One of the government’s key concerns is CUBS’ ability to compete with major banks on a ‘level playing field’. The proposed measures announced in December 2010 included: the Australian Prudential Regulation Authority (APRA) granting permission for CUBS to use the term ‘bank’; government facilitation of development of an aggregated structure to raise cheaper funds; and continued government investment in the securitised mortgages market.

CUBS account for about 9 per cent of new home loans (arguably with lower mortgage rates than the major banks), and are the fifth largest holder of household deposits (The Treasury 2010). Therefore, closer scrutiny of this sector’s positioning in the wider financial sector could contribute to the government’s overall efforts to foster stable, efficient and competitive institutions, with efficient operations a key prerequisite for this.

The government has encouraged CUBS to compete directly with banks and we have already seen some CUBS move to identify themselves as banks. The main motivation for this study is to evaluate the extent to which CUBS can compete with banks and our analysis employs variables commonly used to assess the financial performance of commercial banks. We undertake this evaluation over a five-year period (2006 to 2010), including the GFC, which was at its most severe in 2008, thus generating insights into the performance of these financial institutions in different economic conditions.

Benchmarking to identify best and worst practices
Competition makes it critical that managers develop a better understanding of their institution’s position relative to best practices found among competitors via benchmarking. This study investigates the financial efficiency or profitability of CUBS relative to banks and to each other. We are interested in investigating efficiency because efficient institutions are more capable of tolerating adverse economic conditions, as well as surviving in competitive markets. For example, regulators that monitor performance could conceivably consider permitting more leeway in a bank’s risk profiling exercise if they were satisfied about efficient operations and the implied quality of management. Studying efficiency over a five-year period also provides an opportunity to observe the stability of the Australian financial system.

It is often difficult to discover best or worst practices because simple gap analysis or traditional financial ratio analysis only provides a narrow focus and ignores interactions among multiple variables or trade-offs. The key statistical technique utilised in this study — data envelopment analysis (DEA) — is a multi-criteria decision making tool best known for its ability to capture the various interactions among multiple inputs and

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outputs in a single value. According to Siems and Barr (1998, p.13), DEA has the key attributes expected of a useful benchmarking paradigm, namely, robust economic and mathematical underpinnings, alternative composite best practices, and the ability to capture trade-offs and substitutions while identifying potential improvements in multiple performance dimensions.

We envisage DEA-based financial efficiency analysis as an off-site monitoring instrument that may be of particular interest to regulators and complement existing bank examination procedures. Pille and Paradi (2002) report such a study in collaboration with the Canadian regulator, Deposit Insurance Corporation of Ontario, in which DEA was used to identify weaknesses in credit unions. The results indicate that DEA predicts failure better than, or at worst, comparable with what can be provided by the regulator’s modified Z-score. Such an application of DEA was anticipated much earlier by Barr et al. (1993, p.15). They note that ‘[t]he efficiency scores obtained via DEA can be used by regulatory authorities to identify the most inefficient institutions which require the greatest need of attention’. With this aim in mind, we proceed to outline the performance modelling approach adopted in our investigation.

The ‘global intermediation model’ of benchmarking

The performance perspective which we dub the global intermediation model (GIM) provides a bird’s-eye view of the relative success of an institution’s intermediation activities in converting expenses to income. In modelling financial efficiency through DEA, GIM brings together the inputs of interest expense ($), and non-interest expense ($), and the outputs of gross interest income ($) and non-interest income ($). Other studies which employ the same variables used in this study’s intermediation model include those by Miller and Noulas (1996), Avkiran (1999, 2000), Sturm and Williams (2004), and Banker et al. (2010).

DEA is an efficient frontier technique, based on linear programming, which computes a ratio of weighted outputs to weighted inputs for each organisation in a sample relative to ‘best practice’ implied from the others — reported as the relative efficiency estimate. The linear program scales the efficiency estimate between 0 and 1, thus enabling easy comparison, where 1 represents an efficient operation relative to others in the sample. Thus, a unit with a score of less than 1 is inefficient. This kind of frontier efficiency is also known as X-efficiency and it measures deviations from the frontier defined by the best-practice units.

A more detailed explanation of DEA can be found in a previous JASSA article (Avkiran 2006). In this study, we remove the upper truncation of 1 in efficiency estimates by employing super-efficiency DEA modelling — thus avoiding ranking ties among efficient units and enabling a more discriminating analysis (see the seminal paper by Andersen and Petersen (1993), as well as a more recent paper by Tone (2002)). Essentially, a frontier is established for assessing each institution’s relative efficiency while excluding the evaluated institution from the original frontier calculation. Hence, there is no single frontier and an institution can have an efficiency score greater than 1, for example, while increasing its inputs yet remaining efficient.

We also note that a unit’s efficiency measure is based on actual observed performance within the sample, rather than measures of central tendency or regression fitting. This approach provides a relative measure based on local or peer comparisons of how efficient each unit is in converting inputs to outputs designated in a conceptualised performance model. Note further that the DEA modelling used assumes variable returns-to-scale (VRS) due to the mixed sample. That is, efficiency estimates are computed after the effects of differences in scale have been adjusted for, so that the differences in efficiency are not a consequence of differences in the size of operations.3

The DEA technique used in this study enables a relative comparison based on the principle of simultaneously minimising inputs while maximising outputs. Those units that excel in this joint exercise relative to their peers are dubbed ‘efficient’. This places the best-performing institutions, or those most efficient in operating profitably, on the frontier. Relative financial efficiency (i.e. benchmarking) is executed using the global intermediation model with a panel data set for the period 2006 to 2010. Pooling of the balanced panel data set provides the opportunity for constructing a common frontier across five years. In turn, the common frontier places the focus of analysis onto both an individual institution’s performance over time and the performance of institutions overall.

We work with a single balanced sample of six banks, 10 credit unions and eight building societies, resulting in 120 observations in total across five years. Key features of the different institutions are reported in Table 1.

Because we are looking at the CUBS’ ability to compete with banks, we consider it reasonable to include all of the institutions in a single study, relative to a common frontier. We also note that all of the basic financial intermediation process, which is the primary driver of performance, is undertaken by all of the institutions. Similarly, all institutions need to earn profits: in the case of the mutuals, this is so that they can maintain and strengthen their capital bases.

The government has encouraged CUBS to compete directly with banks and we have already seen some CUBS move to identify themselves as banks.
Key findings
Noting the range of sizes among the institutions studied, we further examine scale inefficiency. We do this by running traditional radial constant returns-to-scale (known as the CCR model in DEA jargon) and variable returns-to-scale (BCC) models, with scale efficiency being measured as the CCR score divided by the BCC score. Results (available from the authors) show that the scale inefficiencies are generally very small, and of no economic significance. Testing for the statistical difference between the CCR and BCC scores (using the Mann-Whitney test) reveals that the differences between the banks and credit unions is not statistically significant, even at the 10 per cent level. Once building societies are introduced into the comparison, however, we find statistical significance at the 5 per cent level, even though the building societies are, on average, larger than the credit unions included in the study. Because of low scale inefficiency, and because we cannot be sure that some of the scale inefficiency identified is not a consequence of the relative dearth of smaller institutions in the study, we retain building societies in the study. The rest of our analysis continues with the originally planned VRS approach which avoids clouding our results with any scale effects.

While examining performance through GIM, our main focus is on understanding how well CUBS would fare when benchmarked against banks, as well as demonstrating how potentially problematic institutions can be empirically identified. Profiling of the sample on efficiency estimates across the 2006-10 common frontier indicates that the composition of the efficient cohort is almost evenly split between banks and CUBS; similarly, credit unions and building societies are equally represented in the latter group. We also note that the banks in the efficient cohort comprise about half of all bank observations across the five-year period. On the other hand, the bottom ranks do not include any banks and consist of a mix of credit unions and building societies.

How do financial institutions fare over the five-year study period? To answer this question more specifically, we return to the common efficient frontier constructed using 120 observations. Once the institutions are sorted in descending order of five-year average efficiency estimates, the major banks comprise four of the top five (with a credit union occupying the fourth position). There is no clear pattern as to the composition of the sorted institutions, except that we notice a stronger presence of building societies towards the bottom of the ranked list. Indeed, five out of six institutions at the bottom of the five-year average efficiency ranking are building societies. Five-year group average super-efficiency estimates are 0.9136 (banks), 0.7469 (credit unions) and 0.6508 (building societies). Testing for the significance of these differences using the Mann-Whitney test finds that banks are more efficient than both building societies and credit unions at the 1 per cent level, and that credit unions are more efficient than building societies at the 5 per cent level, thus lending further support to the preceding observations. Overall, we can therefore infer that banks perform substantially better than CUBS in terms of the global intermediation model of financial performance, and credit unions do better than building societies.

Having set the scene for competition between banks and CUBS, we now expand the analysis to examine the stability of performance of the Australian financial institutions over time. Intuitively, institutions should not exhibit a marked change in their ranking from one year to the next. Rank correlations are 0.790 (across 2006-07), 0.768 (2007-08), 0.536 (2008-09) and 0.804 (2009-10). These correlations are all statistically significant, showing the greatest change during the 2008-09 period, when the impact of the GFC would have been reflected in financial statements. Otherwise, the statistically significant and high rank correlations suggest a stable sector and, according to Bauer et al. (1998), lend support to a frontier approach that could be useful for regulatory analysis.

We also examine the impact of the GFC, with our expectation being that efficiency scores might have deteriorated as banks (in particular) faced relatively higher funding costs and (possibly) reduced opportunities for revenue generation with a slowing in growth. We see in Table 2 that efficiency scores were indeed consistently lower in 2009. With most of our institutions having June balance dates, this is the year in which we would expect the main impact of the GFC to be observed following the crunch in funding markets in September-October 2008.
Finally, we briefly investigate the association between efficiency estimates and key profitability ratios commonly used by practitioners. In the literature there is no common theme regarding correlations between DEA estimates and financial ratios. This is primarily attributed to the uni-dimensional nature of ratios versus the multi-dimensional nature of DEA where interactions among multiple variables are captured in a single score. As Gelade and Gilbert (2003) point out, individual ratios looking at different aspects of an organisation’s effectiveness cannot depict a full picture because ratios are unlikely to be independent. The most extensive and recent exploration of this relationship can be found in Avkiran (2011, p. 325) where it is reported that ‘The few researchers who have tested for the correlation between bank profitability and DEA scores sometimes report insignificant correlations and at other times report significant correlations’. Avkiran (2011) finds the profitability ratio of post-tax profits / average total assets is significantly correlated with various types of DEA estimates at a mean value of 0.553 (0.05 level of significance).

Table 3 reports rank correlations between DEA estimates and key profitability ratios (all significant at the 0.01 level, two tailed). Nevertheless, none of these correlations is very high, confirming anticipated findings. These observations suggest that an institution can be profitable in accounting terms but not necessarily technically efficient. It also highlights room for improvement where such disparity is found. Avkiran (2011, p. 323) states, ‘... a low correlation may present an opportunity to address production inefficiencies that were not obvious in financial ratio analysis, thus enabling an update of inferences drawn from ratios’.

### Concluding remarks

Based on our empirical analysis of 24 Australian financial institutions over the 2006–10 period, we reach the following conclusions.

It is possible that the GFC has put banks in a stronger relative position, because of their ability to access wholesale funding based on their stronger credit ratings. However, this would not explain their superior performance prior to the GFC.

> Half of all bank observations are in the efficient cohort. Similarly, the bottom ranks entirely consist of credit unions and building societies. It is possible that the GFC has put banks in a stronger relative position, because of their ability to access wholesale funding based on their stronger credit ratings. However, this would not explain their superior performance prior to the GFC.

> Five-year average efficiency estimates show that the major banks occupy four of the top five positions and the bottom ranks are dominated by building societies. This ranking is not disturbed by the effects of the GFC in 2009, which suggests that the ranking cannot be attributed only to differences in the mix of business. Otherwise, we would expect to see a stronger effect of the GFC on the major banks with their international linkages.

> Overall, we can infer that banks perform better than CUBS in terms of the global intermediation model of financial performance. That is, when benchmarked on commercial bank terms, CUBS perform poorly; this is particularly true for building societies. This matters because profitability is the source of additional capital needed to maintain financial strength (a particularly important issue for the majority of CUBS that are mutuals).

> There is scope to undertake further analysis to improve our understanding of CUBS performance. We note,
for example, that CUBS generally hold higher levels of equity capital: if capital were included as an input in our analysis, we would expect the results to show CUBS as even less efficient in relative terms (although there would be some trade-off because smaller external funding requirements would reduce their interest costs).

> Statistically significant and high correlations of efficiency rankings across multiple periods of two consecutive years mean that institutions’ efficiency scores were consistent through time — an indication of relative stability in the financial sector.

> The impact of the GFC is noticeable in lower mean and median efficiency estimates in 2009 across the mixed sample and its constituent sub-groups.

## Appendix: Institutional coverage and data sources

### TABLE A1: Financial institutions in the study sorted in descending order of total assets as at end of financial year 2010 ($m)

<table>
<thead>
<tr>
<th>Credit Unions (N=10)</th>
<th>Building Societies (N=8)</th>
<th>Commercial Banks (N=6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credit Union Australia (8,155)</td>
<td>Heritage Building Society (7,565)</td>
<td>National Australia Bank Ltd (621,357)</td>
</tr>
<tr>
<td>Australian Central Credit Union (6,006)</td>
<td>Newcastle Permanent Building Society (6,838)</td>
<td>Commonwealth Bank of Australia (620,169)</td>
</tr>
<tr>
<td>Community CPS Australia (3,048)</td>
<td>IMB Limited (4,696)</td>
<td>Westpac Banking Corporation (606,717)</td>
</tr>
<tr>
<td>Police &amp; Nurses Credit Society (2,654)</td>
<td>Greater Building Society (4,226)</td>
<td>Australia and New Zealand Banking Group Ltd (491,263)</td>
</tr>
<tr>
<td>MECU Limited (2,433)</td>
<td>Wide Bay Australia Limited (2,725)</td>
<td>Bendigo and Adelaide Bank Ltd (521,41)</td>
</tr>
<tr>
<td>Qantas Staff Credit Union (1,993)</td>
<td>The Rock Building Society (1,225)</td>
<td>Bank of Queensland Ltd (38,571)</td>
</tr>
<tr>
<td>Victoria Teachers Credit Union (1,262)</td>
<td>Hume Building Society (705)</td>
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</tr>
<tr>
<td>Queensland Teachers Credit Union (1,124)</td>
<td>B&amp;E Limited (587)</td>
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<tr>
<td>NECU (876)</td>
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<tr>
<td>Police Credit Union SA &amp; NT (563)</td>
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Data were obtained from annual reports and Bankscope (particularly for the building societies). We used consolidated data because, in most cases, subsidiaries are integral to institutions’ operations (even for the major banks where some overseas business is conducted through subsidiaries). The other adjustment made is in relation to the major banks’ insurance business, with insurance liabilities and expenses netted off against insurance assets and income, respectively, so that attention is given only to the banking business.
Notes
2. Queensland Teachers Credit Union, MECU and Heritage Building Society are among the CUBS who have relabelled themselves as banks.
3. Further technical details on DEA are available from the authors.
4. Individual institution estimates are available from the authors.
5. Bauer et al. (1998, p.87) dub this as a ‘consistent-with-reality condition’.
6. The full report and tabulated results used in writing this short article are not reproduced here but are available from the authors.

References