Severity of Loss in the Event of Default in Small Business and Larger Consumer Loans

by Robert Eales and Edmund Bosworth

Westpac Banking Corporation has undertaken several analyses of the severity of loss that occurs when loans default. This article reports on the latest of those investigations and focuses on small business loans and the larger consumer loans, such as home loans and investment property loans, which are significant factors in bank exposure and contribution to profit.

At first glance, small business loans and larger consumer loans may seem an incongruous combination. However, many small business loans are secured by mortgages over the owners’ homes or other property. In addition to determining loss in the event of default (LIED) ratios, the study supporting this article tested commonly held views regarding severity of loss upon default. For example, there is a common perception that loans secured by residential real estate suffer no or little loss in the event of default and also that the purposes to which such loans are applied do not significantly affect the severity of the loss. The results of Westpac’s investigation contradict both of these perceptions.

The loans included in the sample had all been worked out fully. The ultimate outcome was known, enabling a complete economic analysis to be done. This contrasts with LIED proxies sometimes used elsewhere, such as the secondary market value of defaulted loans.

This work was influenced considerably by Asarnow and Edwards. It differs, however, from their approach in several respects:

• The methodology has been refined.
• The geographical location and market segment are different.
• A larger number of defaults are included.
• The large sample enabled subsets to be examined and comparisons to be made between customer segments and security types.

However, this study lacks the time span encompassed by Asarnow and Edwards.

The Scope of the Investigation

Westpac’s investigation included 5,782 customers that defaulted on one or more loans between September 30, 1992, and September 30, 1995. By definition of the seg-
ment, customers with more than A$10 million (approximately US$6.7 million) outstanding at the time of default have been excluded from the analysis presented here. Also excluded are credit card debt and other small value consumer loans such as consumer durable finance.

As in previous Westpac investigations of LIED, the study focused on customers rather than individual loans. The reason is that when any one loan to a customer is in default, all loans to that customer are usually considered to be in default and are worked out together. The bank is interested in making the best recovery of all the funds at risk and manages the situation accordingly, taking all outstanding loans into consideration.

In the corporate loan market, the failure to meet a payment when due will immediately constitute an event of default. In contrast, in the market segment covered by this analysis, banks tend to condone a degree of delinquency and generally do not take recovery action immediately when a payment is missed. Thus, a different definition of default seems appropriate. For this analysis, default was defined by three conditions:
1. The reclassification of the loan to doubtful or nonaccrual.
2. The raising of a specific loan loss provision or the write-off of all or part of the loan.
3. A 90-day payment delinquency or “account out of order” classification of more than six months’ duration.

The occurrence of any one of these conditions was sufficient to trigger inclusion of the loan in the study. Moreover, as mentioned, if any one facility was included, all other credit exposures to that customer were also considered in default and included. There is some redundancy in the three criteria, but differences in recording procedures over time and in different product segments made all three necessary.

This definition of default was arrived at by discussion with the credit officers in the relevant areas. It is broadly consistent with Westpac’s analysis of default risk in this segment and captures all loans transferred to workout teams.

The LIED ratio was calculated by determining the net present value of all cash flows after default, discounted back to the day the triggering event occurred. The loss is expressed as a percentage of the funds outstanding on that day. See the side bar on page 63 for details of the methodology.

The Results
Dollar values in the following discussion refer to Australian dollars. The terms “loss in the event of default” (LIED), and “loss given default” (LGD) are synonymous.

The average LIED ratio for the sample as a whole was 30%. However, as can be concluded from the following discussion, this overall value requires cautious interpretation. It is substantially a function of the mix of loans included in the sample and application to other portfolios is dangerous.

Table 1 shows results segmented by business and consumer loans. The business loans included in this sample are four times as large as the consumer loans and the business defaults are somewhat more expensive.

The effect of size. As shown in Figure 1, the loss given default is sensitive to the size of the customer’s debt with the bank. The ratio rises rapidly as the size of the debt falls below A$50,000. This is in part a consequence of the way workouts are managed. These small defaults are numerous, and workout officers or collection agencies seek quick resolution to minimize costs, even at the expense of foregoing some recovery.

At the other end of the range, as loan size increases, the severity of loss also increases. This trend continues beyond the range of the sample included in this article. Here a contributing factor is the increased time associated with the recovery (greater complexity, increased propensity to litigate) and hence lower discounted recovery. The more protracted workout also results

<table>
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<tr>
<th>Average Size of Debt and LIED by Type of Customer</th>
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<tr>
<td>Average size of debt (A$ ‘000)</td>
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<td>--------------------------------</td>
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<tr>
<td>Average LIED (%)</td>
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<td>Median LIED (%)</td>
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<td>Sample size</td>
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The type of customer—business versus consumer loans. As shown in Table 1, the loss given default is greater for businesses than for consumers. However, given the sensitivity of the results to size of exposure and security, the question is whether this difference is merely the result of the different loan mixes found in each segment. This question is addressed in two steps. Size is analyzed immediately below and security is addressed later in this article.

As seen in Figure 2, the business LIED ratio is worse in every size category in which a comparison was possible. Clearly, size of exposure does not explain differences between consumers and businesses.

The distribution of loss severity. The severity of loss is most frequently expressed simply as an LIED or LGD ratio. Alternatively, the same information may be shown as a recovery rate. This obscures the fact that the final outcomes when loans default are widely distributed. The severity of loss that will ultimately be sustained is very uncertain. Figure 3 shows this for the data in the sample.

The distribution has a long tail and is bimodal. This form of distribution is characteristic of all of the LIED studies Westpac has undertaken and also was reported by Asarnow and Edwards. Similarly, Carty and Lieberman also remarked on the very wide distribution of outcomes in their investigation.

The tail of the distribution extends beyond a loss of 100% of the loan value. This means negative recovery. How does a bank lose more than it has at risk? It fruitlessly incurs recovery expenses. For example, it becomes involved in litigation and is
unsuccessful. Even worse, it extends further credit to the customer after the initial default in the hope that the situation may be turned around or the business sold as a going concern, and this strategy fails.

When internal workout expenses are recognized, as they were in this analysis, there is virtually no such thing as a default with zero loss. Every default incurs some cost—in excess of a performing loan—that usually cannot be recovered fully.

In Westpac's analysis, the cash flows after default are discounted at a rate higher than the interest rate on the loan (see “Methodology” in the side bar). This also results in loss severity being measured as greater than zero when principal and interest are fully recovered after significant elapse of time—even if workout expenses are not taken into consideration.

The impact of security. Of great interest to any lender is the value of security in mitigating loss. Only a small proportion (6%) of the customers in the sample had facilities that were all unsecured or predominantly unsecured. Nevertheless, it is possible to compare the outcomes between secured and unsecured loans.

Figure 4 shows that there is a much greater likelihood that the LIED will be low for secured than for unsecured loans. For unsecured loans, the most common outcome is a loss greater than the principal at risk.

It is sobering to note the extent to which security fails to prevent loss. It substantially improves the recovery prospects, yet even secured loans can have loss in the event of default in excess of 100%.

The effect of the type of collateral. Another common concern is the effectiveness of different types of collateral. To analyze this is not as easy as it may seem. Customers frequently have more than one loan, each with its own security arrangements. As mentioned earlier, in a default situation, banks typically manage all loans together to maximize the recovery. When recoveries are made, they are made on the entire relationship. Thus, the result reflects the mix of security arrangements in place.
The defaults were clustered by primary and secondary type of collateral. For example, if a loan to a business customer was secured by a mortgage over nonresidential real estate and guaranties from the directors, the customer was included in the nonresidential mortgage cluster and also in the guaranty cluster. The existence of further collateral was ignored for this purpose. The average LIED for each cluster was then determined. The results, which are at best a useful indication of the effectiveness of the most common forms of collateral in the sample, are shown in Figure 5.

Not surprisingly, Figure 5 shows that all forms of security are to be preferred over no security at all. In most cases, business losses are again more severe. The type of collateral also does not appear to explain why business defaults result in greater loss than consumer defaults.

Note also how the size effect comes through: When microbusinesses default, the outcome is more costly for the bank than when larger businesses default. This is despite the fact that the loan-to-security ratio was, in general, considerably lower for microbusinesses.

The analysis supports the widely held view that residential real estate is one of the best forms of collateral commonly available. Nevertheless, the still-high severity

<table>
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<th>Definitions</th>
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<tr>
<td>Microbusiness</td>
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<tr>
<td>Small business</td>
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<tr>
<td>Personal</td>
</tr>
<tr>
<td>Residential mortgage</td>
</tr>
<tr>
<td>Nonresidential mortgage</td>
</tr>
<tr>
<td>Leased goods</td>
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<tr>
<td>Supported guaranty</td>
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<td>Clean guaranty</td>
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of loss sustained on loans with this type of security was unexpected.

Discussions with workout managers indicated that recoveries in which residential property is involved can be protracted, typically lasting for more than a year. This is a consequence of consumer protection legislation and a reputational risk. The media have been quick to run with stories portraying large banks as unsympathetic bureaucracies when taking possession of homes. This has caused banks to proceed with great care. The lengthy workouts drive higher costs and motivate banks to make compromises—involving some loss of recovery—in the interests of early closure.

The components of loss. The main components of loss are shown in Figure 6.

The largest components of loss are the loss of principal and interest and cost of carry. “Cost of carry” is shorthand for the shareholders’ opportunity cost associated with the time it takes to recover their capital at risk. This component was calculated by taking the difference between the overall loss for the entire sample and the undiscounted result. In the first calculation, the cash flows were discounted at the cost of equity capital. In the second calculation, no discounting was applied. (See “Methodology” in the side bar.)

Internal workout costs were a relatively small part of the overall loss. “Late recoveries,” another small part of the equation, refers to recoveries made after loans were fully written off.

Workouts also incur external costs, for example, when receivers are appointed or legal assistance obtained. Their fees and expenses are usually deducted from the cash recovered before the proceeds are received by the bank, and so they become a part of the loss of principal and interest. Sometimes however such expenses are incurred, only to be followed by no recovery or recoveries insufficient to meet the outlay. In this analysis, such unrecovered expenses were found to be small—less than half a percent of the principal at risk. They have been omitted from Figure 6.

Conclusions
The results presented in this article are a function of time and place. The workouts all occurred in a stable economy, growing at a healthy rate. Although inflation was low throughout the period, asset values generally rose. If the workouts had occurred during a recession, the results might have been quite different.

All of the workouts were undertaken internally at Westpac. The results, therefore, bear the hallmarks of the bank’s workout practices. Each default raises tactical questions:

- Is it better to foreclose early and crystallize losses or give the customer more time to find a way out?
- Should further financial assistance be provided?
- Should assets be sold immediately or should they be held until the market improves or the right buyer comes along?

The responses to such questions will influence the outcome. So will the legal and social environment in
Methodology Used to Estimate Loss in the Event of Default

For this analysis, the economic cost of the default has been determined by discounting cash flows after default. This will differ from the result obtained by applying accounting conventions. The formula that has been used is:

\[
\text{LIED} \% = 100 \times \frac{\text{Outstanding amount at default} - \text{Net present value of all cash flows after default}}{\text{Outstanding amount at default}}
\]

The net present value is calculated to the day the default is captured in the bank’s systems, and discounting is at the cost of equity capital as determined by the Capital Asset Pricing Model. (See discussion below on discount rate.)

Cash flows after default include some or all of the items on the following table:

<table>
<thead>
<tr>
<th><strong>NEGATIVE CASH FLOWS (INCREASE RISK OR LOSS)</strong></th>
<th><strong>POSITIVE CASH FLOWS (DECREASE LOSS)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Further loan disbursements to the borrower.</td>
<td>• Principal repayments received from the borrower.</td>
</tr>
<tr>
<td>• Internal loan workout costs.</td>
<td>• Interest payments received from the borrower.</td>
</tr>
<tr>
<td>• External workout costs (legal fees, valuations, sales commissions, etc.).</td>
<td>• The proceeds of the realization of security.</td>
</tr>
<tr>
<td></td>
<td>• Recoveries made after account closure.</td>
</tr>
</tbody>
</table>

The methodology pays no attention to write-offs, which can be made at any time after a default event. Cash is what matters. However, it is possible to structure the analysis using write-offs to produce the same results. Specifically we can show that the methodology is mathematically equivalent to that applied by Asarnow and Edwards, who used write-offs in their formulation, and produces identical results if their discount rate is applied.

The Discount Rate

There are several candidates for the discount rate. They include a zero rate (no discounting) the risk-free rate, and the weighted average cost of funds. However, the main candidates appear to be:

- The original loan rate, varied over the period of workout if the loan is a variable rate loan.
- The cost of equity.

In this project, discounting was applied at the pretax cost of equity capital. When loans default, the whole loss is absorbed by the bank’s profit or, in severe circumstances, its equity. The shareholders suffer the loss in full. Thus, the delay in recovering funds represents an opportunity cost for shareholders that is appropriately valued by discounting at the cost of equity.

The conventional approach is probably to use the original loan rate. Its appeal is that in the limiting case of a loan for which all payments are received when due, the LIED is measured as zero if no workout expenses are included (or incurred). The original loan rate also might be considered to represent opportunity cost in that it is a measure of the interest that might have been earned on the funds that are recovered by the workout process had the loan not defaulted or had the funds been available at the default date for making an equivalent loan. This fails to assign economic cost to the uncertainty and incompleteness of the recovery. Moreover, Westpac was able to fund all new lending opportunities during the period under review. It did not decline any loans because funds were tied up in workouts.

If the original loan rate had been used to estimate LIED, the reported losses would have been about 10% lower, that is, the LIED rates would be about 0.9 of those shown in the article. The difference is slightly greater for secured loans because they take longer to workout, and it is correspondingly lower for unsecured loans.

The discount rate was varied according to market rates prevailing over the workout period for each loan as determined by an approximate application of the Capital Asset Pricing Model. The approximations were the assumption of a constant beta and market premium and no adjustment for franking credits. (Dividend franking is a peculiarity of the Australian tax system.) The rate was varied according to the monthly changes in the reference 10-year bond rate.

A pretax rate was used because LIED values are typically used to calculate pretax expected losses. The values are used in models where tax is separately taken into consideration, for example, pricing models.
which the bank operates. Only the
publication of similar results by
other banks will indicate the
extent to which the results
reported here are idiosyn-
cratic.

The results are criti-
cally dependent on the
definition of default.
Had a stricter, more
legalistic definition been
used, many more cus-
tomers would have been
included that breached the
strict terms of their facilities
because of temporary cash flow dif-
ficulties or sloppy management.
Since these customers all recovered
fully, a lower LIED ratio would
have been measured.

Credit risk is the combination
of default risk and severity of loss
given default. Thus, when
undertaking LIED analyses, each
bank must ensure that the definition
of default used for this purpose is
consistent with the definition
applied in determining
default risk.

Finally, this investigation has
shown that LIED has
a wide distribution, a finding sup-
ported by earlier studies in different
markets and market segments. It
may be typically bimodal as shown
in Figures 3 and 4. Thus, it is mis-
leading to describe it simply by a
mean value as is often done, partic-
ularly in estimating unexpected
loss. The severity of loss introduces
considerable volatility into the loss
distribution and fattens and length-
ens the tail of the distribution con-
siderably.

NOTES
1 For example, Carty, L.V. and
Lieberman, D., Defaulted Bank Loan
Recoveries, Moody’s Investors Service,
November 1996.
2 Asarnow, E. and Edwards, D.,
“Measuring Loss on Defaulted Bank
Loans: A 24-Year Study,” The Journal