Loss Given Default
Draft Audit Report
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Introduction

Loss Given Default (LGD) is an important risk component in determining the loan provision and capital requirement for an exposure. Historically, EDC has used an LGD of 30% on certain secured loans and 55% on the remainder of the portfolio with the exception of asset backed lending in the aerospace sector. In 2014, a transactional based LGD calculation was implemented for CABL (excluding Aircraft) and International Financing Direct (previously Commercial Markets Financing). The transactional based LGD uses the Basel experience rates of 45% and 75% for senior and subordinated debt. These experience rates are then adjusted for collateral, country of risk, and expected recovery costs.

Audit Objectives & Scope

The objective of our audit was to evaluate the design and operating effectiveness of the controls surrounding the calculation of transactional LGD. The scope included a review of the related policy framework, LGD model integrity and validation, approval of the LGD model and underlying assumptions, and the calculation of LGD on individual transactions by underwriting teams and asset management.

Internal Audit Opinion

Based on the results of our detailed testing, we have concluded that "***Opportunities Exist to Improve Controls***[1]". The Risk Rating Policy within the Credit Risk Chapter of the Risk & Capital Management Policy (RCMP) defines EDC's processes for measuring credit risk. As such, the policy references the use of Probability of Default (PD) and transactional LGD to generate risk ratings for the loans and guarantees program. However, the policy is silent with respect to the standards to be followed in establishing PD and LGD. Under the Basel II framework, an Internal Ratings Based (IRB) Approach must be followed to determine credit risk and includes detailed standards for determining PD and LGD. The Risk Rating Policy does not address whether EDC is following the Basel II IRB approach and whether some or all of the related standards will be followed. We also noted that many topics integral to the IRB approach for LGD are not adequately addressed within the scope of EDC's policy framework. Examples include: documentation of model assumptions, model ownership and approval authorities; model validation, management and Board reporting requirements; collateral valuation; and use of facility based LGD in determining risk limits and Delegation of Authority (DOA) levels. Finally, we tested a sample of 50 LGD calculations performed at origination and post-origination and found errors in about half of the

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[1] Our standard audit opinions are as follows:

- **Strong Controls**: Key controls are effectively designed and operating as intended. Best in class internal controls exist. Objectives of the audited process are most likely to be achieved.
- **Well Controlled**: Key controls are effectively designed and operating as intended. Objectives of the audited process are likely to be achieved.
- **Opportunities Exist to Improve Controls**: One or more key controls do not exist, are not designed properly or are not operating as intended. Objectives of the process may not be achieved. The financial and/or reputation impact to the audited process is more than inconsequential. Timely action is required.
- **Not Controlled**: Multiple key controls do not exist, are not designed properly or are not operating as intended. Objectives of the process are unlikely to be achieved. The financial and/or reputation impact to the audited process is material. Action must follow immediately.

sample items. In five cases, these errors resulted in the wrong LGD rate being used at origination. It is important to note that our sample was selected for the purposes of testing controls. The results cannot be used to conclude that there is a material error in the calculation of transactional LGD.

Action plans addressing these findings have been developed and are included in Appendix A.

Audit Findings & Action Plans

1. Standards for Lending Credit Risk Components

EDC's allowance for performing loans and capital demand for lending credit risk is based on the following risk components: PD, LGD, and Exposure at Default (EAD). The use of PD and LGD is referenced in the Risk Rating Policy within the Risk & Capital Management Policy (RCMP). However, the policy is silent with respect to the standards to be followed for measuring these risk components. Specifically, the Basel II framework includes detailed standards for determining each risk component, but it is unclear whether EDC is meant to comply with some or all of these standards.

Clarity around the standards to be followed is needed to enable effective oversight by both the RMC and MRMC with respect to lending credit risk levels and the related capital demand, as well as providing a basis for Management's assertion on the quarterly Compliance Certificate regarding compliance with the Risk Rating Policy.

In practice, aspects of Basel II's Foundation Approach to IRB are being followed today, but there are some notable gaps, including:

- The use of internal ratings for most commercial obligors, but with no formal rollout plan for moving to an IRB approach for other asset classes such as sovereign, financial institutions, equity investments, and project finance.
- The use of facility based LGD using Basel seniority experience for only a portion of EDC's loan portfolio. Similarly, a formal rollout plan for the remaining portfolio has not been developed or approved.

Management has agreed to create detailed action plans to address how and when the standards to be followed by EDC in measuring the PD and LGD risk components will be defined and then approved by the RMC and MRMC in accordance with their corresponding terms of reference. This includes specifying which aspects of Basel II IRB standards will be adopted and defining the applicable rollout plan.

Rating of Audit Finding - Major[2]
Action Owner – Vice President, Risk Management
Due Date – Q3 2015

2. Policies Relating to Transactional LGD

LGD is briefly addressed in the Risk Rating Policy within the Credit Risk Chapter of the RCMP. The RMO guideline ("EDC Financing Loss Given Default Model") describes the LGD process and responsibilities. However, there a complete framework governing the LGD process from end-to-end does not exist, including a description of the process, defined responsibilities, monitoring and reporting thereon. In particular, we noted:

- In the absence of clarity on the standards of alignment with Basel, there is no requirement within the existing policy framework to establish a process for an independent, periodic validation of the LGD model and parameter estimates. Validation of the risk rating system underlying an IRB approach is required under Basel and is standard industry practice. Validation processes consist of two main components. One component is the periodic validation of each model at and subsequent to the initial model approval. The second component is the on-going testing to assess model and overall methodology performance.

- The LGD policy framework should also address collateral valuation and management to ensure collateral is appropriately factored into the LGD calculations. Transactional LGD is mainly driven by the seniority ranking, and in turn access to collateral, country risk and work out cost factors.

- The DOA and "Risk Limits" are based on the obligor exposure and the obligor riskiness (PD), but do not address the risk level of the transaction (LGD). LGD is not specifically addressed in the "Delegation of Authorities".

Management has agreed to create detailed action plans to review and update EDC's policy framework addressing LGD related matters including: model assumptions, ownership, and approval authorities; model validation process including frequency, roles and responsibilities and monitoring/approval of results; management and Board reporting requirements relating to LGD; collateral valuation and management; and the use of facility based LGD in managing risk limits.

Rating of Audit Finding – Major
Action Owner – Vice President, Risk Management
Due Date – Q3 2015

[2] The ratings of our audit findings are as follows:
- **Major**: a key control does not exist, is poorly designed or is not operating as intended and the financial and/or reputation risk is more than inconsequential. The process objective to which the control relates is unlikely to be achieved. Corrective action is needed to ensure controls are cost effective and/or process objectives are achieved.
- **Moderate**: a key control does not exist, is poorly designed or is not operating as intended and the financial and/or reputation risk to the process is more than inconsequential. However, a compensating control exists. Corrective action is needed to avoid sole reliance on compensating controls and/or ensure controls are cost-effective.
- **Minor**: a weakness in the design and/or operation of a non-key process control. Ability to achieve process objectives is unlikely to be impacted. Corrective action is suggested to ensure controls are cost-effective.

3. LGD Model

The LGD model uses the Basel experience rates of 45% and 75% for senior and subordinated debt. These experience rates are then adjusted for collateral, country of risk, and expected recovery costs.

The LGD model breaks out the rates into six classes, with LGD bands that span 20% each, except for the lowest and highest bands which are each 10% to total 100%. The final LGD score assigned to a facility is always the middle of the class. For example, the LGD3 class spans from 30% to 49%, with a mid-point of 40%. Senior, unsecured facilities that score within this range will always be assigned an LGD of 40%, which is less conservative than the Basel experience rate of 45% for senior unsecured facilities otherwise scoring in the upper range of this band. The range of the classes should be reviewed to consistently apply the model's principal of using Basel experience for unsecured and subordinated debt.

We also noted that country multiples are only updated annually. A more frequent update of country multiples would be meaningful, particularly when material economic and political changes occur during the year and before the next update.

Management has agreed to develop detailed action plans to review if the Basel experience bases for LGD used by the model of 45% and 75% for unsecured senior and subordinated debt are to be used in practice, and, if so, consider updating the LGD bands as necessary, as well as increasing the frequency of updates to the country multiples from annually to semi-annually.

Rating of Audit Finding - Major
Action Owner – Vice President, Risk Management
Due Date – Q3 2015

4. Effectiveness of LGD Calculation & Reviews

LGD worksheets are used to calculate individual transaction ratings. An effective review process of the LGD worksheet is an important control for maintaining the integrity of risk ratings. The LGD calculation is completed by Underwriters for new facilities and by Assets Managers for annual reviews. Underwriter's and Asset Manager's LGD worksheets are stored on SharePoint which are linked to MBC and AMA.

We selected a sample of 50 LGD worksheets to test the accuracy of data inputs, with 25 each being completed by underwriters and asset management. Although our sample was random, it was not statistically valid for extrapolating other than as an indication of the frequency of exceptions. Input errors were noted in half of the sample selected, causing five incorrect LGD ratings to be used at credit origination. The frequency of input errors indicates a need to improve training for both teams, enhancing their understanding of LGD, the model, and the key factors that affect LGD.

We also noted:

- MBC is not configured to enforce the completion of the LGD model before submitting the transaction for approval. Additional steps may be needed to monitor and ensure the timely completion of the LGD before the transaction is submitted for approval.

- An outdated LGD template was utilized in AMA, leading to the use of outdated country scores by Asset Managers. For example, some LGDs calculated in 2014 were based on the model updated in early 2013.

Management has agreed to develop detailed action plans for monitoring so that LGD models are completed or updated before a transaction is submitted for approval at origination; refreshing an LGD training program to be delivered to current and new underwriters and asset managers to enhance their understanding of LGD, the model and key factors affecting the LGD; and will update AMA to utilize the correct version of the LGD template.

Rating of Audit Finding - Major
Action Owner – Vice President, Risk Management
Due Date – Q3 2015

Conclusion

The audit findings have been communicated to and agreed by management, who has developed appropriate action plans. We would like to thank management for their support throughout the audit.