Portfolio
Risk Management

Module 8
Block 1
- Introduction
- Risk analysis of agriculture and rural loan portfolio: the art of risk analysis
- Type of risks
- Portfolio risk management

Block 2
- Measuring portfolio quality: Portfolio quality ratios

Coffee Break

Block 3
- Strategies for active loan portfolio management

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- Guarantee Funds

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Risk Analysis of Agriculture and Rural Loans
The 5 Cs are Important Factors for Analyzing Credit Risk, but –

- The “art” is much more than knowing how to do calculations! It is smelling, intuition and emotional intelligence!

- Good risk management depends on knowing which, when and how to apply analysis indicators and also how to analyze the social and personal factors of the borrower.
Rural and Agricultural Costs and Risks

Agricultural

<table>
<thead>
<tr>
<th>High</th>
<th>Non-Agricultural</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Agricultural</td>
</tr>
</tbody>
</table>

- Transaction Costs
- Loan Terms
- Cash Flow & Income Regularity
- Co-variant Risk
- Collateral Assessment Skills
- Social Assessment Skills
- Agricultural Technical Understanding
- Market Assessment Understanding
Managing Client Credit Risk

Financial investment outcomes are uncertain – they can be relatively safe, unsure or risky

- Certainty is when only one outcome is possible, or the outcomes are known

- Uncertainty refers to an expected future outcome which is unknown even though the probability of occurrence and the actual magnitude are known

- Risk identify the existence of the probability of an adverse outcome
Portfolio Risk Management

**Portfolio Risk Categories** *(source: Ag.Toolkit ch.4)*

<table>
<thead>
<tr>
<th>Risk category</th>
<th>Source of information on the risk profile</th>
<th>Source of information for the risk exposure of the financial institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regional risk</td>
<td>Reports from provincial government</td>
<td>Past performance per region</td>
</tr>
<tr>
<td>Sector risk</td>
<td>Ministry of Agriculture, Ministry of Small Industries, Chambers of Commerce, Agricultural Extension Services</td>
<td>Past performance per sector and product</td>
</tr>
<tr>
<td></td>
<td>Internal information sources</td>
<td></td>
</tr>
<tr>
<td>Loan terms concentration risk</td>
<td>Internal information sources</td>
<td>Past performance per loan term category</td>
</tr>
<tr>
<td></td>
<td>Long term analyses of financial sectors</td>
<td></td>
</tr>
</tbody>
</table>
Regional Risk

- Factors influencing regional risk

Regional Risk

- Geographic conditions (e.g. microclimates)
- Macroeconomic conditions
- Infrastructure conditions
- Political conditions
- Ecological conditions
- Socio-demographic conditions
Sector Risk

- Factors influencing Sector risk

- Expected sector growth
- Exposure to macroeconomic risks
- Expected sector profitability
- Market structure risks
Loan Concentration Risk

• The loan concentration risk primarily refers to the risk that the loan portfolio is concentrated in very **few, large** loans

• If one loan fails, this would have a very strong overall impact on the loan portfolio quality

• By the same token, allowing that a considerable portion of the loan portfolio is comprised of loans with similar features (e.g. all loans fall due in the same month), can also represent a considerable loan concentration risk
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Measuring Loan Portfolio Quality

Loan Portfolio at Risk

• The loan portfolio at risk is defined as the value of the outstanding balance of all loans in arrears (principal). The Loan Portfolio at Risk is generally expressed as a percentage rate of the total loan portfolio currently outstanding.

\[
\frac{\text{Total outstanding balance of overdue loans}}{\text{Total outstanding loan portfolio}}
\]
## Loan Portfolio at Risk and Sector Distribution

example (Ag. Toolkit ch. 4)

<table>
<thead>
<tr>
<th>In USD or %</th>
<th>Total Outst. Loans</th>
<th>%</th>
<th>Loan Portfolio at Risk</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coffee</td>
<td>284.000</td>
<td>14,2%</td>
<td>40.775</td>
<td>23,3%</td>
</tr>
<tr>
<td>Wheat</td>
<td>278.000</td>
<td>13,9%</td>
<td>22.225</td>
<td>12,7%</td>
</tr>
<tr>
<td>Rice</td>
<td>214.000</td>
<td>10,7%</td>
<td>19.600</td>
<td>11,2%</td>
</tr>
<tr>
<td>Maize</td>
<td>106.000</td>
<td>5,3%</td>
<td>16.450</td>
<td>9,4%</td>
</tr>
<tr>
<td>Vegetable</td>
<td>326.000</td>
<td>16,3%</td>
<td>14.875</td>
<td>8,5%</td>
</tr>
<tr>
<td>Cattle</td>
<td>196.000</td>
<td>9,8%</td>
<td>26.775</td>
<td>15,3%</td>
</tr>
<tr>
<td>Pigs</td>
<td>62.000</td>
<td>3,1%</td>
<td>5.600</td>
<td>3,2%</td>
</tr>
<tr>
<td>Poultry</td>
<td>48.000</td>
<td>2,4%</td>
<td>4.025</td>
<td>2,3%</td>
</tr>
<tr>
<td>Services</td>
<td>126.000</td>
<td>6,3%</td>
<td>8.575</td>
<td>4,9%</td>
</tr>
<tr>
<td>Trade</td>
<td>360.000</td>
<td>18,0%</td>
<td>16.100</td>
<td>9,2%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>2.000.000</strong></td>
<td><strong>100,0%</strong></td>
<td><strong>175.000</strong></td>
<td><strong>100,0%</strong></td>
</tr>
</tbody>
</table>
Measuring Loan Portfolio Quality

Loan Loss Rate

- The loan loss rate refers to the amount of loans that has actually been written off during a specific period of time. These are explicit losses that an institution has acknowledged because there is no possibility to recover or enforce the loan. In a large number of institutions, the loan loss rate is calculated on an annual basis.

\[
\frac{\text{Amount written off during period } n}{\text{Average outstanding loan portfolio during period } n}
\]
Loan Loss Rate and Sector Distribution
example (Ag. Toolkit ch. 4)

- The following table summarises the loan loss ratios as percentages of each sector portfolio.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Coffee</td>
<td>3,2%</td>
<td>3,1%</td>
<td>3,0%</td>
<td>5,1%</td>
<td>5,9%</td>
</tr>
<tr>
<td>Wheat &amp; Rice</td>
<td>2,9%</td>
<td>2,4%</td>
<td>2,2%</td>
<td>2,2%</td>
<td>2,1%</td>
</tr>
<tr>
<td>Maize</td>
<td>5,3%</td>
<td>5,4%</td>
<td>16,0%</td>
<td>5,1%</td>
<td>5,3%</td>
</tr>
<tr>
<td>Vegetable</td>
<td>0,8%</td>
<td>0,7%</td>
<td>0,6%</td>
<td>0,6%</td>
<td>0,6%</td>
</tr>
<tr>
<td>Cattle, Pigs &amp; Poultry</td>
<td>1,5%</td>
<td>1,3%</td>
<td>1,4%</td>
<td>1,5%</td>
<td>1,3%</td>
</tr>
<tr>
<td>Services &amp; Trade</td>
<td>0,2%</td>
<td>0,2%</td>
<td>0,1%</td>
<td>0,1%</td>
<td>0,2%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>2,3%</td>
<td>2,2%</td>
<td>3,1%</td>
<td>2,4%</td>
<td>2,5%</td>
</tr>
</tbody>
</table>
# Measuring Loan Portfolio Quality

- **Portfolio quality**: SEEP ratios (example)

<table>
<thead>
<tr>
<th>R9</th>
<th>PAR &gt; 30 Days + Value of Renegotiated Loans Gross Loan Portfolio</th>
<th>The most accepted measure of portfolio quality. The most common international measurements of PAR are &gt; 30 days and &gt; 90 days.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PAR &gt; 30 Days + Value of Renegotiated Loans Adjusted Gross Loan Portfolio</td>
<td>The adjusted PAR reduces the Gross Loan Portfolio by the Write-off Adjustment.</td>
</tr>
<tr>
<td>R10</td>
<td>Value of Loans Written Off Average Gross Loan Portfolio</td>
<td>Represents the percentage of the MFI’s loans that has been removed from the balance of the gross loan portfolio because they are unlikely to be repaid. MFIs’ write-off policies vary; managers are recommended to calculate this ratio on an adjusted basis.</td>
</tr>
<tr>
<td></td>
<td>Value of Loans Written Off + Write-off Adjustment Average Adjusted Gross Loan Portfolio</td>
<td></td>
</tr>
<tr>
<td>R11</td>
<td>Impairment Loss Allowance Portfolio at Risk &gt; 30 Days</td>
<td>Shows how much of the portfolio at risk is covered by the MFI’s Impairment Loss Allowance.</td>
</tr>
<tr>
<td></td>
<td>Adjusted Impairment Loss Allowance Adjusted Portfolio at Risk &gt; 30 Days – Write-off Adjustment</td>
<td>The adjusted ratio incorporates the Impairment Loss Allowance Adjustment and the Write-off Adjustment.</td>
</tr>
</tbody>
</table>
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Strategies for Active Loan Portfolio Management

• Exclusion of certain regions and economic sectors from accessing loans

• Inclusion of certain sectors or regions only under specific conditions

• Sector and regional limits
Strategies for Active Loan Portfolio Management:
-Sector and regional limits-

Let’s see how AGLEND has defined the upper and lower limits for various economic sectors (example in AgToolkit ch. 4)

<table>
<thead>
<tr>
<th>Crops</th>
<th>Lower limit</th>
<th>Upper limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coffee</td>
<td>5%</td>
<td>10%</td>
</tr>
<tr>
<td>Wheat</td>
<td>10%</td>
<td>20%</td>
</tr>
<tr>
<td>Rice</td>
<td>10%</td>
<td>15%</td>
</tr>
<tr>
<td>Maize</td>
<td>5%</td>
<td>10%</td>
</tr>
<tr>
<td>Vegetable</td>
<td>10%</td>
<td>20%</td>
</tr>
<tr>
<td>Cattle</td>
<td>5%</td>
<td>10%</td>
</tr>
<tr>
<td>Pigs</td>
<td>2%</td>
<td>5%</td>
</tr>
<tr>
<td>Poultry</td>
<td>2%</td>
<td>5%</td>
</tr>
<tr>
<td>Services</td>
<td>5%</td>
<td>15%</td>
</tr>
<tr>
<td>Trade</td>
<td>10%</td>
<td>30%</td>
</tr>
</tbody>
</table>
Strategies for Active Loan Portfolio Management

- Delegation of loan decision-making to higher levels
- Preference to loan renewals
- Stricter borrower selection criteria
- Increased collateral requirements
Strategies for Active Loan Portfolio Management

- Risk premium
- Limits for individual loans
- Write-off policies
- Differentiated loan monitoring
- Provisioning
- Credit derivatives
Strategies for Active Loan Portfolio Management: -Provisioning-

The provisioning rates normally take into account:

- The number of **days in arrears**
- The **loan maturity** and repayment frequency
- The **quality of collateral**
AGLEND applies the following loan provision policy (example in AgToolkit ch. 4)

<table>
<thead>
<tr>
<th></th>
<th>Days with overdue payments</th>
<th>Provisions</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Normal</td>
<td>0 days</td>
<td>2-5%</td>
</tr>
<tr>
<td>II. Watch</td>
<td>&lt; 30 days</td>
<td>25%</td>
</tr>
<tr>
<td>III. Sub-Standard</td>
<td>30 – 90 days</td>
<td>50%</td>
</tr>
<tr>
<td>IV. Doubtful</td>
<td>90 - 180 days</td>
<td>75%</td>
</tr>
<tr>
<td>V. Loss</td>
<td>&gt; 180 days</td>
<td>100%</td>
</tr>
</tbody>
</table>
The *protection buyer* sells the credit risk inherent to a certain obligation (*reference obligation*) to a third party (*protection seller*) without transferring the ownership of the credit title.
Types of Credit Derivatives

- Credit default swaps
- Credit spread products
- Total Rate of Return Swaps
- Credit linked structured notes
Credit Default Swap:

Payment upon the credit event

PROTECTION BUYER

Periodical payment as a % on the contract amount

PROTECTION SELLER
Strategies for Active Loan Portfolio Management

EXERCISE:

• **Rabobank** credit control: an example

• **Rabobank** exposure management paper: an example and application to a bank report
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Credit Enhancements and Credit Guarantees

Definitions

Credit Enhancement:
The process of reducing credit risk by requiring collateral, insurance, guarantees or other agreements to provide the lender with reassurance that it will be compensated if the borrower defaulted.

Credit Guarantee:
A promise made by a third party to pay in the event of default by the borrower.
Glossary point

A **guarantee** is a promise to pay. **Collateral** is a pledge of goods to ensure payment. A guarantee may be collateralized, or may be unsecured.

In several languages **guarantee** is used interchangeably to mean collateral as well as a promise to pay.
Credit Enhancements and Credit Guarantees

Reasons for Providing Credit Guarantees

- Promote private sector lending – reduce credit risk
- Build lending capacity and potential for sustained activity
- Leverage funding from private sources
- Address market imperfections, not distort markets
Guarantee Funds: The Relevant Theory

- Guarantee funds help banks in the process of approaching market segments which they are not used to work with and they consider too risky.

- This perception of high risk often derives from a lack of knowledge of these segments by the banks.

- Typical case: rural entrepreneurs
Some Questions

How should a guarantee fund work? (GROUP WORK)

- Who should take the risk?
- In which percentage?
- Who should evaluate the risk?
- How much would the protection cost?
- Who should be the owner of a g.f.?
- How do I measure the effects?
## The Basic Scheme

<table>
<thead>
<tr>
<th>Borrower</th>
<th>Guarantee fund</th>
<th>Bank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating costs</td>
<td>Risk identification</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Risk analysis and evaluation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pricing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td></td>
</tr>
<tr>
<td>Risk premium</td>
<td>Risk taking</td>
<td>Funding</td>
</tr>
<tr>
<td>Risk free cost of funds</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Masini, 2004
Guarantee Funds: The Typology

- individual models/retail
- portfolio models
- wholesale/intermediation models: the fund guarantees the loans that a bank grants to a micro-finance intermediary
- constitution, in a bank, of a deposit account covering certain types of loans
- mutual agreements among producers
- public and private institutions, domestic or international
Guarantee Funds:
The Relevant Theory

- Banks go through a **learning process** in their relationships with new customers
- Guarantee funds can be considered as “**knowledge facilitators**”.
Guarantee Funds: The Relevant Theory

The effects of guarantee funds may be:

• an increase in the offer of bank loans to the target sector (additionality);

• better conditions on the loans

• a reduction in collateral requirements
Guarantee Funds: The Relevant Theory

Main criticisms:

- **transaction costs** which can be increased rather than reduced;
- the guarantee fund is a form of **subsidy** which distorts the market;
- **moral hazard** (on the bank and on the borrower);
- a **duplication of functions** between the fund and the bank
- a problem of **sustainability** of the funds
**Lessons From The Practice**

**BEST PRACTICES**

<table>
<thead>
<tr>
<th>TARGETS</th>
<th>better performances are found if among beneficiaries, start-ups and young firms are a minority.</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIMITS OF INTERVENTION</td>
<td>The fund coverage should represent 60% to 80% of the loan. The percentage must also be applied in a flexible way on different customers in order to consider the different characteristics of any single customer.</td>
</tr>
<tr>
<td>CONDITIONS FOR THE INTERVENTION</td>
<td>They should be precisely clarified between the bank and the guarantee organisation.</td>
</tr>
<tr>
<td>SUSTAINABILITY</td>
<td>Opening fee of 1-2%; annual premium of 0.5 – 4% on the guaranteed amount (on average it amounts to 2% and it usually represents 20-30% of the real interest rate).</td>
</tr>
<tr>
<td>CLAIM RATES</td>
<td>A claim rate of 2-3% is advised. If the ratio is 0, the fund is probably too conservative; if it is more than 5% a remedial action must be taken.</td>
</tr>
<tr>
<td>LEVERAGE</td>
<td>Leverage of 2 or 3 to 1; 5/1 after five years; 7-8/1 after 10 years.</td>
</tr>
<tr>
<td>PARTICIPANT BANKS</td>
<td>The participation of a high number of competitive banks should be encouraged.</td>
</tr>
<tr>
<td>ADDITIONALITY</td>
<td>A minimum additionality of 60%, and preferably from 80 to 90%, should be recorded.</td>
</tr>
<tr>
<td>DONORS’ ASSISTANCE</td>
<td>Only if the perspectives of additionality are higher than 60%. International contributions, however, should not crowd-out internal resources</td>
</tr>
</tbody>
</table>

Adapted from Doran and Levitsky, 1997
Lessons Learnt And Recommendations

• Role of the guarantee fund is not to complement the collateral but, rather, to encourage banks to get to know a market segment.

• If the information gap is the major problem, once banks get to know this sector, they should not need the guarantee system any longer.

• This is the real additionality effect that should be expected from a guarantee fund.

• Banks should be willing to build long-lasting relationships with new market segments, as a part of their strategy.

• If this expansion is imposed (social objectives pursued by the Government), more risk of moral hazard.
Lessons Learnt and Recommendations

*the percent coverage* should vary according to the responsibility taken by the bank and should not be uniform on all customers.

The fund must offer a *real advantage* to the beneficiary but risk of moral hazard if the beneficiary is aware of the guarantee.
Some Further Analysis

Functions of guarantee fund:

- Support the bank in risk evaluation (perform credit analysis)
- Insurer (does not perform credit analysis)
- Advice, rating, training
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Thanks for the attention!!

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