Credit Risk, Credit Quality Drift, and the Business Cycle

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Overview

- Credit risk
- Credit loss
- Exposure
- Expected loss
- Probability of a credit event
Credit risk

- Credit risk: the possibility that a financial asset may lose value because of the failure of another institution to meet its financial obligations.

- Credit loss: the resulting loss of value.
Characteristics of credit loss

- Credit loss on an asset is a \textit{random} quantity.

- Loss $= 0$ with high probability.

- If credit event occurs,

  $\text{loss} = \text{exposure} \times (1 - \text{recovery fraction})$
Exposure

- For a loan, exposure is known.

- For an option, exposure may vary considerably over a short period of time.

- For other derivatives, exposure may also vary, and may be zero.
Expected loss

Expected loss = Expected loss when credit event occurs \times Probability of credit event

*Note:* “Expected loss” doesn’t adequately characterize credit risk! Worst case may be *much* worse.

Complete characterization consists of

- Probability of credit event, and
- Probability distribution of loss when credit event happens.
Expected loss when credit event occurs

Recall:

\[
\text{loss} = \text{exposure} \times (1 - \text{recovery fraction})
\]

Recovery is difficult to predict.

In the short term, exposure may vary with market conditions.

In the long term, \textit{uncontrolled} exposure will vary even more. Mechanisms for managing exposure include:

- recouponing;
- collateralization.
Probability of credit event (default)

Information about the probability of default is contained in:

- credit ratings, e.g. from Standard & Poor’s or Moody’s;

- credit spreads in bond yields.

Credit ratings are associated with historical default frequencies (e.g. a BB issuer has around a 1% chance of defaulting within 1 year). But default risk varies with market conditions, whereas historical information is averaged.

Credit spreads reflect current market conditions, but are observable only for issuers whose debt has a liquid market.
Current research

- How does credit risk depend on market conditions?

- More specifically, can we predict default probabilities given market conditions?