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 *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, *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 re¤ect 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?