

# ECN 1B—Leverage Ratio and Insolvency

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## 1 Bank Capital

We’ve already talked about how banks accept deposits. But banks also issue equity (issue stocks) and debt (issue bonds). The resources banks obtain from issuing stocks are called **bank capital**. In other words, bank capital is the resources a bank’s owners have put into the institution. *Equity financing* is the process of raising capital through the sale of shares in an enterprise.

Assets		Liabilities and Owners’ Equity	
Reserves	\$200	Deposits	\$800
Loans	700	Debt	150
Securities	100	Capital (owners’ equity)	50

In this example, the bank has raised \$50 by issuing stock—so the bank has \$50 in bank capital. The bank also has \$800 in deposits and has issued \$150 worth of bonds (the debt). These are all *liabilities* of the bank.<sup>1</sup> So the bank has total liabilities of \$1,000.

Of the \$1,000, they’ll keep \$200 of it as reserves, they’ll loan out \$700, and they’ll buy stocks in other companies (the securities) with the remaining \$100. So the bank has total assets of \$1,000.<sup>2</sup>

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<sup>1</sup>Rule of thumb: liabilities are *sources of funds*.

<sup>2</sup>Similarly, think of assets as *usages of funds*. Assets will equal liabilities unless something has gone terribly wrong.

## 2 Leverage

**Leverage** is the use of borrowed money to supplement existing funds for purposes of investment. The **leverage ratio** is given by the equation

$$\text{leverage ratio} = \frac{\text{bank's total assets}}{\text{bank's capital}}.$$

In this case, the company has \$1,000 in assets and \$50 in capital, so the leverage ratio is

$$\frac{\$1,000}{\$50} = 20.$$

This means that for every dollar that a bank owner (i.e. stockholder) has contributed, the bank has \$20 worth of assets.

### 2.1 Increase in Value of Assets

Now suppose that the bank's assets rise in value by 5%; perhaps some of the \$100 in stock they purchased did well. The assets are now worth \$1,050, an increase in \$50. *The amount of money owed to depositors and bondholders has not changed*—it is still \$950. But remember that assets equal liabilities. Since the deposit liabilities didn't change and the debt liabilities didn't change, it must be the case that the value of the bank's capital has risen from \$50 to \$100. So now the leverage ratio is

$$\frac{\$1,050}{50} = 21.$$

To recap: the 5% increase in the value of the assets has increased the owners equity by 100%, i.e. from \$50 to \$100.

## 2.2 Decrease in Value of Assets

Now suppose that the bank's assets fall in value by 5%; perhaps some of the \$100 in stock they purchased did poorly. The assets are now worth \$950, a decrease of \$50. *The amount of money owed to depositors and bondholders has not changed*—it is still \$950. But remember that assets equal liabilities. Since the deposit liabilities didn't change and the debt liabilities didn't change, it must be the case that the value of the bank's capital has fallen from \$50 to \$0.

To recap: the 5% decrease in the value of the assets has decreased the owner's equity by 100% from \$50 to \$0.

## 2.3 Insolvency

Now suppose there's an even bigger decrease in the value of assets—say, 10%. The assets are now worth \$900, a decrease of \$100. *The amount of money owed to depositors and bondholders has not changed*—it is still \$950. But remember that assets equal liabilities. Since the deposit liabilities didn't change and the debt liabilities didn't change, it must be the case that the value of the bank's capital has fallen from \$50 to  $-\$50$ .

But bank capital cannot be negative—it can only fall to zero. Therefore *the bank's assets are less than their liabilities*. In this case, we say that the bank is **insolvent**. In other words, they are unable to pay their debt holders the \$950 they're owed because their assets are only worth \$900.

To avoid insolvency, bank regulators require bank's to hold a certain amount of capital, called a **capital requirement**, so that they never become insolvent, and therefore have enough assets to pay off their depositors if they need to.