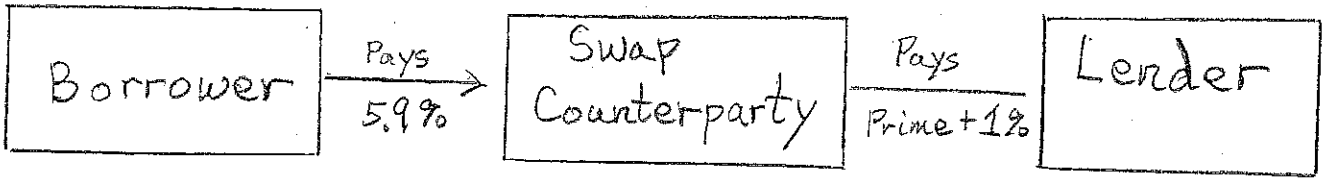
# Chapter D1 — Derivatives

**Derivative** — A financial instrument (agreement) that has

**Example foreward**: Make an agreement to purchase 100 shares of XYZ stock at $40 per share one year from today. This agreement may not include a premium (transaction fee paid to the seller). It obligates both buyer and seller.

**Example option**: Pay $200 for the option to purchase 100 shares of XYZ stock one year from today at $40 per share. The option buyer has the ability to purchase the stock at a preset price, but not the obligation to purchase it.

Example swap: A company has a $10M loan on which it pays interest of 1% above prime (floating rate). It is worried about its exposure to interest rate increases. So it forms an agreement with a swap counterparty for a 5.9% fixed interest rate. The swap counterparty




may charge a premium to enter this agreement.

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Bet Analogue:

Depending on the unknown future value of some quantity one of the two parties in this agreement makes money in the transaction and the other loses this potential amount.

## Why are derivatives used?

A.

B. Speculation

C. Reduced transaction costs or freedom from regulatory restriction.

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## Insurance Analogue

Example foreward: This agreement locks in a good purchase price for next year. It prevents excessive expense if the price of this stock should dramatically increase.

Example option: This agreement is very much like an insurance policy that is designed to avoid excessive

expense if the price of the stock rises dramatically. If the price of this stock fall below $40, then the buyer only loses the premium and can purchase the stock at the going, lower price.

Example swap: Here the buyer is seeking protection against an increase in the prime lending rate and is willing to incur some potential loss in order to be certain to avoid the damage that a large increase in the prime rate might bring.

Insurance - For a home owners insurance policy a family will pay a premium to insure their home against excessive damage. If the damage in a given year exceeds

their deductable amount, the insurance company must cover the excess. This completely analogous to the purchase of an option. The value of this option to the purchaser is dependent on the unknown future damage to their home incurred during the year.

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A pool of home insurance clients of an insurance company essentially agree to _____ of home damage. The unlucky get reimbursed for damage, while the lucky forfeit their premium to avoid the possibility of substatial losses.

Insurance companies also _____ _____ by buying insurance against very high levels of claims from a reinsurance company.

Reinsurance companies share their risk by offering catastrophy bonds to investors who are given high interest rates if they buy a bond for which they will get nothing returned if a specific catastrophy (like a devastating hurricane in Florida) were to occur.

A <u>diversifiable risk</u> is one that can be (eg homeowners' insurance).

A nondiversifiable risk is one that is so large that it can not be broken into small pieces (e.g. results of a devastating hurricane).

Financial markets enable diversifiable risks to be shared widely and for nondiversifiable risks to be borne by those willing to hold it.

## Buying an Asset

There is often a commission (transaction fee) that must be paid when buying an asset. It is typically couched as a percent of the price.

The price at which you can buy an asset is called its _____ (offer price).

The price at which you can sell an asset is called its _____

The difference between these two is:

bid-ask spread

= (  ) − (  )

# Short-Selling

When buying an asset, you pay the ask price and you own it. In a short-sale, you borrow an asset and

Example: You borrow 1000 shares of XYZ stock and sell it at its current bid price of $39 per share. In 90 days you must return the shares. If the ask price falls to $37 over that 90 day period, you will be able to return the shares and make a $2000 = $2(1000) profit.

You might enter into a short-sale because of

(a) Speculation - You believe the value of this asset is going to decrease.

(b) Borrow Money - You get immediate cash and don't have to pay it back until later. The interest that you pay depends on the change in the asset price until it is returned.

In a sense, a short-sale is the opposite of buying. In buying, you spend money, and in a short-sale you borrow money.

Of course, the lender will seek to ensure that the asset is returned and that the lender makes money on the agreement.

The lender may require a _____ rate be paid for use of the asset. If the asset is stock, this will include any stock dividend payments over the loan period and potentially more.

The lender will likely also require _____ for this loan. If your purpose is speculation, then the collateral may be the cash equivalent of the current ask price plus more (called a haircut) to ensure repayment if the asset increases in value. The lender can then earn interest on this cash over the loan period, a fraction of which may be returned to you.