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of Economics
& Management
Universidade de Lisboa

Financial Markets and Investments

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PART I

FINANCIAL MARKET STRUCTURE AND INSTRUMENTS



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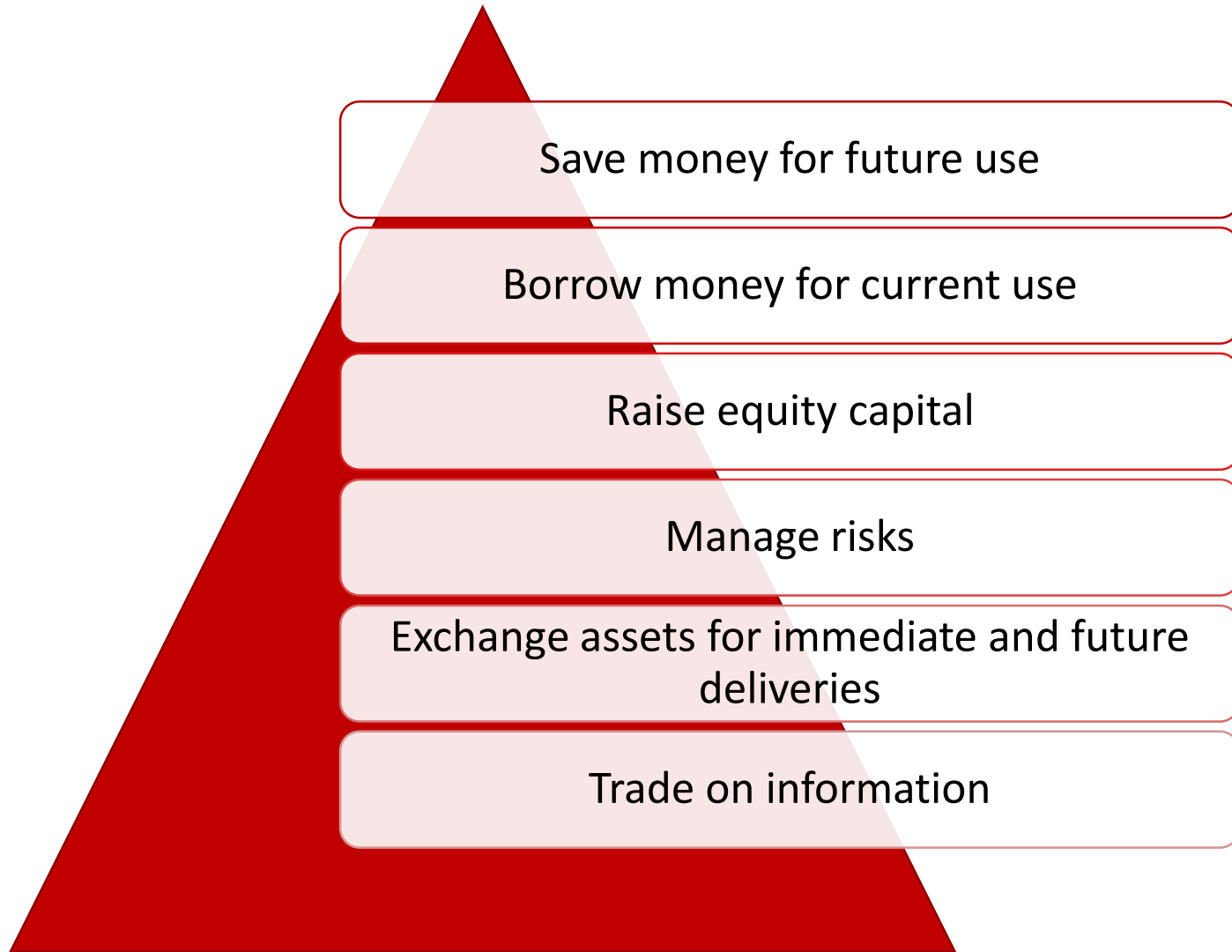
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MARKET ORGANIZATION AND STRUCTURE

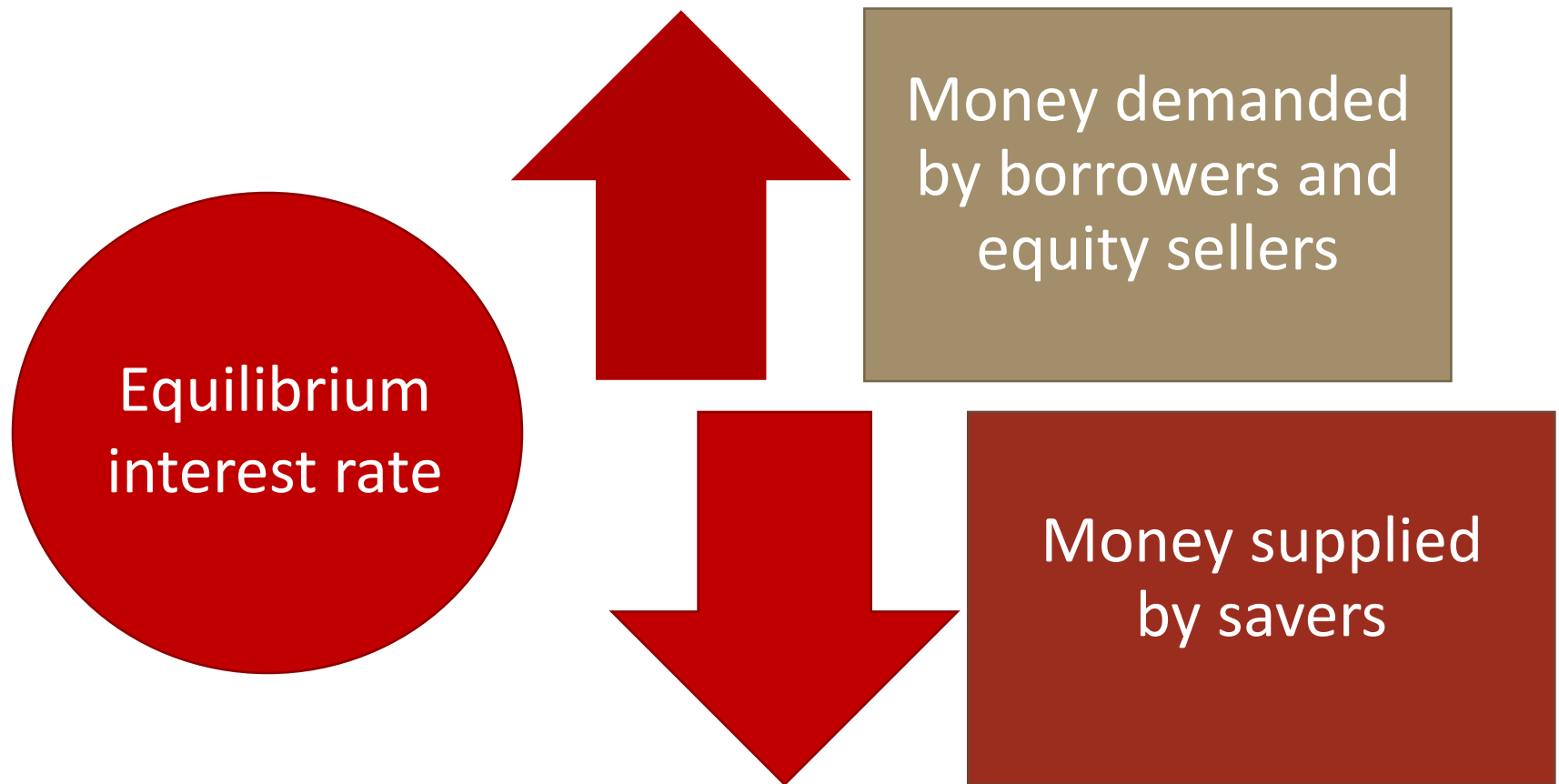
1.1

FUNCTIONS OF THE FINANCIAL SYSTEM

WHAT ARE THE MAIN FUNCTIONS OF THE FINANCIAL SYSTEM?



HOW ARE RATES OF RETURN DETERMINED?



1.2

MARKET CLASSIFICATION

HOW ARE MARKETS CLASSIFIED?

Category 1

- Spot markets
- Forward and futures markets
- Options markets

Category 2

- Primary markets
- Secondary markets

Category 3

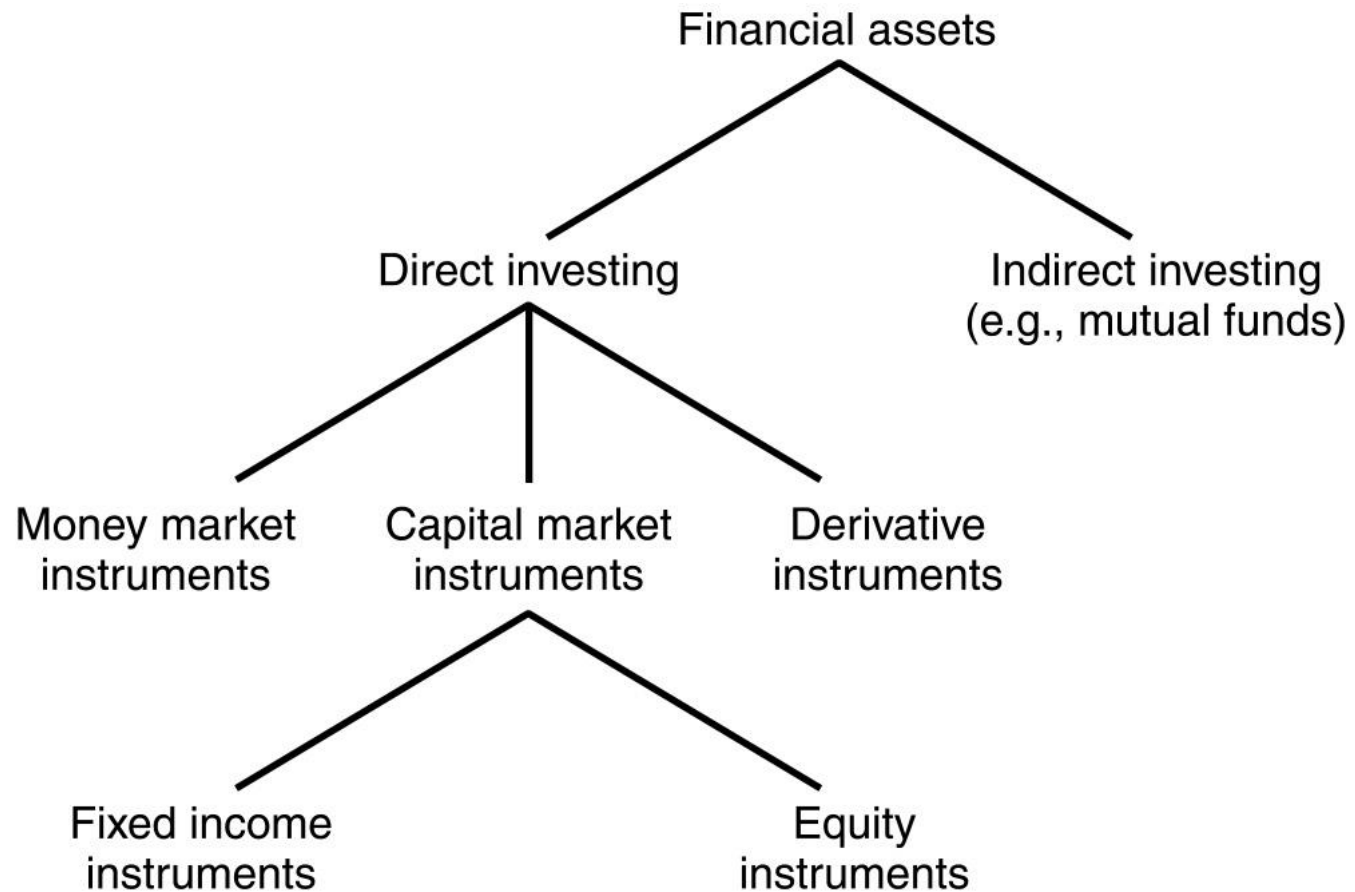
- Money markets
- Capital markets

Category 4

- Traditional investment markets
- Alternative investment markets

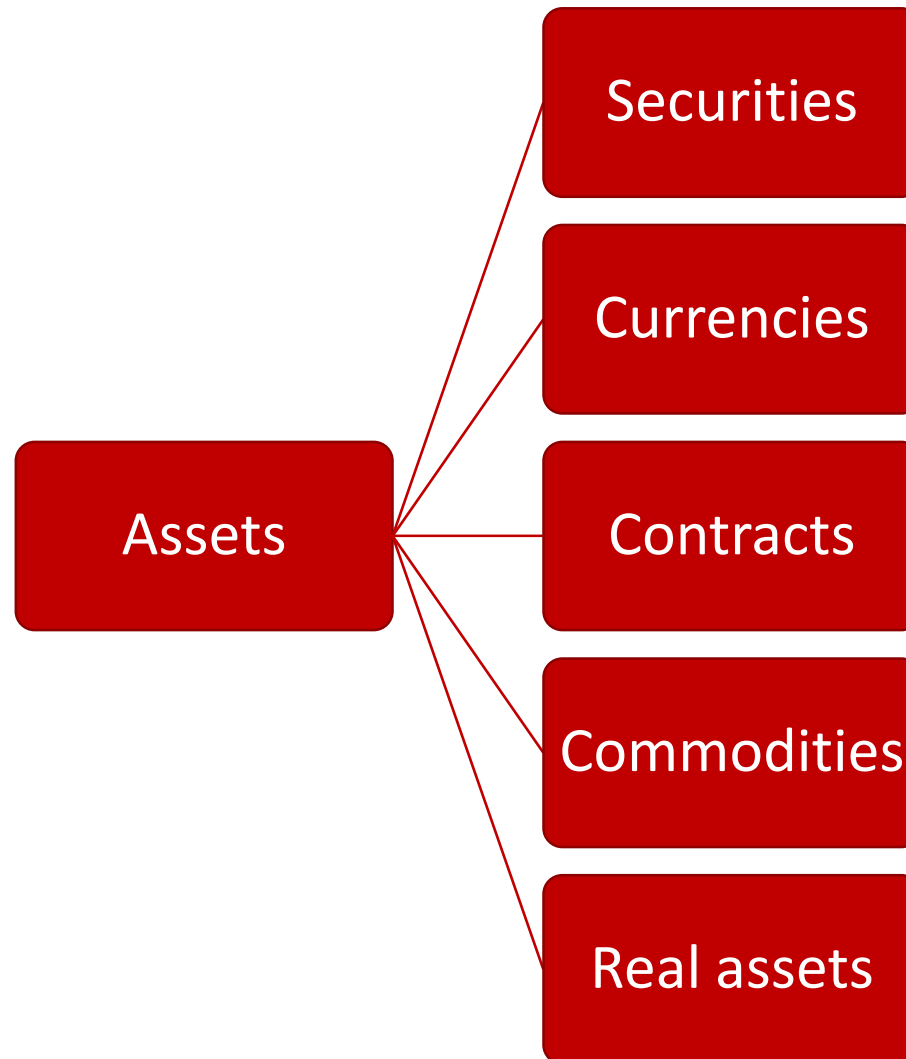
1.3

FINANCIAL INSTRUMENTS

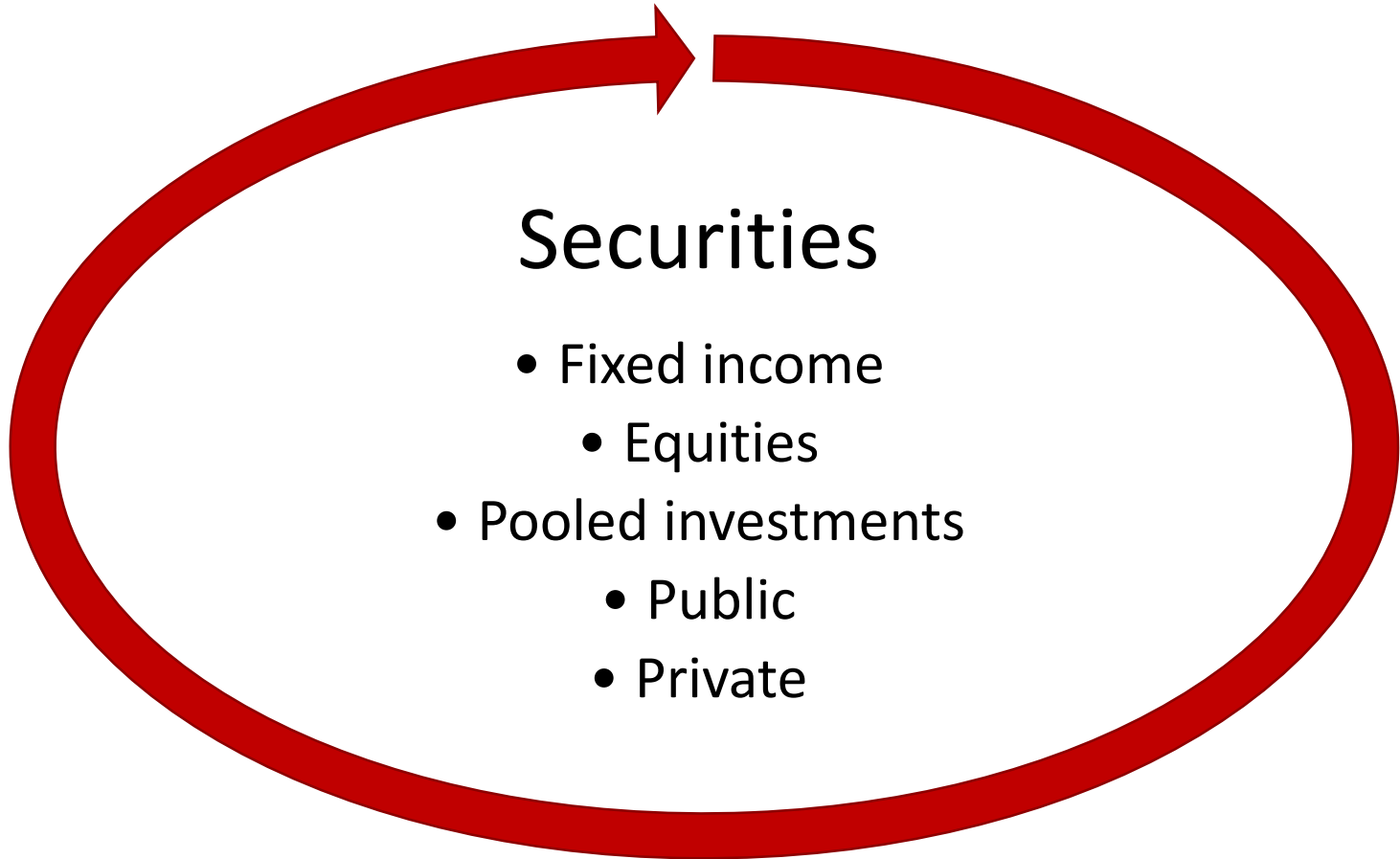


- ✓ For the investors, they represent alternative forms of investment.

HOW ARE ASSETS CLASSIFIED?



SECURITIES



Examples of Securities

- Stocks
- Bonds
- Fund units
- Securitized credit units
- Warrants
- Detached Rights
- Structured Certificates
- Mandatory Convertibles
- Reverse Convertibles
- Credit Linked Notes

1.2.1 EQUITY SECURITIES

STOCKS (SHARES)

Stocks are financial securities that represent a partial ownership position (called equity) in a corporation.

Rights

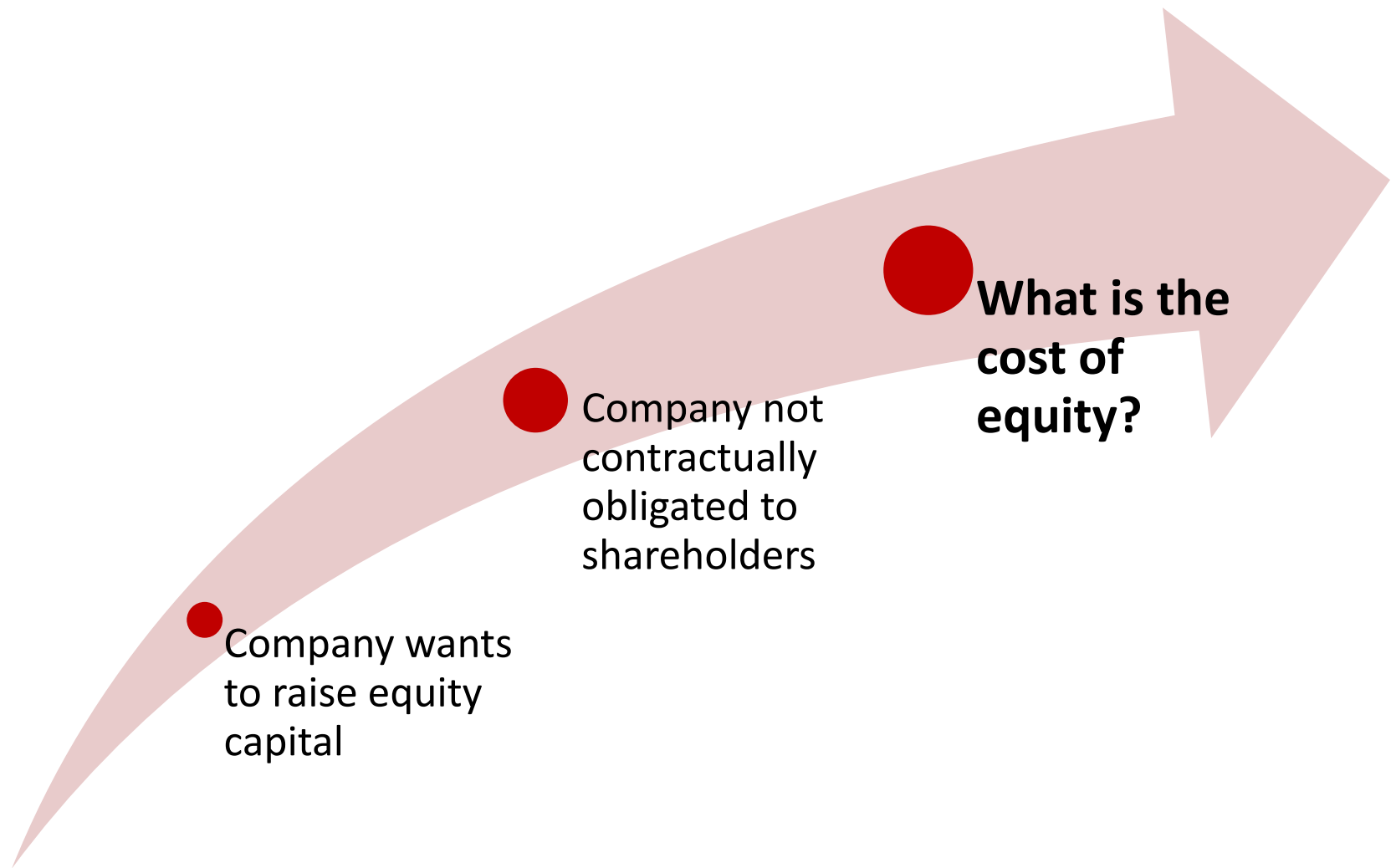
Stocks give investors, in particular, the right:

- To be present at general shareholders' meetings and to vote;
- To be informed about the business of the company, under certain conditions;
- To participate in profits and receive dividends in proportion to the shares held;
- If the company stops to exist, to receive a liquidation share value for the its assets after all creditors are paid, (if it exists).
- In the company's statutes there may also be other rights and obligations of investors, as well as limitations to the exercise of the right to vote.

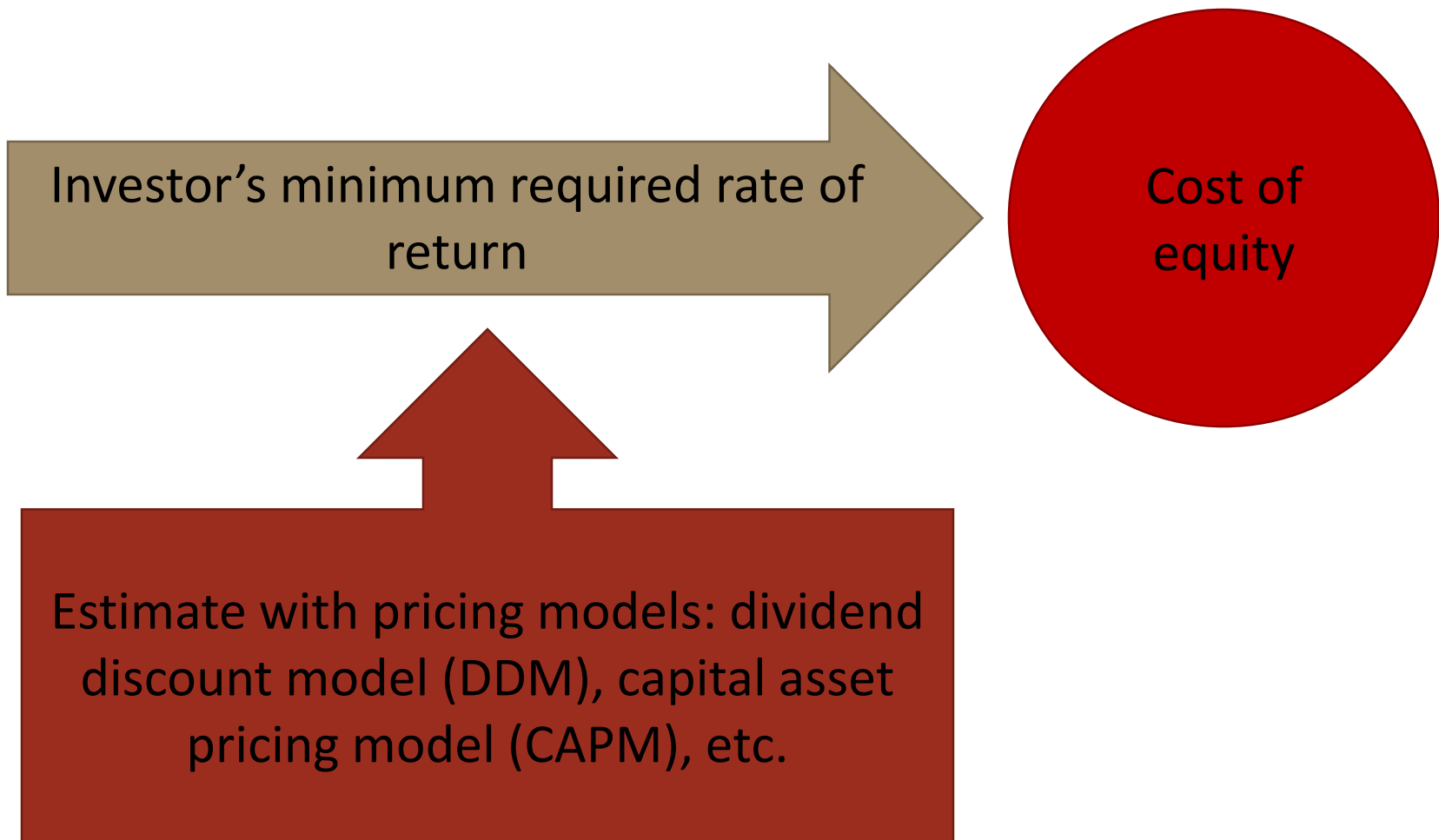
Valuing Stocks

- Valuing a stock is to determine its “fair price”, which should reflect the value of the company.
- The price of shares in a stock market tends to approach the actual value of the company, to the extent that the price incorporates all existing information.
- As any financial asset one should think in terms of **discounting future cash-flows**. In this respect, valuing stocks is a complex task for two reasons:
 - ❖ It is hard to predict the main sources of future returns of stocks traded in financial markets (dividends and capital gain/loses)
 - ❖ The risk differ from stock to stock and depends on a large amount of factors (e.g. interest rate evolution, how other companies perform in the market, etc.), so it is hard to figure out discount factors.

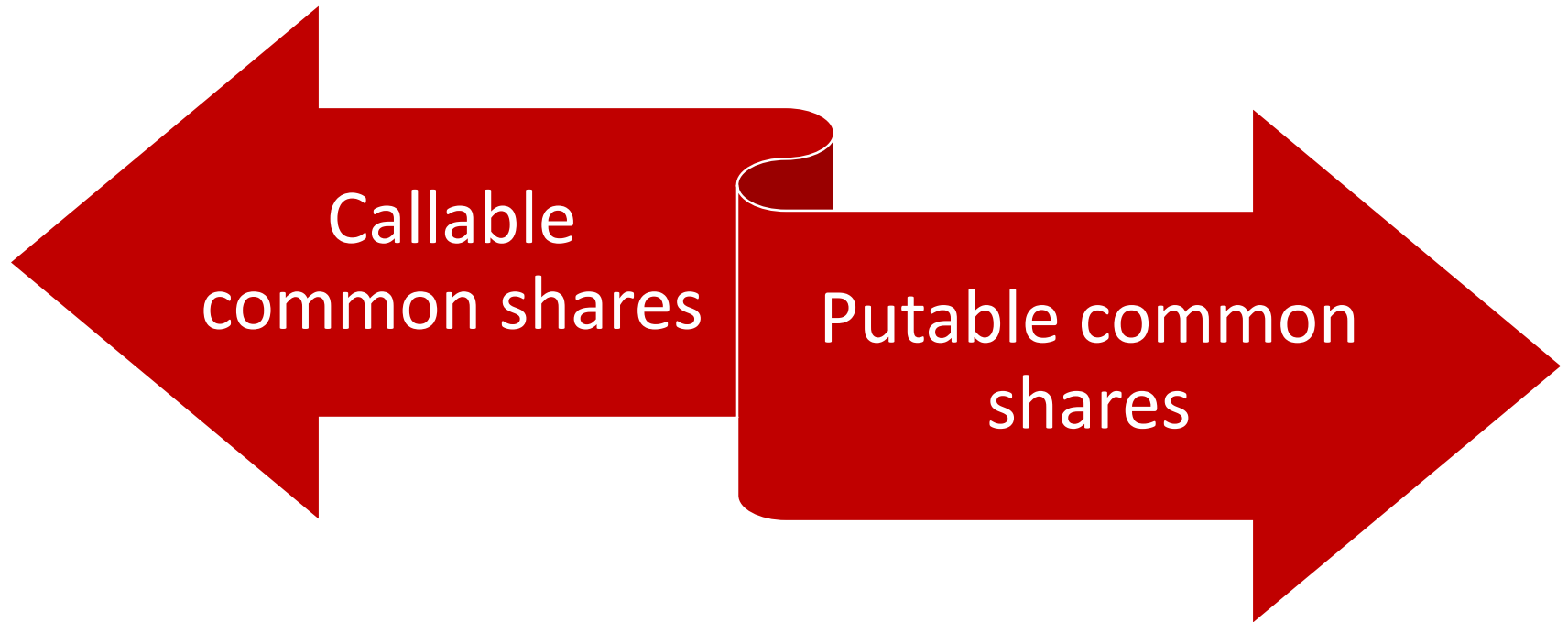
THE COST OF EQUITY



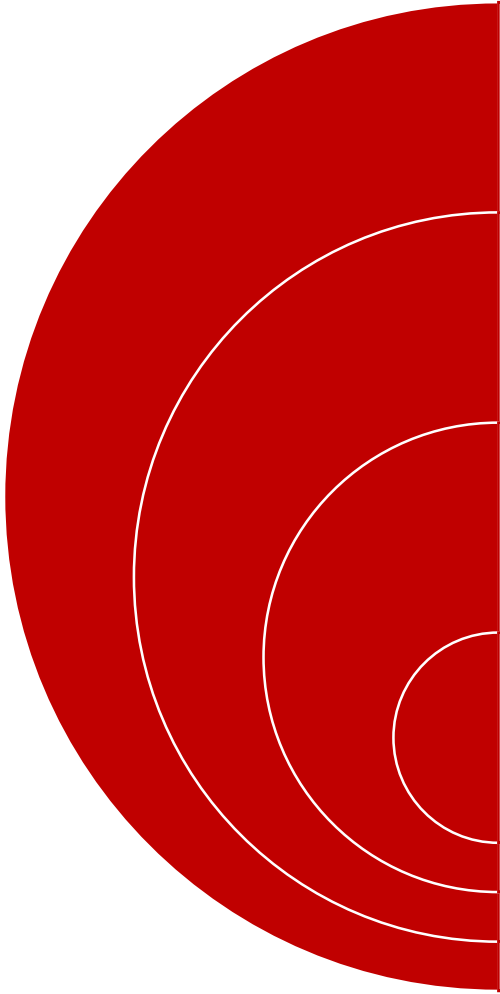
INVESTOR'S REQUIRED RATE OF RETURN



EMBEDDED OPTIONS



PREFERENCE SHARES (PREFERRED STOCK)



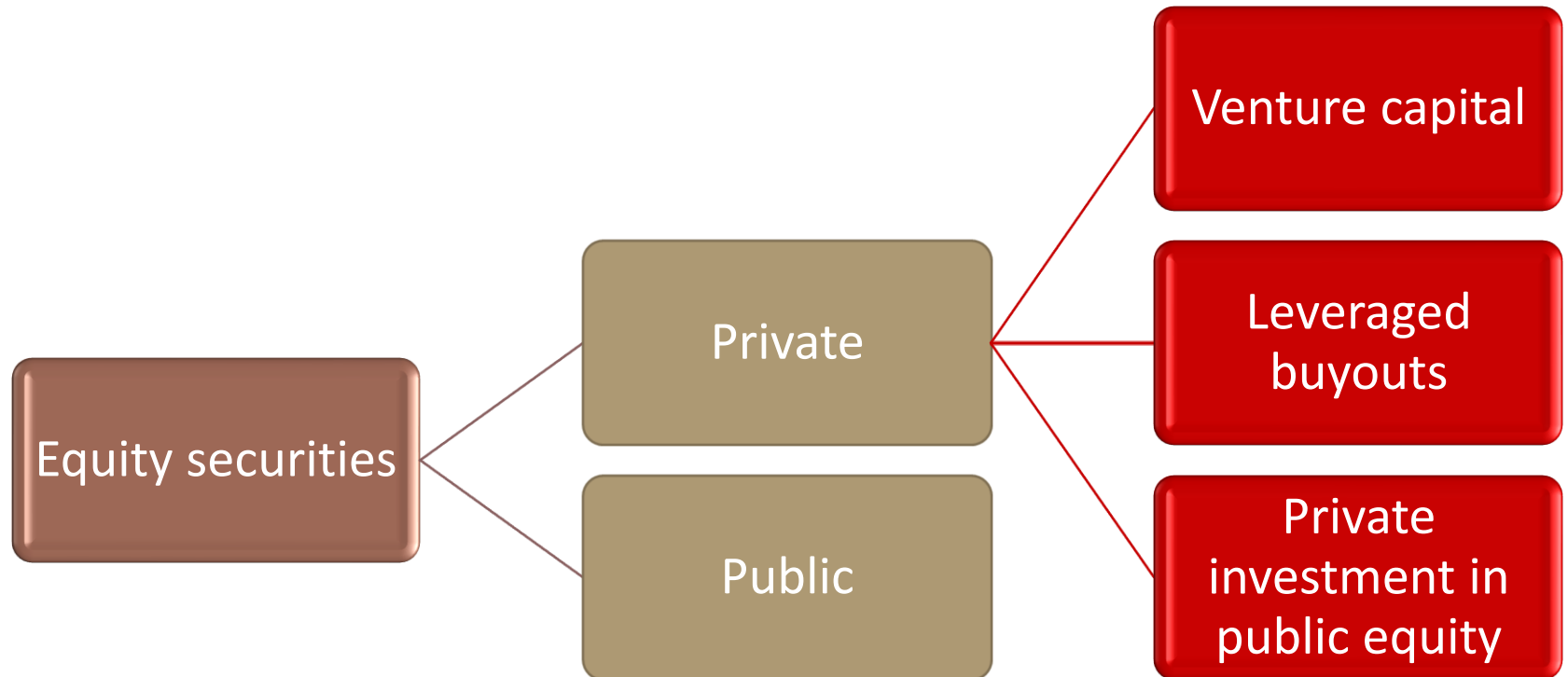
Rank above common stock for dividend payments and liquidation claims

Shareholders do not share in the firm's operating performance

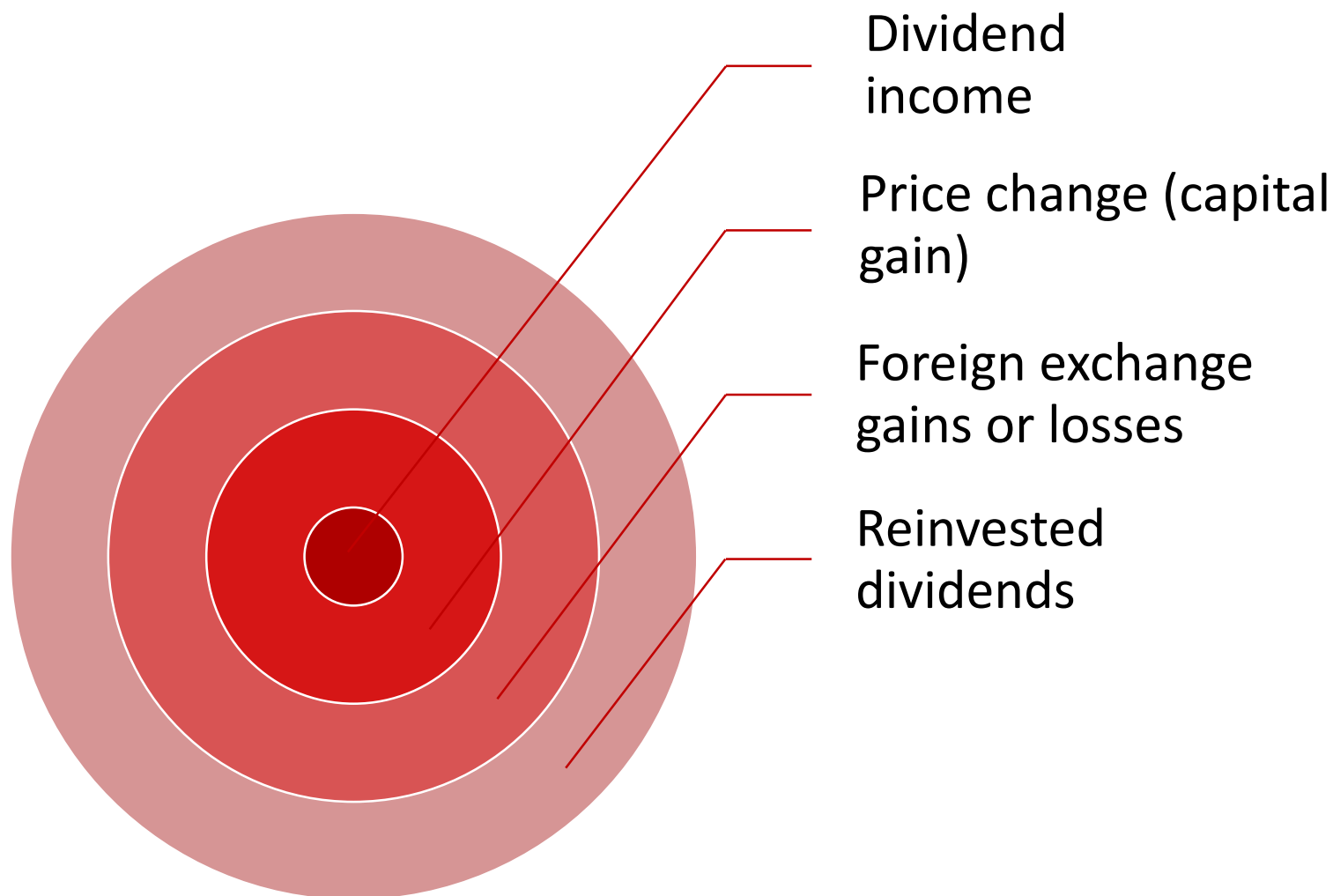
Generally do not have voting rights

Dividends are fixed and typically higher than common dividends

PRIVATE EQUITY SECURITIES



RETURN CHARACTERISTICS OF EQUITY SECURITIES



FUND UNITS

- ✓ **Fund units** are securities that represent parcels of a collective investment fund.
- ✓ The capital of the fund results from savings of various investors. This capital is then invested in a variety of assets.
- ✓ The net value of the underlying assets (allowing for any charges and any accumulated income) is reflected in the fund value and, consequently, on the price of the units.
- ✓ The maturity of fund units is the same as the maturity of the fund.

OBS: There is a big variety of fund types (we come back to this issue later)

WARRANTS

- ✓ **Warrants**, are securities, with a limited lifespan, that concede investors a right over other assets (called the underlying assets).
- ✓ The underlying assets may be other securities (stocks, bonds, etc.), but also, financial indices, interest rates or exchange rates.
- ✓ The investor has always the possibility of not exercising the rights by letting the warrant expire.
- ✓ The **issuing entity** of a warrants takes on the position of guaranteeing those rights, if and when exercised.
- ✓ Only rights (no obligations) change hands when investors resell their positions to other investors.

Rights

The most common rights warrants give investors are:

- ✓ The right to **buy** the underlying asset (*call* warrants)
- ✓ The right to **subscribe** the underlying asset
- ✓ The right to **sell** the underlying asset (*put* warrants)
- ✓ The right to **receive a difference between two prices** (a price computed based upon the underlying at exercise date and the exercise price)

Types of Warrants

Warrants may differ according to the timeframe investors are allowed to exercise their rights:

- ✓ Some warrants can only be exercised at the maturity (**European type warrants**)
- ✓ Other warrants can be exercised at any moment since the moment investors buy it until maturity (**American type warrants**)
- ✓ But other exercise schemes also exist as exercise allowed a several pre-established dates (**Bermudan type warrants**)
- ✓ ...

DETACHED RIGHTS

Some securities (stocks, bonds, etc.) include rights that may be detached and traded separately.

These **Rights** that may be **detached** and become tradable by themselves are also securities per se.

- ✓ Their main characteristic is their typical short lifespan.

Examples from stocks:

- ❖ Subscription rights
- ❖ Capitalization rights

Examples from Bonds:

- ❖ STRIPS of Bond

Subscription Rights

✓ When companies decide to increase their shared capital by **issuing new shares**, investors who already hold shares will have, as a general rule, the right of preference in the purchase of the new shares to be issued.

✓ It is common to detach these subscription rights, from the previously existing shares.

Subscription rights are then traded separately from the shares themselves, for a short period time.

Investors who buy these rights can subscribe the new shares under the same conditions of previous shareholders.

✓ After the period during which rights can be traded or exercised, the subscription rights expire and stop existing.

Capitalization Rights

- ✓ Companies may assign a portion of each year profits to a reserve account.
- ✓ This reserve may later then be used for the purposes of increasing the subscribed capital by the **capitalization of reserves**, issuing new shares.
- ✓ Existing shareholders have the right to a given ratio of the new shares for free.
- ✓ These capitalization rights may sometimes be tradable separately.

1.2.2 DEBT INSTRUMENTS

BONDS

Bonds are securities limited time frame, issued by companies or other entities, representing a part of loan investors concede the issuer.

- To hold bonds , thus, means that investors are creditors of the issuer.
- At the end of the bond's lifespan (called maturity), the investor has the right to receive a redemption value based upon the nominal value, in the meanwhile she receives periodic interest (called coupons).

Types of Bonds

Bonds differ from one another:

- ❖ In the length and nominal value of the loan
- ❖ In the way redemption value is computed (in most cases it is equal do the nominal value, but there is a huge variety of alternatives)
- ❖ In the way coupons are defined (periodicity, type of interest – variable or fixed, conventions, etc.)
- ❖ In more exotic features that may be embedded. (e.g. convertible bonds, etc)

Credits Risk

The investor should be aware that investment in bonds implies taking in credit risk, i.e., there is the possibility that the investor does not receive the redemption value and/or coupons, if the issuer face financial difficulties.

Rights

Bond investors' have the following rights:

- ❖ To receive the periodic coupons at the pre-established dates.
- ❖ To receive the redemption value at maturity;
- ❖ To be aware of the decisions of the shareholders and participate in general meetings through the appointment of a common representative of bondholders;
- ❖ To be informed about the progress of the business via the common representative of bondholders.
- ❖ To any other non-standard rights that may be embedded.

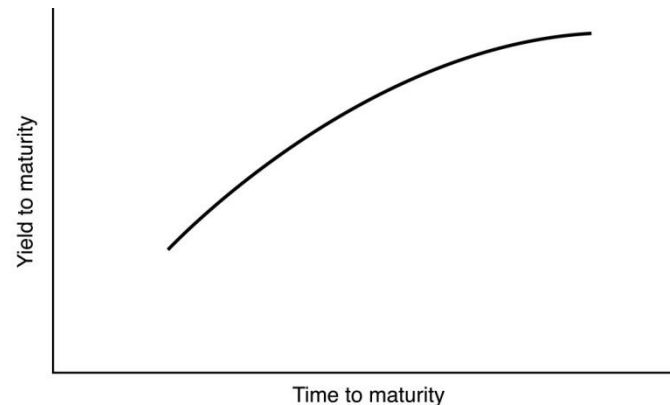
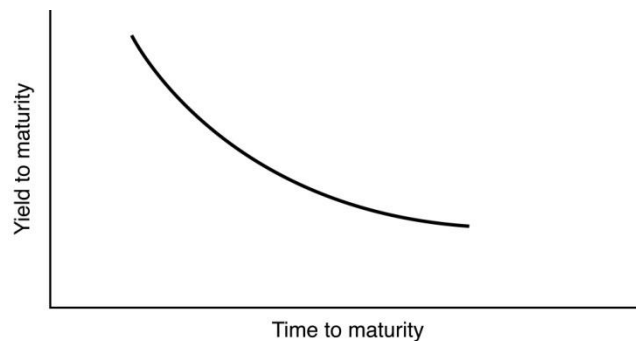
Valuation of Bonds

To find out the fair value of a bond one should properly discount its future cash-flows (both periodic interest and redemption value). This value usually does not coincide with its nominal value.

The discount factor should be based upon:

- ✓ the market interest rates, 

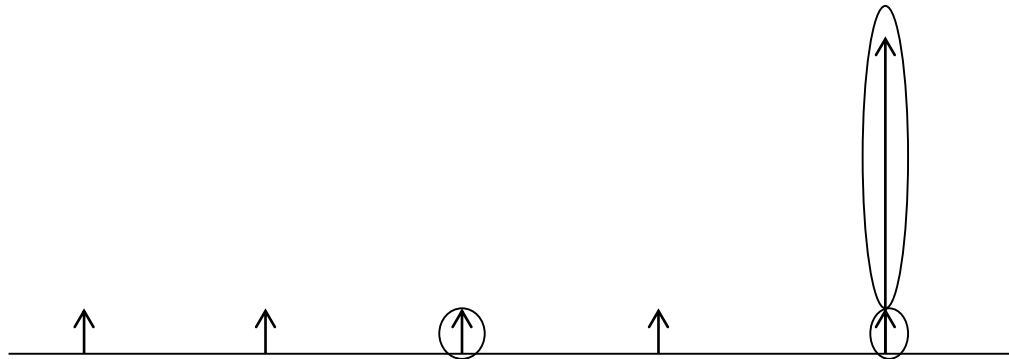
Examples of interest rate term structures



- ✓ but also the credit spread(s) of each issuer (to take into account credit risk)

STRIPS of Bonds

- ✓ STRIP – Separate Trading of Registered Interest and Principal
- ✓ Both the coupon and principal amounts of (treasury) Bonds may be “stripped” (i.e. considered as independent assets with a single payment).
- ✓ Strips can, thus, be understood as ZCB and be independently traded
 - ❖ C-Strips
 - ❖ P-strips



SECURITIZED CREDIT UNITS

- ✓ Similarly to fund units, **Securitized Credit Units**, are the parcels of assets of funds. The capital of these specific funds is all invested in buying credits from financial institutions, which is then structured and sold to investors.
- ✓ There may exist various classes of units (typically due to different priority payment schemes).
- ✓ Investors receive the cash-flows resulting from the payments associated with the credits they bought.
- ✓ The main risk of these securities is **credit risk**. This credit risk is **harder to evaluate** than companies' credit risk, both because the underlying assets are credits conceded to various persons by the originator(s) financial institution(s), but also due to the structuring the fund performs on credits.

1.2.3 DERIVATIVES



Contracts

- Forward contracts
- Futures contracts
 - Swap contracts
- Option contracts
- Other contracts

HEDGING WITH FORWARD CONTRACTS

Farmer needs to sell wheat to the miller at a future date.

- Risk: the price of wheat decreases.
- The farmer is currently long wheat in the spot market (needs to sell it in the future).
- The farmer hedges the spot market position by selling wheat forward.

Miller needs to buy wheat from the farmer at a future date to sell to bakers.

- Risk: the price of wheat increases.
- The miller is currently short wheat in the spot market (needs to buy it in the future).
- The miller hedges the spot market position by buying wheat forward.

FUTURES VERSUS FORWARD CONTRACTS

Futures contracts

Standardized

Clearinghouse
guarantees performance

Strong secondary
markets

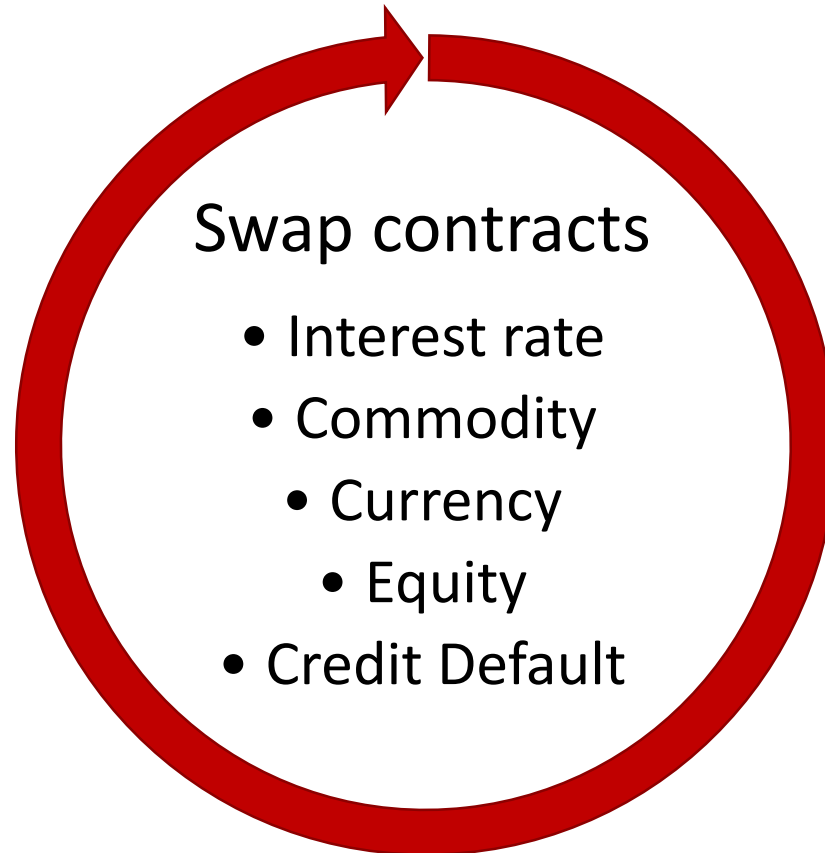
Forward contracts

Customized

Counterparty risk

Typically held to
maturity

SWAP CONTRACTS



OPTIONS

Put: Option to sell.
Exercised when
strike or exercise
price is above
market price.

Call: Option to
buy. Exercised
when strike or
exercise price is
below market
price.

Options

WHY SO MANY DIFFERENT FINANCIAL ASSETS?

Different risk – return profiles

- The **return** of a financial security is the rate computed based upon what the investment generates during an interval of time. It usually includes two parcels: price evolution (capital gains/losses) and the cash-flows it may generate (e.g. dividends in the case of stocks, coupons in the case of bonds, etc.).
- Expected/potential return should be distinguished from realized return. “Past returns are no guarantee for future returns”.
- The **risk** represents the uncertainty concerning future returns variability. This uncertainty may be connected, for instance, with unpredictable price movements.

METHODS FOR ESTIMATING RISK AND RETURN



Historical data

- Average rate of return
- Standard deviation



Probability distribution of possible returns

- Expected return
- Standard deviation



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1.4

TRADING IN FINANCIAL MARKETS

WHAT ARE THE MAJOR TYPES OF FINANCIAL INTERMEDIARIES?

Commercial, mortgage, and investment banks

Brokers and exchanges

Mutual funds and hedge funds

Credit unions

Dealers and arbitrageurs

Insurance companies

Credit card companies

Clearinghouses and depositories

Other finance corporations

EXCHANGES VERSUS ALTERNATE TRADING SYSTEMS (ATS)

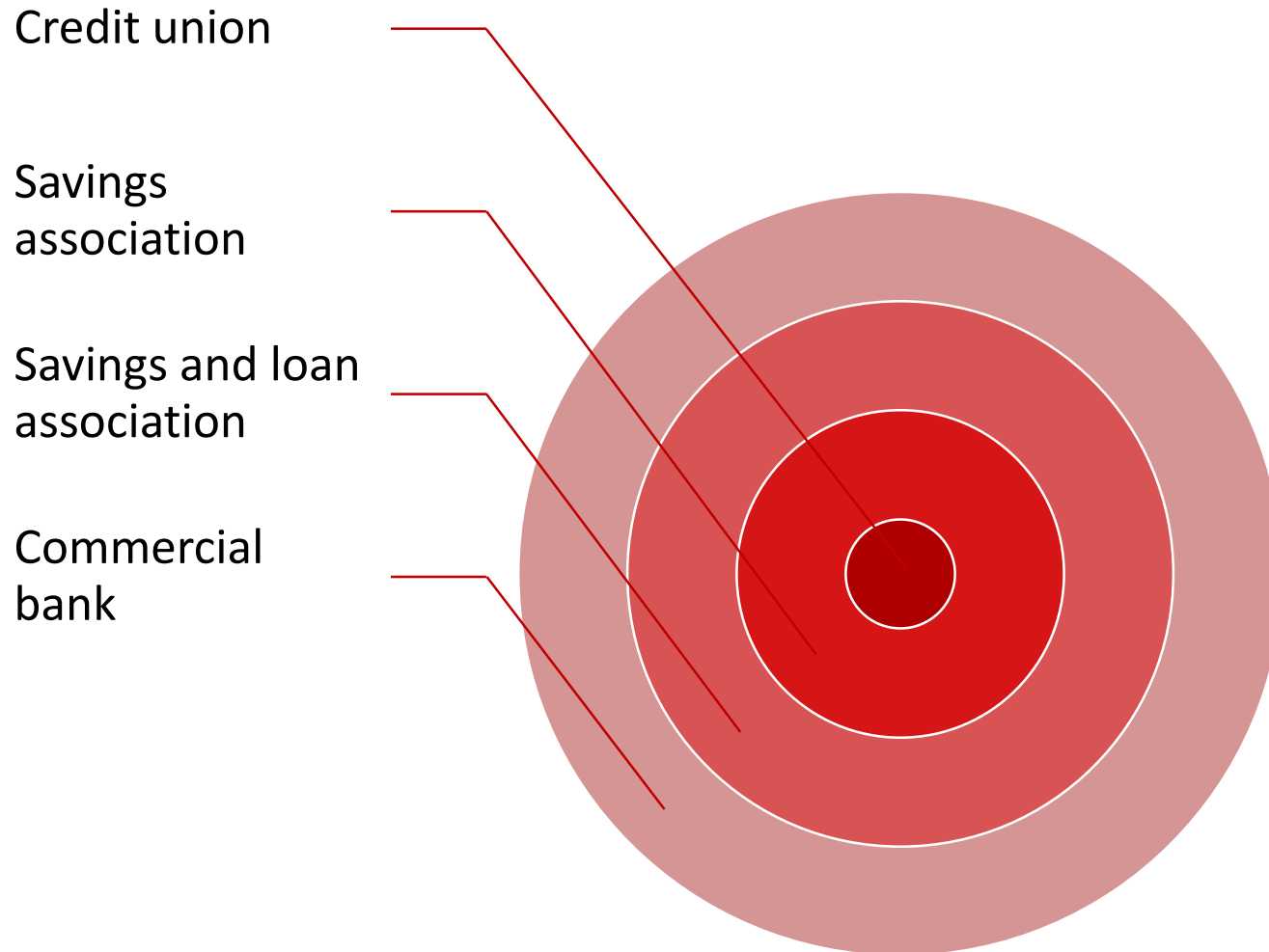
Exchanges

- Marketplace (physical location) for trading.
- Increasingly arrange trades submitted via electronic order matching systems.
- Regulatory authority derived from governments or through voluntary agreements.

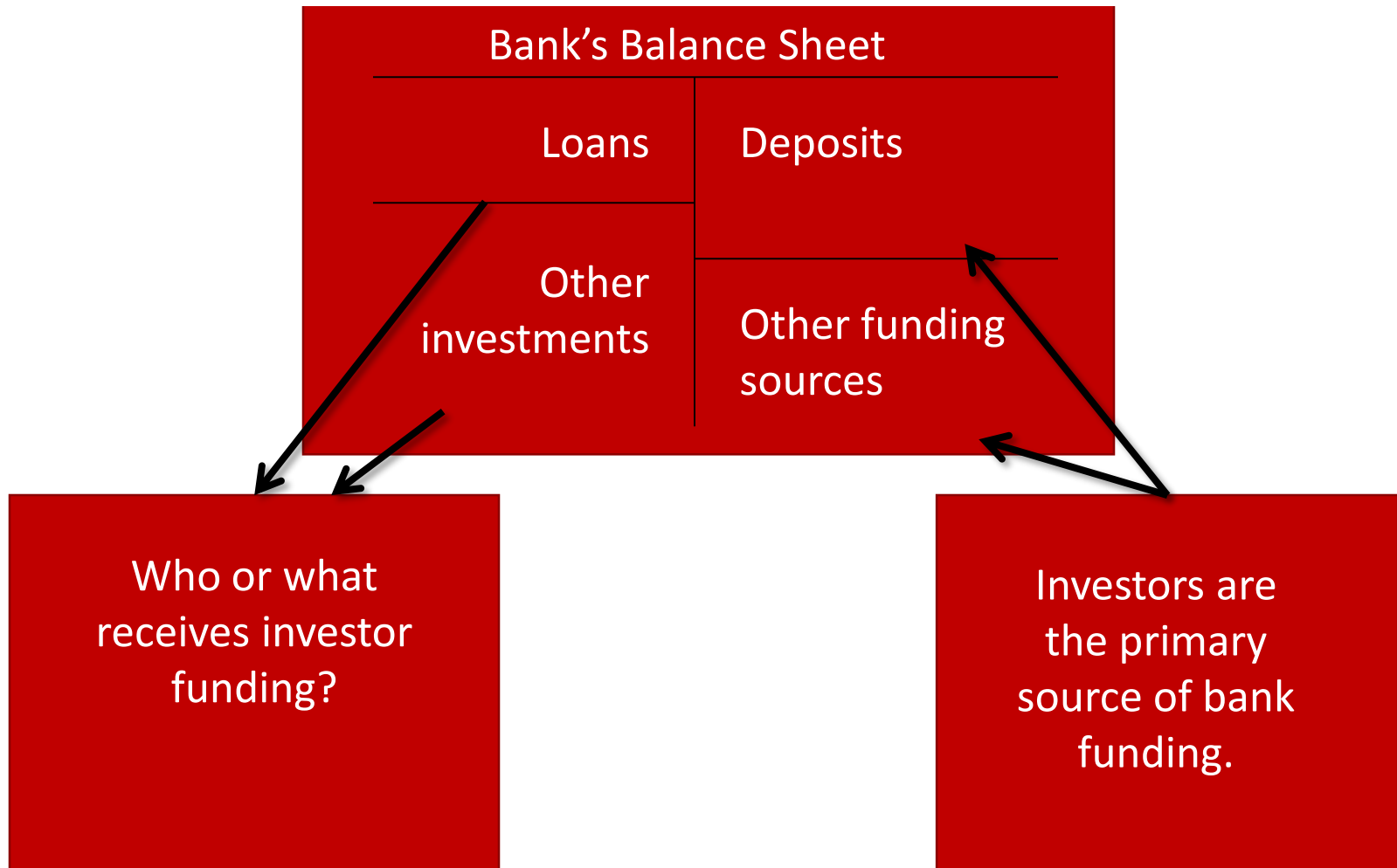
ATS

- Also called electronic communication networks (ECNs) or multi-lateral trading facilities (MTFs).
- Some offer services similar to exchanges, others offer innovative systems that suggest trades to clients.
- Do not exercise regulatory authority except with respect to trading.
- *Dark pools*—do not display orders.

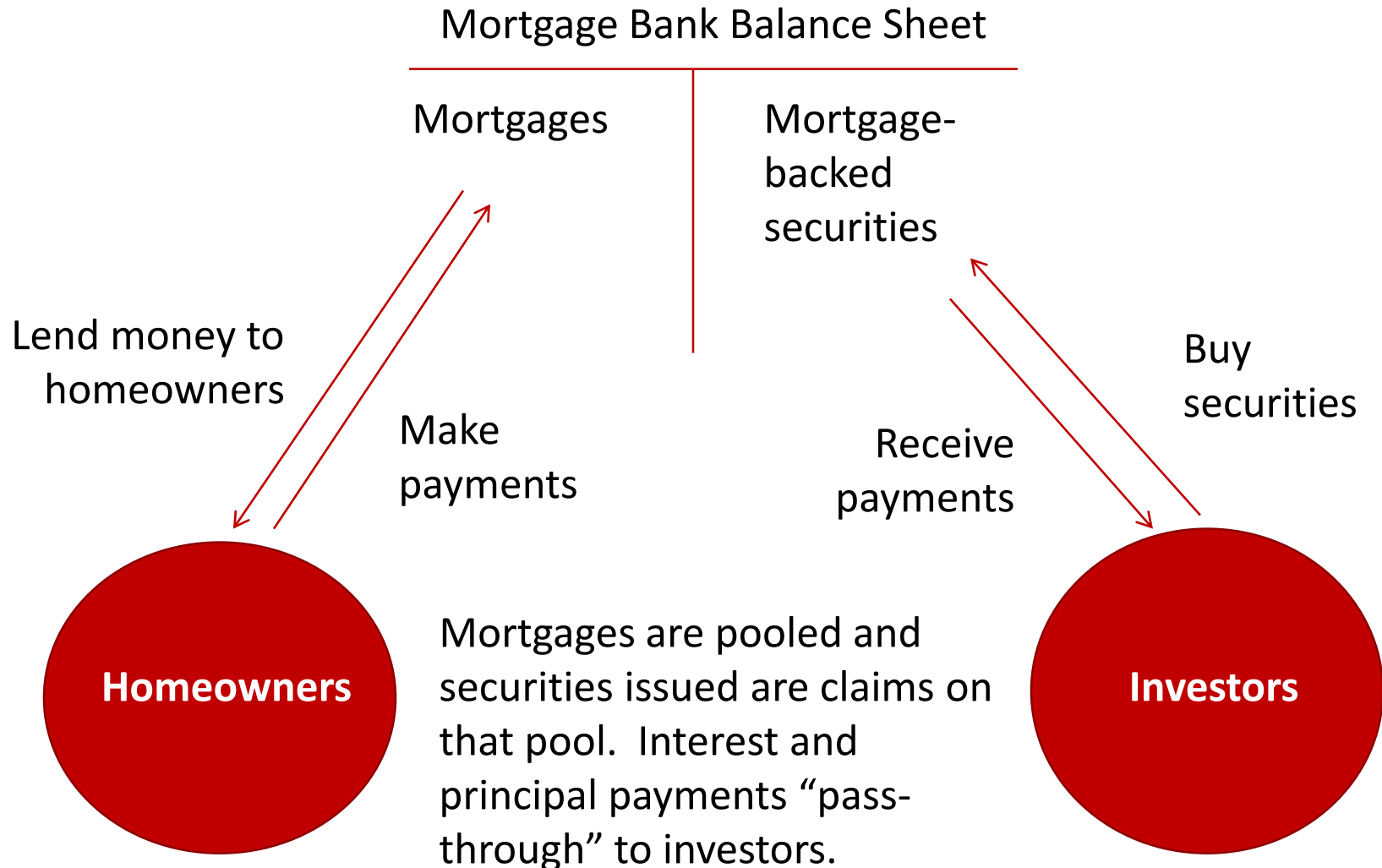
DEPOSITORY INSTITUTIONS



HOW DO INVESTORS INFLUENCE A BANK'S INVESTMENT DECISIONS?



EXAMPLE OF SECURITIZATION



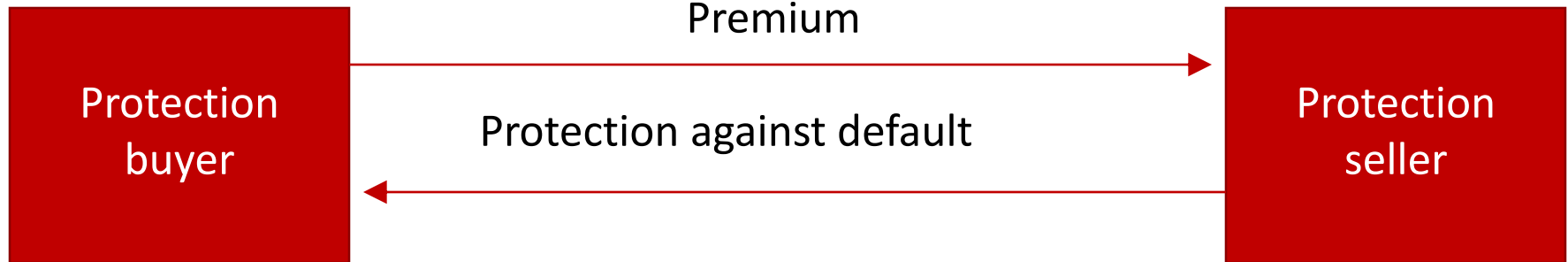
INSURANCE COMPANIES



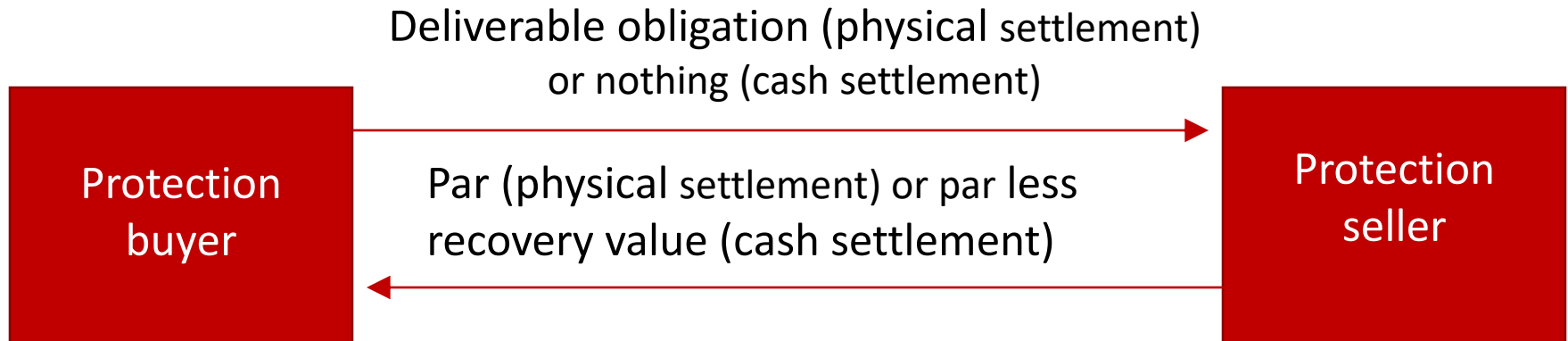
INTERMEDIATION

CREDIT DEFAULT SWAPS (CDS)

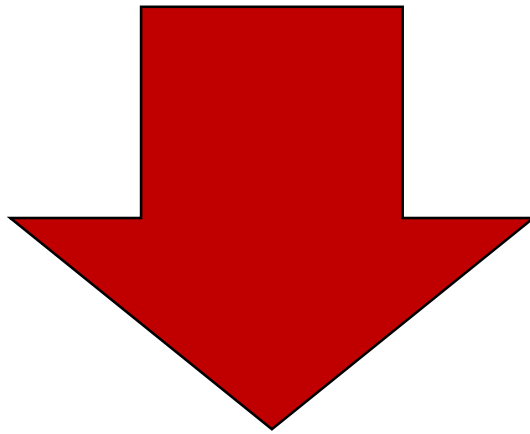
Prior to maturity or default



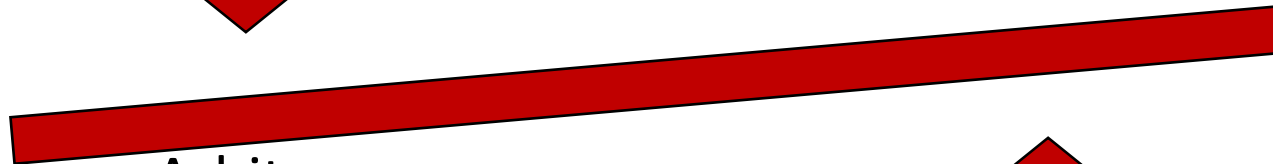
In the event of default



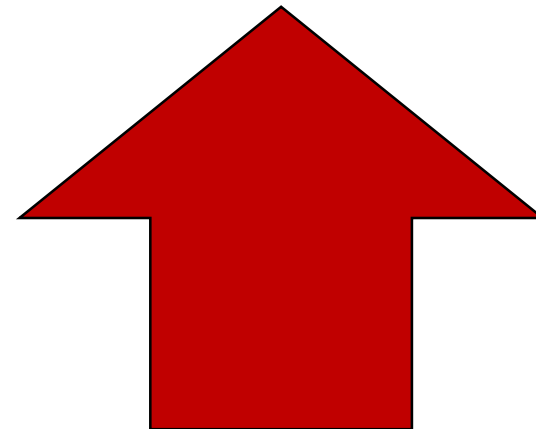
DEALERS VERSUS ARBITRAGEURS



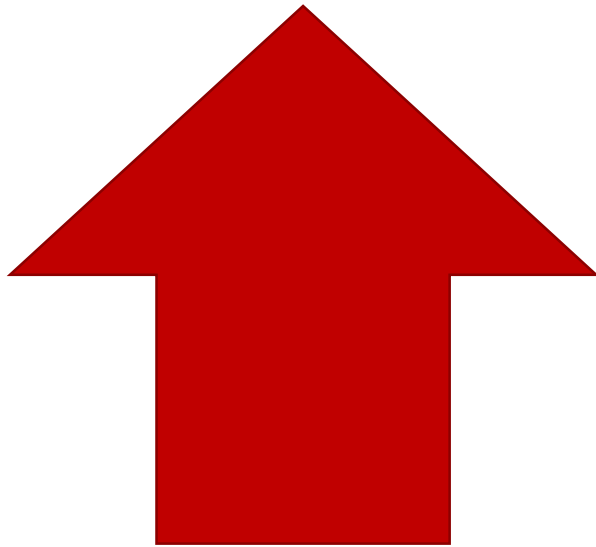
Dealers provide liquidity to buyers and sellers who arrive at the same market at different times.



Arbitrageurs provide liquidity to buyers and sellers who arrive at different markets at the same time.

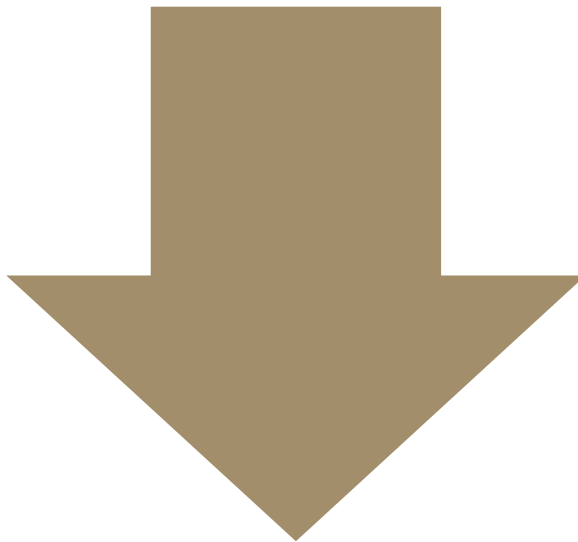


WHAT POSITIONS CAN I TAKE IN AN ASSET?



Long positions


- Assets or contracts are owned
- Position benefits from price appreciation



Short positions

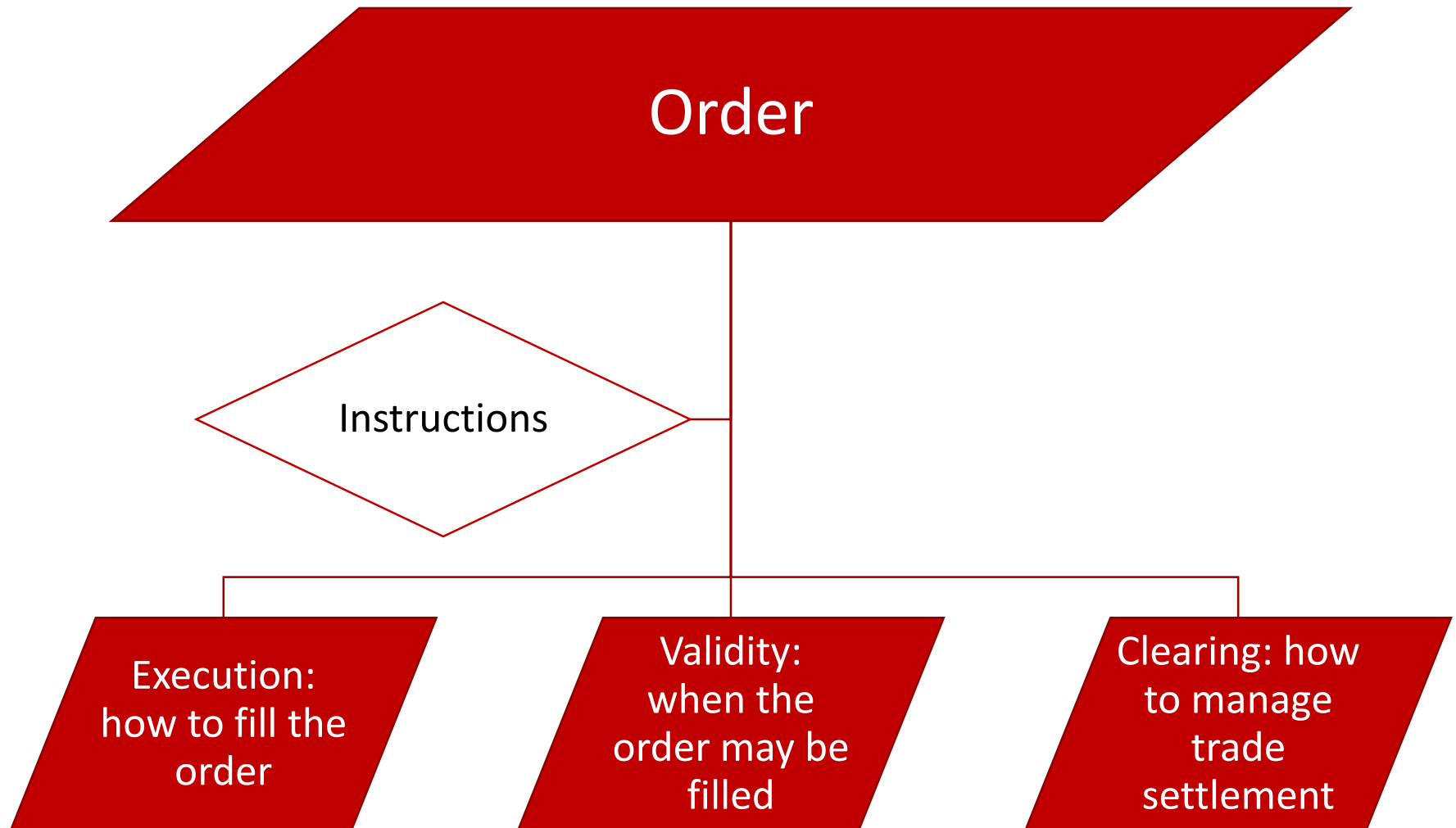
- Assets not owned are sold or contracts are sold
- Position benefits from a decrease in price

TERMINOLOGY FOR LEVERED POSITIONS



Buying on margin
Margin loan
Call money rate
Initial margin requirement
Maintenance margin requirement
Margin call
Leverage ratio

COMPARE AND CONTRAST EXECUTION, VALIDITY, AND CLEARING INSTRUCTIONS



COMPARE AND CONTRAST MARKET ORDERS WITH LIMIT ORDERS

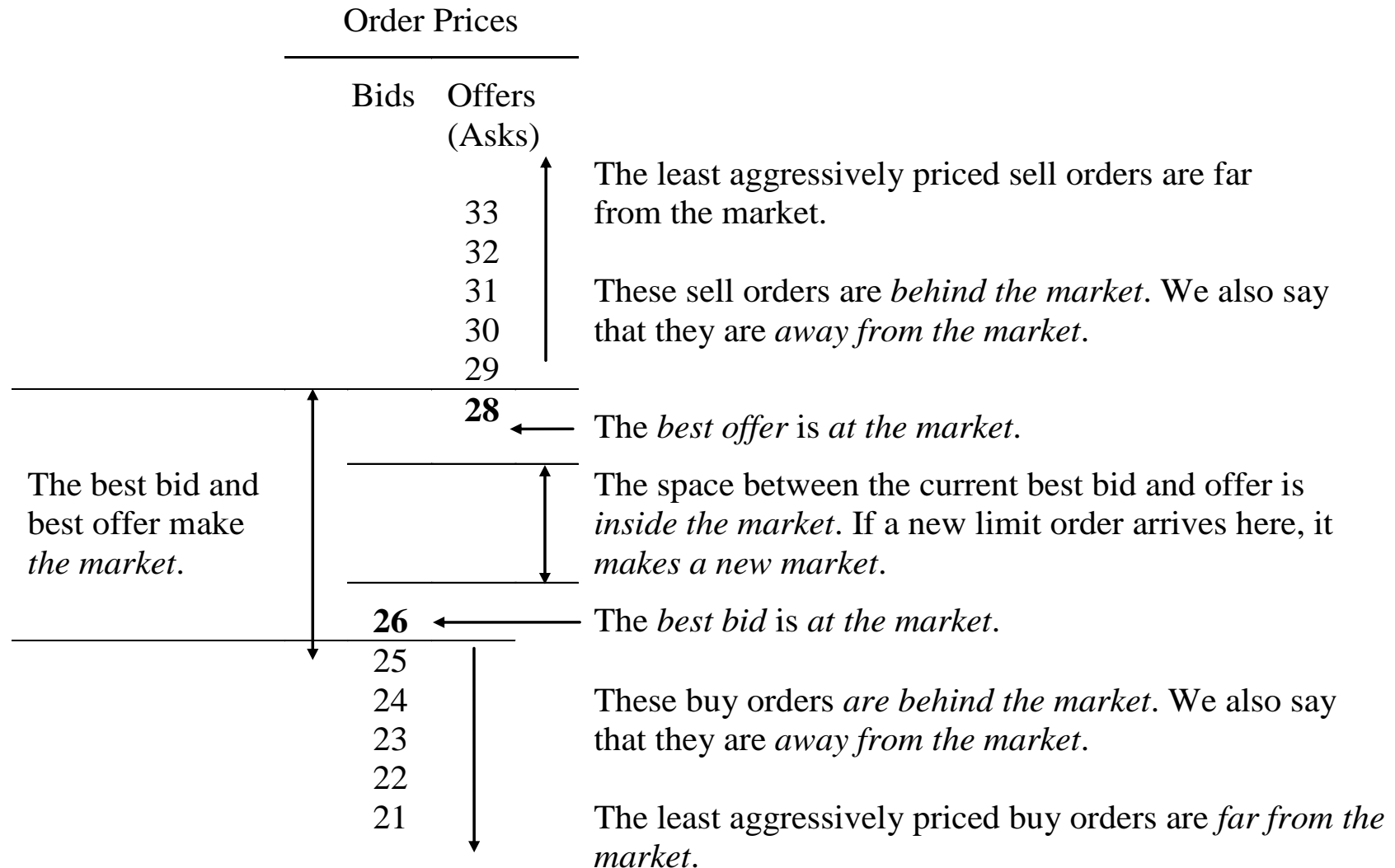
Market order

- Executes immediately
- Receives best available price
- May be expensive to execute

Limit order

- Executes at limit price or better
- Receives best available price
- Mitigates concerns over price concessions

LIMIT ORDER BOOK: "26 BID, OFFERED AT 28"



VALIDITY INSTRUCTIONS

Day order

Good-till-cancelled order (GTC)

Immediate-or-cancel order (IOC)

Good-on-close order

Market-on-close order

Good-on-open order

STOP ORDERS (STOP-LOSS ORDERS)



PRIMARY AND SECONDARY MARKETS

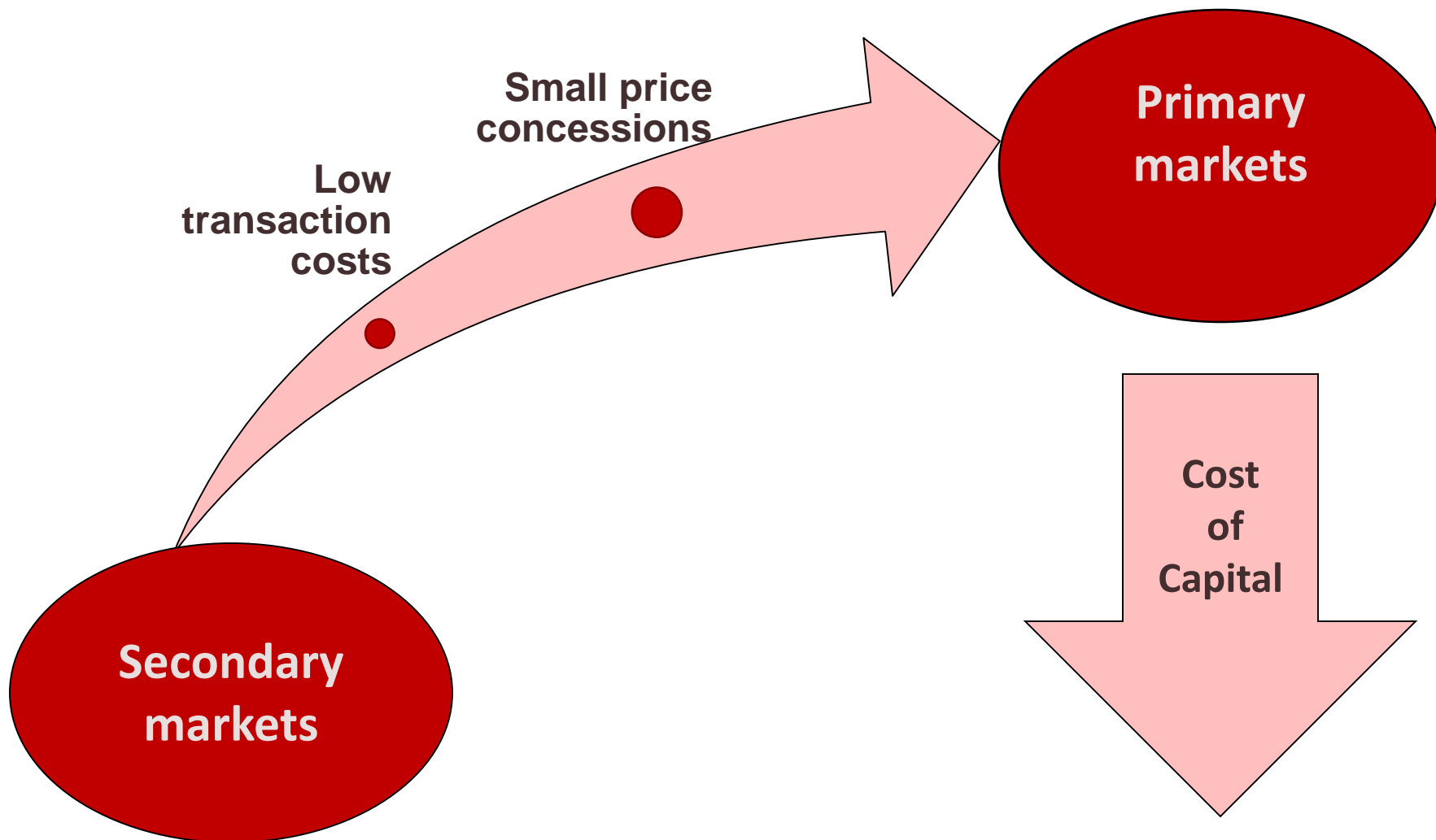
Primary
market

- Public offering: Initial public offering (IPO)
 - Public offering: Seasoned offering
 - Private placement
 - Shelf registration
 - DRPS or DRIPS
 - Rights offering

Secondary
market

- Call markets
- Continuous markets

HOW DO SECONDARY MARKETS SUPPORT PRIMARY MARKETS?



EXECUTION MECHANISMS

Order-driven markets

- Customers trade with dealers
- Bond, currency, and most spot commodity trading

Quote-driven markets

- Order-matching systems or ATS matches trades
- Stock trading

Brokered markets

- Brokers arrange trades
- Trading in unique instruments

ORDER-DRIVEN MARKETS

Order matching rules

Order precedence hierarchy

- Price priority
- Secondary precedence rules

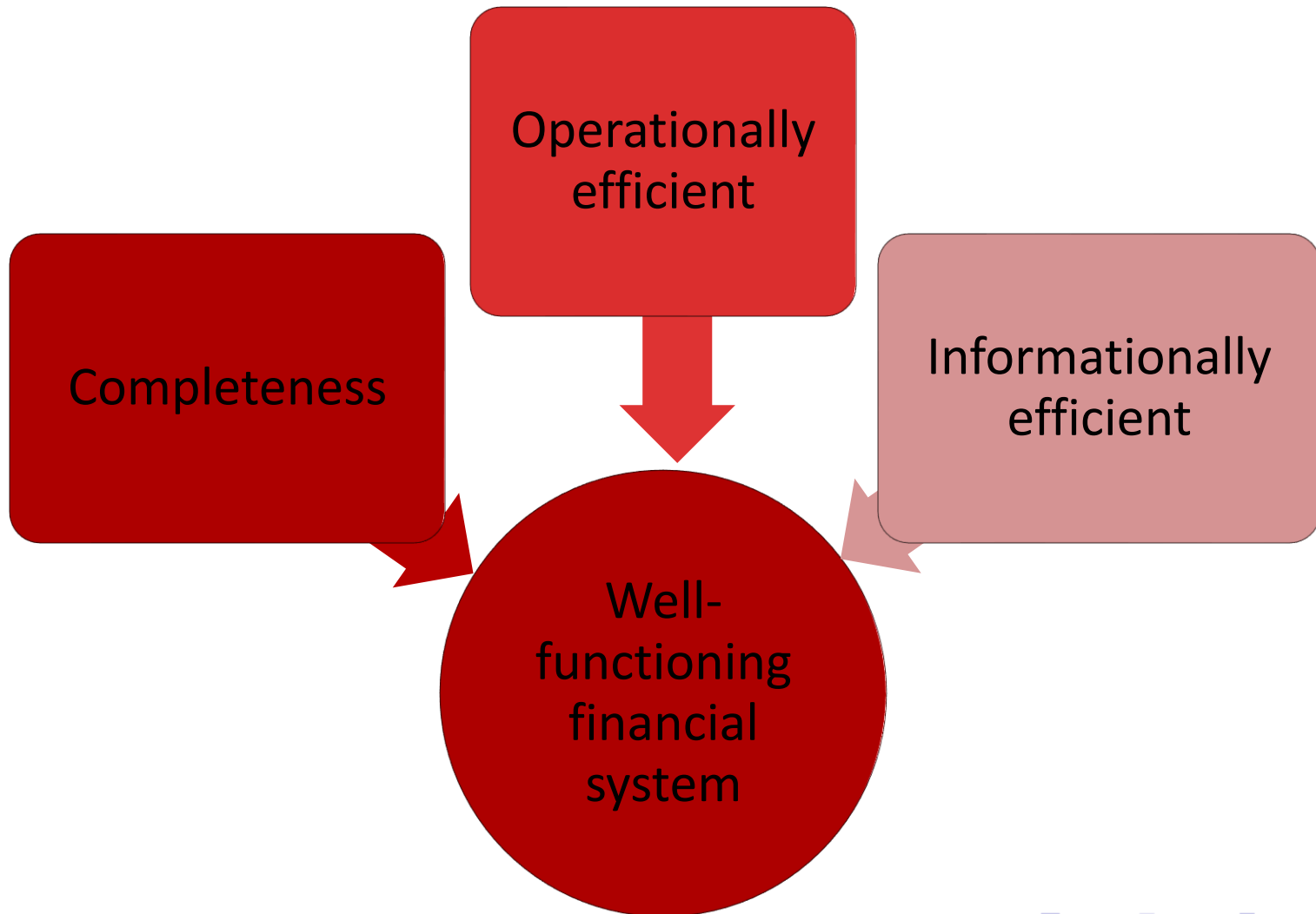
Trade pricing rules

Uniform pricing rule

Discriminatory pricing rule

Derivative pricing rule

WHAT ARE THE CHARACTERISTICS OF WELL-FUNCTIONING FINANCIAL SYSTEM?



WHAT ARE THE OBJECTIVES OF MARKET REGULATION?

Control fraud

Control agency problems

Promote fairness

Set mutually beneficial standards

Prevent exploitation

Insure liabilities are funded

SUMMARY

- Main functions of the financial system
- Classifications of assets and markets
- Financial intermediaries
- Long and short positions
- Leveraged positions
- Execution, validity, and clearing instructions
- Market and limit orders
- Primary and secondary markets
- Quote-driven, order-driven, and brokered markets
- Characteristics of a well-functioning market
- Objectives of market regulation



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1.5

SECURITY MARKET INDICES

THE ROLE OF INFORMATION

Information is critical to operate in financial markets. Prices constantly respond to the arrival of **new information**.

There are two broad classifications

Public information: newspapers, companies' announcements of results, experts forecasts, etc. Via the Internet, market's information circulates fast, requiring investors continuous attention to what is happening in the economy and businesses.

Private information: not publicly available and hard to pin down, but sometimes revealed by trading activity via indirect "signals" (substantial buy or sell orders).

OBS: Trading based upon inside information is illegal.

Information and investors

The information that the investor needs to make the decision to invest or to follow the evolution of investment must be provided by:

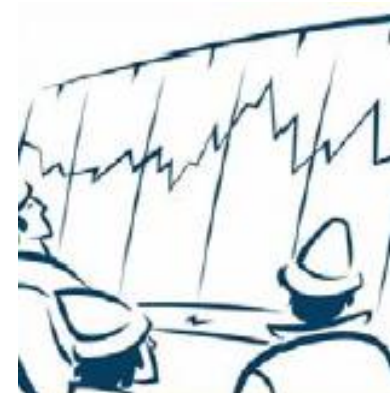
- ❖ **Financial intermediaries** (that are also obliged to assess the risk profile and level of financial knowledge of investors and make sure they are taking an informed investment decision)
- ❖ **Issuers of securities** (on what concerns their specific securities, via periodic reports, business announcements, etc.)
- ❖ **Supervision authorities** (posting on their websites relevant news about any issuer of securities)



Indices

Indices are numbers or percentages that illustrate the evolution of a given market or of a particular market segment.

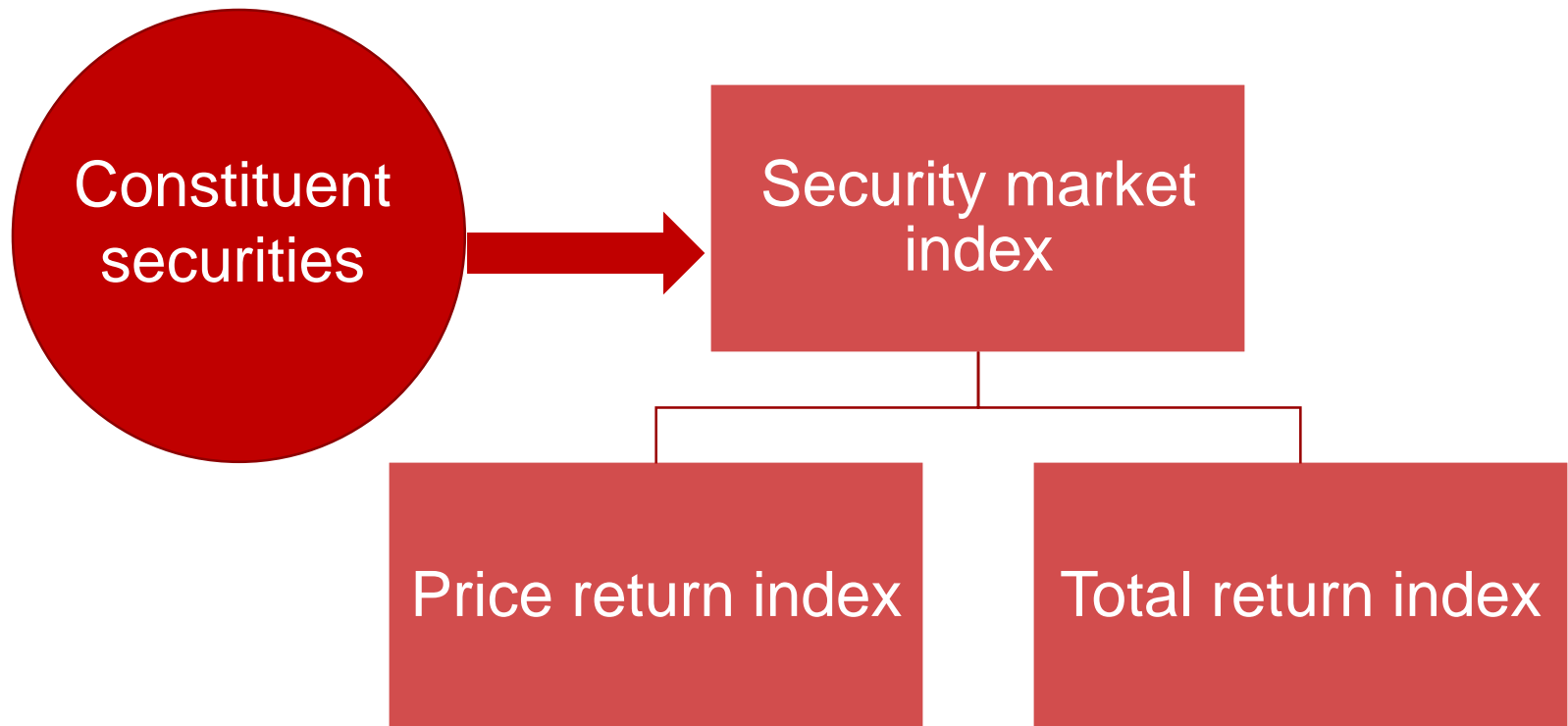
There are **price indices** and **total return indices**. Total return indices are computed similarly to price indices but include an additional correction for payment of dividends.



Examples of stock indices:

- ❖ Euronext 50
- ❖ CAC
- ❖ FTSE
- ❖ S&P500
- ❖ IBEX 35
- ❖ PSI 20
- ❖ Hang Seng
- ❖ ...

DESCRIPTION OF A SECURITY MARKET INDEX



CHOICES IN INDEX CONSTRUCTION AND MANAGEMENT

Which target market should the index represent?

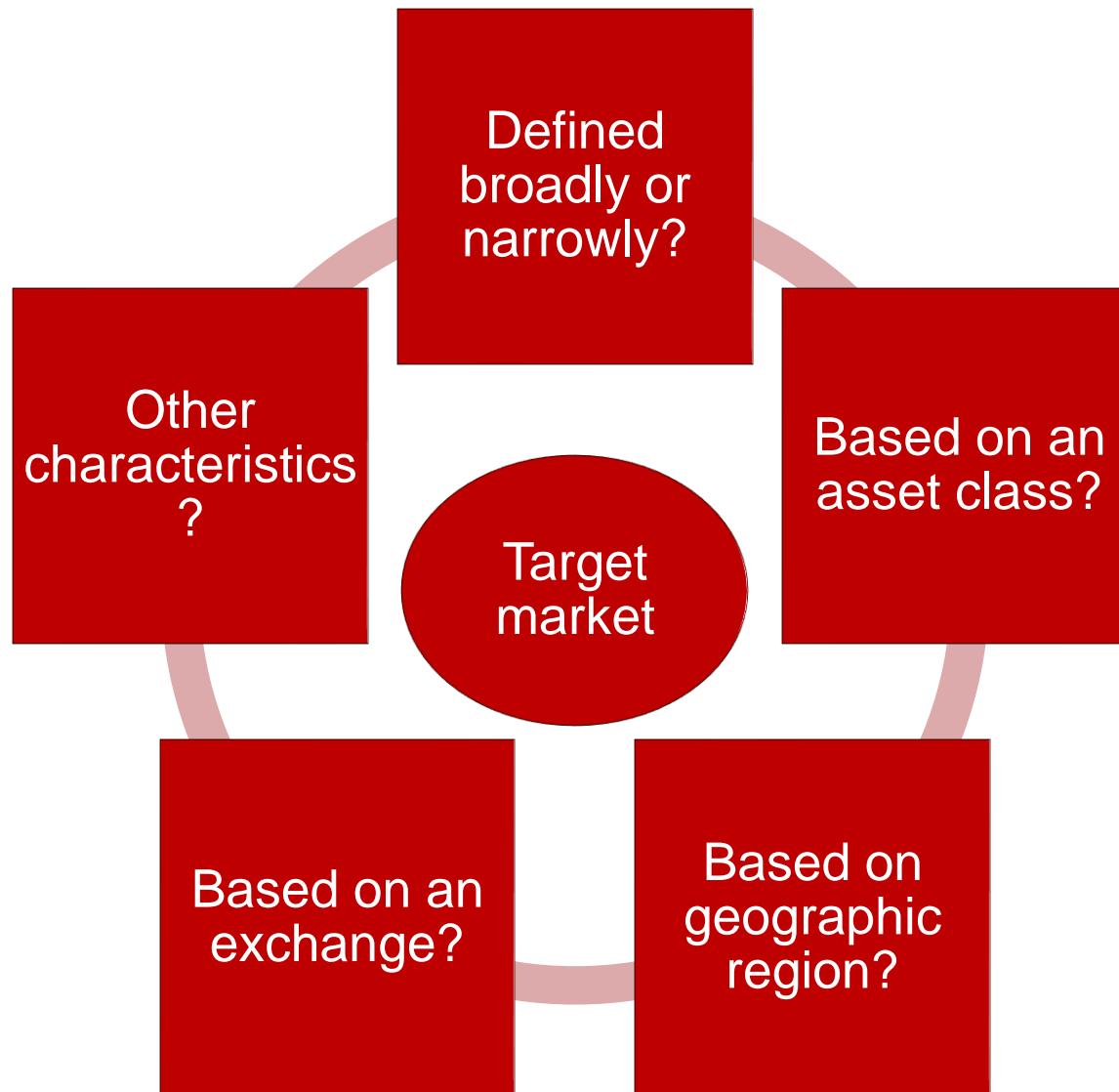
Which securities should be selected from that target market?

How much weight should be allocated to each security in the index?

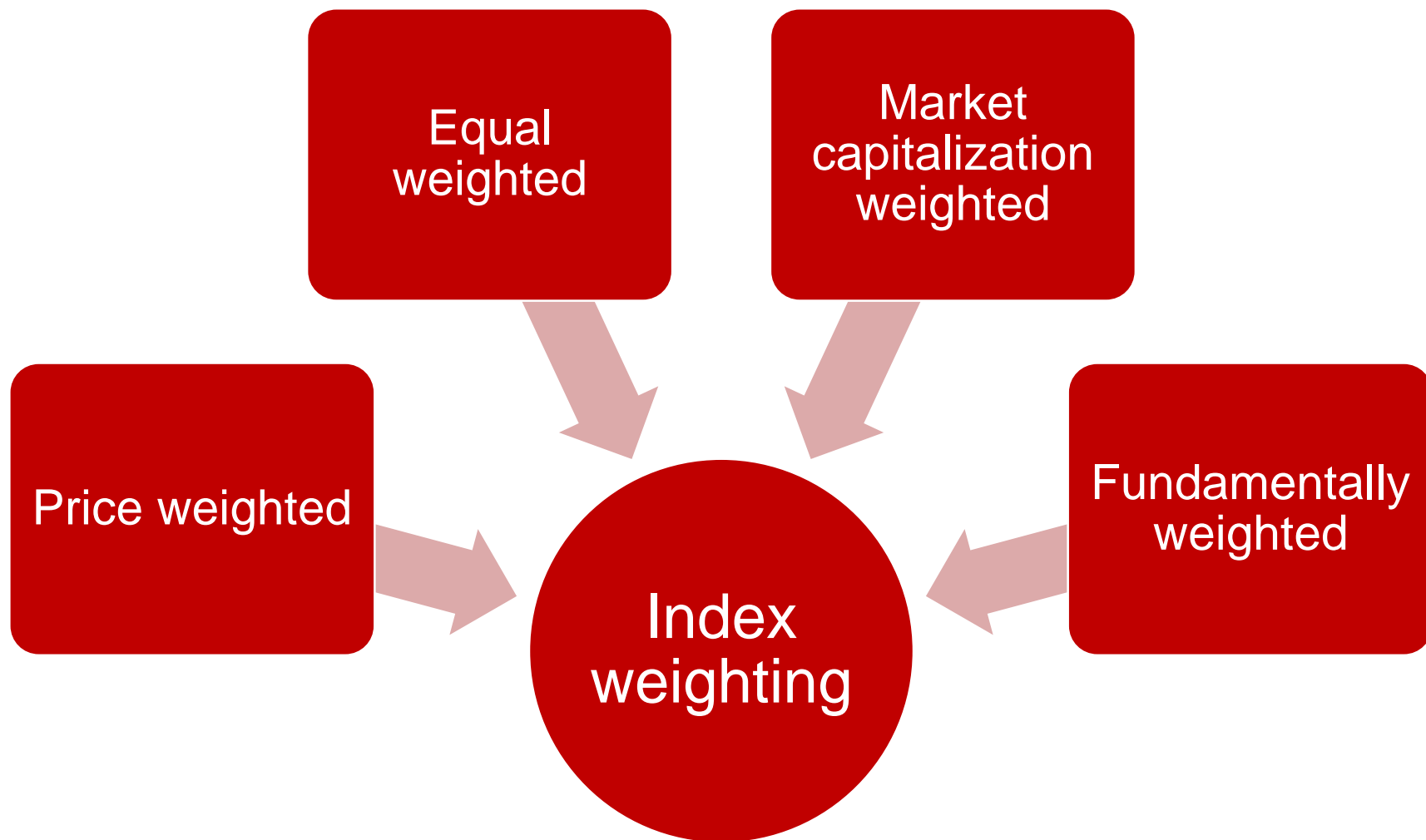
When should the index be rebalanced?

When should the security selection and weighting decision be re-examined?

TARGET MARKET SELECTION



DIFFERENT WEIGHTING METHODS USED IN INDEX CONSTRUCTION



ADVANTAGES AND DISADVANTAGES

Price weighted

Simple

High price stocks have greater impact

Stock splits result in arbitrary changes

Equal weighted

Simple

Under- and over-representation

Frequent rebalancing

Market capitalization weighted

Securities held in proportion to their value

Similar to a momentum strategy

Fundamental weighted

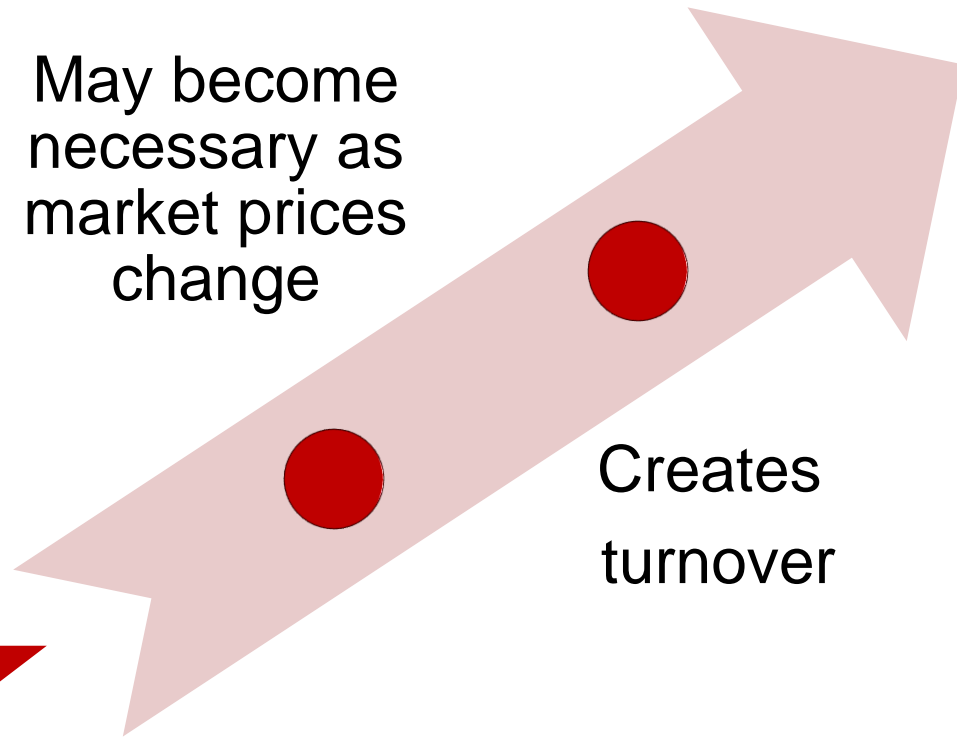
Ensures a value or contrarian tilt

Data intensive

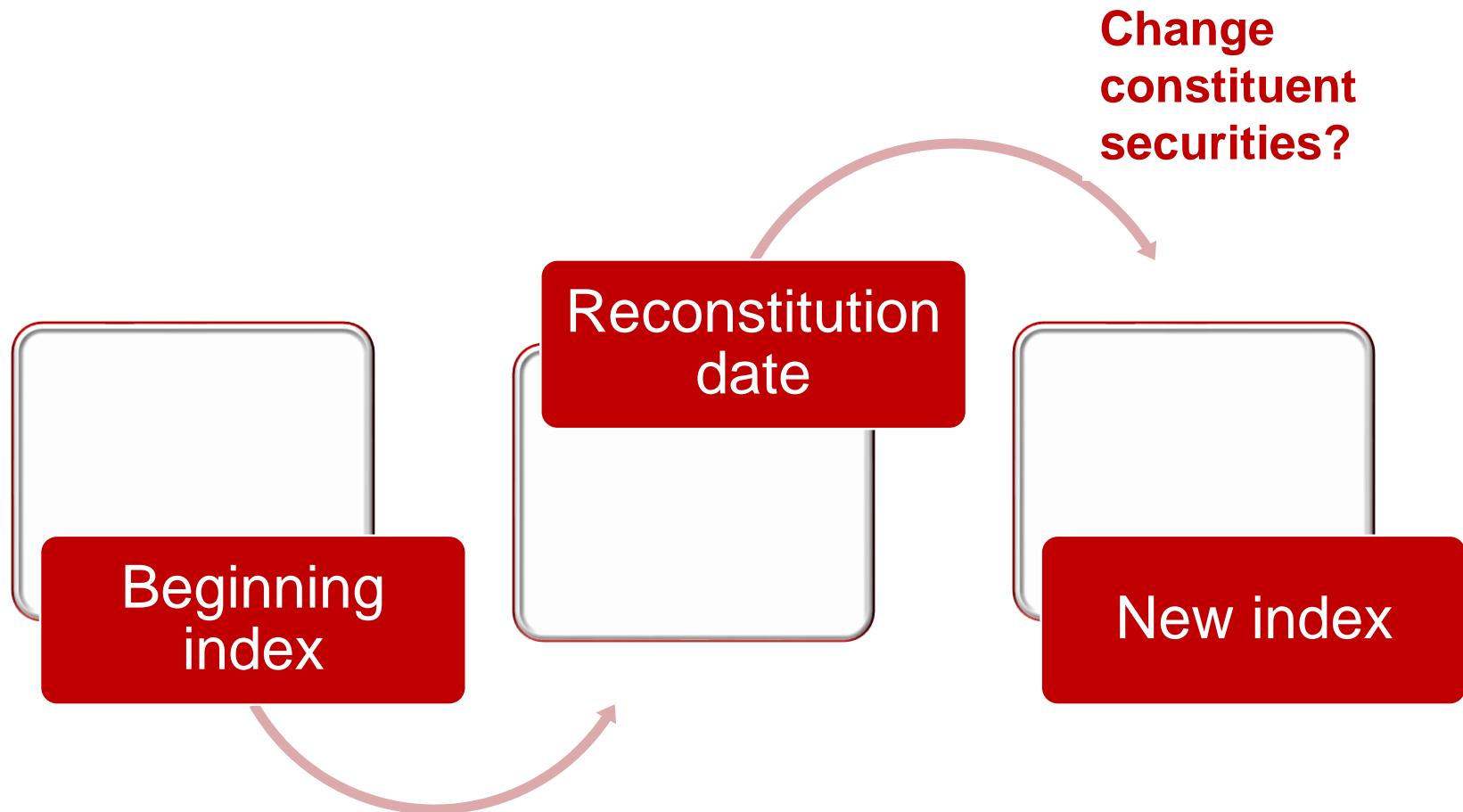
REBALANCING

May become necessary as market prices change

Creates turnover



RECONSTITUTION



USES OF MARKET INDICES

Gauges of market sentiment

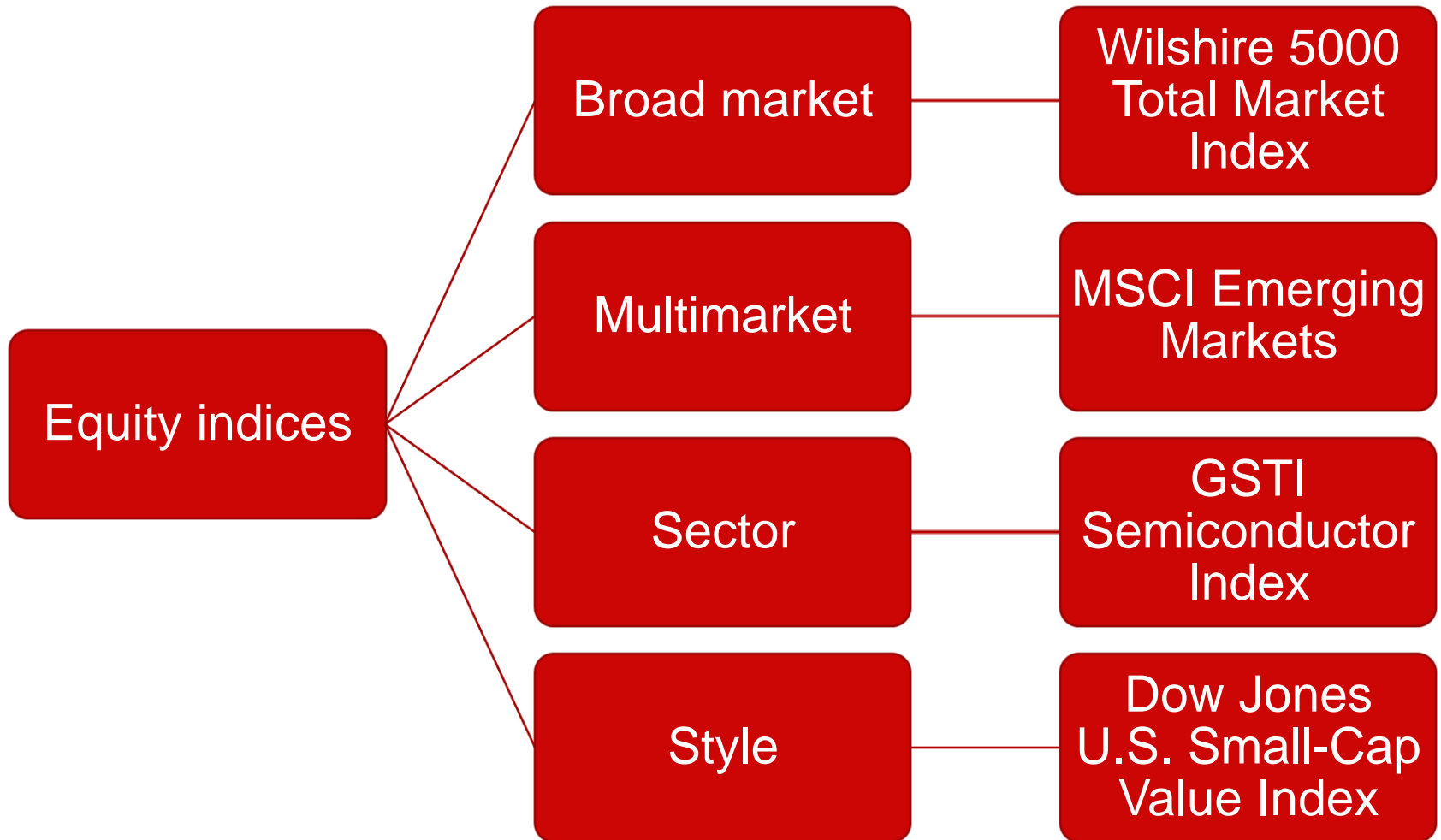
Proxies for measuring and modeling returns, systematic risk, and risk-adjusted performance

Proxies for asset classes in asset allocation models

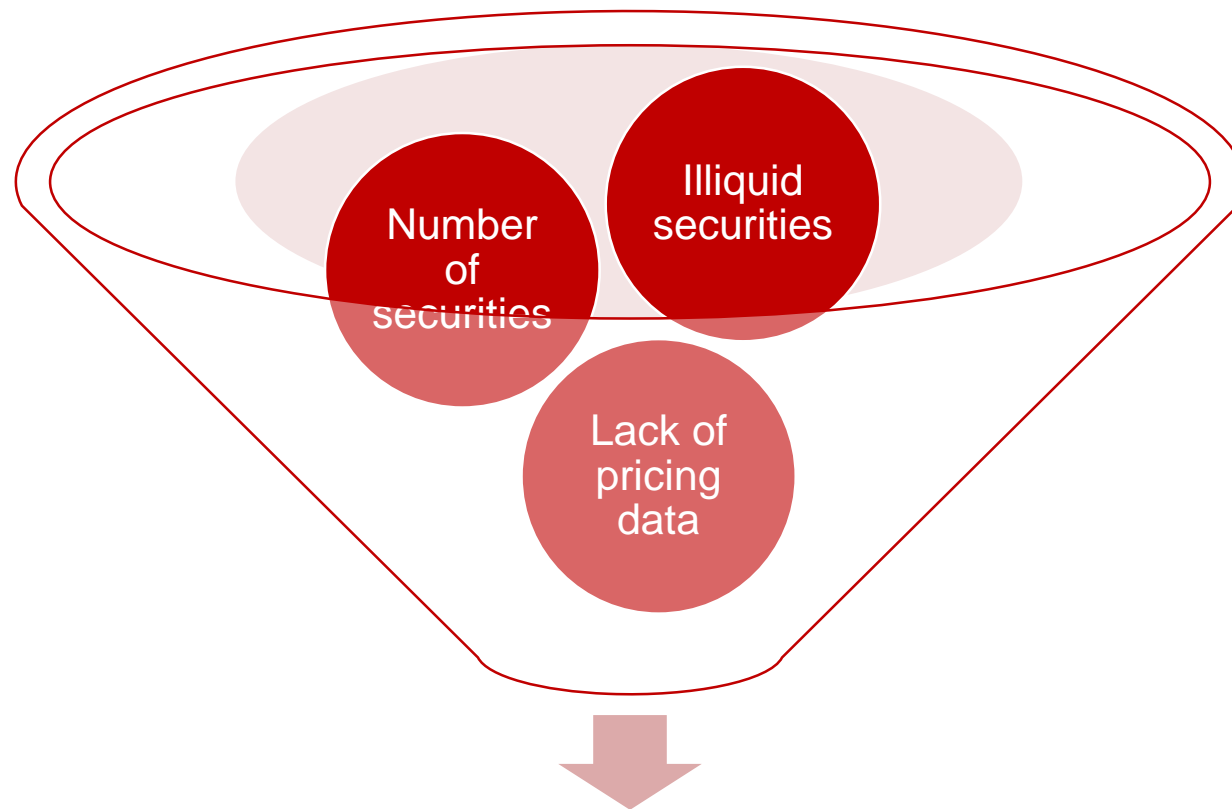
Benchmarks for actively managed portfolios

Model portfolios for such investment products as index funds and exchange-traded funds (ETFs)

EQUITY INDICES



CHALLENGES FACING FIXED INCOME INDEX CONSTRUCTION

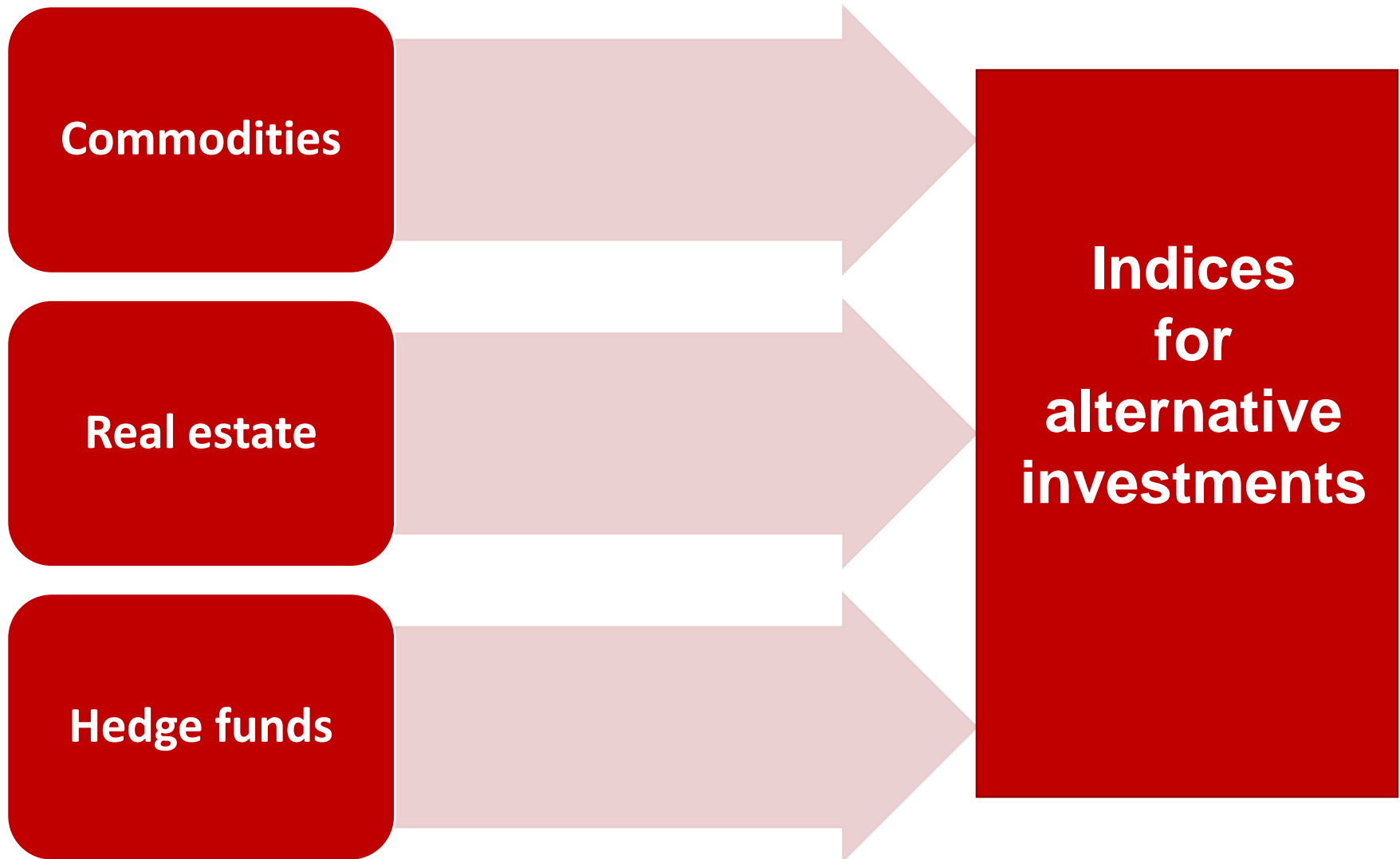


Fixed income index

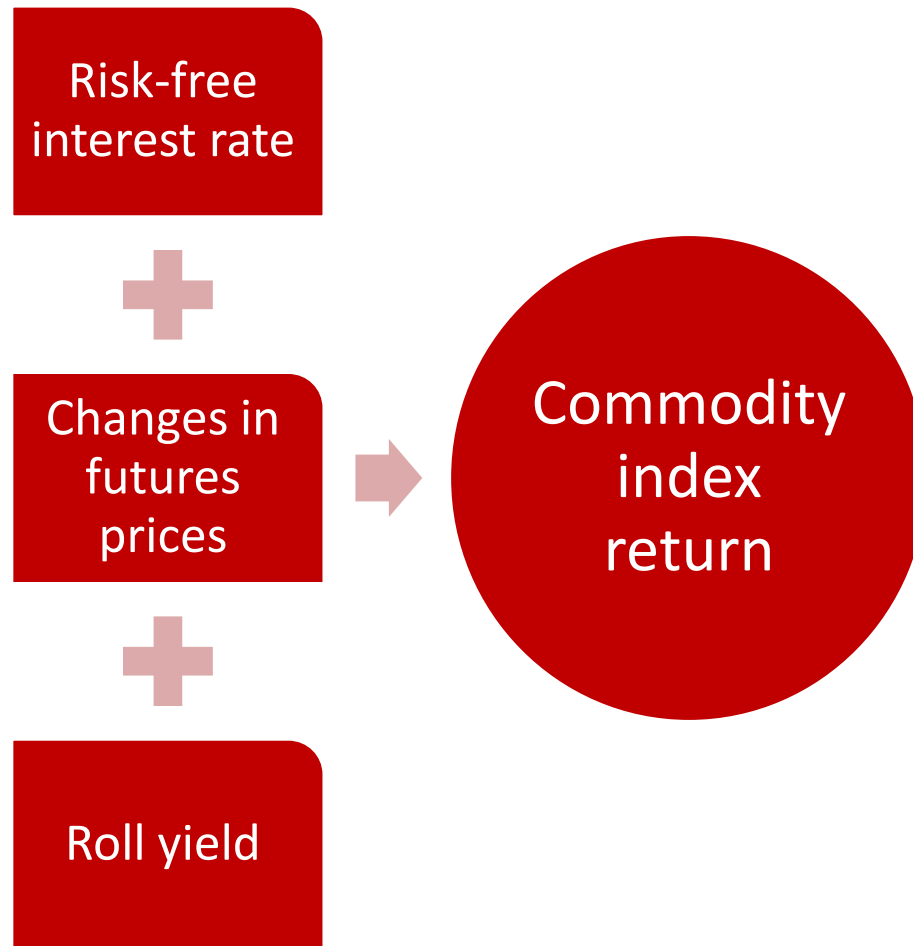
DIMENSIONS OF FIXED-INCOME INDICES

Market	Global			
	Regional			
	Country or currency zone			
Type	Corporate	Collateralized Securitized Mortgage- backed	Government agency	Government
Maturity	For example, 1–3, 3–5, 5–7, 7–10, 10+ years; short-term, medium-term, or long-term			
Credit quality	For example, AAA, AA, A, BBB, etc.; Aaa, Aa, A, Baa, etc.; investment grade, high yield			

INDICES FOR ALTERNATIVE INVESTMENTS



COMMODITY INDICES




REAL ESTATE INDICES




HEDGE FUND INDICES

Hedge funds are private investment vehicles that typically use leverage and long and short investment strategies.



Research organizations maintain databases of hedge fund returns and summarize these returns into indices.



Most indices reflect performance on a broad global level or on a strategy level.



Most indices are equal weighted.

PROBLEMS CAUSED BY VOLUNTARY INVESTMENT REPORTING

Voluntary
investment
performance

Survivorship bias

Indices reflect
different
performances for
the same time
period

SUMMARY

- Price return index
- Total return index
- Choices in index construction and management
- Advantages and disadvantages of different weighting schemes
- Rebalancing and reconstitution
- Uses of market indices
- Equity, fixed income, and alternative investment indices