



# RISK AND RETURN:

## A DEEP DIVE

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# DEFINING **RISK** AND **RETURN**

## **RISK**

The potential for loss or variability in investment outcomes. Measured as standard deviation or volatility.

## **RETURN**

The profit or loss generated from an investment. Calculated as a percentage of the initial investment.

# SYSTEMATIC AND UNSYSTEMATIC RISK

## Systematic Risk

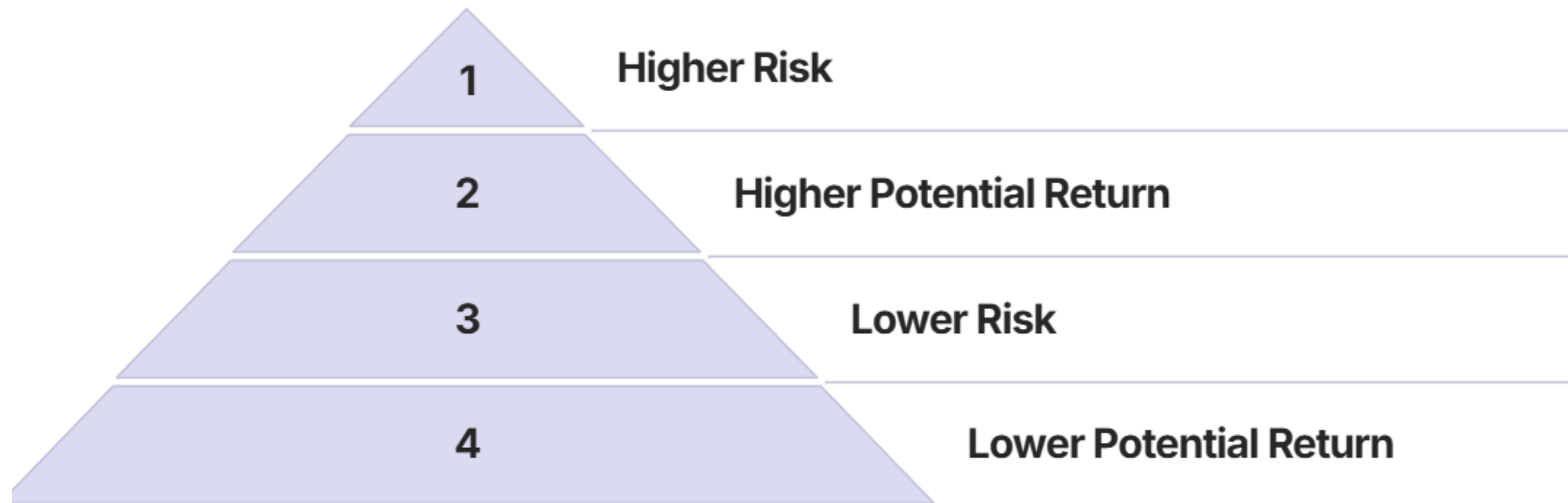
Market-wide risk, impacting all investments. Examples: inflation, economic recession.

## Unsystematic Risk

Specific to a particular investment, can be diversified away.



# RISK-RETURN TRADEOFF



# PORTFOLIO DIVERSIFICATION

## REDUCE RISK

Invest in diverse assets across different sectors, industries, and asset classes.

## ENHANCE RETURNS

Increase overall potential returns by investing in assets with potentially higher returns.





# THE CAPITAL ASSET PRICING MODEL (CAPM)



## CAPM Formula

Expected Return = Risk-Free Rate  
+ Beta \* (Market Risk Premium)



## Beta

Measure of a security's volatility  
relative to the market.



## Risk-Free Rate

Return on a risk-free investment,  
typically government bonds.



## Market Risk Premium

The additional return investors  
expect for investing in the market  
versus risk-free assets.

LAST	CHG	%CHG	BID	OFFER	OPEN	HIGH	LOW	PREV
12.20	-0.10	-0.82%	12.20	12.30	12.30	12.40	12.20	12.30
17.30	0.50	2.95%	17.30	17.40	16.80	18.10	16.70	16.70
22.50	-0.50	-2.17%	22.40	22.50	22.50	23.00	22.40	23.00
25.50	0.50	2.00%	25.40	25.50	25.00	25.25	24.80	25.00
112.00	-3.00	-2.68%	112.00	113.00	111.50	116.00	112.00	115.00
4.84	0.10	2.11%	4.84	4.85	4.82	4.84	4.80	4.74
235.00	-1.00	-0.42%	234.00	235.00	233.00	240.00	233.00	236.00
244.00	0.00	0.00%	244.00	244.00	244.00	244.00	244.00	244.00
14.50	0.50	4.29%	14.50	14.60	13.80	15.00	13.70	14.00
54.00	0.50	0.93%	54.00	55.00	53.00	56.00	53.00	53.50
2.48	0.14	5.98%	2.48	2.49	2.33	2.50	2.30	2.34
7.60	-0.10	-1.32%	7.60	7.60	7.60	7.60	7.60	7.60
3.00	-0.04	-1.29%	3.00	3.00	3.00	3.00	3.00	3.00
17.30	0.40	2.38%	17.30	17.30	17.30	17.30	17.30	17.30
194.50	-0.50	-0.26%	194.50	195.00	193.00	198.00	194.00	195.00
15.00	0.00	0.00%	15.00	15.00	15.00	15.00	15.00	15.00
75.00	0.00	0.00%	75.00	75.00	75.00	75.00	75.00	75.00

# CALCULATING EXPECTED RETURN USING CAPM

**10%**

**Risk-Free Rate**

US Treasury Bond yield

**1.2**

**Beta**

Company stock's volatility

**5%**

**Market Risk Premium**

Expected return on the market  
over risk-free assets

**16%**

**Expected Return**

Calculated using CAPM formula



# ESTIMATING BETA AND THE RISK-FREE RATE

$$\text{CAPM} = R_f + [B \times (R_m - R_f)]$$

## ➤ BETA

Historical stock price data

Beta = Covariance (Stock Returns, Market Returns) / Variance (Market Returns)

## ➤ RISK-FREE RATE

Current yield on US Treasury bonds

β



# IMPLICATIONS AND LIMITATIONS OF CAPM

1

## Investment Decisions

Inform investment choices based on expected risk and return.

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2

## Performance Evaluation

Assess the performance of investments against expected returns.

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3

## Assumptions

CAPM assumes rational investors and efficient markets, which may not always hold true.



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**Corporate Finance**