

COURSE: INVESTMENTS | CHAPTER 8

THE EFFICIENT MARKET HYPOTHESIS

Chapter Purpose

Can investors consistently beat the market by analyzing available information?

We will examine:

- Market efficiency
- Information and prices
- Random walks
- Three forms of EMH
- Technical analysis
- Fundamental analysis
- Event studies
- Market anomalies
- Active vs passive investing

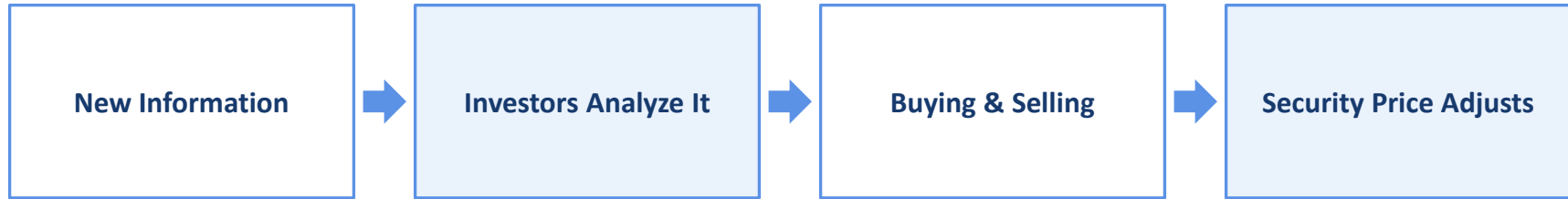
Learning Objectives

By the end of this chapter, students should be able to:

1. Define market efficiency.
2. Explain how information affects security prices.
3. Explain the random-walk idea.
4. Distinguish weak, semi-strong and strong forms of EMH.
5. Explain implications for technical analysis.
6. Explain implications for fundamental analysis.
7. Describe event studies.
8. Identify major market anomalies.
9. Explain how market efficiency is tested.
10. Compare active and passive investing.
11. Discuss practical implications of EMH.

What Is an Efficient Market?

An efficient market is one in which security prices incorporate relevant available information rapidly.



Information flows in, competition among investors processes it, and the price moves.

Market Efficiency

Imagine a supermarket announces:

“Tomorrow, sugar prices will increase significantly.”

- If everyone knows this today, people may immediately buy sugar.
- The effect begins before tomorrow.
- Financial markets work similarly.

Once information becomes known, investors may act immediately.

The Core EMH Idea

Suppose a company announces unexpectedly strong profits. Thousands of investors may immediately:

- Read the announcement
- Update valuations
- Buy shares
- Sell shares
- Change orders

Result: the share price may adjust very quickly.

The Important Question

Suppose you read the positive announcement 30 minutes later. Can you easily earn an abnormal return by buying?

Answer

Possibly not

Why

The market may already have adjusted

Information can be valuable without providing an exploitable trading opportunity after it becomes widely known.

Efficient Does Not Mean Perfect

Market efficiency does NOT mean:

- Prices are always correct.
- Prices never change.
- Investors never make mistakes.
- Markets never crash.
- Every investor has identical beliefs.
- Securities have no risk.

Instead: prices reflect available information sufficiently well that consistently exploiting that information is difficult.

What Moves Security Prices?

Security prices may respond to information about:

Earnings

Dividends

Interest rates

Inflation

Economic growth

New products

Management

Regulation

Political events

Investor expectations

All of these feed into one number: the security price.

Expected vs Unexpected Information

Suppose everyone expects a company to report a given profit — and it reports exactly that.

Expected profit

ETB 100 million

Actual profit

ETB 100 million

Price jump?

Not necessarily

The result may already have been expected and incorporated into the price.

Surprise Matters

Expected profit

ETB 100 million

Actual profit

ETB 150 million

Unexpected component

Positive surprise

Prices react primarily to new information relative to what investors already expected.

The expected part of the news is, in an efficient market, already in the price before the announcement.

Bad News Can Produce a Price Increase

Expected result

ETB 500m loss

Actual result

ETB 100m loss

Interpretation

Better than expected

- The company still lost money.
- But the outcome beat investor expectations, so the share price could rise.

Key lesson: prices react to surprises, not merely whether news sounds good or bad.

Good News Can Produce a Price Decline

Analysts expect

30% profit growth

Company reports

15% profit growth

Interpretation

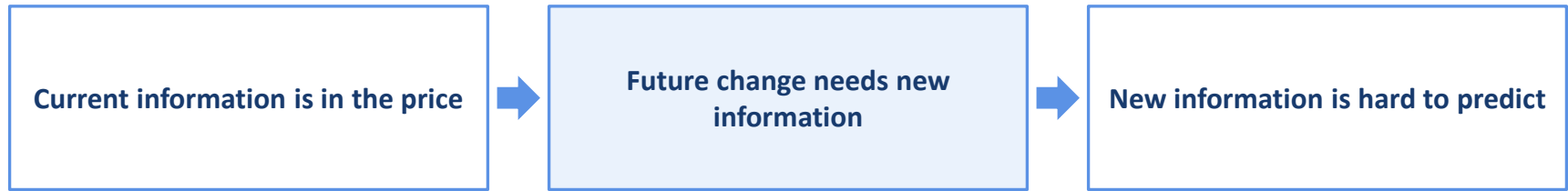
Worse than expected

- Profit increased in absolute terms.
- But performance fell short of expectations, so the share price could decline.

Positive profit, negative surprise — the surprise drives the price reaction.

What Is a Random Walk?

If prices already reflect currently available information, future price changes should depend substantially on new information.



Short-term price changes may be difficult to forecast systematically from existing public information.

— Random Walk

Imagine tomorrow's headline. If you already knew exactly what it would say:

It would not really be tomorrow's news.

Similarly:

Future security-price changes depend partly on information that investors do not yet know.

Random Does Not Mean Meaningless

A random-walk concept does not imply that prices have no economic basis. Prices may still reflect:

- Expected cash flows
- Risk
- Interest rates
- Economic conditions

The uncertainty concerns future changes driven by new information — not the level of the price itself.

Three Forms of Market Efficiency

The classic EMH framework distinguishes three progressively broader information sets.

1. Weak Form

Past market information

2. Semi-Strong Form

All publicly available information

3. Strong Form

All information, public and private

Each form nests the one before it: the information set becomes progressively broader.

Weak-Form Efficiency

Weak-form efficiency proposes that current security prices reflect information contained in:

- Historical prices
- Past returns
- Trading volume
- Other historical trading data

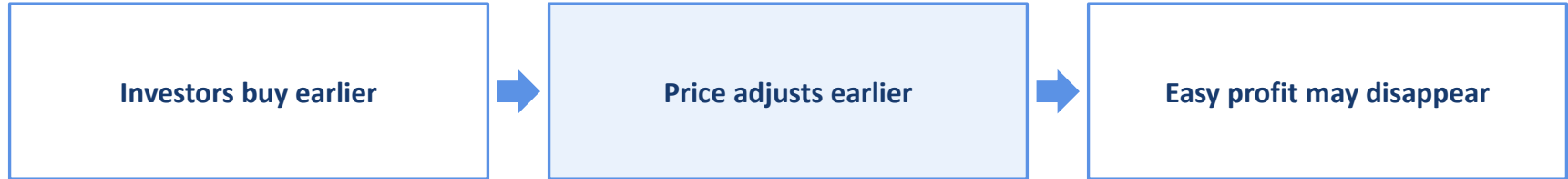
Historical trading data → already reflected in today's price.

— Weak Form

Suppose you study yesterday's chart and notice a pattern:

“Every time this pattern appears, the stock should rise tomorrow.”

If everyone can identify and exploit that pattern:



Weak Form and Technical Analysis

Technical analysis studies:

- Price patterns
- Trading volume
- Trends
- Momentum
- Support / resistance
- Chart formations

If markets are weak-form efficient, historical price and volume information alone should not consistently generate abnormal risk-adjusted returns after costs.

What Is Technical Analysis?

Technical analysts attempt to forecast price movements using market-generated data. Common tools include:

Moving averages

Momentum indicators

Trend lines

Trading volume

Chart patterns

Relative strength

All of these are built from past prices and volume — the weak-form information set.

Simple Technical Strategy

The Rule

Buy when a short-term moving average rises above a long-term moving average.
Sell when it falls below.

EMH question: if this rule reliably generated easy abnormal profits, why would sophisticated investors not exploit it until the opportunity weakened?

Does EMH Say Charts Are Useless?

Not exactly. Historical data can still be useful for:

- Understanding volatility
- Measuring liquidity
- Risk management
- Trade execution
- Studying market behavior

The stronger claim is that past price information alone should not provide persistent easy abnormal profits in a weak-form efficient market.

Semi-Strong-Form Efficiency

Semi-strong efficiency proposes that security prices reflect all publicly available information, including:

- Historical prices
- Financial statements
- Earnings announcements
- Economic reports
- Dividend announcements
- Public regulatory information
- Public news

Many public information sources → one market price.

— Semi-Strong Form

A company publishes excellent financial results at 9:00 AM. At that moment, thousands of participants can react:

- Investors
- Analysts
- Algorithms
- Fund managers

By the time you read the report later, much of the information may already be incorporated into the price.

Semi-Strong Form and Fundamental Analysis

Fundamental analysis studies:

- Financial statements
- Earnings
- Cash flows
- Growth
- Industry conditions
- Management
- Valuation

If markets are semi-strong efficient, public fundamental information should not consistently produce abnormal risk-adjusted returns after costs.

What Is Fundamental Analysis?

Fundamental analysis estimates an investment's economic value using factors such as:

- Revenue
- Profit
- Cash flow
- Assets
- Debt
- Growth
- Competitive position
- Economic environment



Fundamental Value

An analyst asks: what is this company actually worth? Then compares:

Analyst estimate

Estimated intrinsic value

Observed in market

Market price

If intrinsic value > market price, the security may appear undervalued.

The reverse comparison suggests the security may appear overvalued.

The EMH Challenge to Fundamental Analysts

Finding a strong company is not enough. The analyst must identify:

Information or interpretation that is not already adequately reflected in the price.

Great Company $\neq$ Automatically Great Investment

Why? Because a great company's shares can already be expensive.

Example — Great Company, Poor Investment?

Company A shows every sign of quality:

- Excellent profits
- Strong brand
- High growth
- Strong management

But everyone knows this — its price may already embed extremely optimistic expectations.

Key question: is the company's future performance better than what the current price already implies?

Strong-Form Efficiency

Strong-form efficiency proposes that prices reflect all information:

Information set

Public information

Information set

Private information

Result

Fully reflected in price

This is the strongest and most controversial version of EMH.

— Strong Form

Imagine a senior executive privately knows the company has discovered something extremely valuable.

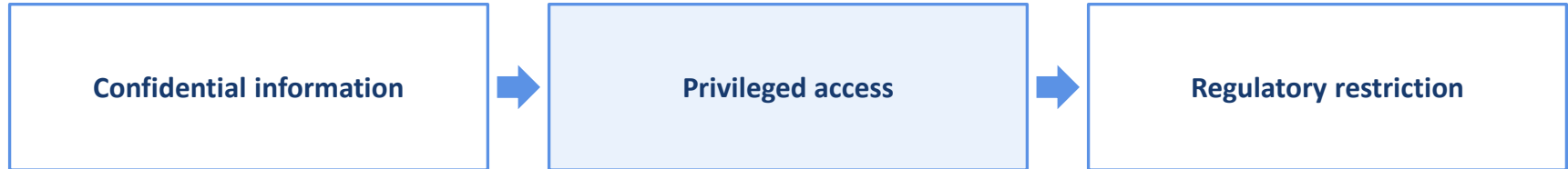
Strong-form efficiency would imply that even this private information cannot systematically provide an abnormal trading advantage.

This is a very demanding claim — and the hardest form of EMH to defend empirically.

Is Strong-Form Efficiency Realistic?

Evidence that insiders or privileged parties can sometimes benefit from private information creates challenges for the strongest version of market efficiency.

This is also why securities markets regulate insider trading.



Three Forms Compared

The information set becomes progressively broader across the three forms.

Form	Information Reflected
Weak	Historical market data
Semi-Strong	All public information
Strong	Public + private information

Each form contains the previous one — strong form is the most demanding claim.

Implications

Weak Form

Challenges consistent profits from historical price patterns.

Semi-Strong Form

Challenges consistent profits from public information.

Strong Form

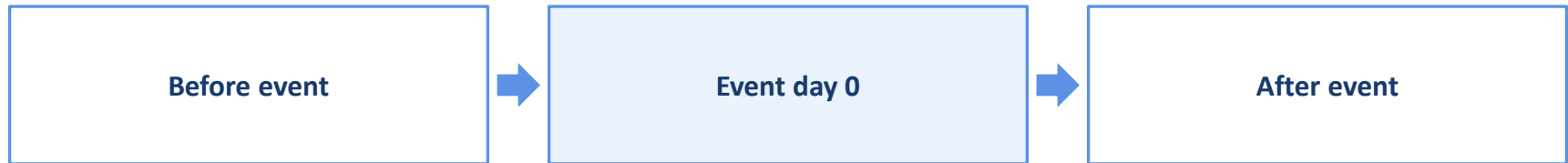
Challenges consistent profits even from private information.

How Do Researchers Test Market Efficiency?

One important technique is an:

EVENT STUDY

An event study examines how security prices behave around a specific information event.



Typical Events Studied

Researchers may study market reactions to:

Earnings announcements

Dividend announcements

Mergers

Stock splits

Credit-rating changes

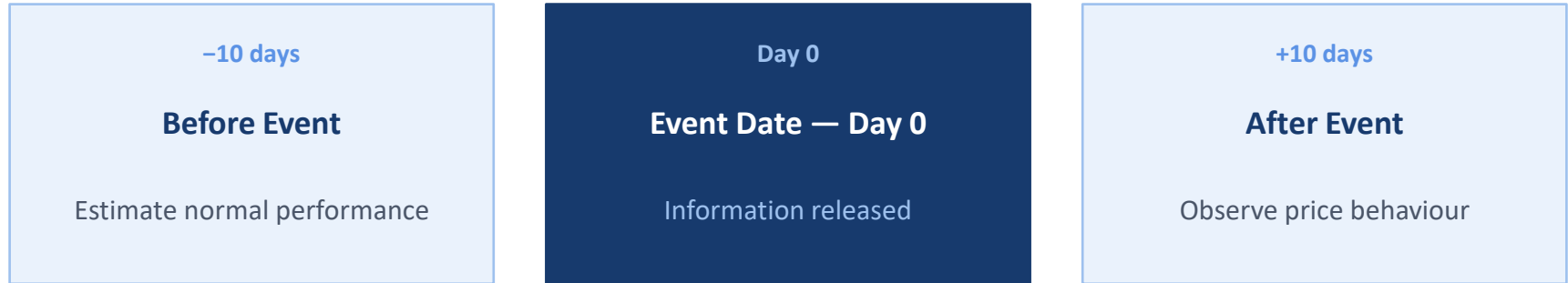
Regulatory decisions

Acquisitions

Each event places new information into the market at a known point in time.

Event Study Timeline

Researchers compare behaviour before, on, and after the event date.



Researchers ask: did prices adjust quickly, or gradually?

Abnormal Return

$$\text{Abnormal Return} = \text{Actual Return} - \text{Expected Normal Return}$$

Actual return

10%

Expected normal return

3%

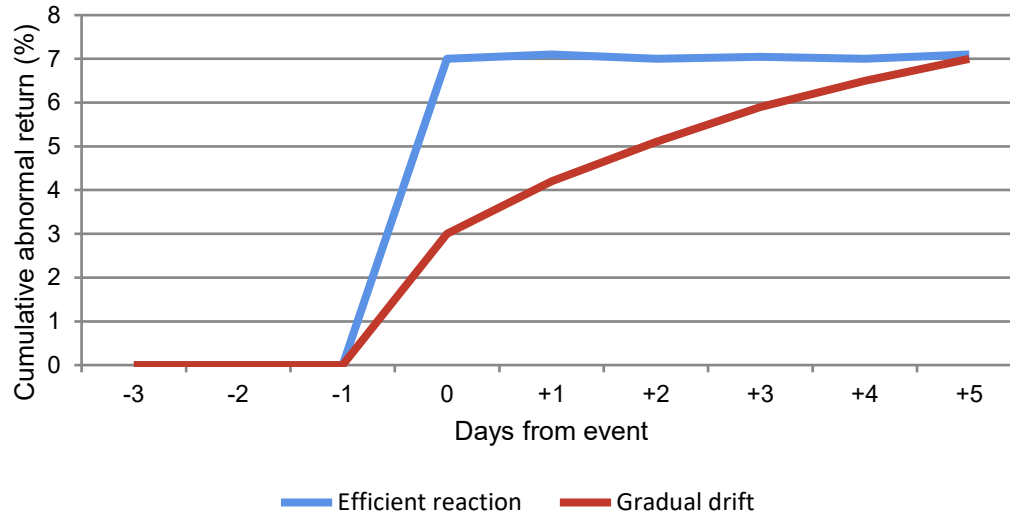
Abnormal return

7%

The abnormal return isolates the part of performance attributable to the event itself.

What Would Efficiency Suggest?

Compare an immediate adjustment with a gradual, predictable drift.



Efficient reaction

Price adjusts rapidly to the new information.

Potential inefficiency

Predictable adjustment continues long enough to create exploitable abnormal returns after risk and costs.

What Is a Market Anomaly?

A market anomaly is a pattern in returns that appears inconsistent with a simple efficient-market model. Examples historically investigated include:

- Momentum
- Reversal
- Size effects
- Value effects
- Calendar effects
- Post-earnings-announcement drift

An anomaly is a warning flag on the simple model — not automatically proof of inefficiency.

Momentum

Momentum refers to the tendency, documented in some markets and periods, for securities with relatively strong recent performance to continue outperforming for a time — and vice versa.

EMH question: can this pattern produce persistent abnormal returns?

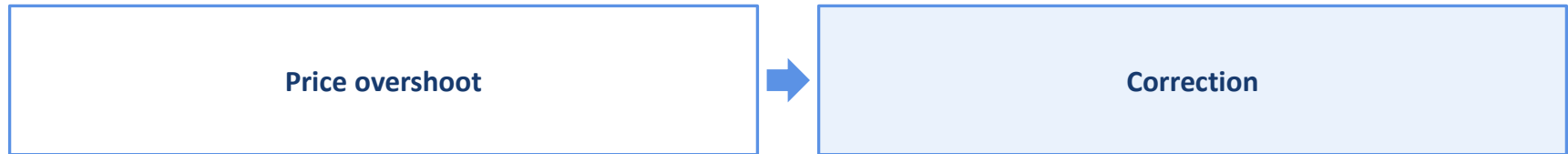
- After adjusting for risk
- After transaction costs
- After allowing for data mining

Reversal

Reversal patterns suggest that extreme past performance may sometimes partially reverse.

Possible explanations include:

- Investor overreaction
- Changing fundamentals
- Risk
- Market microstructure effects



Value Effect

Researchers have examined whether relatively low-priced securities, measured by ratios such as price-to-book or price-to-earnings, have generated different returns from high-valuation securities.

Possible explanations include:

- Risk
- Behavioural effects
- Mispricing

Value versus growth remains one of the most studied comparisons in empirical finance.

Size Effect

Researchers have also examined whether smaller companies have historically earned different average returns from larger companies.

Possible explanations include:

- Greater risk
- Lower liquidity
- Information differences
- Market inefficiency

Comparison

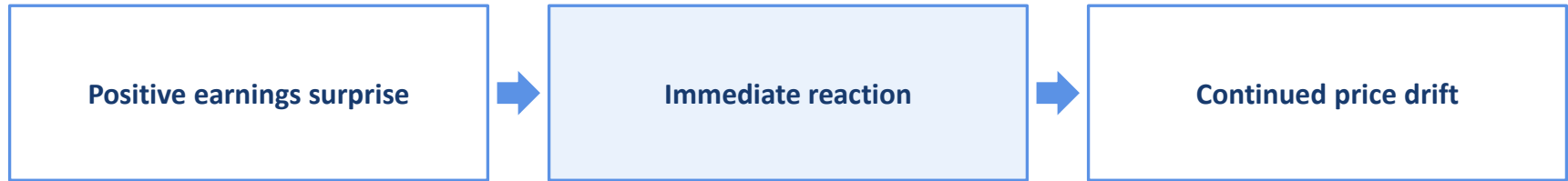
Small companies

Comparison

Large companies

Post-Earnings-Announcement Drift

Sometimes prices appear to continue moving in the direction of an earnings surprise after the announcement.



If persistent and exploitable, such behaviour poses a challenge to simple semi-strong efficiency.

An Anomaly Is Not Automatically Free Money

Before concluding that markets are inefficient, ask:

- Is the result statistically reliable?
- Does it persist in new data?
- Does it survive transaction costs?
- Does it survive taxes?
- Does it involve additional risk?
- Was the pattern discovered by data mining?

Examine every apparent anomaly with the same scrutiny you would apply to any investment claim.

The Problem of Data Mining

Strategies tested

10,000

Purely by chance

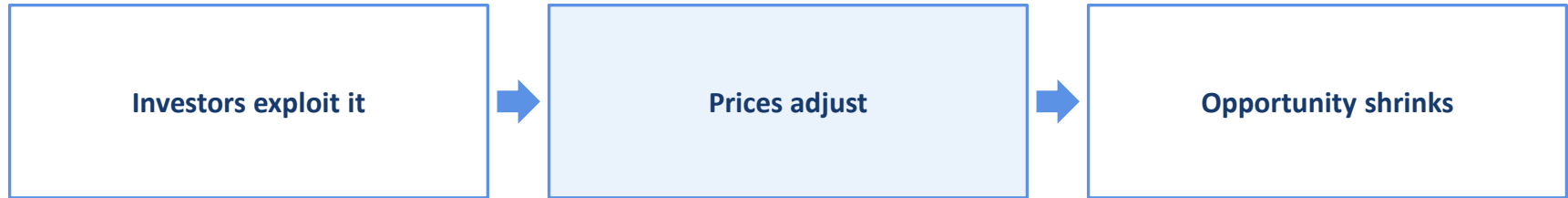
Some look excellent historically

A successful backtest does not automatically prove a genuine investment opportunity.

The more strategies you search over, the more likely you are to find one that fit the past by luck alone.

Anomalies May Disappear

Once an anomaly becomes widely known:



This itself is consistent with the idea that markets can become more efficient through competition.

Active Investing

Active investors attempt to outperform the market through:

- Security selection
- Market timing
- Fundamental analysis
- Technical analysis
- Sector rotation
- Tactical asset allocation

Goal: beat an appropriate benchmark after risk and costs.

Passive Investing

Passive investing seeks to capture market or benchmark performance rather than consistently outperform it. Examples:

- Index funds
- Broad-market ETFs
- Benchmark-tracking portfolios

The portfolio's return path is designed to follow the index closely.

Why EMH Supports Passive Investing

If market prices already incorporate available information, finding persistently mispriced securities is difficult.

Therefore, a rational strategy may be to:

- Diversify broadly
- Reduce unnecessary trading
- Control costs
- Track an appropriate market benchmark

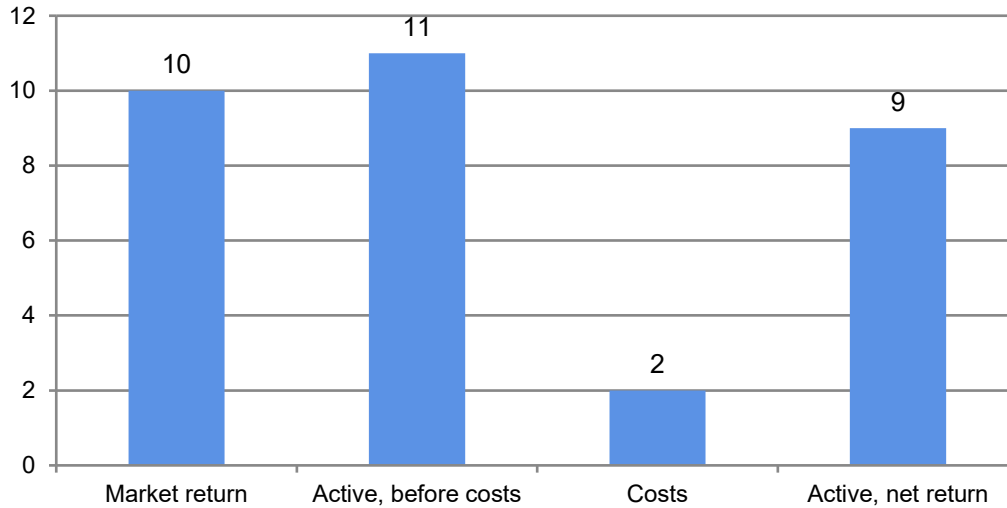
Active vs Passive

Active	Passive
Seeks to outperform	Seeks to track
More research	Less security selection
Potentially more trading	Generally lower turnover
Usually higher costs	Usually lower costs
Manager skill important	Benchmark design important
Potential alpha	Market return exposure

Two investment paths — the choice depends on your view of how efficient the market is, and on costs.

Costs Make the Challenge Harder

An active strategy can beat the market before costs and still lose after costs.



$$11\% - 2\% = 9\%$$

The strategy beat the market before costs but underperformed after costs.

What Costs Matter?

Active investment strategies may incur:

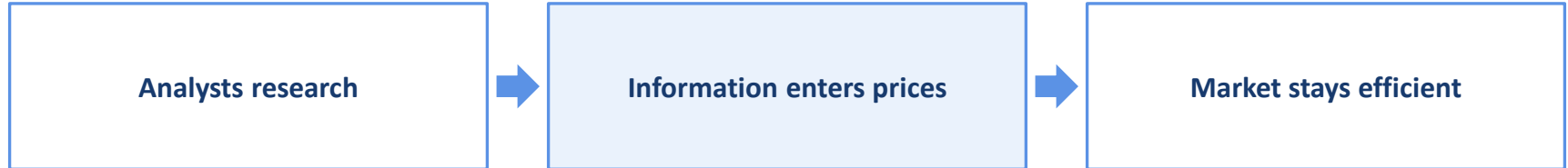
- Management fees
- Brokerage costs
- Bid–ask spreads
- Market impact
- Research expenses
- Taxes, where applicable

Therefore performance should always be evaluated after costs.

A Common Misunderstanding

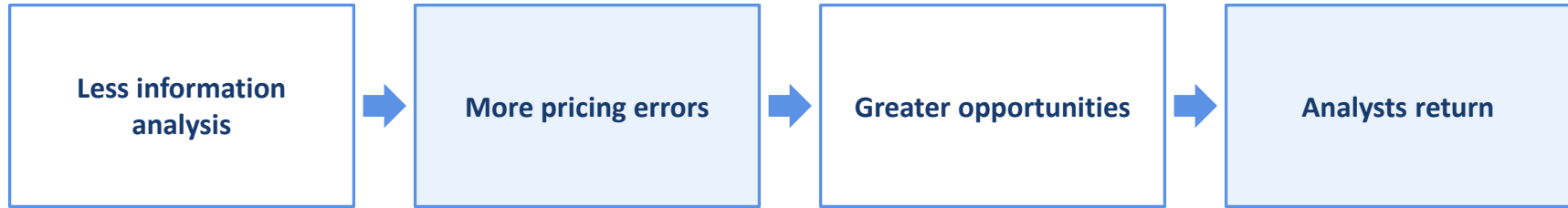
If markets are efficient, why do we need analysts, researchers, fund managers and traders?

Because markets may be efficient partly because large numbers of participants continuously search for and process information.



The Efficiency Paradox

If everyone stopped analyzing securities because markets were efficient:



Information gathering and market efficiency reinforce each other.

What Should an Investor Learn from EMH?

EMH encourages investors to focus on what they can control:

- Diversification
- Asset allocation
- Risk exposure
- Investment horizon
- Fees
- Taxes
- Discipline
- Rebalancing

...rather than assuming that every apparent pattern is an easy profit opportunity.

EMH and Investment Advice

Before accepting a claim such as “this stock will definitely rise”, ask:

1

What information supports the claim?

2

Is the information already public?

3

Is it already reflected in price?

4

What risk is involved?

5

What are transaction costs?

6

Is the evidence statistically reliable?

A six-question due-diligence checklist before acting on any tip.

Example — Earnings Announcement

Suppose ABC Company's share price is ETB 100 before the announcement.

Market expectation

Growth = 10%

Actual announcement

Growth = 25%

This represents

**Positive unexpected
information**

The surprise — not the level of growth — is what the market must now price.

Efficient Price Reaction

Before announcement

ETB 100

Immediately after

ETB 115

- The price rapidly incorporates the revised expectations.
- An investor buying only after the adjustment cannot automatically capture the original 15% increase.

Lesson: the ability to identify good news is different from the ability to profit from it before the market adjusts.

Practical Exercise

Scenario

A company's stock has increased for five consecutive weeks. Tomorrow it releases its annual financial statements.

Investor A: “The stock has risen for five weeks, so it will rise again.”

Investor B: “The annual report will tell me whether to buy.”

Student Tasks

1. Which argument relates to technical analysis?
2. Which relates to fundamental analysis?
3. What would weak-form EMH suggest?
4. What would semi-strong-form EMH suggest?
5. What information could change tomorrow's price?
6. Why are unexpected results more important than expected ones?
7. Would a strong company automatically be a good investment?
8. How would transaction costs affect the strategy?

Key Takeaways

- Market efficiency concerns how quickly and accurately available information is incorporated into prices.
- Prices respond particularly to new and unexpected information.
- Random-walk reasoning: future changes are hard to predict from known information.
- Weak form: prices reflect historical market information.
- Semi-strong form: prices reflect publicly available information.
- Strong form: extends the claim to public and private information.
- Weak form challenges purely historical-price-based trading strategies.
- Semi-strong form challenges public-information-based fundamental strategies.
- Event studies examine market reactions to new information.
- Anomalies must survive tests for risk, costs and data mining.
- EMH provides a theoretical basis for passive investment strategies.
- Active managers must outperform enough to cover their extra costs.
- Efficient markets do not imply perfect markets.
- Efficiency varies across markets, securities, information types and time.
- Diversification, allocation, cost control and discipline always matter.

The question is not whether information matters — it is whether you can act on it before the price already reflects it.

Next Chapter — Chapter 9

BEHAVIORAL FINANCE AND TECHNICAL ANALYSIS

- Traditional vs behavioral finance
- Rational investor assumptions
- Limits to arbitrage
- Investor psychology
- Overconfidence
- Conservatism
- Representativeness
- Anchoring
- Confirmation bias
- Loss aversion
- Prospect theory
- Mental accounting
- Herd behavior
- Market sentiment
- Bubbles and crashes
- Behavioral explanations of anomalies
- Technical analysis
- Trends and momentum
- Moving averages
- Support and resistance
- Behavioral finance and market efficiency

THANK YOU

Questions and Discussion

Dr Abenet Yohannes, Ph.D.

Email: abenetyohannes@gmail.com

Website: abenetyohannes.com

