Executive Certificate Program in

Financial Data Analytics
&
Corporate Finance

IIM VISAKHAPATNAM

विद्या परं दैवतम्

IIM
भारतीय प्रबंध संस्थान विशाखपट्टणम
Indian Institute of Management Visakhapatnam

Program Roadmap

Module 1: Corporate Finance Fundamentals	Apr 27 - May 10
Module 2: R Programming Essentials for Financial Data Analytics	May 11 - May 18
Module 3: Applied Financial Analytics: Cross-sectional Models	May 24 - Jun 01
Module 4: Time Series Analysis and Forecasting with R	Jun 08 - Jun 15
Module 5: Investment Analysis and Financial Markets	Jun 22 - Jun 29
Module 6: Applied Corporate Finance	Jul 06 - Jul 12
Module 7: Machine Learning and AI in Finance	Jul 13 - Jul 20
Module 8: Trading Strategies and Sentiment Analysis Using R	Jul 26 - Aug 03
Module 9: Essentials of Emerging Financial Technologies and Innovations	Aug 09
Capstone Project Discussion	Aug 10
Module 10: Advanced Data Visualization and Financial Dashboarding with Power BI	Sep 6 - Sep 7
Campus Immersion	6 & 7 Sep (tentative)

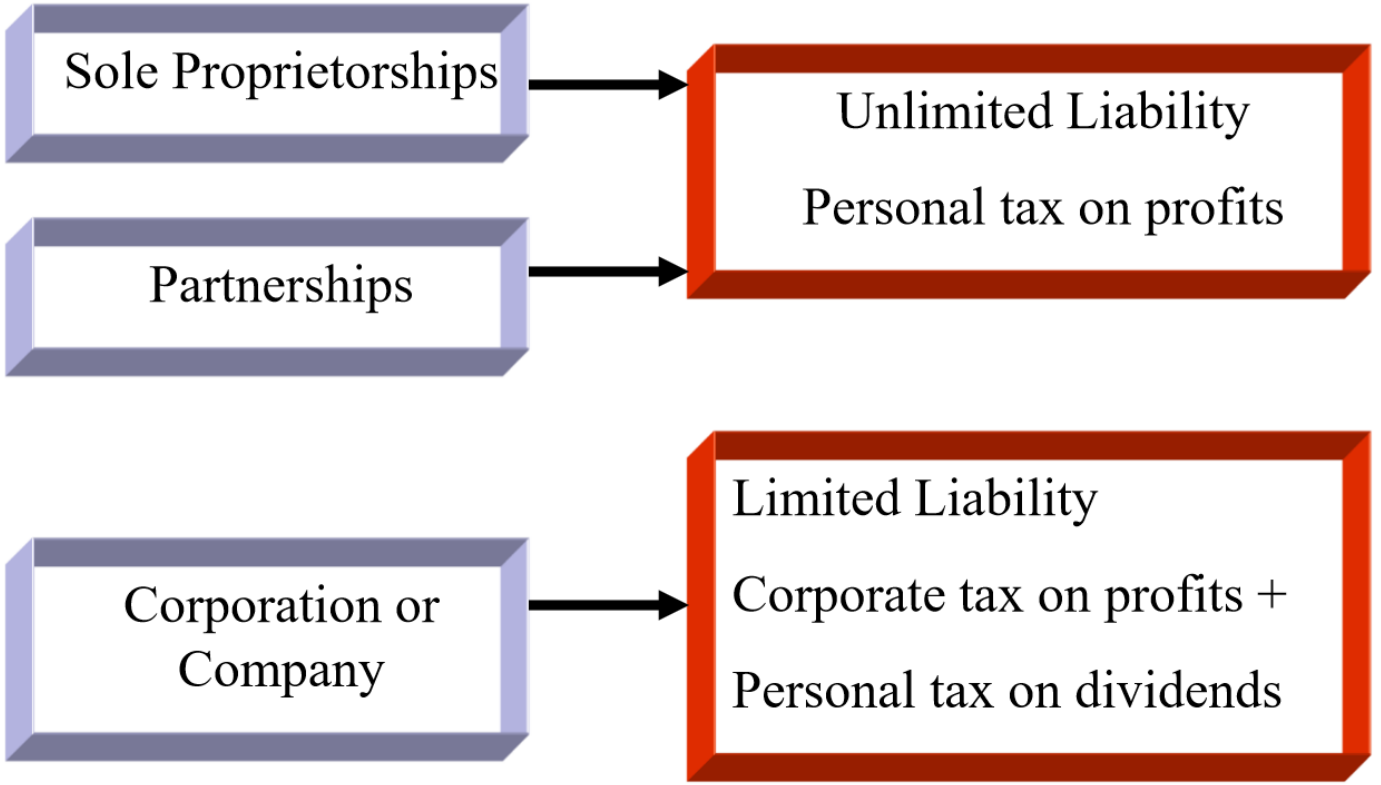
FDAC – Module 1

CORPORATE FINANCE FUNDAMENTALS

Key Topics: Module-1

Date	Time	Session Title	Facilitator(s)
27/Apr/2025	1500-1730	• Overview of Corporate Finance, Time Value of Money & Valuation Fundamentals	• Prof M Shameem Jawed
04/May/2025	1500-1730	• Financial Statements Analysis	• Prof Praveena M
10/May/2025	1500-1730	• Capital Budgeting: Principles, Tools & Techniques, Cash Flow Estimation	• Prof M Shameem Jawed

Business Structure



Key financial decisions a company makes to support its operations and growth

Investment Decision

- Purchase of real assets

Financing Decision

- Sale of financial assets

Capital Structure

- Choice between debt and equity financing

Understanding Real Assets & Financial Assets

Real Assets

- Used to produce goods and services
- Tangible, eg. Plant and machinery
- Intangible, eg. Technical expertise, brands, patents

Financial Assets/Securities

- Financial claims on income generated by firm's real assets; eg - Stocks, bonds

Corporate Investment and Financing Decisions

Capital Budgeting/Capital Expenditure (CAPEX)

- Decision to invest in tangible or intangible assets

Capital Budgeting Examples

- **Tangible Assets**
  - i.e., Expanding stores
- **Intangible Assets**
  - i.e., Research and development for new drug

Corporate Investment and Financing Decisions

Corporate Financing Decision is about **how a company chooses to fund its operations and growth**

— basically, *where the money will come from.*

Examples:

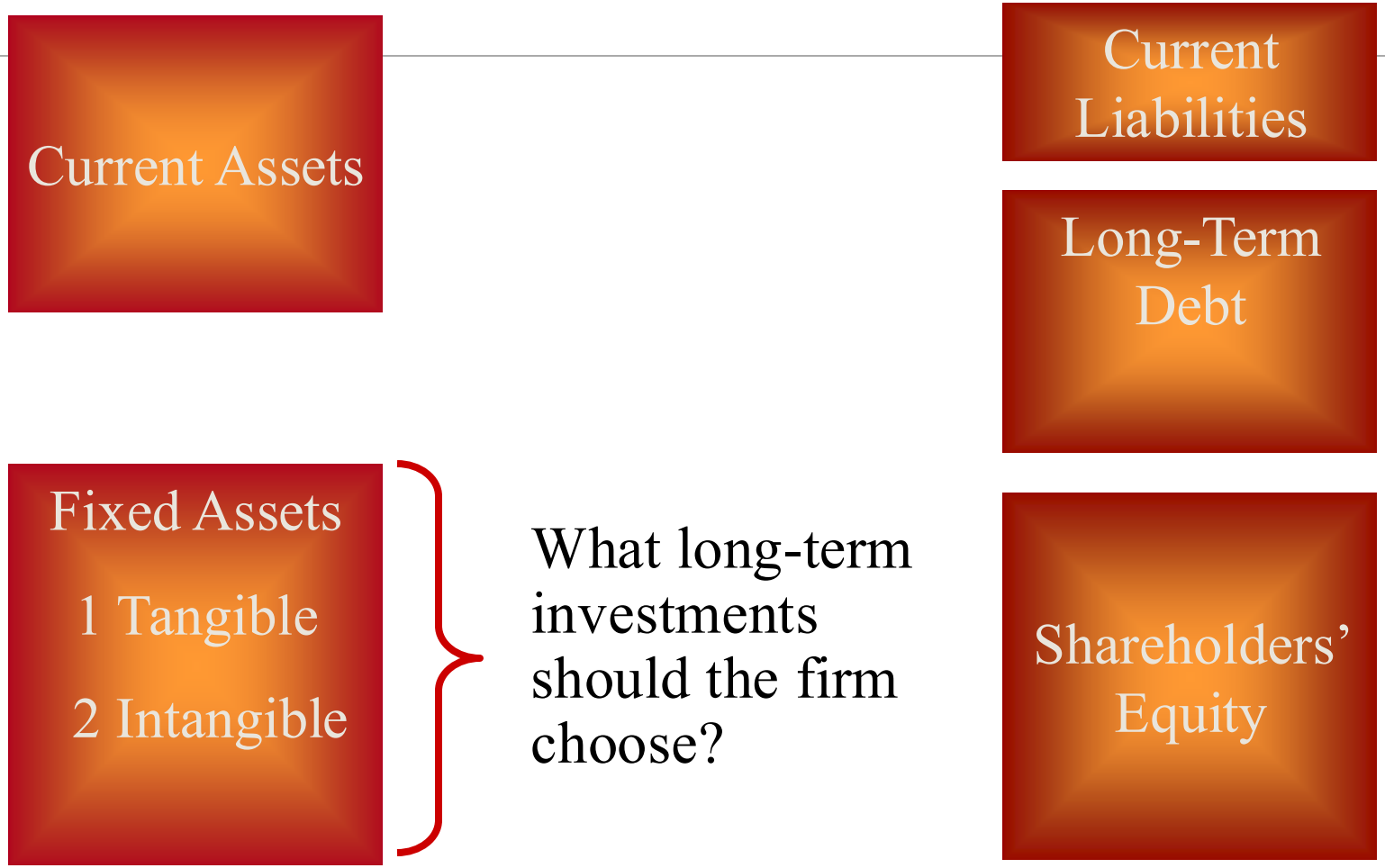
- **Equity Financing:** Raising money by selling ownership (shares)
  — no obligation to repay, but ownership is diluted.
- **Debt Financing:** Borrowing money
  — must repay with interest, but ownership stays intact.

Balance Sheet Model of the Firm

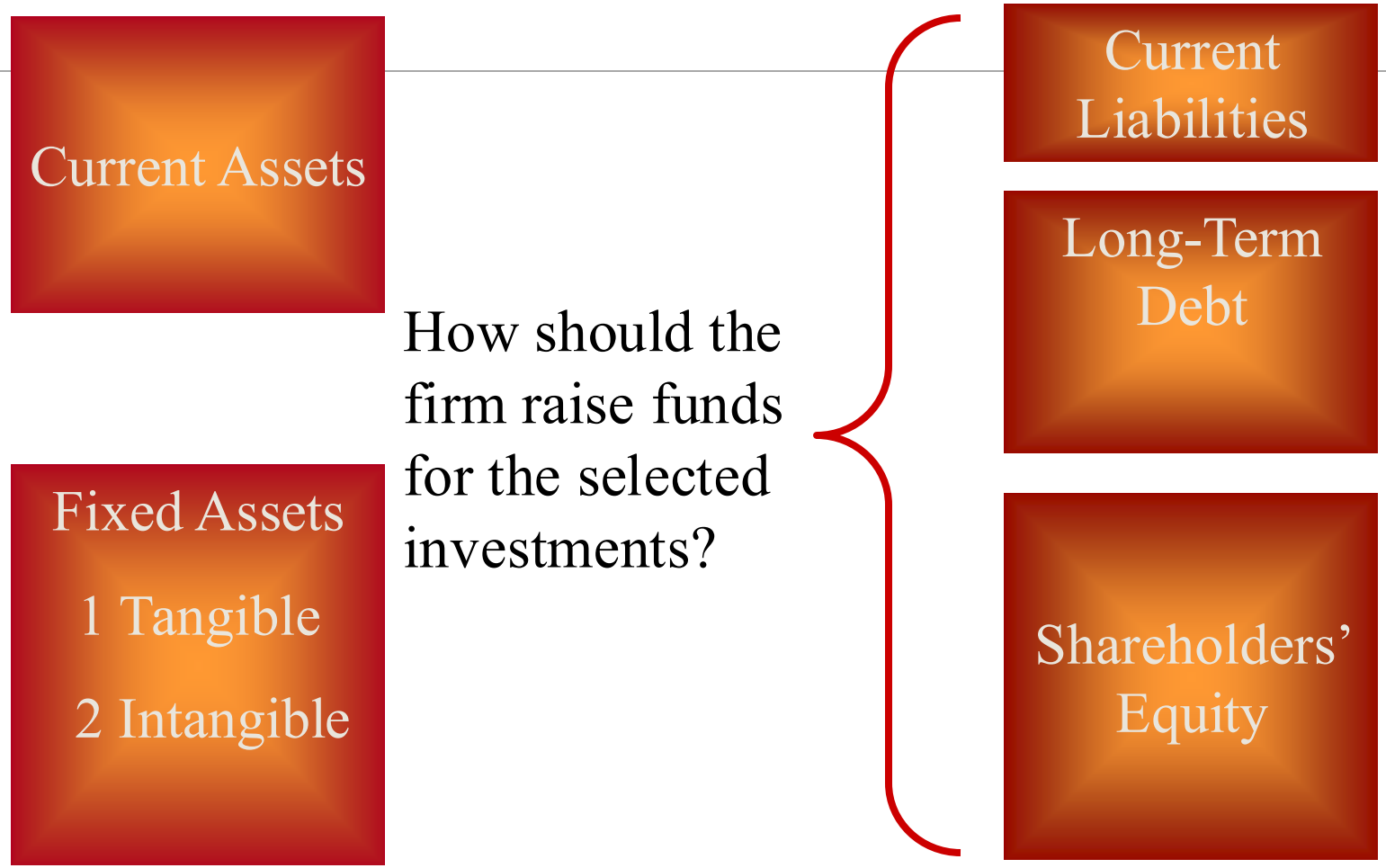
Total Value of Assets:

Total Firm Value to Investors:

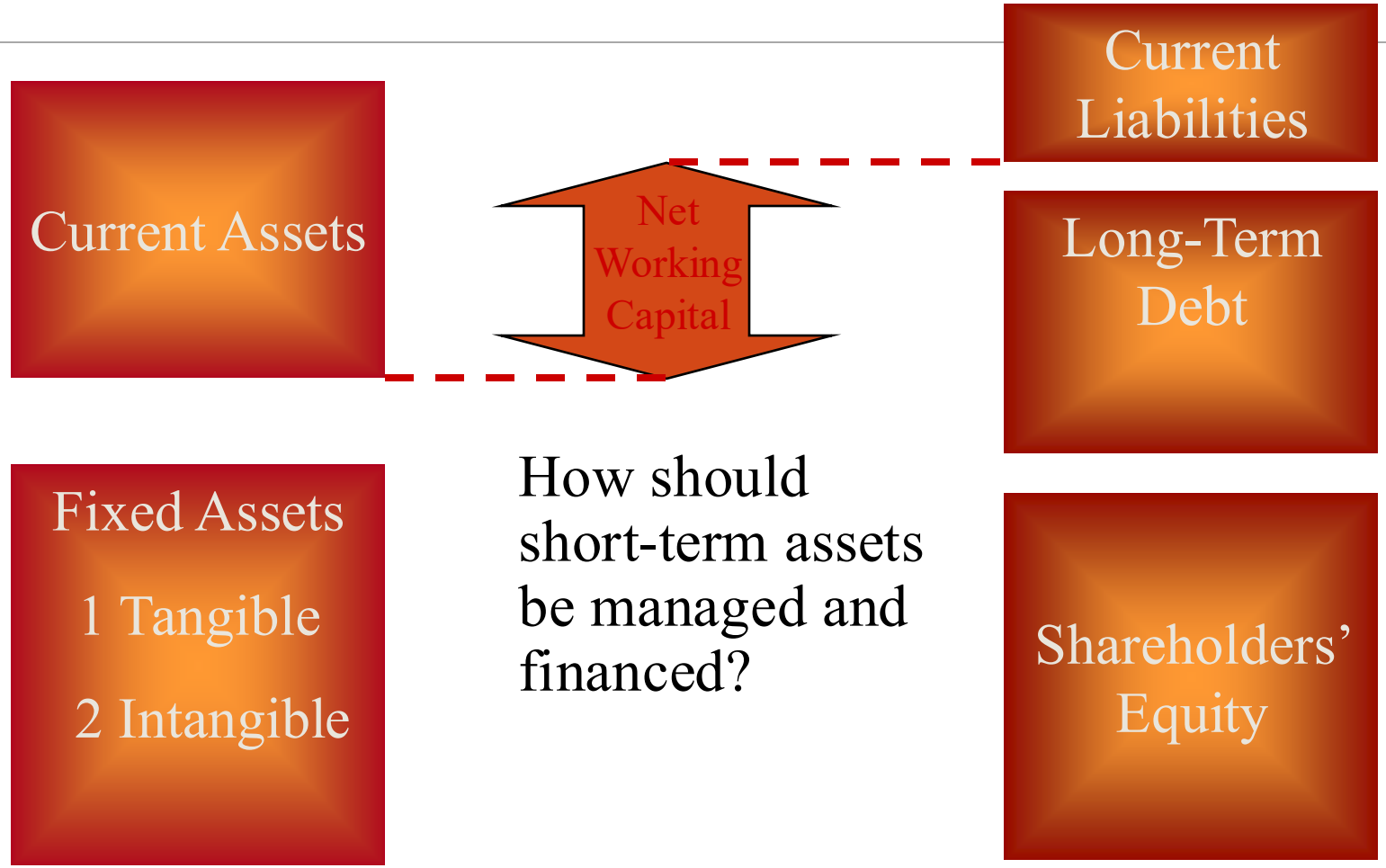
The Capital Budgeting Decision



The Capital Structure Decision



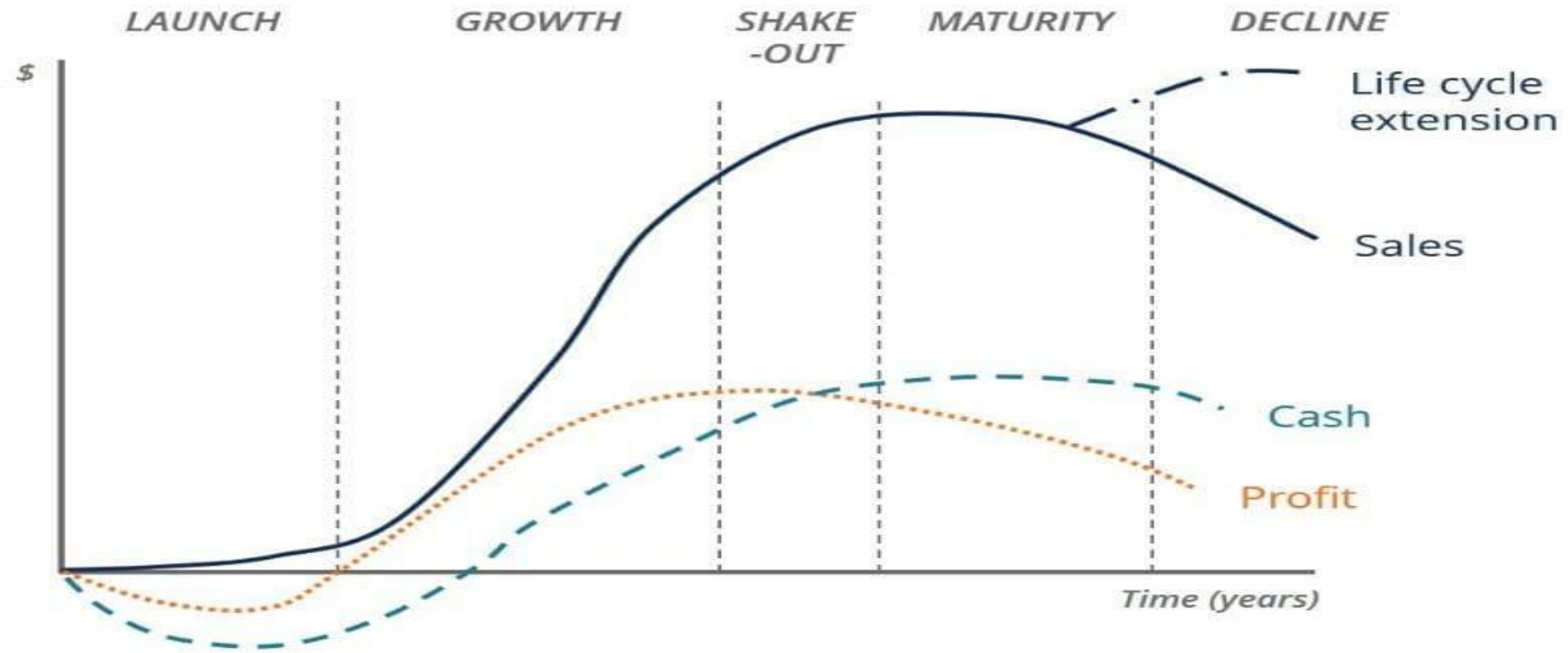
Short-Term Asset Management



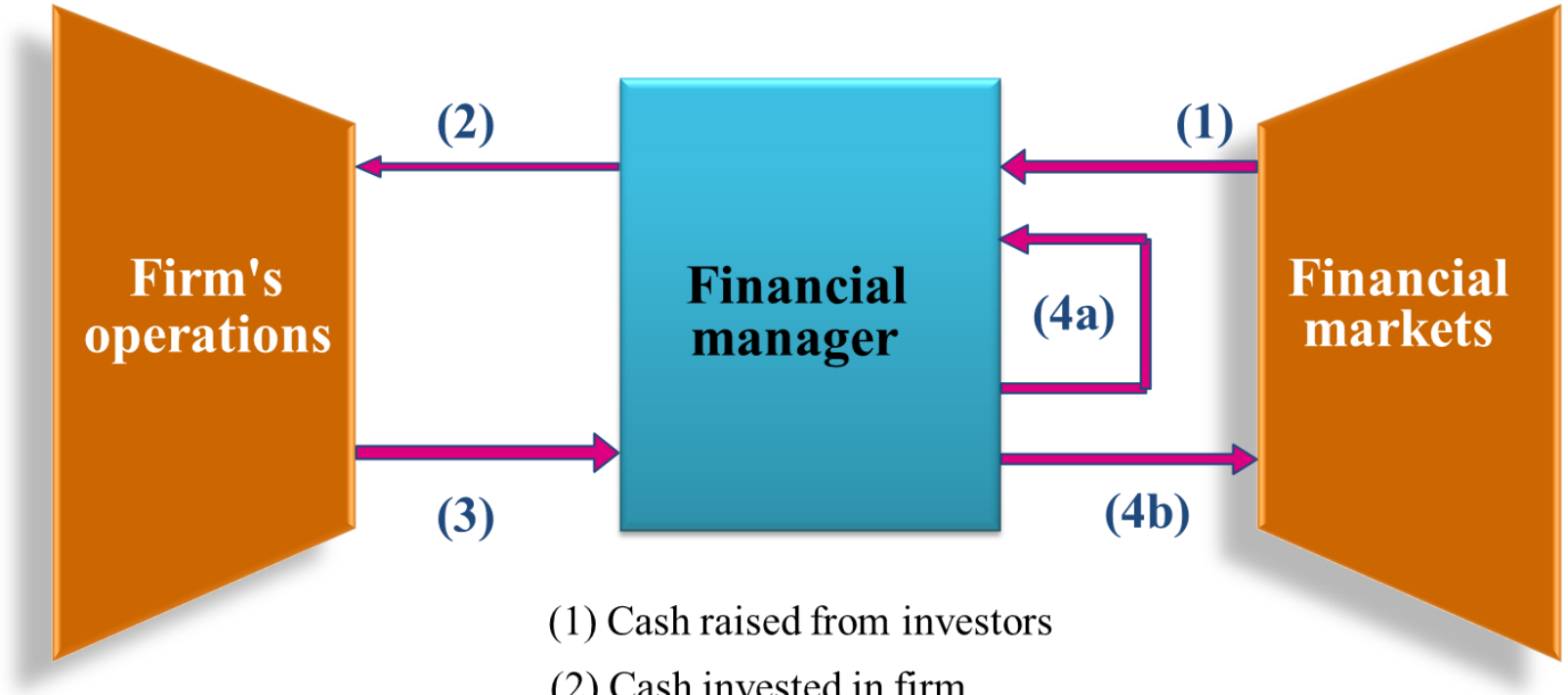
What is a Corporation?

- Legal entity, owned by shareholders
- Can make contracts, carry on business, borrow, lend, sue, and be sued
- Shareholders have limited liability and cannot be held personally responsible for corporation's debts

Life cycle of a corporation



Cash Flow between Financial Markets & Firm's Operations



(1) Cash raised from investors

(2) Cash invested in firm

(3) Cash generated by operations

(4a) Cash reinvested

(4b) Cash returned to investors

The Financial Goal of the Corporation

Stockholders Want **Three Things**

- To maximize current wealth.
- To transform wealth into most desirable time pattern of consumption.
- To manage risk characteristics of chosen consumption plan.

The Financial Goal of the Corporation

Maximize shareholder value: Is it Profit Maximization? - Not a well-defined financial objective!

- Which year's profits?
- Shareholders will not welcome higher short-term profits if long-term profits are damaged
- Company may increase future profits by cutting year's dividend, investing freed-up cash in firm
- Not in shareholders' best interest if company earns less than opportunity cost of capital

Opportunity Cost

- The return on alternative investments of similar risk
- Investing in a project means that the resources could not be used for an alternative investment and the cost associated with the foregone returns from the alternative is the opportunity cost.
- A good investment project should earn more than opportunity cost.

How is value created?

Managers need to compare the return on a project with the opportunity cost.

If the project's return is greater than the opportunity cost, the project is creating value.

Managers look to the financial markets to estimate the opportunity cost.

The Financial Goal of the Corporation

- Shareholders desire wealth maximization, but what does the managers want?
- "**Agency Problems**" represent the conflict of interest between management and owners
- Managers, acting as agents for stockholders, may act in their own interests rather than maximizing value

Agency costs are incurred when:

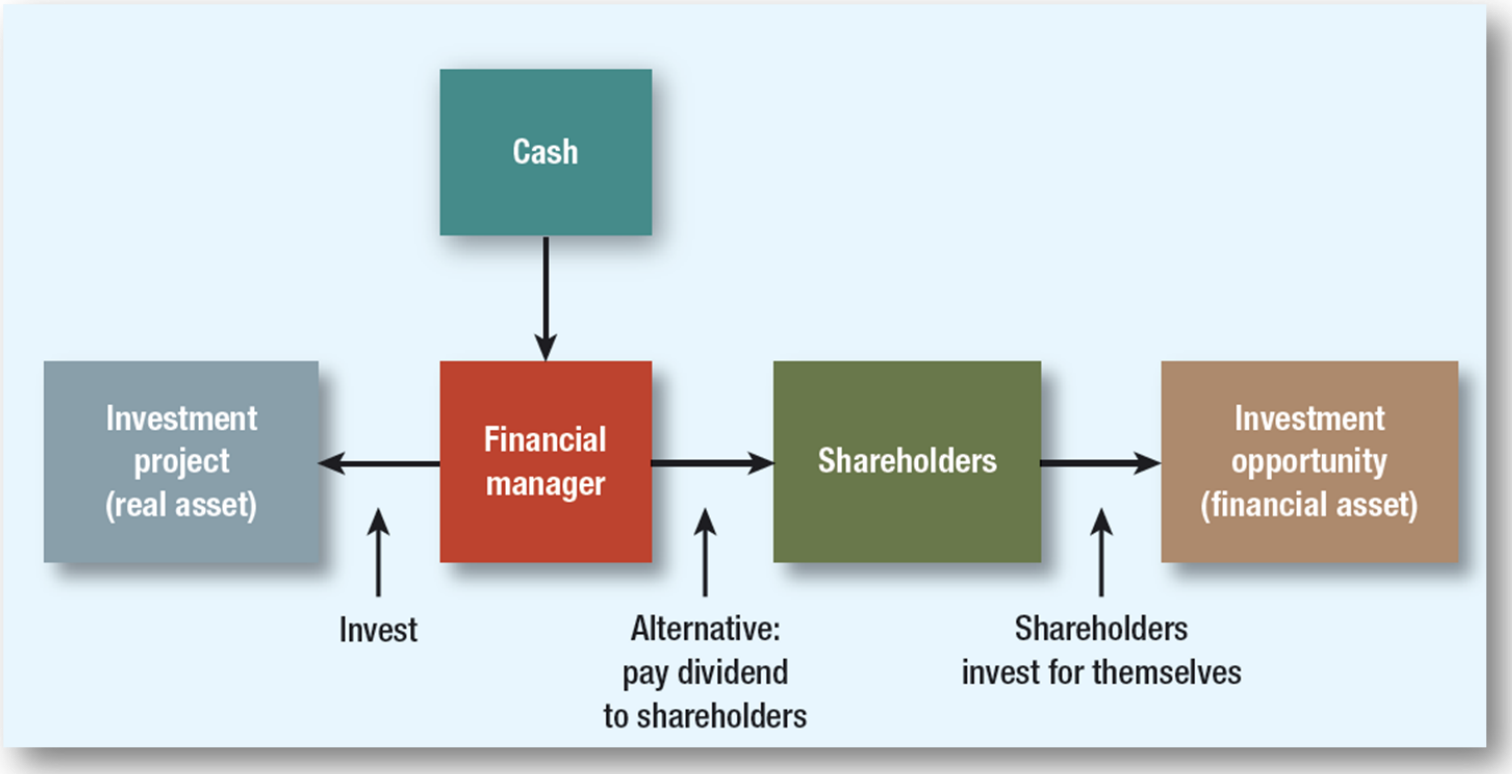
- Managers do not attempt to maximize firm value
- Shareholders incur costs to monitor managers and constrain their actions

The Financial Goal of the Corporation

The Investment Trade-off

- Hurdle Rate/Cost of Capital
  - Minimum acceptable rate of return on investment
- Opportunity Cost of Capital
  - Investing in a project eliminates other opportunities to use invested cash

The Investment Trade-off



Project A

- Year - 0: Investment of 700,000
- Year - 1: Cash Flow of 30,000
- Year – 2: Cash Flow of 30,000 & Sale at the end of year @ 840,000

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- Is this project profitable?
  - Cash Outflow (Investment) = 700,000
  - Cash Inflow = 900,000 (30,000+30,000+840,000)

Project A

- Year - 0: Investment of 700,000
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- Is this project profitable?
  - Cash Outflow (Investment) = 700,000
  - Cash Inflow = 900,000 (30,000+30,000+840,000)

- Profit = (900,000-700,000)/700,000 = **28%**

Time Value of Money

₹

A rupee today is worth more than a rupee tomorrow.

Investments in projects that are expected to generate cash flows in the future. Since the cash received at different time periods is not the same, we need a way to be able to assess their value.

How to calculate present values

Future Values and Present Values

- **Future Value**
  - Amount to which investment will grow after earning interest

- **Present Value**
  - Value today of the cash flows received in the future

The one-period case

If you were to invest $10,000 at 5-percent interest for one year, your investment would grow to $10,500.

$500 would be interest ($10,000 × .05)

$10,000 is the principal repayment ($10,000 × 1)

$10,500 is the total due. It can be calculated as:

$$\$10{,}500 = \$10{,}000 \times (1.05)$$

The total amount due at the end of the investment is call the *Future Value* (*FV*).

Future Value

In the one-period case, the formula for FV can be written as:

$$FV = C_0 \times (1 + r)$$

Where C_0 is cash flow today (time zero), and
r is the appropriate interest rate.

The Multiperiod Case

The general formula for the future value of an investment over many periods can be written as:

$$FV = C_0 \times (1 + r)^T$$

Where

C_0 is cash flow at date 0,

r is the appropriate interest rate, and

T is the number of periods over which the cash is invested.

Present Value

If you were to be promised $10,000 due in one year when interest rates are 5-percent, your investment would be worth $9,523.81 in today's dollars.

$$\$9{,}523.81 = \frac{\$10{,}000}{1.05}$$

The amount that a borrower would need to set aside today to be able to meet the promised payment of $10,000 in one year is called the *Present Value* (*PV*).

Note that $10,000 = $9,523.81×(1.05).

Present Value

In the one-period case, the formula for PV can be written as:

$$PV = \frac{C_1}{1+r}$$

- Where C_1 is cash flow at date 1, and
- r is the appropriate interest rate.

Future Values

Future Value of Rs.100 =

$$FV = `100 \times (1 + r)^t$$

Example: FV

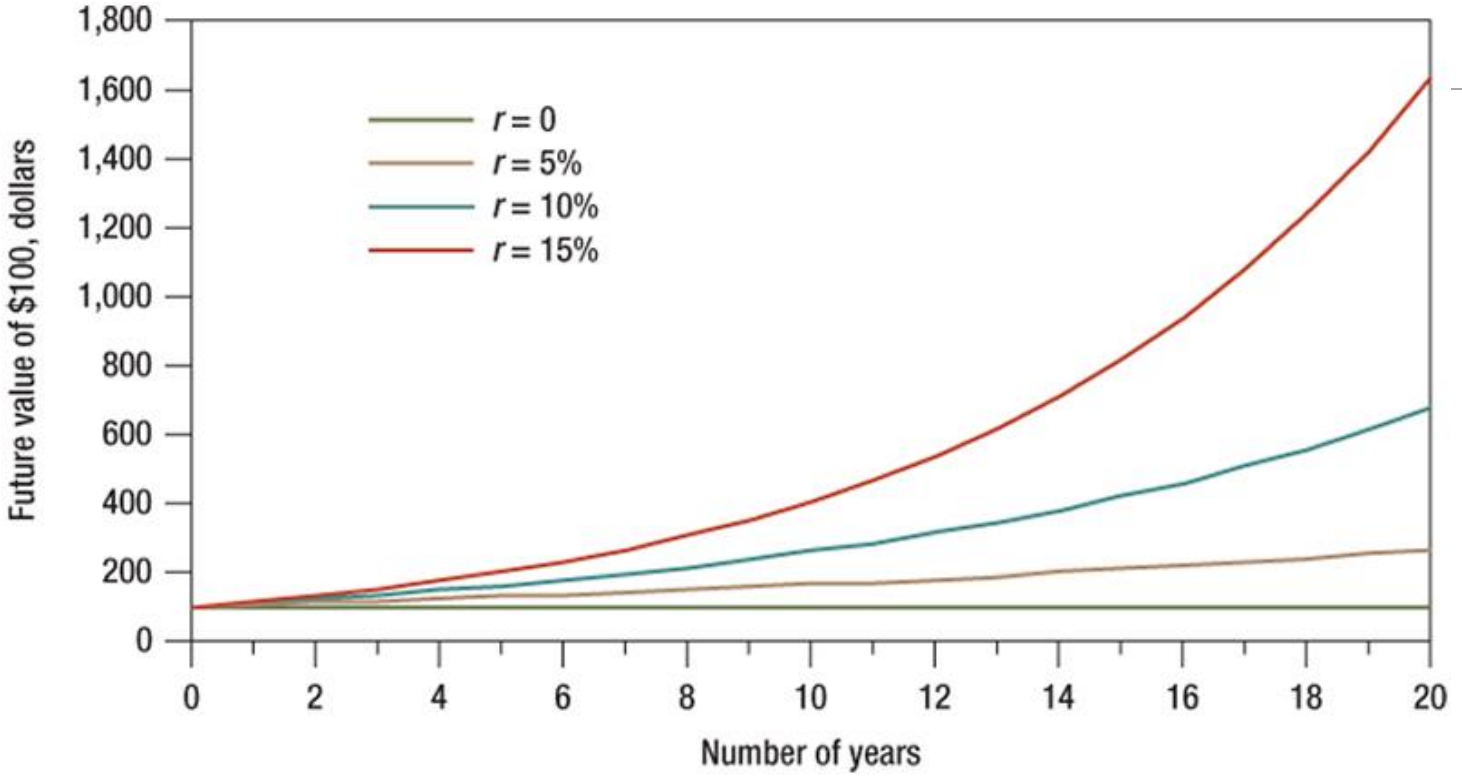
- What is the future value of Rs. 100 if interest is compounded annually at a rate of 7% for two years?

$$FV = `100 \times (1.07) \times (1.07) = `114.49$$

$$FV = `100 \times (1 + .07)^2 = `114.49$$

Time	Future Value			
	0%	5%	10%	20%
0	100	100	100	100
1	100	105	110	120
2	100	110	121	144
3	100	116	133	173
4	100	122	146	207
5	100	128	161	249
6	100	134	177	299
7	100	141	195	358
8	100	148	214	430
9	100	155	236	516
10	100	163	259	619
20	100	265	673	3834
30	100	432	1745	23738
40	100	704	4526	146977
50	100	1147	11739	910044

FV of Rs 100 earning different returns



Future Values with Compounding

Present Values

$$Present\ value = PV$$

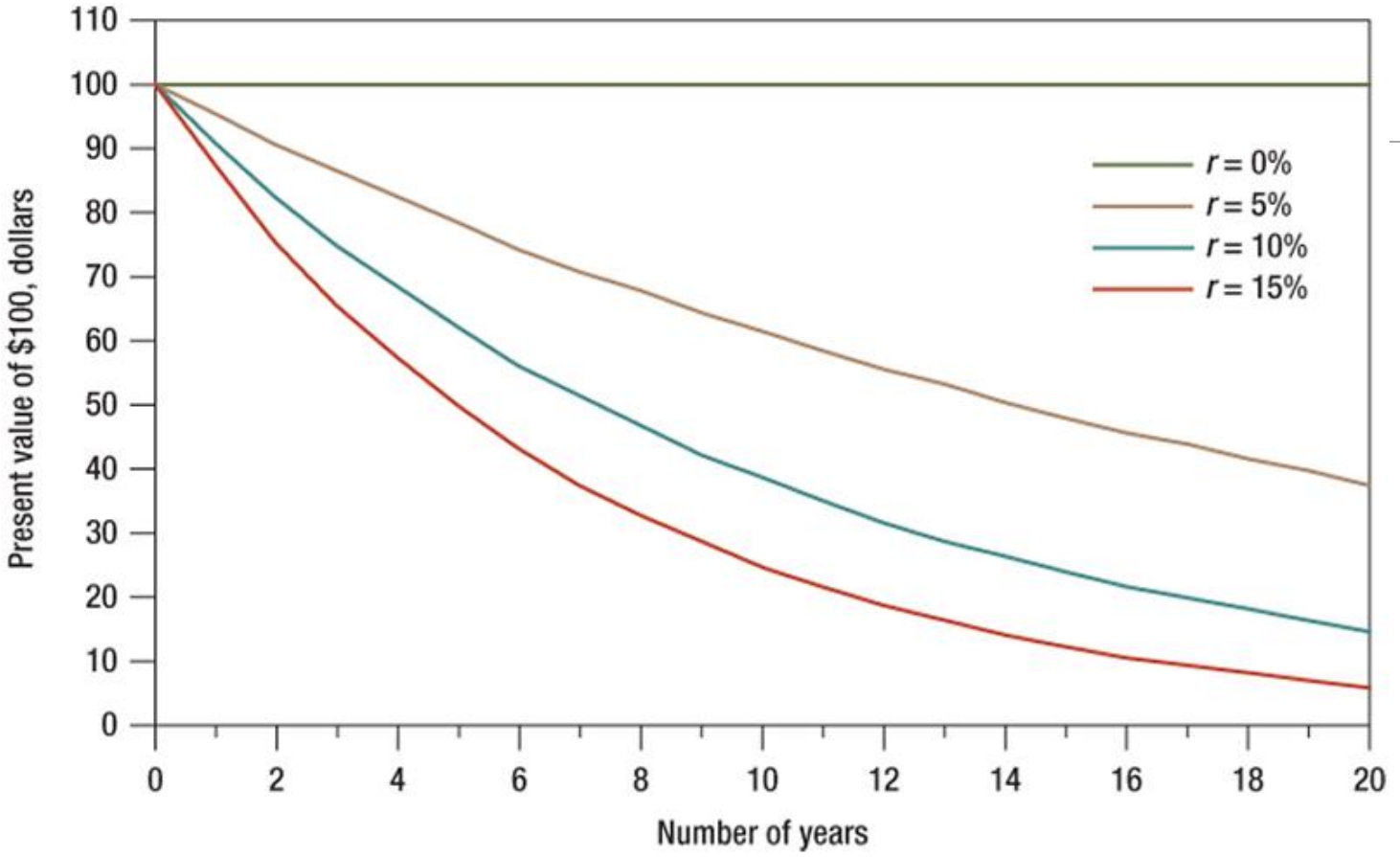
$$PV = discount\ factor\ x\ C_1$$

Future Values and Present Values

Discount factor = DF = PV of Rs. 1

$$DF = \frac{1}{(1+r)^t}$$

Discount factors can be used to compute present value of any cash flow



Present Values with Compounding

Future Values and Present Values

Valuing an Office Building

- Step 1: Forecast Cash Flows
  - Cost of building = C_0 = Rs. 700,000
  - Sale price in year 1 = C_1 = Rs. 800,000

- Step 2: Estimate Opportunity Cost of Capital
  - If equally risky investments in the capital market offer a return of 7%, then cost of capital = r = 7%

Future Values and Present Values

Valuing an Office Building

- Step 3: Discount future cash flows

$$PV = \frac{C_1}{(1+r)} = \frac{`\,800{,}000}{(1+.07)} = `\,747{,}664$$

- Step 4: Go ahead if PV of payoff exceeds investment

$$NPV = `\,747{,}664 - `\,700{,}000$$

$$= `\,47{,}664$$

Future Values and Present Values

Net Present Value

$$\text{NPV} = \text{PV} - \text{required investment}$$

$$\text{NPV} = C_0 + \frac{C_1}{1 + r}$$

Future Values and Present Values

Risk and Present Value

- A safe rupee is more valuable than a risky rupee
- Higher risk projects require a higher rate of return
- Higher required rates of return cause lower PVs

PV of C_1 = 800,000 at 12%

$$PV = \frac{800{,}000}{1.12} = 714{,}286$$

Future Values and Present Values

Net Present Value Rule

- Accept investments that have positive net present value
- NPV = PV(cash inflows) – PV(investments OR cash outflows)
- Using the original example: Should one accept the project given a 10% expected return?

$$NPV = -` 700{,}000 + \frac{\$800{,}000}{1.1} = ` 27{,}273$$

Future Values and Present Values

Rate of Return Rule

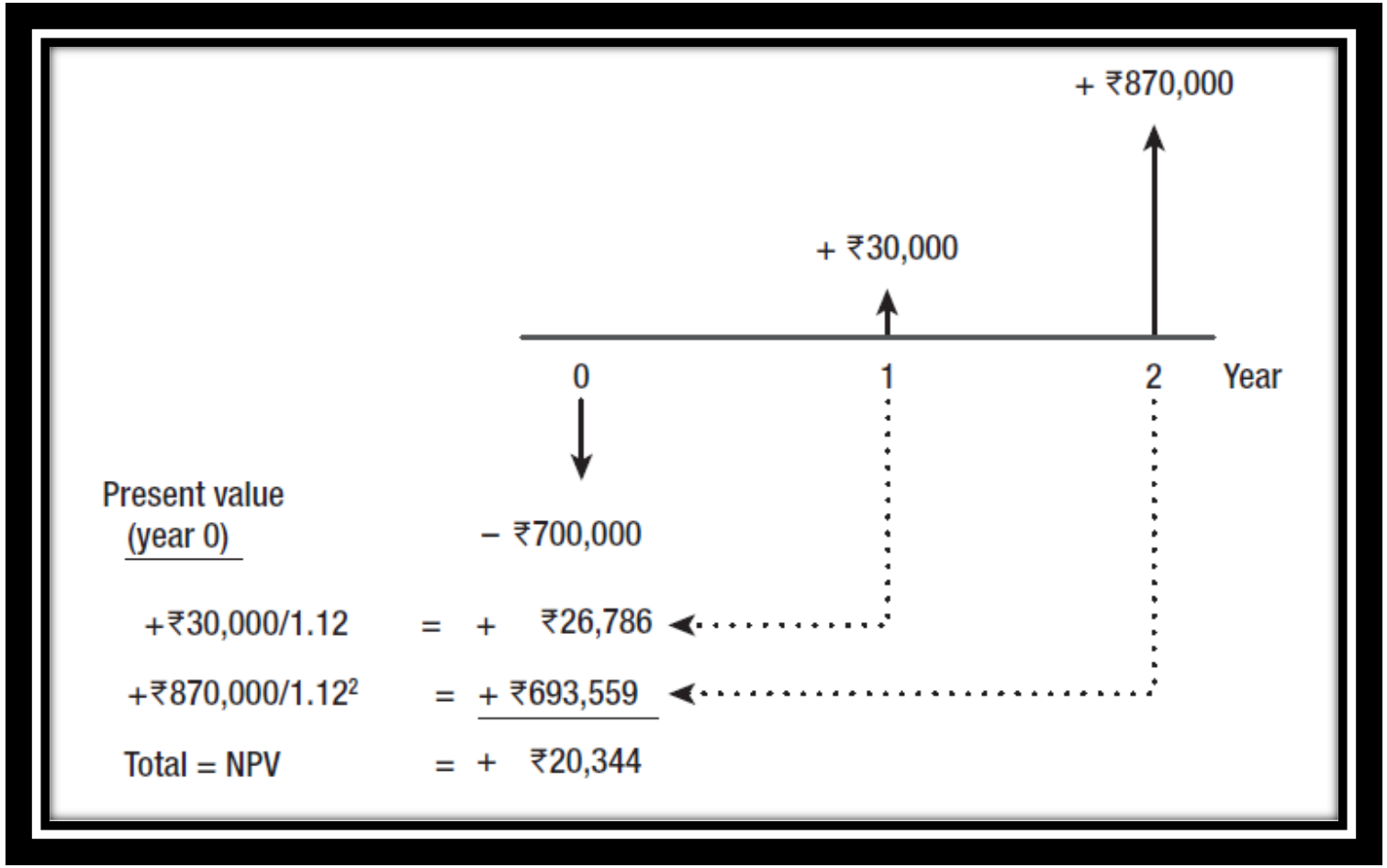
- Accept investments that offer rates of return in excess of their opportunity cost of capital
- In the project listed below, the opportunity cost of capital is 12%. Is the project a wise investment?

$$\text{Return} = \frac{\text{profit}}{\text{investment}} = \frac{\text{`}800,000 - \text{`}700,000}{\text{`}700,000} = .143, \text{ or } 14.3\%$$

Net Present Values

Now, let's say the building can be sold after 2 years for $840,000 but you will earn $30,000 in year 1 and 2.

How does it affect the NPV of the project if opportunity cost is 12%?



Future Values and Present Values

Multiple Cash Flows

- Discounted Cash Flow (DCF) formula:

$$\mathrm{PV}_0 = \frac{C_1}{(1+r)^1} + \frac{C_2}{(1+r)^2} + \ldots. + \frac{C_t}{(1+r)^t}$$

$$\mathrm{NPV}_0 = C_0 + \sum_{t=1}^{T} \frac{C_t}{(1+r)^t}$$

Net Present Value

The Net Present Value (*NPV*) of an investment is the present value of the expected cash flows, less the cost of the investment.

Suppose an investment that promises to pay $10,000 in one year is offered for sale for $9,500. Your interest rate is 5%. Should you buy?

$$NPV = -\$9{,}500 + \frac{\$10{,}000}{1.05}$$

$$NPV = -\$9{,}500 + \$9{,}523.81$$

$$NPV = \$23.81$$

If we had *not* undertaken the positive *NPV* project considered on the last slide, and instead invested our $9,500 elsewhere at 5 percent, our *FV* would be less than the $10,000 the investment promised, and we would be worse off in *FV* terms :

$$\$9{,}500 \times (1.05) = \$9{,}975 < \$10{,}000$$

Future Value

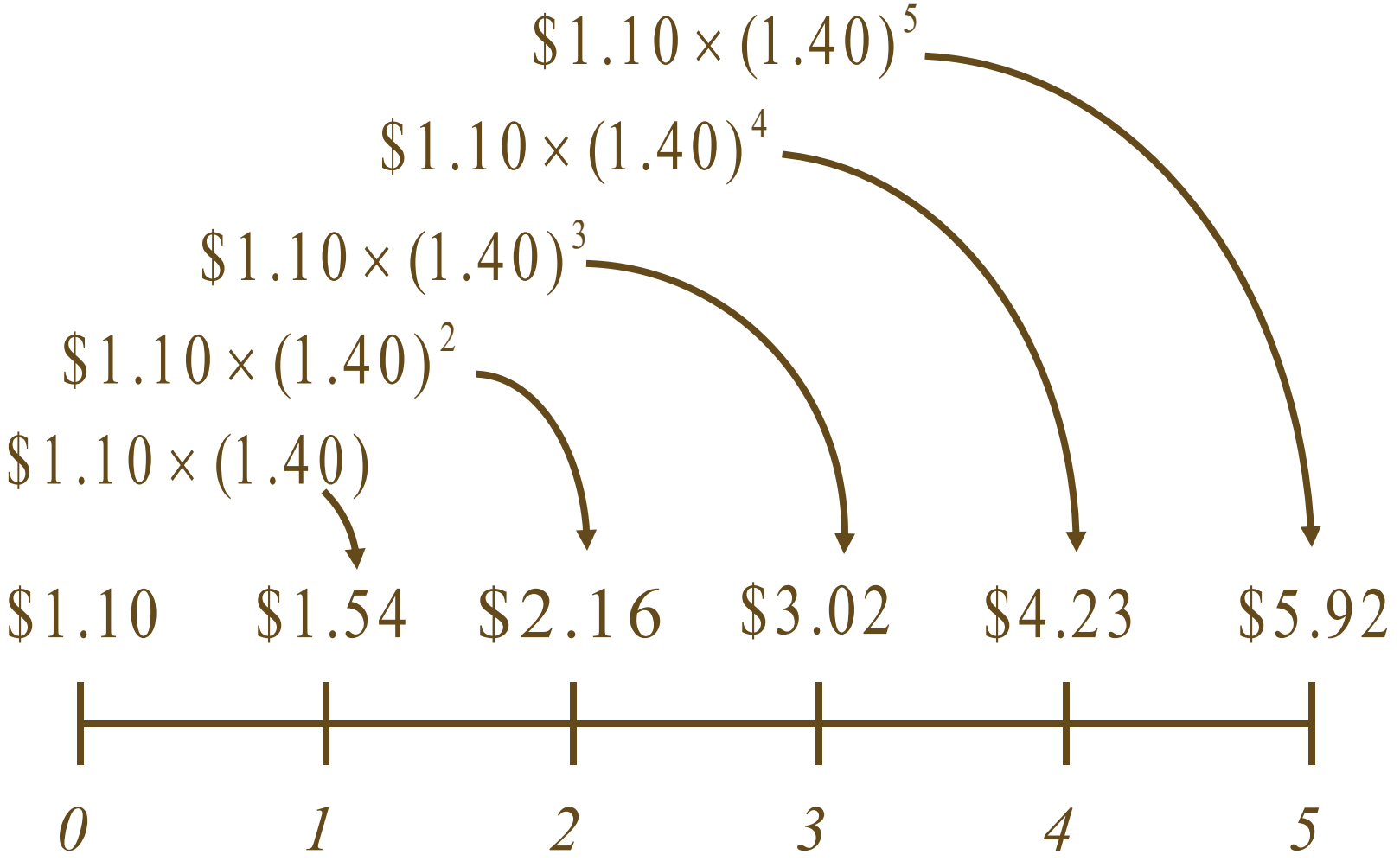
Suppose a stock currently pays a dividend of $1.10, which is expected to grow at 40% per year for the next five years.

What will the dividend be in five years?

$$FV = C_0 \times (1 + r)^T$$

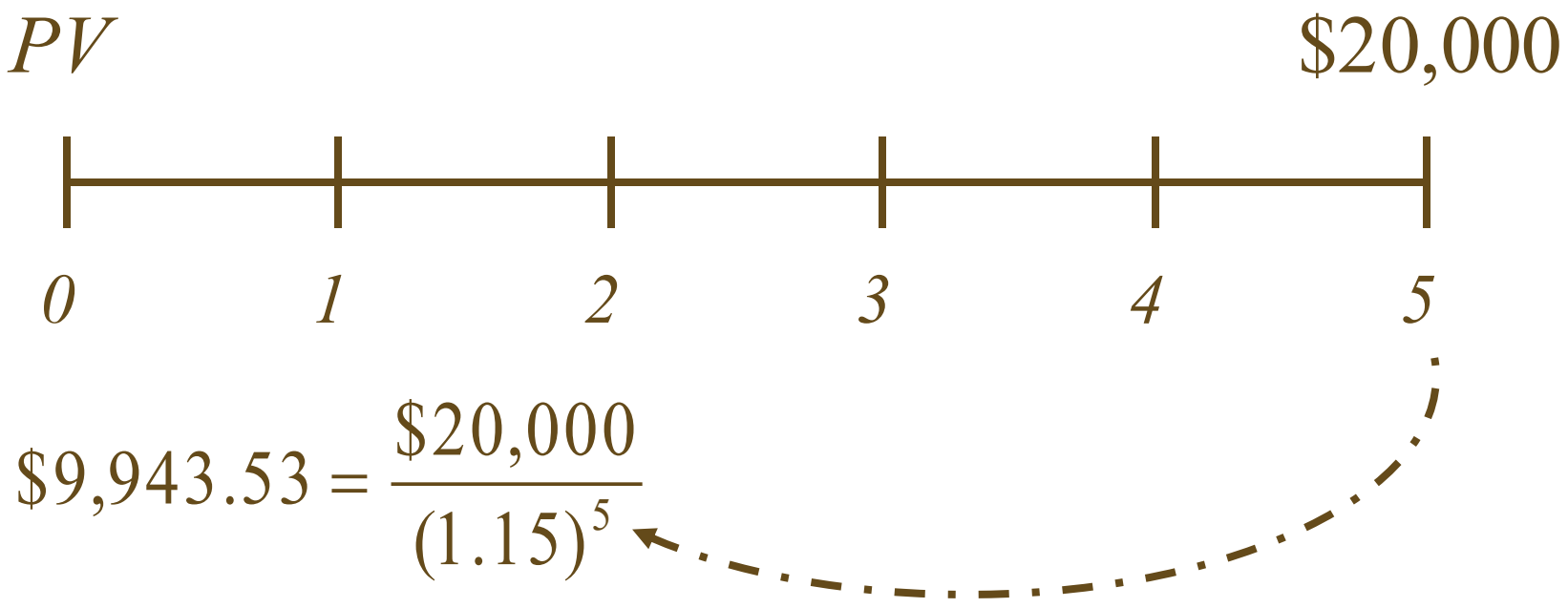
$$\$5.92 = \$1.10 \times (1.40)^5$$

Future Value and Compounding



Present Value and Discounting

How much would an investor have to set aside today in order to have $20,000 five years from now if the current rate is 15%?



Finding the Number of Periods

If we deposit $5,000 today in an account paying 10%, how long does it take to grow to $10,000?

$$FV = C_0 \times (1+r)^T \qquad \$10{,}000 = \$5{,}000 \times (1.10)^T$$

$$(1.10)^T = \frac{\$10{,}000}{\$5{,}000} = 2$$

$$\ln(1.10)^T = \ln(2)$$

$$T = \frac{\ln(2)}{\ln(1.10)} = \frac{0.6931}{0.0953} = 7.27 \text{ years}$$

Multiple Cash Flows

Consider an investment that pays $200 one year from now, with cash flows increasing by $200 per year through year 4.

If the interest rate is 12%, what is the present value of this stream of cash flows?

If the issuer offers this investment for $1,500, should you purchase it?

PV = 1432.93

Present Value < Cost → Do Not Purchase