



Economics II

(a Non-Economist's views)

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Measures of Wealth

- $\text{GDP} = \text{consumption} + (\text{capital}) \text{ investment} + \text{exports} - \text{imports}$
[final goods and services only]
- $\text{GNP} = \text{includes net income from abroad}$
- $\text{NNP} = \text{GNP} - \text{Depreciation of Capital}$
- $\text{Green NNP} = \text{GNP} - \text{Depreciation of Produced Assets} - \text{Depletion of Natural Resources}$
- $\text{Genuine Savings} = \text{Production} - \text{Consumption} - \text{Depreciation of Produced Assets} - \text{Depletion of Natural Assets}$
 - (Also takes out net borrowings)

Issues of sustainability are outside typical economic metrics

- But, what is expenditure on education?
 - Consumption, *or*
 - Investment into the future

Microeconomics

- Where does it apply?
- What are its fundamentals?
- What are its components?
- What are its limits and shortcomings?
- Individual, selfish actors
- Markets, competition, information
- Supply, Demand, Price (latter signals behavior)
- Assumes efficient markets, no externalities, market-clearing prices, etc.

A firm (or individual, *rational* actor) usually deals with microeconomics

What does a market need?

- Perfect information
- No barriers to entry
 - I.e., meaningful competition
 - What are examples (modes) of barriers to competition?
- No externalities
- Markets are meant to be efficient, not equitable

Well Functioning Markets = Competitive

- Leads to efficiency
- So, why does an iPod Nano cost \$149 or \$199? (4 GB and 8 GB, respectively, 9/18/07)
 - What do you think it costs them to make these?
- Aren't companies/entities not supposed to earn super-normal profits?
 - Theory would say no earning profits beyond costs of capital
- Successful products need a large *ecosystem* around them
- Conversely, an individual product has its own lifecycle of costs and human impact

Bill of Materials – iPod Nano

Direct materials cost estimate of the new iPod nanos (US\$)*

Component	4GB	8GB
Flash memory	\$24.00	\$48.00
Display	\$10.60	\$10.60
Core video processor/microprocessor	\$8.60	\$8.60
Electro mechanicals	\$2.44	\$2.44
SDRAM	\$2.72	\$2.72
Mechanicals	\$2.33	\$2.33
Misc. components	\$2.25	\$2.25
battery	\$1.40	\$1.40
Power management IC	\$1.38	\$1.38
Video driver	\$0.85	\$0.85
CODEC	\$0.90	\$0.90
Mixed signal array / Touch wheel controller	\$0.65	\$0.65
Buck regulators	\$0.15	\$0.15
Utility flash memory	\$0.59	\$0.59
Subtotal	\$58.85	\$82.85

Source: iSuppli (2007)

Costs vs. Prices

- They are not the same!!
- Profit margins vary
 - Long-run and short-run marginal costs differ
 - Bill of materials (BOM) excludes R&D, software, etc.
 - BOM also excludes marketing and other soft costs
- Consider WiFi Phones
 - Isn't the BOM very low?
 - Why hasn't this become the norm yet?

Profits – Good or Bad?

- Isn't this an inherent tension:
 - o Profits vs. affordability?
 - o Economies of scale or volume could allow both
- Profits are a necessary thing
 - o Spur investment, growth, etc.
 - o We'll study profits and economic sustainability/viability shortly

Macroeconomics

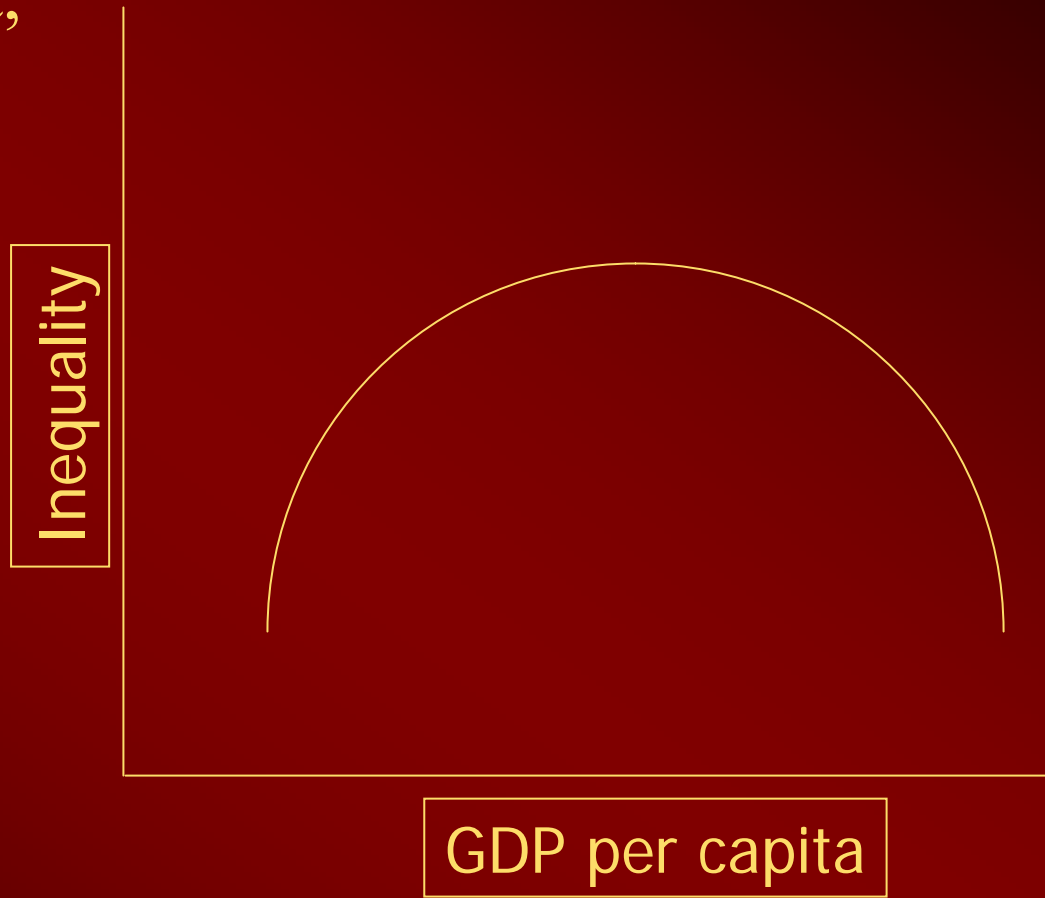
- Study of the overall economy, including overall production, supply, prices, employment, etc.
 - Includes currency, taxes, monetary policy, etc.
 - Domain including policy interventions
- (Beyond the scope of this course to discuss these issues in depth)
- Development linkages
 - Trade
 - Tariffs
 - Exchange rates

Some other issues with Economic metrics

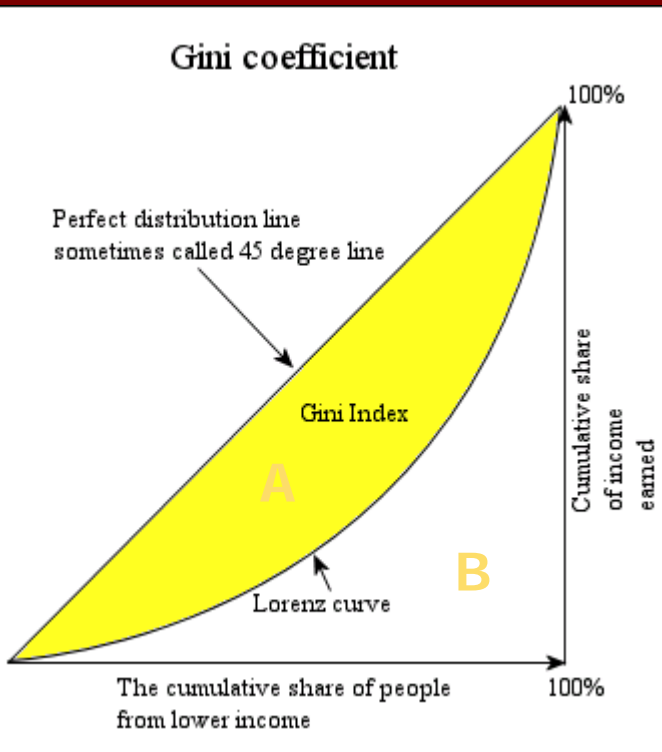
- Information asymmetry and inaccuracy
- Non-monetary transactions
 - Black economy
- Models apply only at the margin (e.g., elasticity)
 - Under equilibrium conditions
 - Mean vs. median issues
- What am I spending money on?
 - Goods versus services (different accounting)
 - What is hardware vs. software
- Time spent on different activities
 - Himachal Pradesh (India) gives an interesting example
 - Schooling vs. gathering wood and water

Kuznet's Curve

- Using cross-country data, Kuznet postulated inequality grows and then decreases over time
- Has been applied to environmental degradation as well
- Criticisms
 - Used cross-sectional data across countries, instead of time-series
- More equitable trajectories possible?



Gini Coefficient



Measure of attribute distribution
vs. population = $A/(A+B)$

■ *Criticisms*

- Data issues (not unique to Gini)
- Granularity (sample size/geography; data steps)

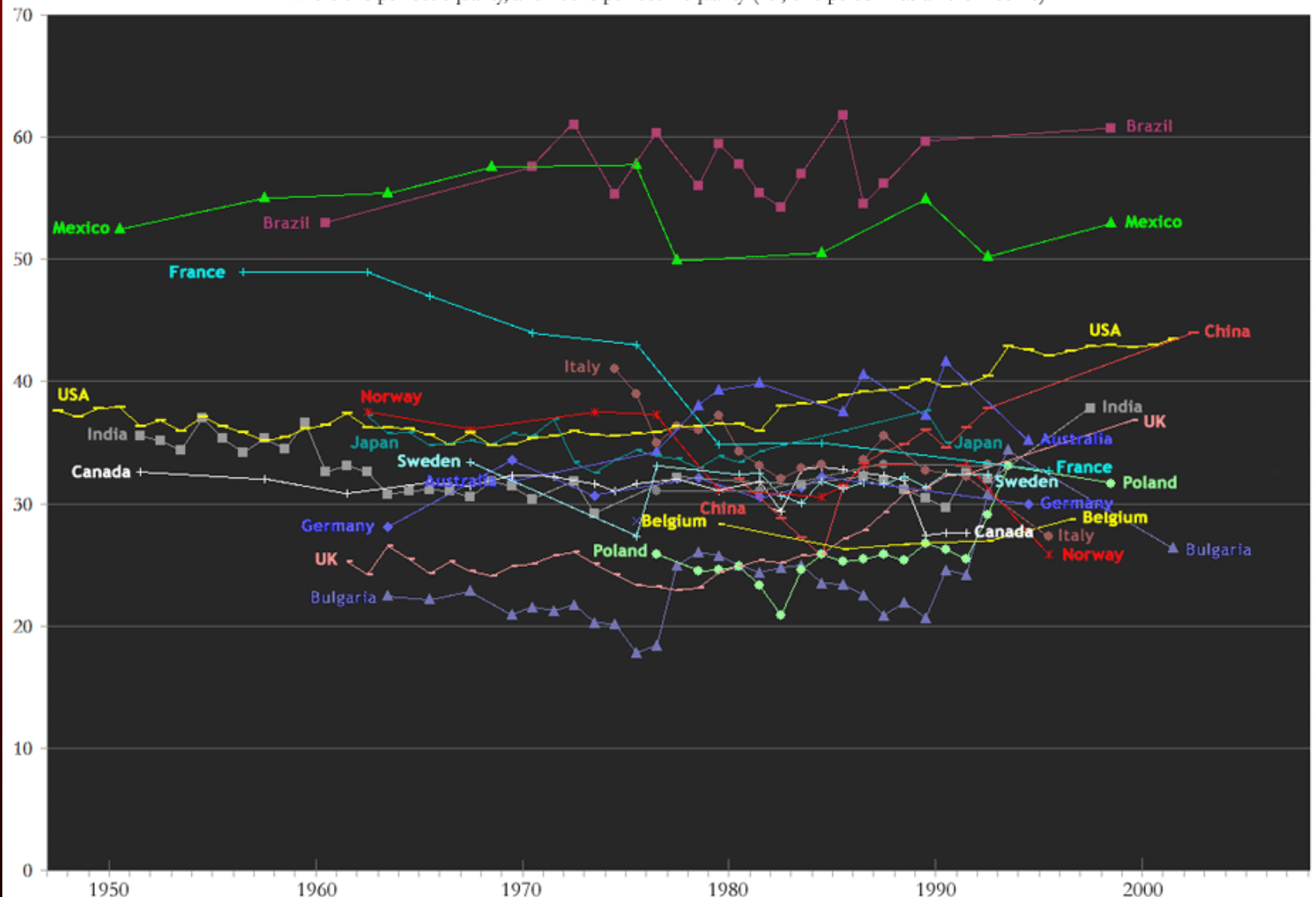
■ Households vs. individuals differ

- E.g., poorer families may have 2 earners

Gini Coefficients over Time

Income Disparity since World War II – the Gini Index

where 0 is perfect equality, and 100 is perfect inequality (i.e., one person has all the income)



Rest of the world

- Why is such data limited in value for many developing countries?
 - Non-monetary expenditures
 - Wide variance between very poor and super rich
- What expenditures are public vs. private?
 - Education
 - Infrastructure (water, electricity, etc.)
 - Exit strategies ... can lead to vicious cycles
- Can we assume developing countries will follow similar trajectories as developed?

Jobs and Developing Countries

- Job creation
 - Sharing vs. growing the pie
 - Changes in jobs
 - Fraction in agriculture
 - Globalization
 - Changes in demographics
- How do you grow jobs?
 - Small enterprises
 - Entrepreneurship
- Role of Competition is important
 - Globalization means competition is not just domestic, e.g., WTO obligations

Developing Country Issues

- Higher risk perceived in developing countries
- Lack of insurance schemes
 - Social Security, farmers, etc.
- Credit is expensive
 - Cell phones example – innovation beyond technology
 - Prepaid
 - Reduces distances
 - » Scratch cards for bribes!
 - Low-cost banking
 - Kiosks are inevitable for interfacing
 - Q: What is the biggest bank in India?

Switching Gears...



Project (Techno-economic) Evaluation

- If I'm an entrepreneur, how do I know a particular idea is worthwhile?
 - Cynical answer – doesn't matter, just need someone to fund me!
 - That is a venture capital worldview (think dot.coms)
 - Not true if we're taking out a loan
 - *What's the difference between debt (loans) and equity?*

Project Valuation

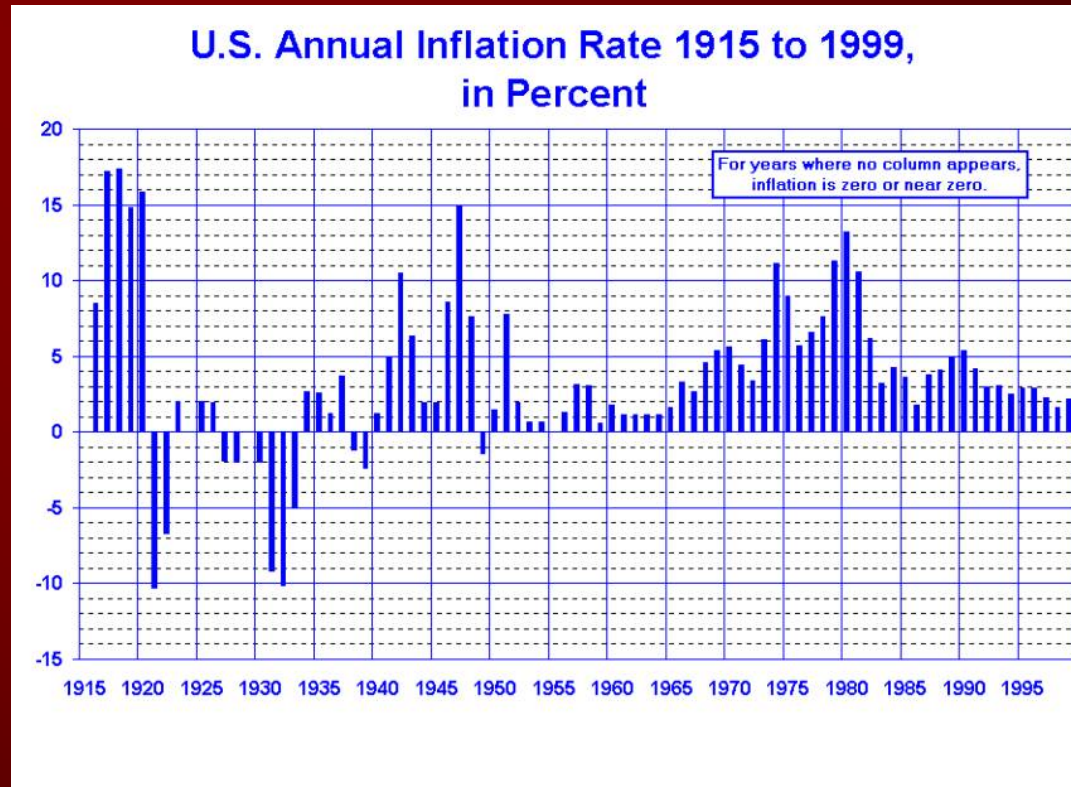
- Is this worth it?
- What are my alternatives?
- Risk-return tradeoff
 - More risk, higher *expected* return
 - Bond ratings
 - Country risks
 - Currency exchange rates
 - Nationalization
 - Regulation
 - Large projects involve sophisticated financial instruments, such as options, derivatives, hedges, etc.

Time Value of Money

- **Discount Rate**
 - Personal, Market, Societal
 - Borrowing \neq Lending rate
 - Inflation (real vs. nominal)
 - Opportunity Cost
- **Cost of Capital**
 - Debt
 - Equity (“riskier”)
 - In the absence of “distortions” (e.g., taxes), ratio shouldn’t matter – it is the project cash flows that matter

- **Inflation**

- Consumer Prices Index (CPI), Wholesale Price Index (WPI), Prime

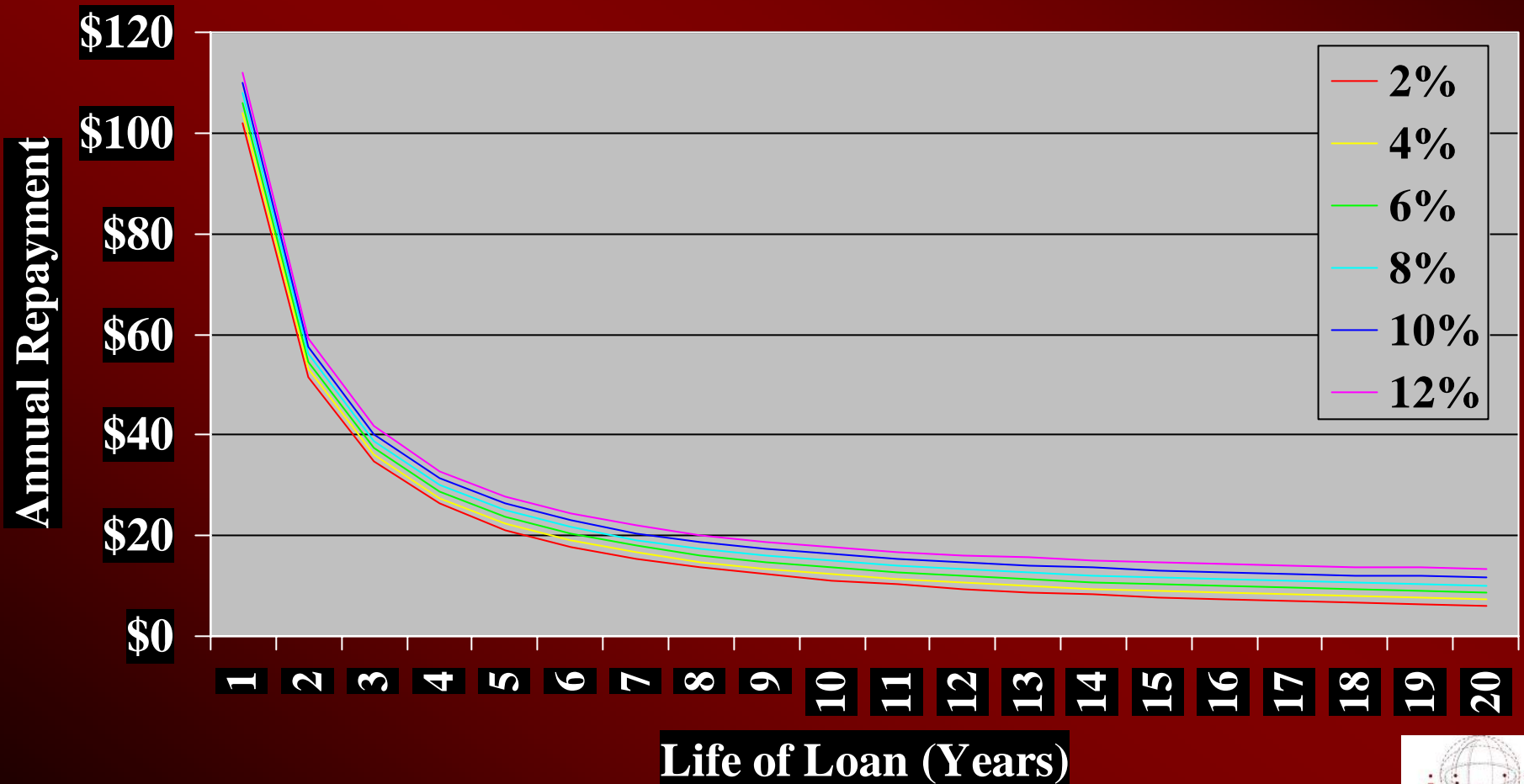


Calculations – Project Valuation

- **Simplification**
 - Assume ‘r’ is the discount rate
 - ‘N’ is the number of periods (e.g., years)
 - $n = 0, 1, 2, \dots, N$ ($n=0$ means now)
- **Time Value of Money**
 - $\text{Value}_{\text{final}} = \text{Value}_{\text{init}} \times (1 + r)^{\Delta n}$
 - Leads to compounding effects
- **Say I borrow \$100 @ 5% p.a.**
 - If I can earn \$6/yr from this, is that enough?

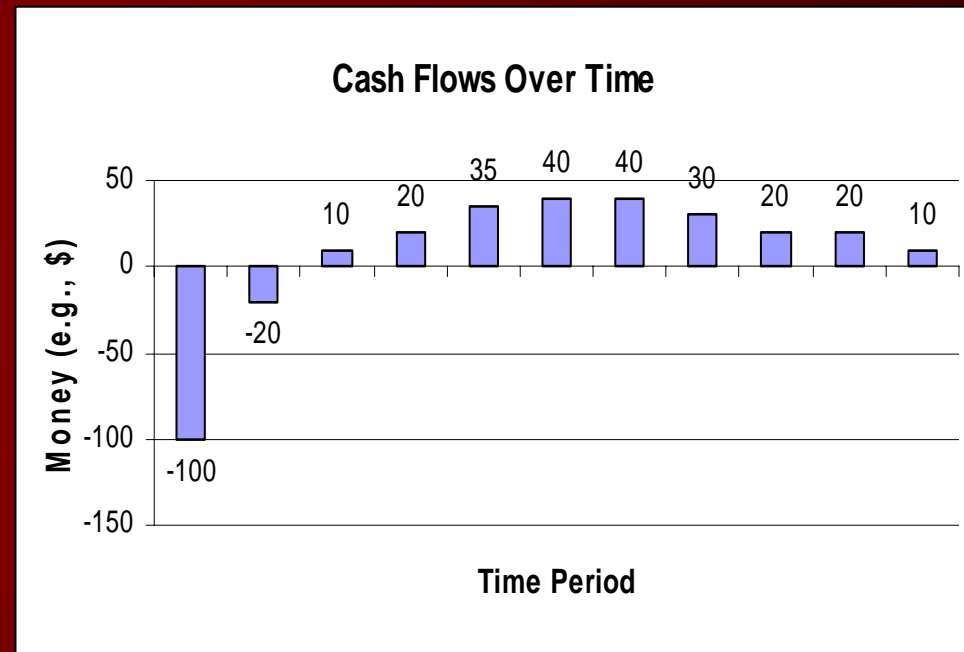
What about principal repayment?

Repayment of \$100 Loan



Project Cash Flows

- (Raw $\Sigma = 105$ net)
- But: time value of money?
- *Net Present Value (NPV)*
 - Convert all future values to present values using chosen rate 'r'
 - Add them up
 - If $NPV > 0$, it is a worthwhile project
 - Answer depends on the discount rate



Internal Rate of Return (IRR)

- Alternative technique to valuation
- Defined as that discount rate such that $NPV = 0$
 - Previous example, $IRR = 12.3\%$
 - Sounds simple
- Complexity
 - Shape of cash flows matters – only useful when cash flows are simple
 - Can have 2+ IRRs (!)
 - Best to choose the “appropriate” discount rate and perform NPV calculations