Capital, Consumption and Investment

Copeland, Thomas E. and J. Fred Weston, Financial Theory and Corporate Policy (4th ed), Addison-Wesley, 2005: Ch1 (pp 1 -11)

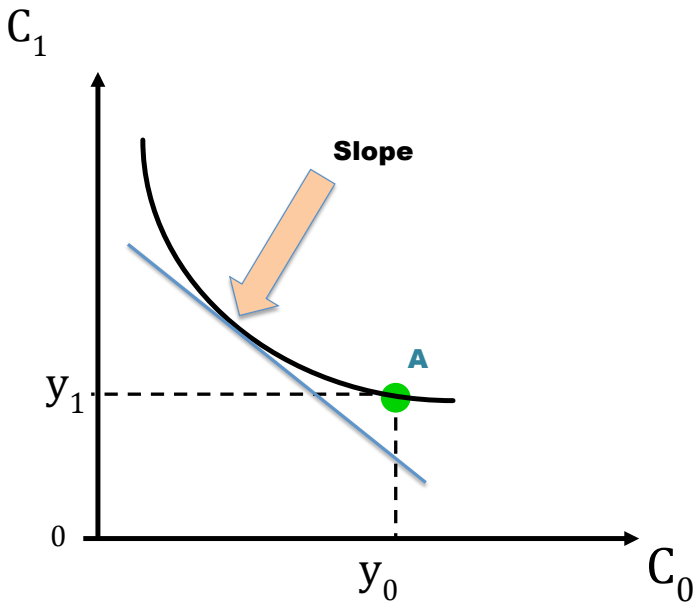
August 2011

Introduction

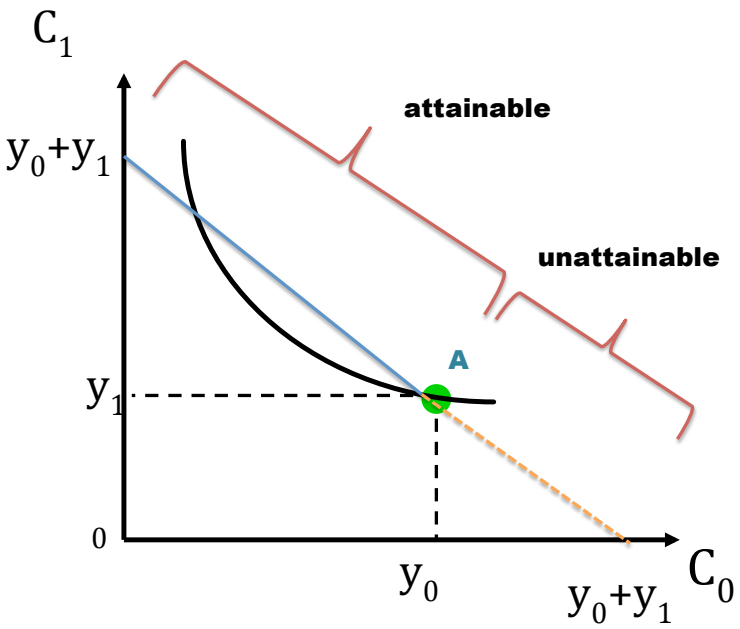
- Supply of financial assets: borrowers, investors
- Demand for financial assets: lenders, savers
- The behavior of market participants determines the price of financial assets
- Miicroeconomic theories explains how market participants make their economic decisions; saving, investment, selection of financial assets
- The first part of the course: microeconomic foundation and financial asset pricing theories

Robinson Crusoe Economy

- Do financial market benefit the society?
- Autarky, Self -sufficient, without trade in financial market
- An individual is rational : $U'(C) > 0$ and $U''(C) < 0$. Marginal utility is positive. MU is decreasing as consumption increases.
- Indifference curve is convex. Average is always preferred to extreme.

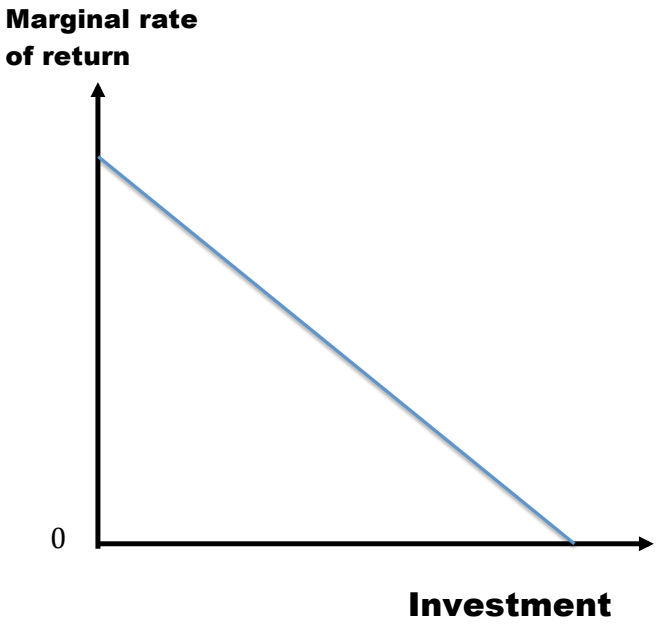


- Intertemporal consumption: allocation between consumption today and tomorrow
- Slope of IC = $MRS_{C_1}^{C_0} = \left.\frac{\partial C_1}{\partial C_0}\right|_{U=\text{constant}} = -(1+\rho^i)$
- initial endowment (y_0, y_1)
- Higher ρ implies more impatience; the ICs are steeper

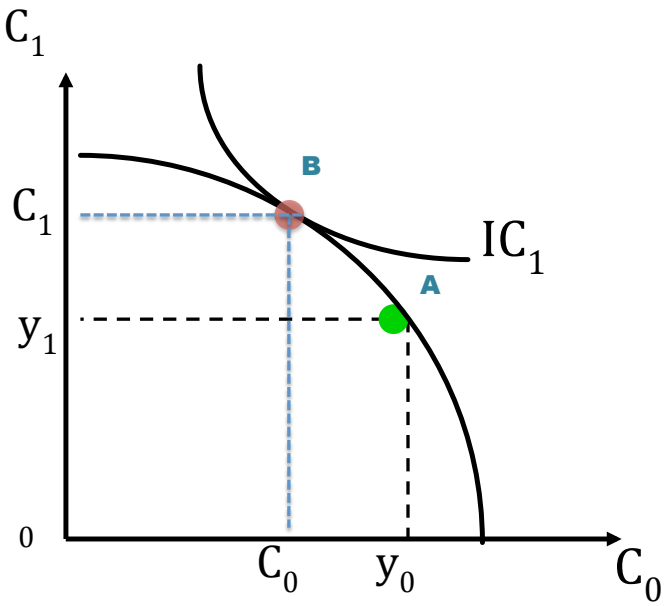


Consider a case where

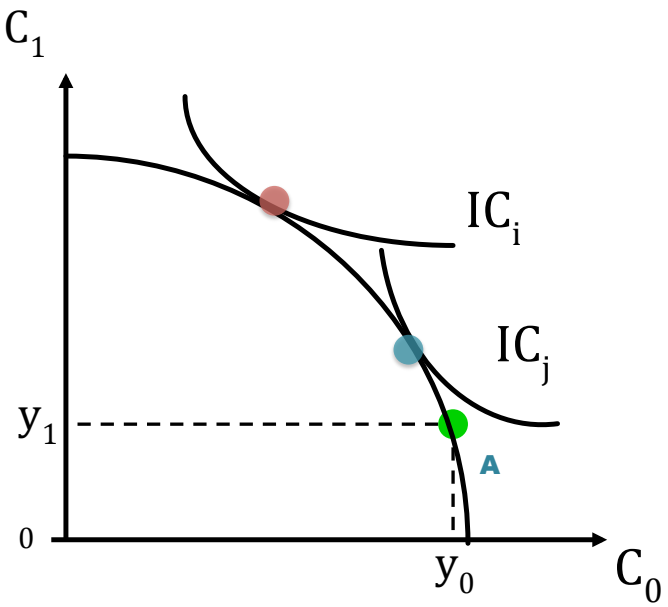
- There is no financial market
- There is no investment opportunities
- The goods can be stored for future consumption
- Any points on the straight line below A are unattainable. Without a financial market, there is no borrowing opportunity



- Investment opportunities allow one unit of current consumption to be turned into more than one unit of future consumption
- Diminishing marginal returns on investment



- Slope of PPC: marginal rate of returns on investment
- Consumer's choice : MRS = MRT (marginal rate of transformation), implies $\rho^j = r^j$
- If $C_0 < y_0$, the person save and invest.
- Saving = $y - C_0$
- A person will save and invest until his subjective rate of time preference equals to rate of return on the last investment

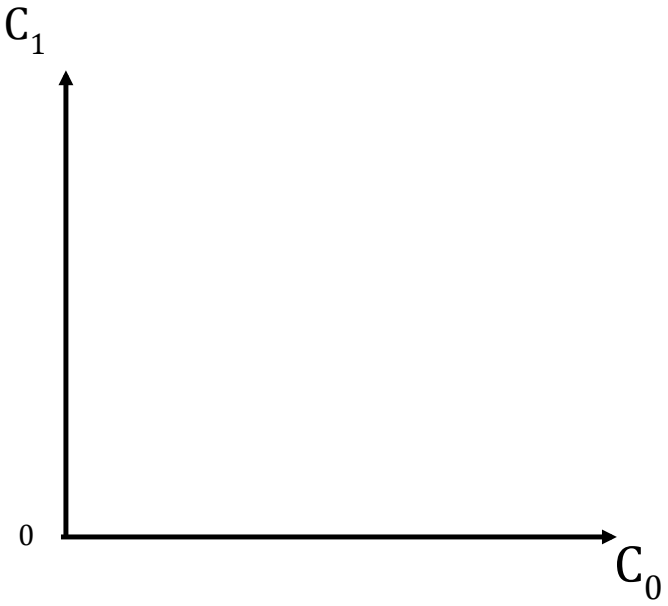


- Without financial markets, individuals (with the same endowment and the same investment opportunities) may choose different investments because they have different preference
- Person *i* save (and invest) more than person *j* because she is more patient (lower ρ)

Present Value and Future Value

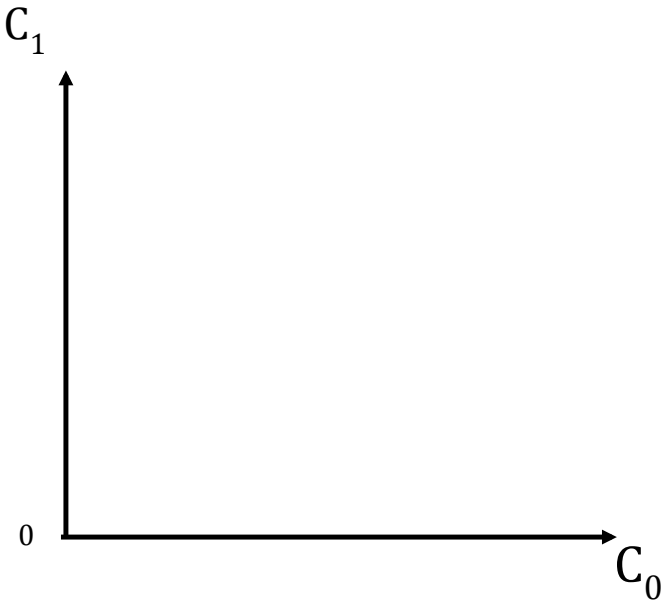
- financial market : borrow or lend unlimited amount at r, a market-determined rate of interest, no ponzi game condition (you cannot spend more than your life-time income)
- The principal amount , X_0. Future value : $X_1 = X_0 + rX_0$
- Present value : $X_0 = \dfrac{X_1}{(1+r)}$

Optimization: ignoring PPC



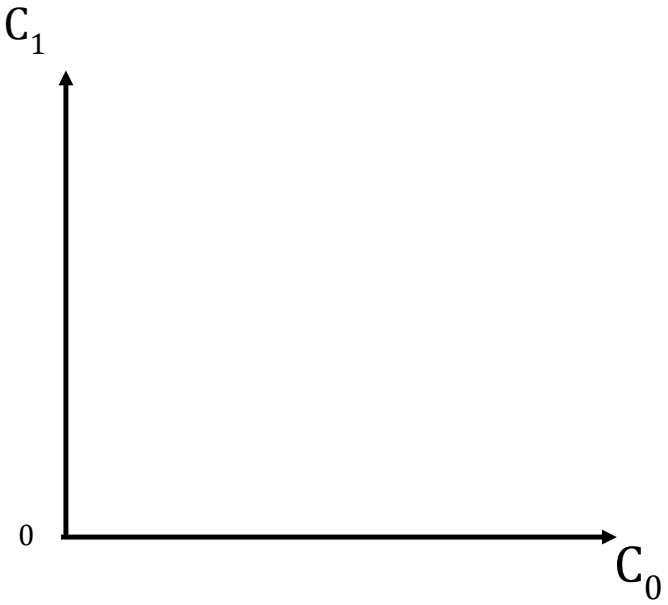
- Present value of the initial endowment : $W_0 = y_0 + \frac{y_1}{1+r}$
- Future value of the initial endowment : $W_1 = (1+r)W_0 = (1+r)y_0 + y_1$
- Capital market line: $C_1 = (1+r)(W_0 - C_0)$: borrowing and lending opportunities
- Slope = $-(1+r)$

Optimization: ignoring PPC



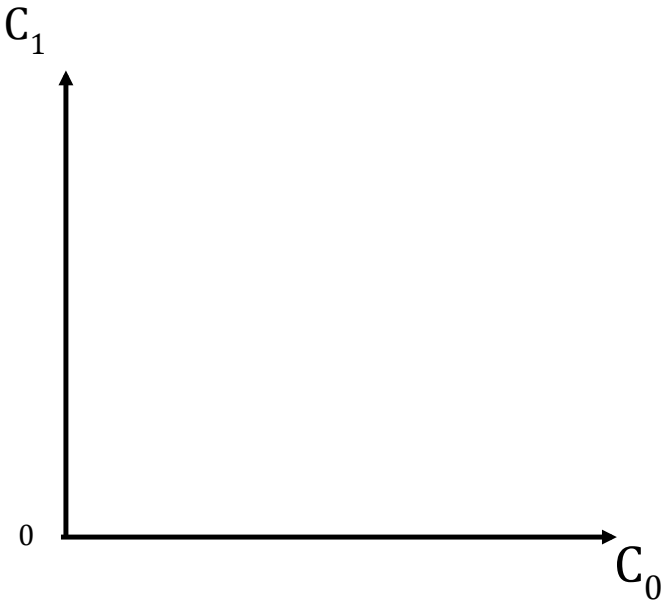
- Lenders
- Optimization: a point where IC is tangent to the capital market line
- current consumption .....
- saving .....
- future consumption .....

Optimization: ignoring PPC



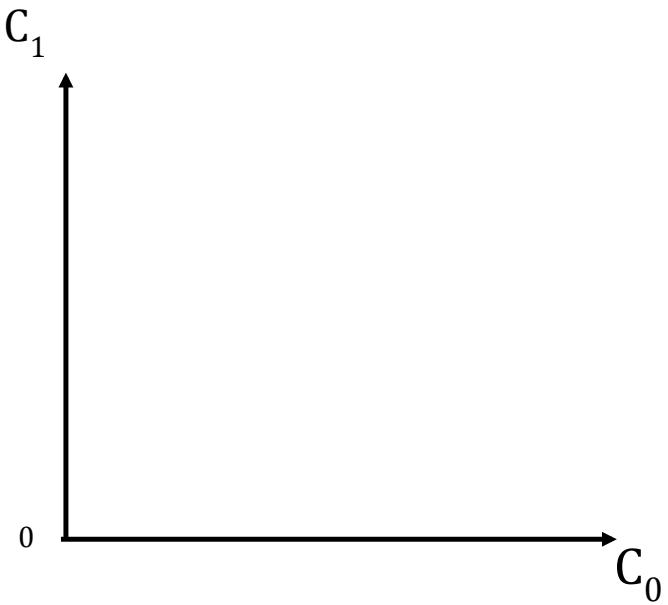
- An individual will maximise her utility by choosing a point where IC is tangent to the capital market line
- current consumption .....
- borrowing .....
- future consumption .....

Optimization: with PPC



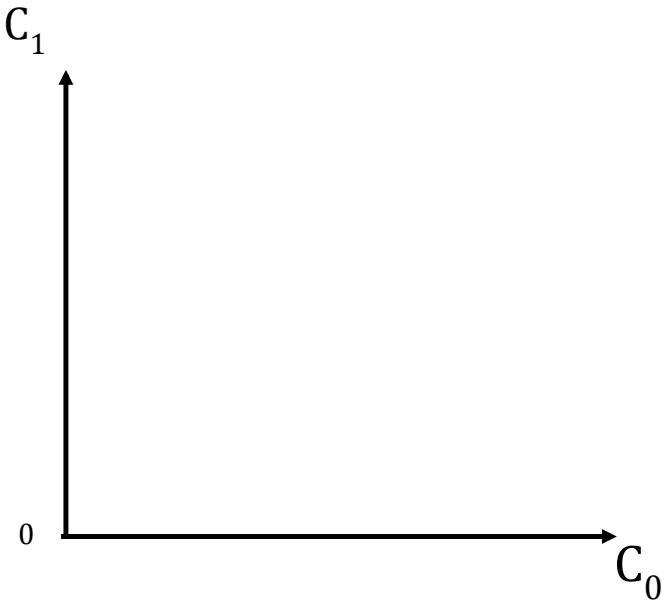
- Budget line: the capital market line which passes through any point on PPC
- Any points on the CML are attainable
- Examples

Optimization: with PPC



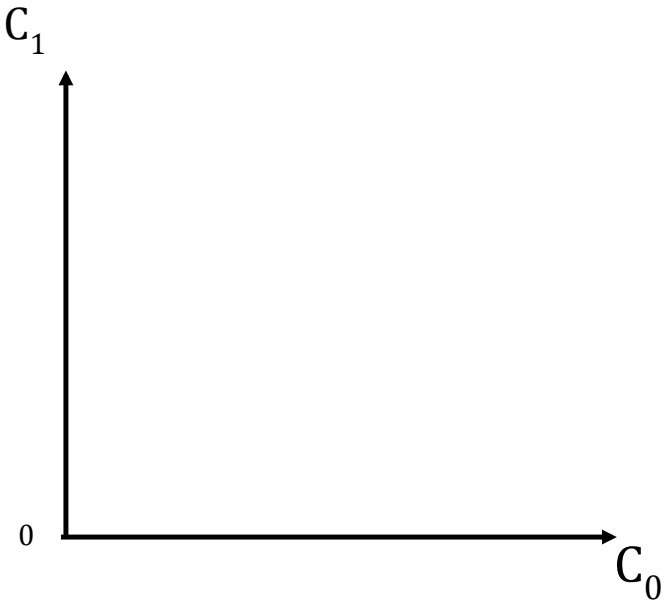
- The CML, which touches the PPC, gives consumers the highest utility
- Production : .....
- Investment: .....
- Current consumption : .....
- Saving: .....
- Lending or borrowing : .....
- Future consumption: .....
- Debt repayment: .....

Optimization: with PPC



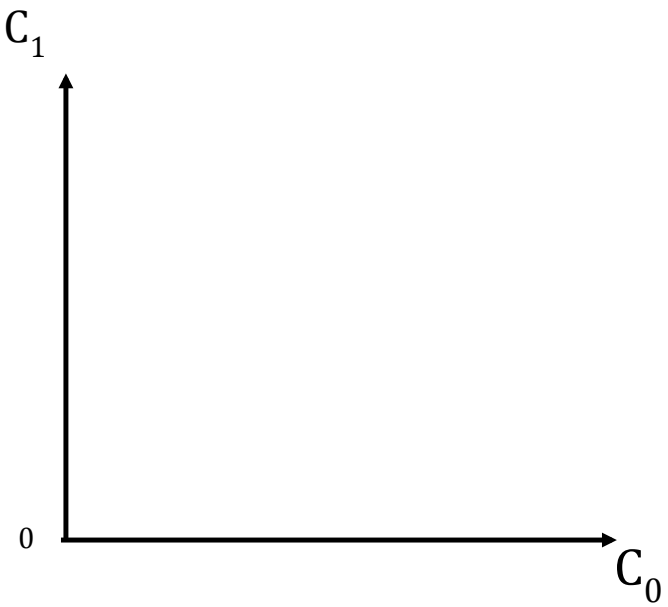
- Production: not depend on the form of preferences
- 2 steps decision
  1. choose the optimal production
  2. choose consumption patterns by borrowing or lending
- "Fisher Separation Theorem"
- application: invest until the mariginal rate of return on last investment project equals to market interest rate

Optimization: with PPC



- Compare 3 cases:
- Initial endowment
- Production alone
- Production and exchange
- Individuals are clearly better-off

Effect of a change in interest rate



- Initial consumption
  .....
- Final consumption
  .....
- The decompositon point
  .....
- Substitution effect :
  .....
- Income effect: .....
- 2 Cases:
  1. $r \uparrow$, $c_0 \uparrow$, saving
     .....
  2. $r \uparrow$, $c_0 \downarrow$, saving
     .....