

Topics for Today

① Consumption & Saving

a.) Alternative Theories

- Keynes (the "marginal propensity to consume")
- Fisher (the "intertemporal approach")
- Modigliani (the "Life-Cycle Hypothesis")
- Friedman (the "Permanent Income Hypothesis")

b.) Implications of the PIH

- Hall's Random Walk Model
- The Predictive Content of Saving

c.) The Effects of Fiscal Policy

- Ricardian Equivalence

The Goods Market

- When studying the labor market, we focused on the supply-side of the economy. That is, what determines the total output produced in the economy?
- When studying the goods market, we turn our attention to the demand-side of the economy. That is, what determines the overall demand for goods + services.
- The price that adjusts to ensure equality between the supply + demand for goods is the interest rate. To see why this makes sense, consider a closed economy with no government. Equality between the Aggregate Supply of goods + the Aggregate Demand can then be written:

$$Y = C + I$$

Or

$$Y - C = I$$

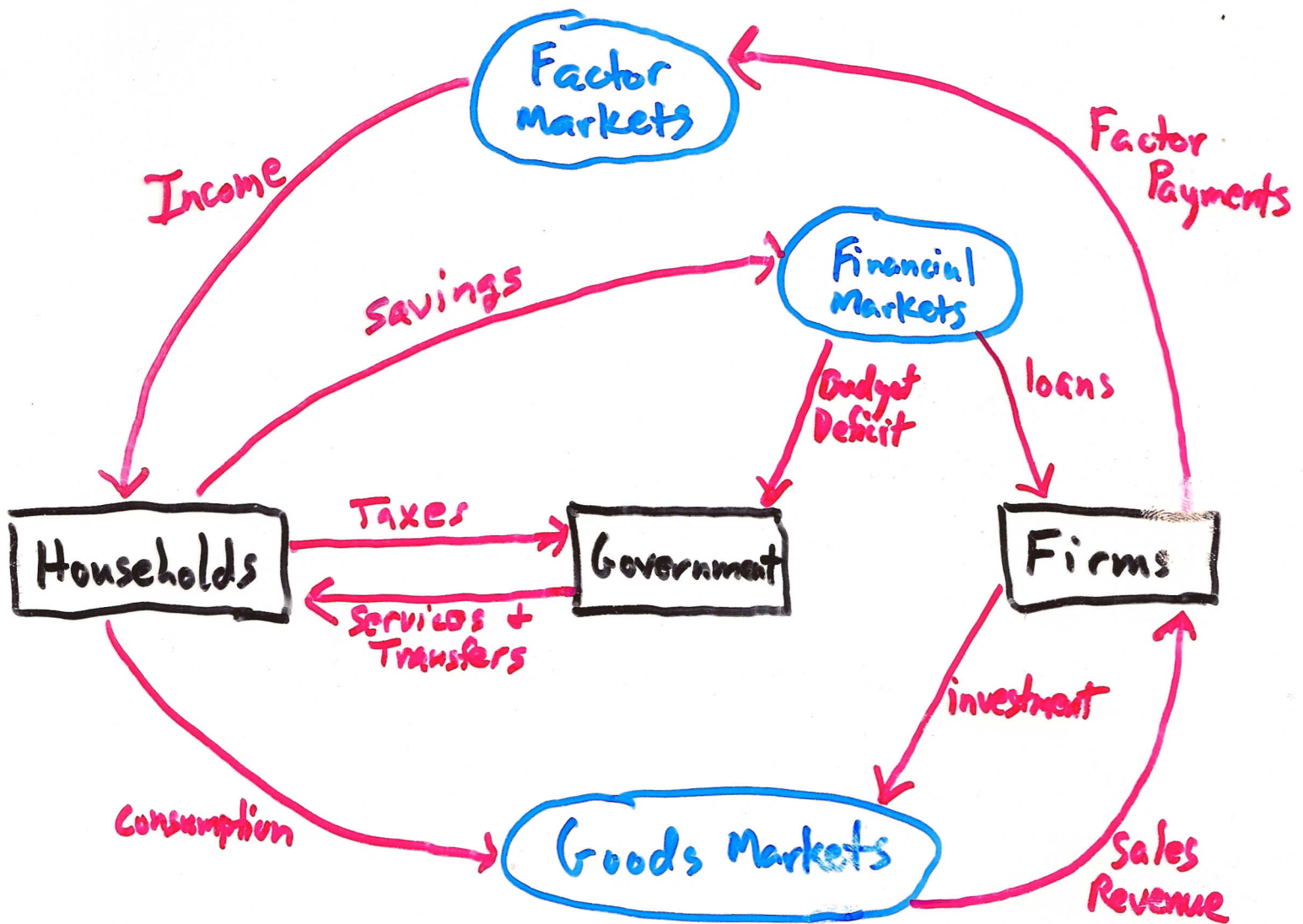
Since Saving equals $Y - C$,

$$\boxed{S = I}$$

Our model will demonstrate how both S and I depend on the interest rate.

- As before, we will focus separately on profit maximizing investment by firms and utility maximizing saving by households. Market-clearing adjustments in the interest rate ensures that the solutions to these two separate problems are consistent with each other.
- Keep in mind that the goods market and labor market are inter-dependent. Labor supply is determined by a household's optimal choice of consumption + leisure. As a result, labor supply depends on consumption (and vice versa). Likewise, we saw that labor demand is determined by the MPL, which depends on the stock of capital, which in turn depends on previous investment decisions!

Circular Flow

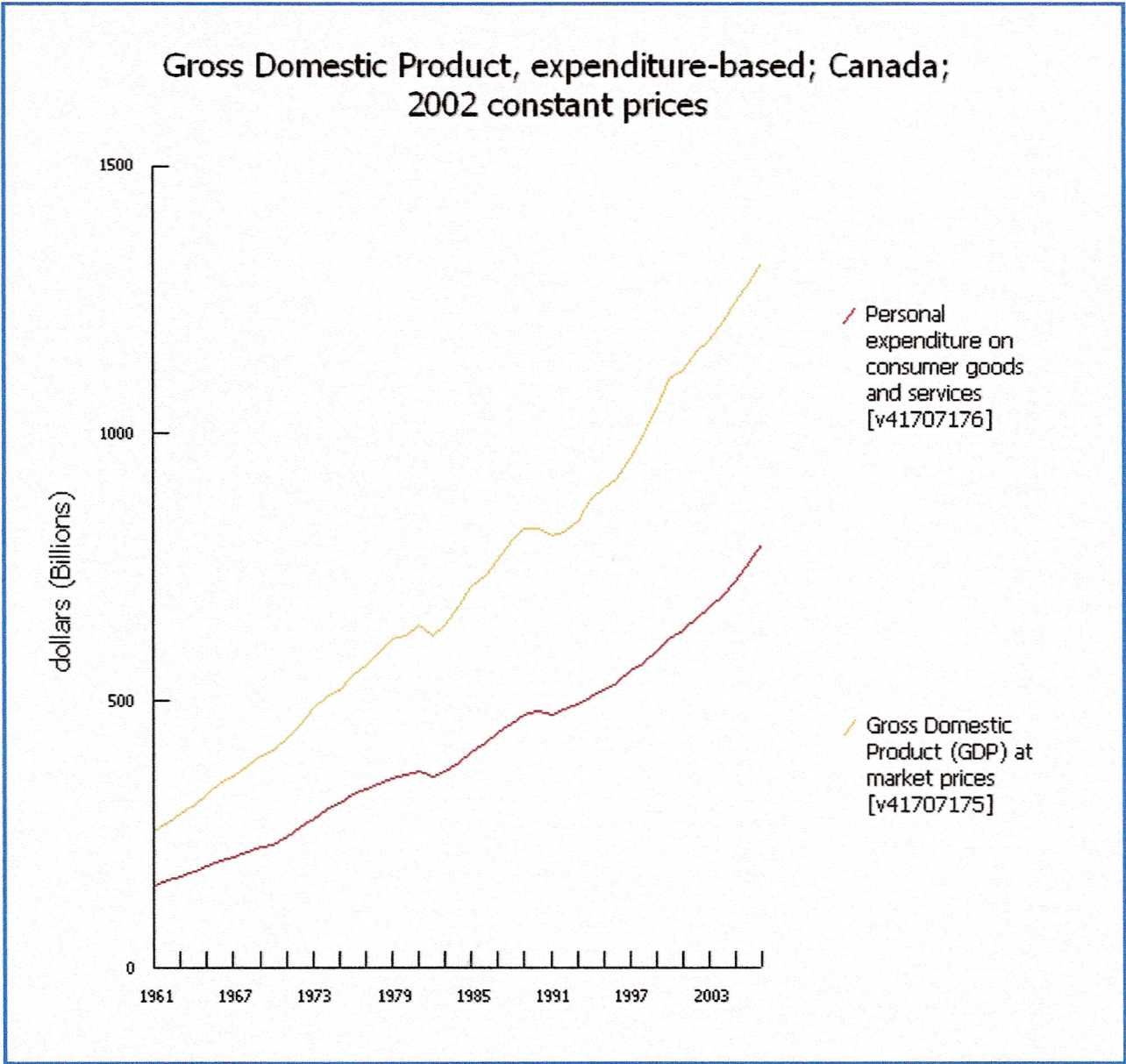


3 Sectors

Households
Firms
Government

3 Markets

Goods and Services
Factors of Production
Financial



Source: Statistics Canada, CANSIM table 380-0017.

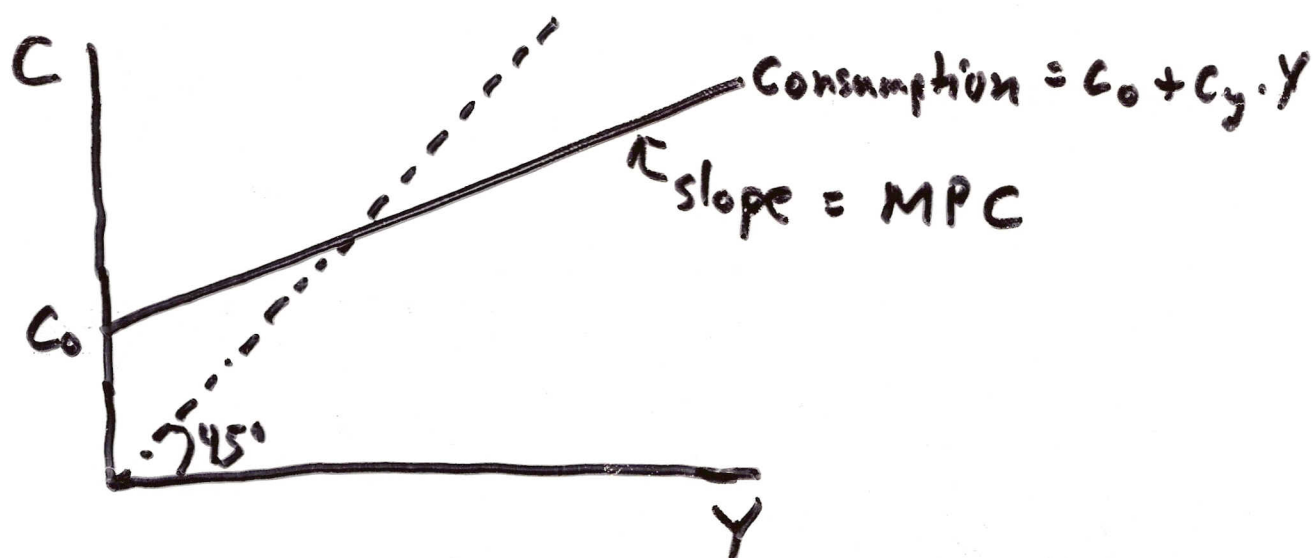
The Keynesian Consumption Function

Keynes made 2 basic assumptions:

- 1.) The "marginal propensity to consume" is between 0 and 1, and is relatively constant
- 2.) The "average propensity to consume" declines with income. Equivalently, the saving rate rises with income.

The following function captures these assumptions:

$$C = C_0 + C_y \cdot Y$$



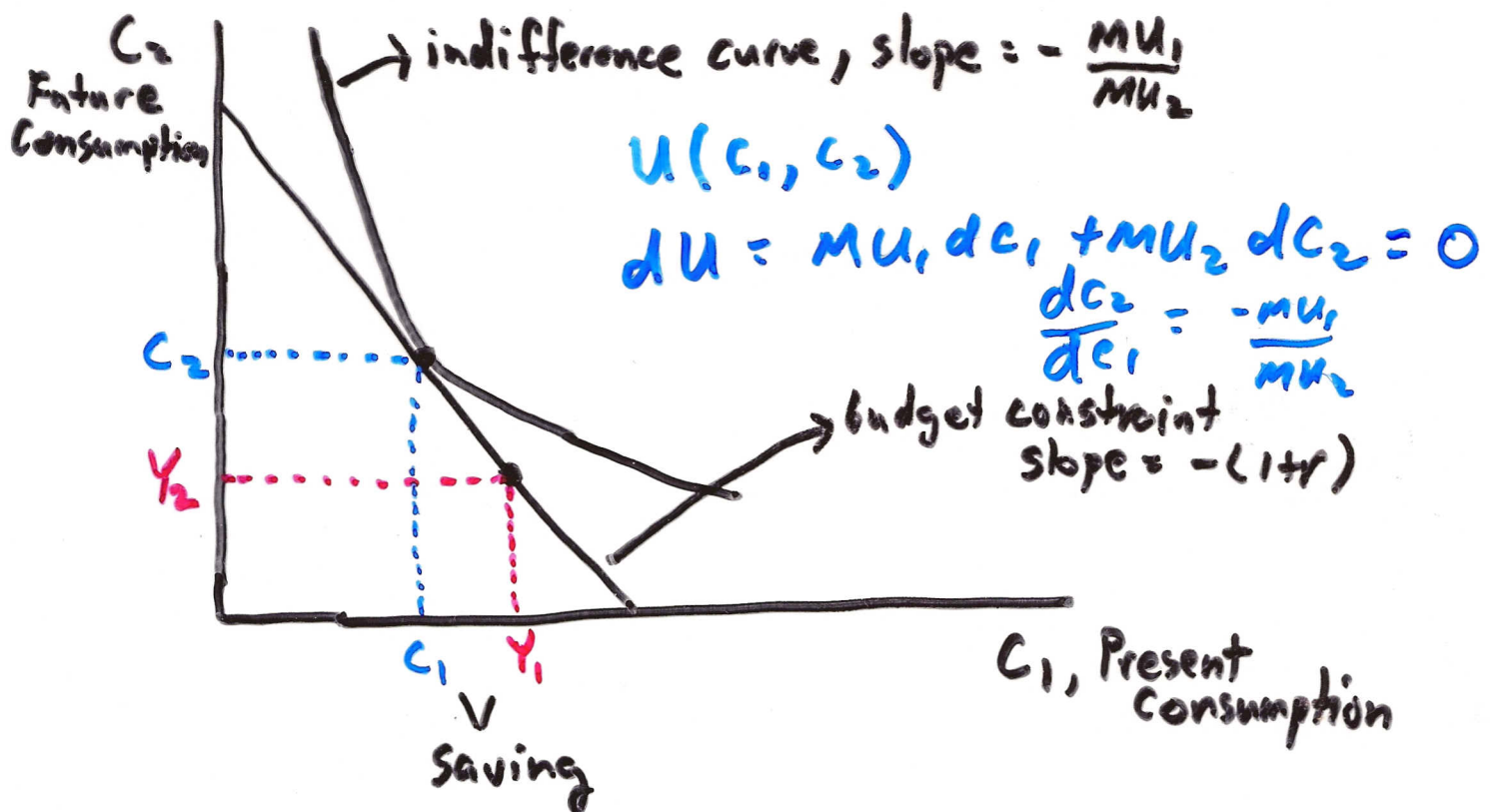
$$MPC = C_y$$

$$APC = \frac{C_0}{Y} + C_y$$

Empirical Findings



The Fisherian (Neoclassical) Approach



Budget Constraint

$$\left. \begin{aligned} C_1 + S &= Y_1 \\ C_2 &= Y_2 + (1+r)S \end{aligned} \right\} \Rightarrow C_1 + \frac{1}{1+r}(C_2 - Y_2) = Y_1$$

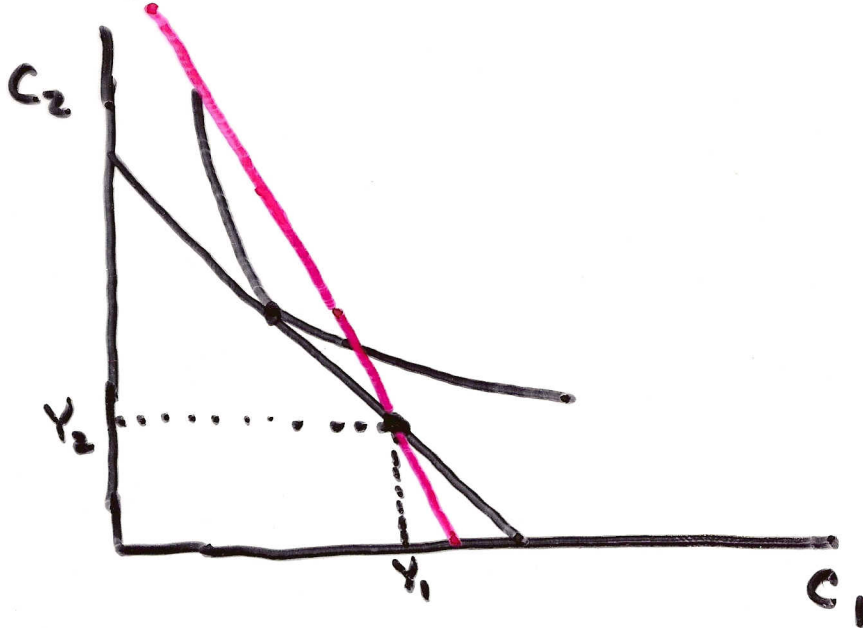
$$\Rightarrow \boxed{C_1 + \frac{1}{1+r}C_2 = Y_1 + \frac{1}{1+r}Y_2}$$

Optimal Consumption Pt.

$$\boxed{\frac{MU_1}{MU_2} = (1+r)}$$

Effects of Interest Rate Changes

Suppose the interest rate rises,



What happens to current consumption and saving?

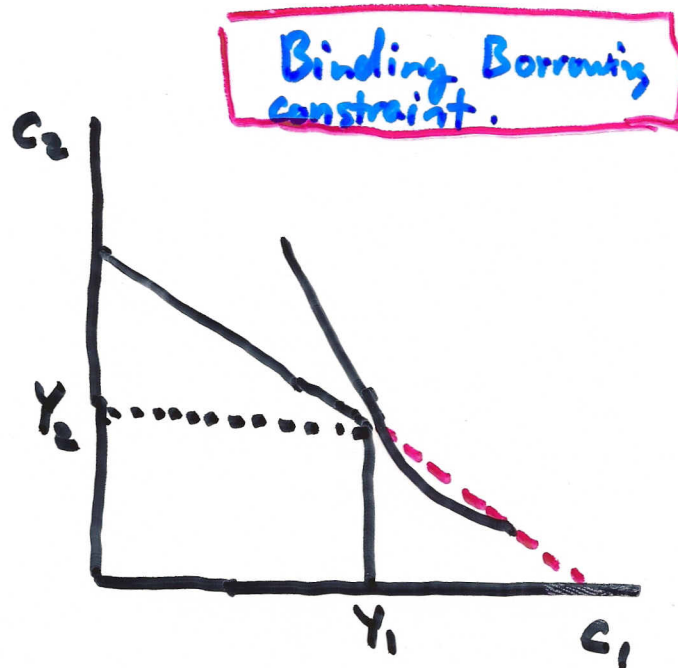
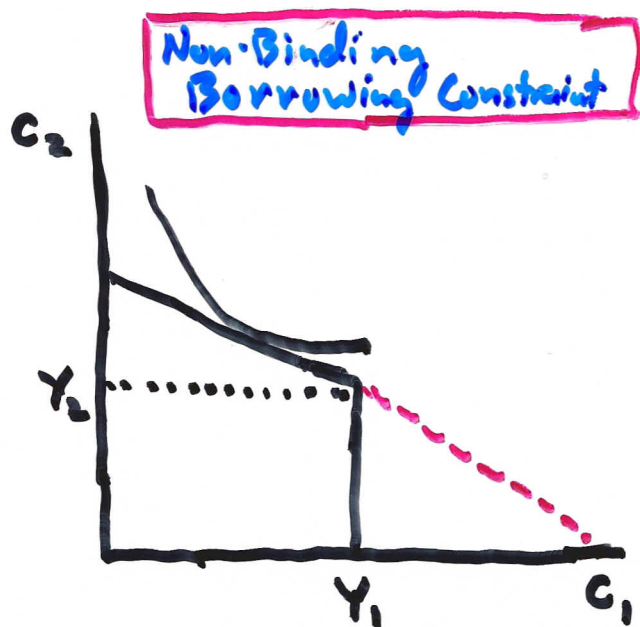
- 1.) Substitution Effect $\Rightarrow$ decrease
- 2.) Income Effect $\Rightarrow$ increase

Total Effect is ambiguous

What if the consumer was initially a ~~borrower~~ borrower?

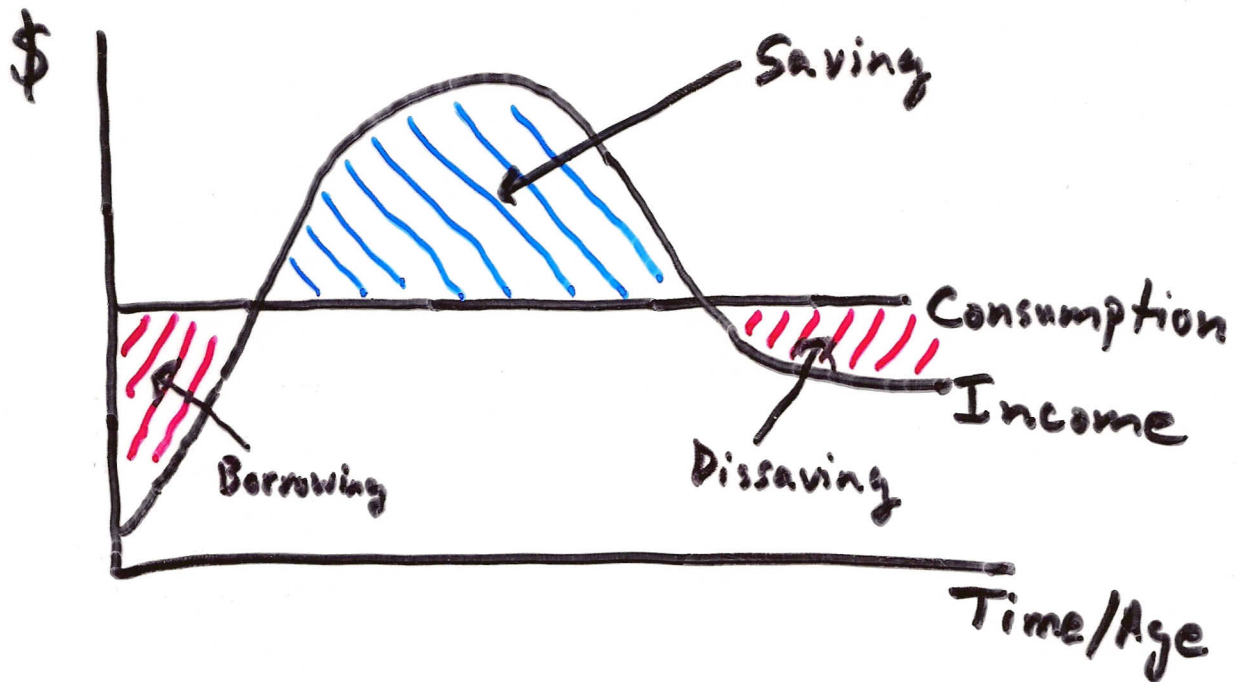
Keynes vs. Fisher

- At first, the theories of Keynes & Fisher seem quite different. According to Keynes, the main determinant of consumption is current income. According to Fisher, consumption depends on both current and future income (and the interest rate).
- However, if households face borrowing constraints, then the two theories tend to become similar



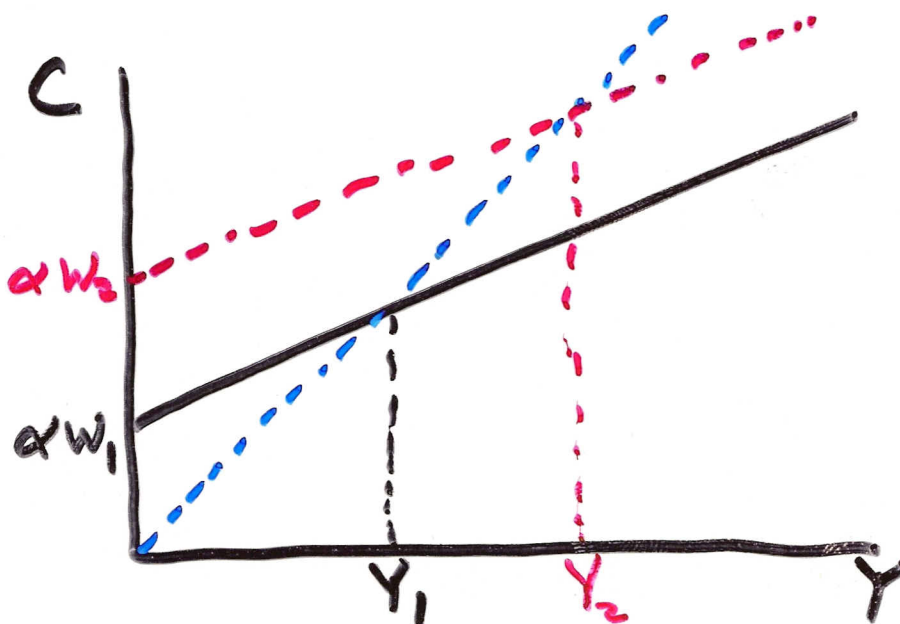
- When borrowing constraints bind, consumption will only depend on current income
- Hence, the main difference between Keynes & Fisher can be interpreted as reflecting different assumptions about the importance of borrowing constraints

Modigliani's Life-Cycle Hypothesis



Life-Cycle Consumption Function

$$C = \alpha \cdot W + \beta \cdot Y$$



Friedman's Permanent Income Hypothesis

$$1.) Y = \underset{\substack{\uparrow \\ \text{permanent} \\ \text{income}}}{Y^P} + \underset{\substack{\uparrow \\ \text{transitory} \\ \text{income}}}{Y^T}$$

$$2.) C = \alpha Y^P$$

$$\text{Note, measured APC} = \frac{C}{Y} = \alpha \frac{Y^P}{Y}$$

In cross-sectional data, those with high income are more likely to have low $\frac{Y^P}{Y}$. (Some of them just got lucky). Hence the APC will decline with income.

Implications of the PIH

1.) Hall's Random Walk Model

PIH + REH $\Rightarrow$ Changes in Consumption should be unpredictable

$$C = \alpha Y^P$$
$$\Delta C = \alpha \Delta Y^P \quad \Delta Y^P: \text{\$ (news about future income)}$$

2.) The Predictive Content of Saving

Assume a Fisher Model with

$$r=0 \quad \text{and} \quad C_1 = C_2$$

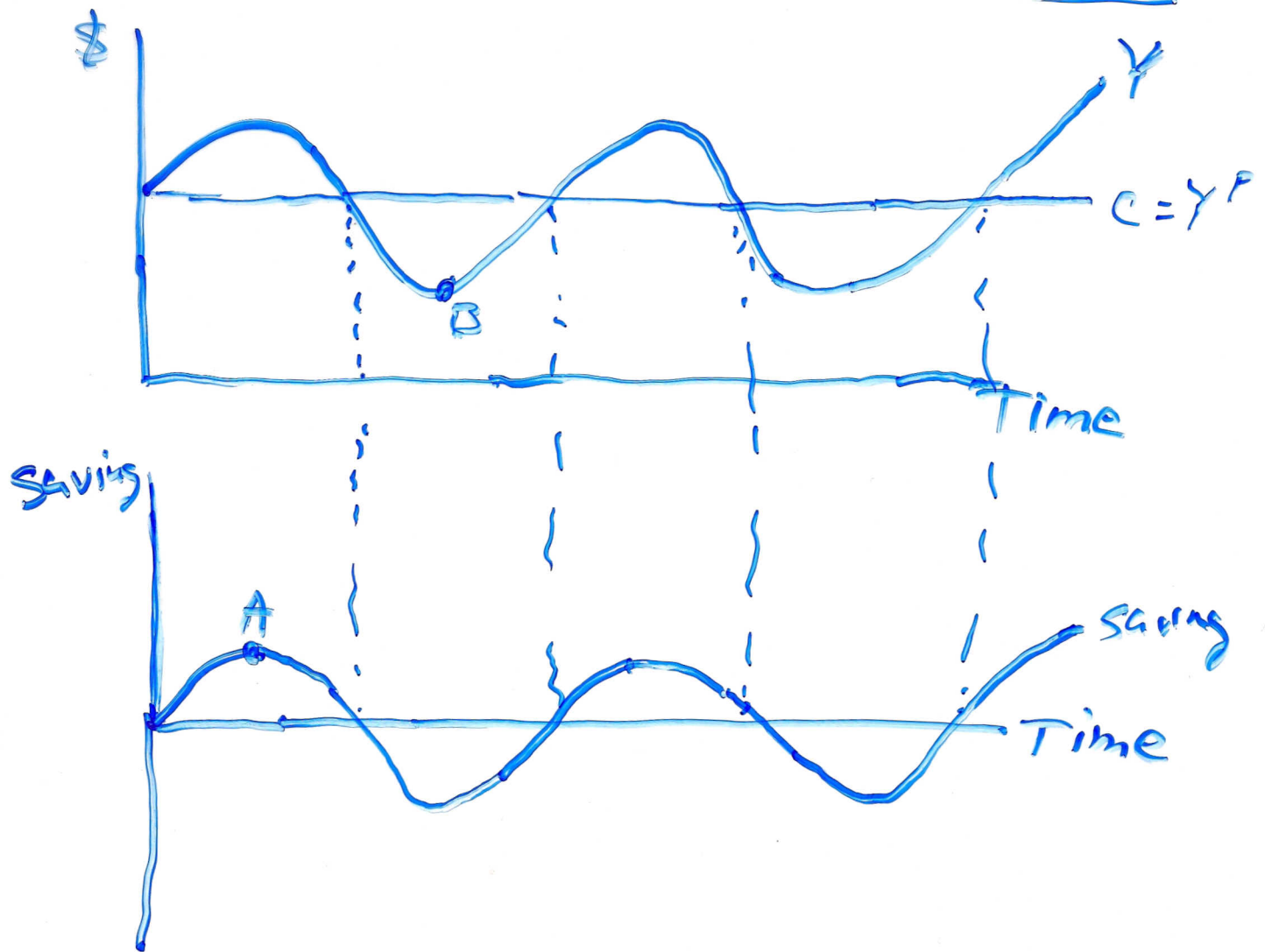
$$\Rightarrow C_1 = \frac{1}{2}(Y_1 + Y_2)$$

$$C_2 = \frac{1}{2}(Y_1 + Y_2)$$

$$\Rightarrow S = Y_1 - C_1 = \frac{1}{2}(Y_1 - Y_2)$$

$$\Rightarrow \left| \frac{S}{Y_1} = -\frac{1}{2} \left(\frac{Y_2 - Y_1}{Y_1} \right) \right| \quad \text{Saving predicts recessions}$$

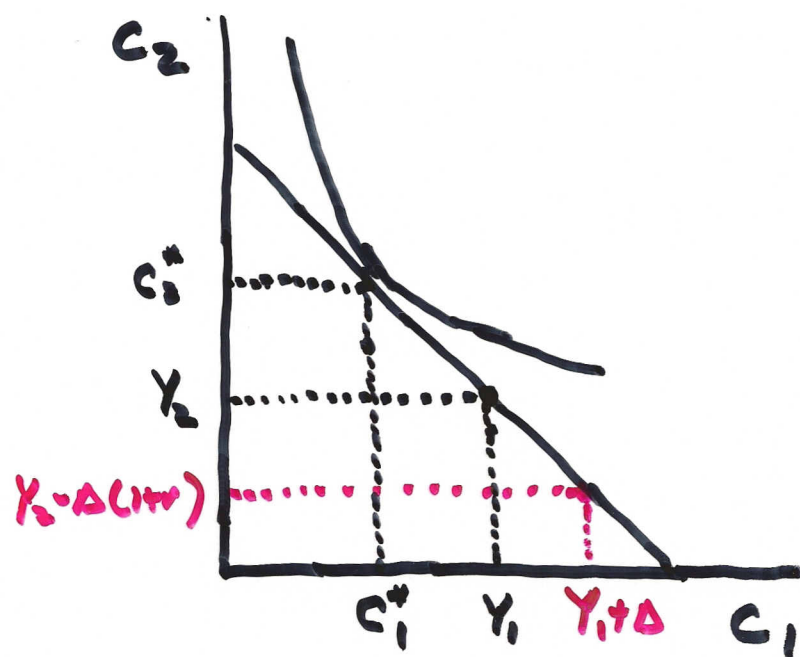
Forecasting Implications of the PIH



Notice, Saving at Pt. A predicts the future "recession" at pt. B.

The Effects of Fiscal Policy

- When studying the effects of fiscal policy it is useful to distinguish between the effects of government spending (i.e., changes in G), and the effects of how a given amount of spending is financed (i.e., changes in taxes)
- Under certain conditions, changes in the timing of taxes are irrelevant. This irrelevancy proposition is known as Ricardian Equivalence
- Suppose taxes decrease by Δ
 $\Rightarrow$ Future taxes must increase by $(1+r)\Delta$



The tax cut just shifts the household's (after-tax) endowment to the lower right.

It doesn't change the budget constraint itself, and so therefore, doesn't change the household's choices.

Ricardian Equivalence

R
Ricardian Equiv. = Government's Intertemporal Budget Constraint
+ Fisherian Model of Consumption

Govt. Intertemporal Budget

$$G_1 + \frac{G_2}{1+r} = T_1 + \frac{T_2}{1+r}$$

Consumers Budget Constraint

$$C_1 + \frac{C_2}{1+r} = Y_1 - T_1 + \frac{Y_2 - T_2}{1+r}$$

$$= Y_1 + \frac{Y_2}{1+r} - \underbrace{\left(T_1 + \frac{T_2}{1+r}\right)}_{\text{PV of Govt. Spend}}$$

Note, $T_1 + \frac{T_2}{1+r}$ doesn't change unless govt. spending changes. Deficit financed tax cuts, which just re-arrange the timing of taxes, do not affect the consumer's budget constraint, and therefore, consumption.

Caveats to Ricardian Equivalence

- 1.) Myopia. Maybe households are too short-sighted to realize their taxes will be higher in the future.
- 2.) Selfishness. Maybe people don't care about what happens after they die.
- 3.) Imperfect Capital Markets. Maybe governments + households face different interest rates.

Government Spending

- Unlike tax policy, changes in G definitely impact the household sector, since they influence the resources available to the private sector.
 $G \uparrow \Rightarrow$ Household wealth $\downarrow$
 $G \downarrow \Rightarrow$ Household wealth $\uparrow$
- We know that Fisherian/PIT households will spread out the effects of govt. spending. For example, an anticipated increase in future govt. spending will cause current household consumption to fall
- Consequently, when studying the effects of govt. spending on saving it is important to know whether the spending change is perceived to be temporary or ~~permanent~~ permanent.

Examples

1.) $\Delta G_1 > 0$ $\Delta G_2 = 0$

} Temporary
Increase in
Govt. Spending

$C_1 \downarrow$ (but not as much as $G_1 \uparrow$)

$\Rightarrow$ Current Aggregate Saving $\downarrow$
[i.e., $(Y - C - G) \downarrow$]

2.) $\Delta G_1 = 0$ $\Delta G_2 > 0$

} Anticipated
Increase in
Future Govt.
Spending

$C_1 \downarrow$

$\Rightarrow$ Current Aggregate
Saving $\uparrow$

3.) $\Delta G_1 = \Delta G_2 > 0$

} Permanent
Increase
in Govt.
Spending

$C_1 \downarrow$ by the same amount
as $G_1 \uparrow$

$\Rightarrow$ No effect on Aggregate Saving