345 NOTES:
THREE SECTOR MODEL

Intertemporal Choice:

Need model of Consumption + Savings

Savings: $\underbrace{\text{Money} + \text{Bonds} + \text{Stocks} + \ldots +}_{\text{ASSET PORTFOLIO}}$

MUST HAVE AT LEAST 2 PERIODS

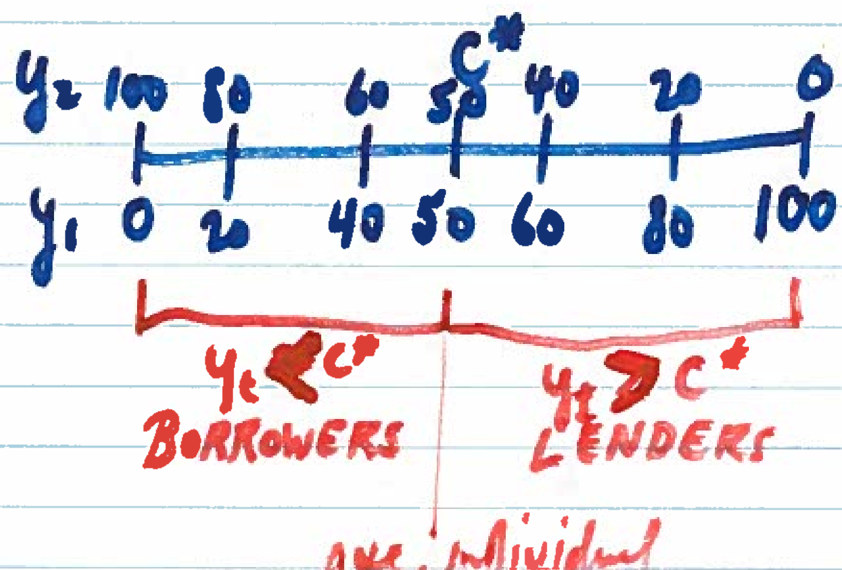
① Savings > 0 iff $y_t > c_t$

LENDER

② Savings < 0 iff $y_t < c_t$

BORROWER

e.g.



One asset - 1 yr bond (b)

Budget Constraints

① $c_1 + b_1 = y_1$ $\quad b_1 > 0$ Lender $\quad b^d$

$b_1 < 0$ Borrower $\quad b^s$

$\Sigma b_1 = 0 = B$

② $c_2 = y_2 + (1+i) b_1$

$\left[b_1 = \frac{c_2}{1+i} - \frac{y_2}{(1+i)} \right]$

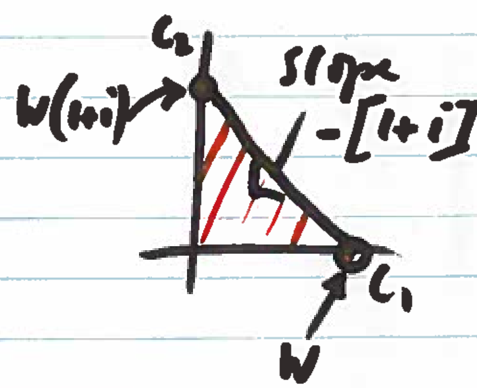
$\Longrightarrow$

$$c_1 + \frac{c_2}{(1+i)} = \underbrace{y_1 + \frac{y_2}{(1+i)}}_{\text{Wealth } (W)}$$

$$c_1 + \frac{c_2}{(1+i)} = W$$

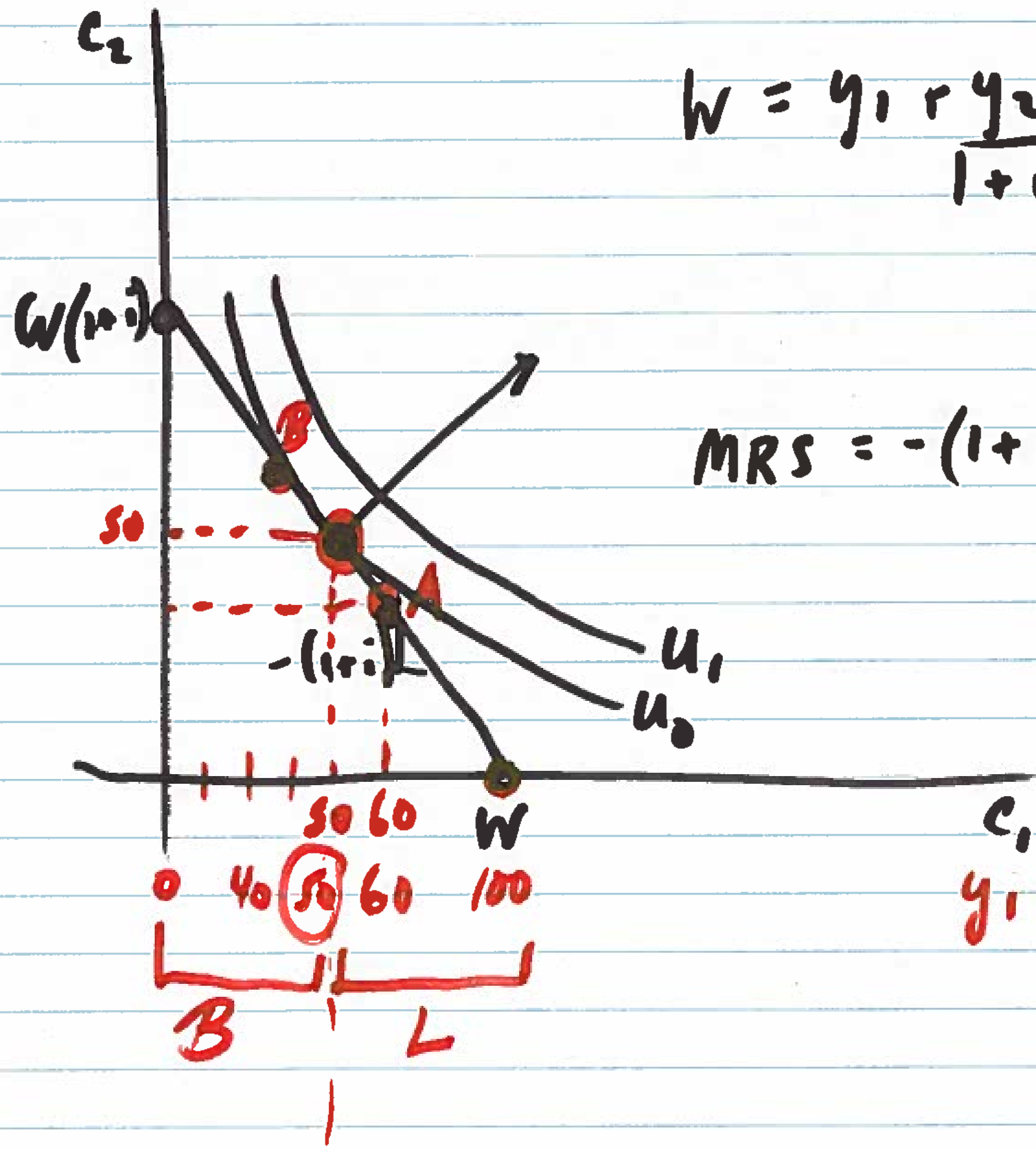
$$[W - c_1][(1+i)] = c_2$$

$$W(1+i) - (1+i)c_1 = c_2$$

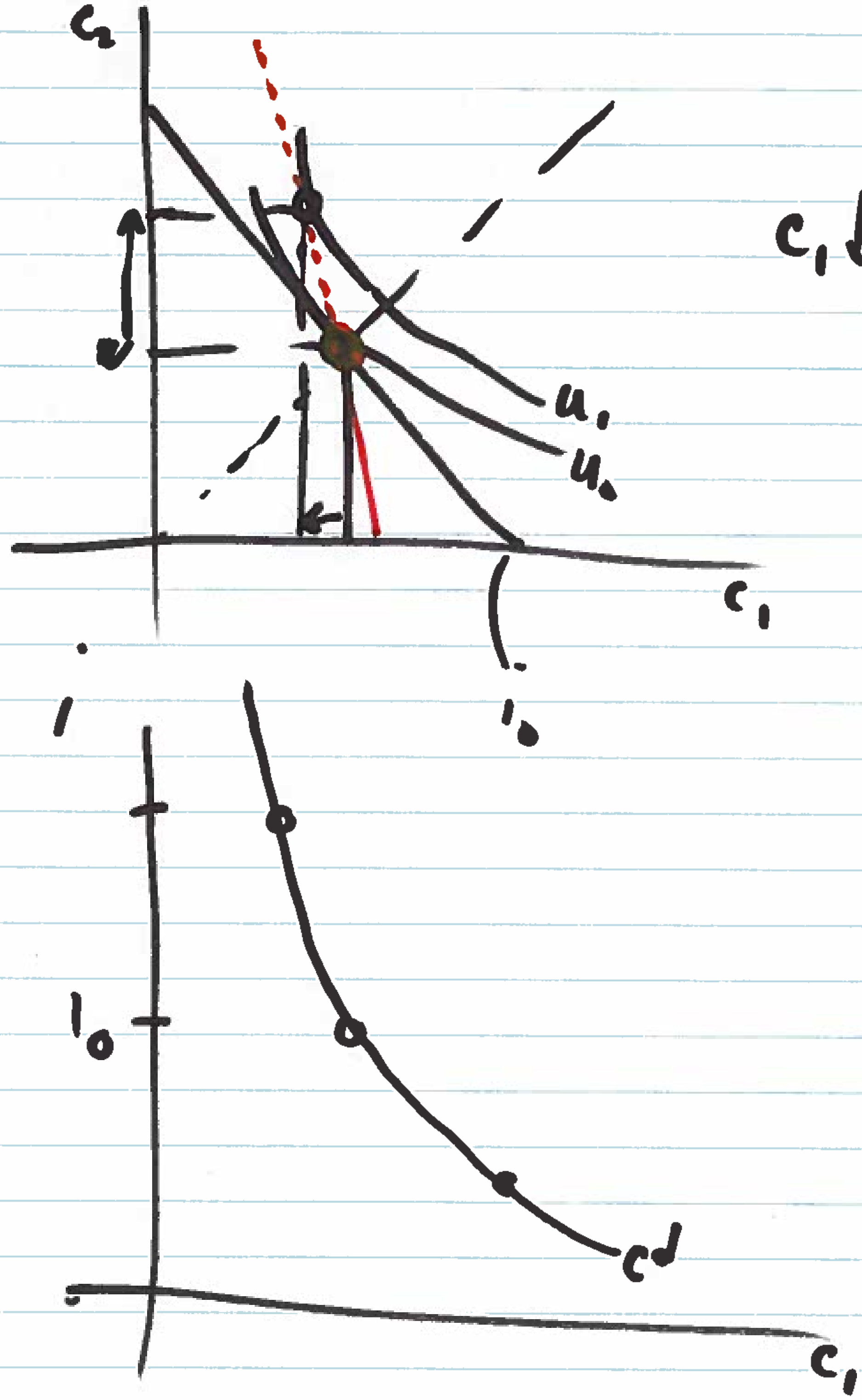


$$W = y_1 + \frac{y_2}{1+i}$$

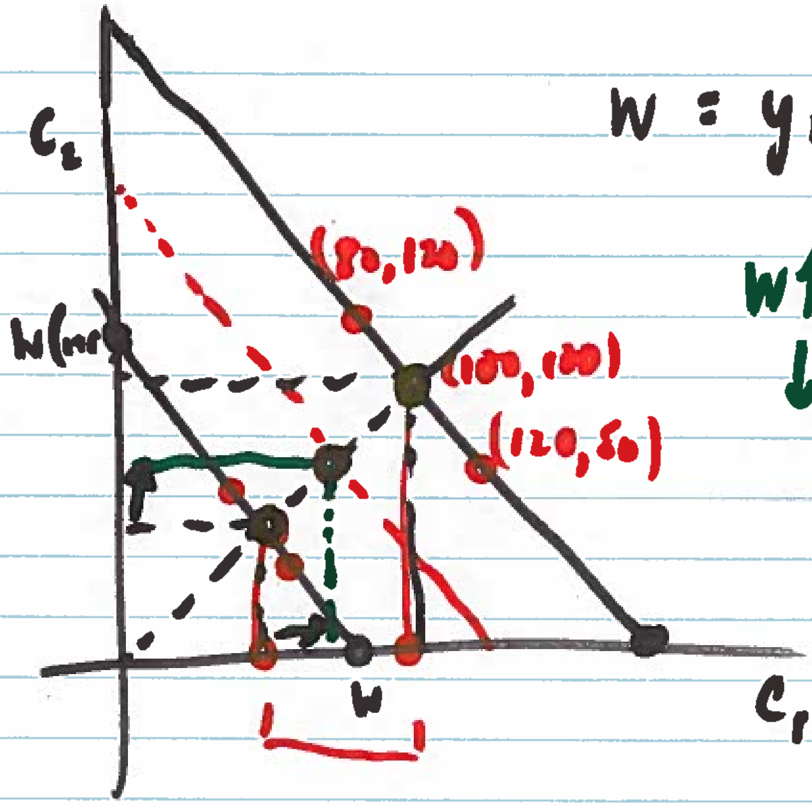
$$MRS = -(1+i)$$



Substitution Effect ($\tilde{w}$, vary i)



$c_1 \downarrow$ $c_2 \uparrow$



$W = y_1 + \frac{y_2}{(1+r)}$

$W \uparrow \quad c_1 \uparrow, c_2 \uparrow$

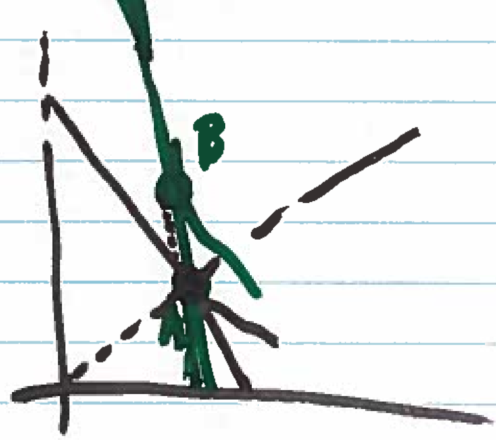
$\downarrow \quad c_1 \downarrow, c_2 \downarrow$

WE only A : y_1 and $y_2 \uparrow \times 2$ $\quad \bar{r}$

WE + SE B : $y_1 \times 2$; $\bar{y}_2$ $\quad r \downarrow$

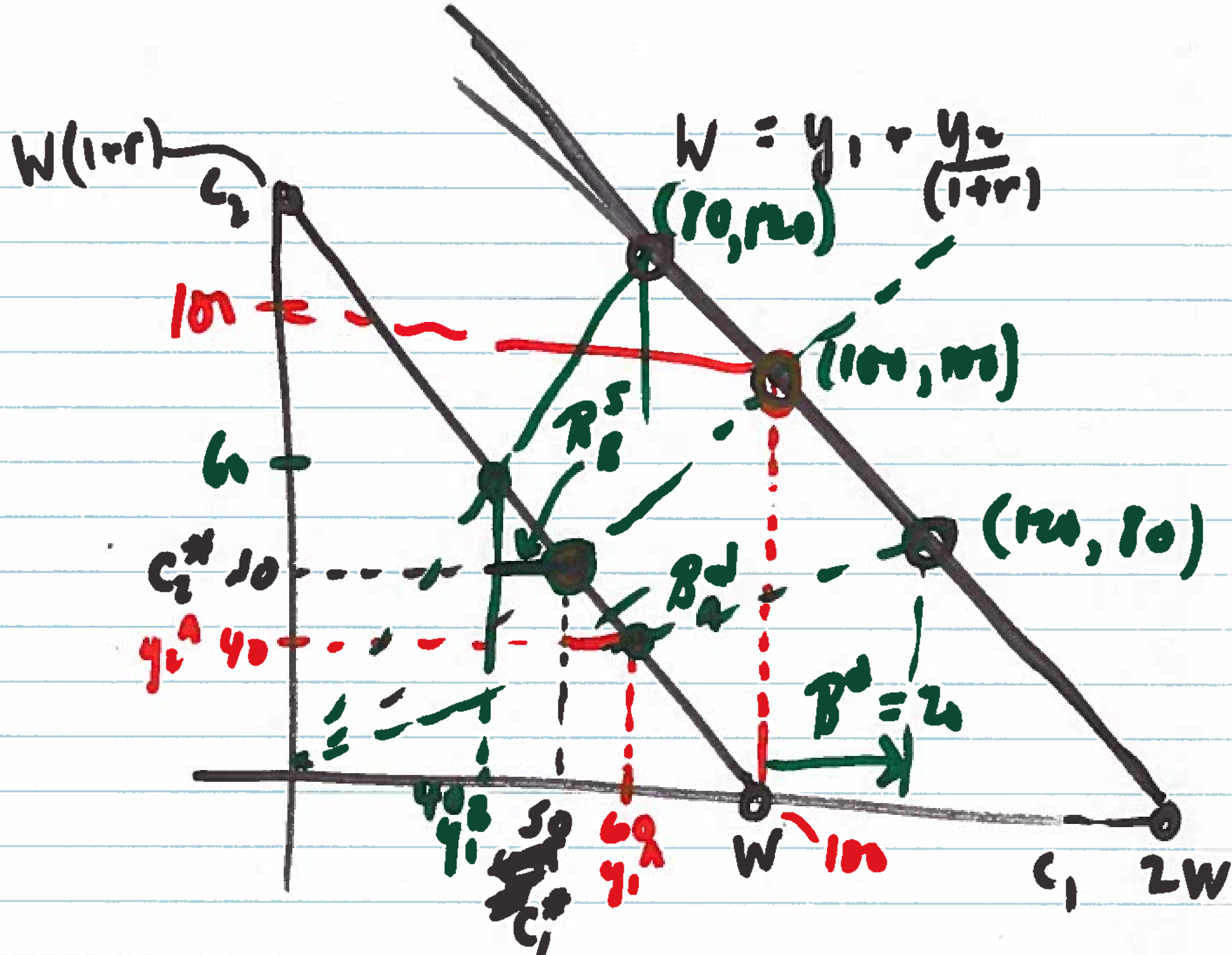
" C : $\bar{y}_1$; $y_2 \times 2$ $\quad r \uparrow$

Substitution Effect



$r \uparrow \quad c_1 \downarrow \quad c_2 \uparrow$

$r \downarrow \quad c_1 \uparrow \quad c_2 \downarrow$



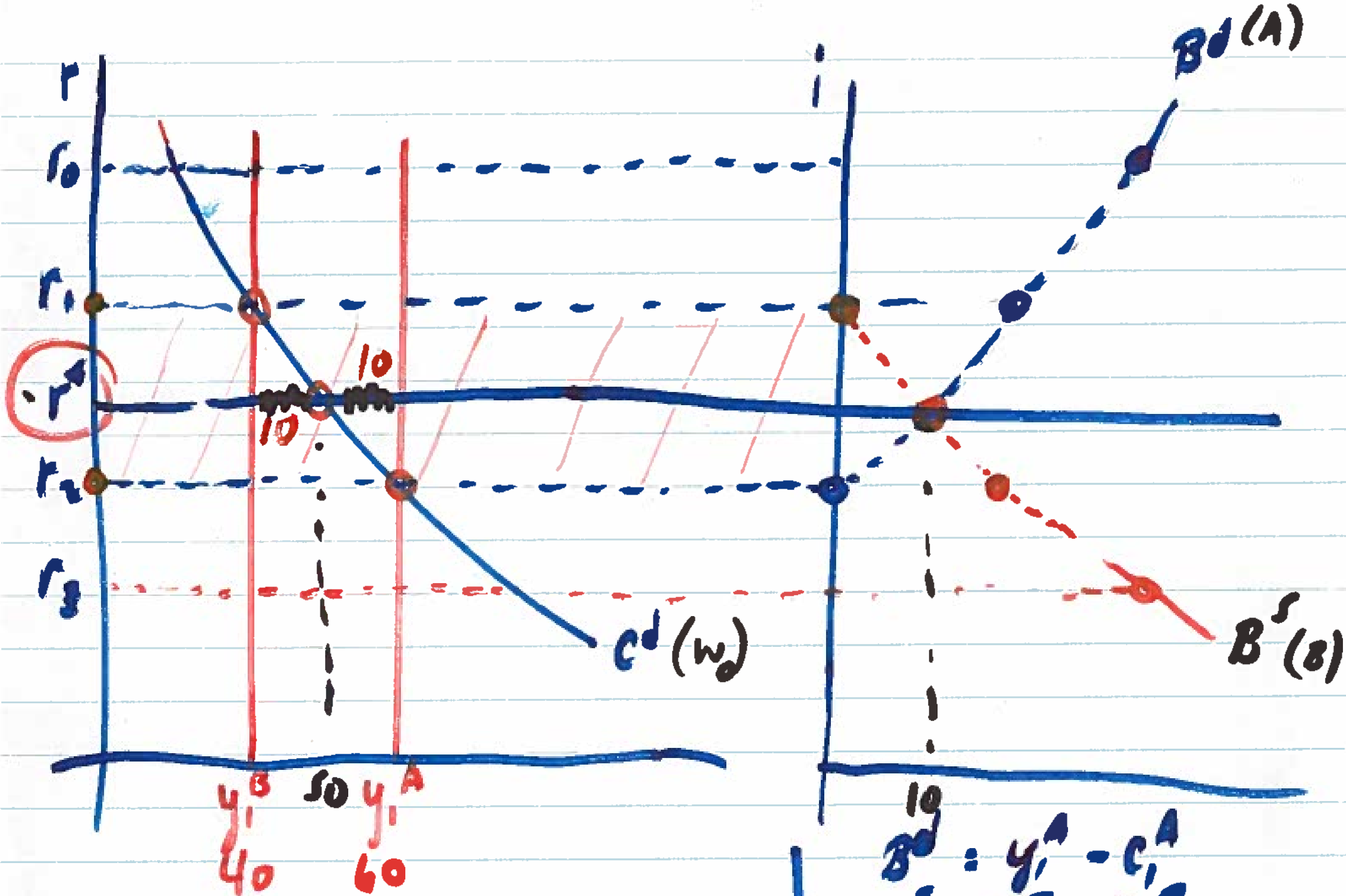
	B		A	
y_1 0	40	50	60	100
y_2 100	60	50	40	0

$\underbrace{\qquad\qquad}_{\text{Borrow.}}$ $\underbrace{\qquad\qquad}_{\text{Lend}}$

Case A $2y_1$ $2y_2$

B $2y_1$ $\bar{y}_2$ A: 120, 40 B: 80, 60

C $\bar{y}_1$ $2y_2$



$B^d = y_1^A - c_1^A$

$B^s = c_1^B - y_1^B$

BOND MARKET

$B^d = B^s$

GOODS MKT

Since $B^d = B^s \Rightarrow$

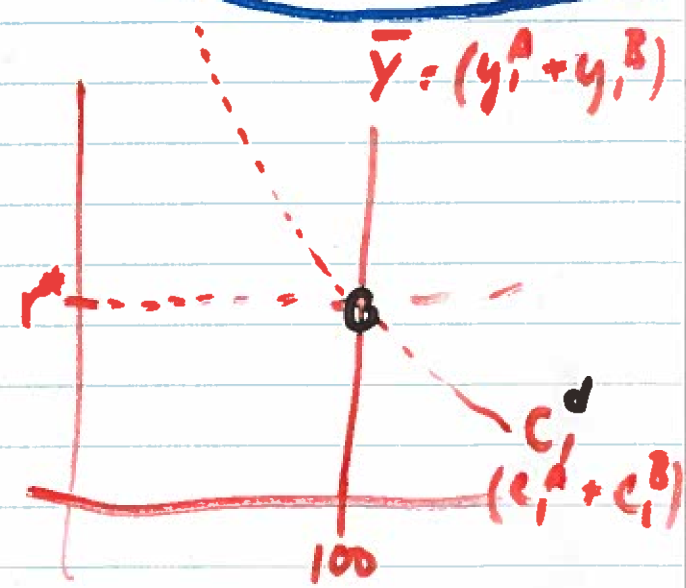
$y_1^A - c_1^A = c_1^B - y_1^B$

Then

$y_1^A + y_1^B = c_1^A + c_1^B$

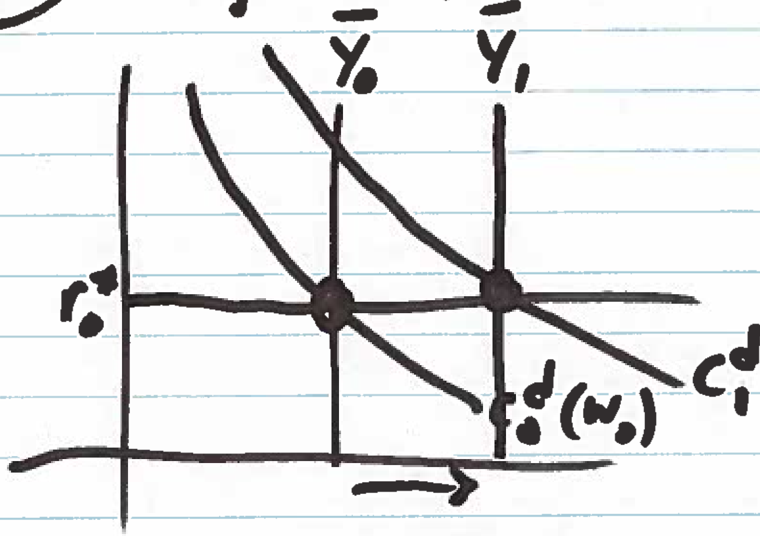
$\bar{Y} = C^d$

$\Rightarrow$

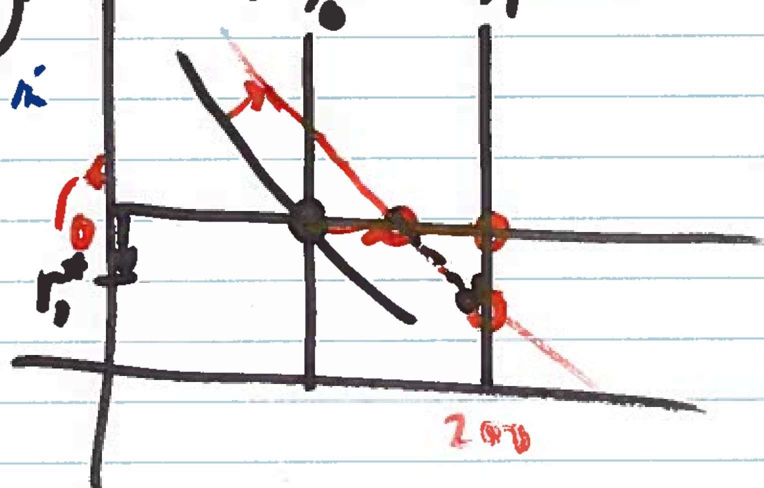


Case (A) $\uparrow y_1 \quad \uparrow y_2$

$$W = y_1 + \frac{y_2}{1+r}$$

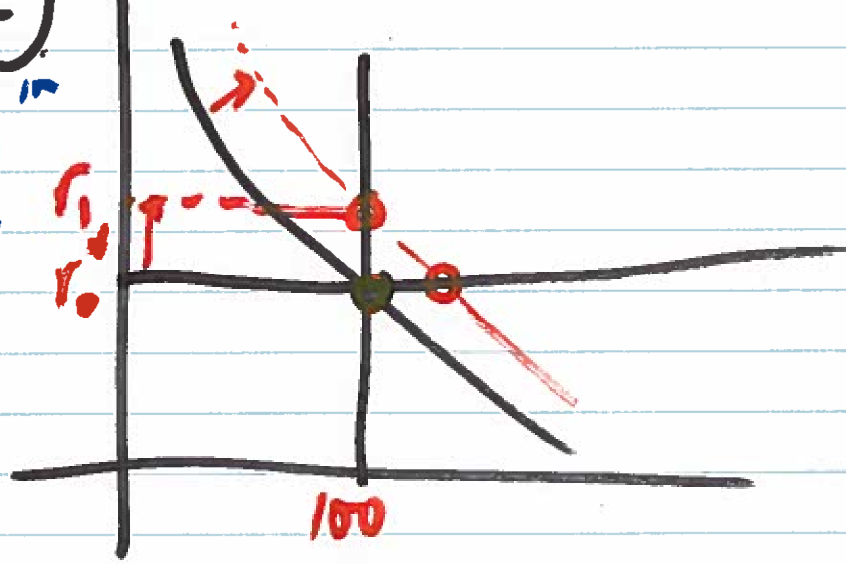


(B) (same change in Y_1 as A) $\uparrow y_1 \quad \bar{y}_2$



$r\downarrow$

(C) (Same change in C^d as in B) No Δ in Y_1 $\bar{y}_1 \quad \uparrow y_2$



$r\uparrow$

THE 'BIG' MODEL

(1) $W = y_1 + \frac{y_2}{1+r}$

(2) $i = r + \pi^e$ (or $r = i - \pi^e$)

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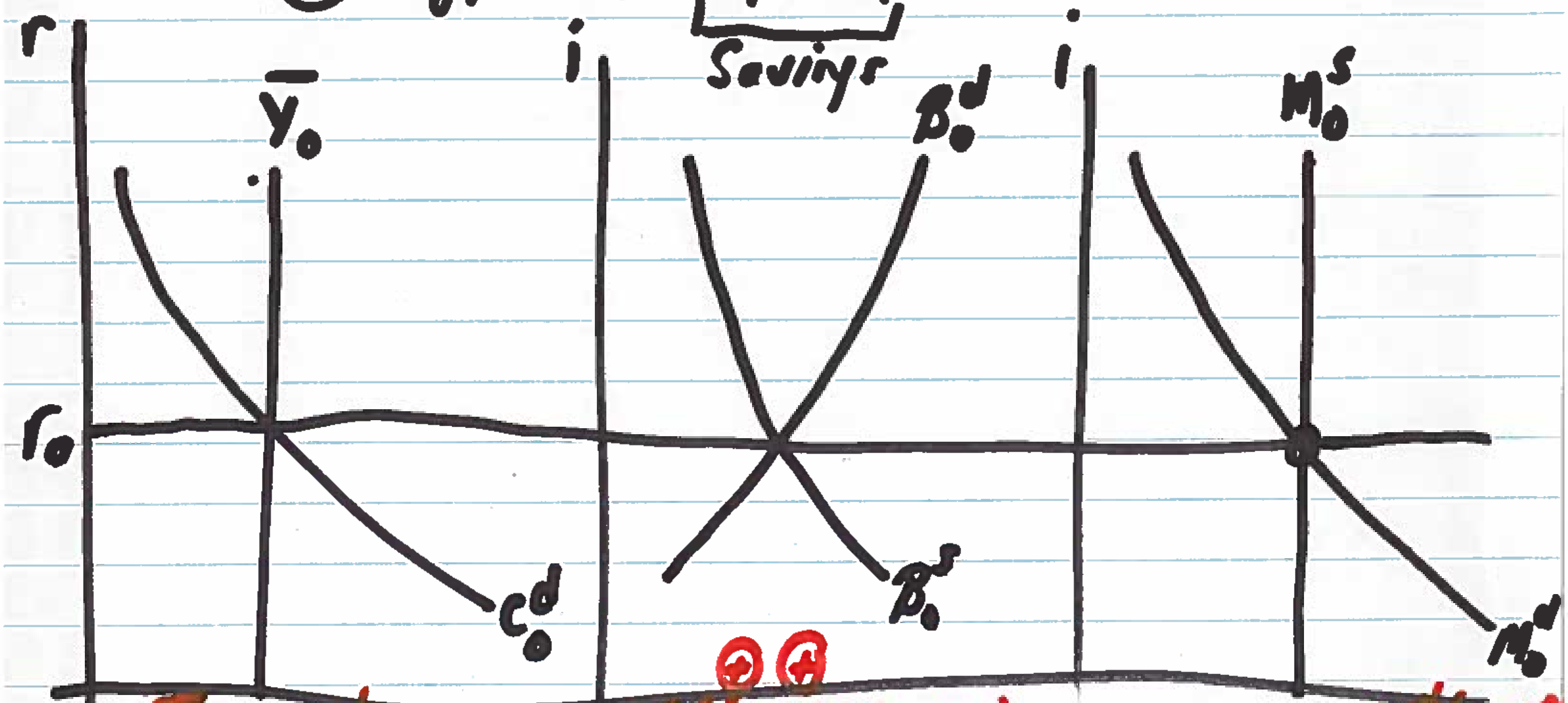
(3) $y_1 = c_1^d + \underbrace{b_1^d + m_1^d}_{\text{Savings}}$



$\bar{Y} = C^d(\underset{-}{r}, \underset{+}{W})$

GOODS MKT

$B^d(\overset{+}{i}, \overset{+}{W}, y_1, y_2) = B^s(\underset{-}{i}, \underset{+}{W}, y_1, y_2)$

BOND MKT

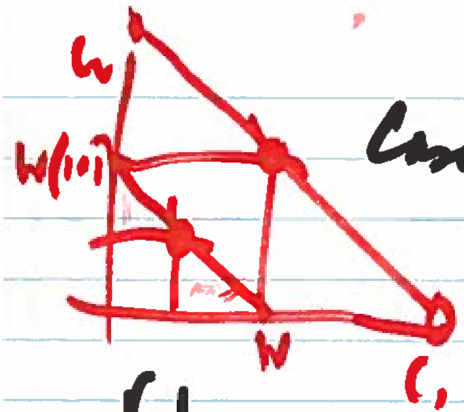
$M^d(\underset{+}{W}, \underset{+}{P})$

MONEY MKT

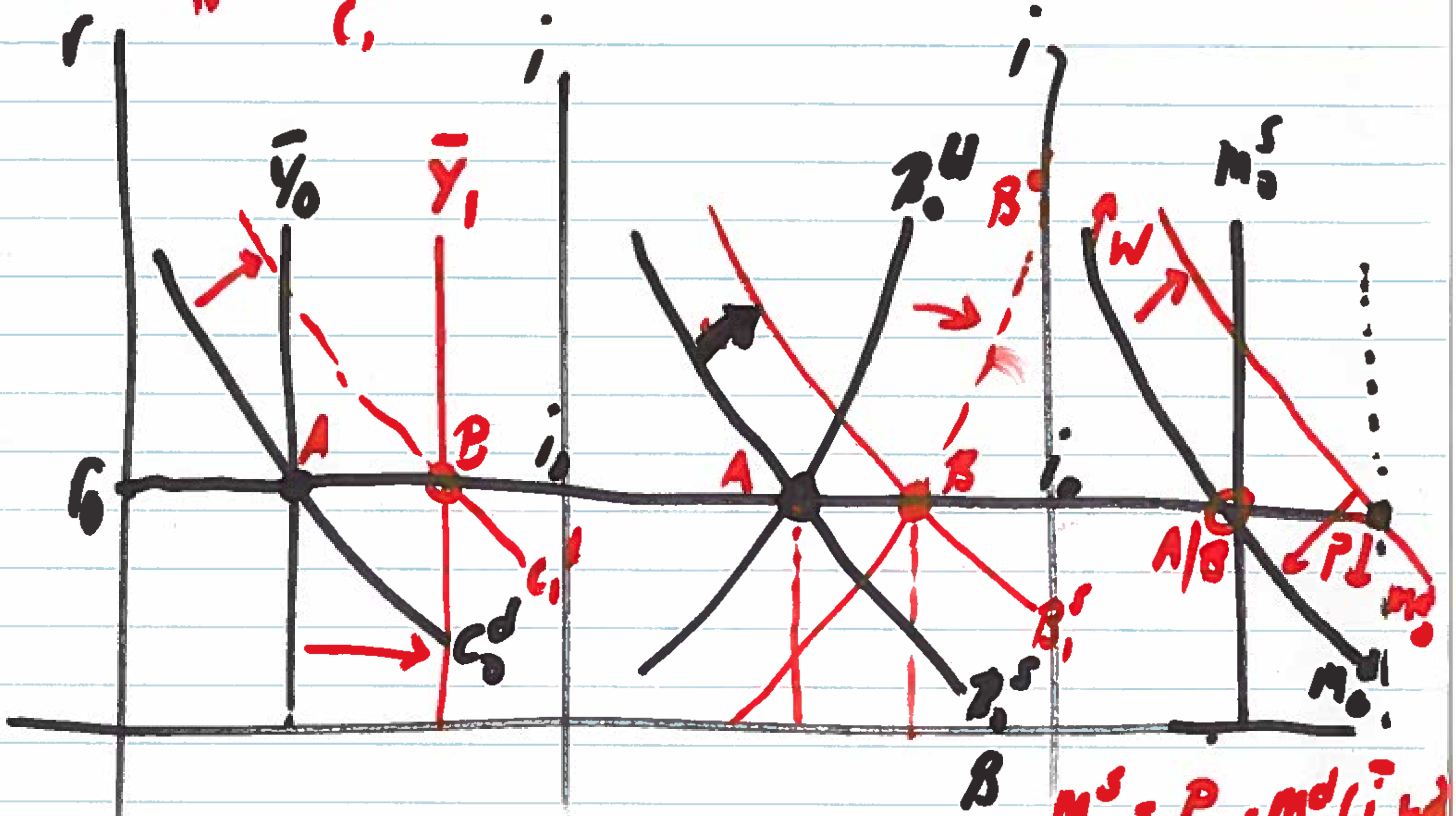
$M_0^s = \underbrace{P \cdot M^d(\overset{-}{i}, \overset{+}{W})}$

FIRST PERIOD DIAGRAMS NEEDED ONLY

$2W = 2y_1 + \frac{2y_2}{1+r}$



Case (A) : y_1 , y_2 x 2 permanent.



$M^s = P \cdot m^d(\bar{i}, W)$

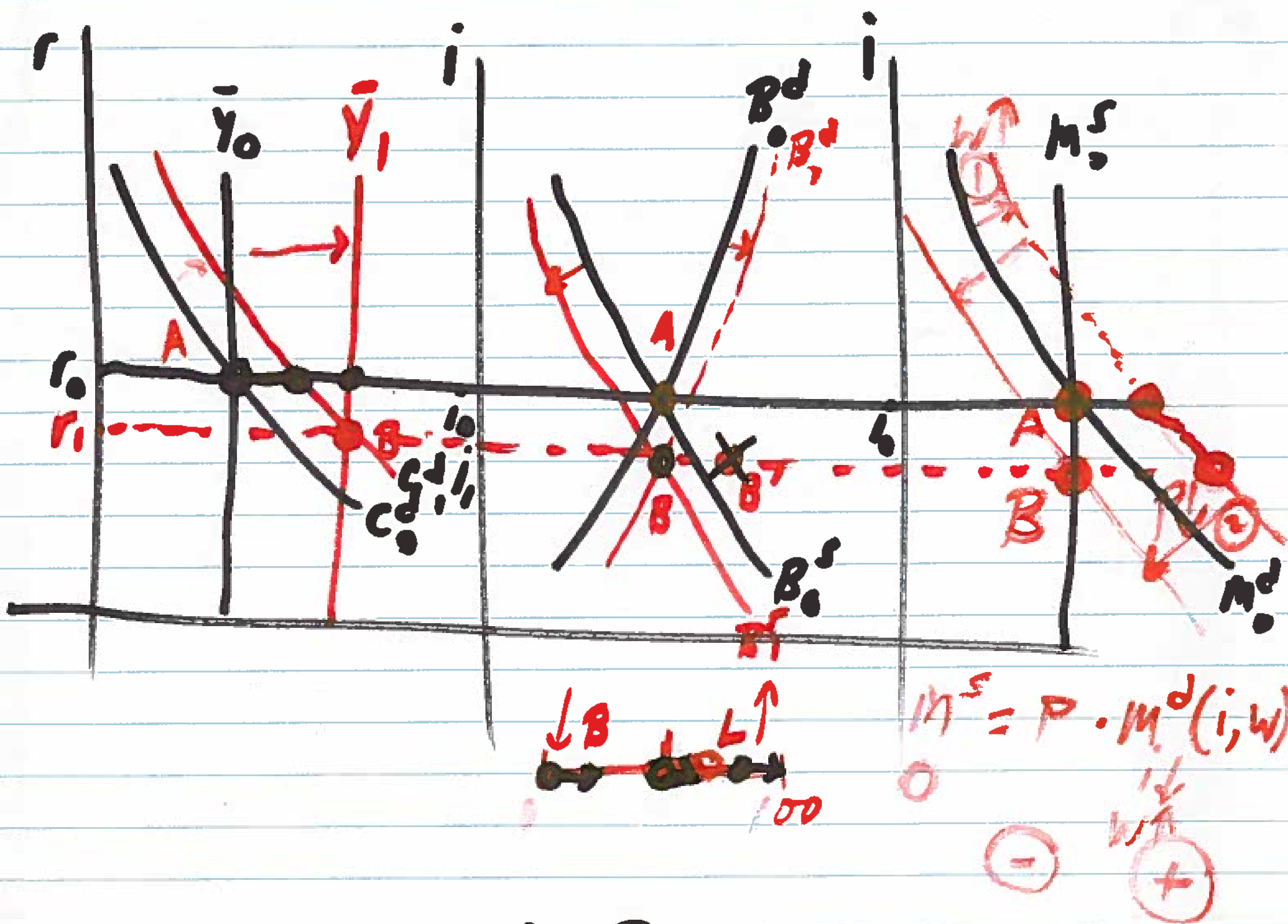
0   W↑

0   (−)   (+)

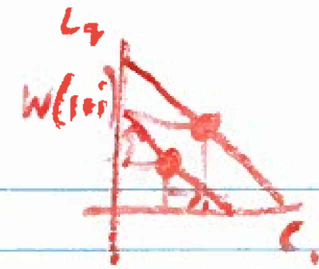
		Y	C	r	B	P		M^s
A	a	↑	↑	—	↑	↓	flexible price	0
	b	↑	↑	—	↑	0	inflation "	↑

$W = 2y_1 + \frac{y_2}{1+r}$

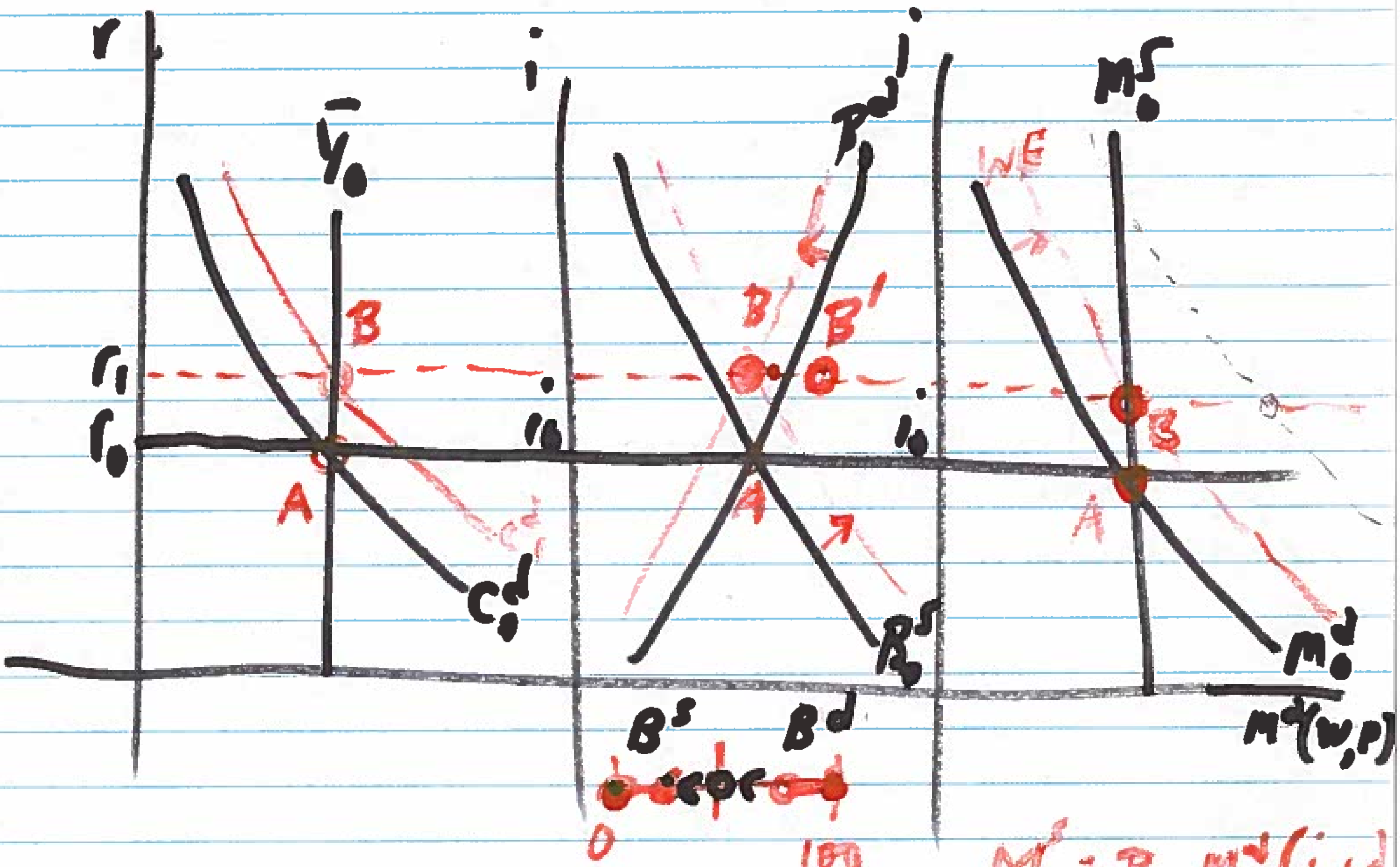
B $y_1 \times 2$ y_2 'boom'



	Y	C	r	i	B	P
Case B (+)	↑	↑	↓	↓	↑	↓



(c) $\bar{y}_1$ $y_2 \times 2$



$M^s = P \cdot M^d(i, w)$

Y	C	r	i	B	P	0
—	—	↑	↑	↑	?	

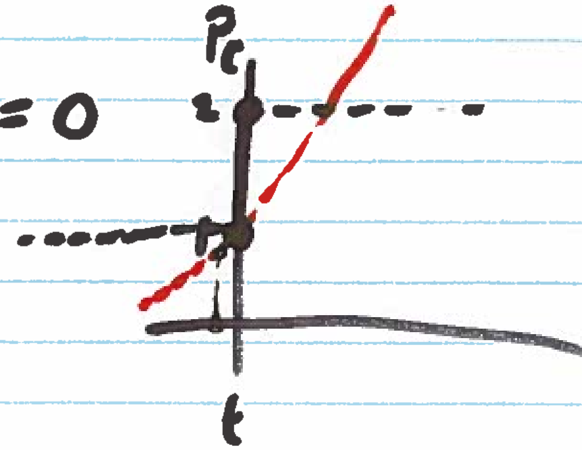
$i \uparrow$ $W \uparrow$

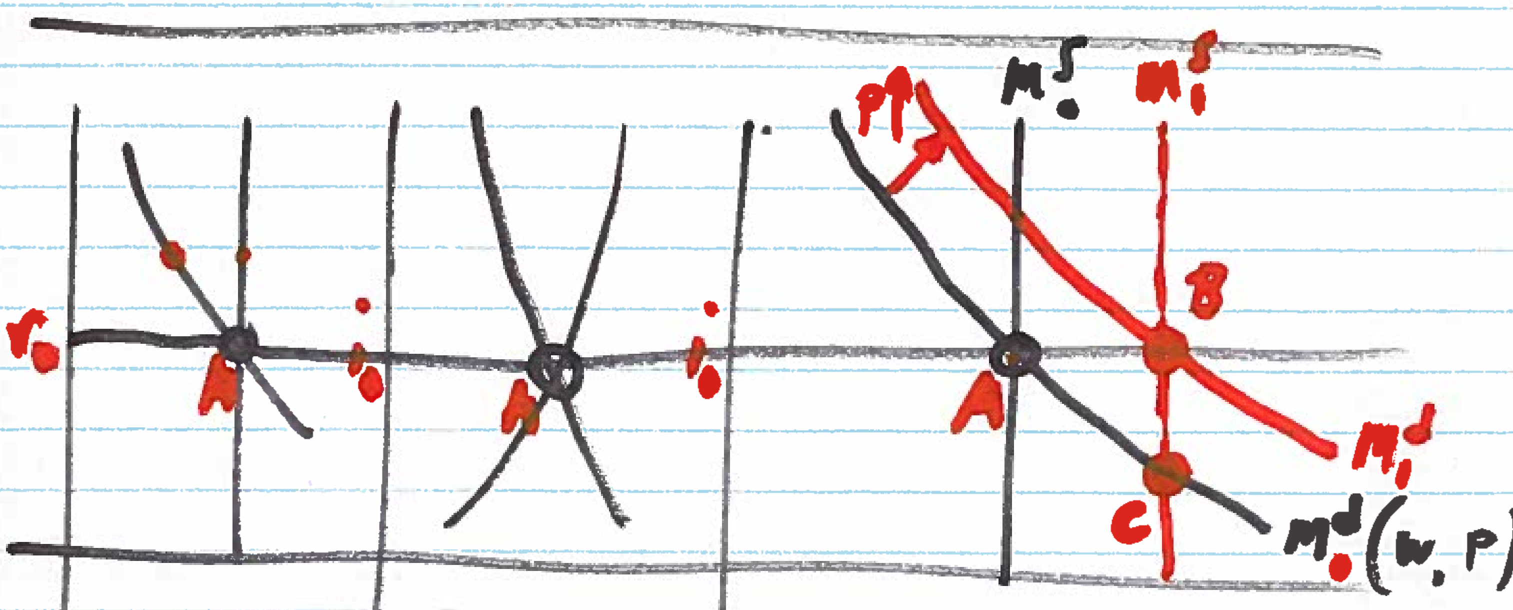
−	+
+	−
0	0

Money Shocks

Once for all: $\pi^e = 0$

Inflation: $\dfrac{P^{2}_{t+1} - P^{1}_t}{P^{1}_t} = \pi$





No Δ   No Δ

$\uparrow M^s = \uparrow P \cdot M^d(i, W)$

Classical A → B

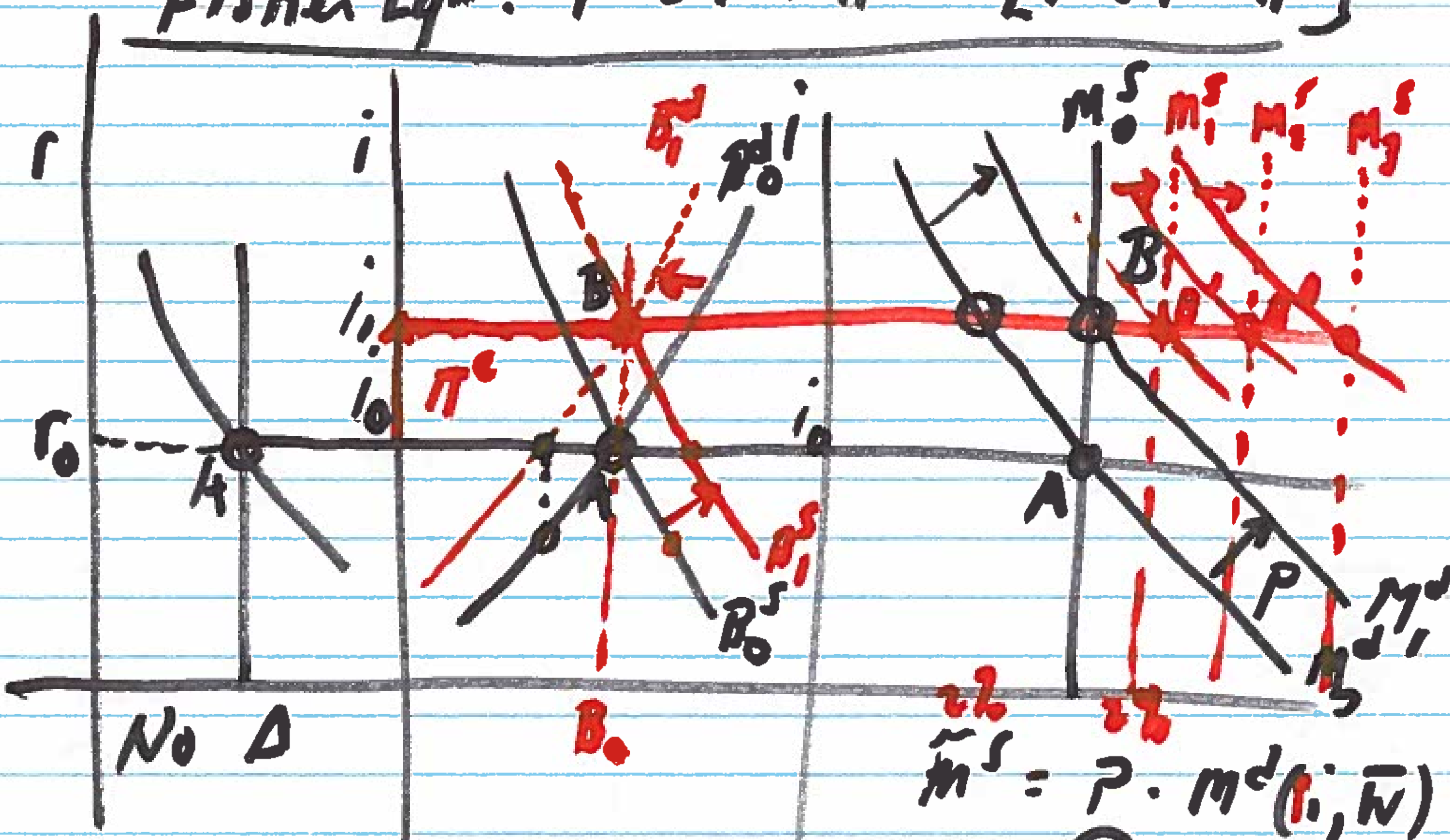
Keynesian A → C → slowly to B

Money Growth
growth rate : μ

$$M_{t+1} = (1+\mu) M_t \qquad P_{t+1} = (1+\pi) P_t$$
$$M_{t+2} = (1+\mu)^2 M_t \qquad P_{t+2} = (1+\pi)^2 P_t$$
$$M_{t+3} = (1+\mu)^3 M_t$$

$$\mu = \pi \qquad \pi^e_t = \pi_t$$

Fisher Eqn : $i = r + \pi^e \quad [r = i - \pi^e]$



$\tilde{m}^s = P \cdot m^d(i, \bar{W})$
(+) (−)

Start $\pi^e = 0$, sudden ↑ $\pi^e = 2\%$
↑ i by 2%
(*) P↑

① A → B
② A → A' → A''