Real Rigidity

$\frac{P^*}{P}$

P^*/P
1

$D(Y^f)$ $D(Y)$

MC(y,y)

MC(y,Y)

MR(y,y)

MC(y,Y^f)

MR(y,Y)

MR(y,Y^f)

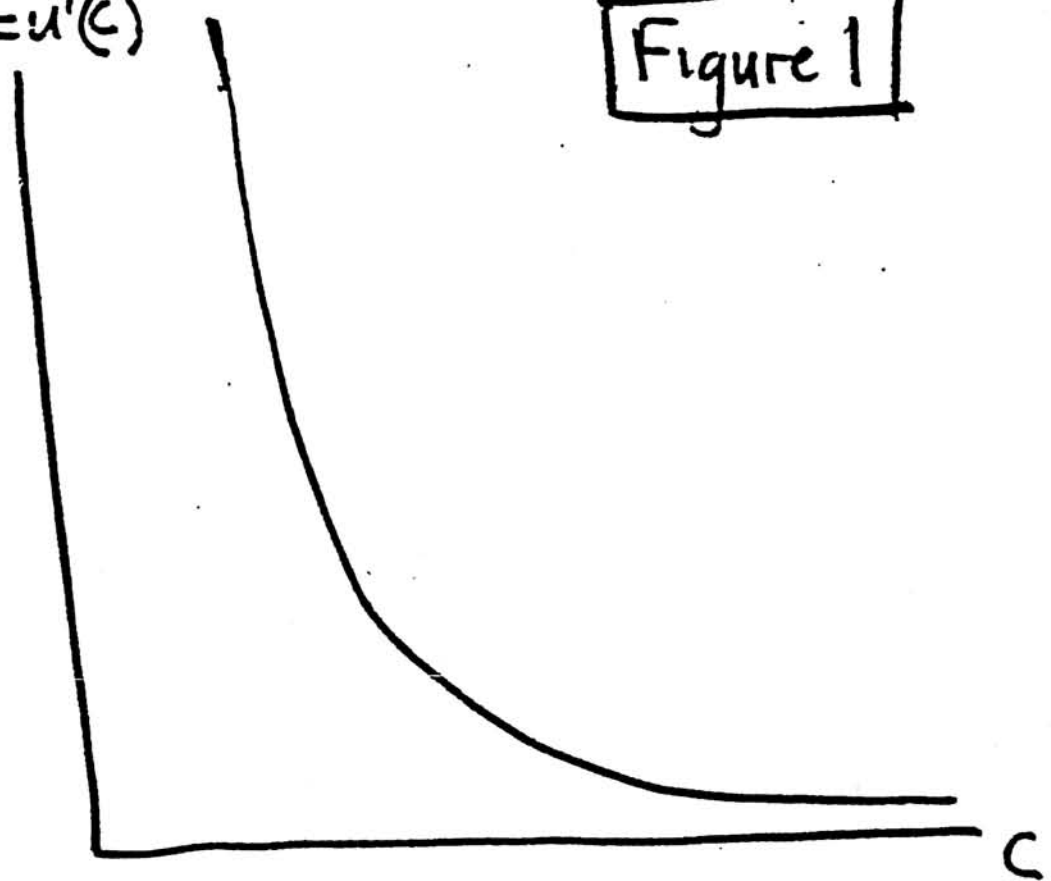Y^f $y^\#$ Y y

$\lambda = u'(c)$

Figure 1

c

$c = u'^{-1}(\lambda)$

Figure 2

λ

Figure 3

$\dot{\lambda}=0$

Figure 4

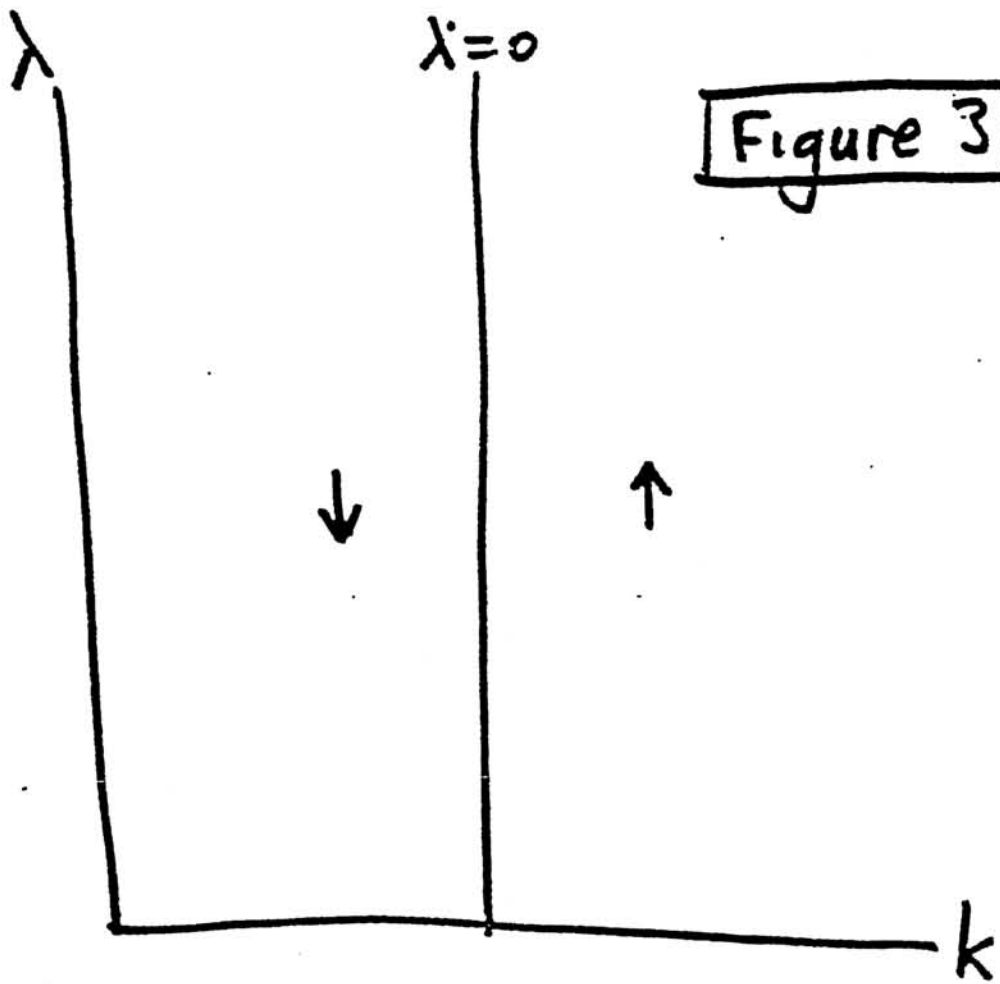$\dot{k}=0$

Figure 5

Figure 6

4

Figure 7

Figure 8

Figure 9

$\lambda = 0$

$\dot{k} = 0$
(new)

$\dot{k} = 0$
(old)

Figure 10

$\dot{k} = 0$
(interim)

$\dot{k} = 0$
(old)

saddle path

Figure 11

Figure 12

$\lambda = 0$

λ

$\dot{k} = 0$ (new)

$\dot{k} = 0$ (old)

k

Figure 13

Permanent Increase in g

c _____

_____

Temporary Increase in g

_____ _ _ _

_____

Anticipated Increase in g

_____ _ _ _

_____

Basic RBC

The Phase Diagram

λ

$\dot\lambda = 0$

$\dot k = 0$

k
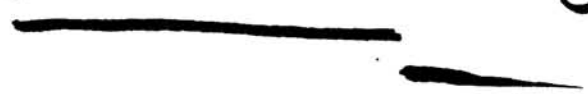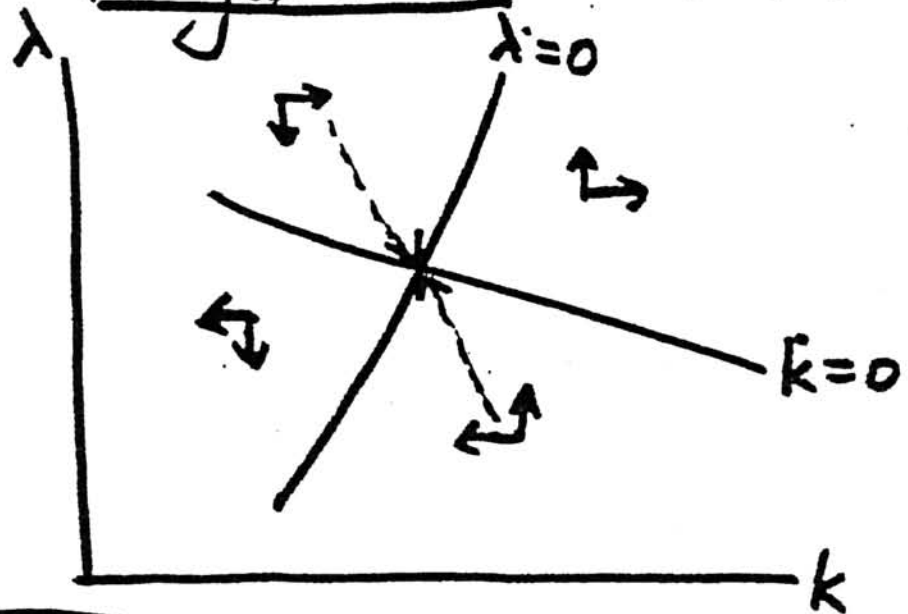
Figure 2

Supply and Demand
in the Labor Market

$n^s(\lambda)$

$n^d(k, z)$

w

n
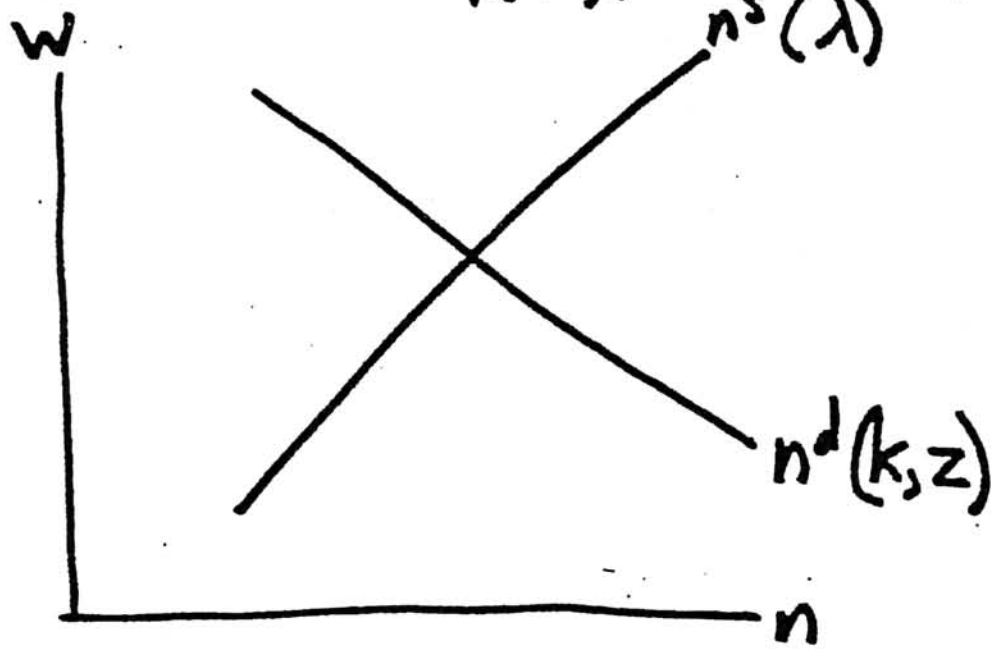
Figure 3 — The Factor Price Possibility Frontier

R

K/n low

$\frac{k}{n}$ high

FPPF(z)

W
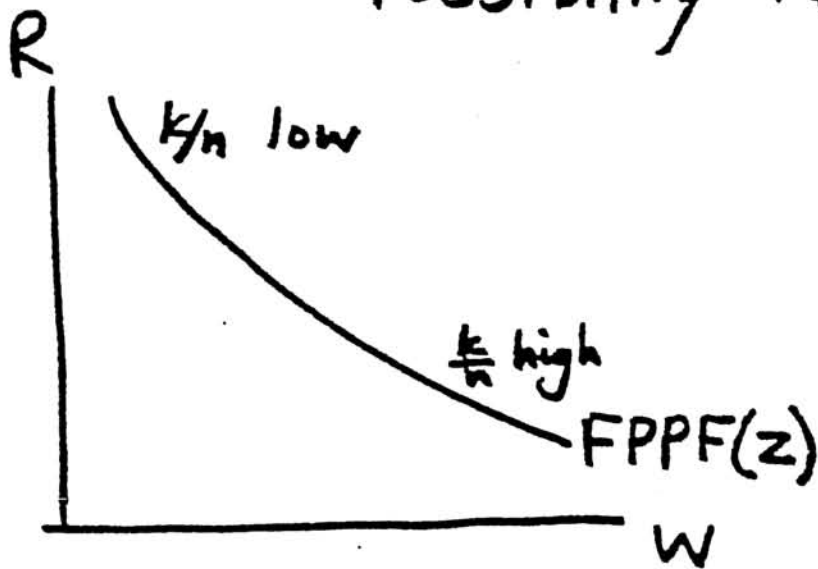
Figure 4 — The Effect of a Higher Marginal Value of Capital

λ

λ_1

λ_0

k

Quantities		Prices
c↓		
n↑		w↓
y↑		R↑
i↑		r↑
k↑		λ↓

Figure 5

Labor Supply Increases

$n^s(\lambda_o)$

$n^s(\lambda_1)$

$n^d(k,z)$

w (vertical axis), n (horizontal axis)
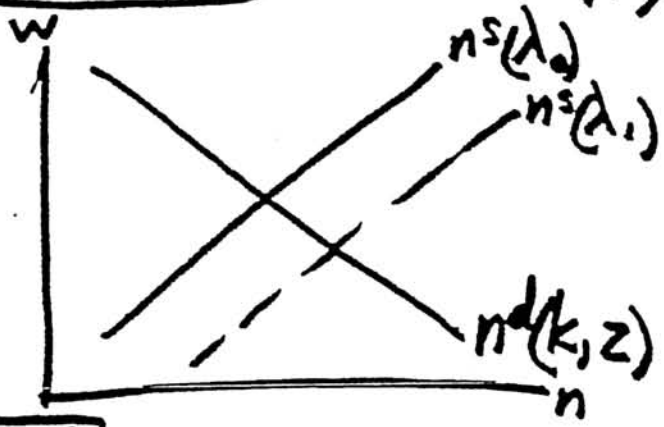
Figure 6

The Marginal Revenue Product of Capital Increases as $\frac{n}{k}$

R

$FPPF(z)$

w
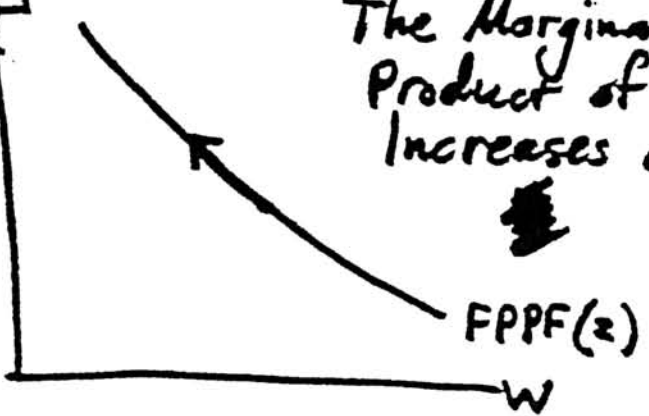
Figure 7

The Effect of a Higher Capital Stock

λ (vertical axis), k (horizontal axis)

$\bullet \bullet \rightarrow \bullet$
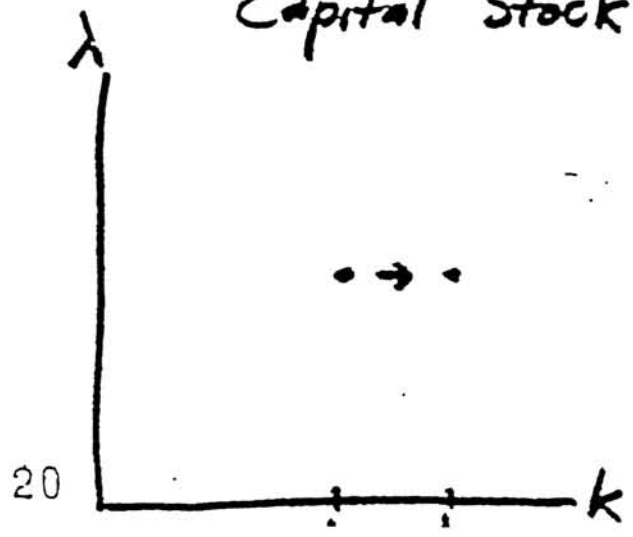
Quantities		Price	
c ?			
n ↑		w ↑	
y ↑		R ↓	
i ↑		r ↓	
k ↑		λ ↑	

20

Figure 8

Labor Demand Increases

$n^s(\lambda)$

$n^d(k_1, z)$

$n^d(k_0, z)$

W

n

Figure 9

R

The Marginal Revenue Product of Capital Fall as $\frac{n}{k} \downarrow$

FPPF(z)

W

Figure 10

An Increase in Government Purcha

$\dot{\lambda} = 0$

$k \downarrow$

$i \downarrow$ for given k and λ

$\dot{k} = 0$ (new)

$\dot{k} = 0$

λ

k
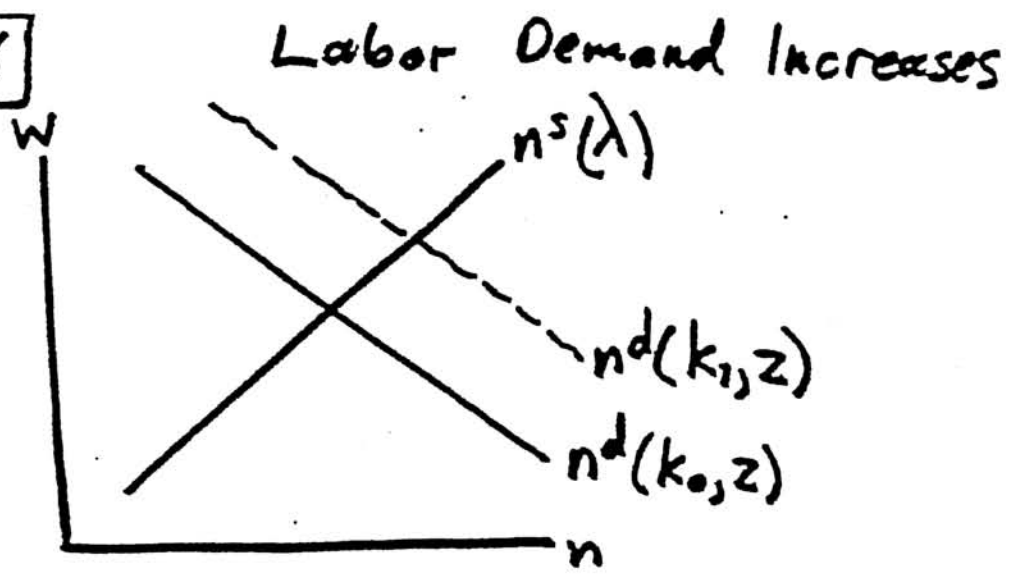
Figure 11

An Improvement in Labor-Augmenting Technology

For Given k and λ:

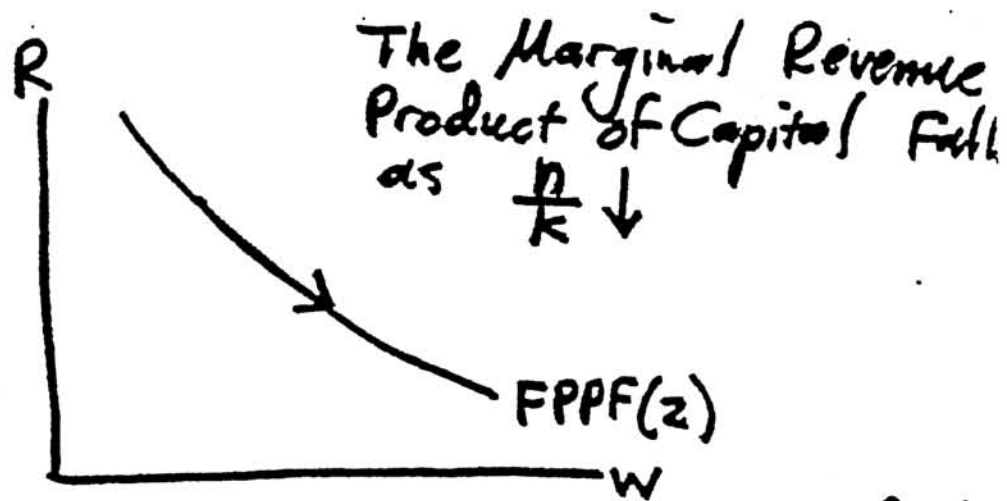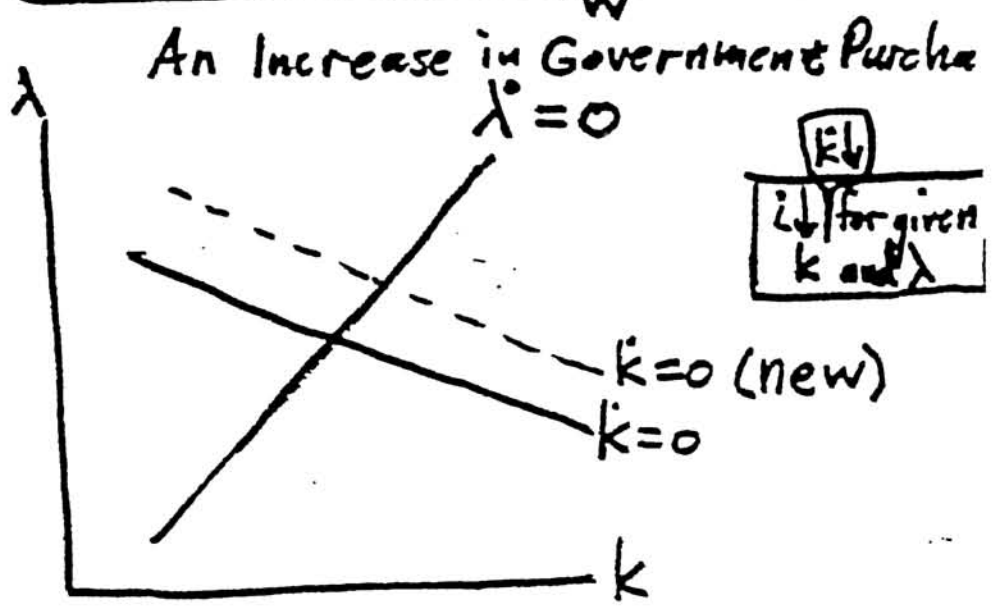| Quantities	Prices
c ?	
$n \uparrow$	$w \uparrow$
$y \uparrow$	$R \uparrow$
$i \uparrow$	$r \uparrow$
$\dot{k} \uparrow$	$\dot{\lambda} \downarrow$

Figure 12

Labor Demand Increases

$n^s(\lambda)$

$n^d(k, z_1)$

$n^d(k, z_0)$
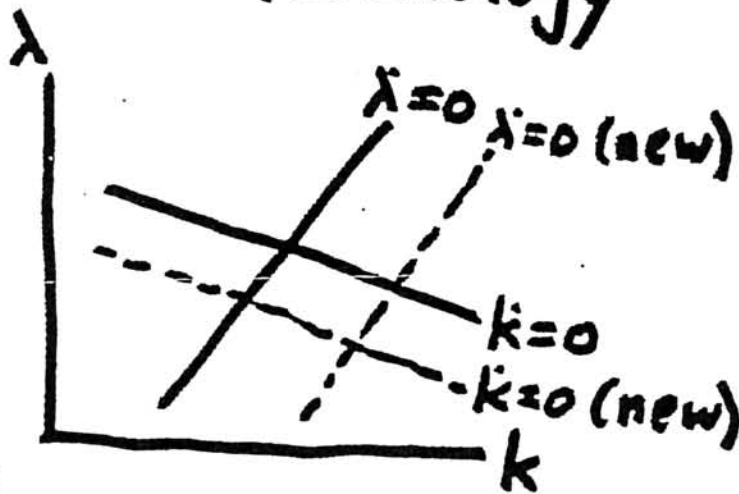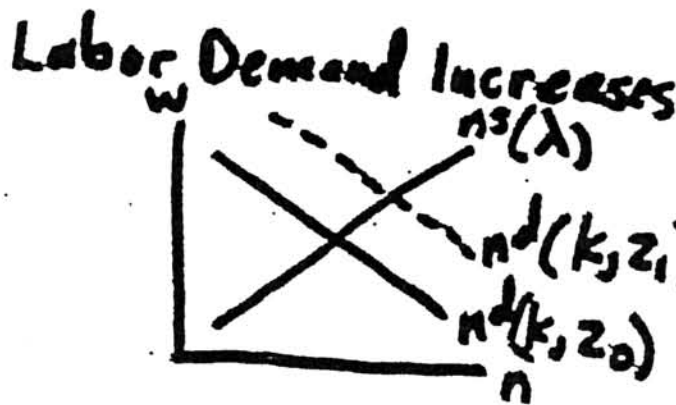
Figure 13

The Factor-Price Possibility Frontier Shifts Out

$\frac{zn}{k} \uparrow$

FPPF(z_1)

FPPF(z_0)

22
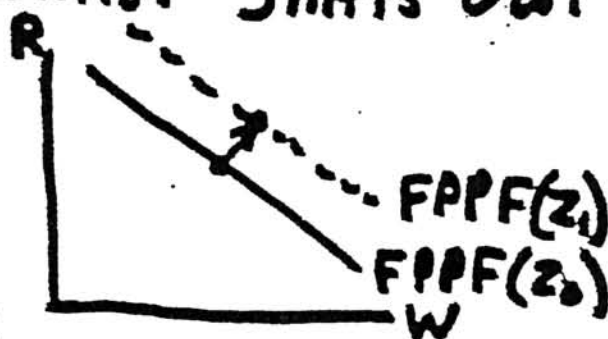
Figure 14

Investment Demand

ν (MUC)

$\nu = \lambda J'\left(\frac{i}{k}\right)$

$II(\lambda)$

ν = marginal utility of consumption

λ = marginal value of capital

$\dot{k} = 0$

$\left(\frac{i}{k} = \delta\right)$

$\frac{i}{k}$
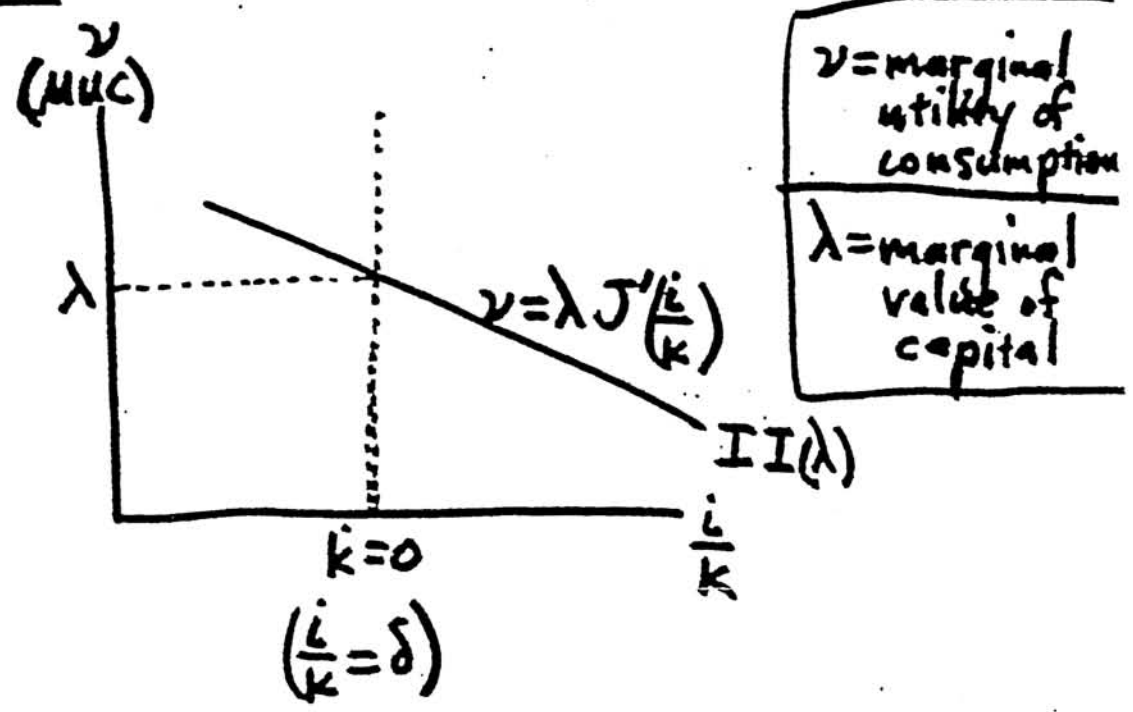
Figure 15

Saving Supply When Investment Demand is Perfectly Elastic

ν (MUC)

$SS(k, z, g)$

$\nu = \lambda$

II

λ

31

$\frac{i}{k}$
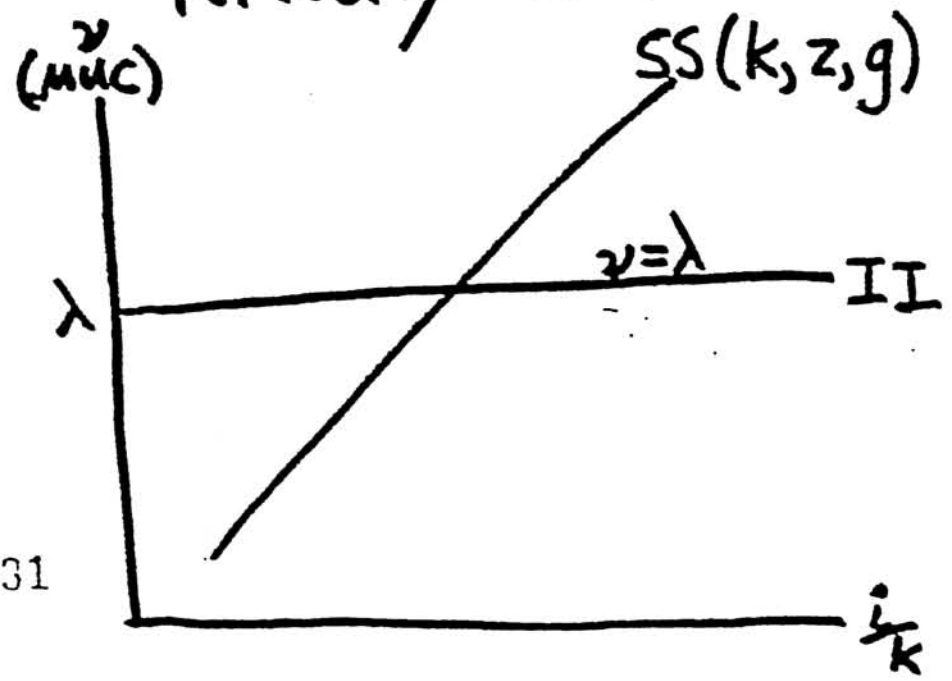
Figure 16 Saving Supply When Investment Demand is Less Than Perfectly Elastic

$SS(k,z,g)$

λ

ν

$II(\lambda)$

$\frac{i}{k}=\delta$

$\frac{i}{k}$
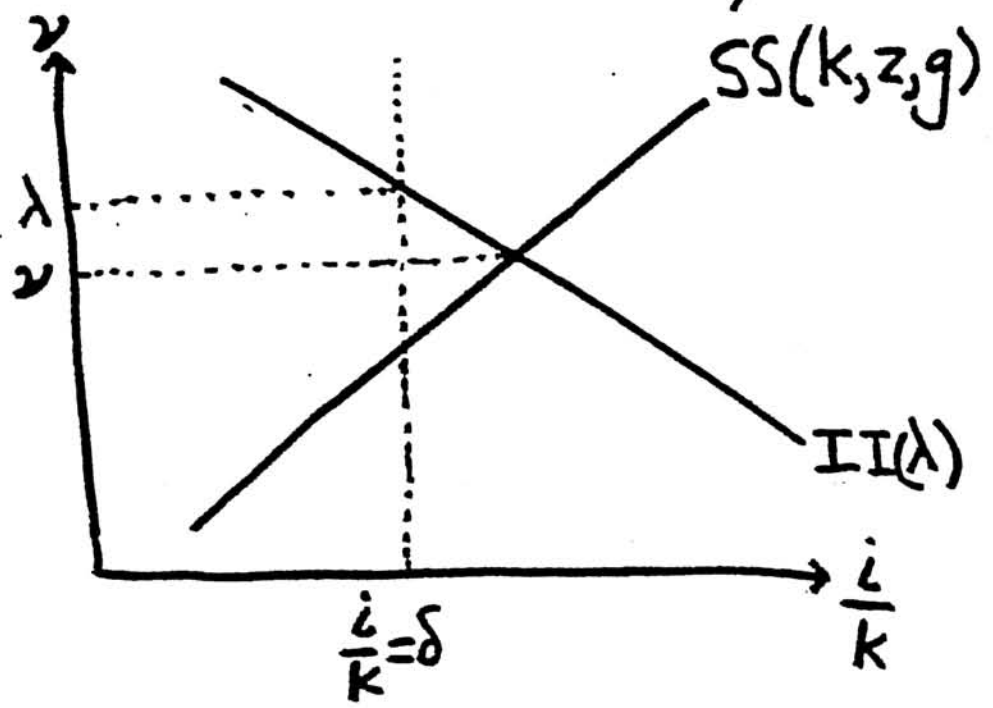
Figure 17 Labor Supply and Demand When $\nu \neq \lambda$

$n^s(\nu)$

$n^d(k,z)$

w

n

32
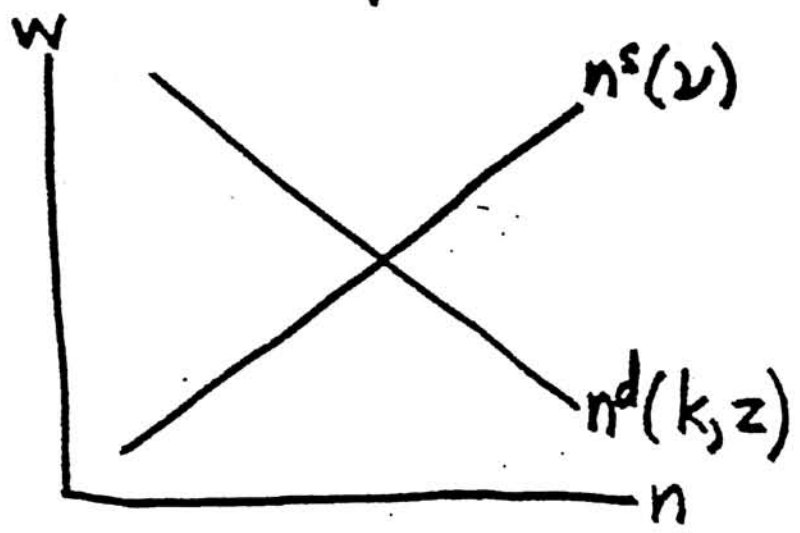
Figure 18 — The Effect of an Increase in k

$SS(k,z,g)$ $SS(k',z,g)$

ν

$\dfrac{i}{k}$
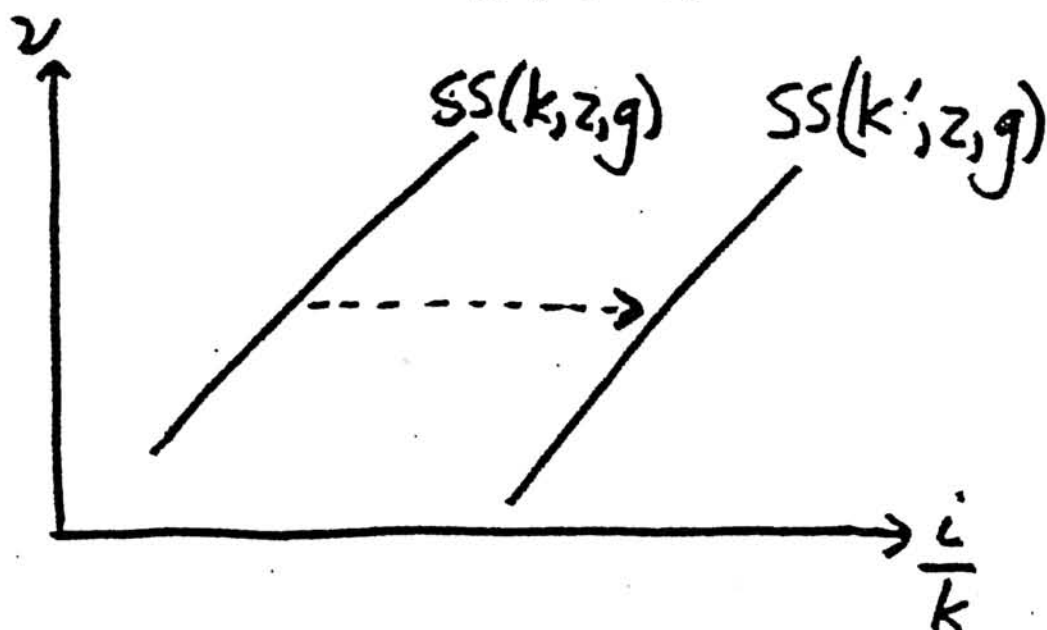
Figure 19 — Behind the Scenes: The Labor Market When k Increases with ν Fixed

w

$n^s(\nu)$

$n^d(k',z)$

$n^d(k,z)$

n

33
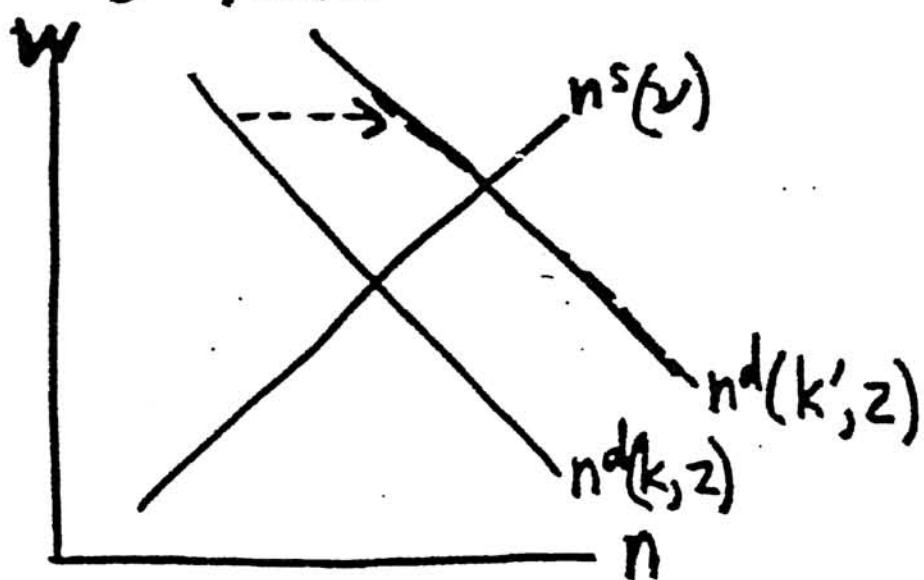
Figure 20   The Effect of an Increase in z

Axes: ν (vertical), $\frac{i}{k}$ (horizontal)

Curves labeled: $SS(k,z,g)$ and $SS(k,z',g)$
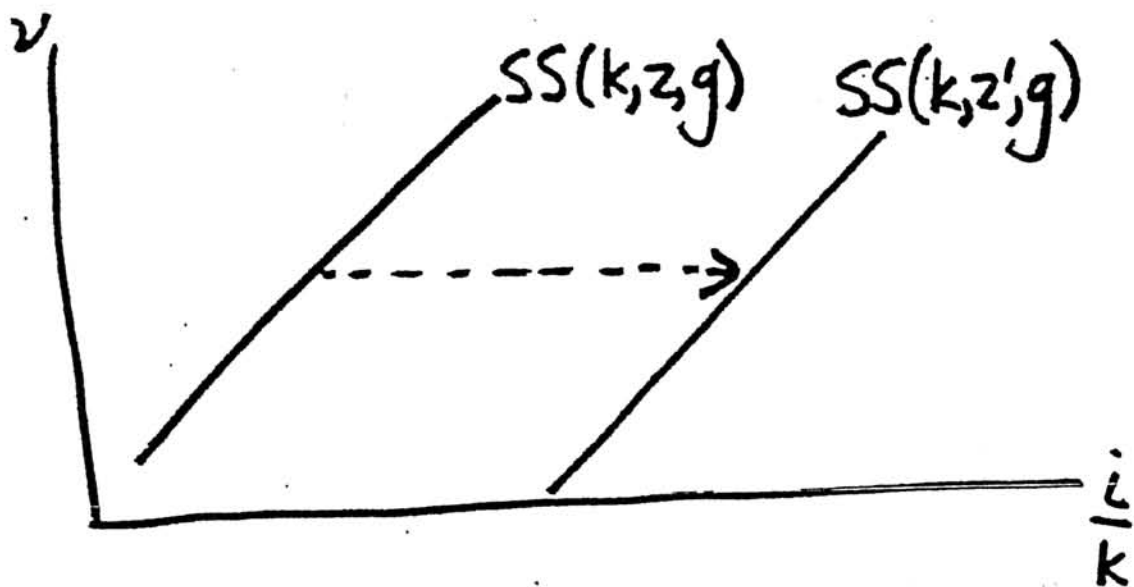
Figure 21   Behind the Scenes: The Labor Market When z Increases with ν Fixed

Axes: w (vertical), n (horizontal)

Curves labeled: $n^s(\nu)$, $n^d(k,z')$, $n^d(k,z)$

34
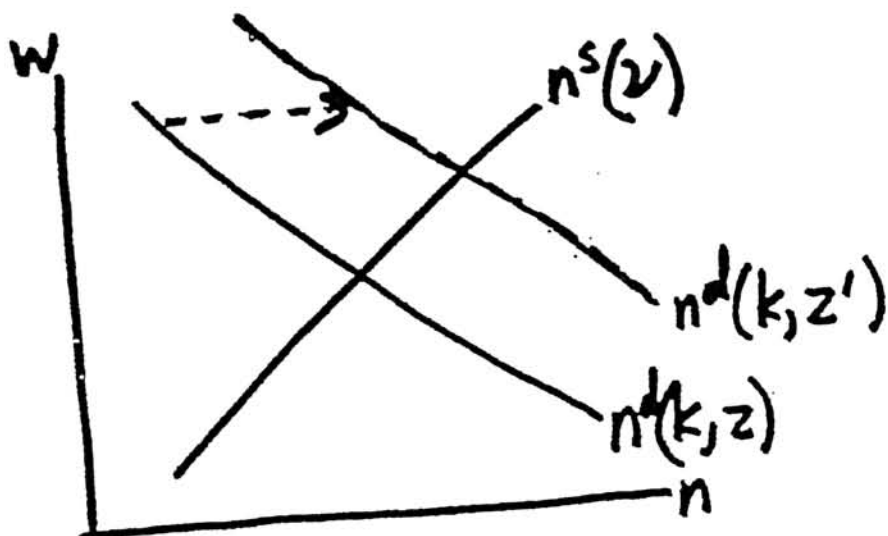
Figure 22

The Effect of an Increase in g

$SS(k_2, g')$ $SS(k_2, g)$

ν

$\frac{i}{k}$
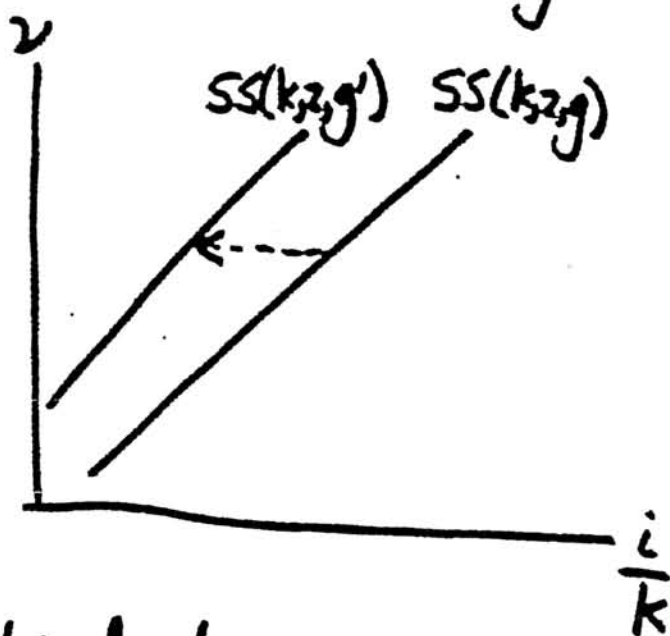
Figure 23

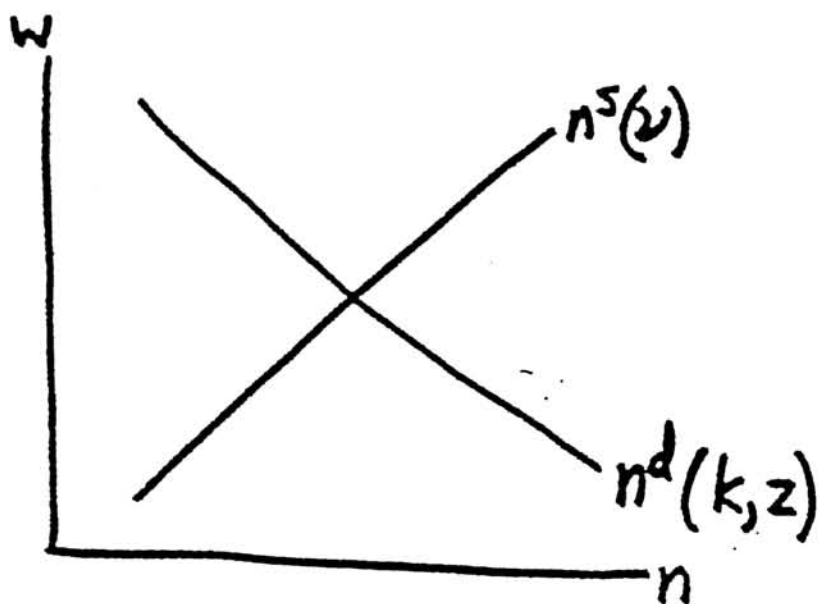Behind the Scenes: The Labor Market When g Increases for Fixed ν

$n^s(\nu)$

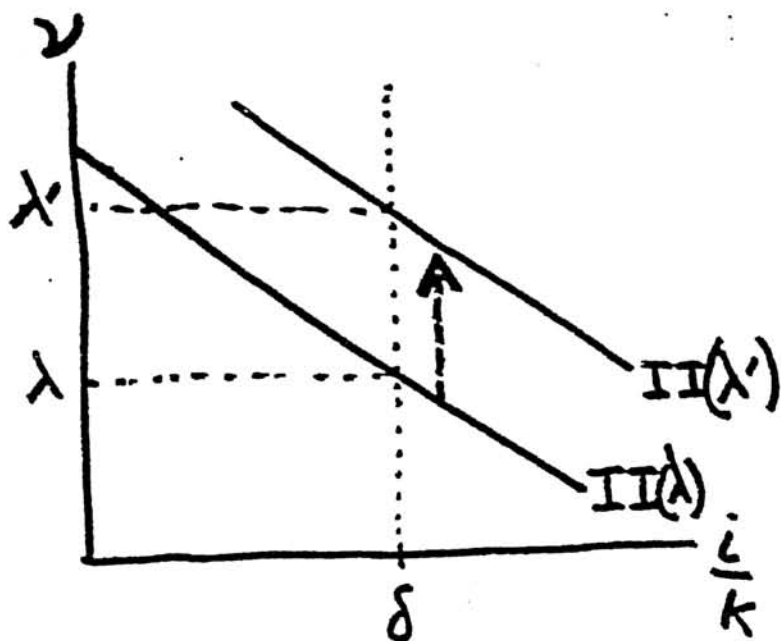$n^d(k, z)$

w

n
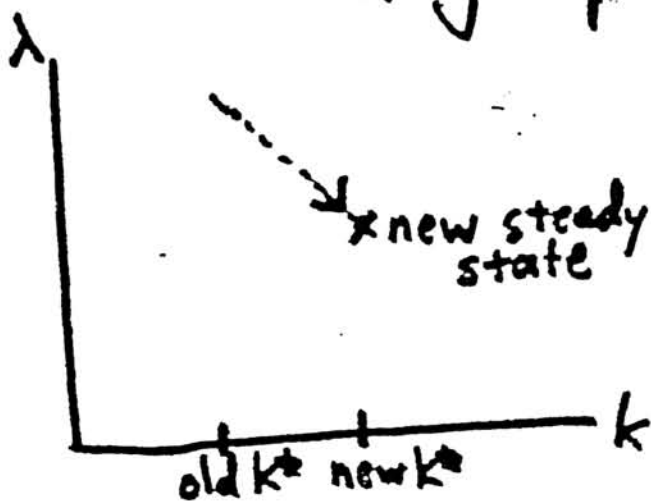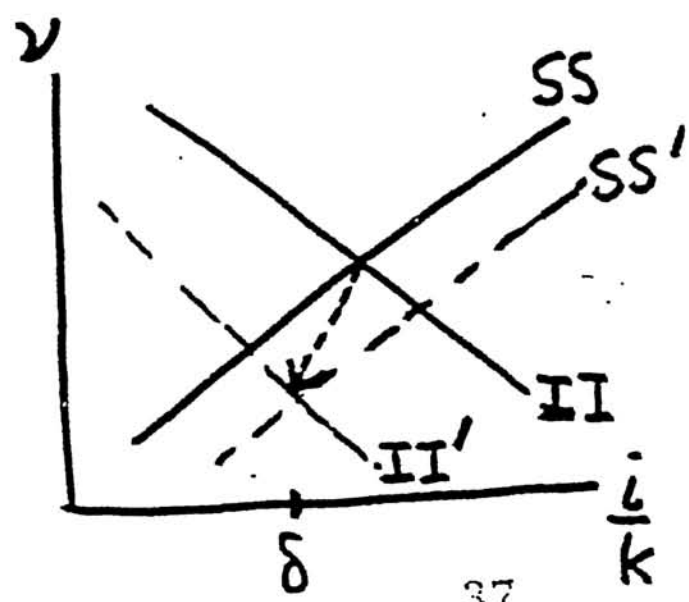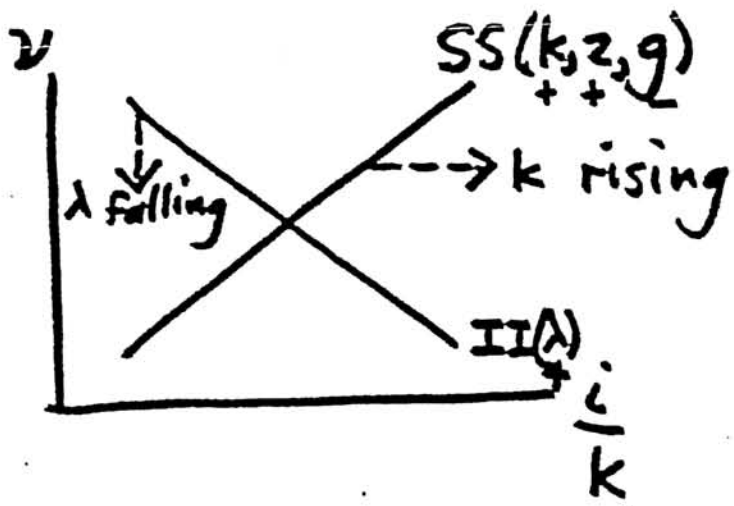
35

Figure 24 — The Effect of an Increase in λ

Figure 25 — The Adjustment to A Permanent Increase in z or g—after the Initial Jump in λ

36

Figure 26

The Adjustment of Investment Demand and Saving Supply to a Permanent Increase in z or g — After the Initial Jump

ν

$SS(k, z, g)$
$\quad + \; +$

λ falling

$\dashrightarrow k$ rising

$II(\lambda)$

$\frac{i}{k}$

ν

SS

SS'

II'

II

$\frac{i}{k}$

δ

Equilibrium ν Falling

(Equilibrium $\frac{i}{k}$ falling)
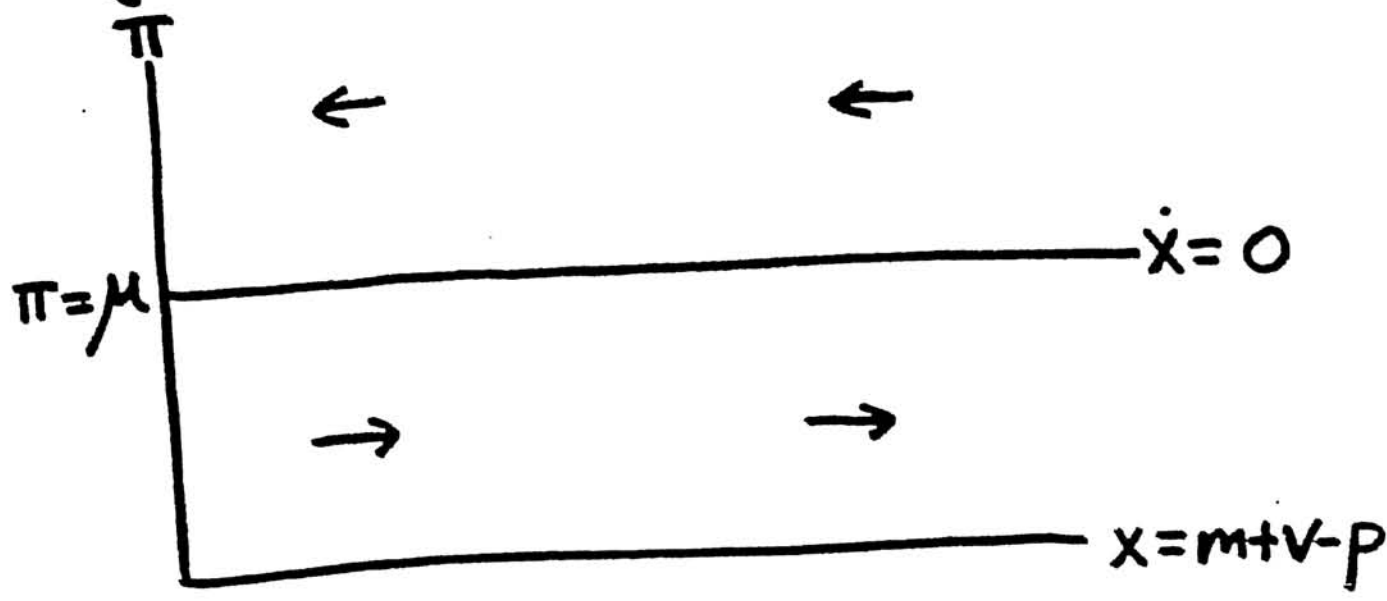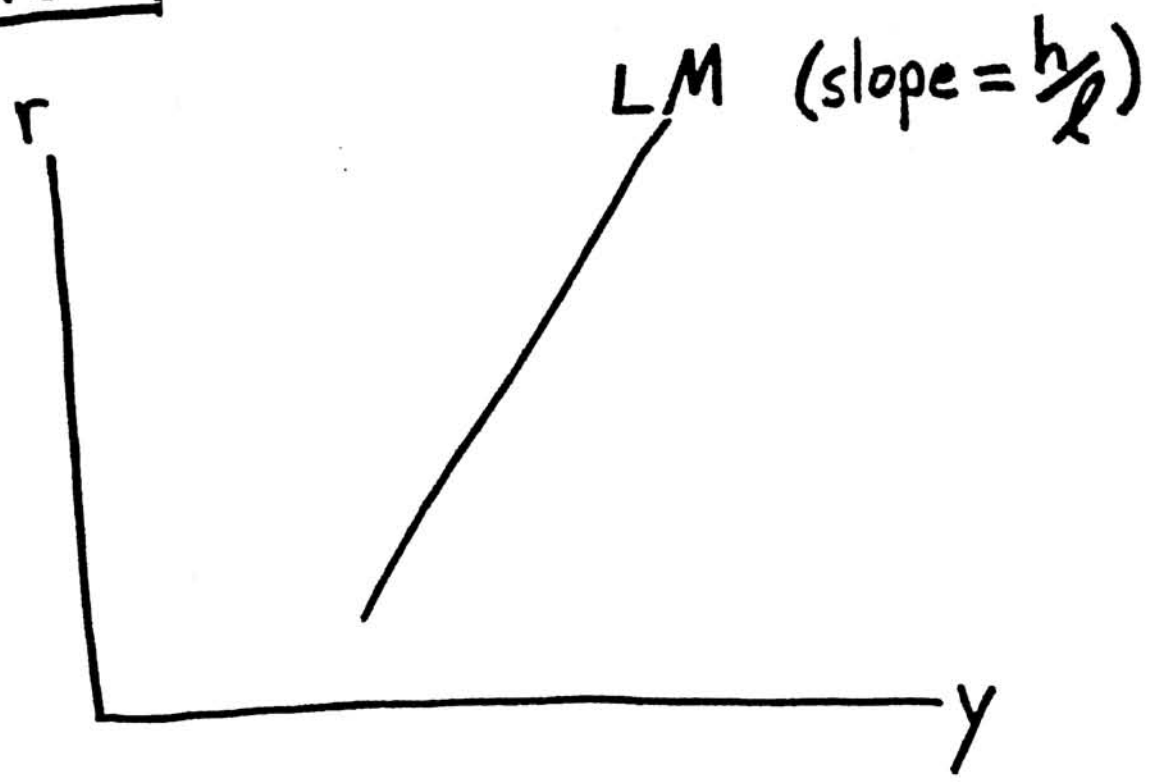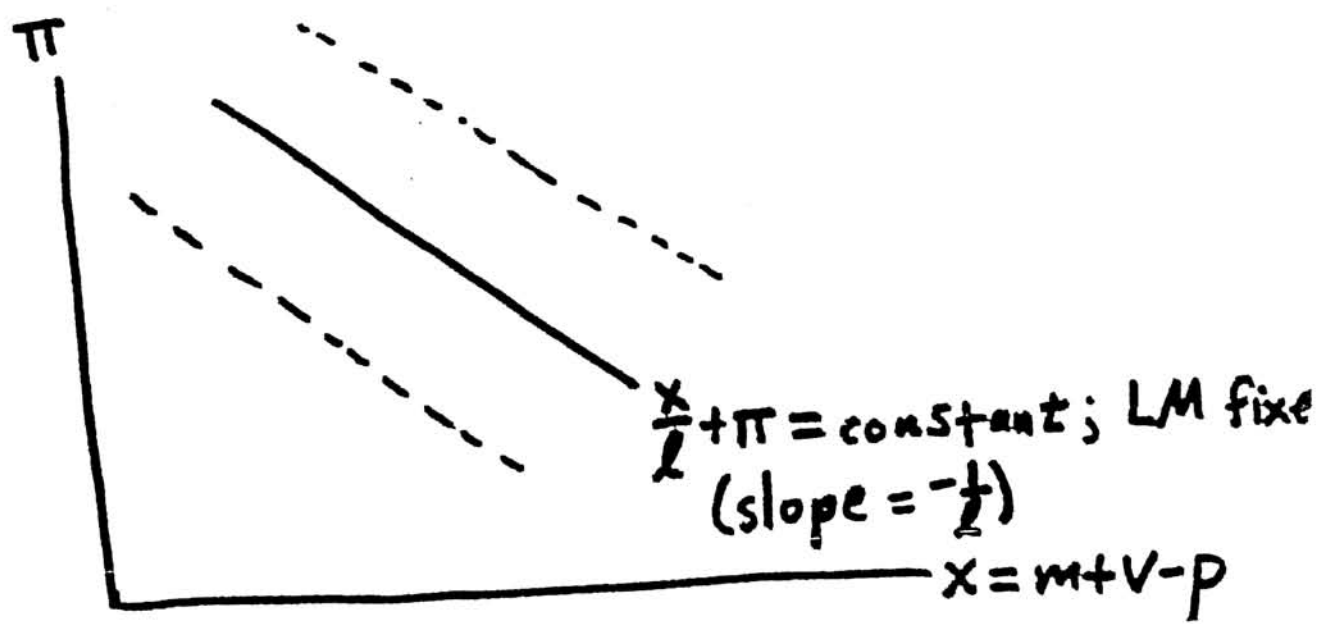
37

M-NRK   Overdementaros money

Figure 1

$$\dot{x} = \mu - \pi$$

π

$\leftarrow$ $\leftarrow$

$\pi = \mu$ ———————————————— $\dot{x} = 0$

$\rightarrow$ $\rightarrow$

———————————— $x = m + v - p$

Figure 2

r

$LM \left(slope = \frac{h}{\ell} \right)$

y

Figure 3

$$\frac{x}{\ell} + \pi = \text{constant}; \text{ LM fixed}$$
$$(\text{slope} = -\tfrac{1}{\ell})$$
$$x = m + V - p$$

Figure 4

slope $= \beta$

$p^{\#}$: Notional SR.

SRAS

P

y^f

y

$P, P^{\#}$

Figure 5
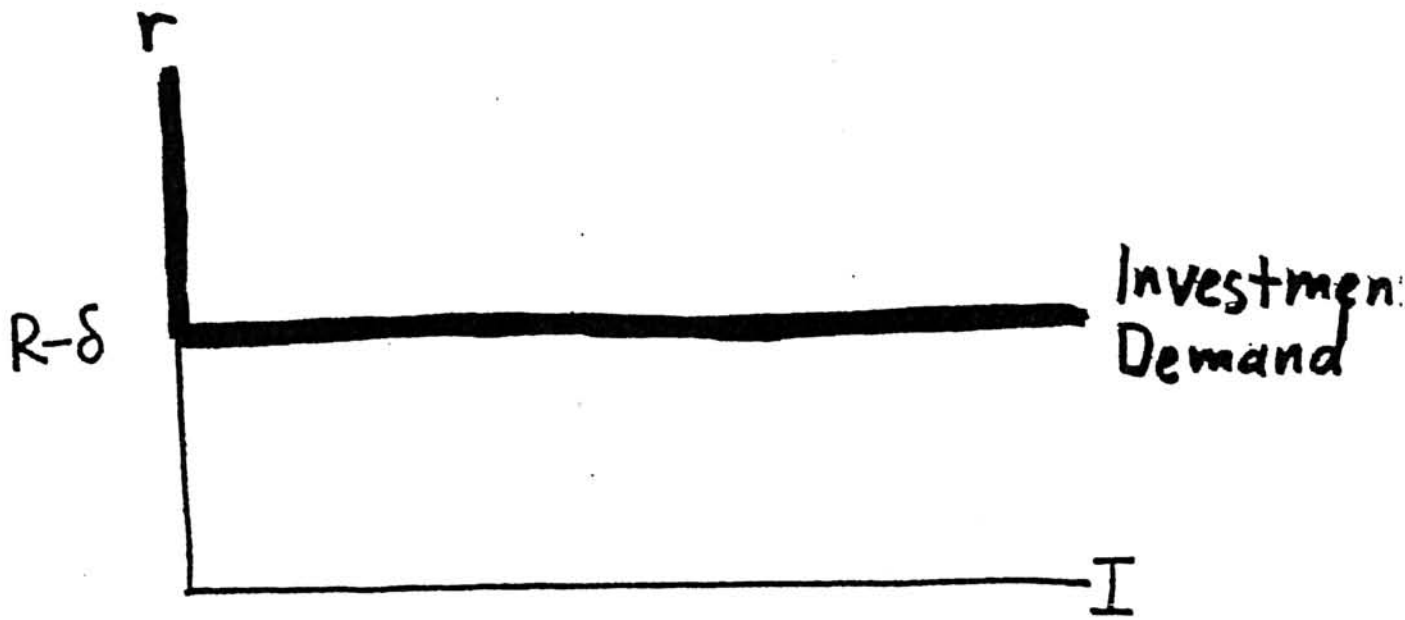

r

$R-\delta$

Investment Demand

I

Figure 6

r

slope $= \phi$

NRR (15)

r^f

y^f

y

Figure 7

Figure 8

Figure 9

LM (slope$=\frac{h}{\ell}$)

r

NRR
(slope$=\phi$)

r

y

y

Figure 10

π

$\downarrow$

$y > y^f$

$\uparrow$

slope$=-\frac{1}{\ell}$

$\downarrow$

$\uparrow$

$\dot{\pi}=0$ $(y=y^f)$

$y < y^f$

$x=m+v-p$

Figure 11

π

saddle path

μ $\dot{x}=0$

saddle path $\dot{\pi}=0$

$x = m + V - p$

Figure 12

π

short-run dynamics   initial jump

μ' $\dot{x}=0$ (new)
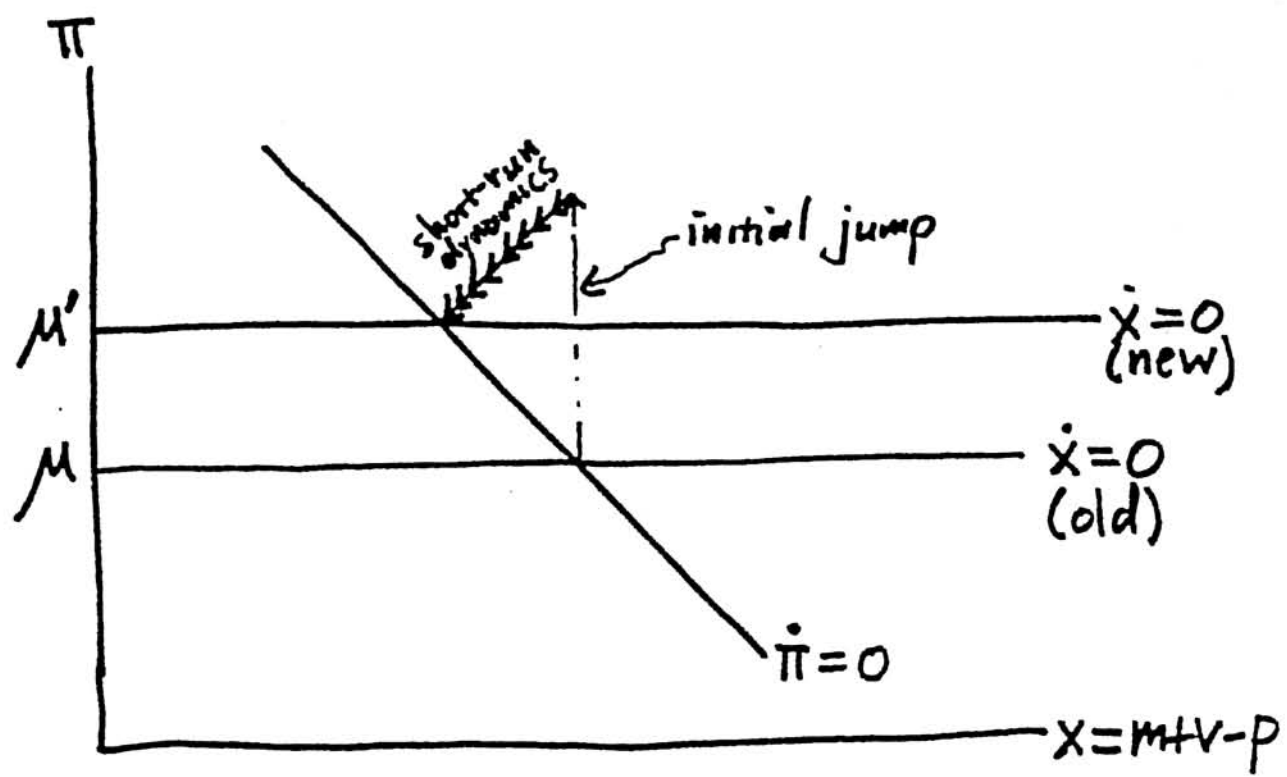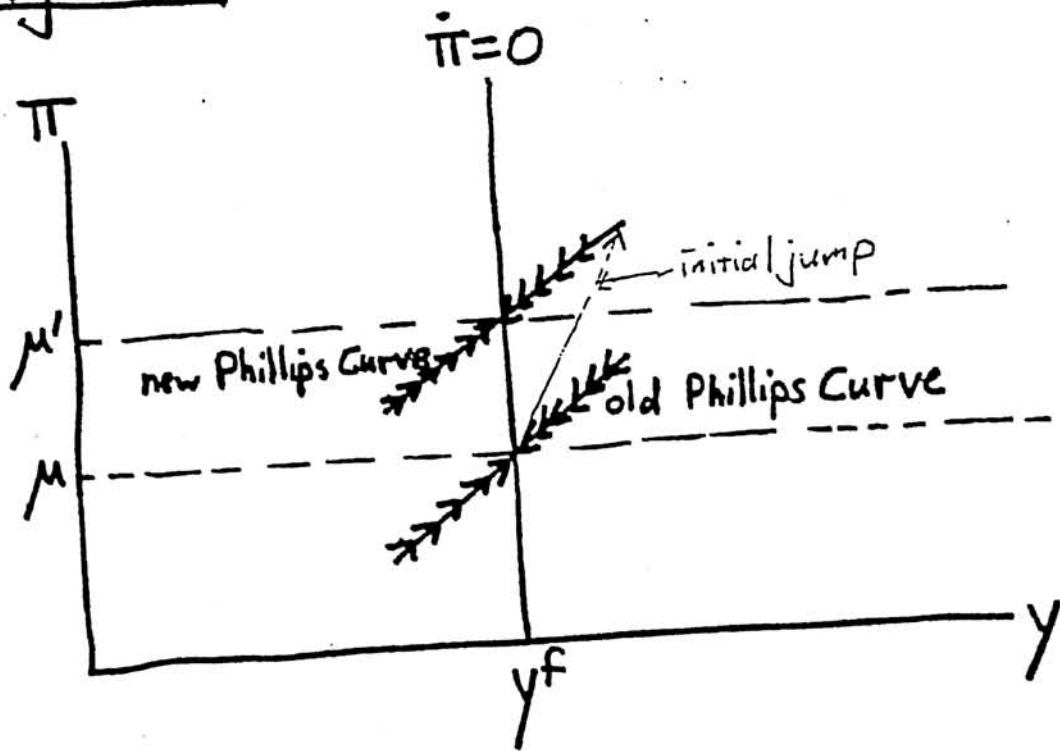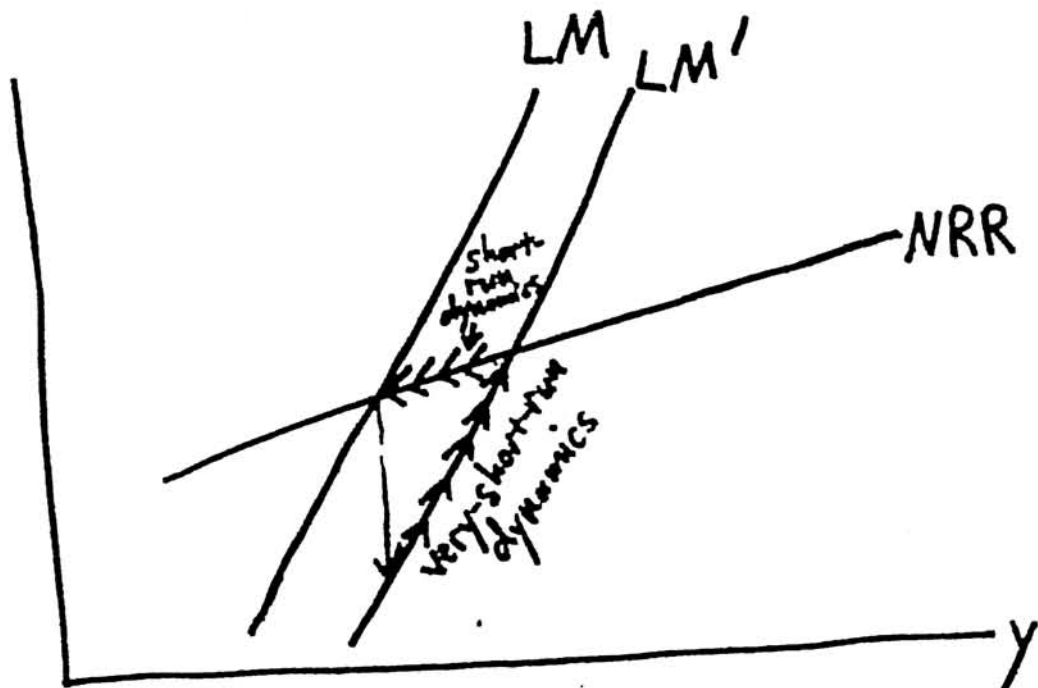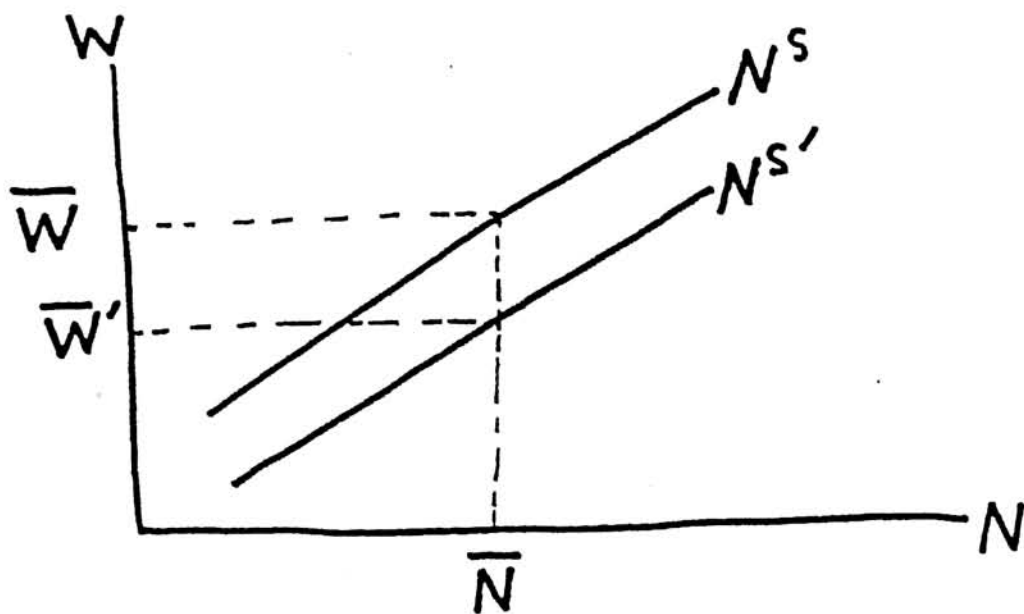
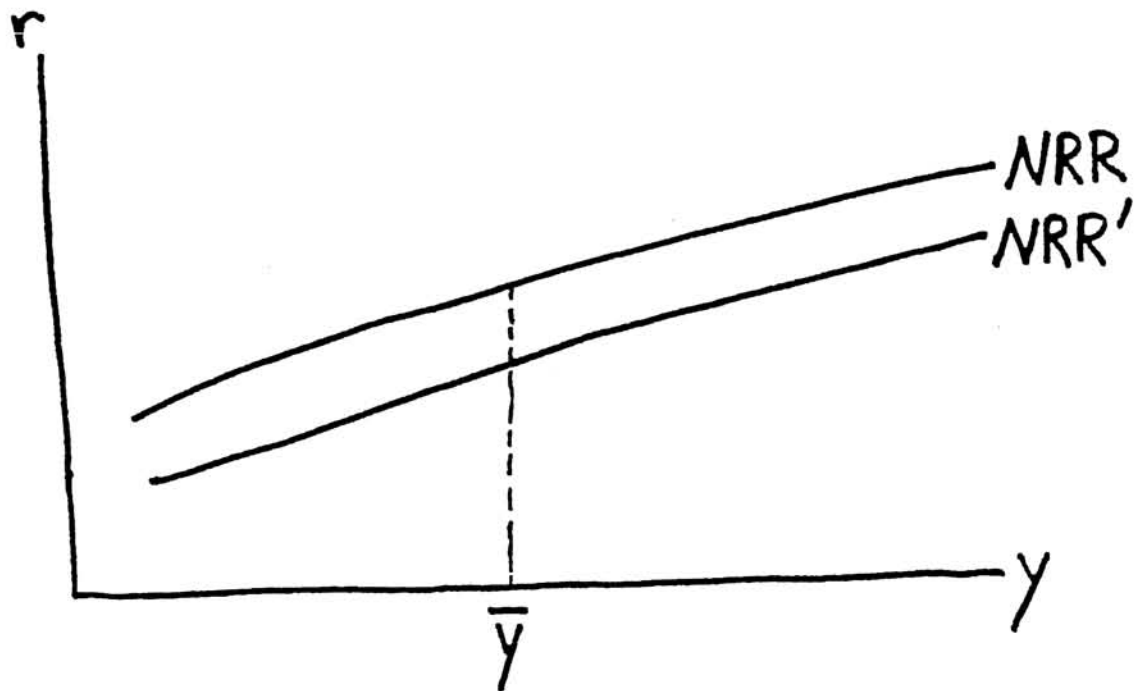μ $\dot{x}=0$ (old)

$\dot{\pi}=0$

$x = m + V - p$
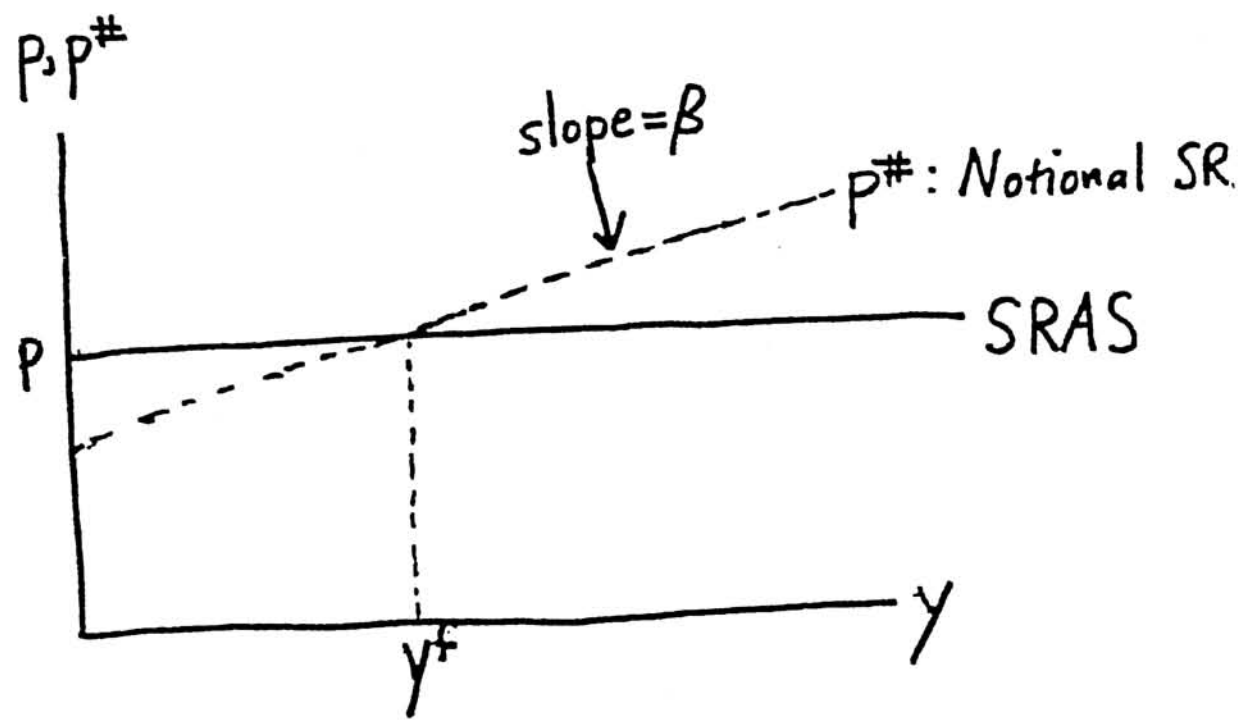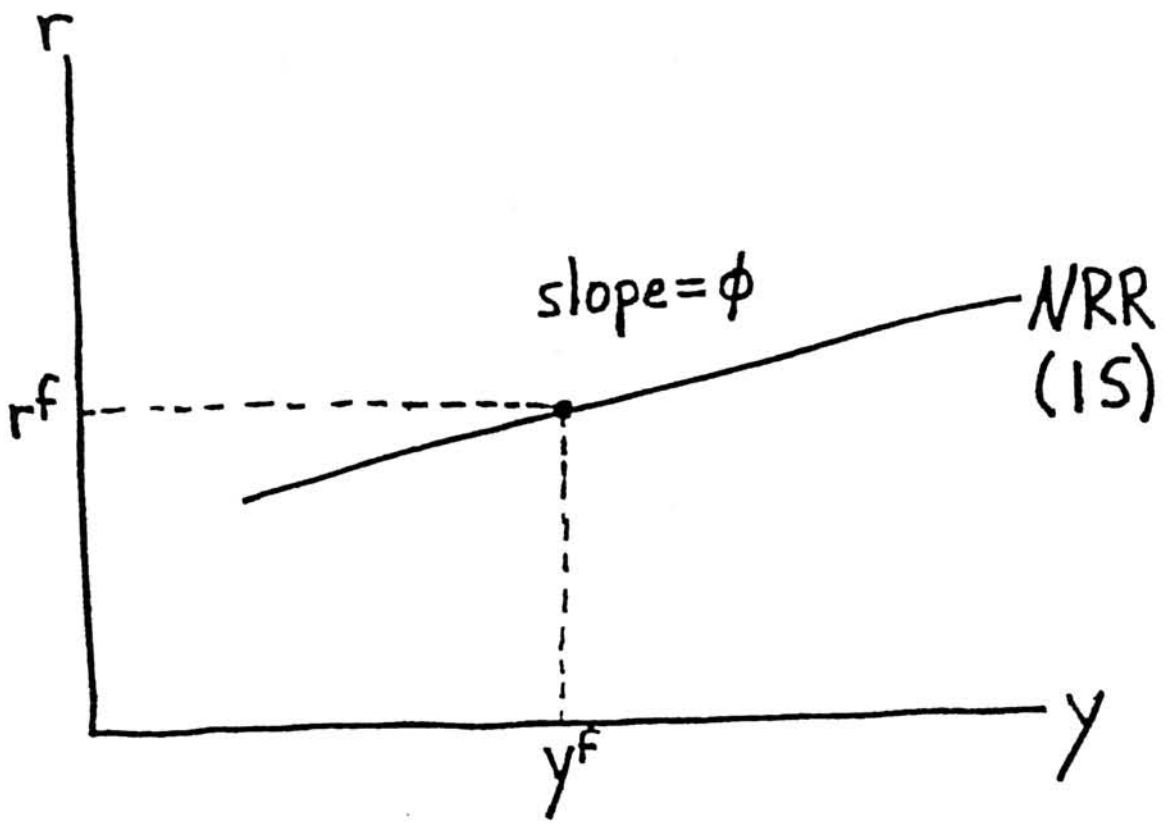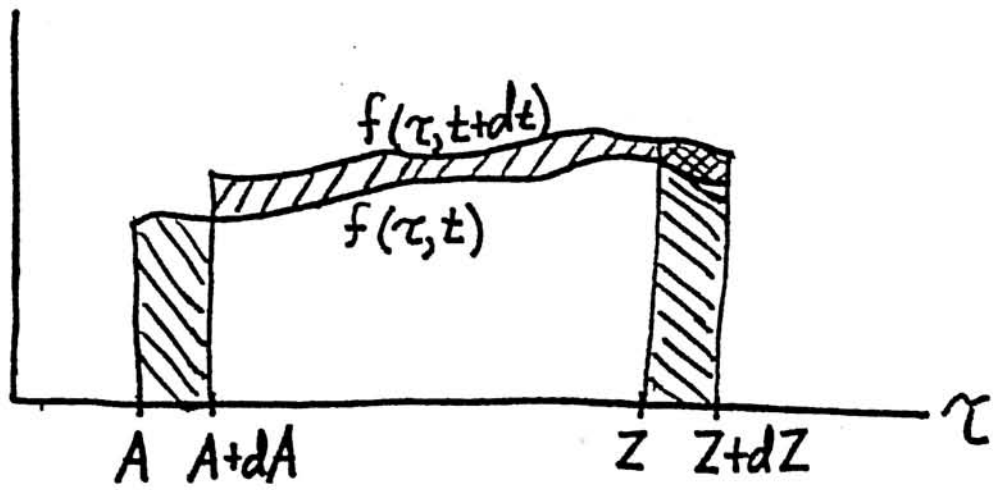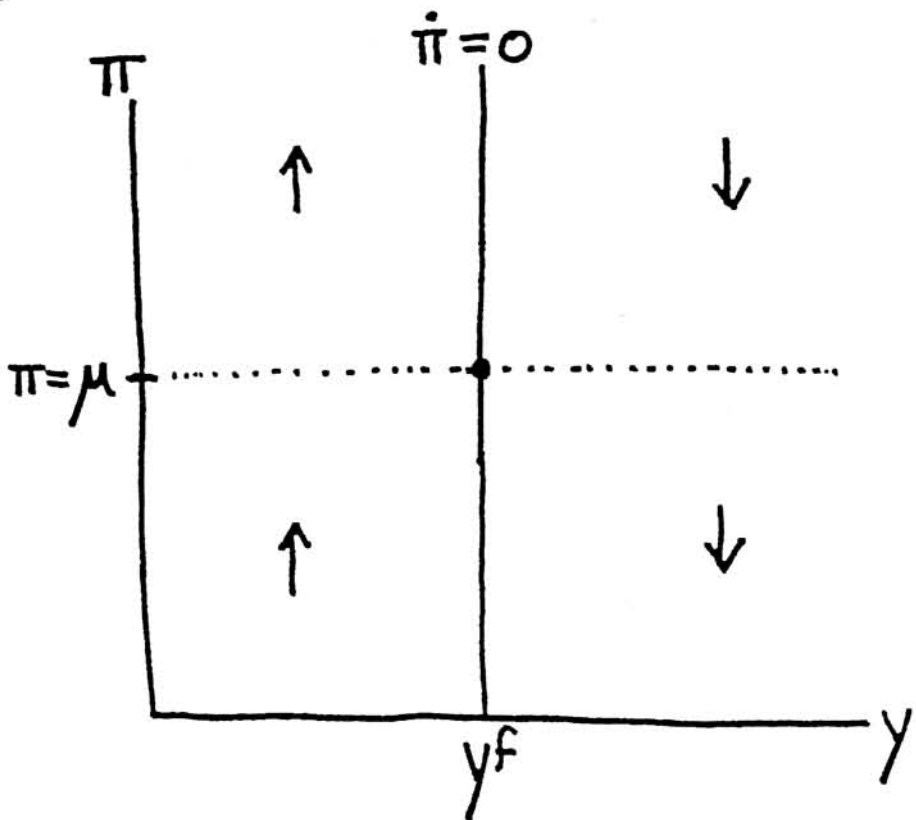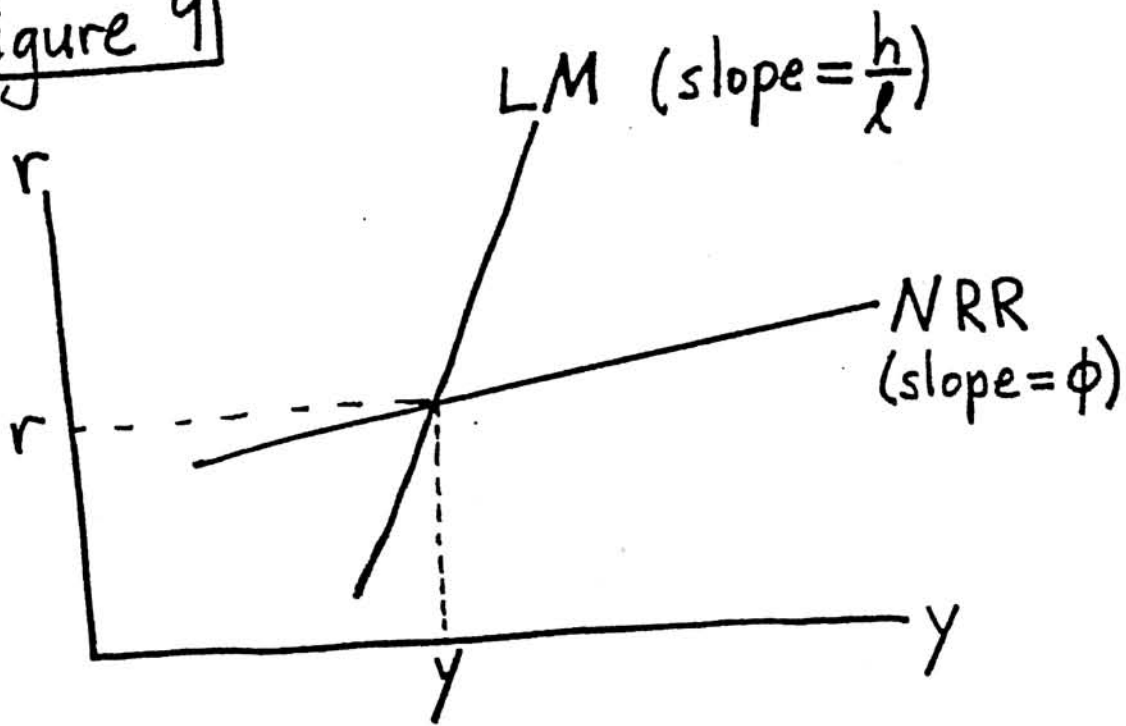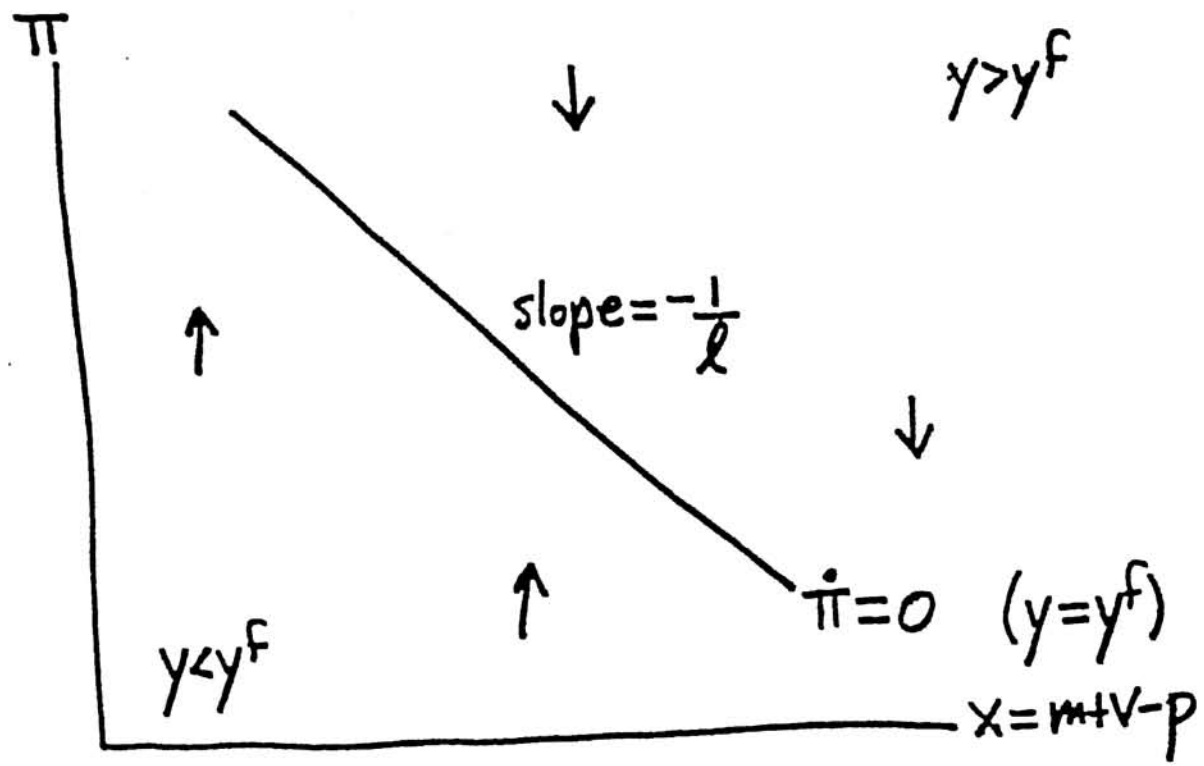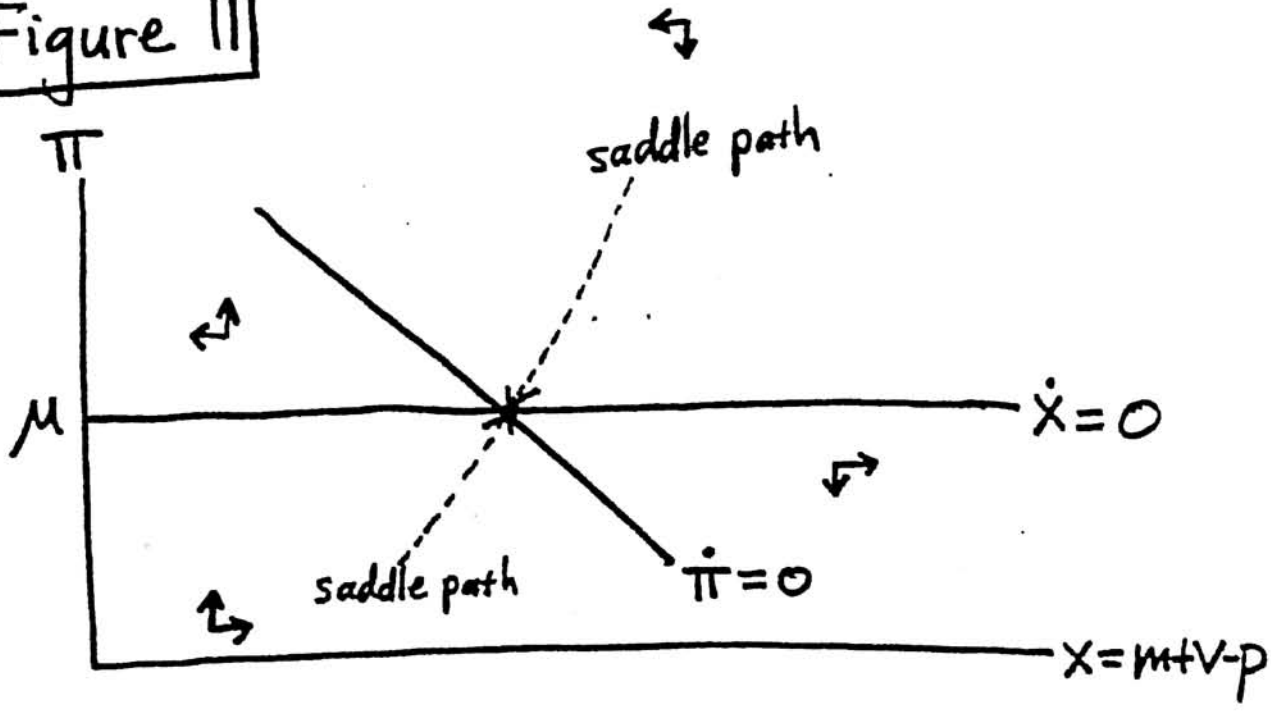
Figure 13

Figure 14

Figure 15

Figure 16

Figure 17
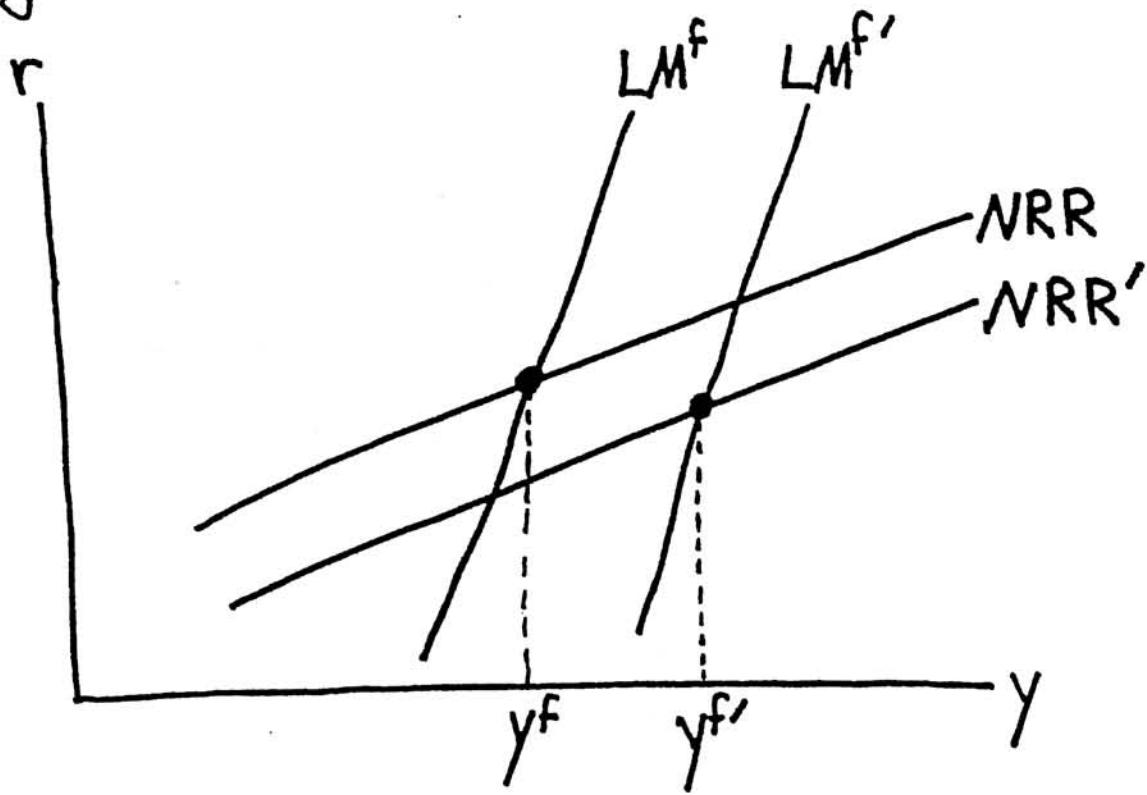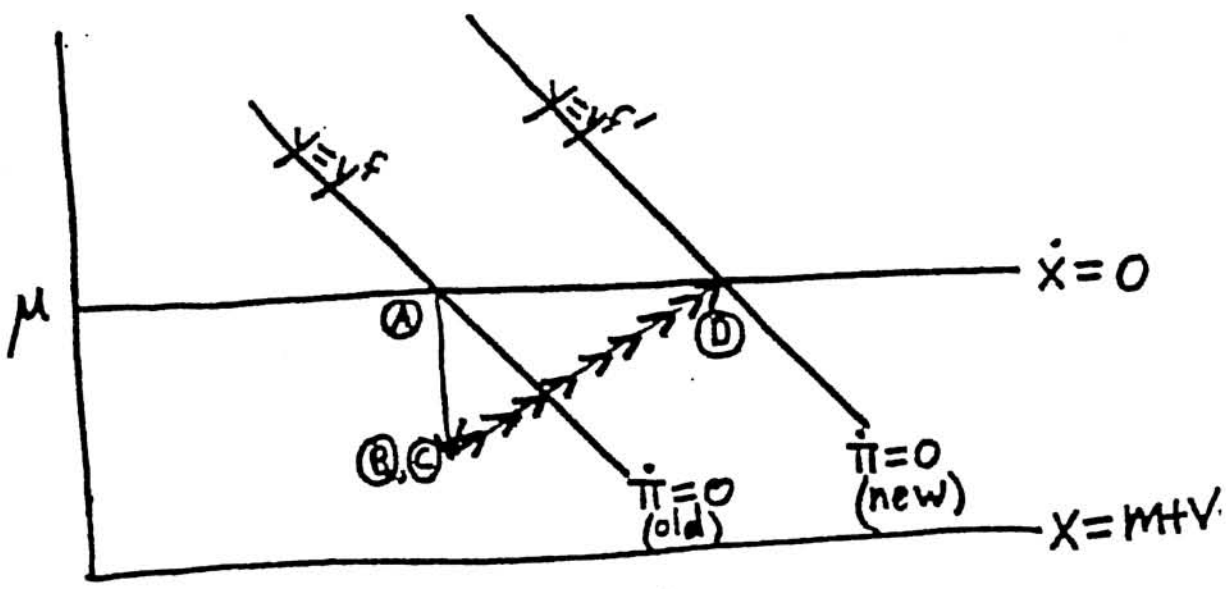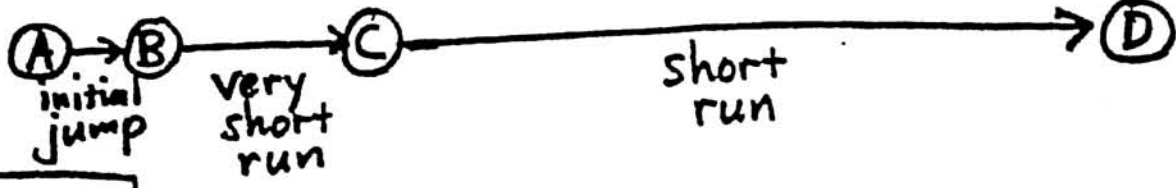
r

LM^f $LM^{f'}$

NRR

NRR'

y^f $y^{f'}$ y

Figure 18

$y = y^f$ $y = y^{f'}$

$\dot{x} = 0$

μ

Ⓐ   Ⓓ

Ⓑ,Ⓒ

$\pi = 0$ (old) $\pi = 0$ (new)

$x = m + v$

Figure 19

LM' LM LM"

NRR
NRR'

r^f
$r^{f'}$

yf yf' y

Ⓐ→Ⓑ ———→Ⓒ ——————→Ⓓ
initial   very   short
jump   short   run
           run

Figure 20

r

MP MP' MP"

NRR
NRR'

r^f
$r^{f'}$

y

Figure 21

Figure 22