

Inflation, Disinflation, and Deflation

조남운

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Outline

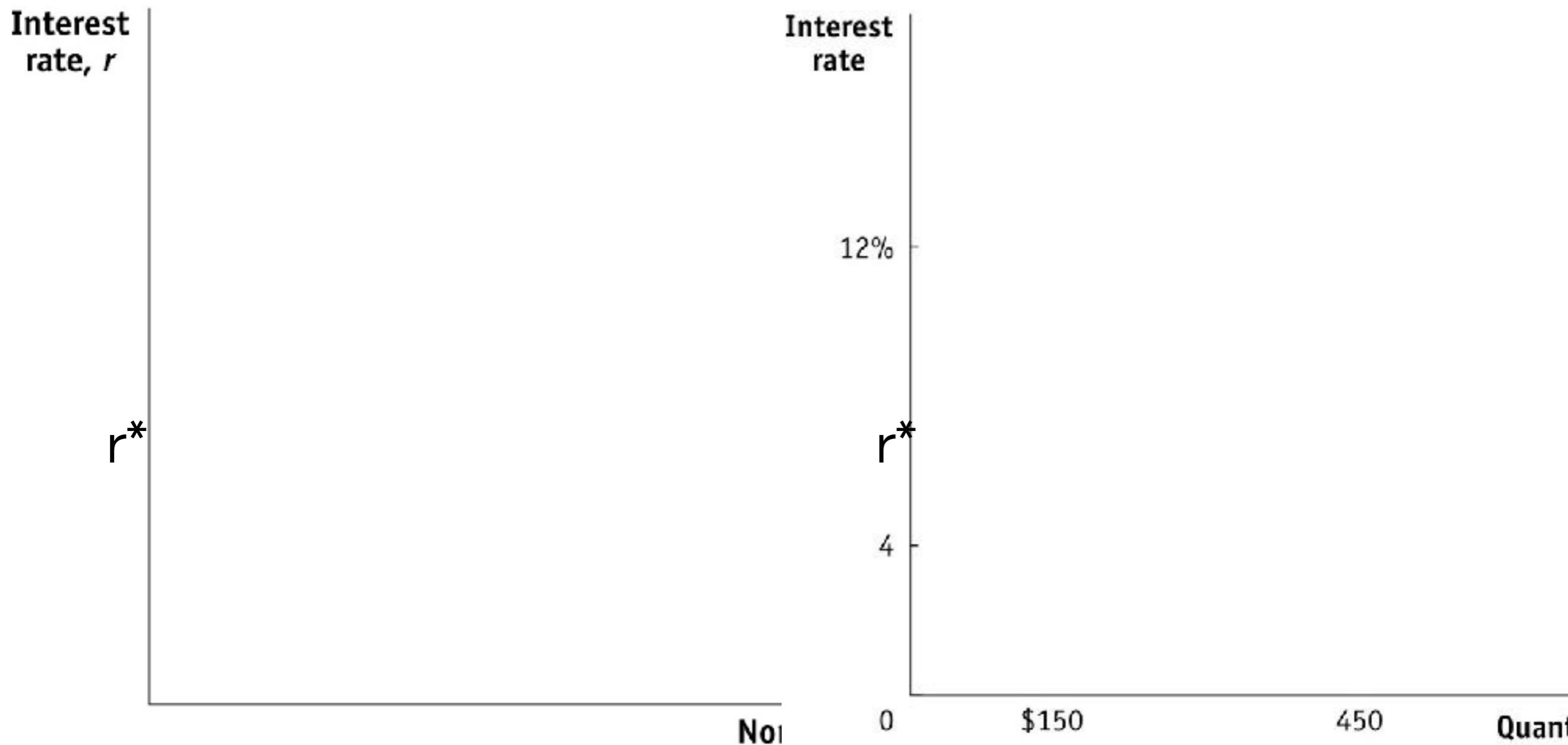
- 화폐와 인플레이션
- 인플레이션의 영향
- 완만한 인플레이션과 디스인플레이션
- 디플레이션

Money and Inflation

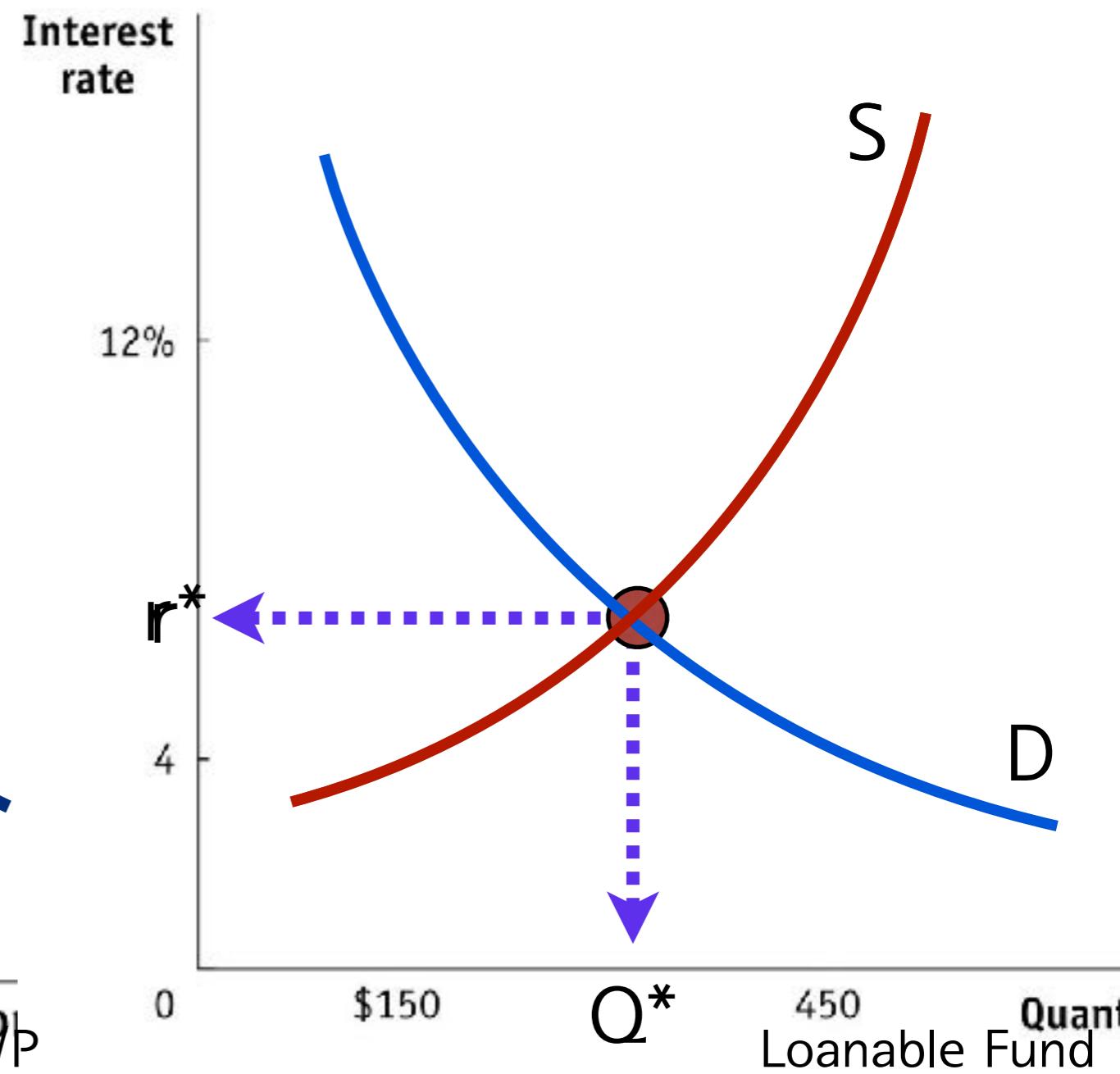
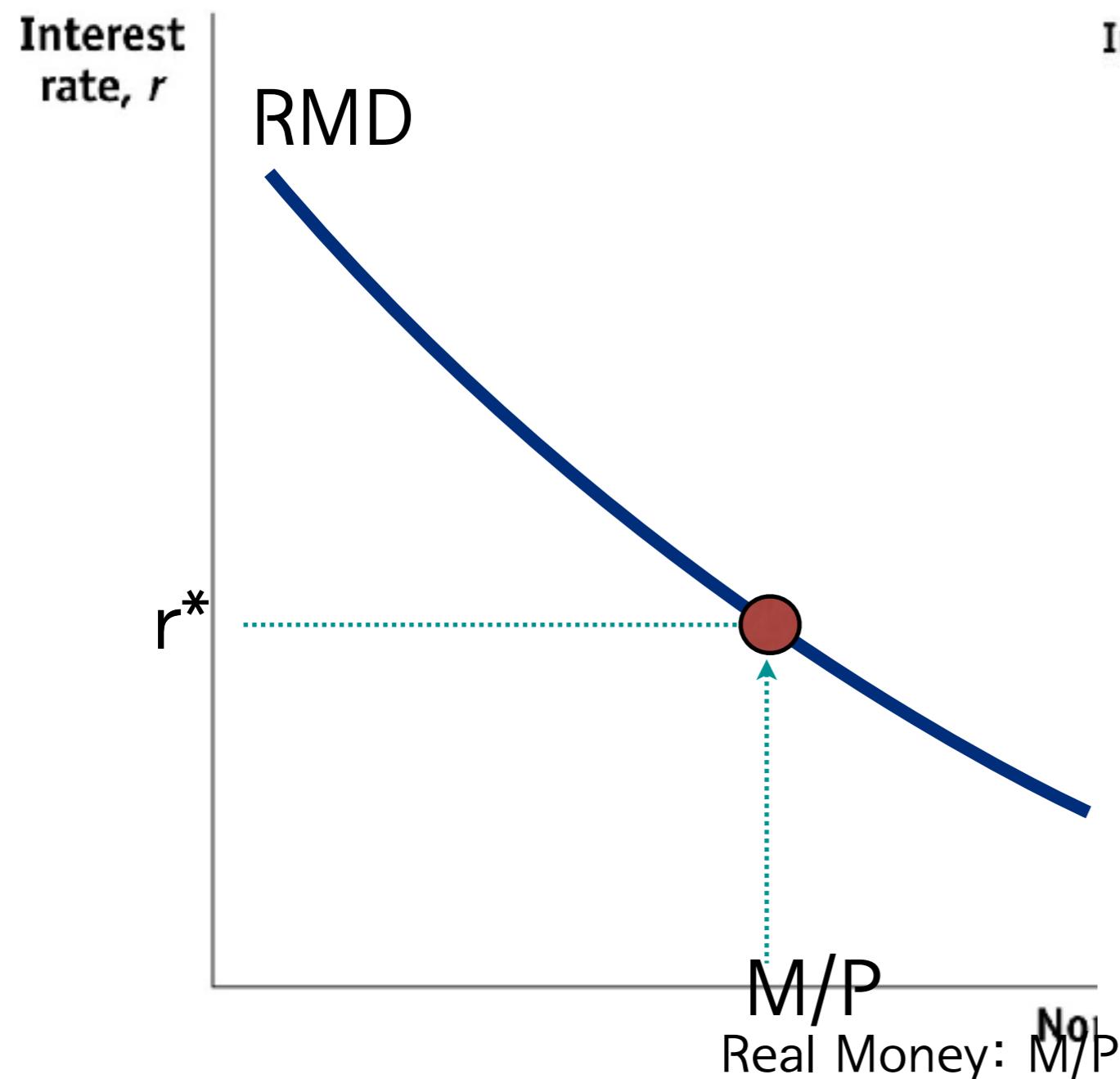
화폐공급증가와 물가

- 화폐공급이 증가($M \uparrow$)하면 단기적으로는 생산이 증가($Y \uparrow$)하지만, 장기적으로는 장기추세수준으로 복귀($Y \rightarrow Y^*$): 남는 것은 물가변화($P \uparrow$)
- 복귀 메커니즘: 화폐증가(이자율 하락) \rightarrow 생산증가 \rightarrow 물가상승 \rightarrow 화폐증가효과상쇄 \rightarrow 잠재생산수준복귀(이자율 포함)

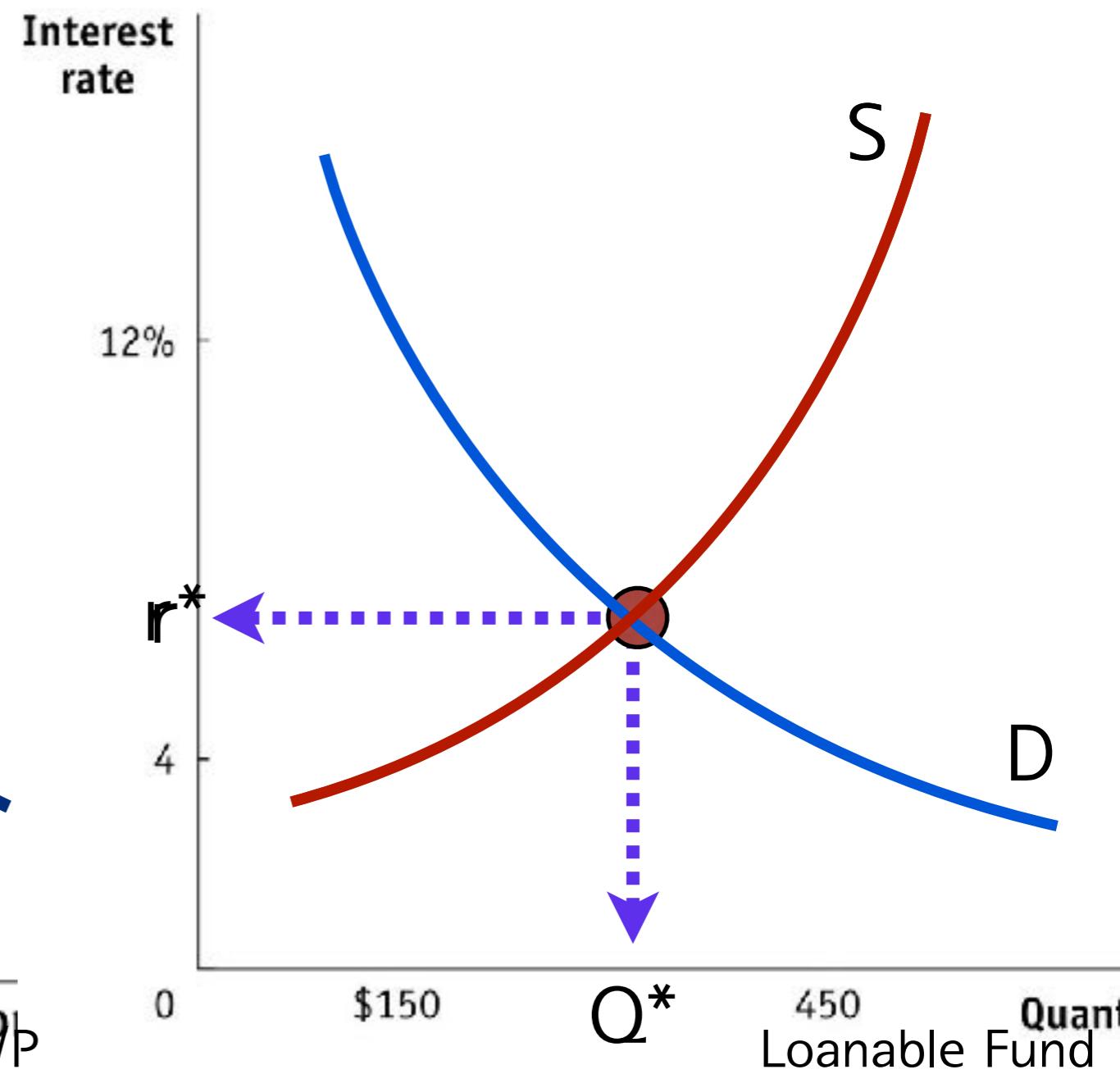
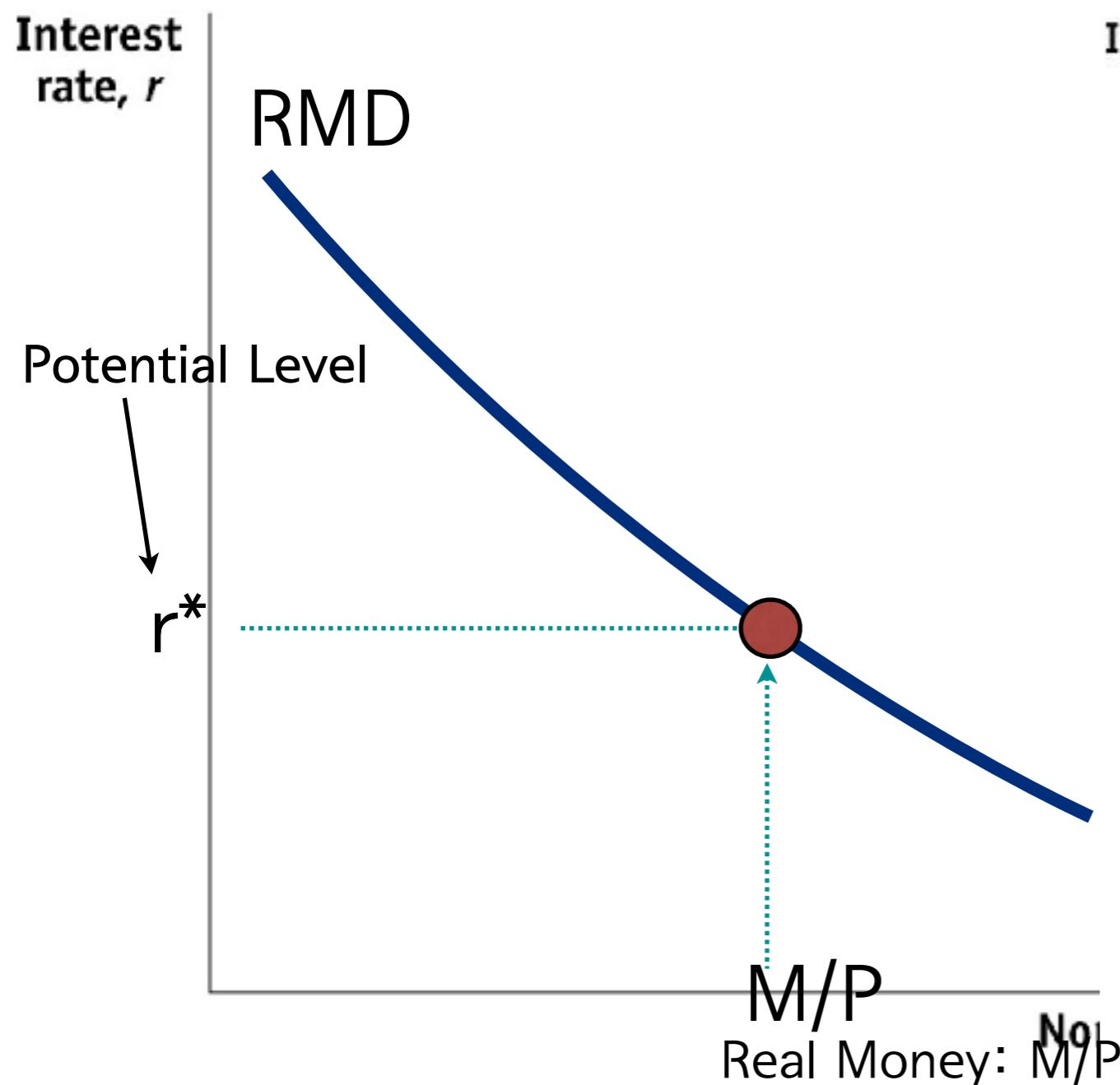
Monetary Policy and Interest Rate



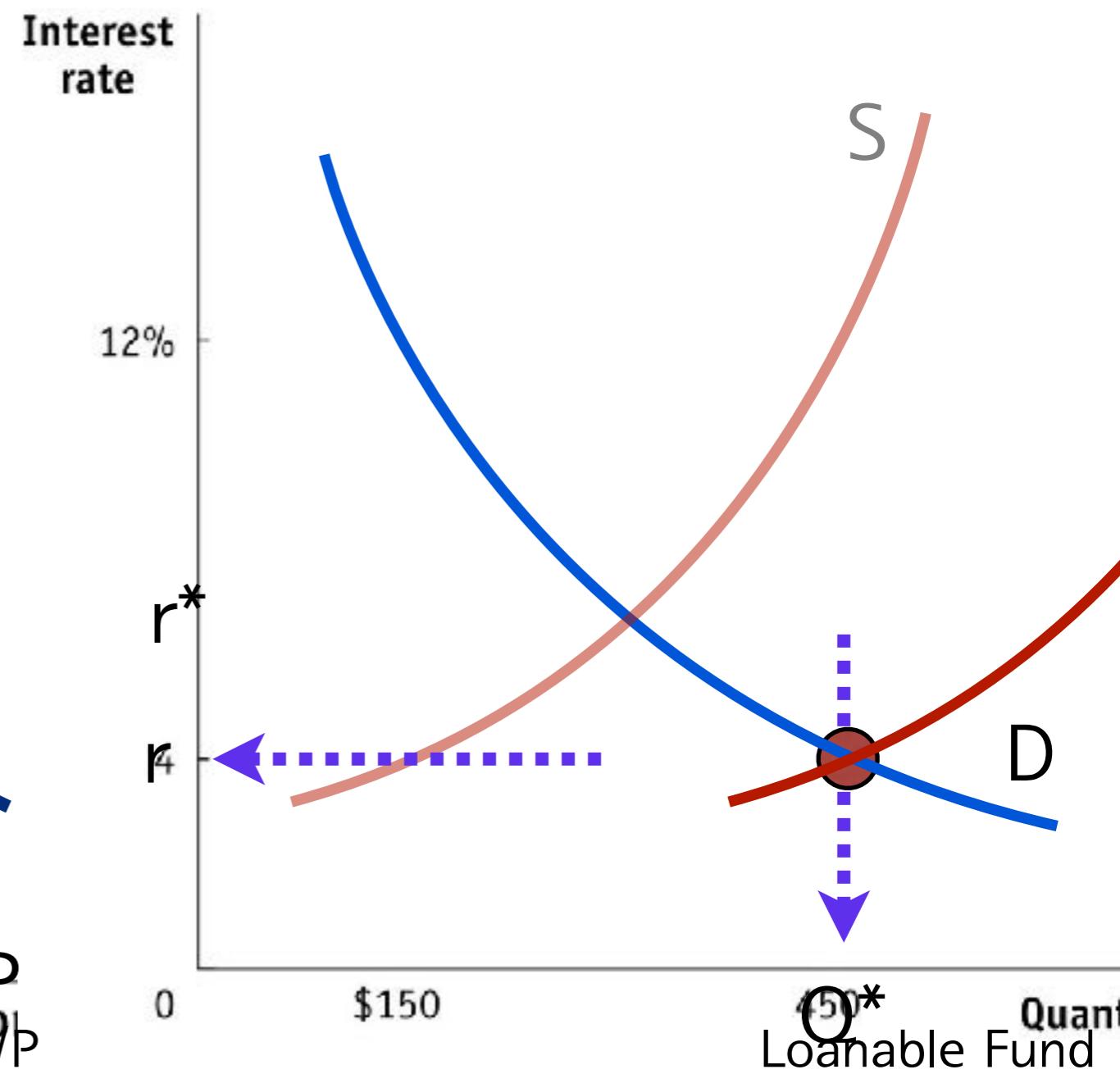
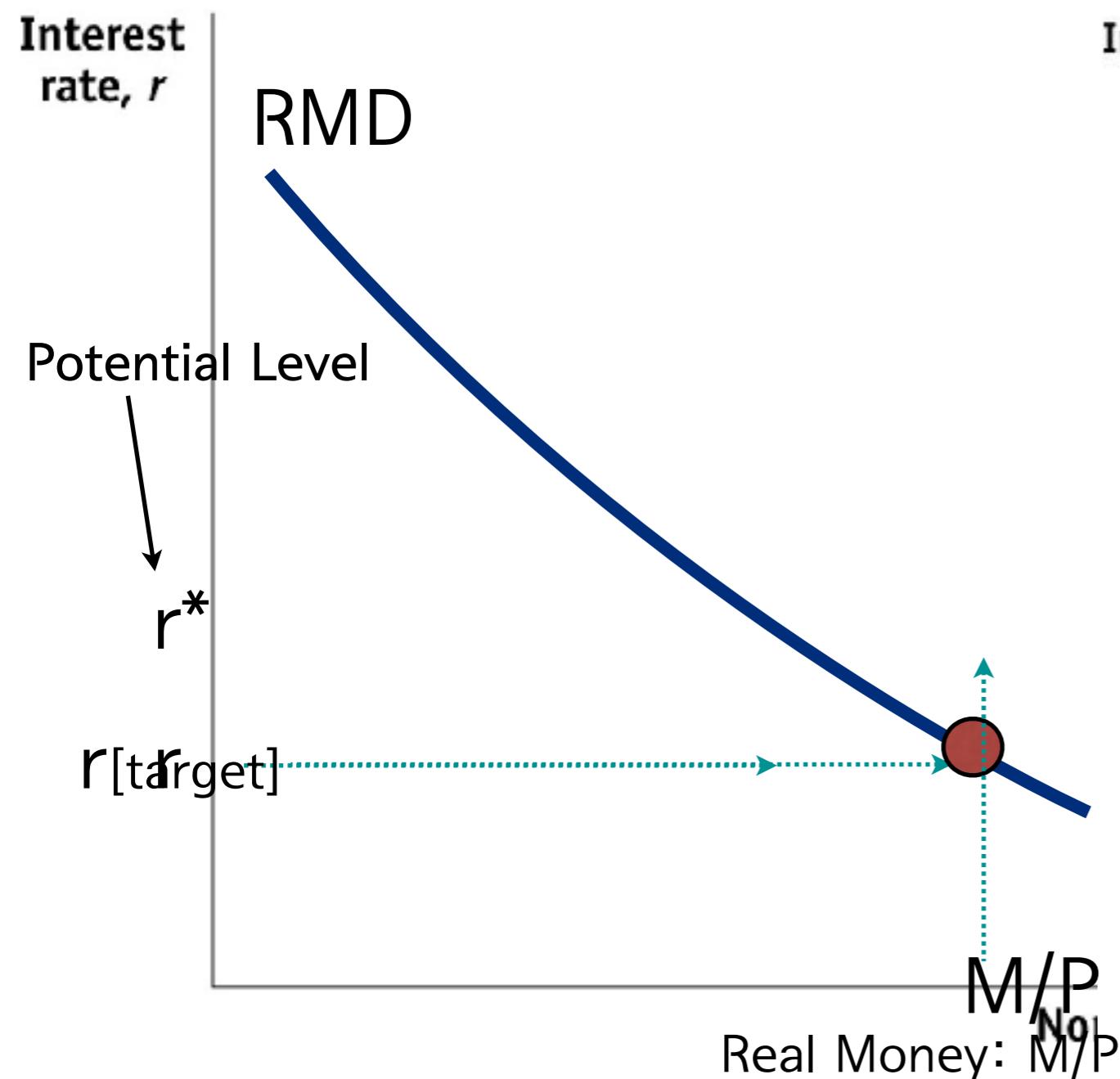
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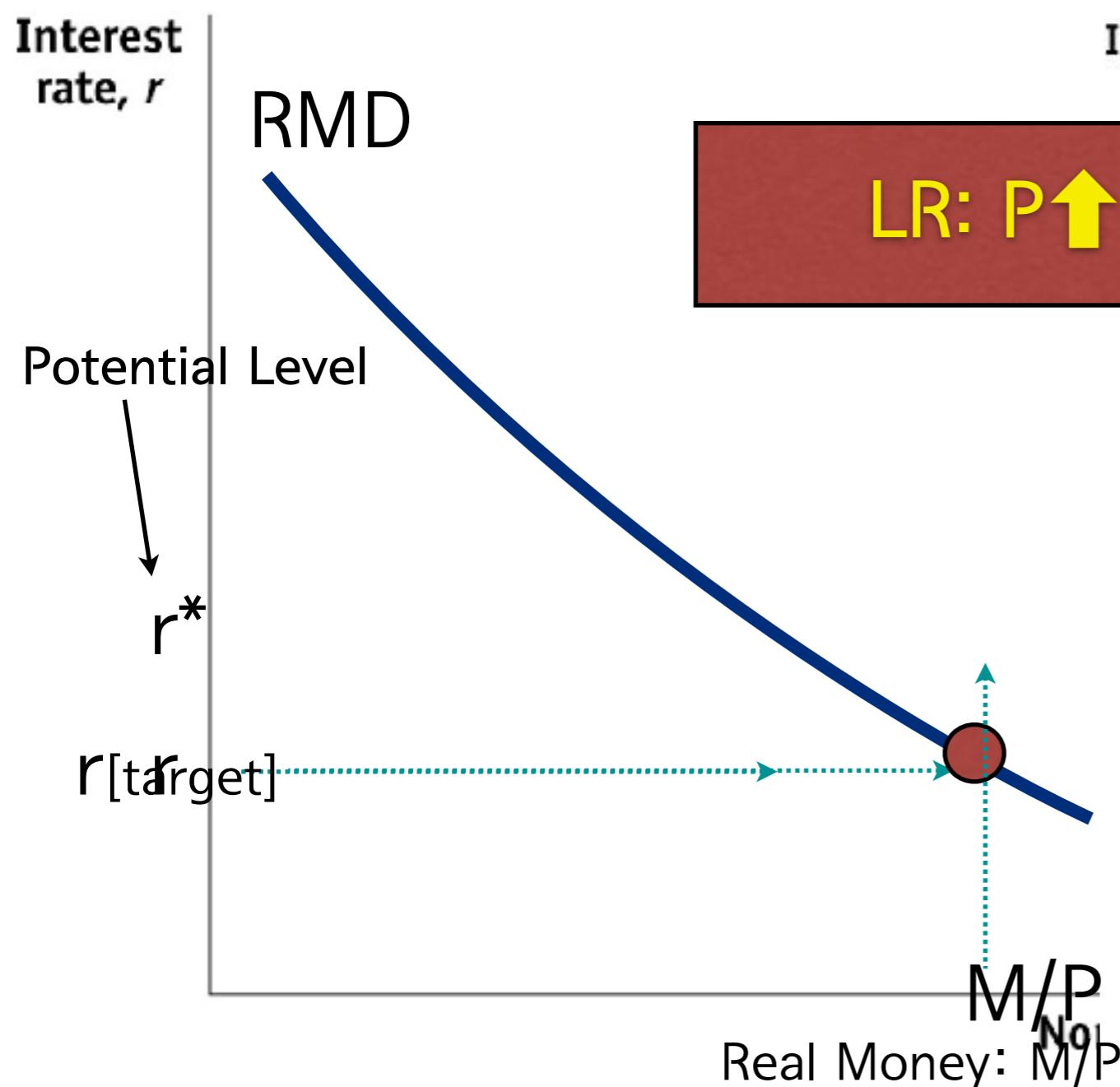
Monetary Policy and Interest Rate



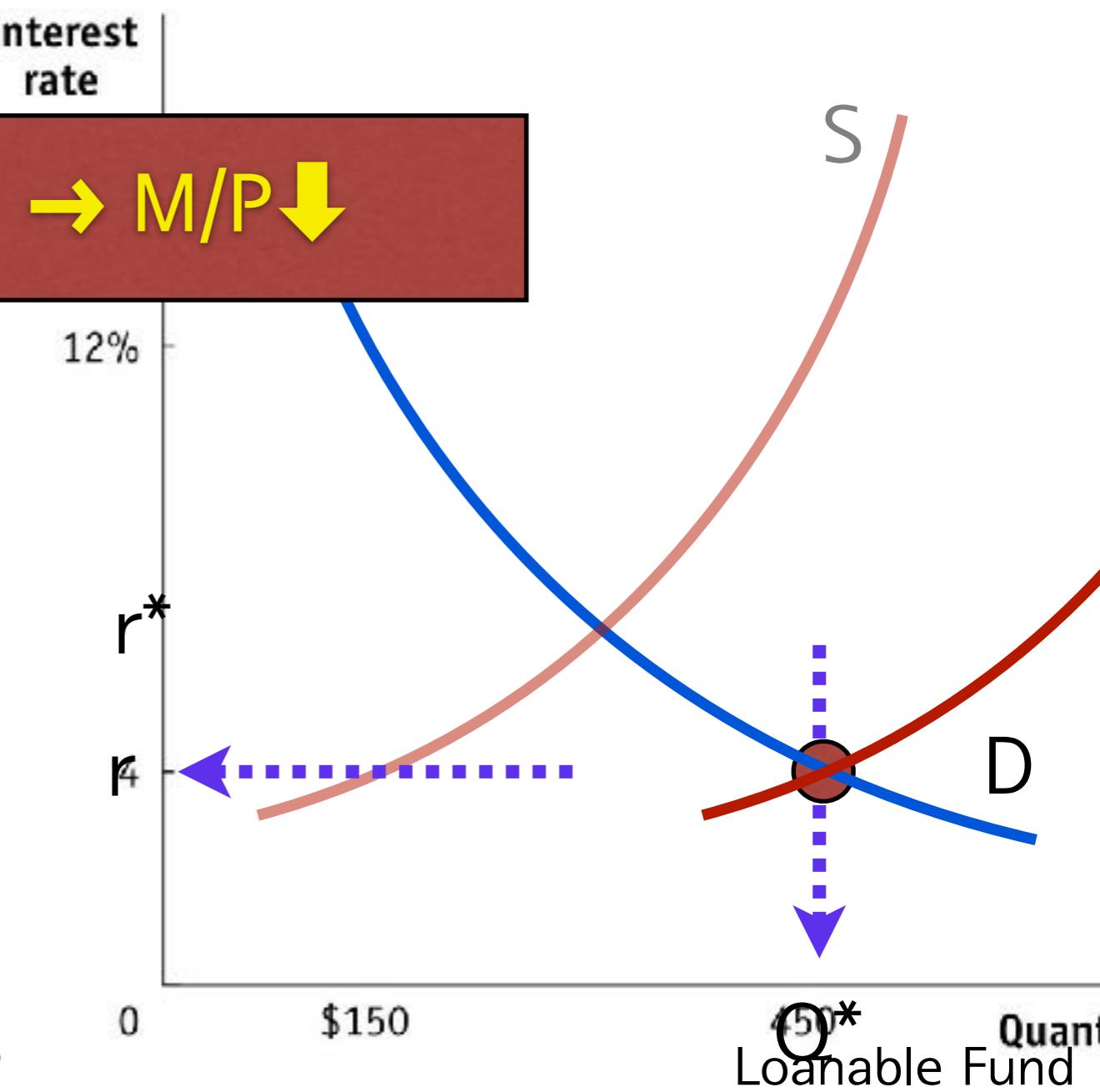
Monetary Policy and Interest Rate



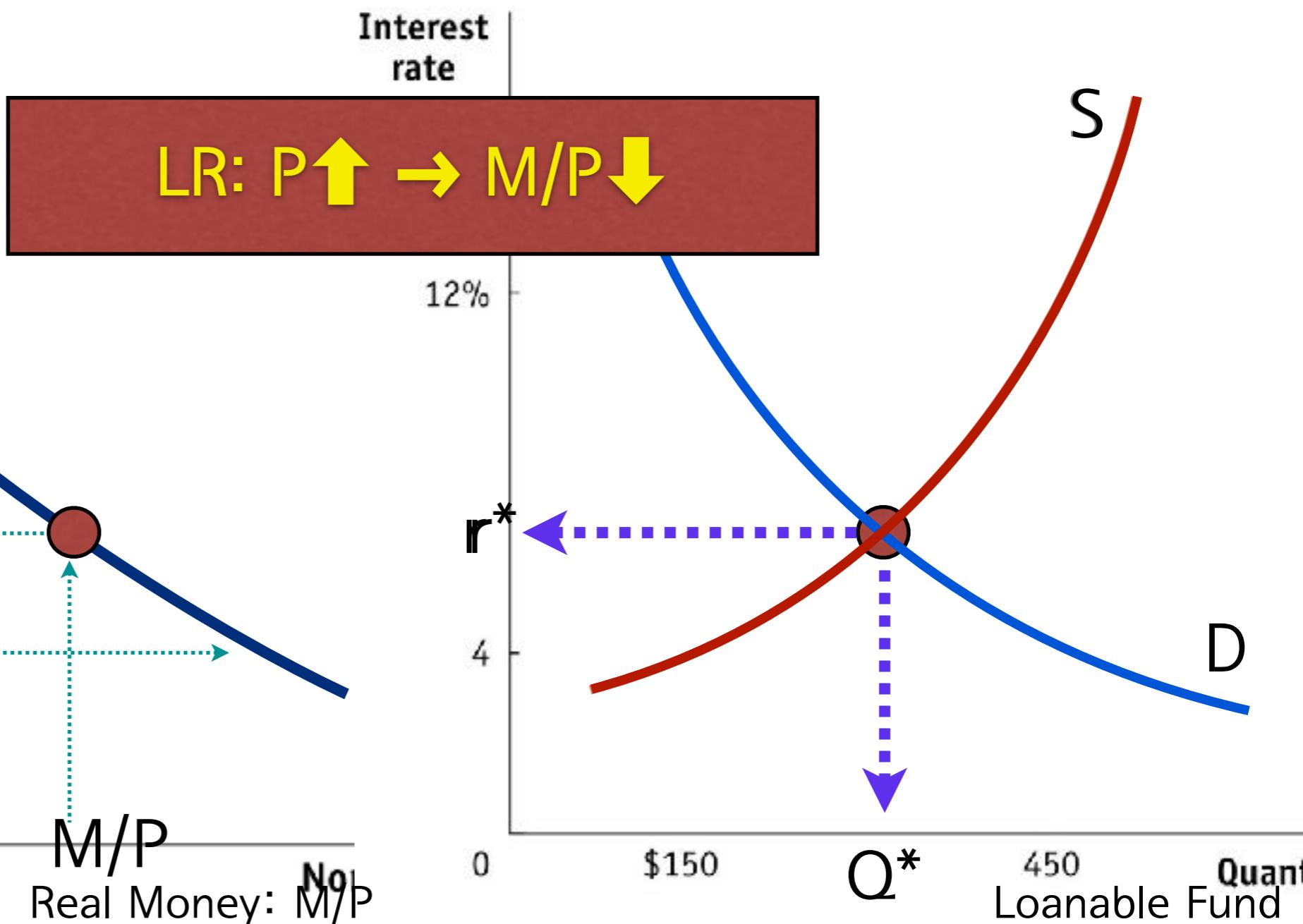
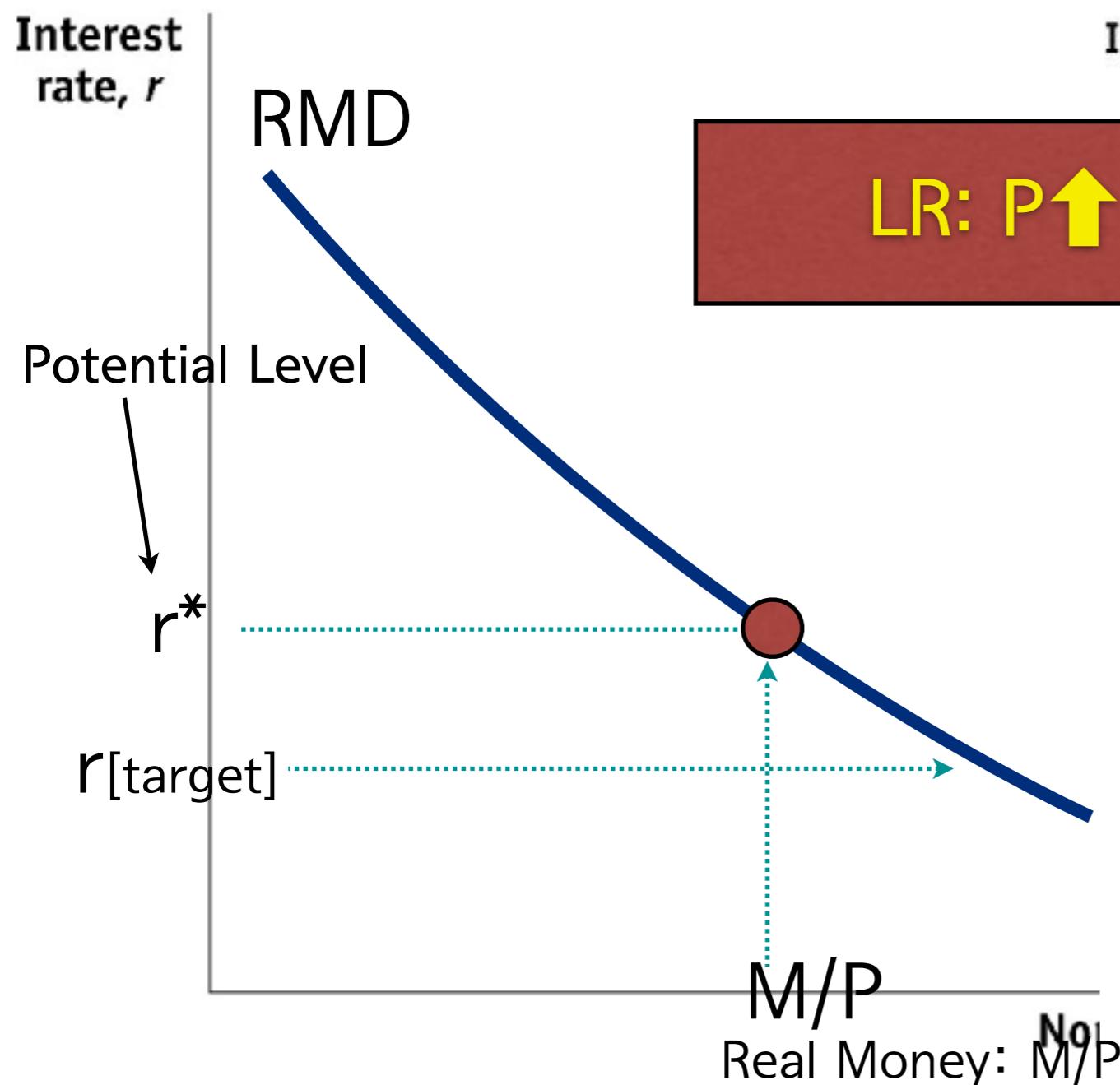
Monetary Policy and Interest Rate



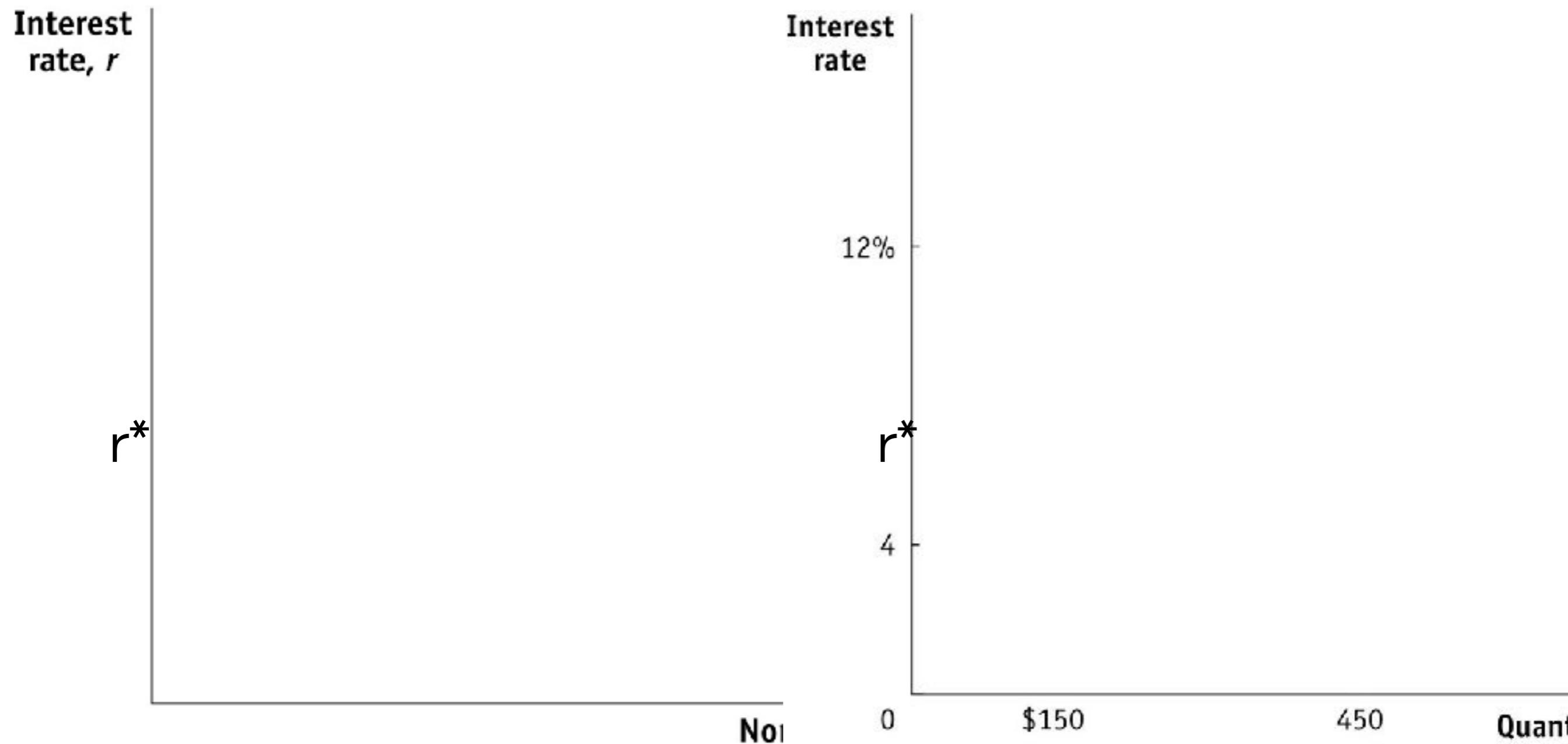
LR: $P \uparrow \rightarrow M/P \downarrow$



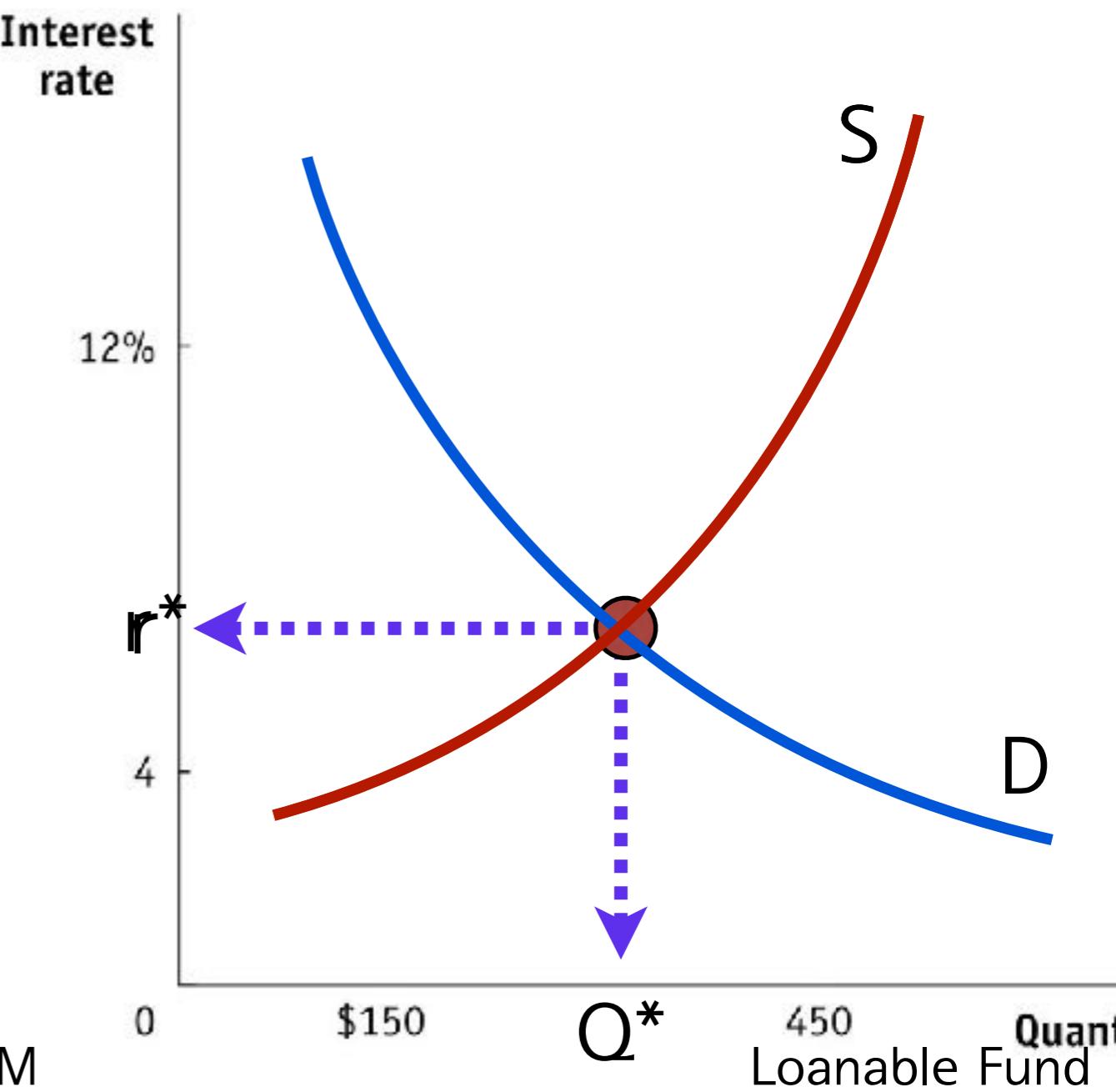
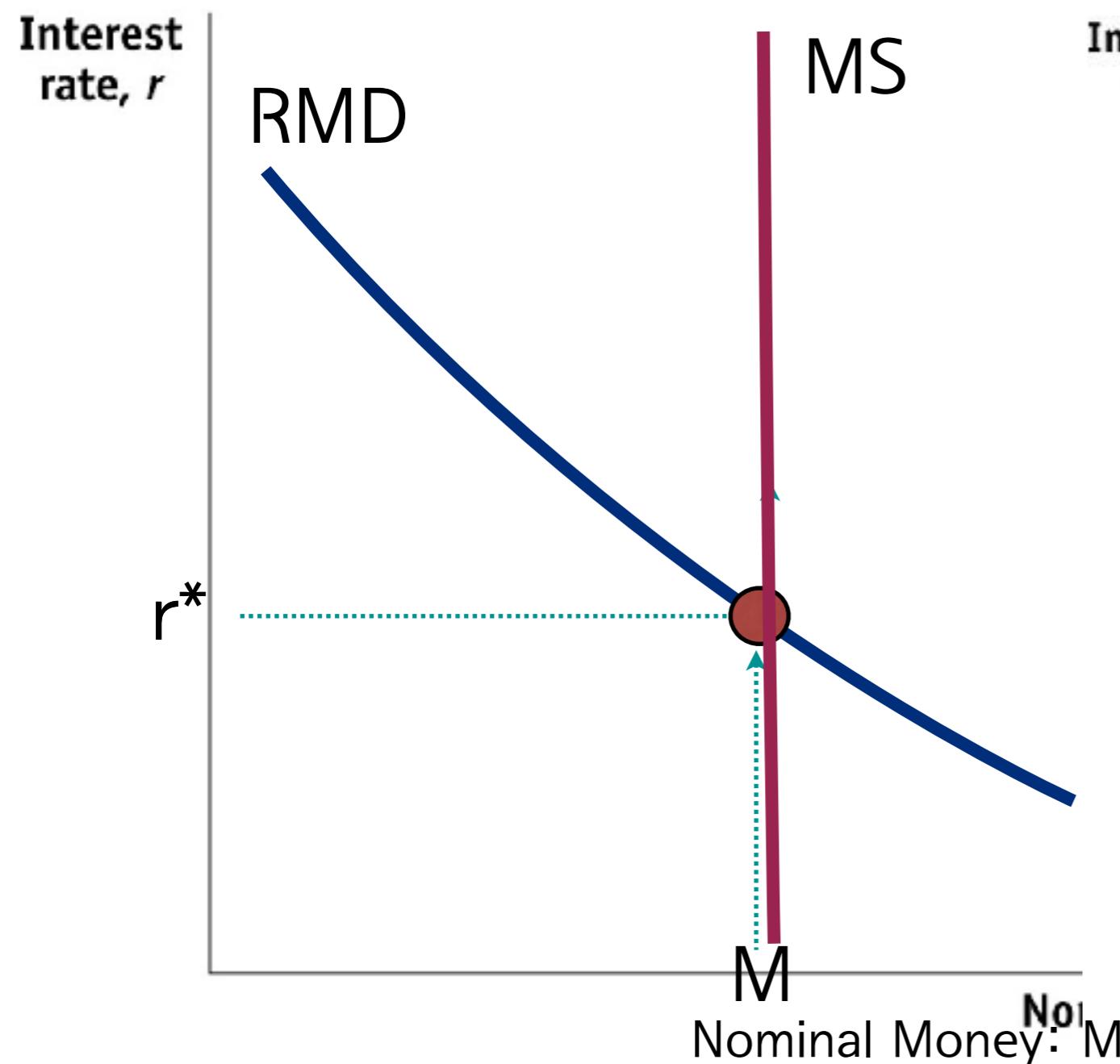
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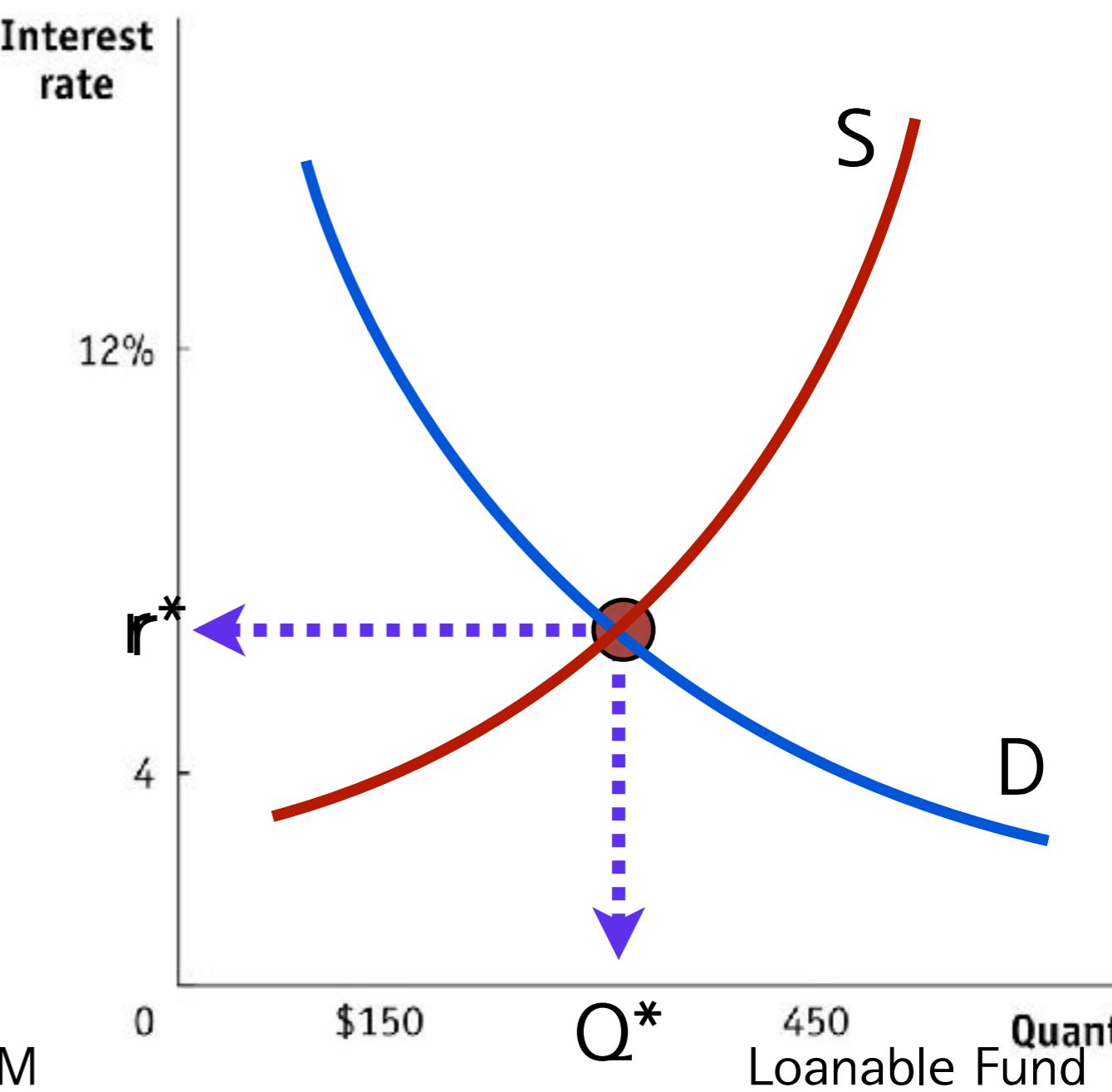
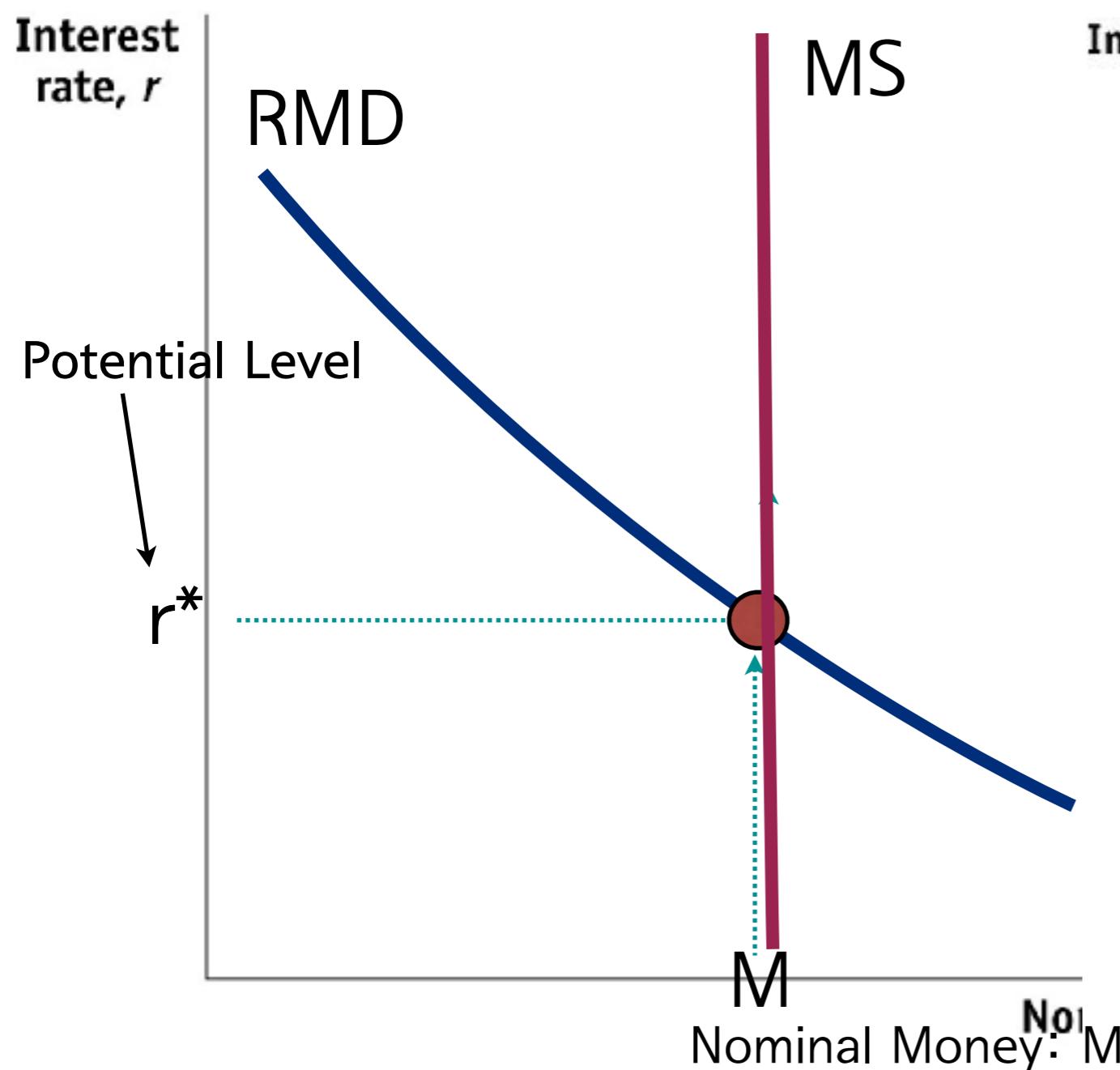
Monetary Policy and Interest Rate



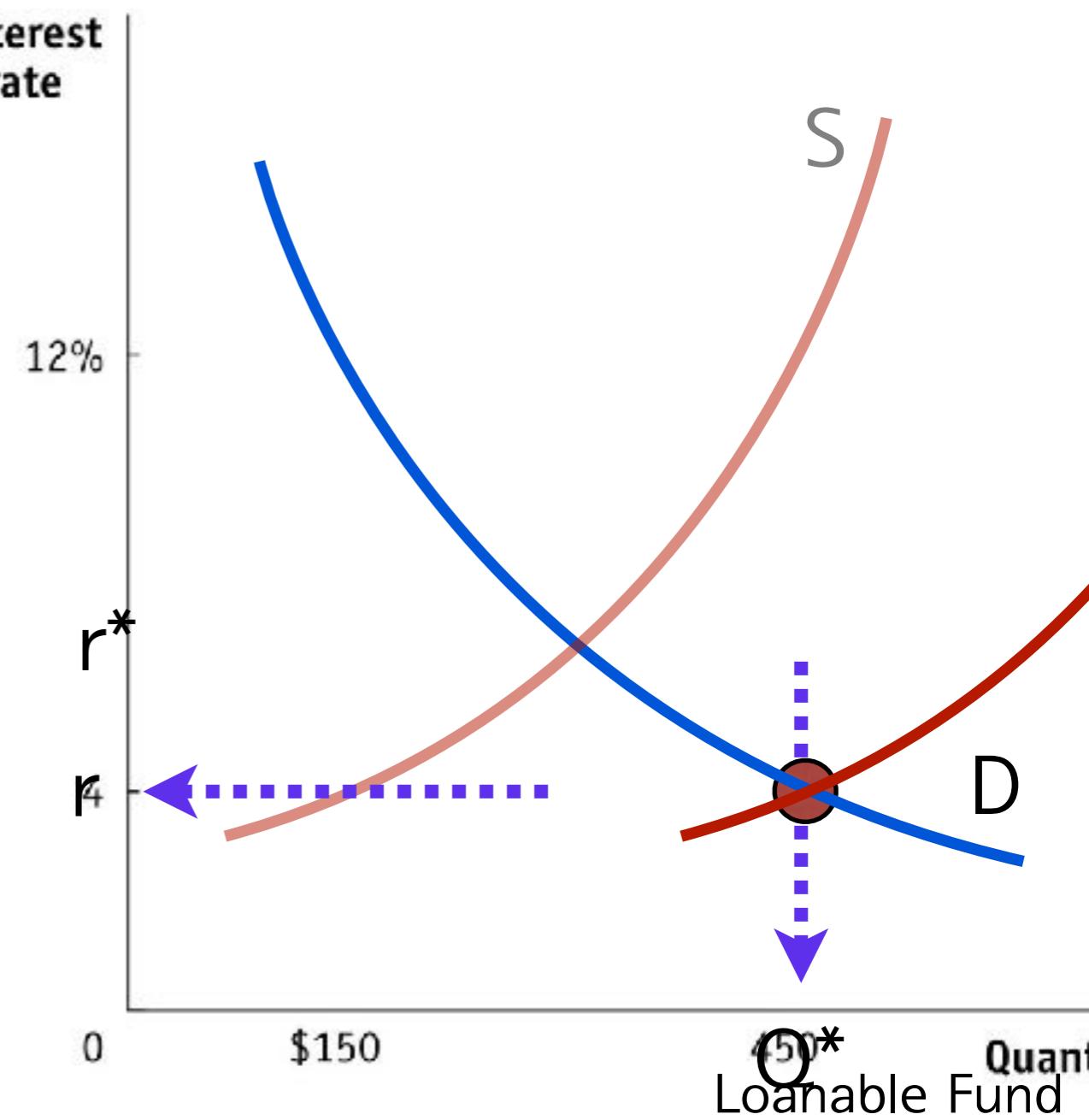
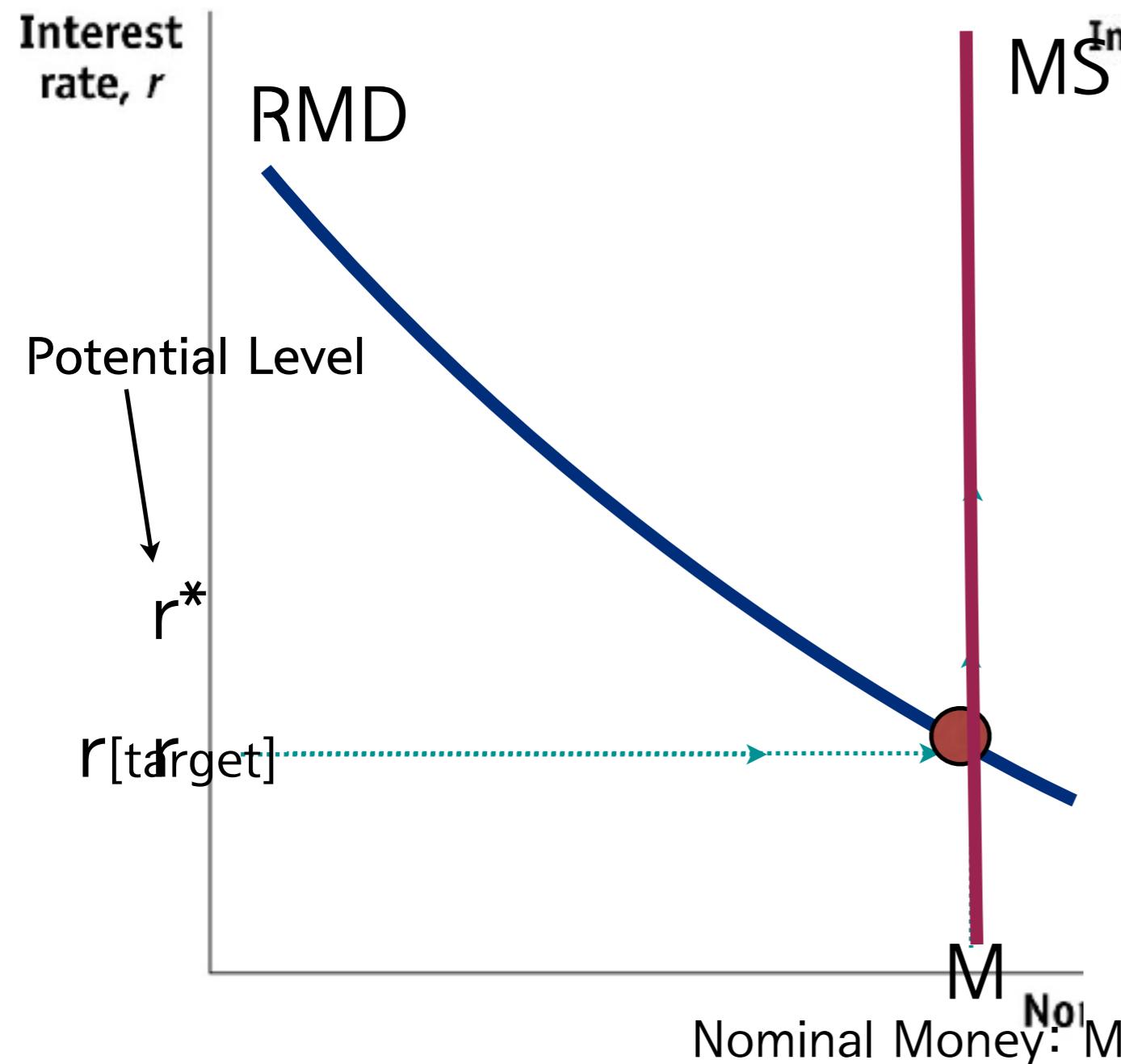
Monetary Policy and Interest Rate



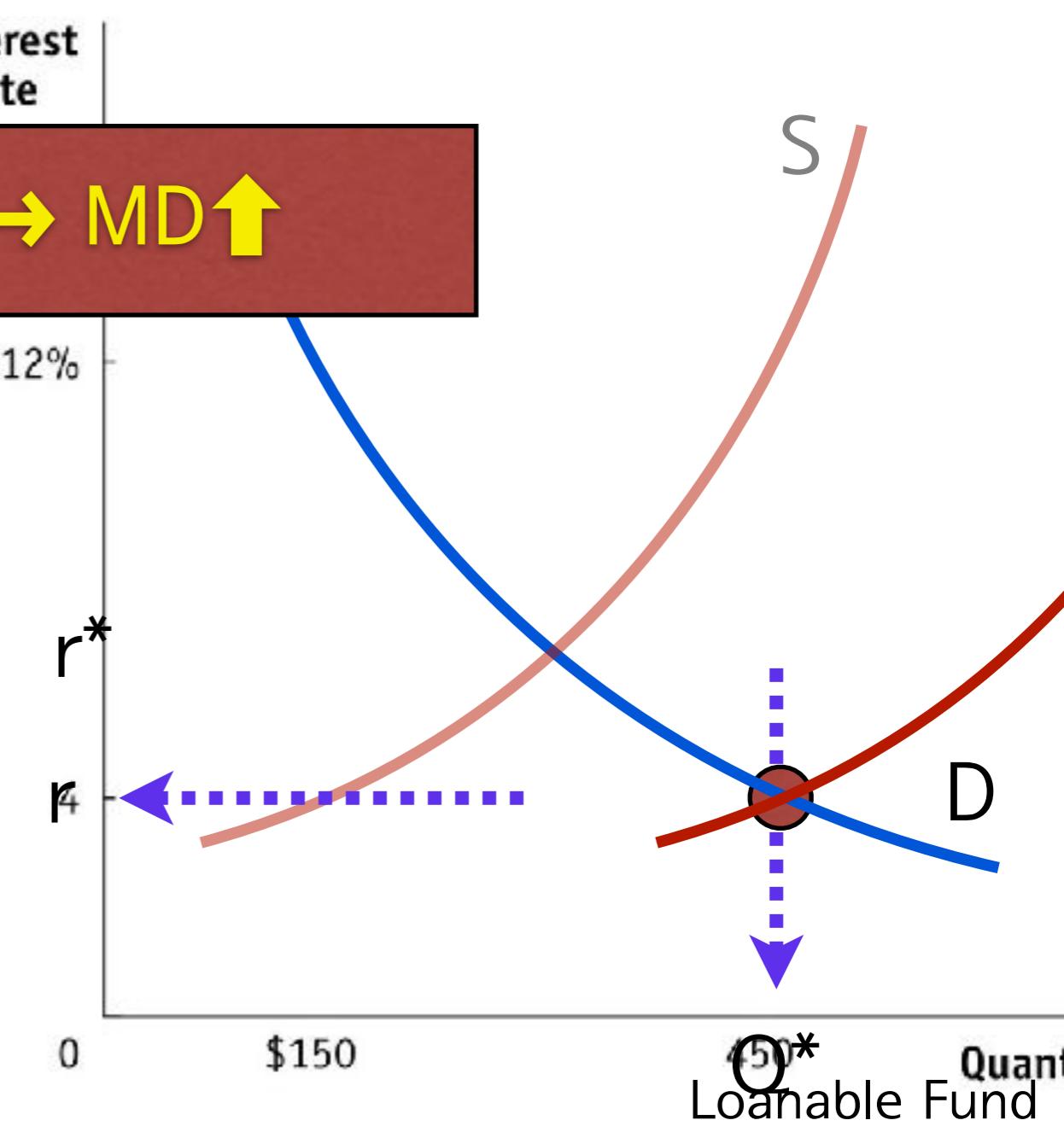
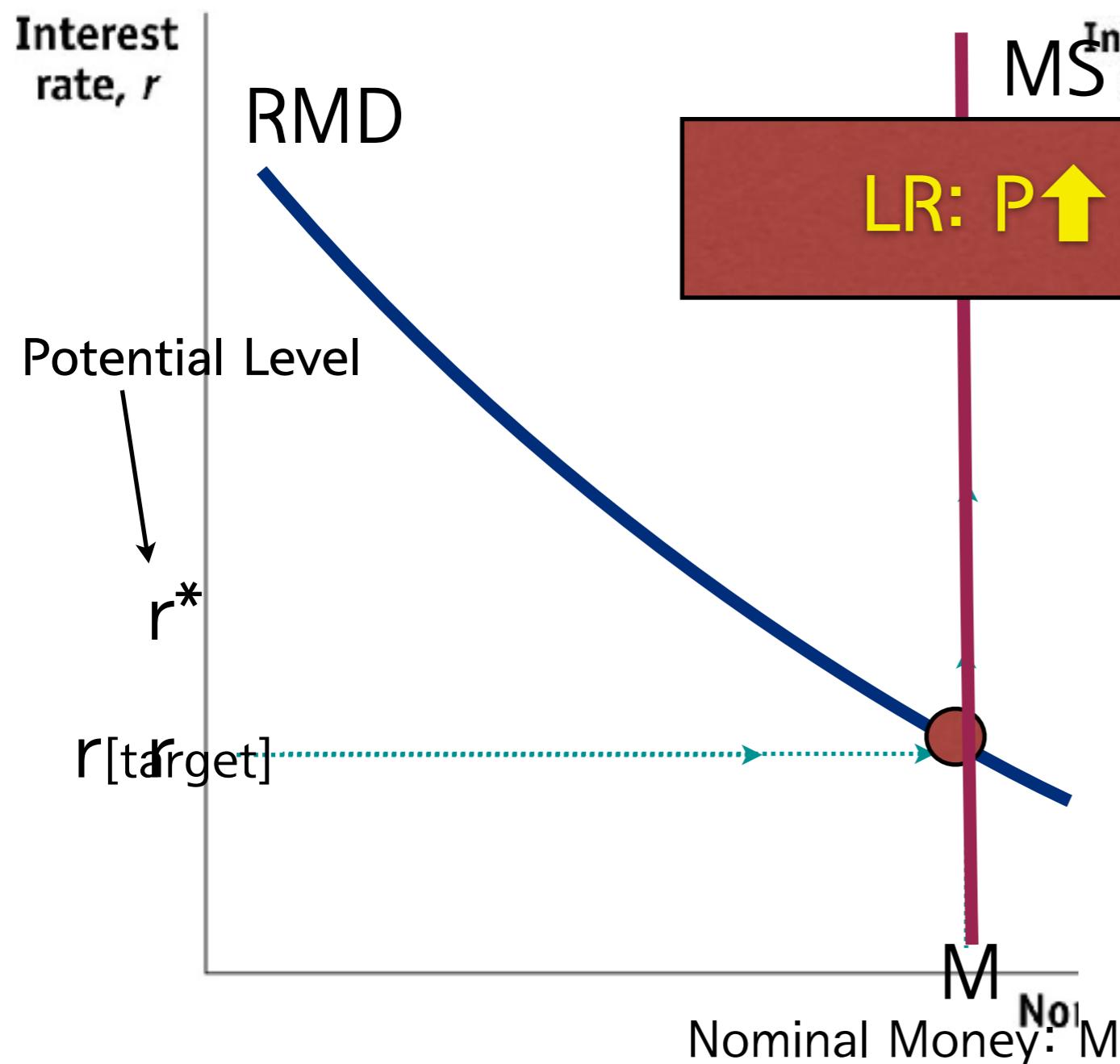
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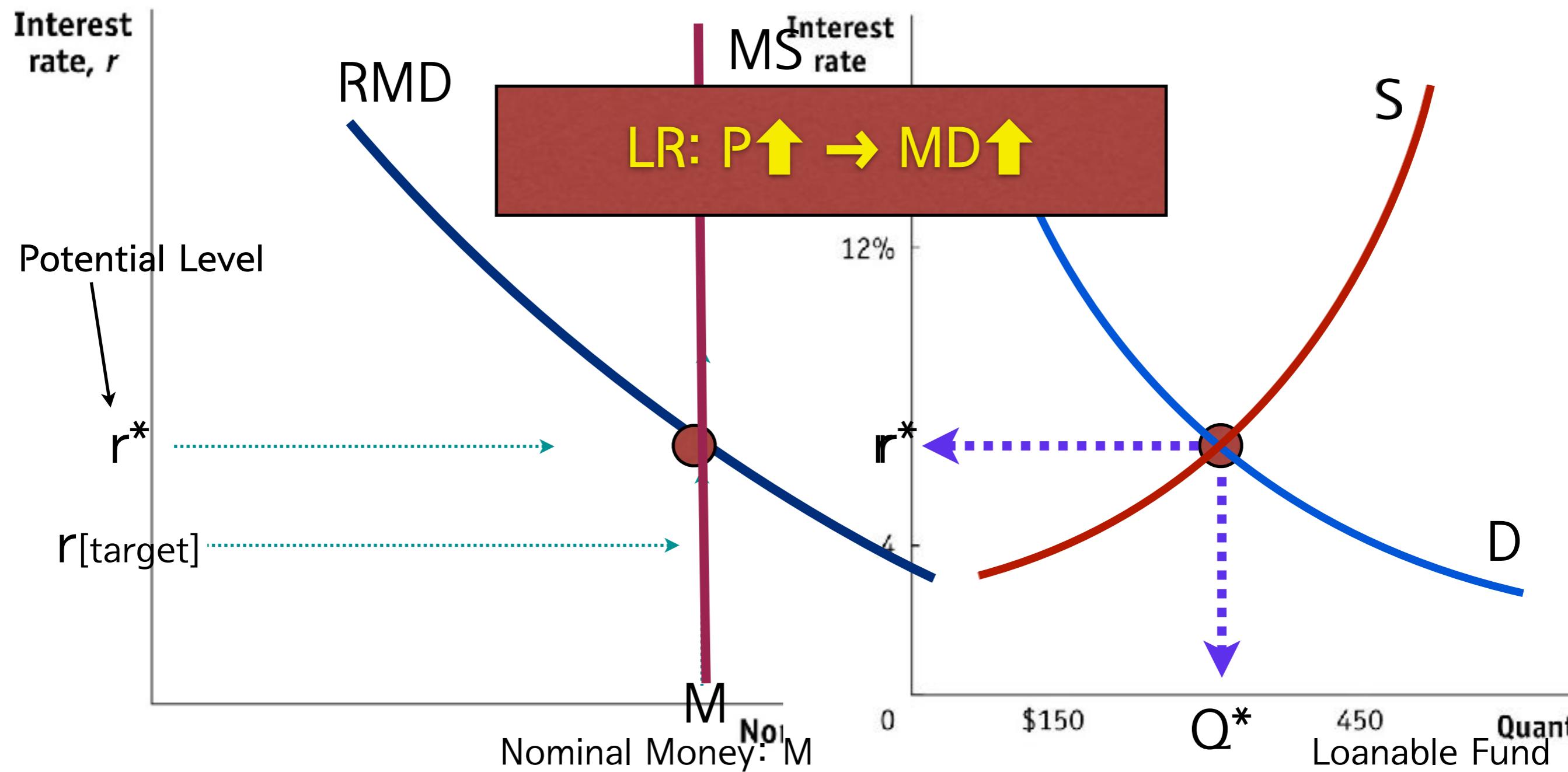
Monetary Policy and Interest Rate



Monetary Policy and Interest Rate



Monetary Policy and Interest Rate

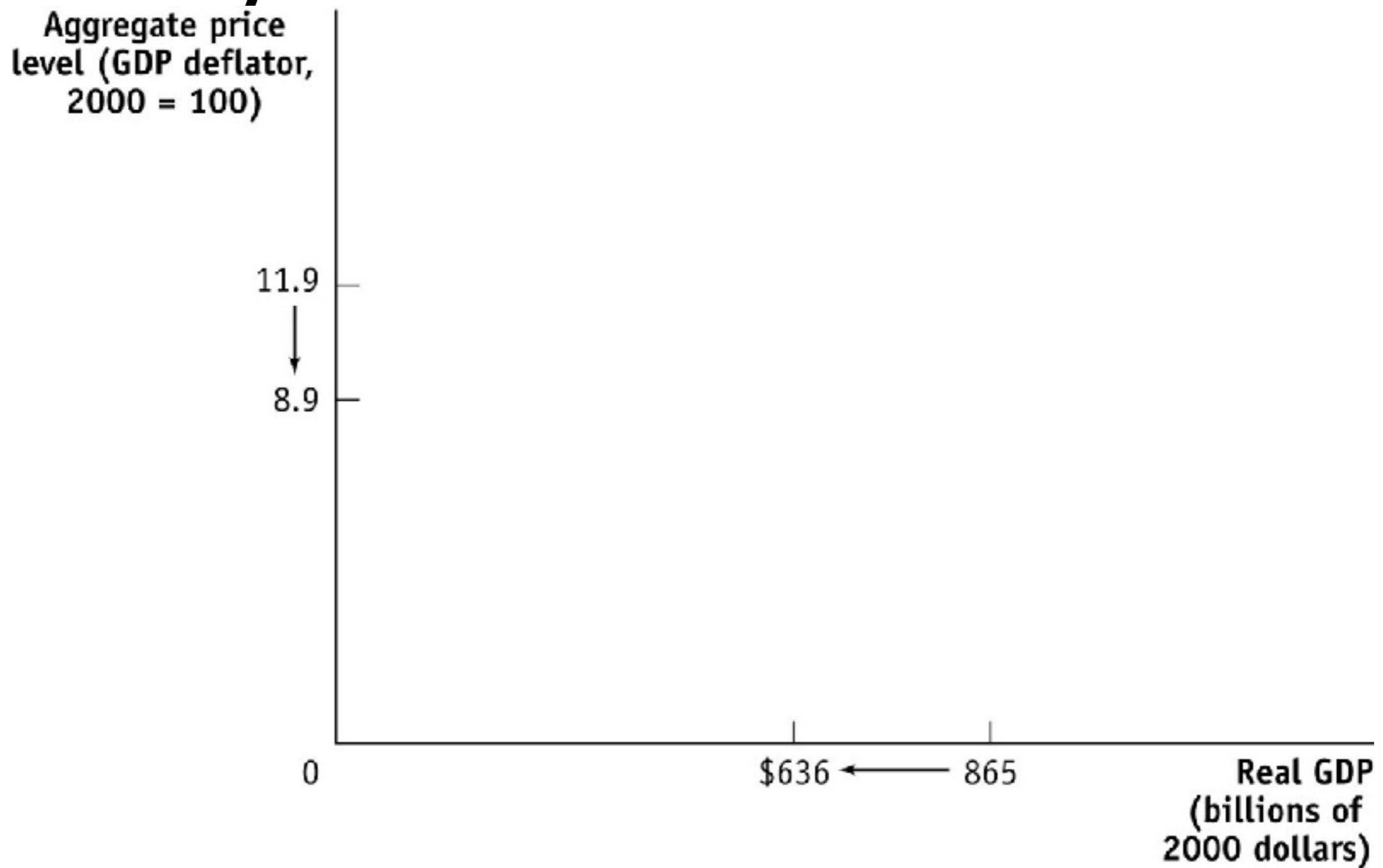


물가에 대한 고전모형

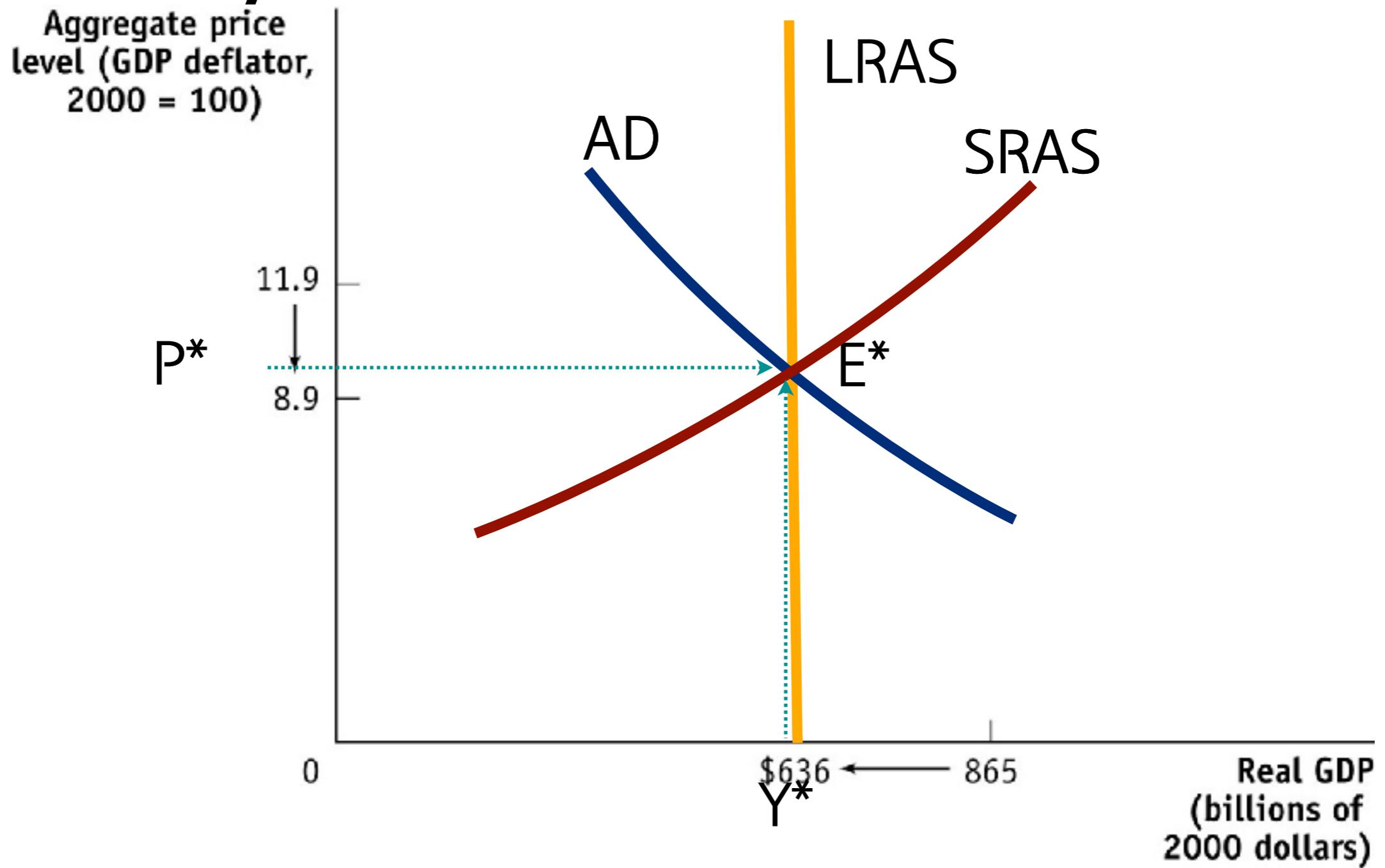
Classical Model

- 실질통화량이 즉각적으로 장기균형에 조응
- 단기 경직성 무시
- 가격의 단기 경직성이 사라지는 특수한 경우엔 실제로 관찰 가능

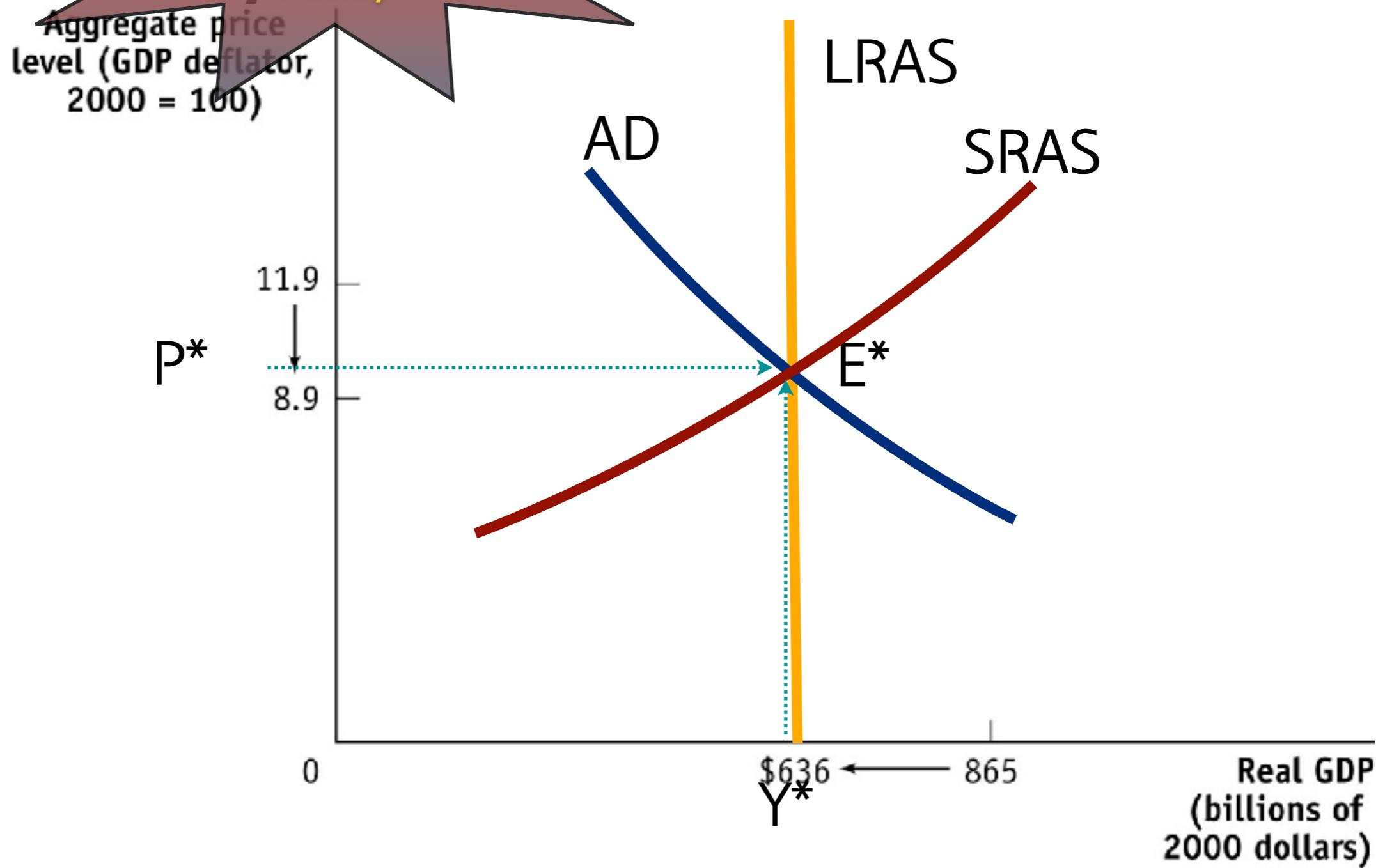
Expansionary Monetary Policy: Modern version



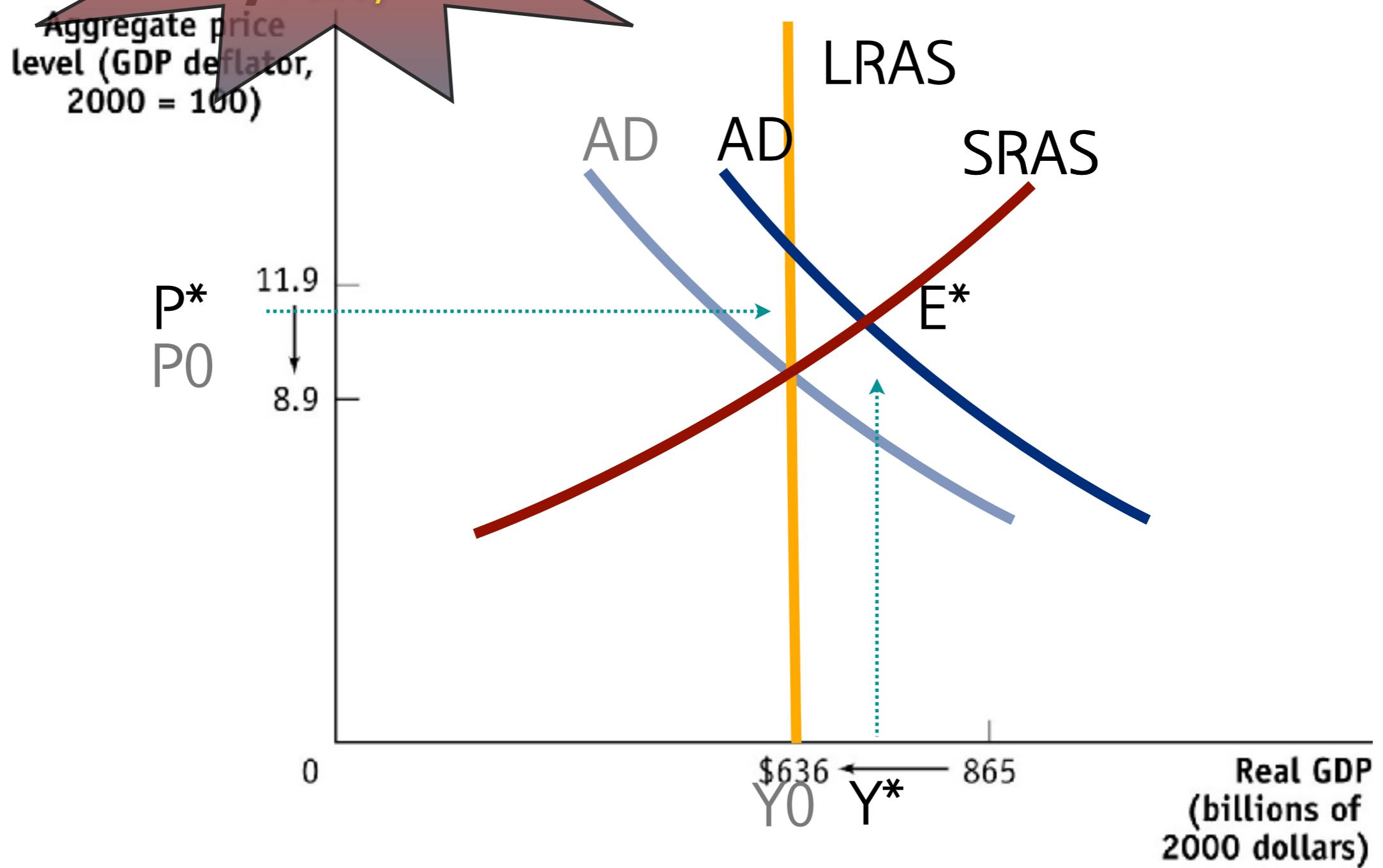
Expansionary Monetary Policy: Modern version



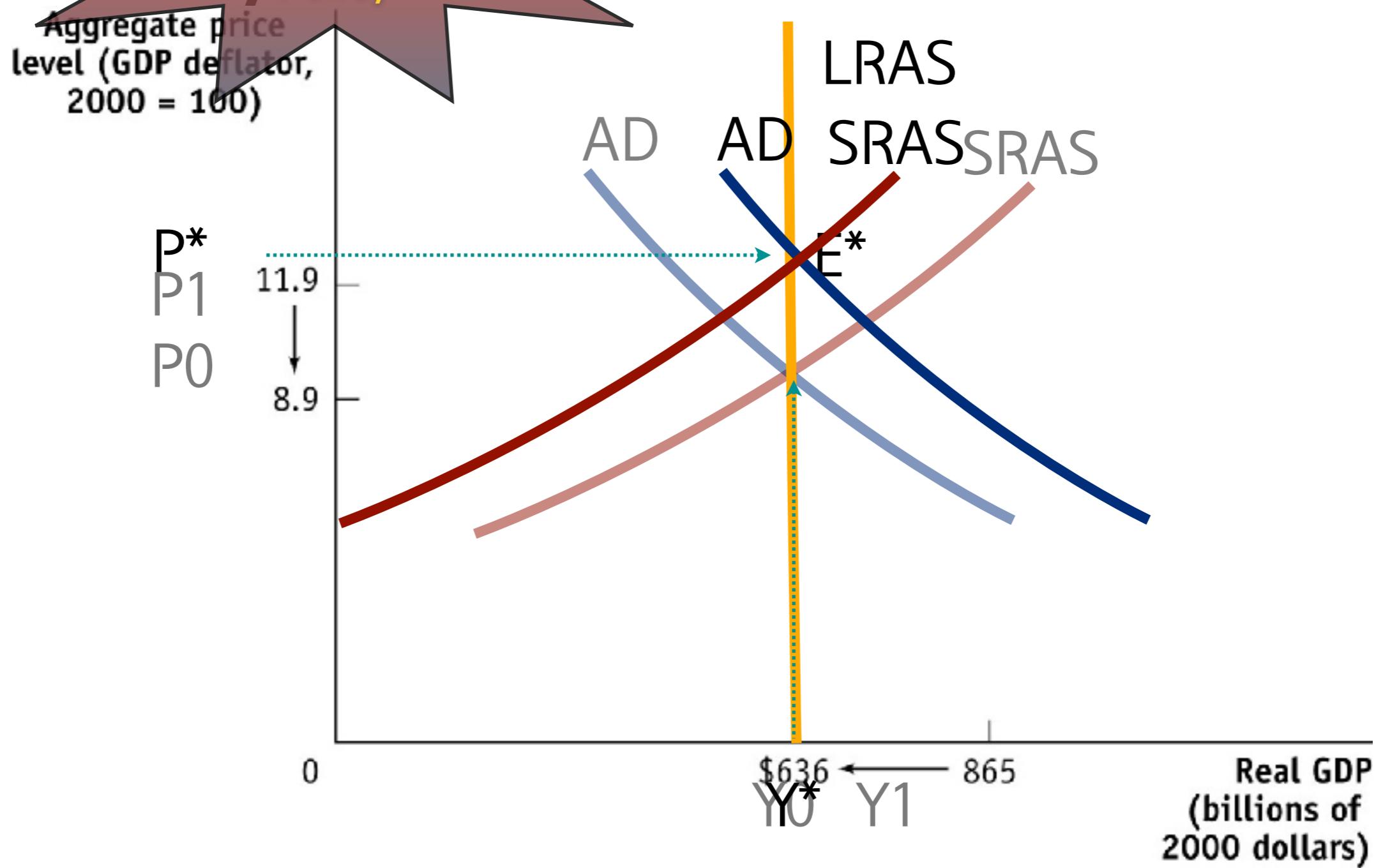
Expansionary Monetary Policy: Modern version



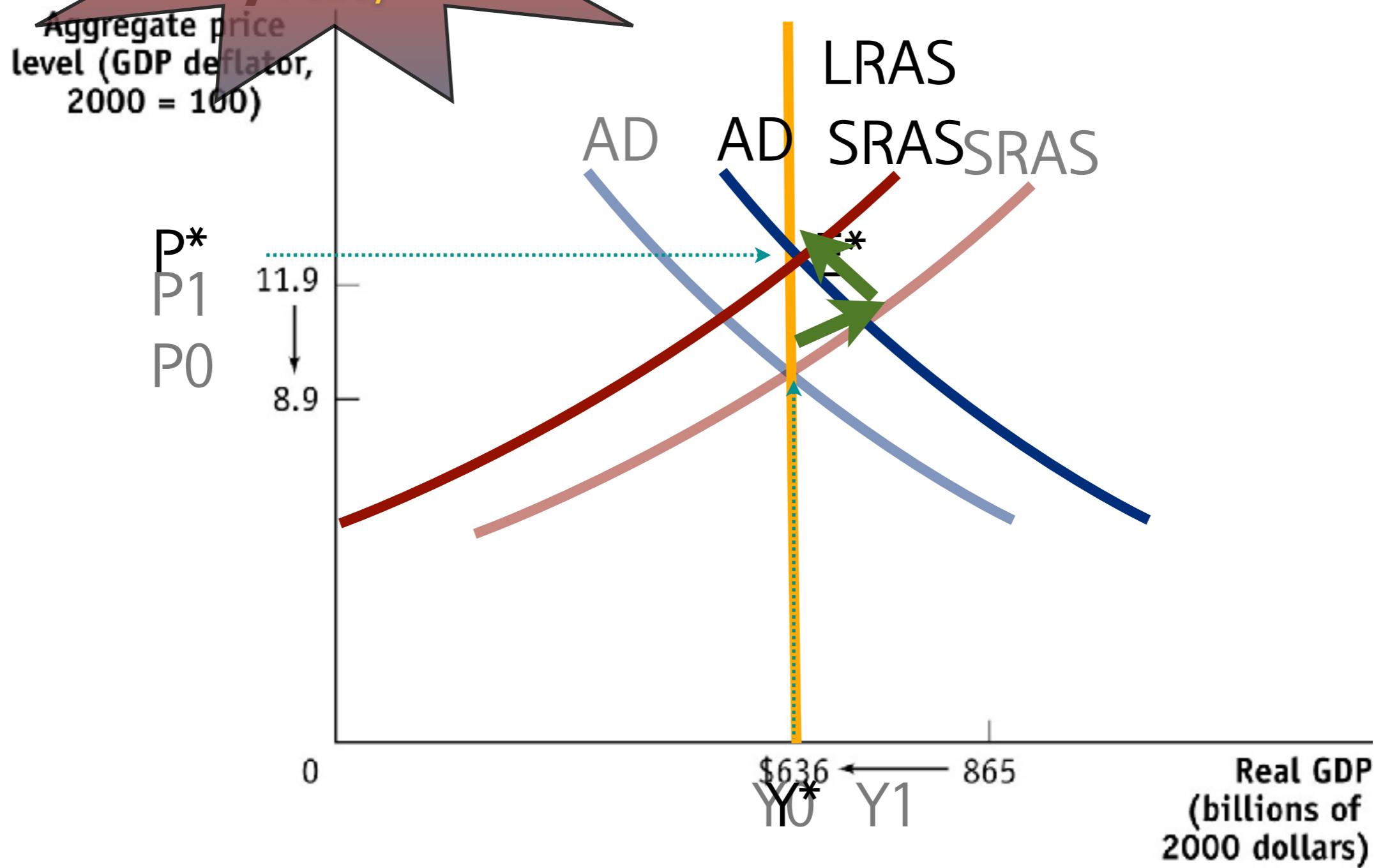
Expansionary Monetary Policy! Modern version



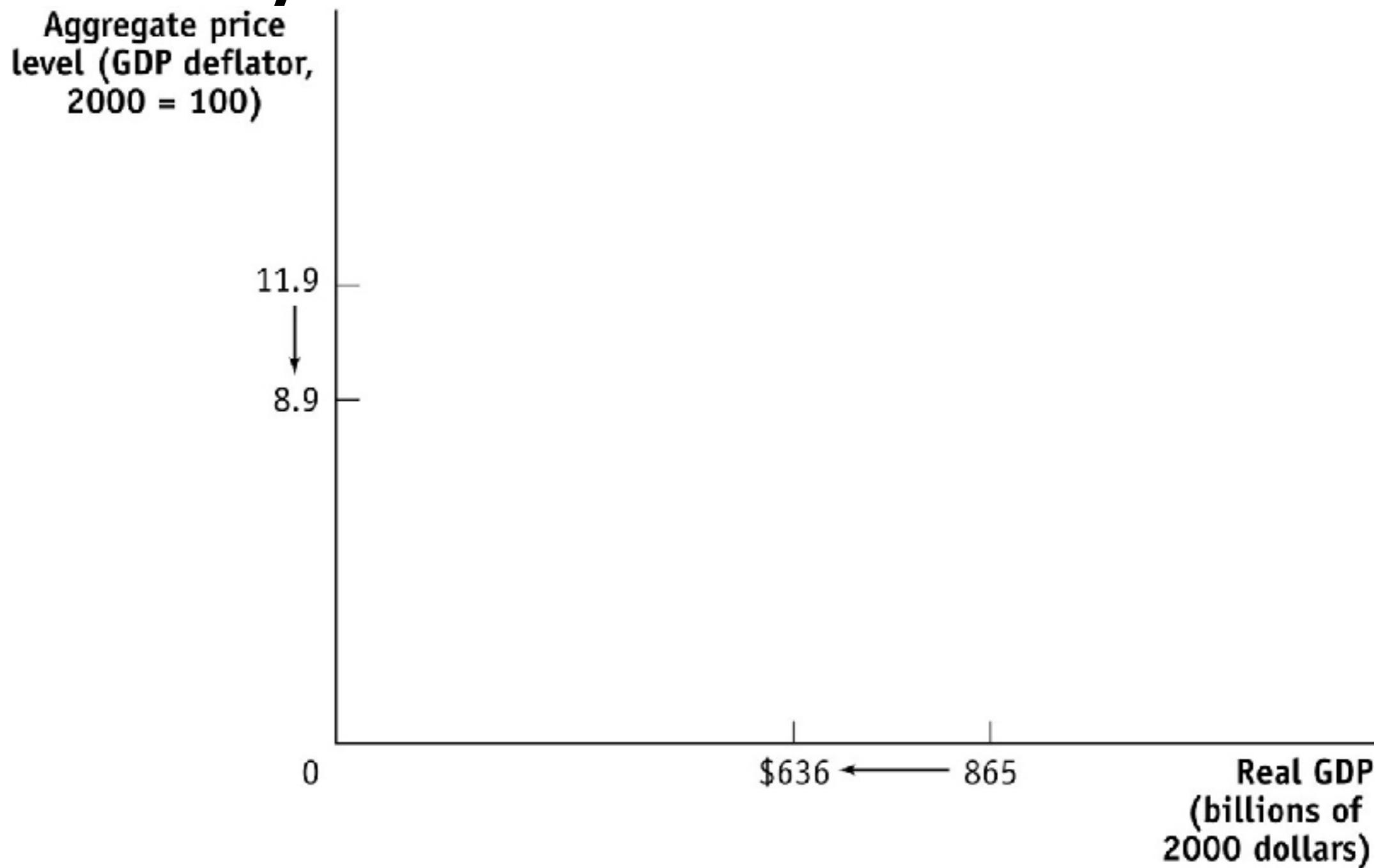
Expansionary Monetary Policy! Modern version



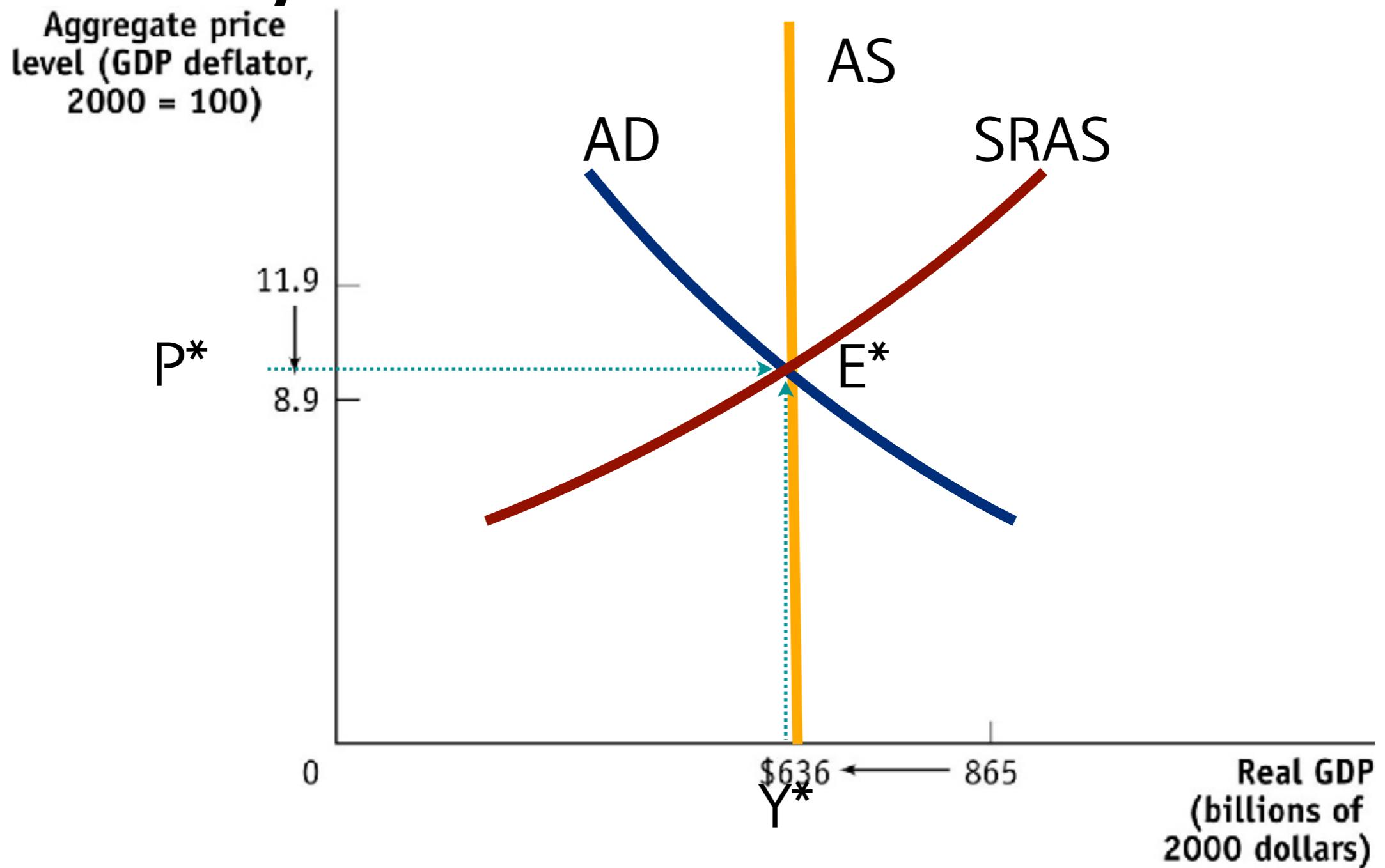
Expansionary Monetary Policy! Modern version



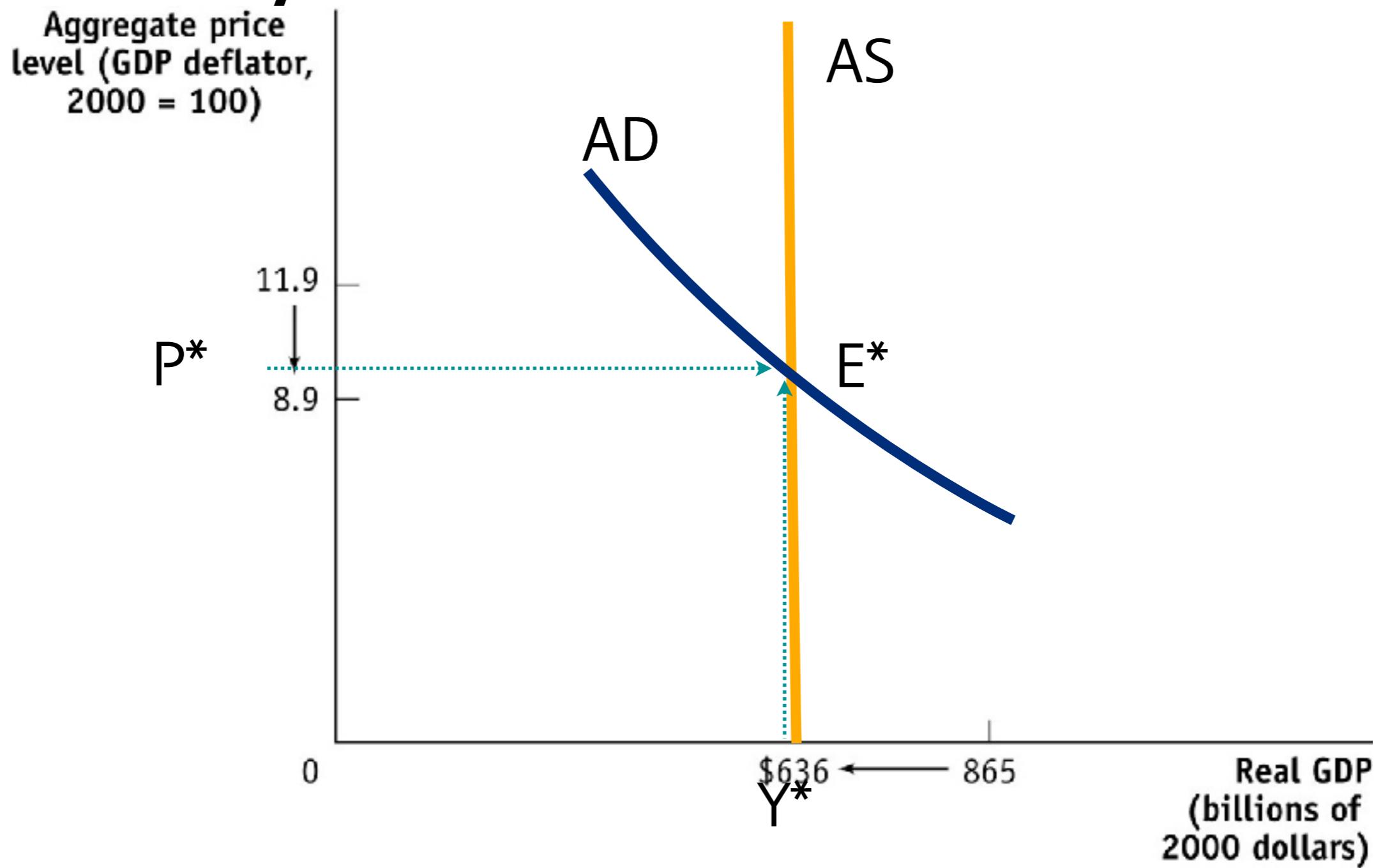
Expansionary Monetary Policy: Classic version



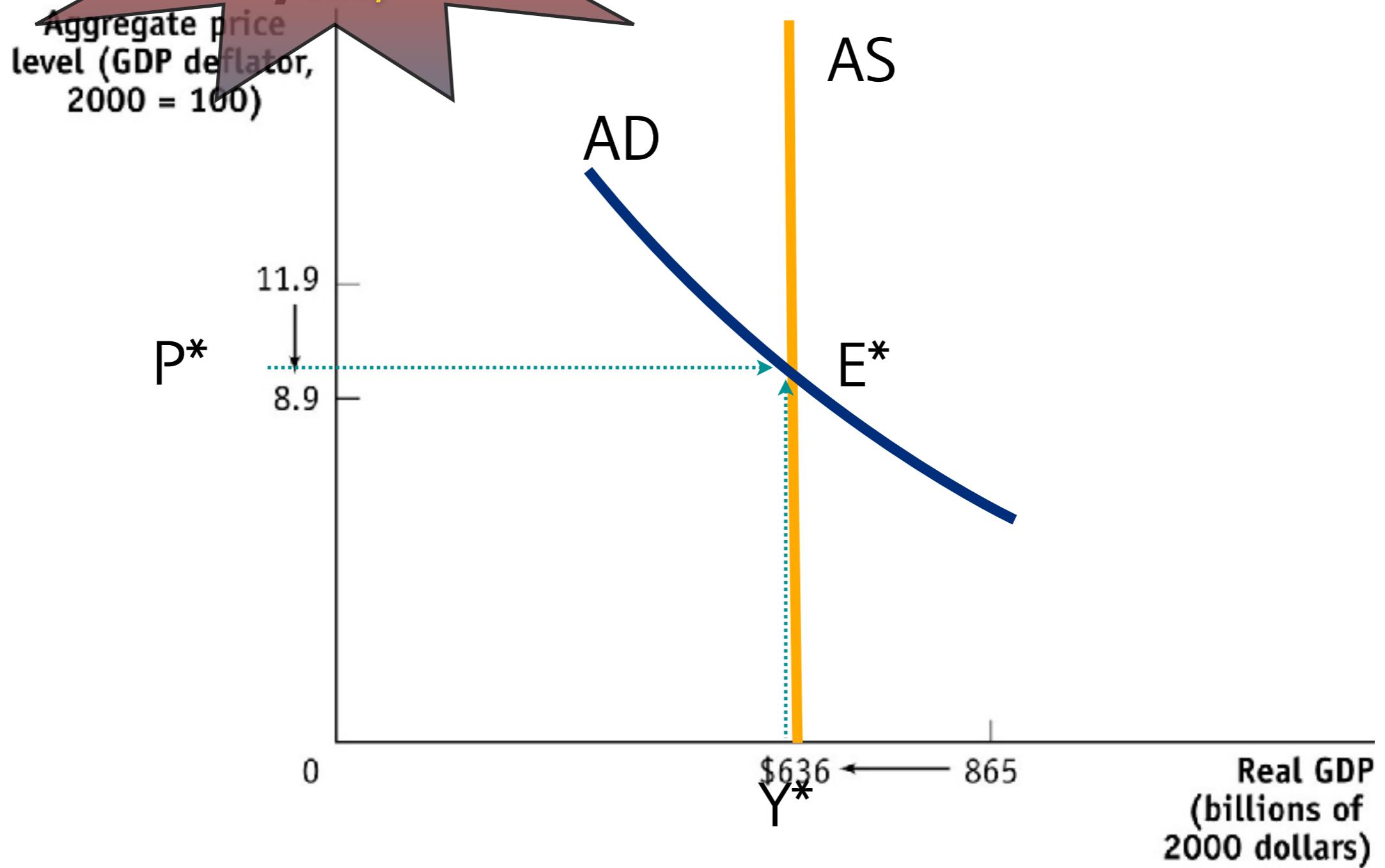
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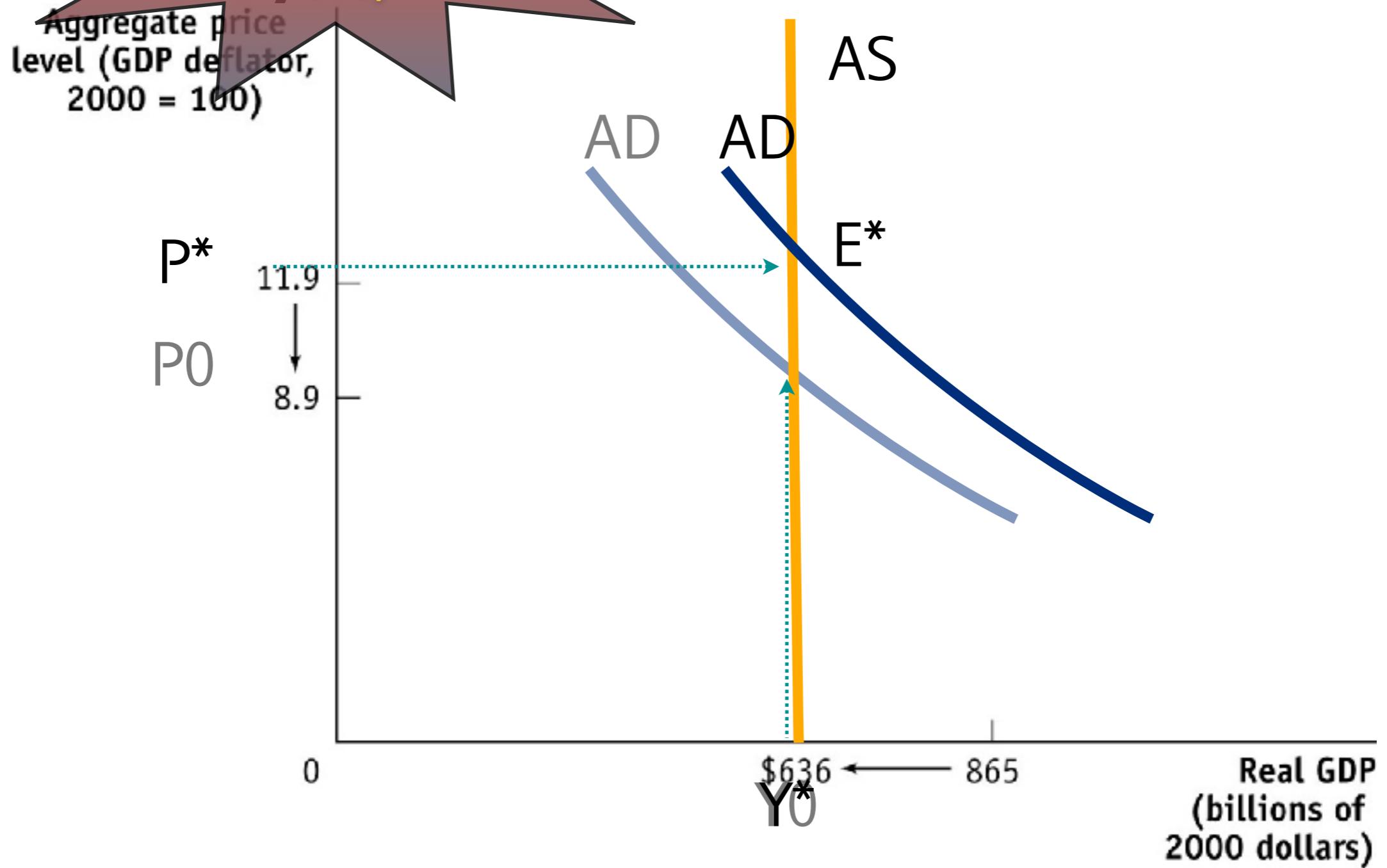
Expansionary Monetary Policy: Classic version



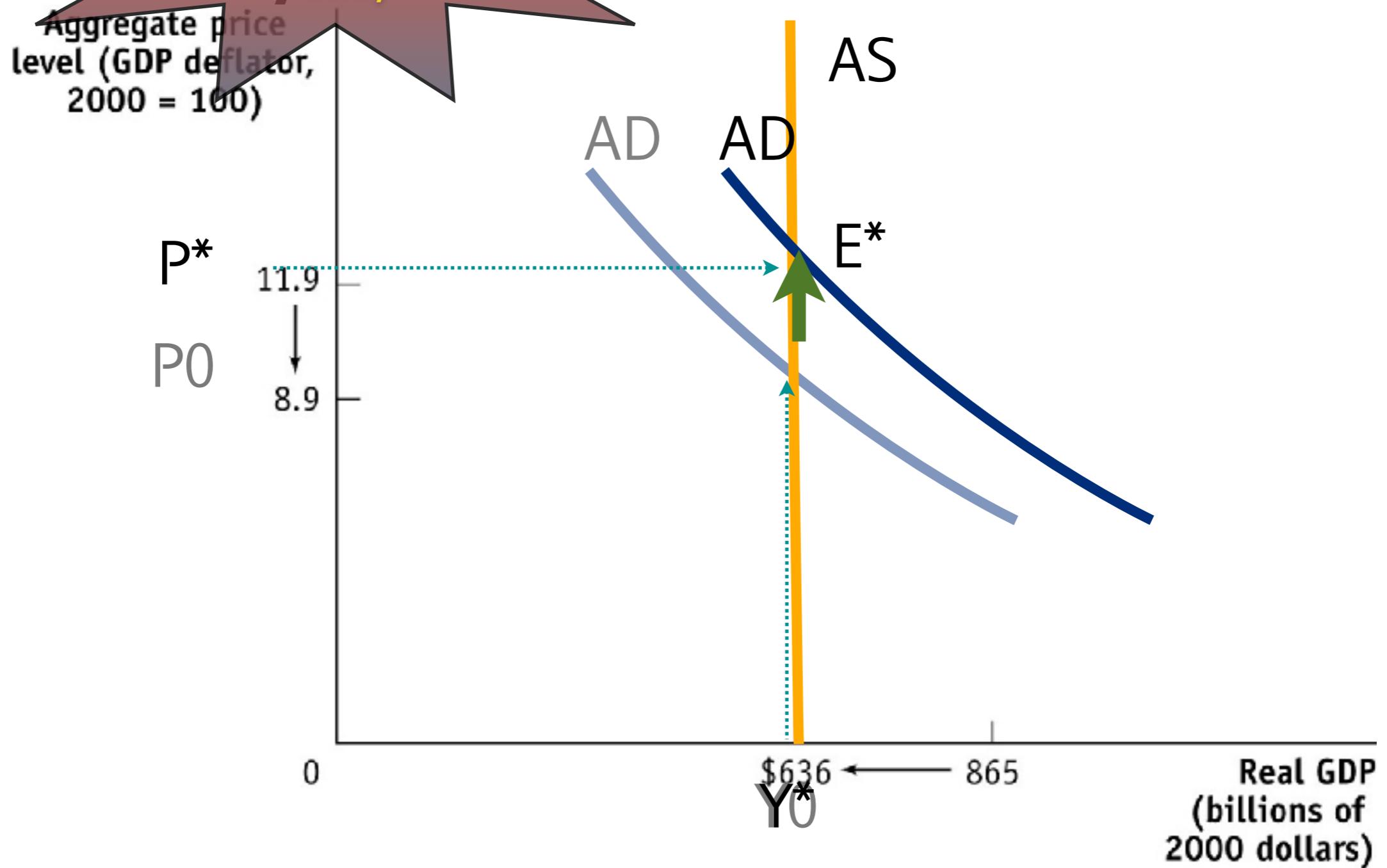
Expansionary Monetary Policy



Expansionary Monetary Policy



Expansionary Monetary Policy



가격의 단기경직성이 사라지는 경우

Disappearance of Short-run Price Rigidity

- 고전모델은 가격의 경직성이 무시할만하다고 보았음
- 일반적으로 가격은 단기적으로 경직적
- 예외가 발생하는 경우: 인플레이션이 심한 상황:
가격 조정에 대한 마찰이 사라짐 \Rightarrow Hyper Inflation

초인플레이션

Hyper-Inflation

- Hyper-Inflation: 월 물가상승률이 50%를 초과하는 현상

초인플레이션

Hyper-Inflation

Date:	German Marks needed to buy one ounce of gold
Jan 1919.....	170.00
Sept 1919.....	499.00
Jan 1920.....	1,340.00
Sept 1920.....	1,201.00
Jan 1921.....	1,349.00
Sept 1921.....	2,175.00
Jan 1922.....	3,976.00
Sept 1922.....	30,381.00
Jan 1923.....	372,477.00
Sept 1923.....	269,439,000.00
Oct 2, 1923.....	6,631,749,000.00
Oct 9, 1923.....	24,868,950,000.00
Oct 16, 1923	84,969,072,000.00
Oct 23, 1923	1,160,552,882,000.00
Oct 30, 1923	1,347,070,000,000.00
Nov 5, 1923	8,700,000,000,000.00
Nov 30, 1923.....	87,000,000,000,000.00

:ion: 월 물가상승률이 50%를 초과하

초인플레이션

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Nov 30, 1923.....	87,000,000,000,000.00

-ion을 초과하는 10%를 초과하



초인플레이션 Hyper-Inflation

Date: German Marks needed
to buy one ounce of gold

Jan 1919.....	170.00
Sept 1919.....	499.00
Jan 1920.....	1,340.00
Sept 1920.....	1,201.00
Jan 1921.....	1,349.00
Sept 1921.....	2,175.00
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Oct 30, 1923.....	1,347,070,000,000.00
Nov 5, 1923.....	8,700,000,000,000.00
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:join

0%를 초과하



초인플레이션 Hyper-Inflation

Date:	German Marks needed to buy one ounce of gold
Jan 1919.....	170.00
Sept 1919.....	499.00
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-ion



1923 Inflation

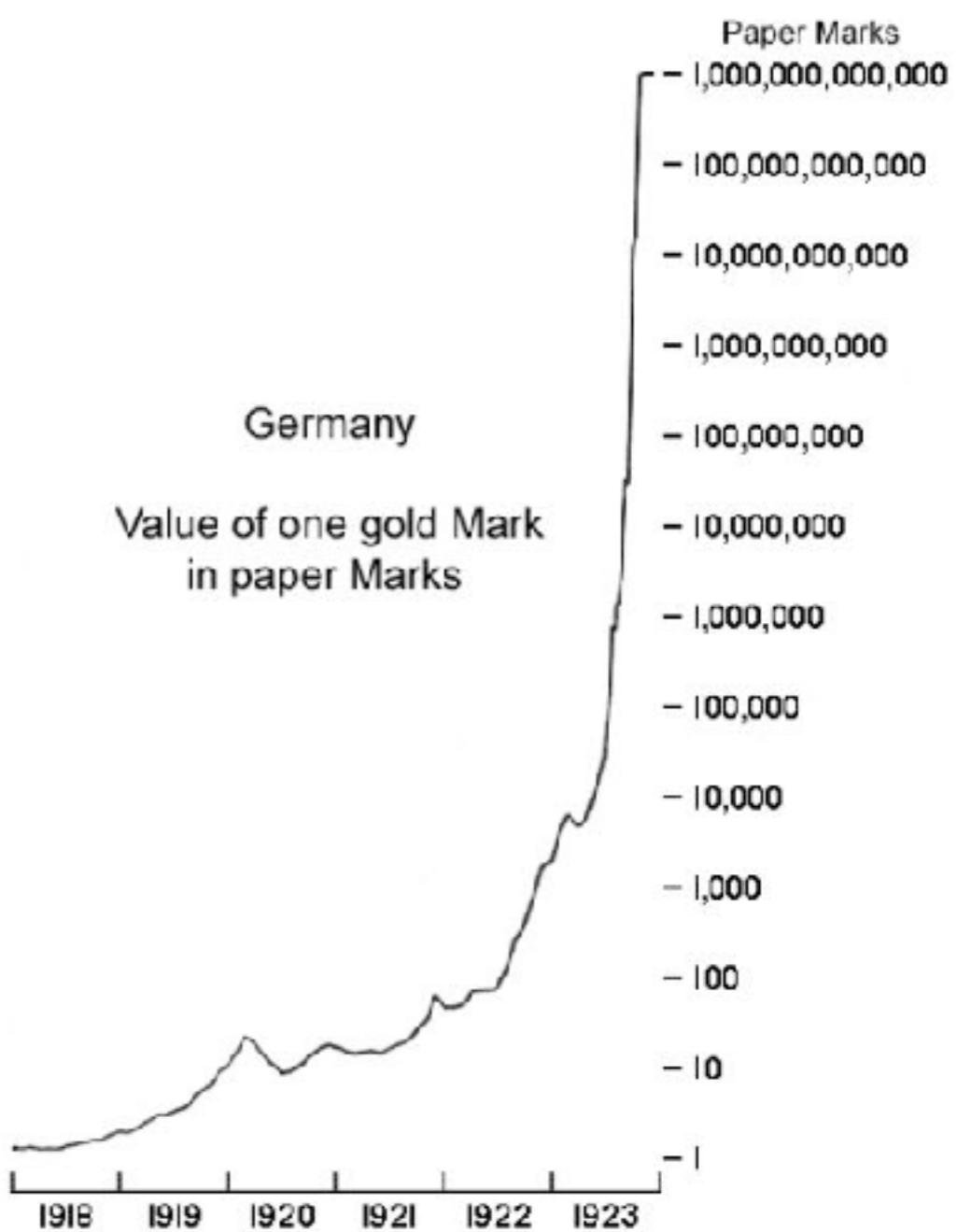


Oct 30, 1923	1,347,070,000,000.00
Nov 5, 1923	8,700,000,000,000.00
Nov 30, 1923.....	87,000,000,000,000.00

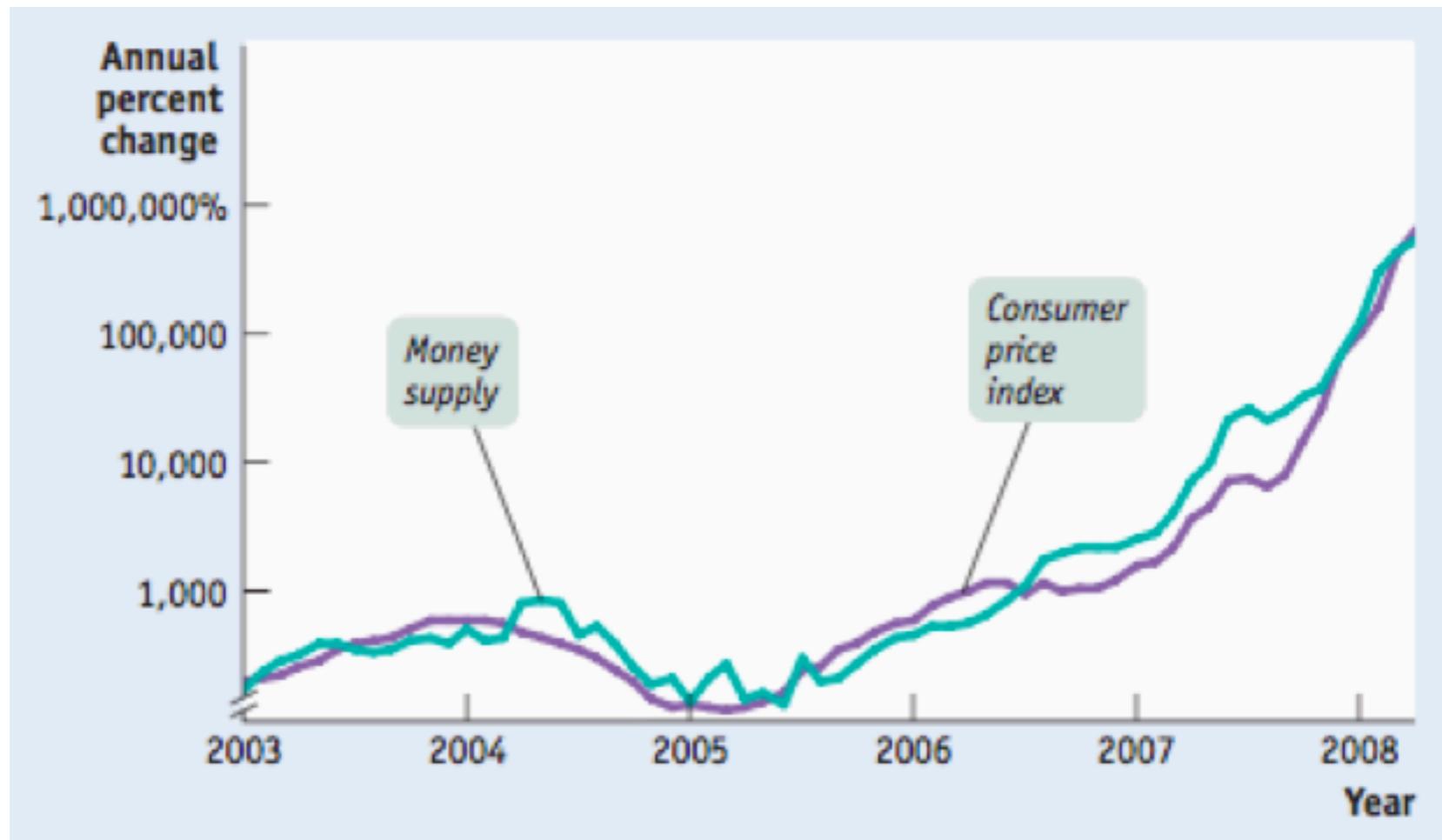
Hyperinflation in the Weimar Republic



Hyperinflation in the Weimar Republic



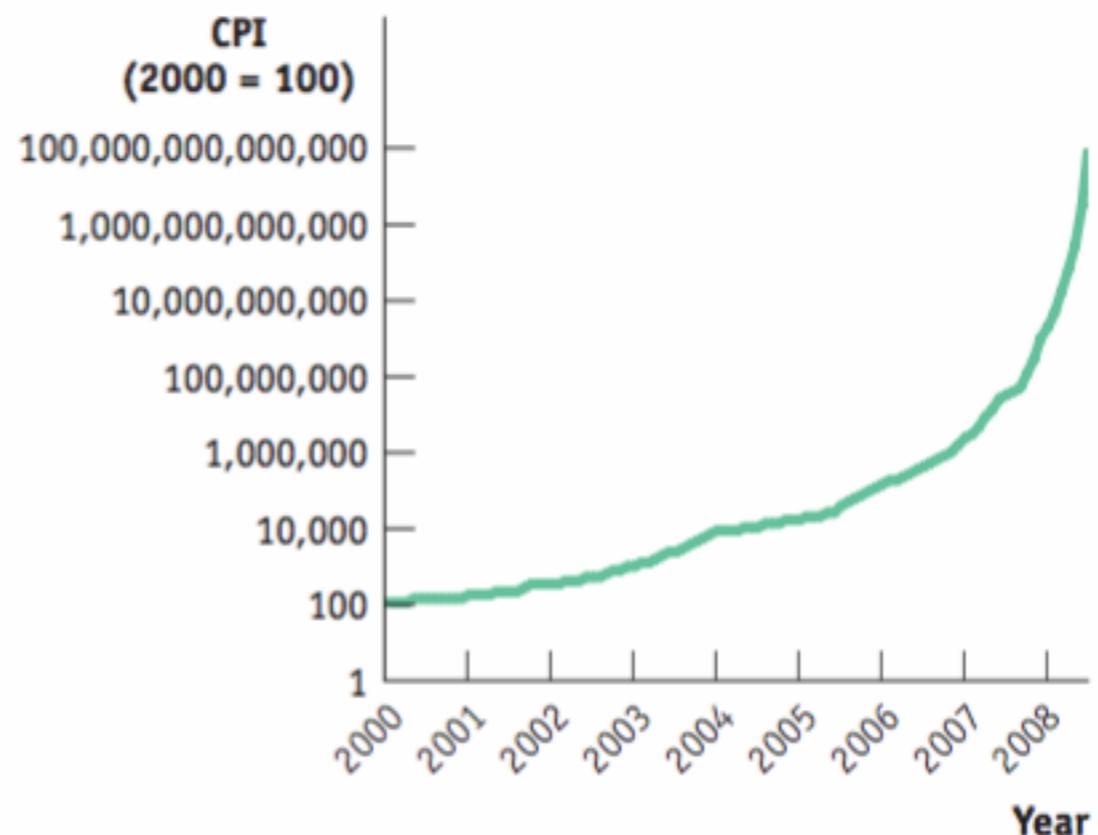
Money Supply Growth and Inflation in Zimbabwe



Postage Stamps During Hyper inflation



CIP in Zimbabwe



Source: International Monetary Fund.

Causes of Hyper-inflation

- 화폐 제조권이 있는 중앙정부(중앙은행)가 과다하게 화폐발행: 주조수익(Seigniorage)
- 인플레이션세: 주조수익으로 인한 화폐보유자의 부 감소분
- ex) 정부의 화폐발행으로 7% 인플레이션 발생: 화폐가치 93%으로 저하(7% 저하) ⇒ 명목 인플레이션세는 총화폐의 7%

사고실험

- 물가를 제외한 모든 거시지표(rGDP, 기술, 인구수 등)가 변하지 않을 경우를 가정
- CASE1: 5%의 (연간)인플레이션 발생: 1000원에 A만큼 살 수 있다면, 1년후에는 1000원에 $A \times 0.95$ 만큼 살 수 있게 됨
- CASE2: 0%의 인플레이션이 있는 상태 + 국가가 모든 화폐에 대해 매년 5%의 비례세를 매김

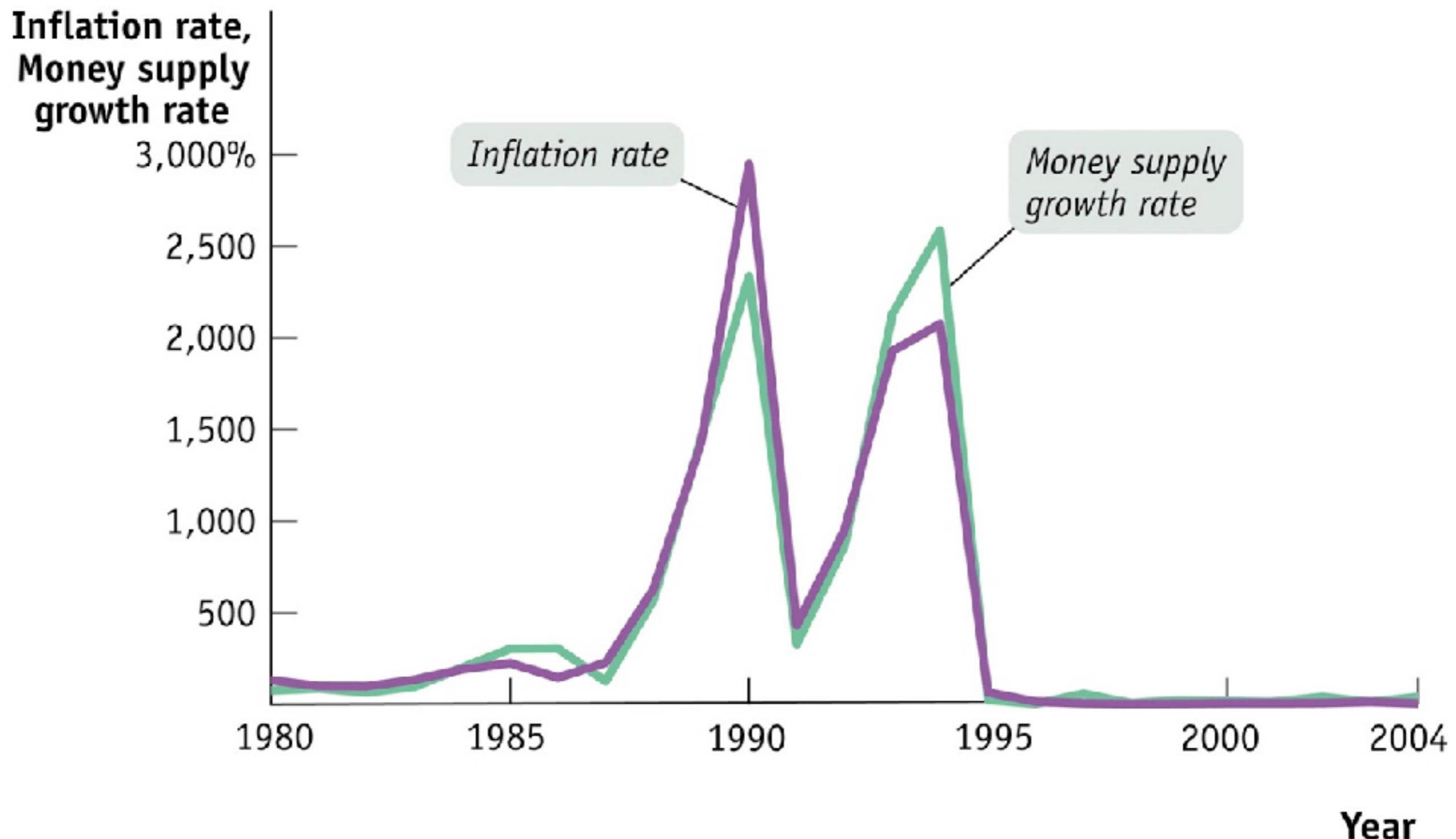
Comparison

1000원의 구매력 (year 0 기준)	CASE 1	CASE 2
year 0:	1000	1000
year 1:	$1000 * 0.95$	$1000(1 - 0.05)$
year 2:	$1000 * 0.95^2$	$1000(1 - 0.05)^2$
year 3:	$1000 * 0.95^3$	$1000(1 - 0.05)^3$

Inflation Tax

- $[\text{Nominal Inflation Tax}] \approx [\text{Inflation rate}] * [\text{Nominal Money Supply}:M]$
- $[(\text{Real}) \text{ Inflation Tax}] \approx [\text{Inflation rate}] * [\text{Real Money Supply}:M/P]$
 - 위 식은 근사식이므로 비교적 낮은 수준의 Inflation rate에만 적용 가능
- ex. inflation = 1000%: 인플레이션세는 실질 화폐공급의 1000%? (X) 화폐의 구매력이 1/10이 되므로 인플레이션세는 실질 화폐의 90%임.

Hyper Inflation in Brazil



Why Government need Seigniorage?

- 부채가 많은 정부가 적자를 감당하지 못할 경우 지폐인쇄로 해결하려 할 수 있음
- 실질 인플레이션세를 통해 재정 적자를 경감/완화

From Inflation Tax to Hyper-Inflation

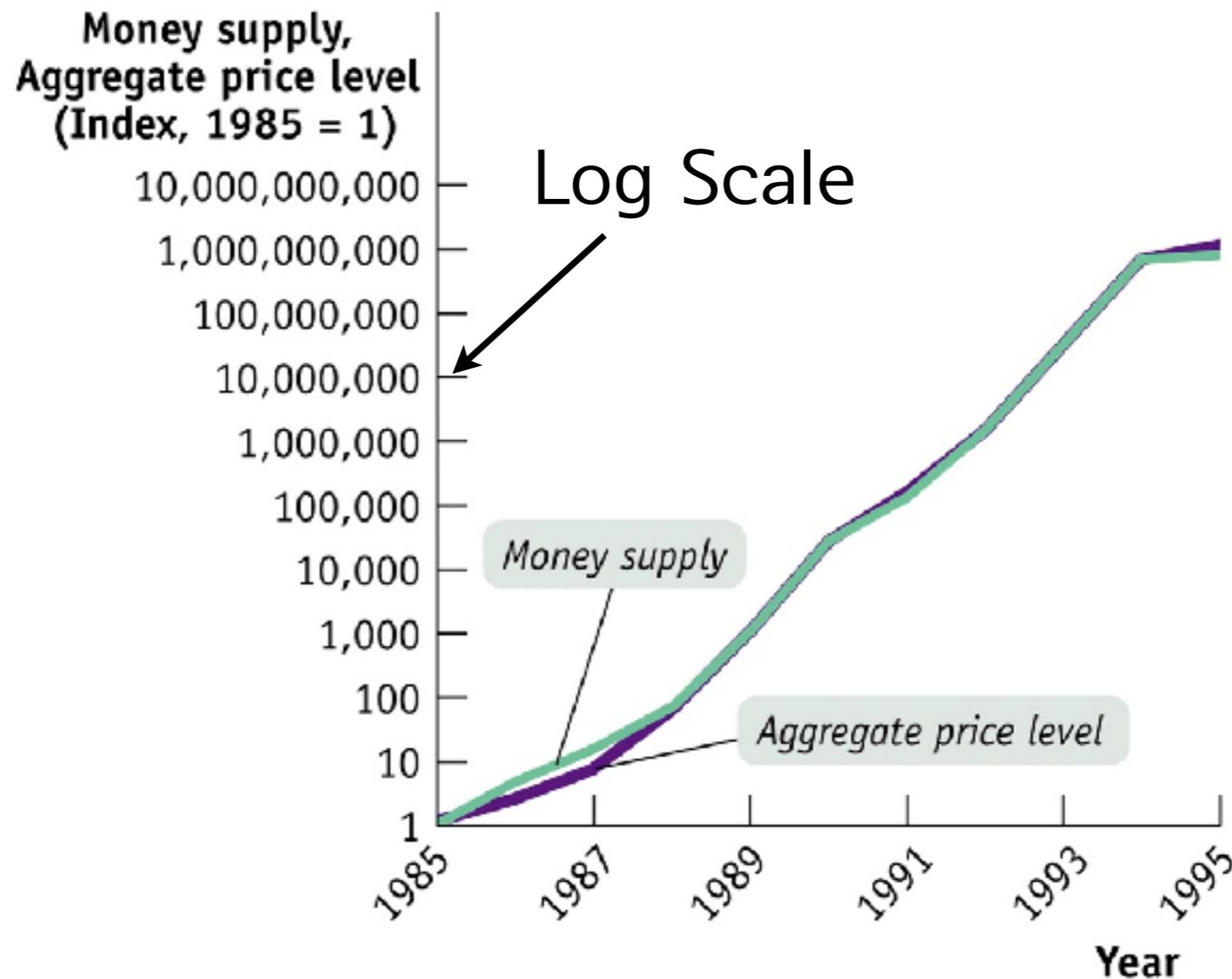
- 발생경로
 1. Inflation Tax 징수 : $M++$
 2. Inflation 발생: $P \uparrow$
 3. 실질화폐보유량 감소: $M/P \downarrow$, 화폐 자체를 보유하려하는 성향도 감소 $M/P \downarrow \downarrow$



인플레이션 급상승 메커니즘

- [Inflation Tax needed] \approx [Inflation rate] * [Real Money Supply: M/P] 이므로 필요한 Inflation Tax를 조달하기 위한 명목화폐발행(M_s) 속도는 인플레이션률보다 높게 설정되어야 함
 - 즉, $(M \uparrow\uparrow / P \uparrow) \Rightarrow$ 인플레이션 추가 상승 $(P \uparrow\uparrow) \Rightarrow$ 명목화폐공급 추가상승($M \uparrow\uparrow\uparrow$)
 $\Rightarrow \infty ..$

결론은? Hyper-Inflation! (of Brazil, 1980s)



인플레이션의 영향

Influence of Inflation



인플레이션의 영향(1)

- 소비자의 입장에서 인플레이션은 화폐의 구매력 약화를 의미
- 하지만, 임금, 명목이자율도 인플레이션에 조응하여 상승하기 때문에 총 구매력 저하효과는 상쇄됨
- 실물적으로는 특히 장기적으로 인플레이션은 실물부문에 큰 영향을 미치지 않음

인플레이션의 영향(2)

- 화폐중립성 (장기적 실물영향 없음)에도 불구하고
 - 미시변수적으로는 의미가 있음: 분배 변화 발생
- 예상치 못한 인플레이션의 경우
 - 설령 예상된 인플레이션이라 할지라도 실질비용이 부과될 수 있음 - 조건부로 실물 경제에 영향을 줄 수 있음

예상치 못한 인플레이션 : Lender and Borrower

- 차입자와 대부자간의 계약은 인플레이션을 감안하여 체결
- 하지만, 예상하지 못한 인플레이션이 발생하면:
 - 예상보다 높을 경우: 차입자가 이득
 - 예상보다 낮을 경우: 대부자가 이득

실질금리 Real Interest Rate

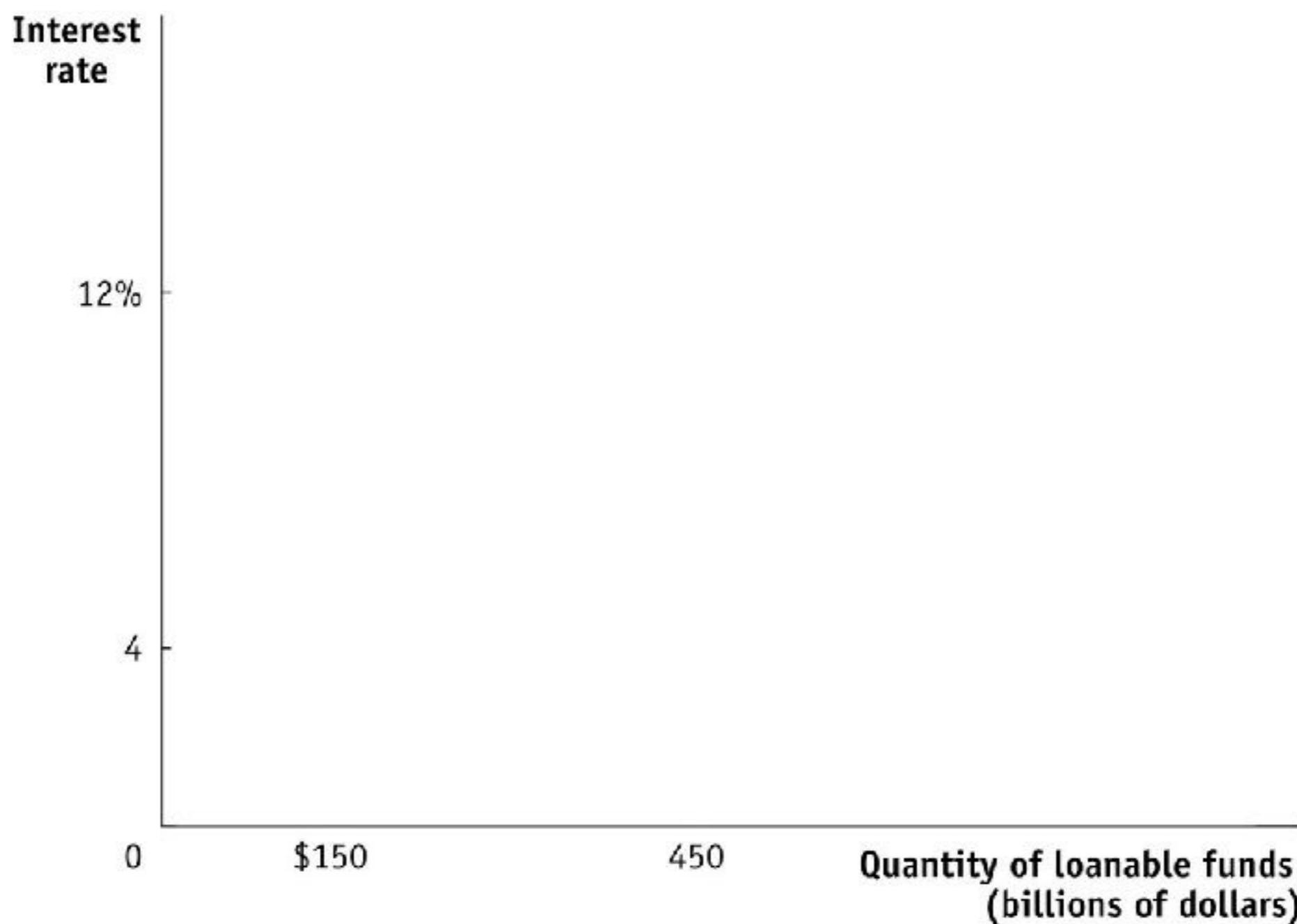
- 대부분 관계자들은 명목금리로 계약을 체결하지만, 판단기준은 실질금리임.
- [실질금리] \approx [명목금리]-[(예상)인플레이션율]
- 예상치 않은 인플레이션 발생시 부(wealth)의 이동이 생김
- 이를 회피하기 위해 인플레이션이나 기준금리가 바뀔 경우에 따라 조정하는 계약을 할 수도 있음: ex) 변동금리

Review: Fischer effect

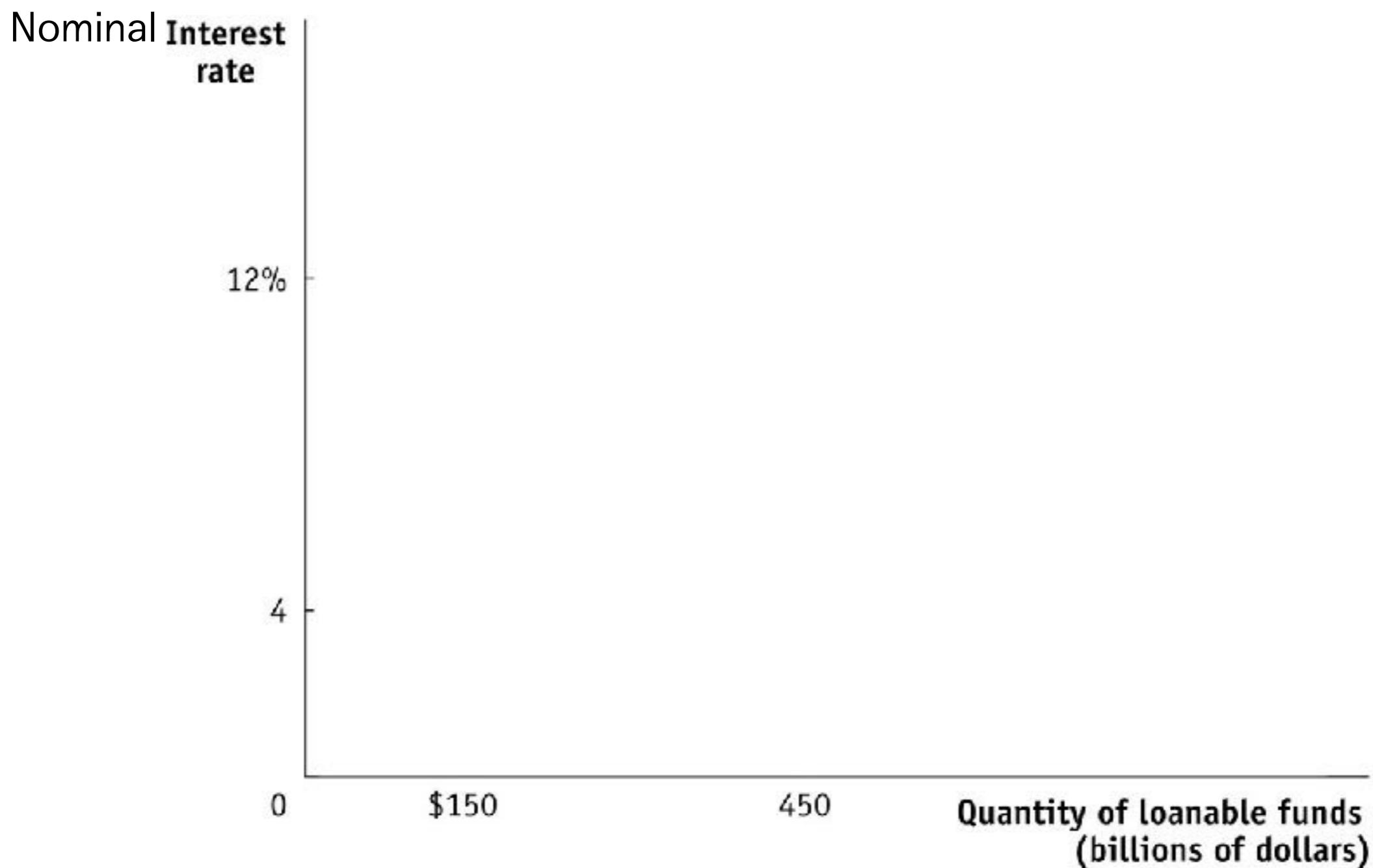


- Irving Fischer, 1867-1947
- Fischer Equation: $r \approx i - \pi$
 - 엄밀한 관계식: $(1+r) = (1+i)/(1+\pi)$
- Fischer Effect: 예상된 실질이자율은 예상 인플레이션율의 변화에 따른 영향을 받지 않는다. 단지 명목이자율을 상승시킬뿐이다.

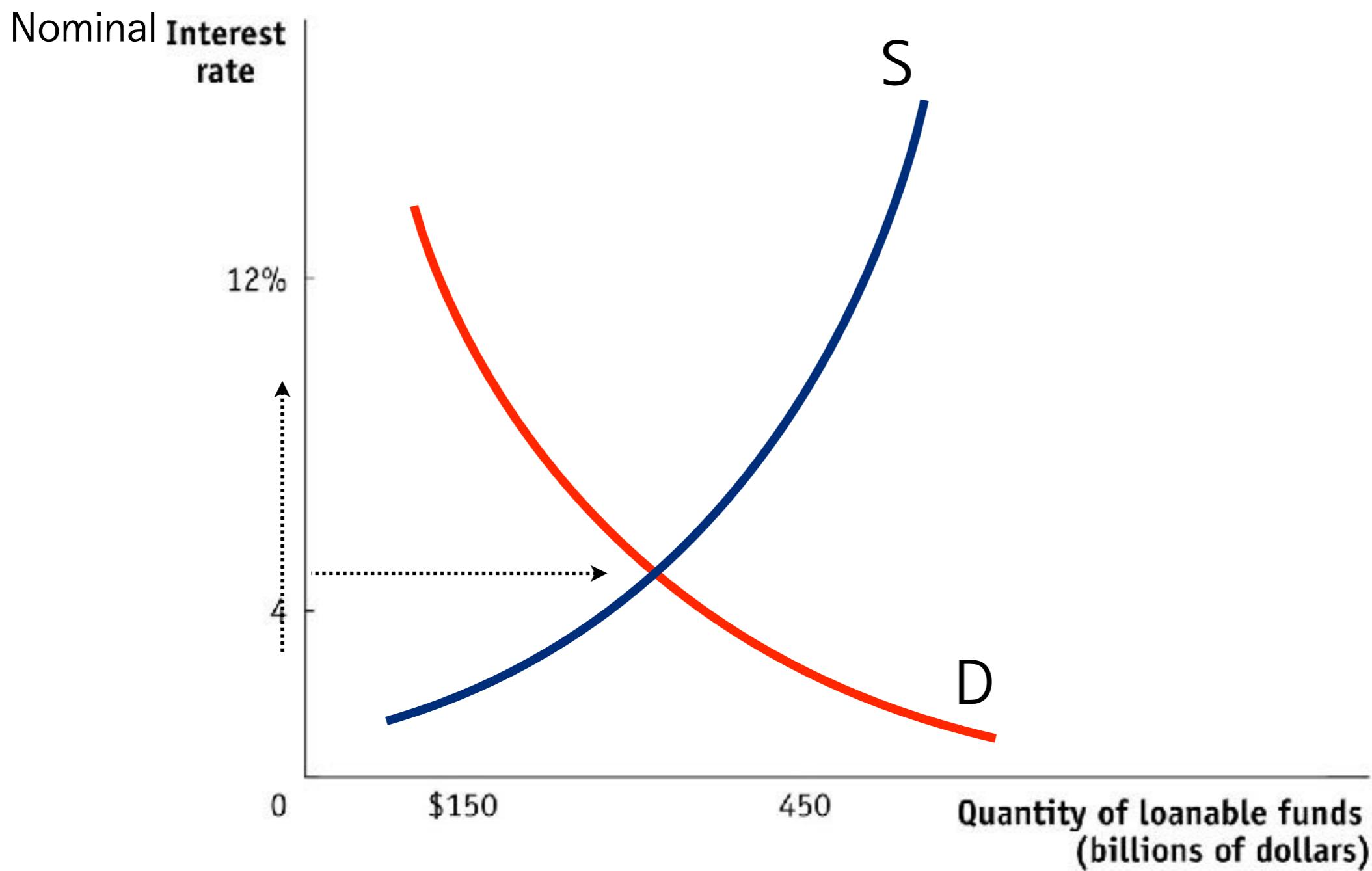
Fischer Effect: Graphical Expression



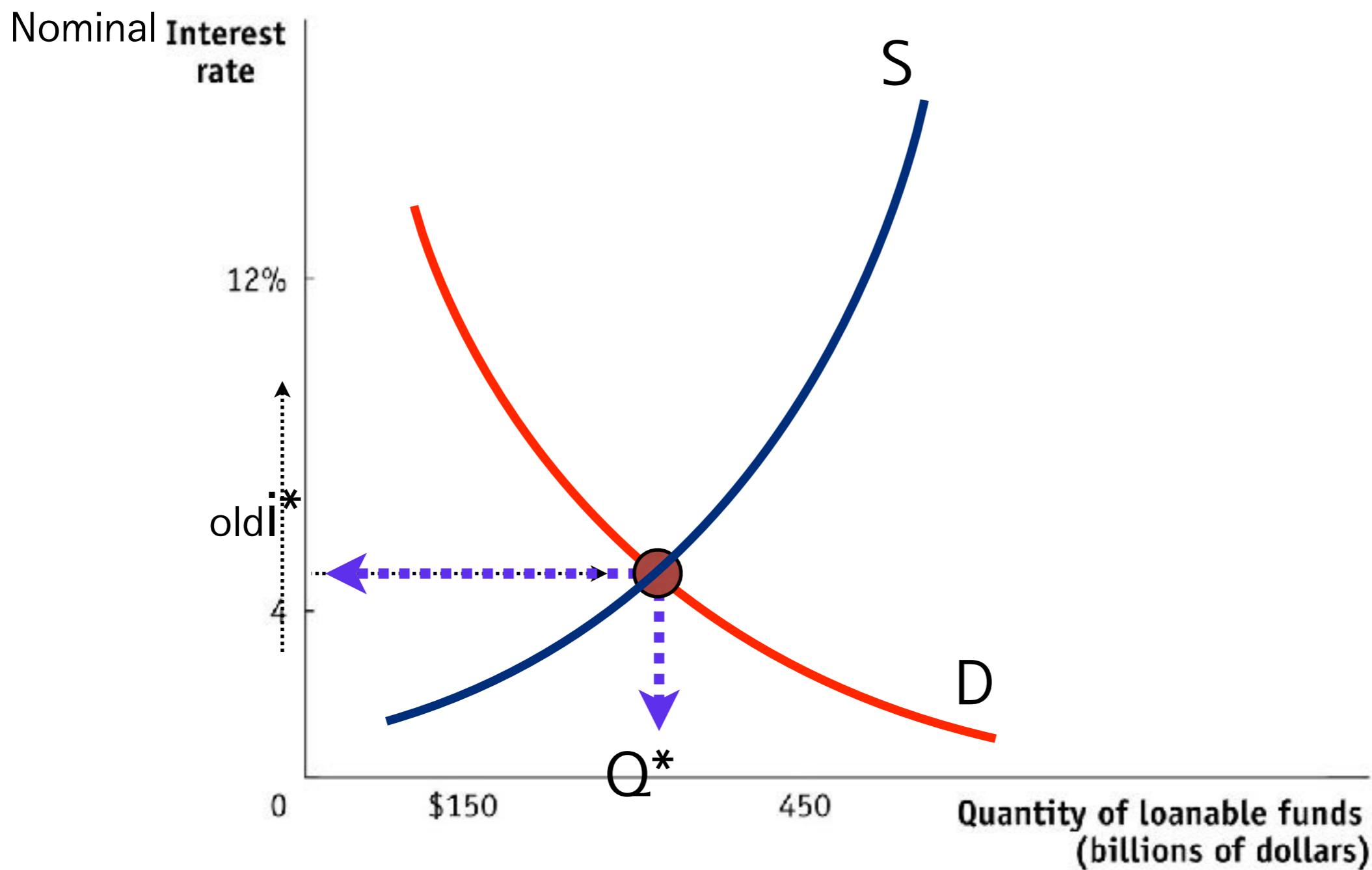
Fischer Effect: Graphical Expression



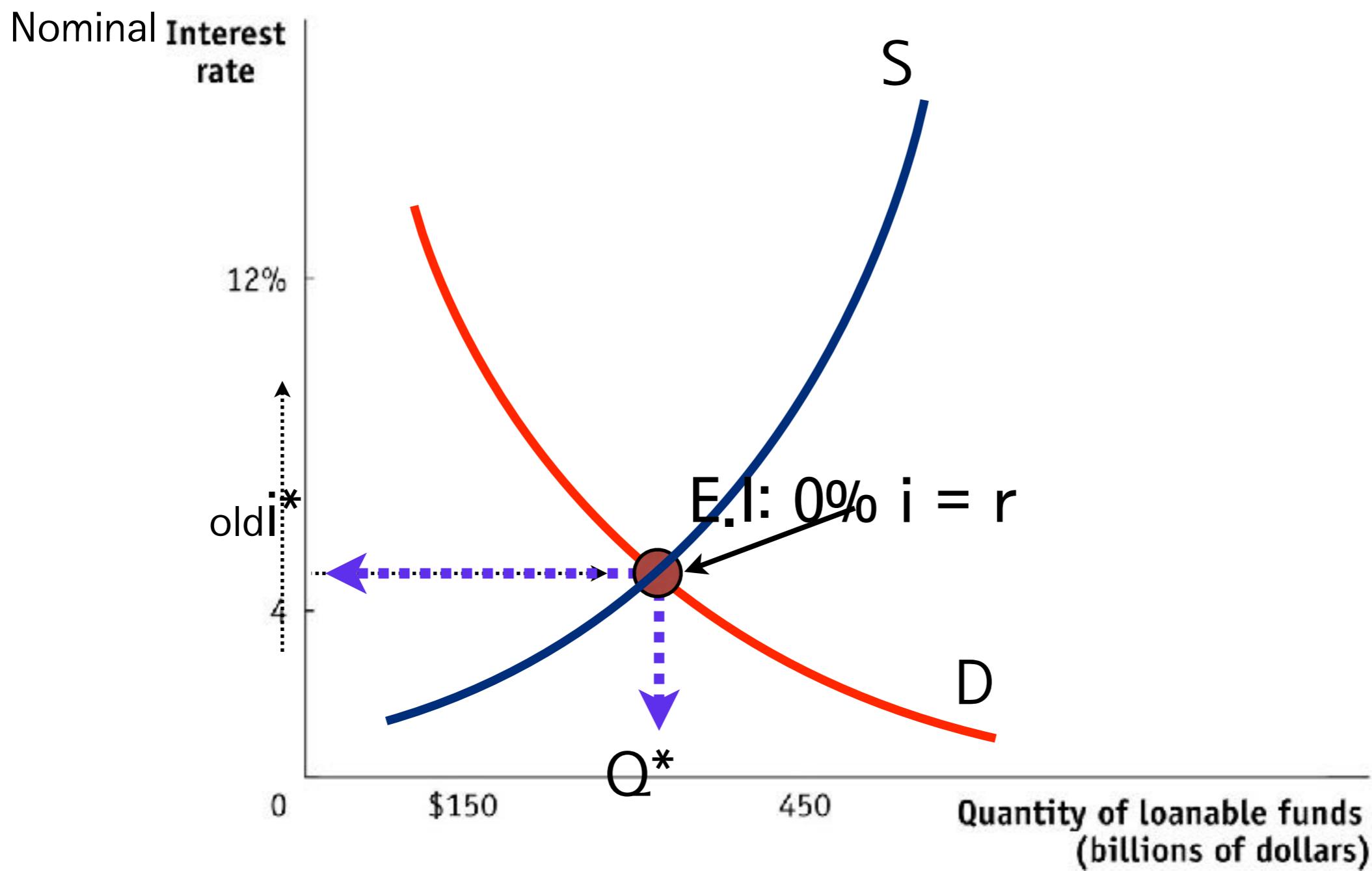
Fischer Effect: Graphical Expression



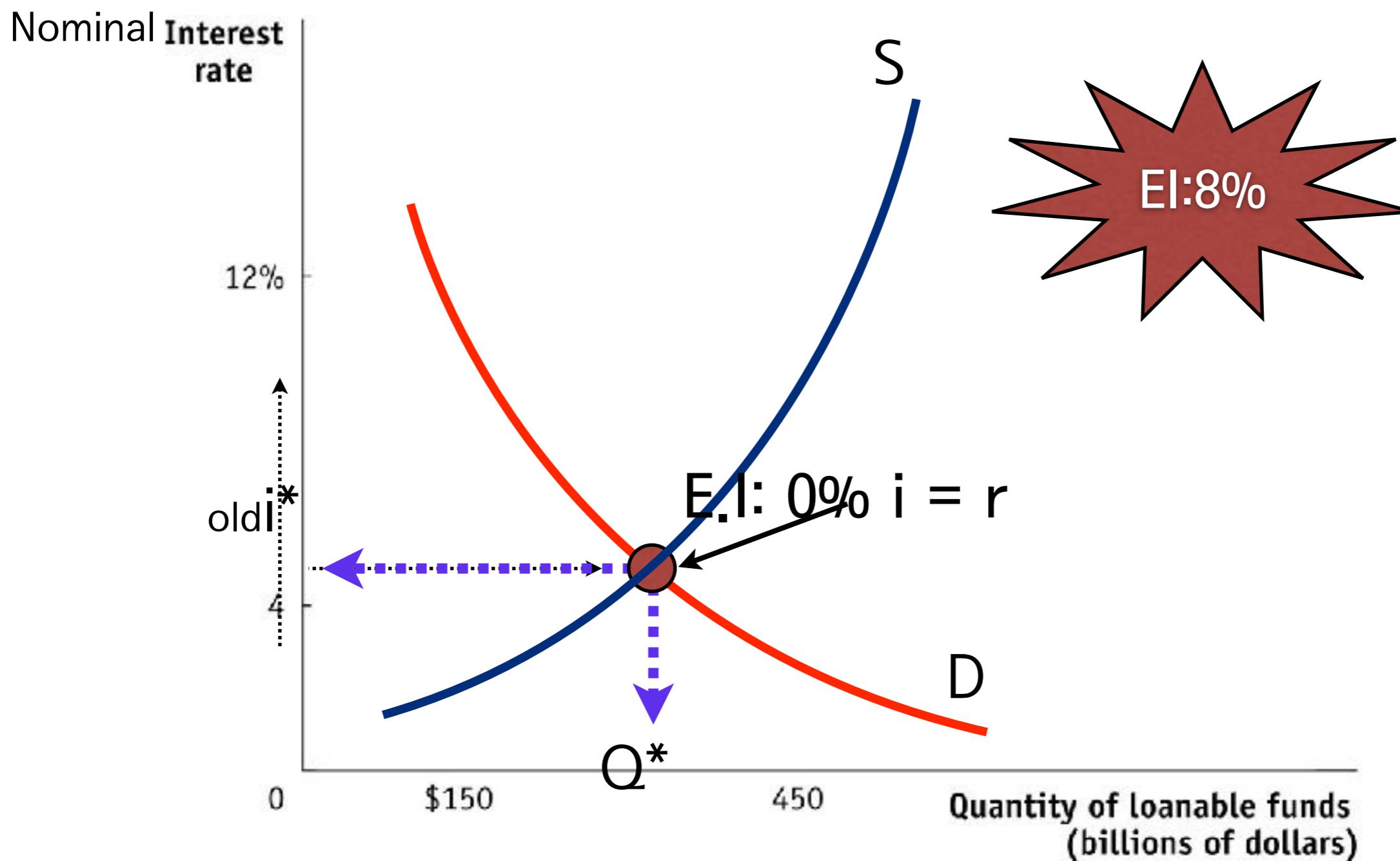
Fischer Effect: Graphical Expression



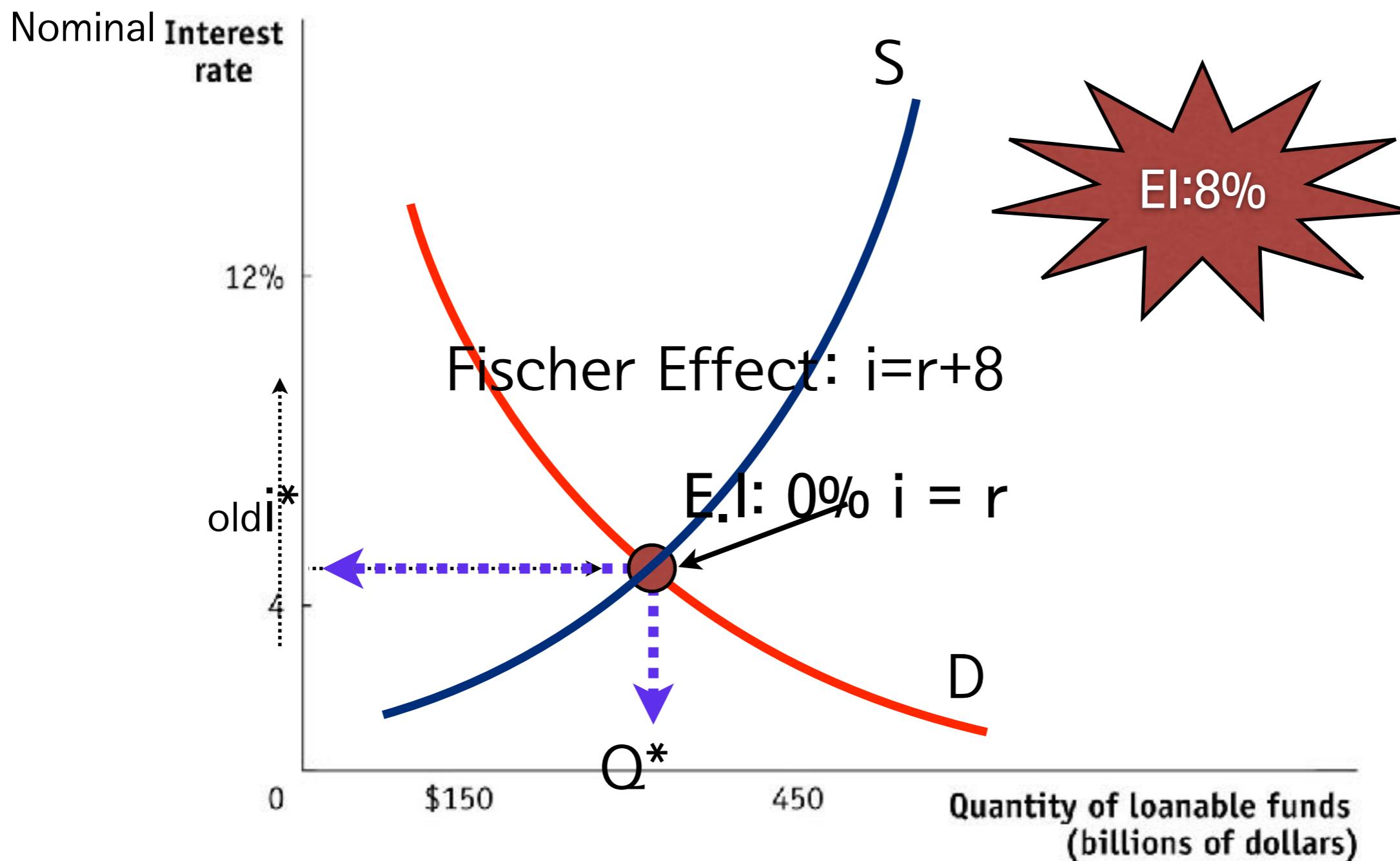
Fischer Effect: Graphical Expression



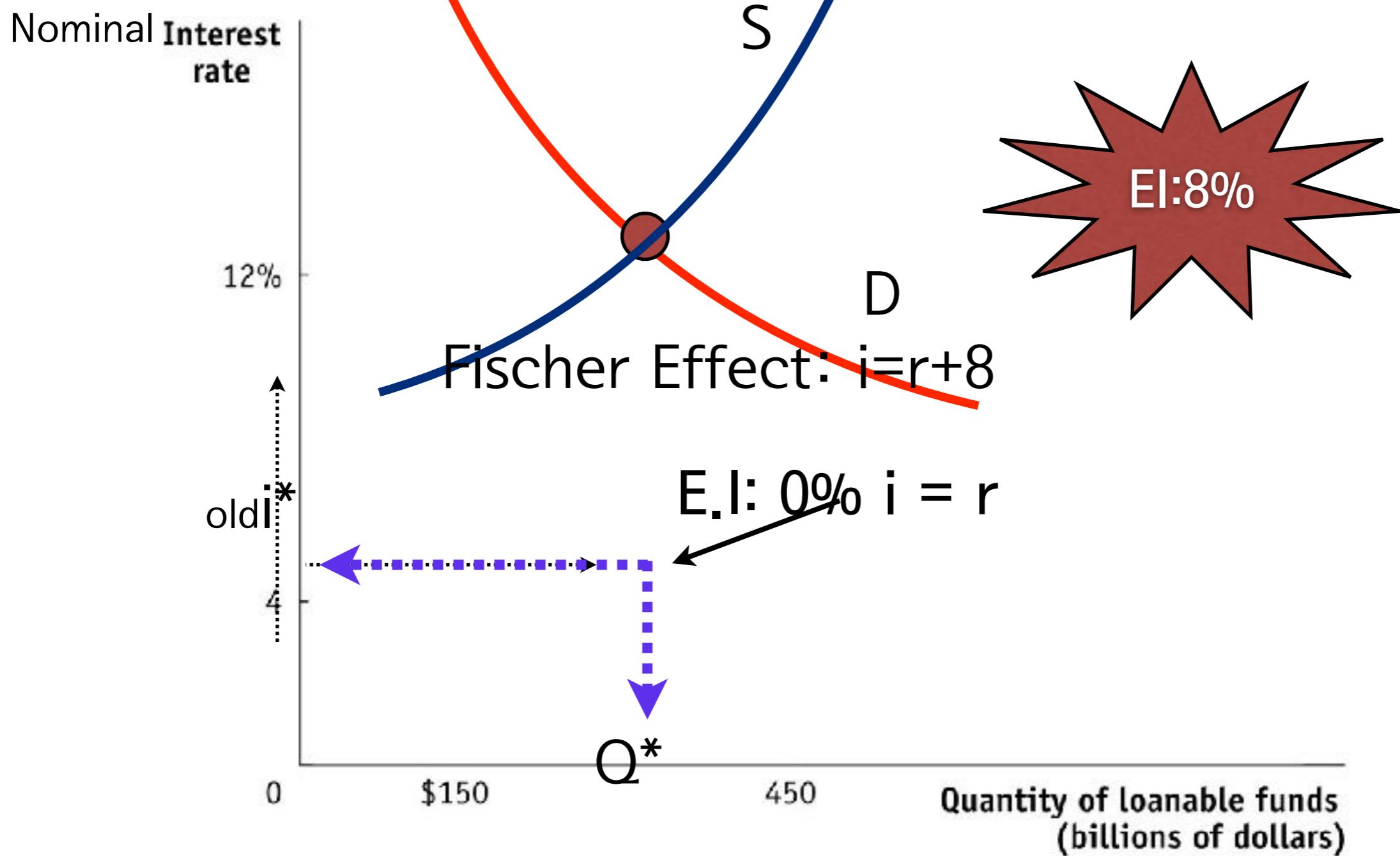
Fischer Effect: Graphical Expression



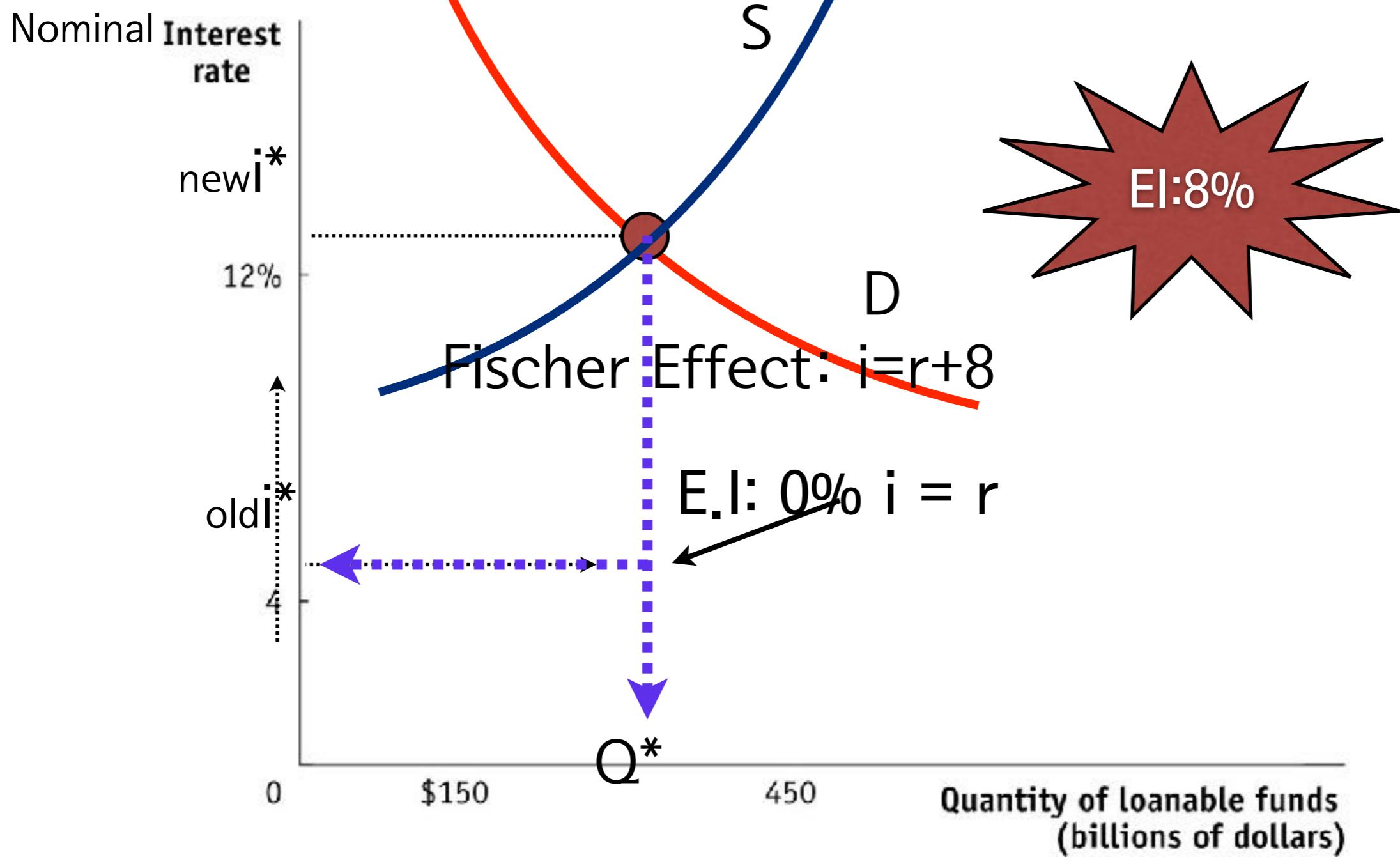
Fischer Effect: Graphical Expression



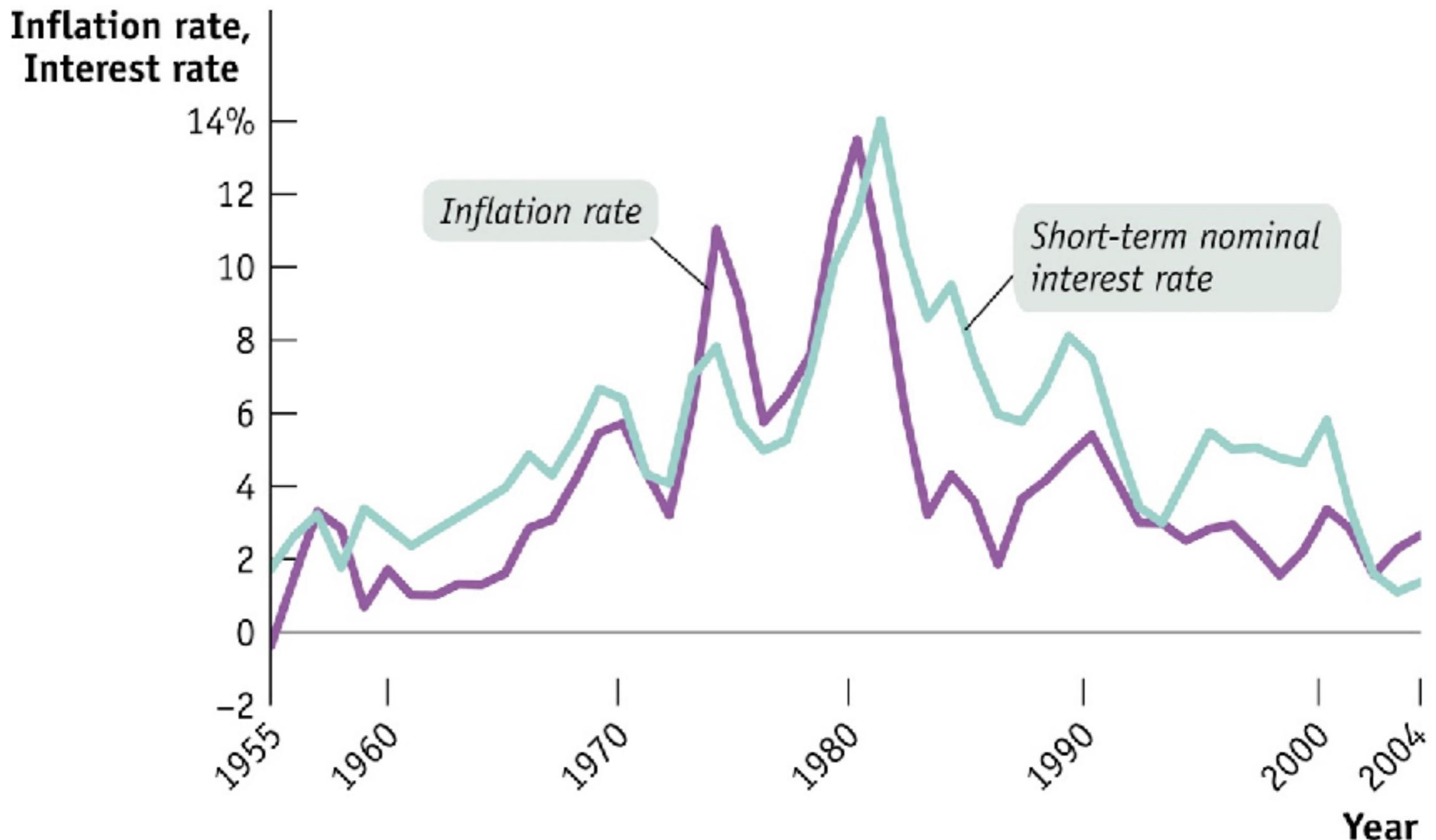
Fischer Effect: Graphical Expression



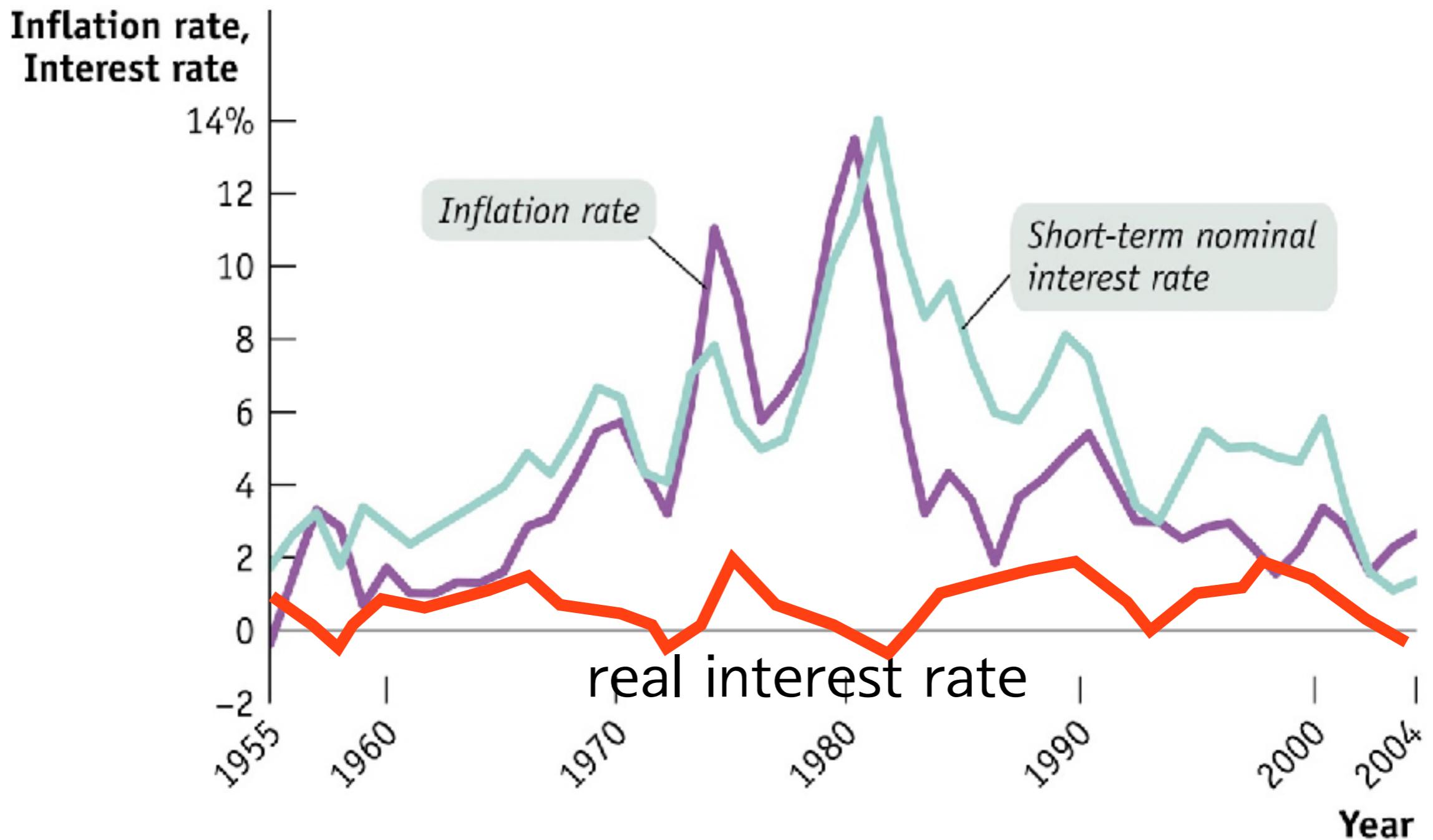
Fischer Effect: Graphical Expression



Fischer Effect: Empirical Observation



Fischer Effect: Empirical Observation



Cost of Inflation

- 초인플레이션의 경우 명백한 비용 발생: 화폐의 기능상실로 인한 거래비용 폭증
- 한편, 초인플레이션이 아닌 일반적 인플레이션도 약간의 실질적 비용 초래
 - 구두창비용
 - 메뉴비용
 - 계산단위비용

구두창 비용

Shoe-leather Cost

- 인플레이션세를 피하기 위한 노력:
 - 보유현금의 최소화
 - 이러한 노력을 구두창에 비유

구두창 비용

Shoe-leather Cost

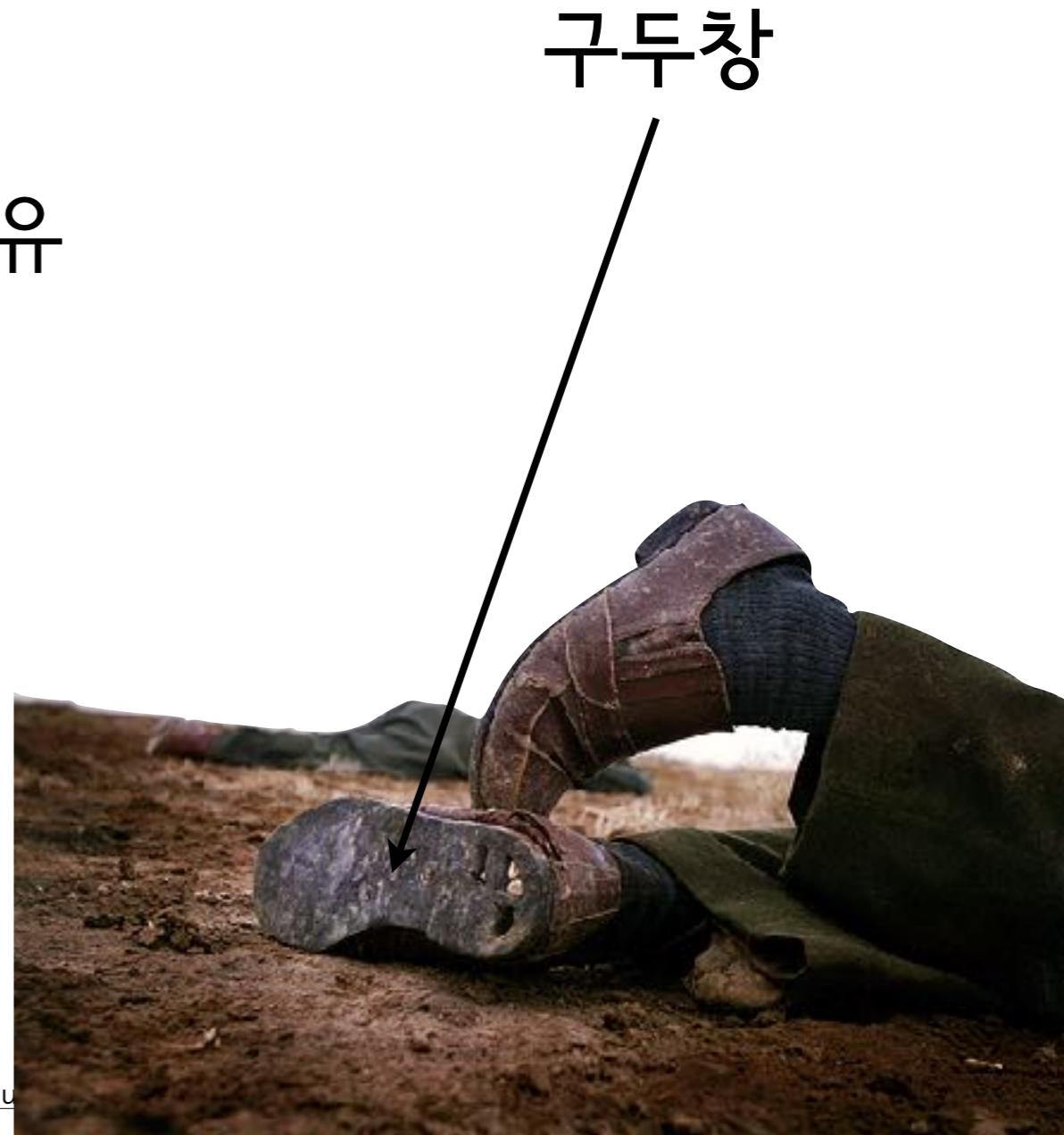
- 인플레이션세를 피하기 위한 노력:
 - 보유현금의 최소화
 - 이러한 노력을 구두창에 비유



구두창 비용

Shoe-leather Cost

- 인플레이션세를 피하기 위한 노력:
 - 보유현금의 최소화
 - 이러한 노력을 구두창에 비유



Menu Cost

- 가격 변화로 인해 발생하는 비용
 - 가격 수정에 따른 비용
 - 가격 변화에 따른 경제주체의 추가적 판단에 들어가는 비용



계산단위비용

Unit-of-account Cost

- 인플레이션이 가치척도로서의 화폐에 대한 신뢰도를 저하시켜 발생하는 비용
- 예: 시차로 인한 조세왜곡 등

최적 인플레이션율

Optimal Inflation Rate



- M. Friedman(1912-2006): 최적 인플레이션율은 음(-)의 값이 되어야 한다고 주장-구두창 비용을 줄이기 위해.
- 디플레이션: 음의 값을 가지는 인플레이션율
 - 반론: 구두창 비용 < 디플레이션의 비용
- 따라서, 대부분의 중앙은행은 2~3% 정도의 낮은 인플레이션율을 유지: 부의 공급충격에 대한 대응에 유리

Next Topics

- Disinflation
- Deflation

수고하셨습니다!



수고하셨습니다!



완만한 인플레이션, 디스인플레이션

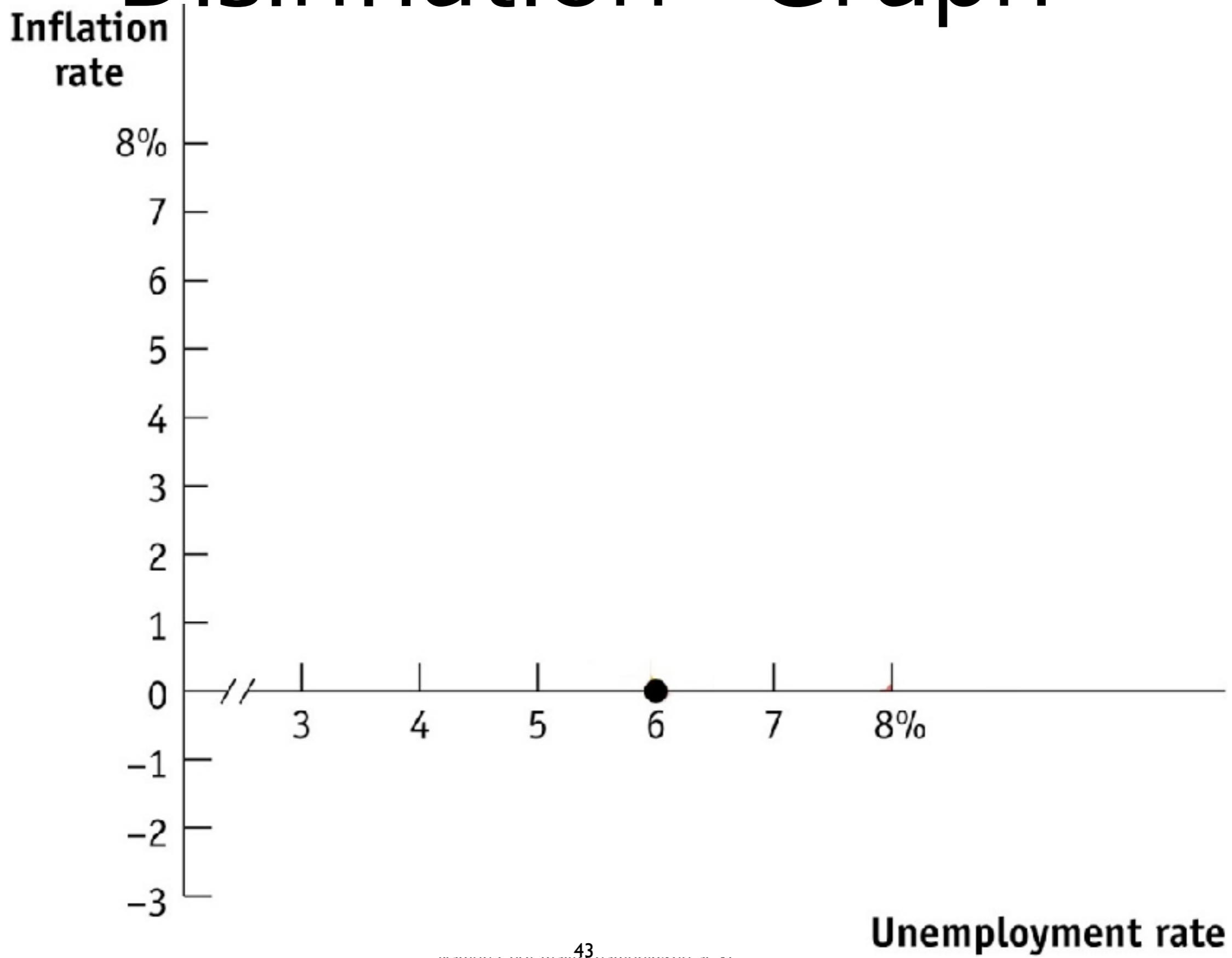
인플레이션의 또 다른 원인: 정치

- 인플레이션은 적정수준에 비해 과도하게 발생할 정치학적 유인이 있음
- 원인: 정당의 최우선 목표가 경제안정이 아니라, 정권 획득이기 때문
- 기회주의설: 실업률은 득표에 민감: 인플레이션을 발생시키는 비용을 감수하고 낮은 실업율을 유지할 유인 발생

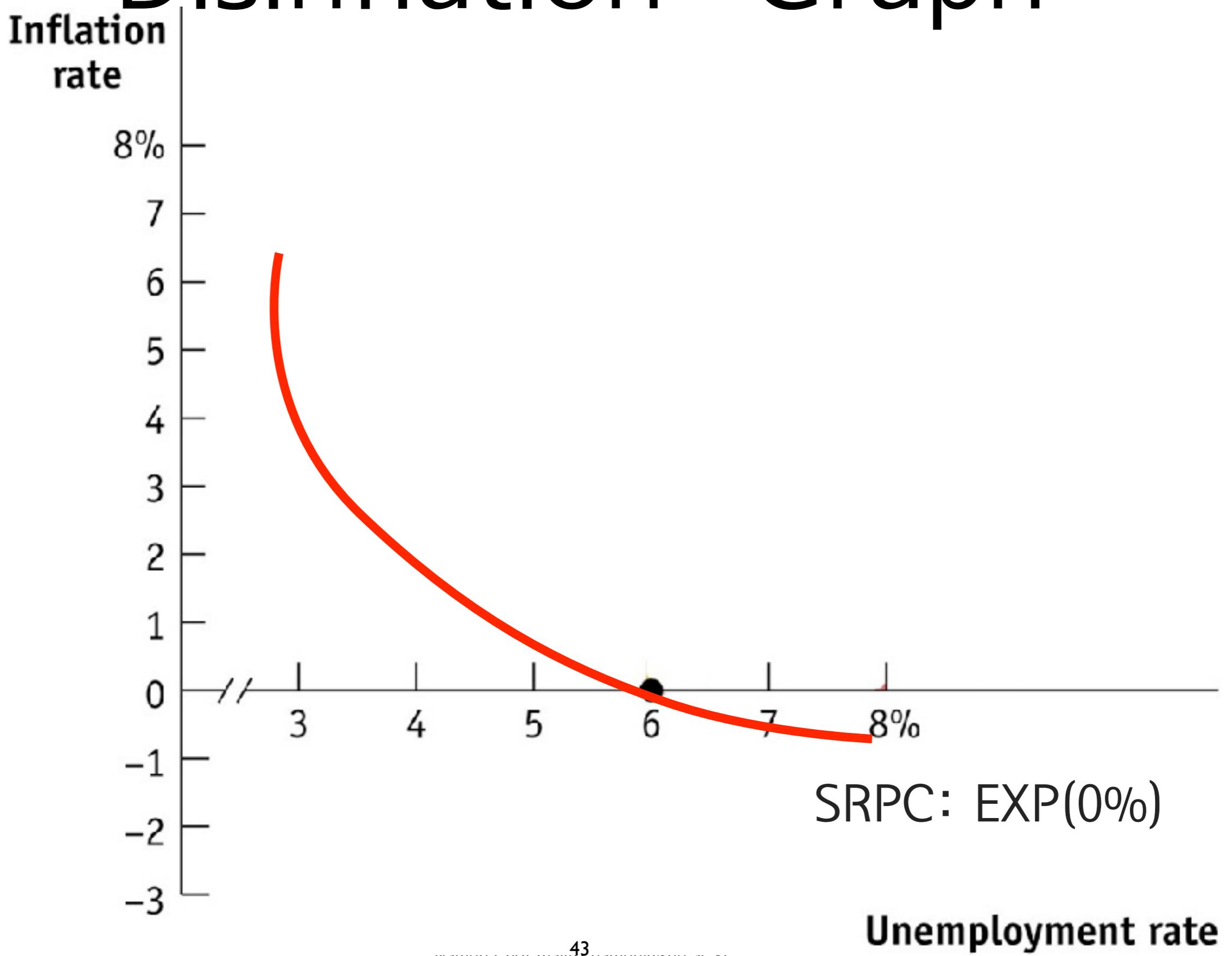
Cost of Disinflation

- Disinflation: 기대가 형성된 인플레이션을 낮추는 과정
- 매우 고통스럽고 어려운 과정

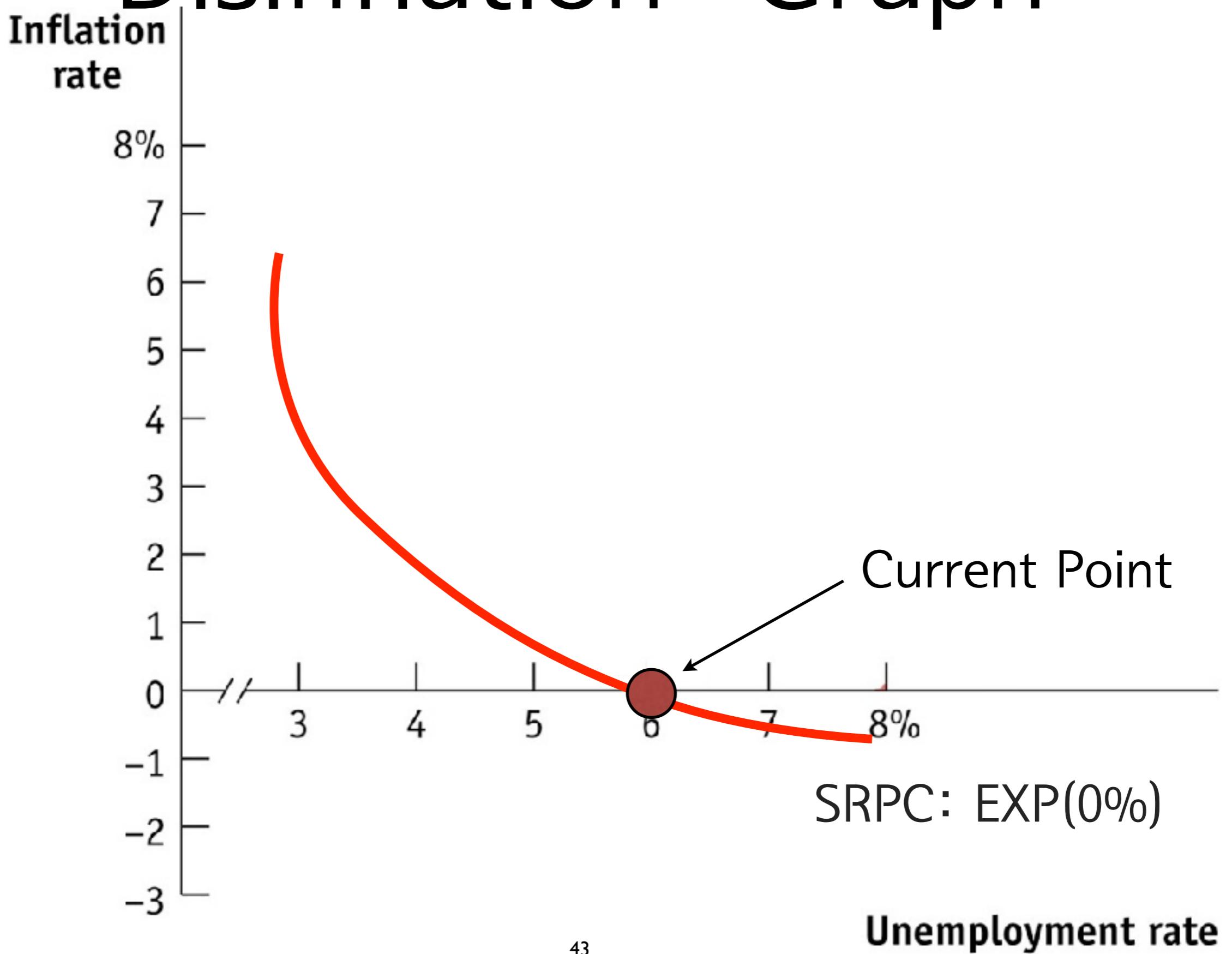
Disinflation: Graph



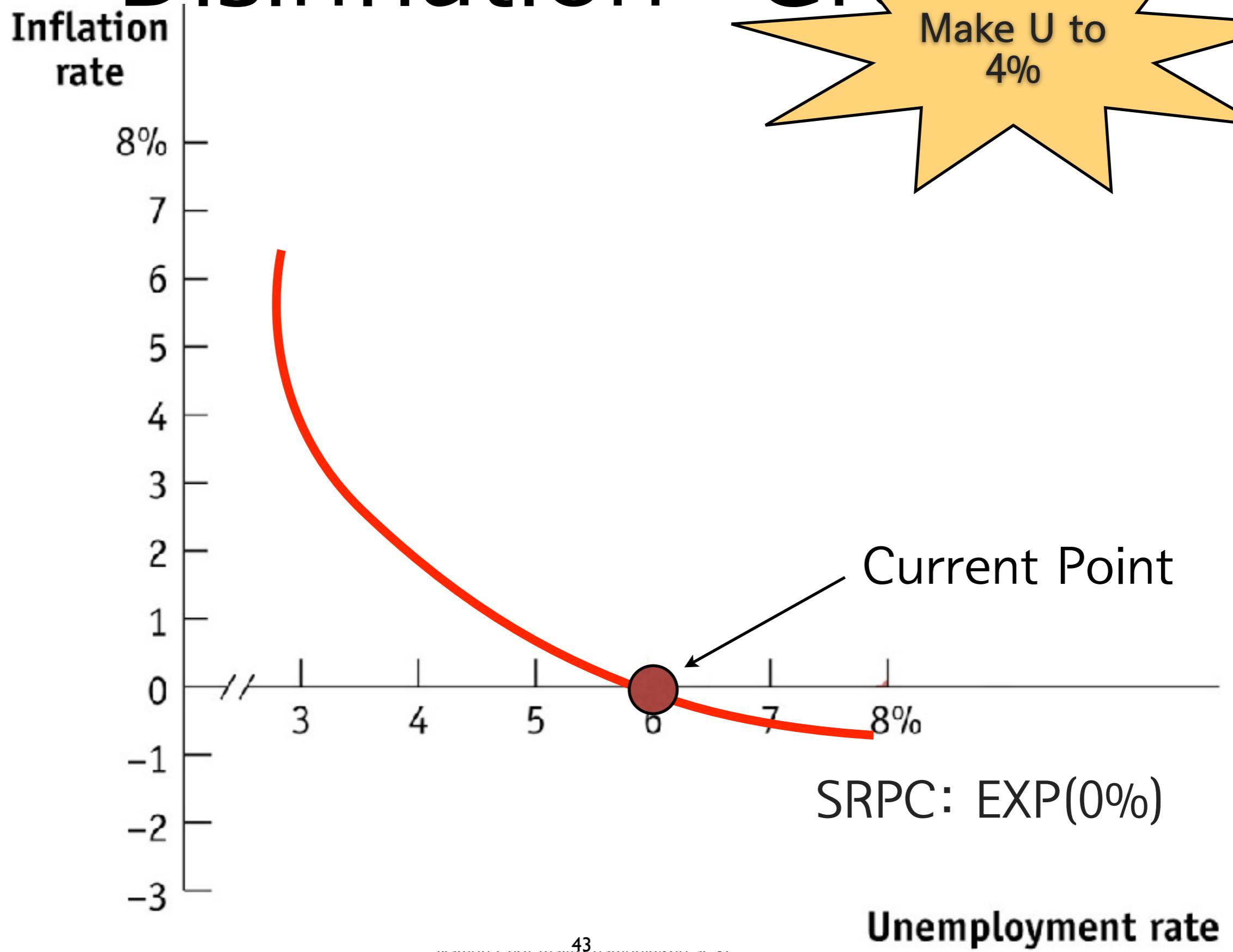
Disinflation: Graph



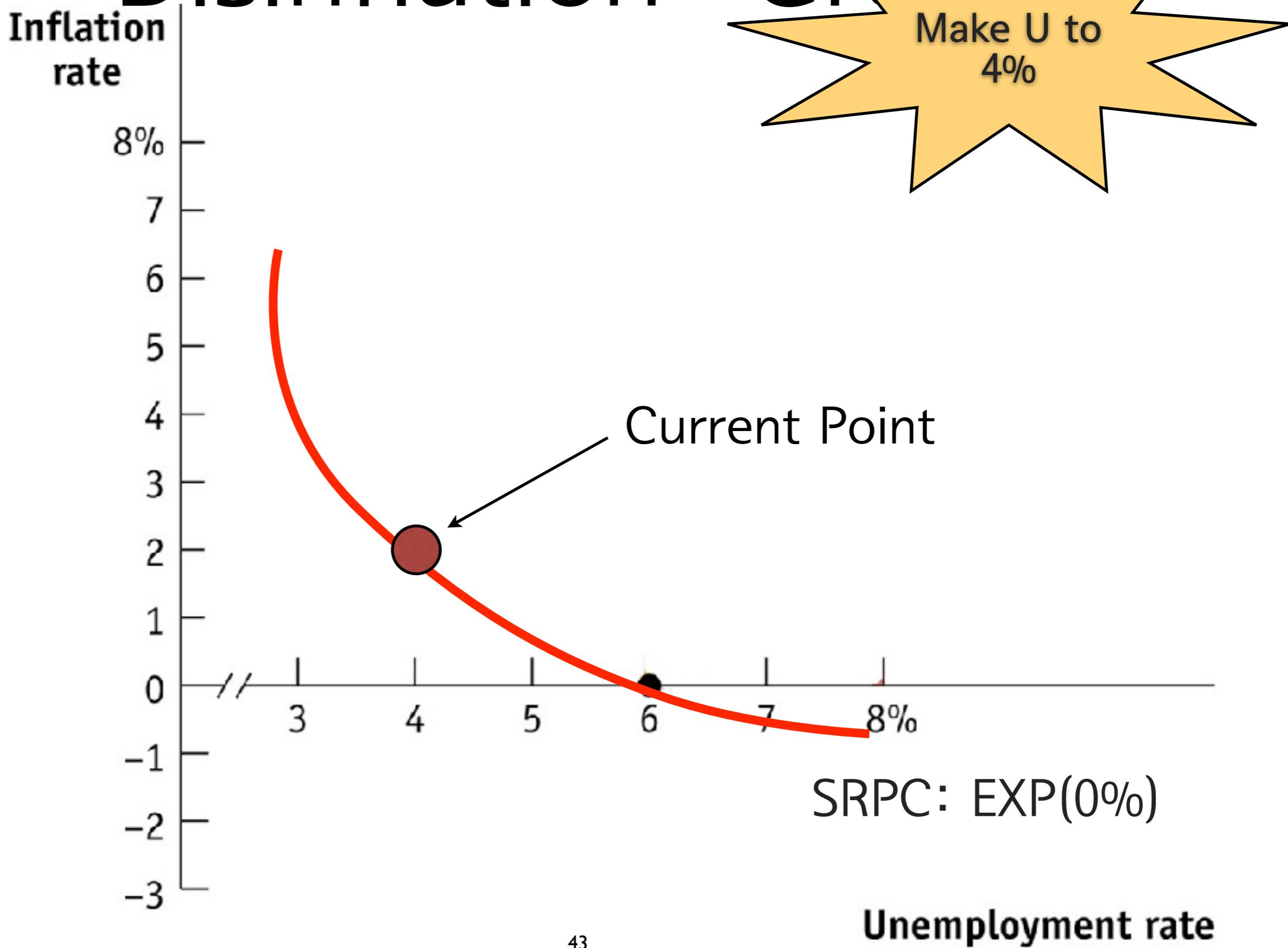
Disinflation: Graph

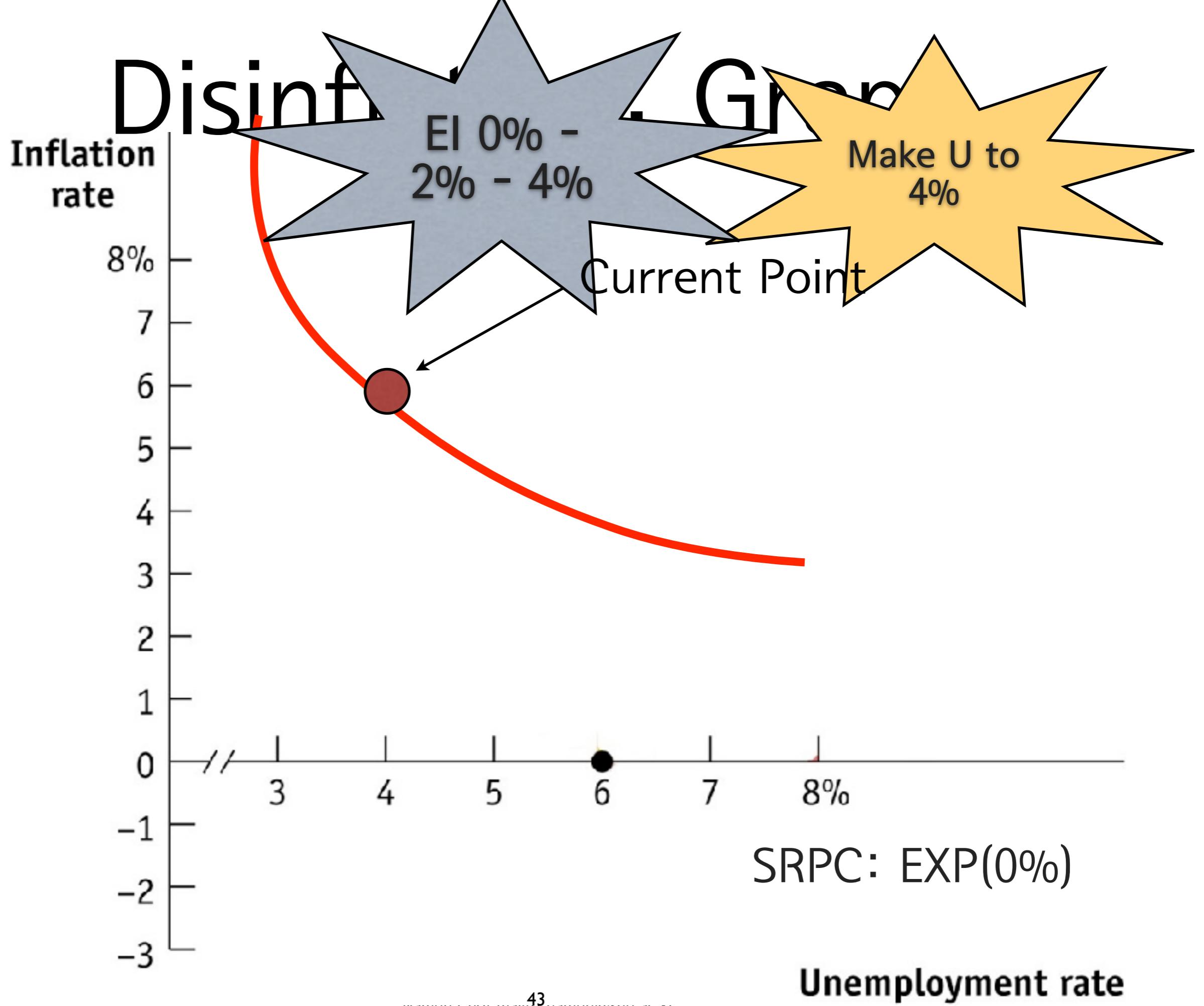


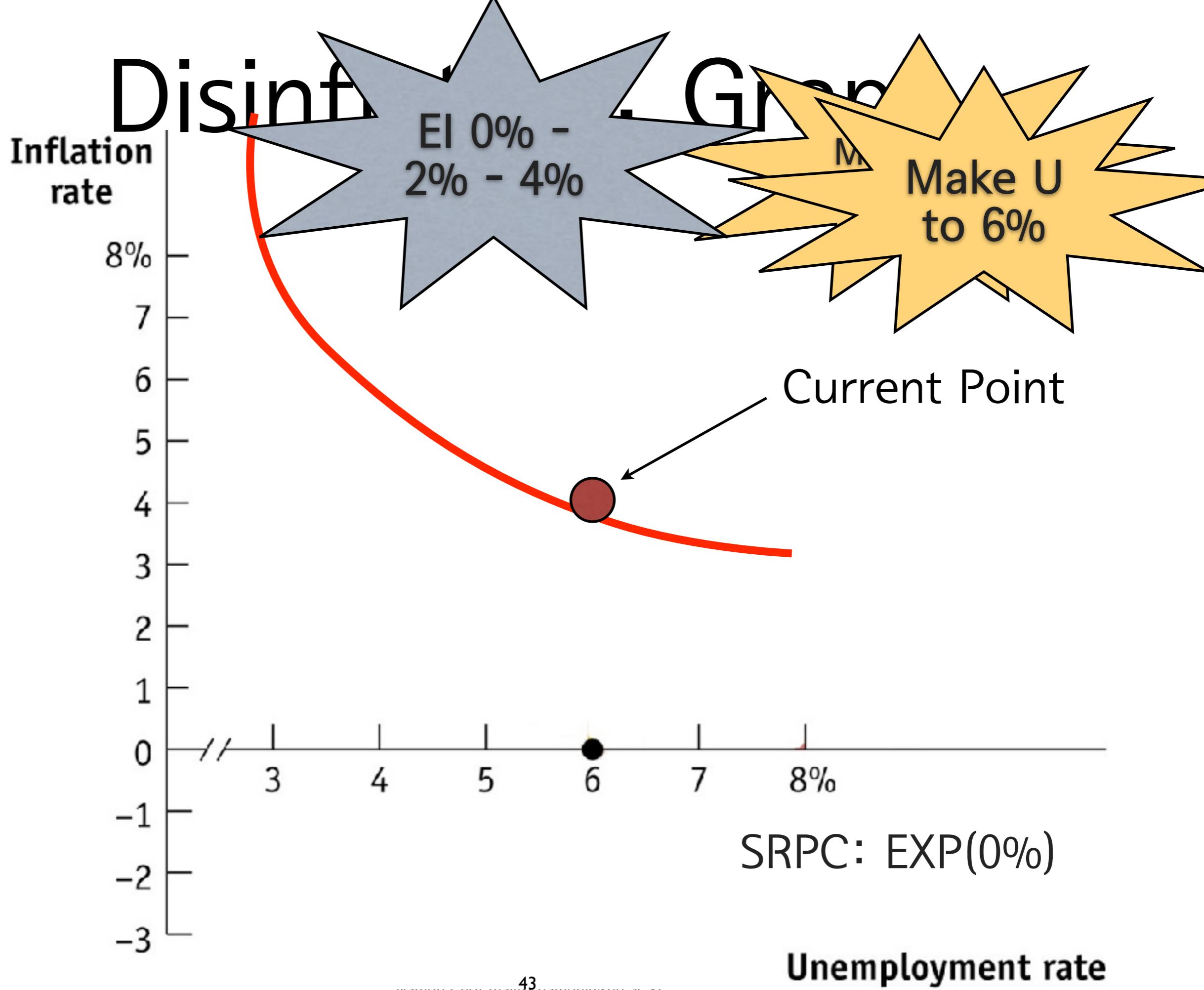
Disinflation: Grap

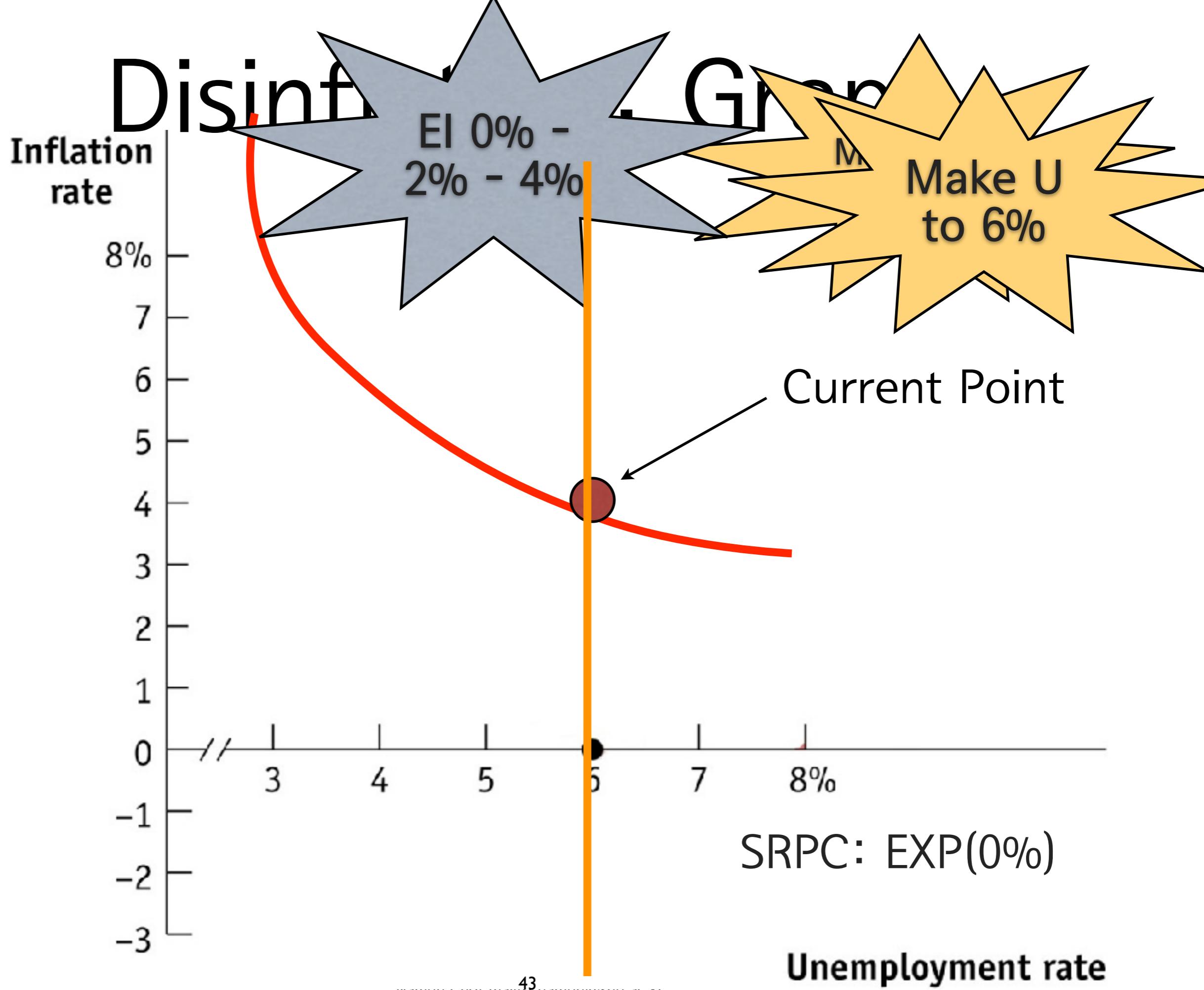


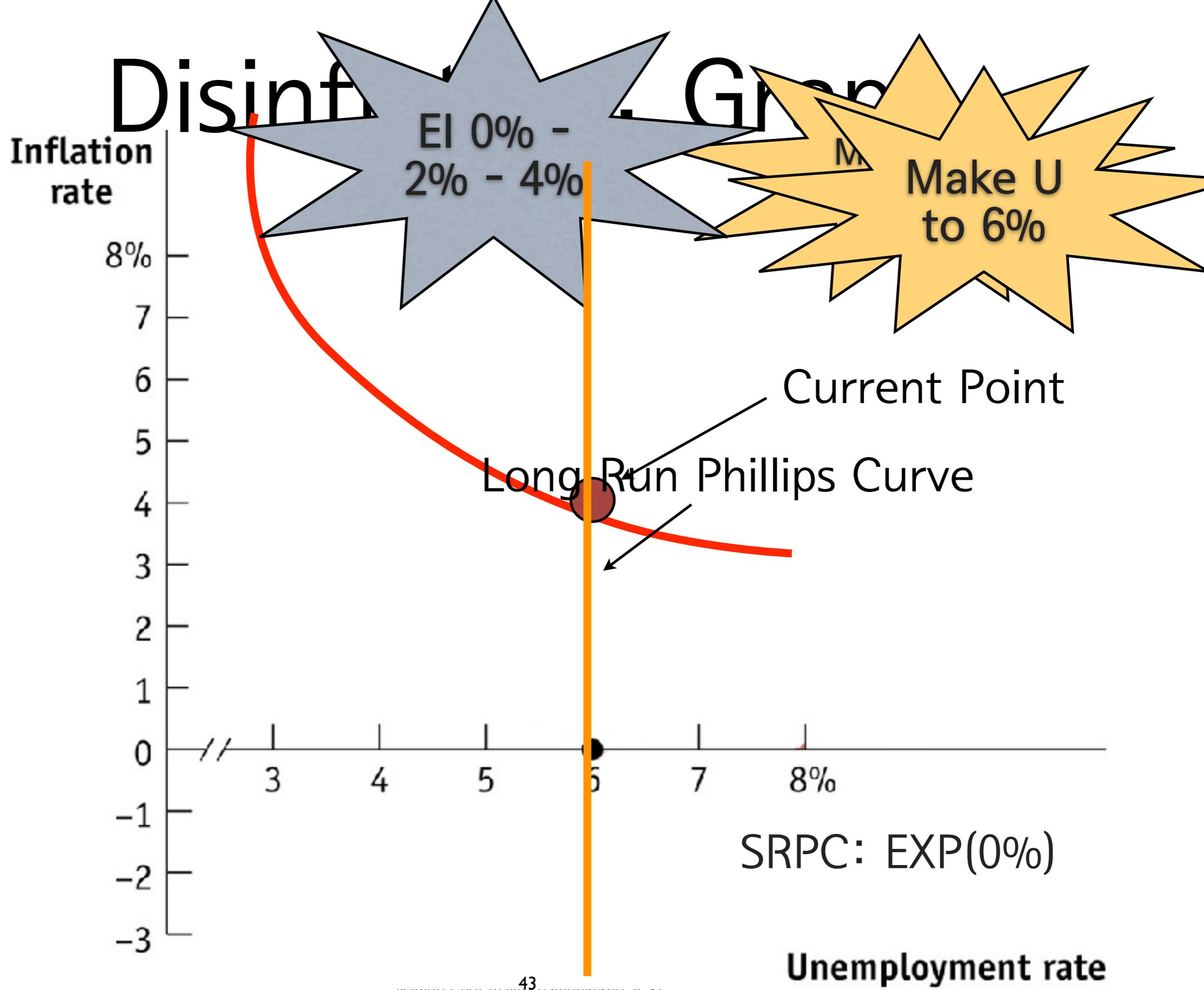
Disinflation: ~~Great~~

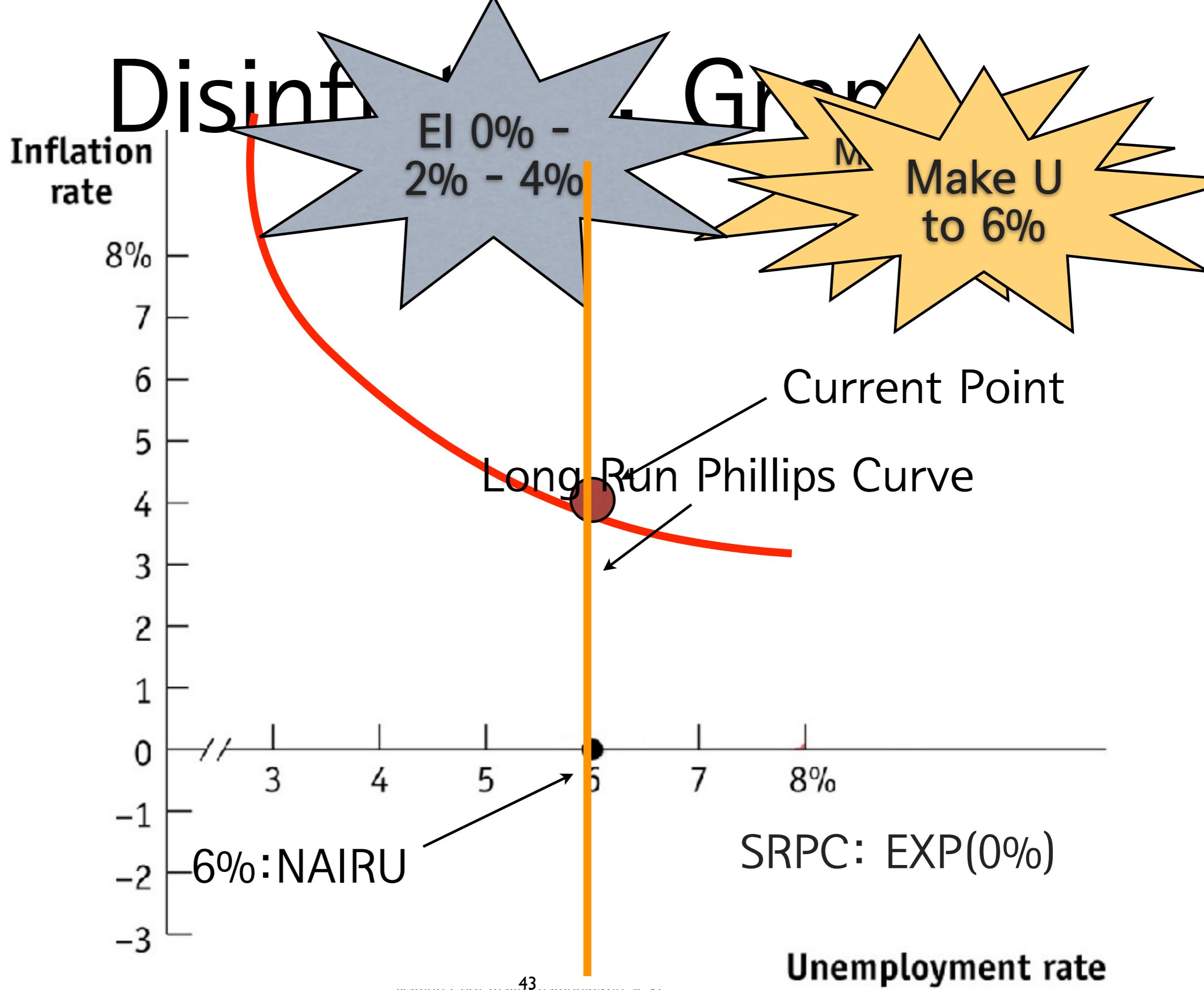


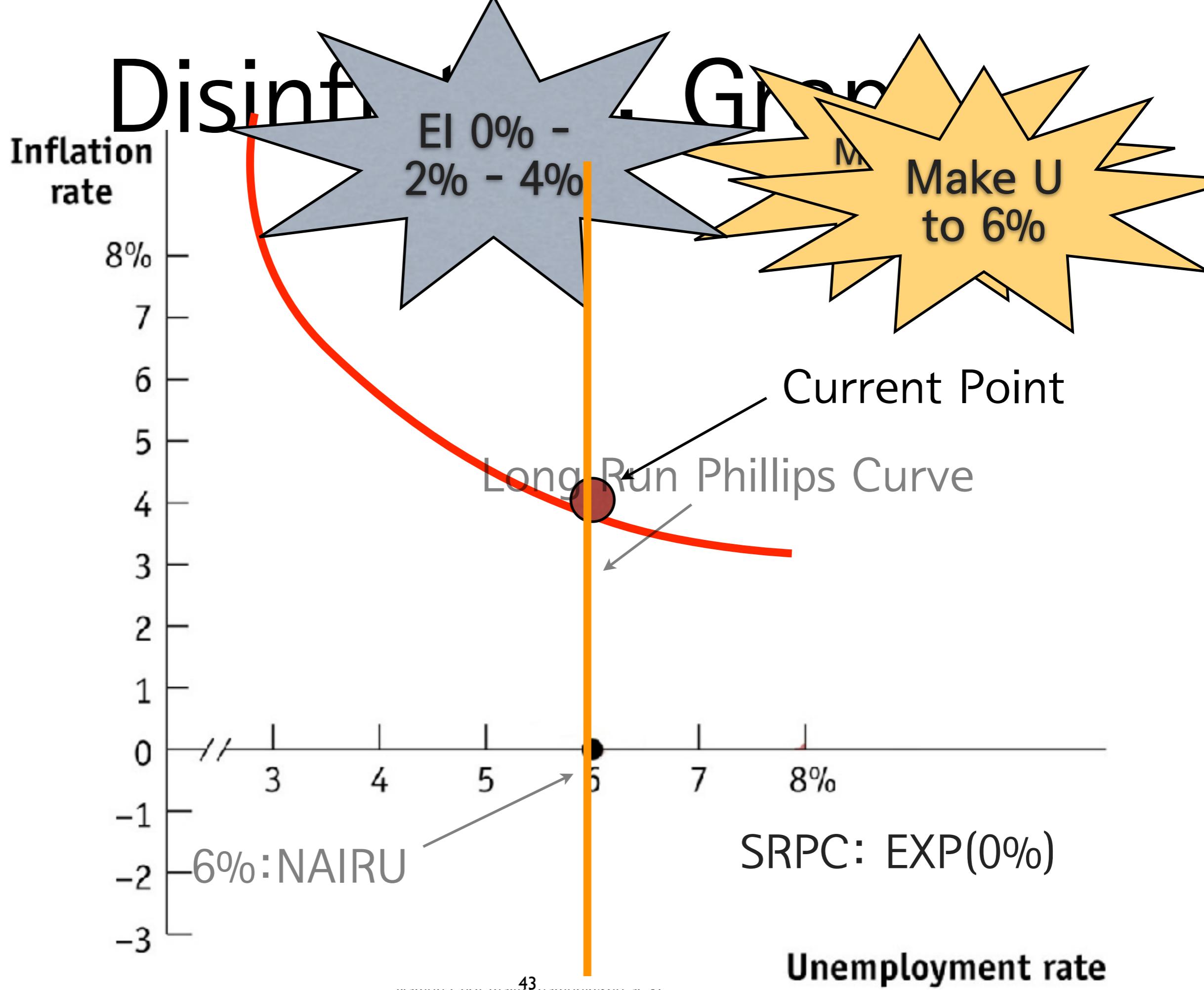


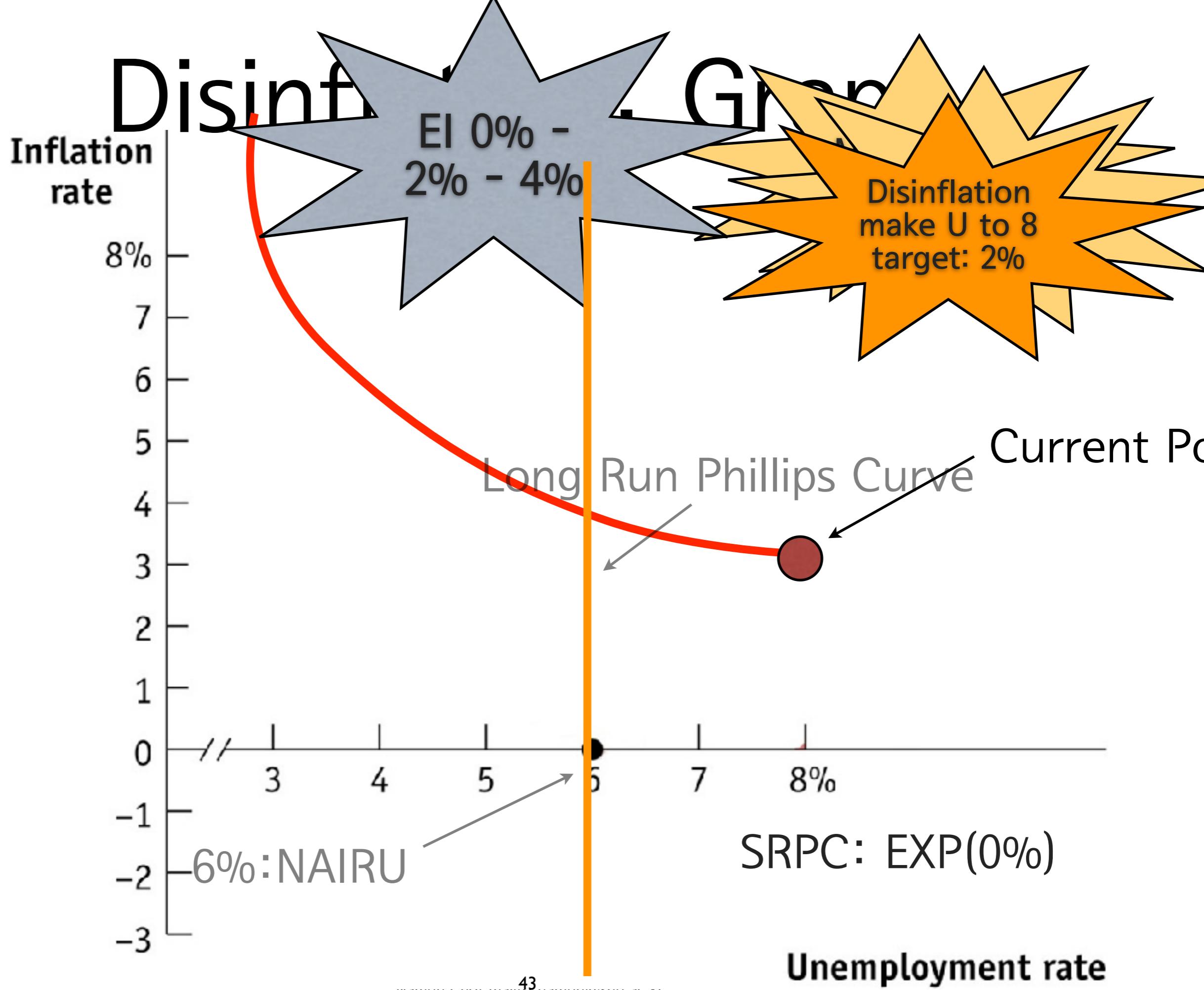


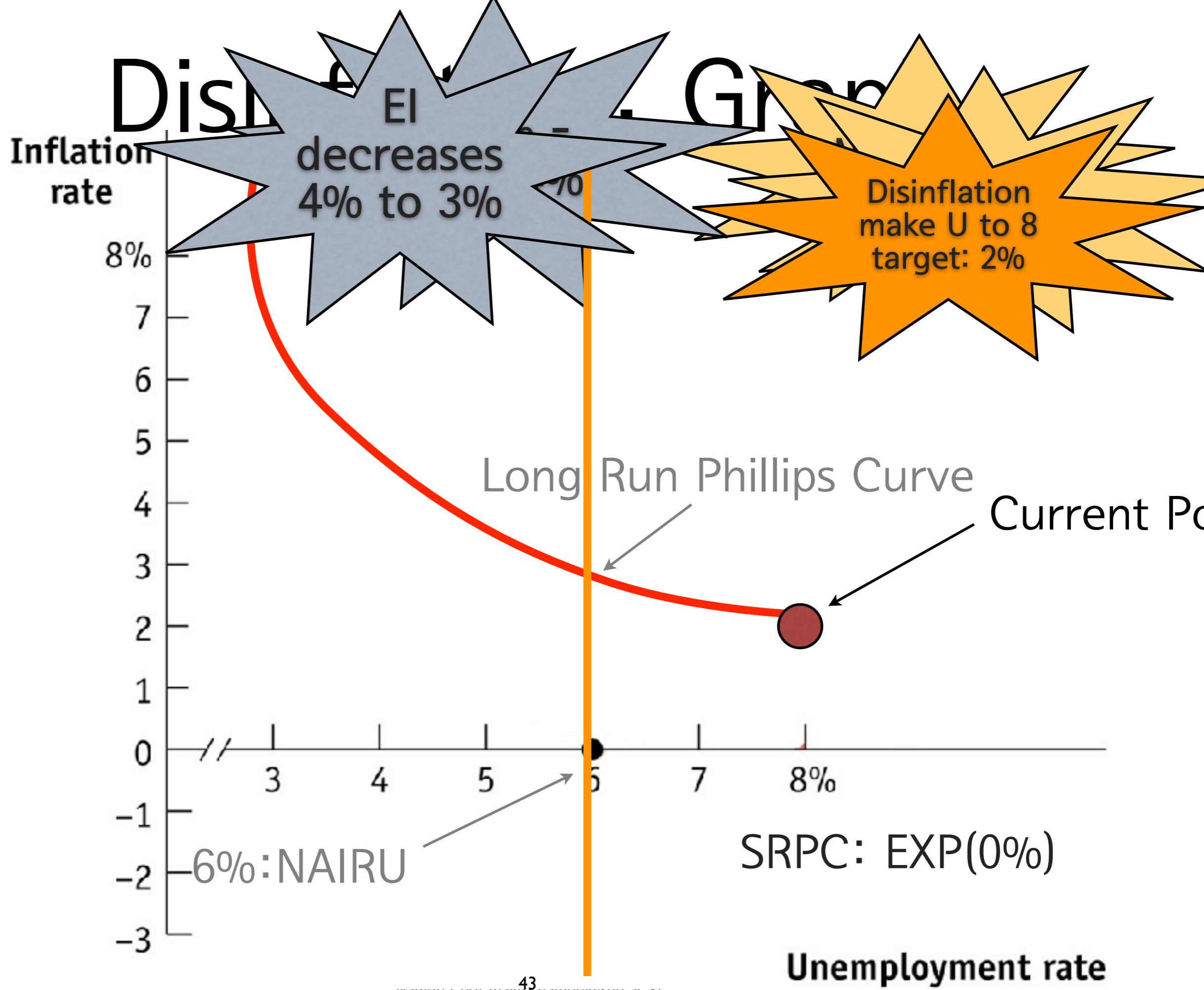


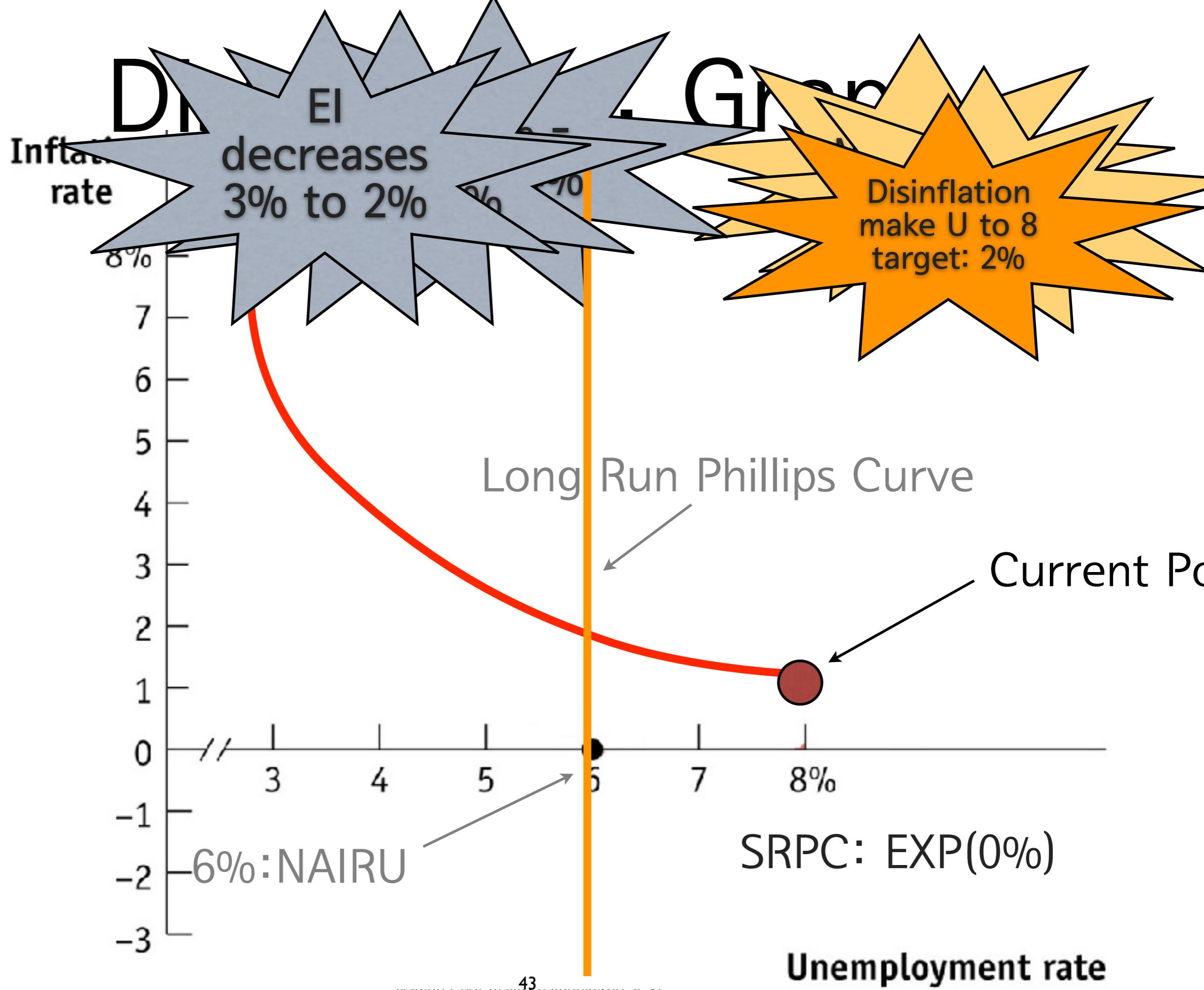


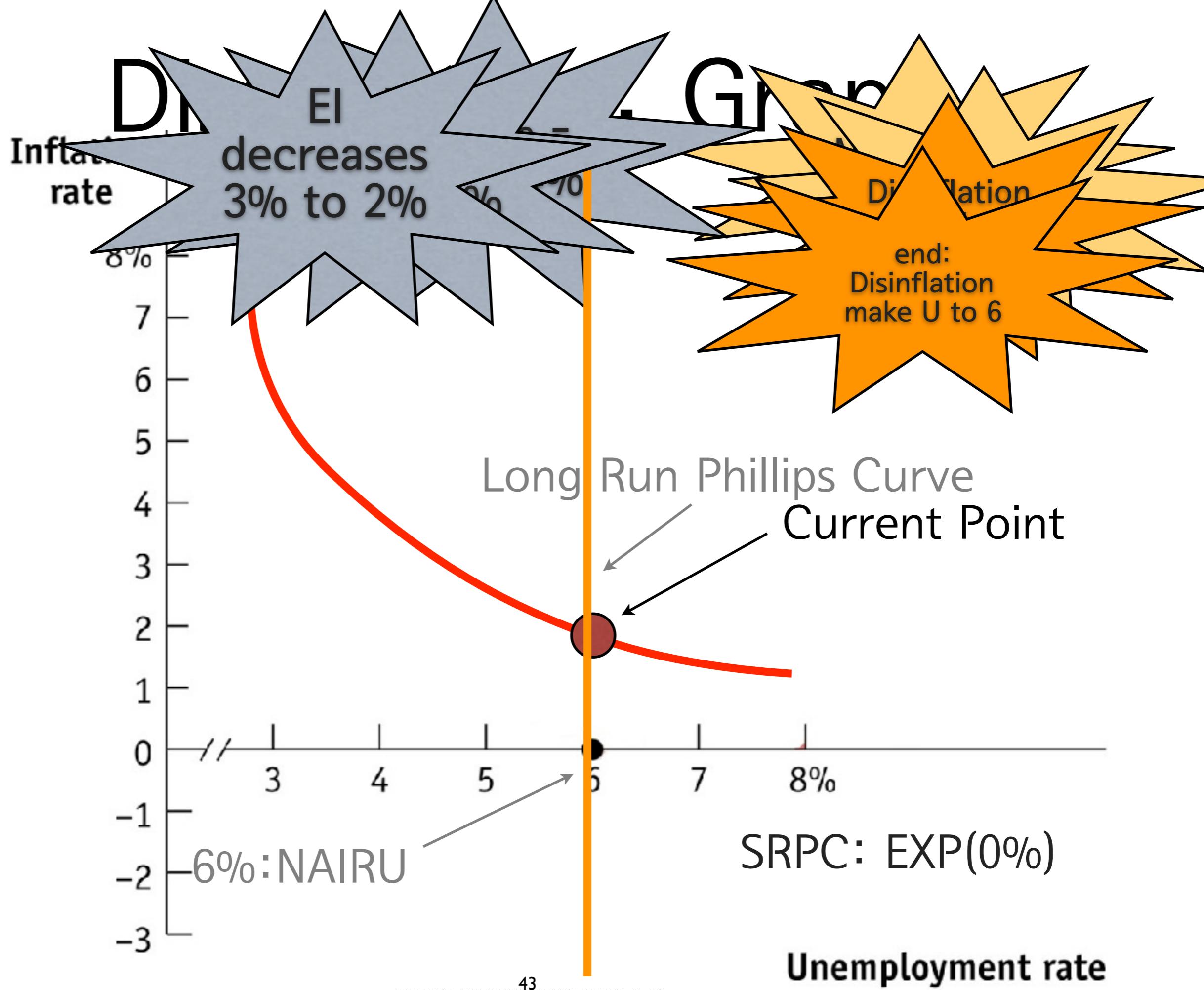






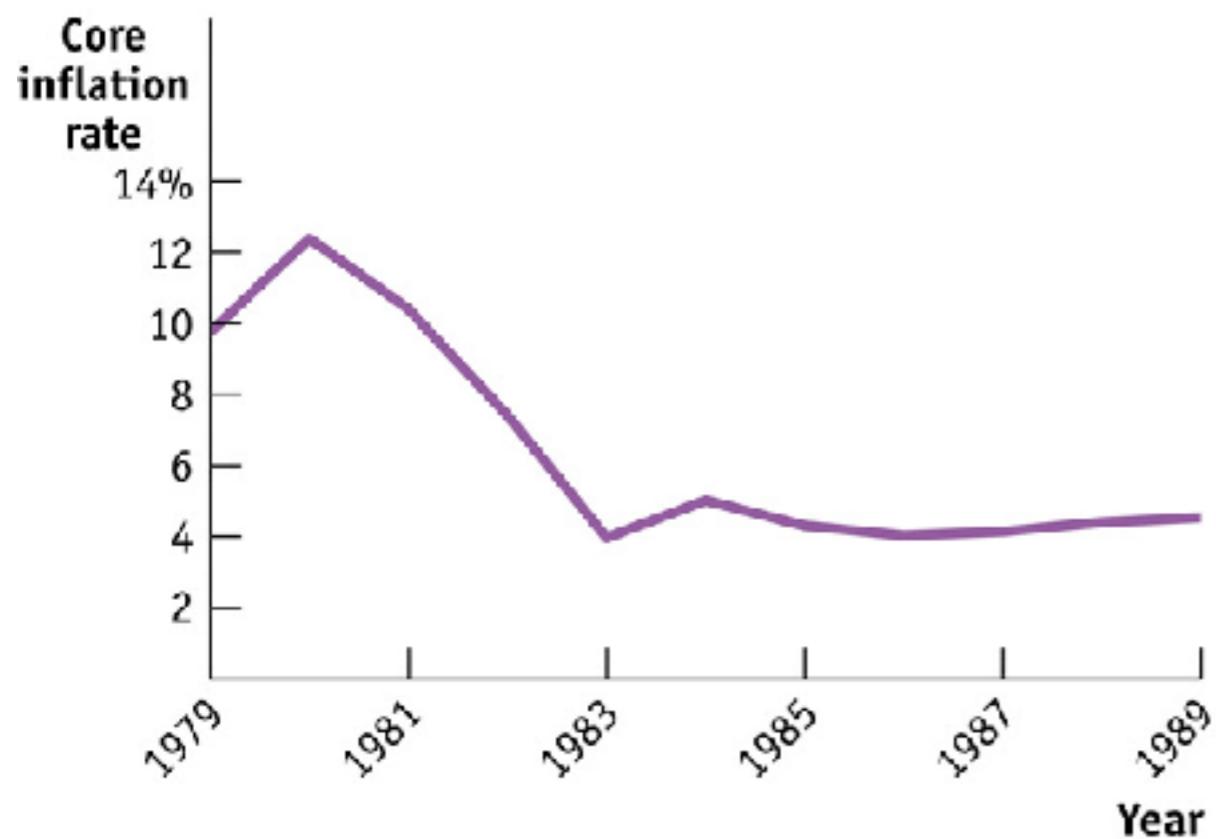






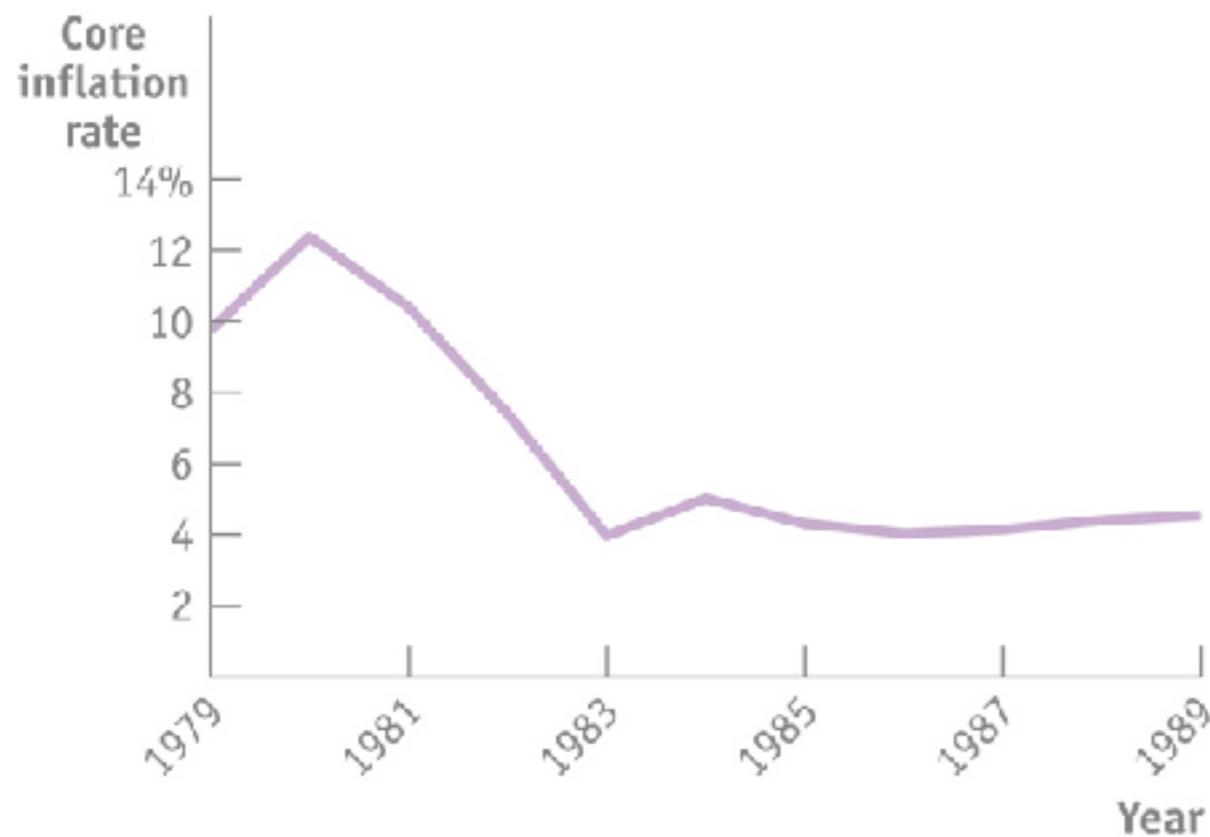
Empirical case: Disinflation in US 1980s

(a) The Core Inflation Rate in the United States
Came Down in the 1980s . . .

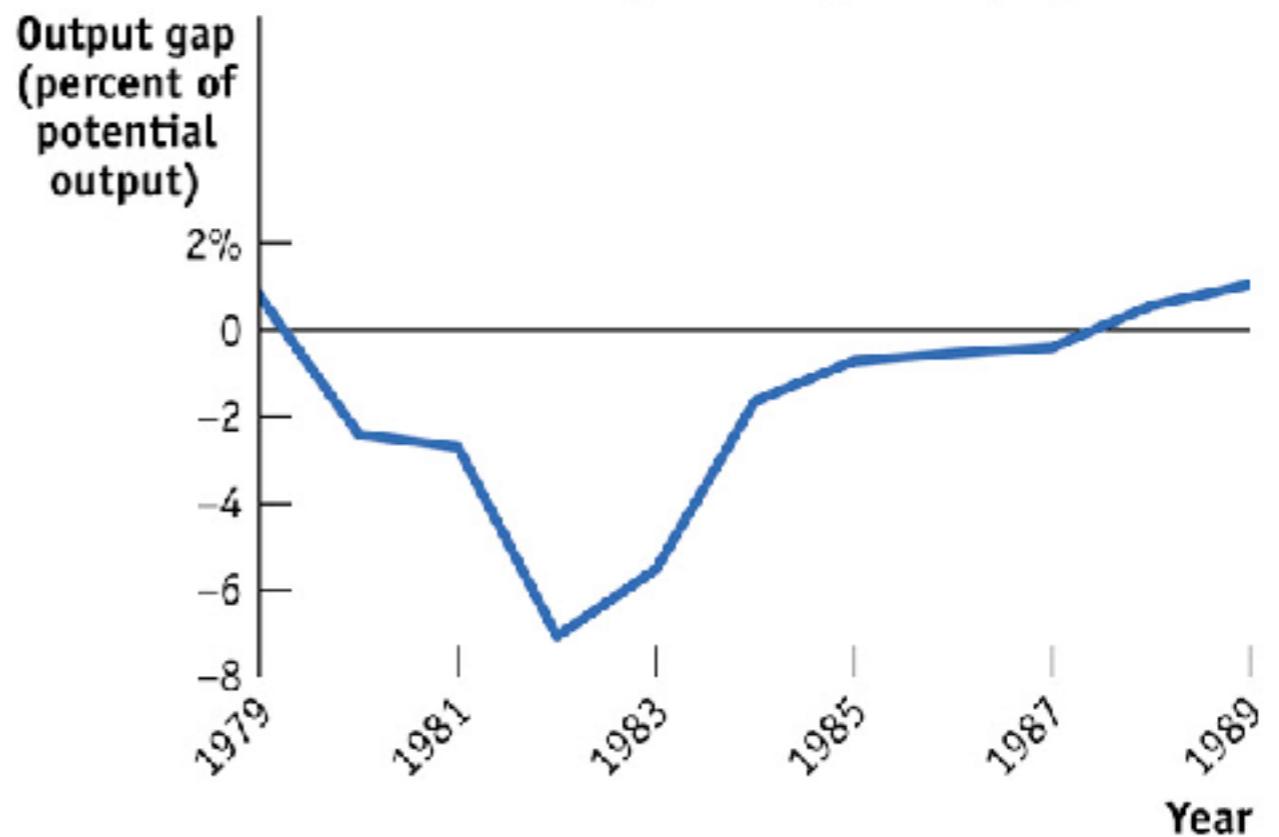


Empirical case: Disinflation in US 1980s

(a) The Core Inflation Rate in the United States
Came Down in the 1980s ...



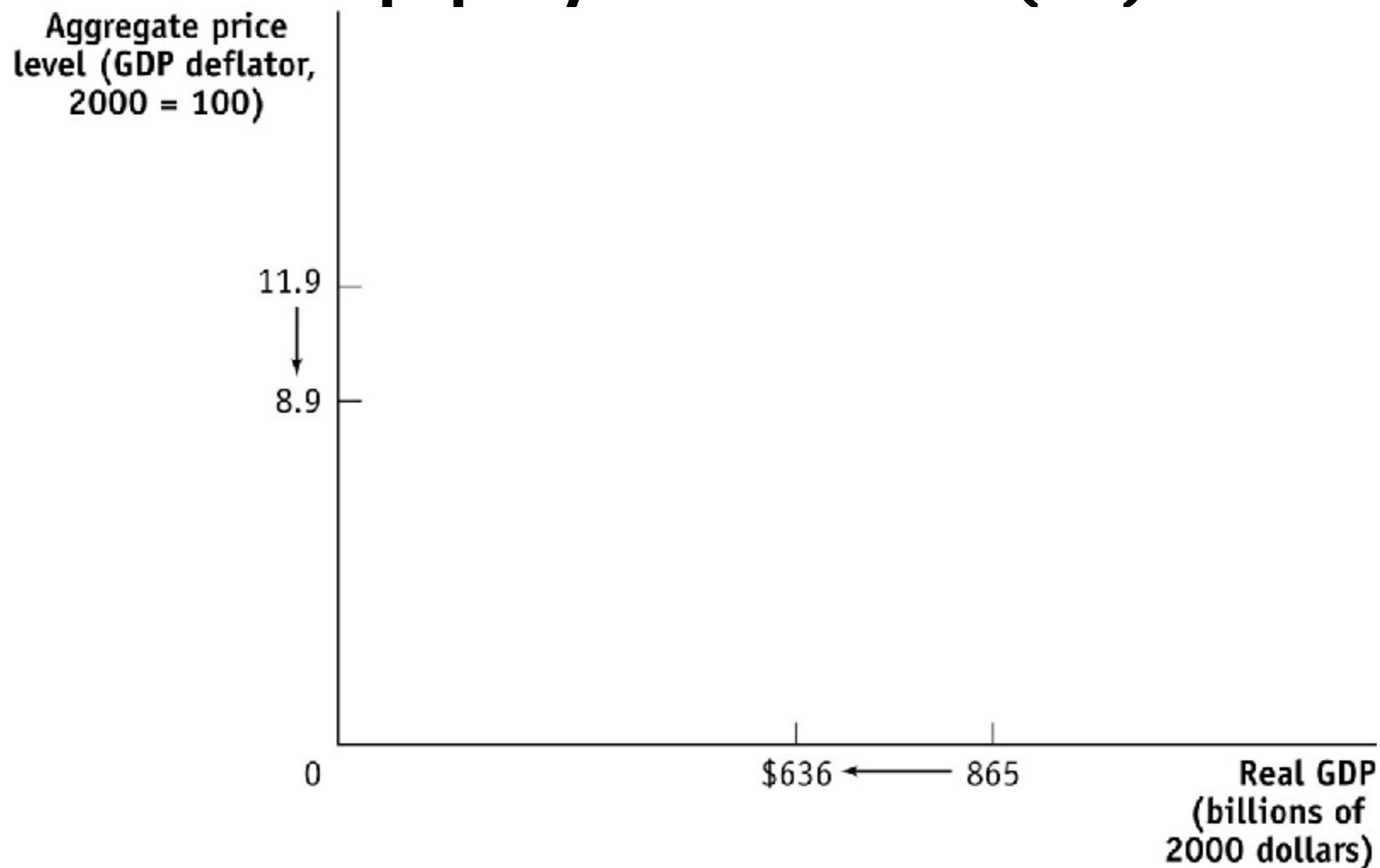
(b) ... but Only at the Expense of a Huge
Sacrifice of Output and High Unemployment



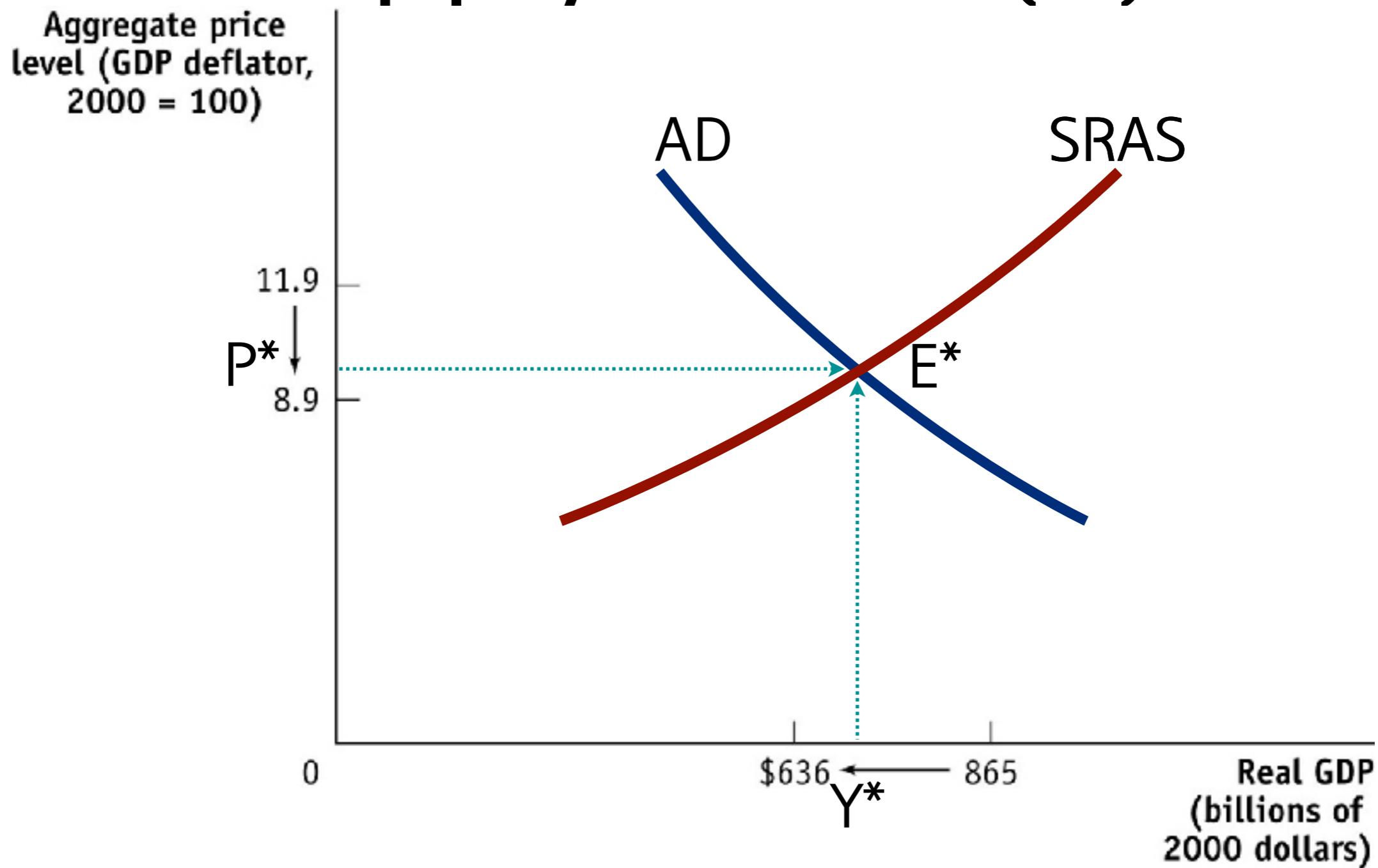
Cost of Disinflation

- 고정되어 있는 인플레이션 예상을 낮추기 위해서는 자연실업률 이상의 실업률을 발생해야함
- (+)의 공급충격은 고통없는 Disinflation이 가능하지만.. 쉽지 않음

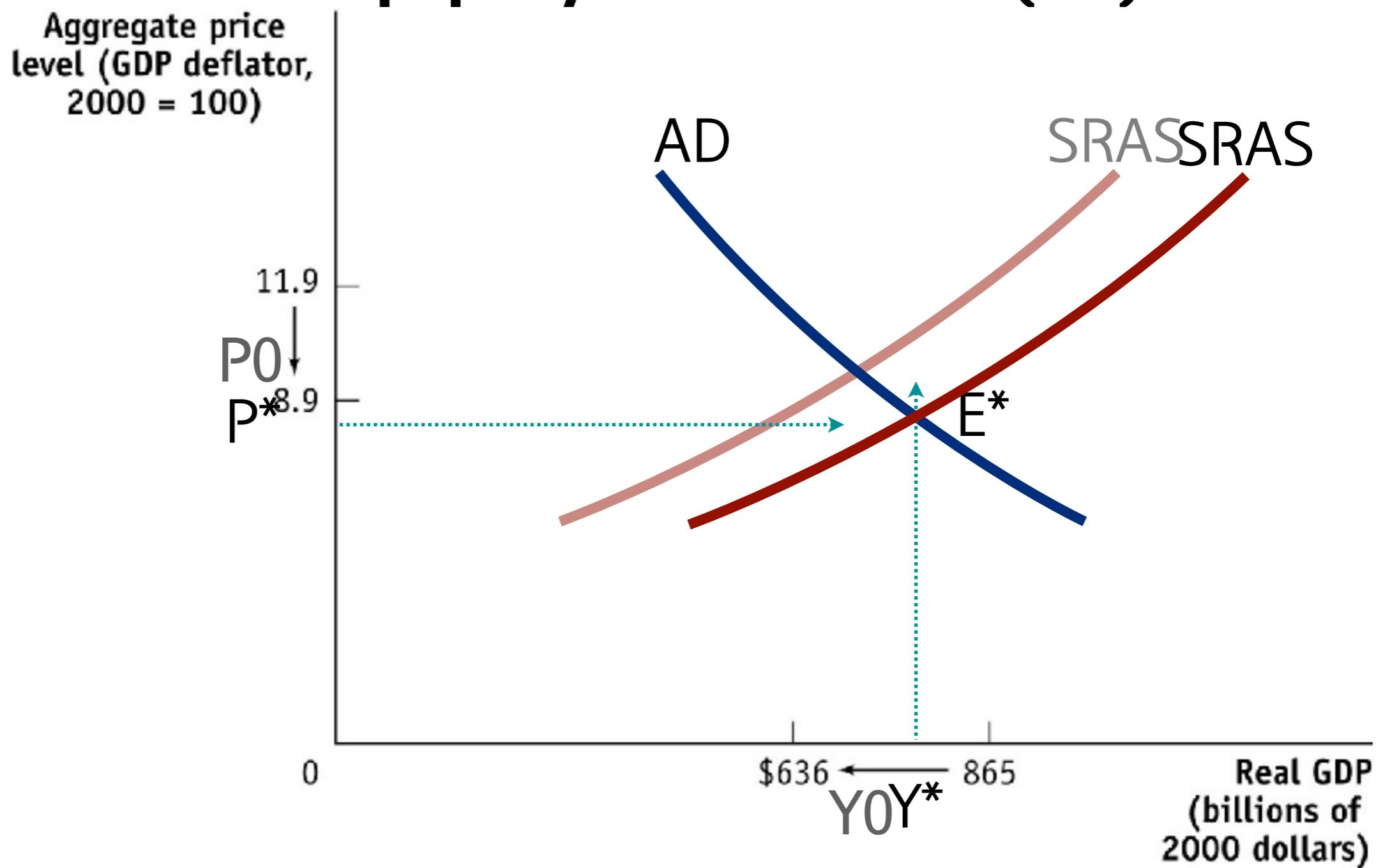
Review: Supply Shock(+)



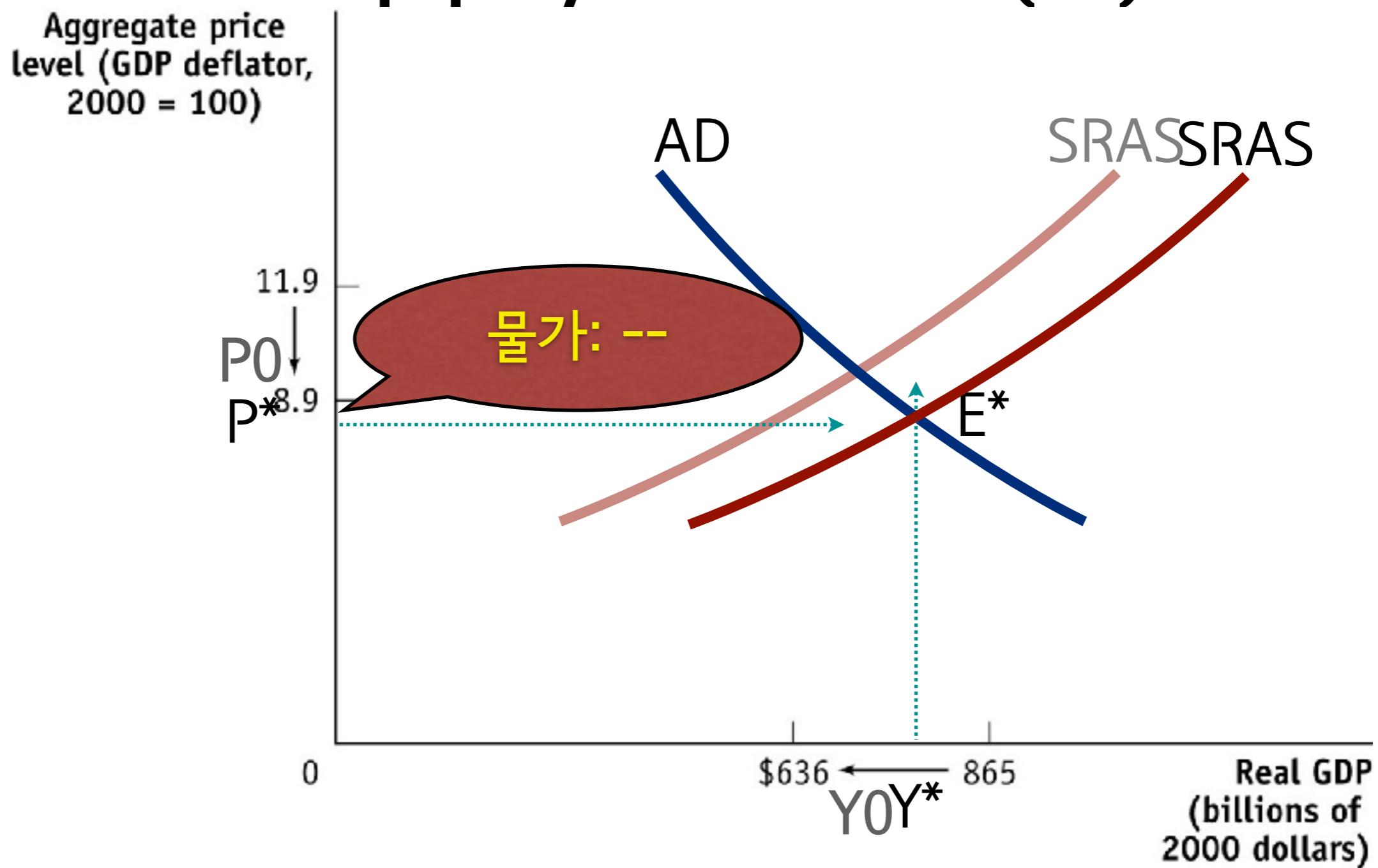
Review: Supply Shock(+)



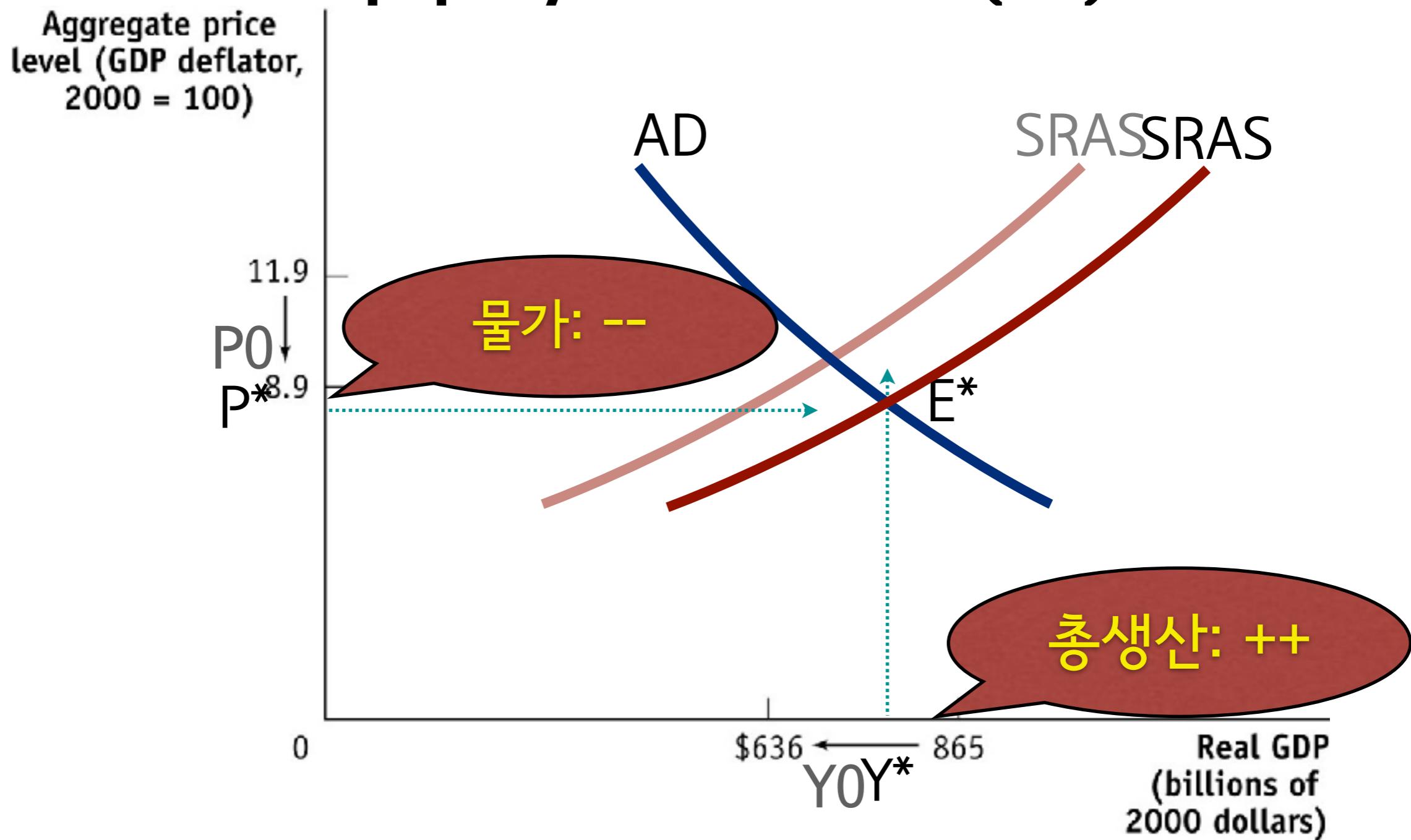
Review: Supply Shock(+)



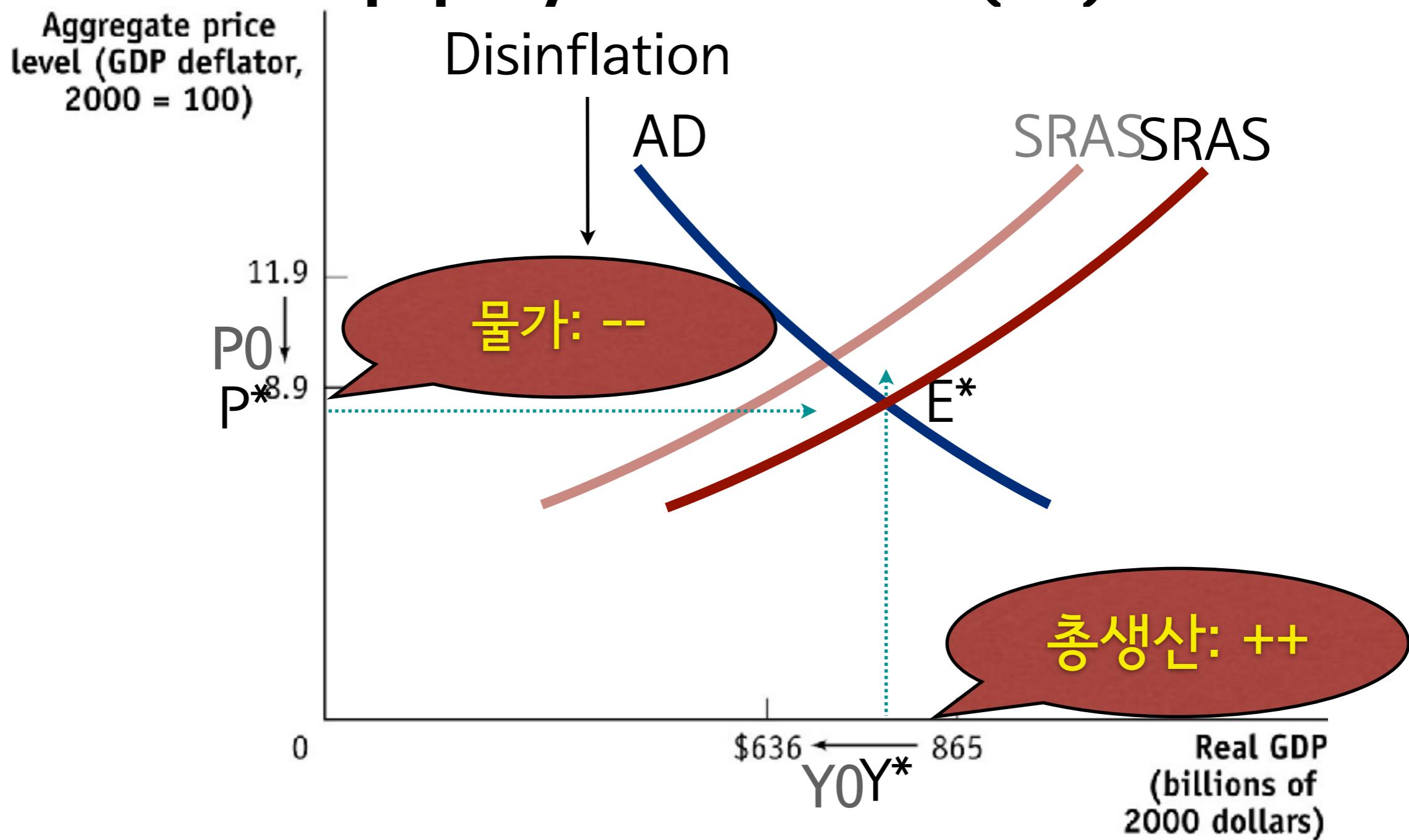
Review: Supply Shock(+)



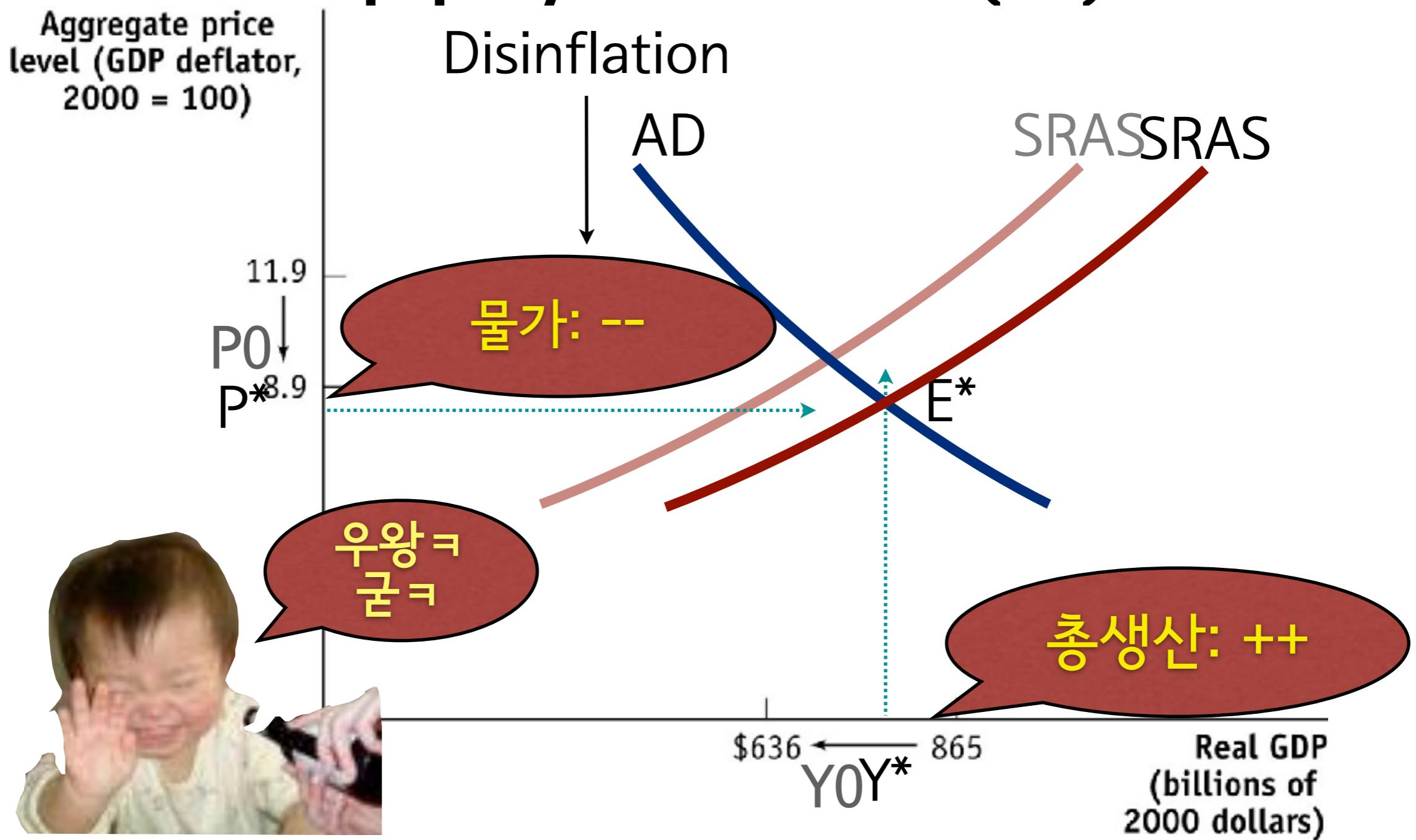
Review: Supply Shock(+)



Review: Supply Shock(+)



Review: Supply Shock(+)



Deflation

What is Deflation?

- 물가수준이 하락하는 현상
- 즉, 인플레이션율이 음(-)의 값인 상태
- 2차세계대전 전에는 흔했던 현상
- 2차세계대전 이후 양(+)의 인플레이션이 일반화되면서 거의 나타나지 않음
- 1990년대 들어 일본 등 선진국 일부에서 관찰되기 시작, 2010년대 전후로 종종 관찰

Problem of Deflation

Debt Deflation

- Unexpected Deflation은 대부-차입 관계에서 차입자에게 실질적 부담을 줌
- Debt Deflation (by Fischer): 차입자/대부자가 실질자산 감소/증가에 직면하여 감소/증가하는 지출의 민감도가 다르기 때문에 발생: 총수요 감소
 - 차입자의 지출 민감도 > 대부자의 지출 민감도

Liquidity Trap

- Expected Deflation의 영향:
 - 명목이자율(i)감소 -- 화폐수요 증가
 - 문제점: Zero Bound - “Nominal Interest Rate cannot have negative value”

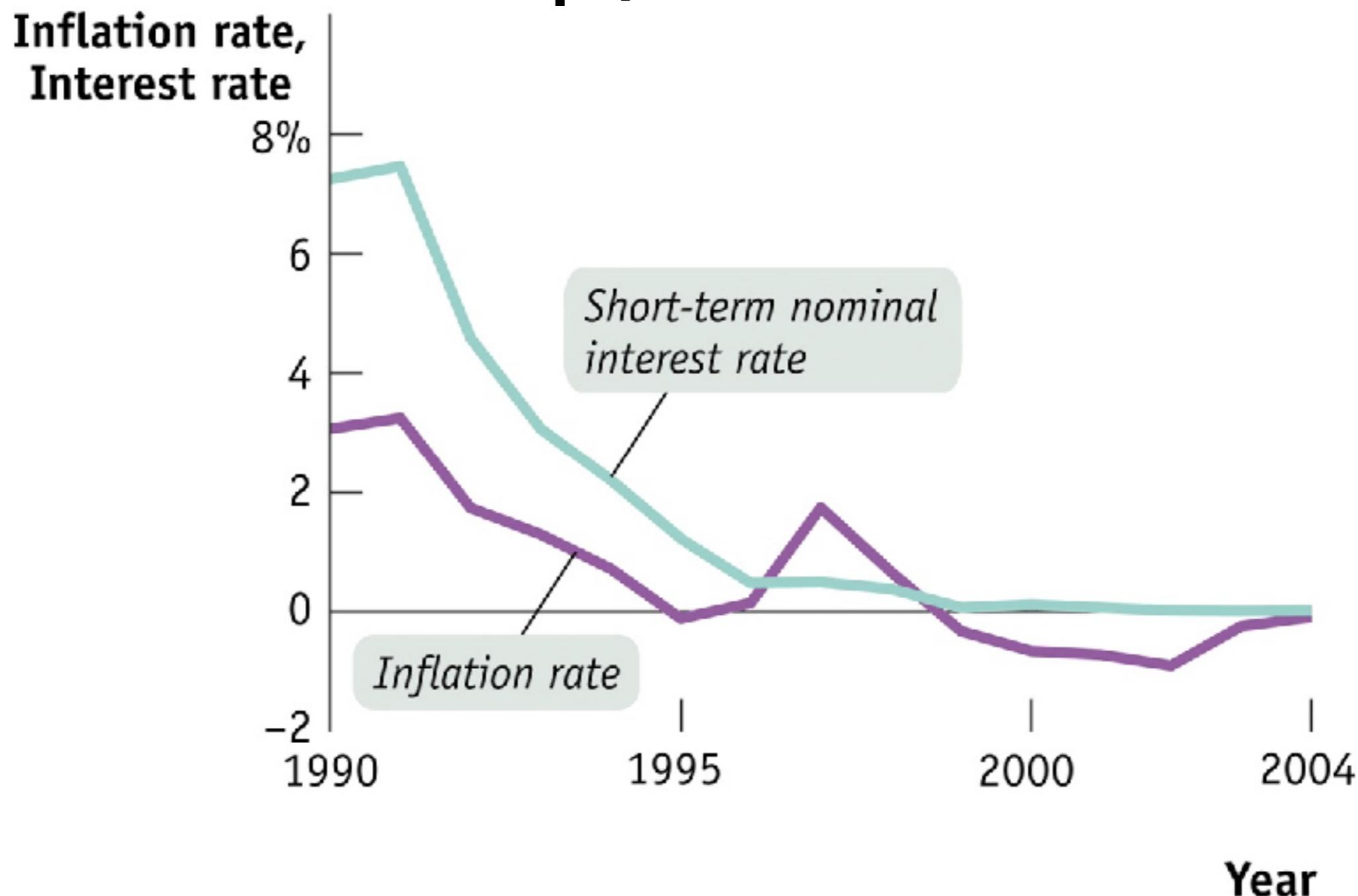
Zero Bound

- 이론적으로, $i < 0$ 은 가능
 - ex) $p_i = -5\%$, $r = 4\% \longrightarrow i = -1\%$
- But, 현실에서 $i < 0$ 은 성립 불가능
 - $i < 0$ 이 되면 거래 자체를 할 이유가 사라짐: 이자 를 지급하면서 대부해줄 이유가 없으므로!

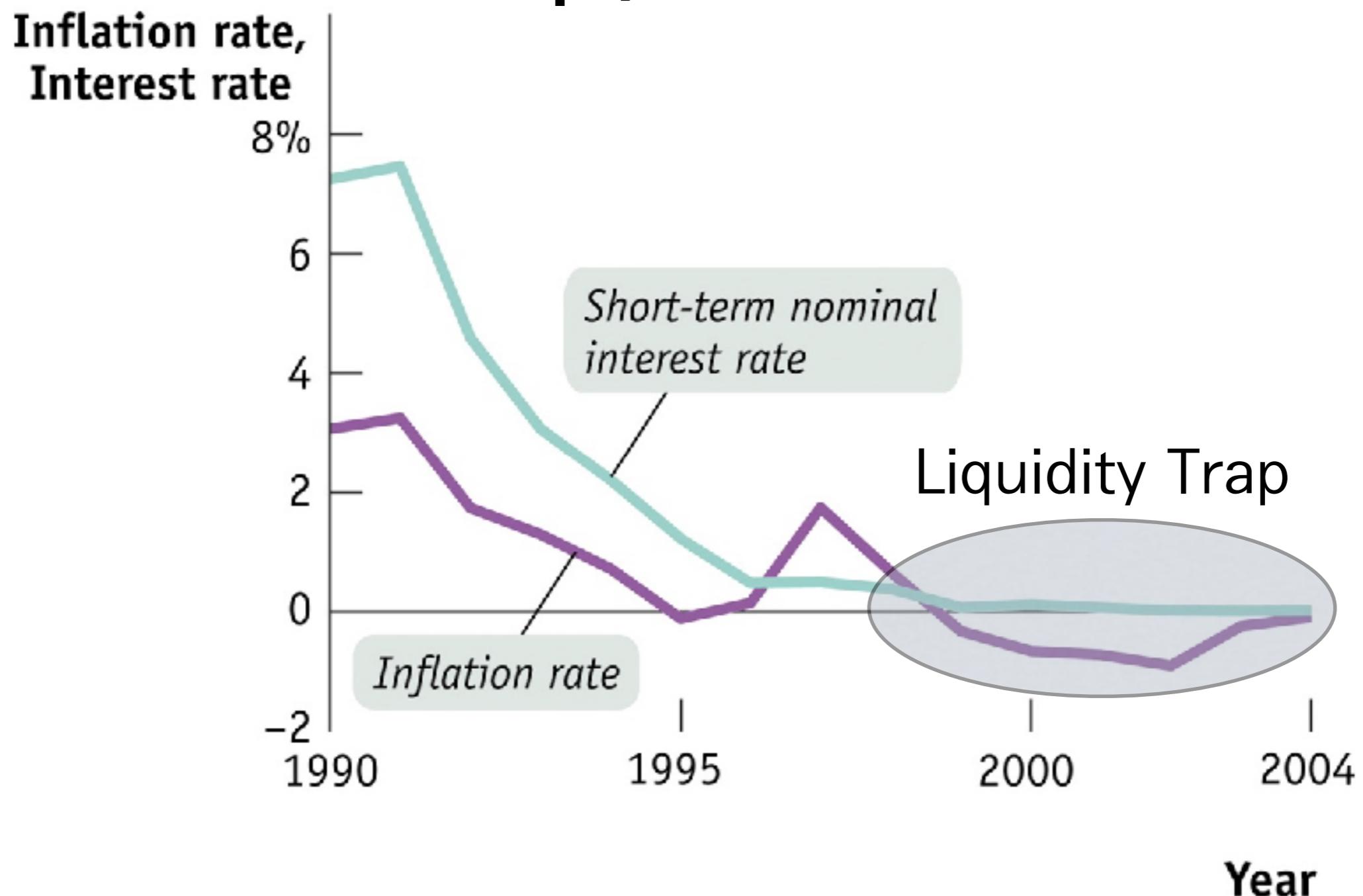
Liquidity Trap

- 통화정책의 확장한계는 명목이자율 0%
- 명목이자율이 0%에 가까운 경우 확장적 통화정책을 구사할 수 없게 됨: 아무리 화폐를 공급하더라도 확장 메커니즘이 작동하지 않음(1990년대 일본이 직면한 상황)
- 따라서 0%의 인플레이션율은 Liquidity Trap에 빠질 가능성을 높이므로 중앙은행들은 2~3% 정도의 인플레이션을 선호

Japan in the Liquidity Trap, 1990s



Japan in the Liquidity Trap, 1990s



양적 완화

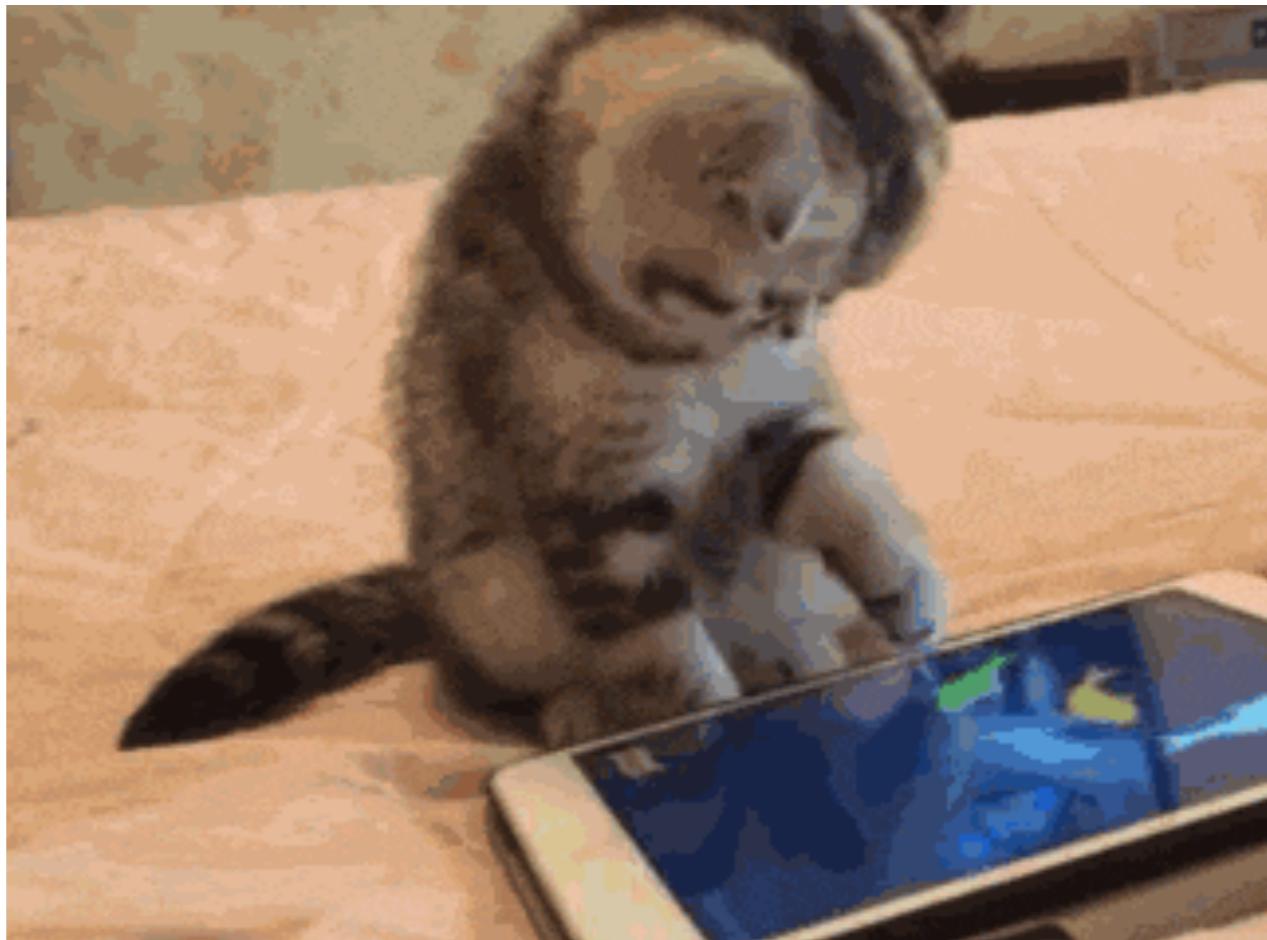
Quantitative Easing

- Liquidity Trap 상태일 때 취할 수 있는 확장적 통화정책
- Standard expansionary monetary policy:
Buying short-term gov. bonds
- QE: buying financial assets + increasing MS
→ Raising price of financial asset

Next Topic

- Open Economy

수고하셨습니다!



수고하셨습니다!

