

Today-

- Inflationary Finance M+I 5
- Inflationary Redistributions of Income,
- Indirect Fiscal Effects of π

M+I 7

Inflation vs Money Growth

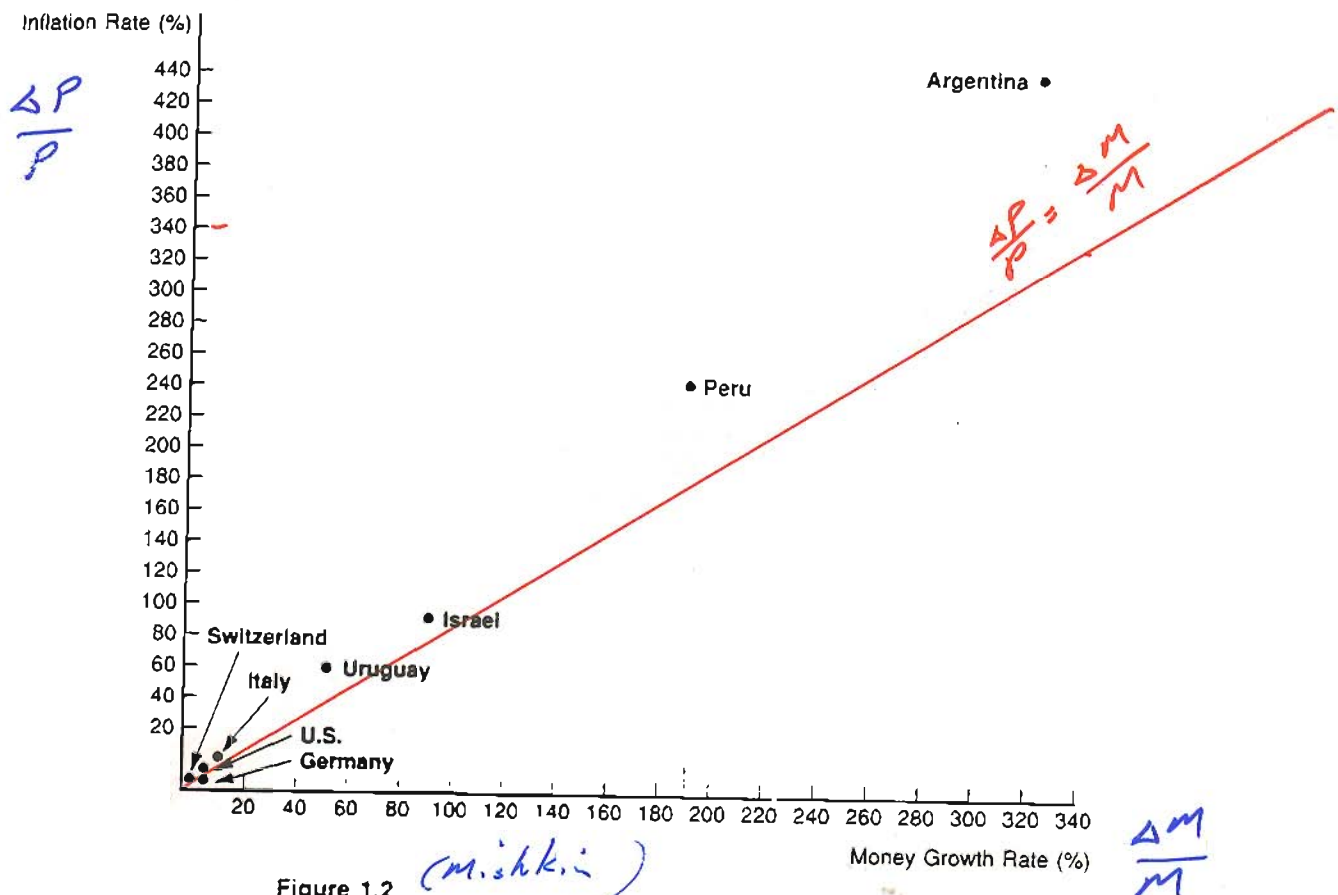
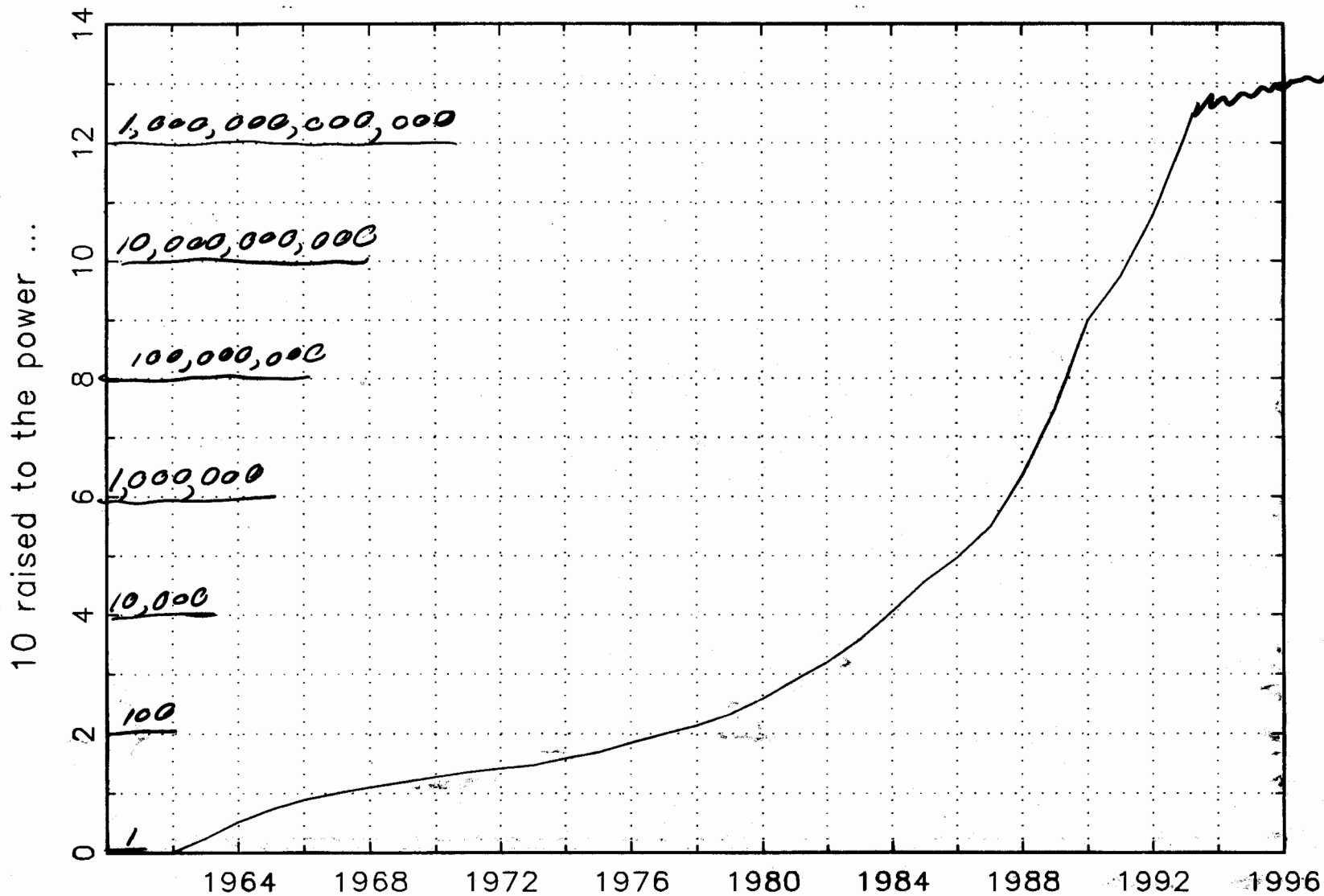


Figure 1.2 (mishkin)
Average Inflation Rate Versus Average Rate of Money Growth for a Number of Countries: 1960–1990 Source: International Financial Statistics.

Why do some countries allow high $\frac{\Delta M}{M}$?

Brazilian CPI (1962 = 1), Ratio Scale



Brazilian Currency

1962 Cruzeiro

Cz

1967 New Cruzeiro

= 1000 Cruzeiros

1986 Cruzado

= 1000 N. Cz.

1989 New Cruzado

= 1000 Cruzados

1994 Real Cruzeiro

Cz. R.

= 1000 N. Cruzados



Alan Greenspan:

“The United States can pay any debt it has because we can always print money to do that, so there is zero probability of default.”

Meet the Press, Aug. 7, 2011

3 motives for $\Delta M/M$:

1. Inflationary Finance
(M+I 5)

2. Reduce unemployment
(M+I 6)

3. Reduce R, r
(M+B 21)

First Motive: Inflationary Finance

Simplest case:

Gov't creates all M
directly at 0 cost, pays
no interest on M .

$\Rightarrow \Delta M =$ perpetual interest-free
loan to Gov't.
(same as gift).

$S = \Delta M =$ nominal Seigniorage

$s = S/P =$ real Seigniorage

$$S = \frac{\Delta M}{P} \cdot \frac{M}{M}$$

$$= \frac{\Delta M}{M} \cdot \frac{M}{P}$$

$$S = \mu \cdot m$$

$$\mu = \frac{\Delta M}{M}$$

$$m = \frac{M}{P}$$

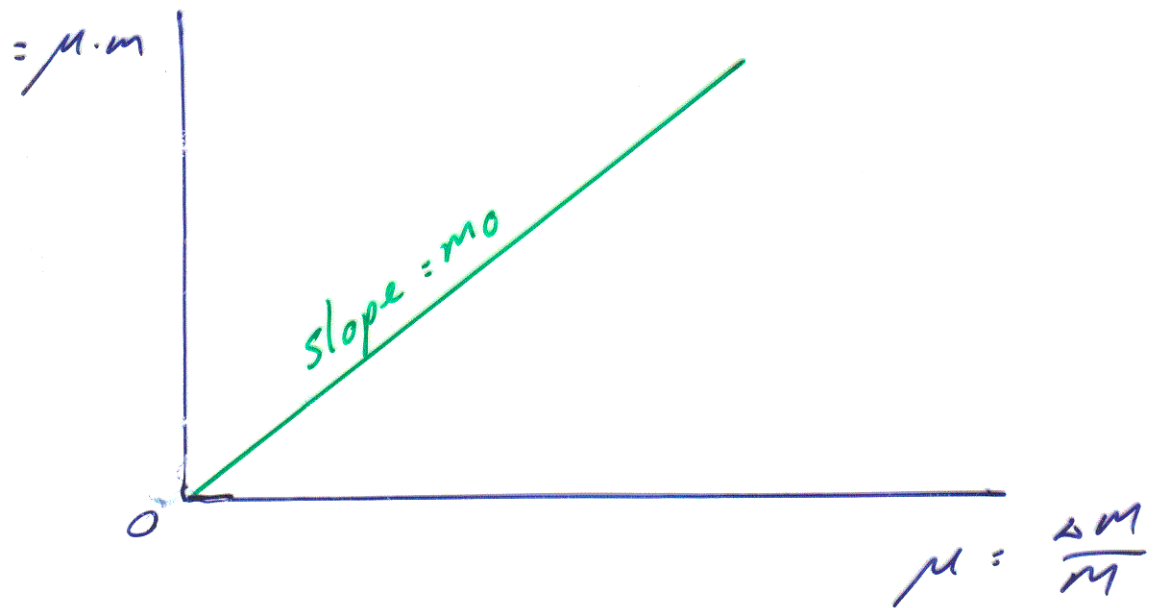
(μ = Greek mu)

Seigniorage:

$$S = \frac{\Delta M}{P} = \mu \cdot m$$

If m were constant at m_0 ,

$$S \propto \mu :$$



S would be unbounded.

Not valid in Long Run

Instead,

$\mu \uparrow \rightarrow \pi \uparrow$ by Q.E.

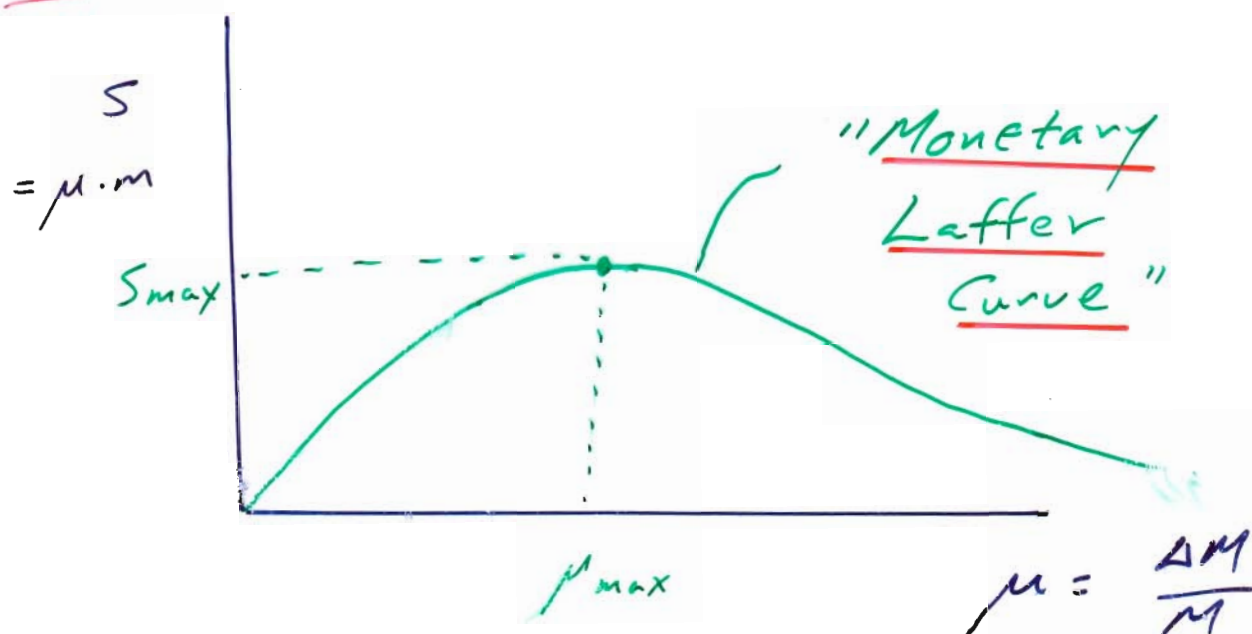
$\rightarrow \pi^a \uparrow$ by Adaptive Learning

$\rightarrow i \uparrow$ by Fisher eq'n (aka R)

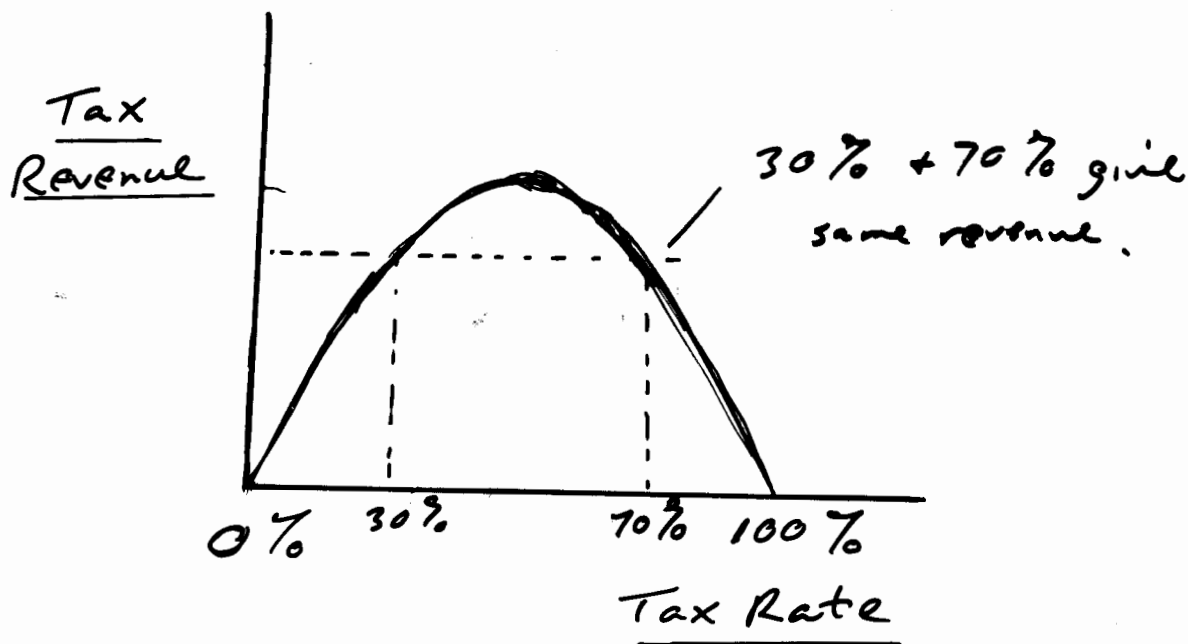
$\rightarrow m^D \downarrow$ by slope of $m^D(i)$

$\rightarrow m \downarrow$ by Q.T.o.M.

SO (in L.R.)



Ordinary Laffer Curve (Arthur Laffer)



1981 Reagan Tax Cut

Top rate 70% \rightarrow 28%

(Clinton \rightarrow 39.6%,
GWB \rightarrow 35%)

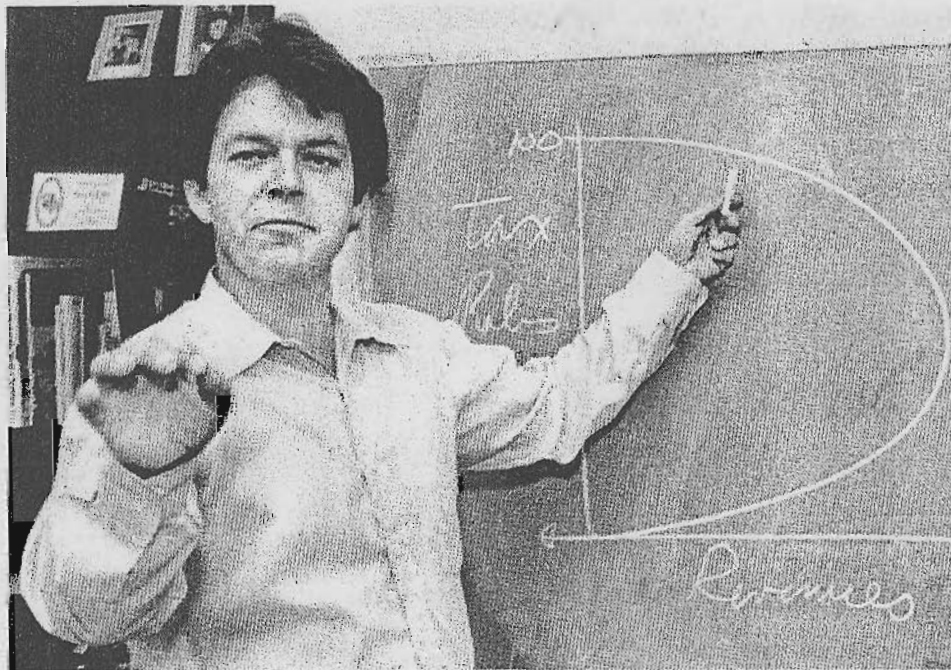
C. Northcote Parkinson
The Law + the Profits 1960

John Ramsey M'Culloch,
Principles of Taxation, 1863

Laffer Curve

Back in Business

Supply-Side Economists Regain Influence Under Bush



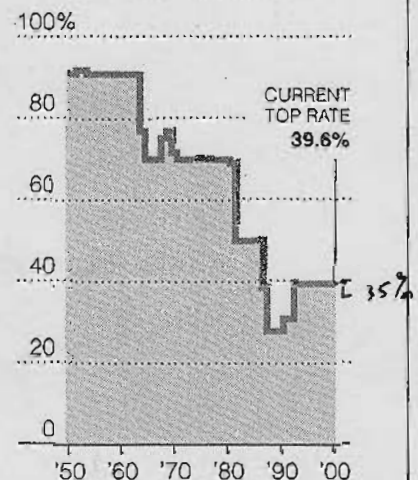
Above, United Press International; below, Carol T. Powers for The New York Times

Arthur Laffer, above, explained his curve with the help of a blackboard in Los Angeles in 1981.



Taxing the Top Tier

The maximum federal income tax rate on high incomes, once over 90 percent, remains far below its peak despite rising in the 1990's. It fell most sharply during the Reagan years, when supply-side economists had their greatest influence.

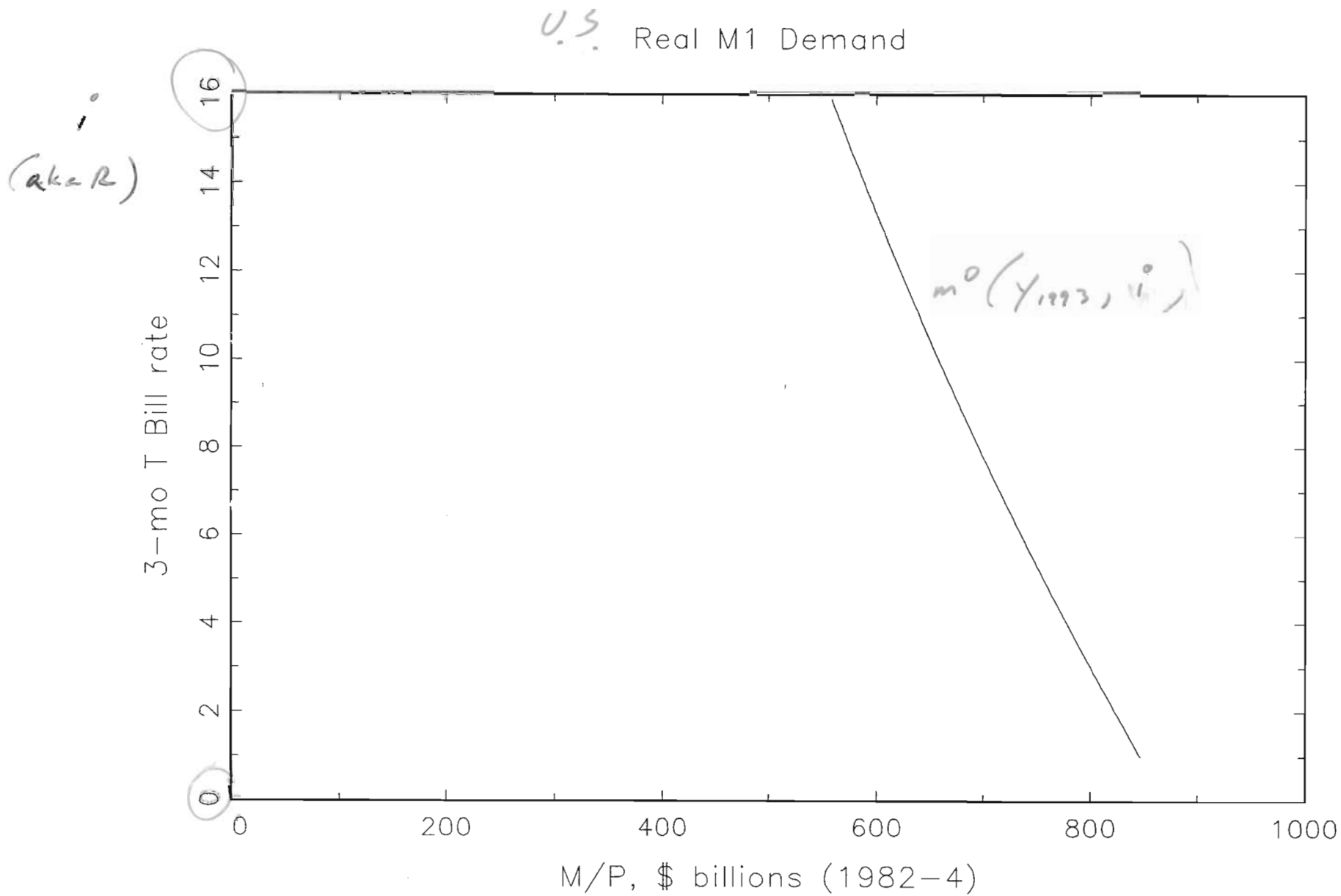


Source: Congressional Joint Committee on Taxation

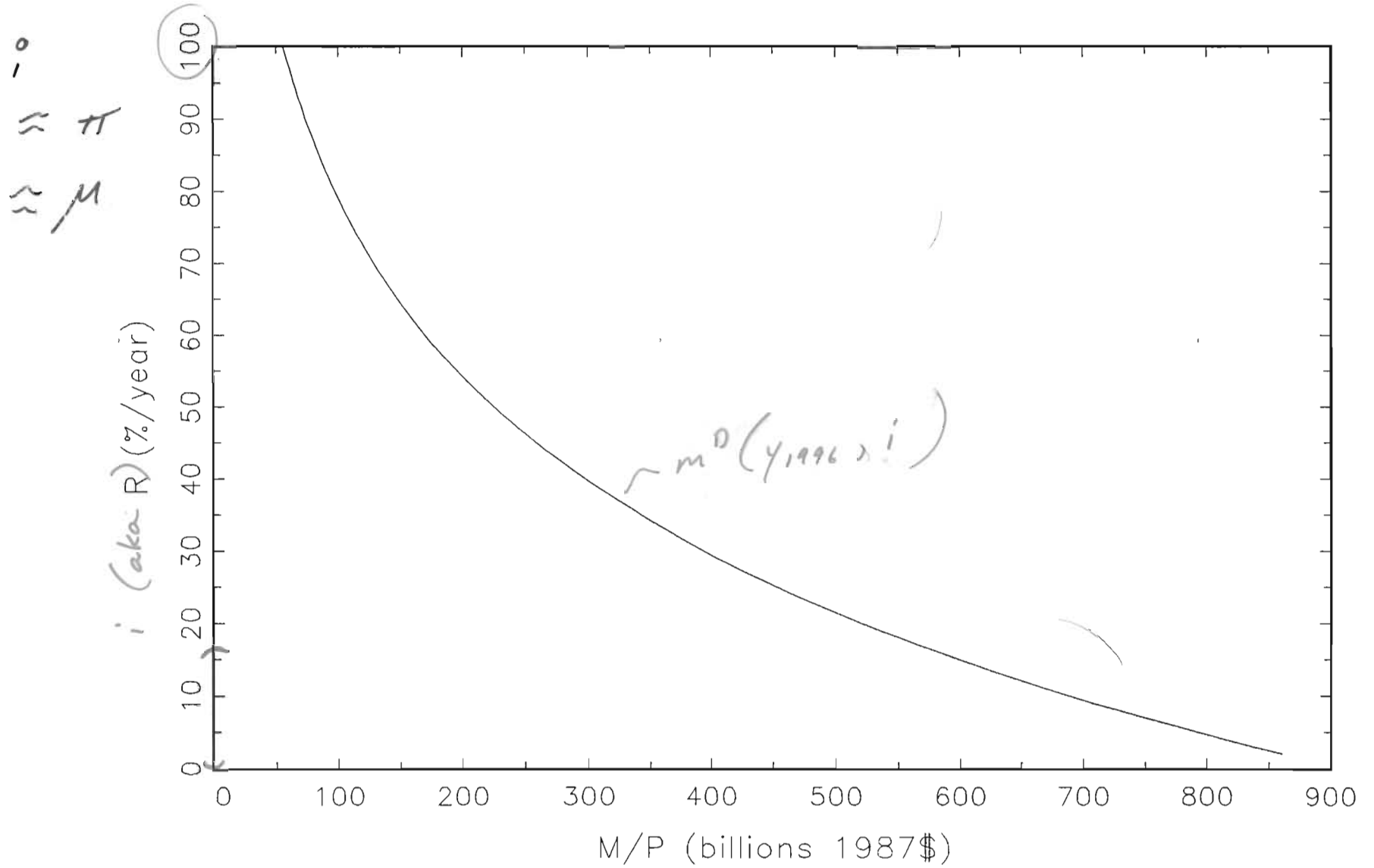
The New York Times

1981 Reagan Tax Cut

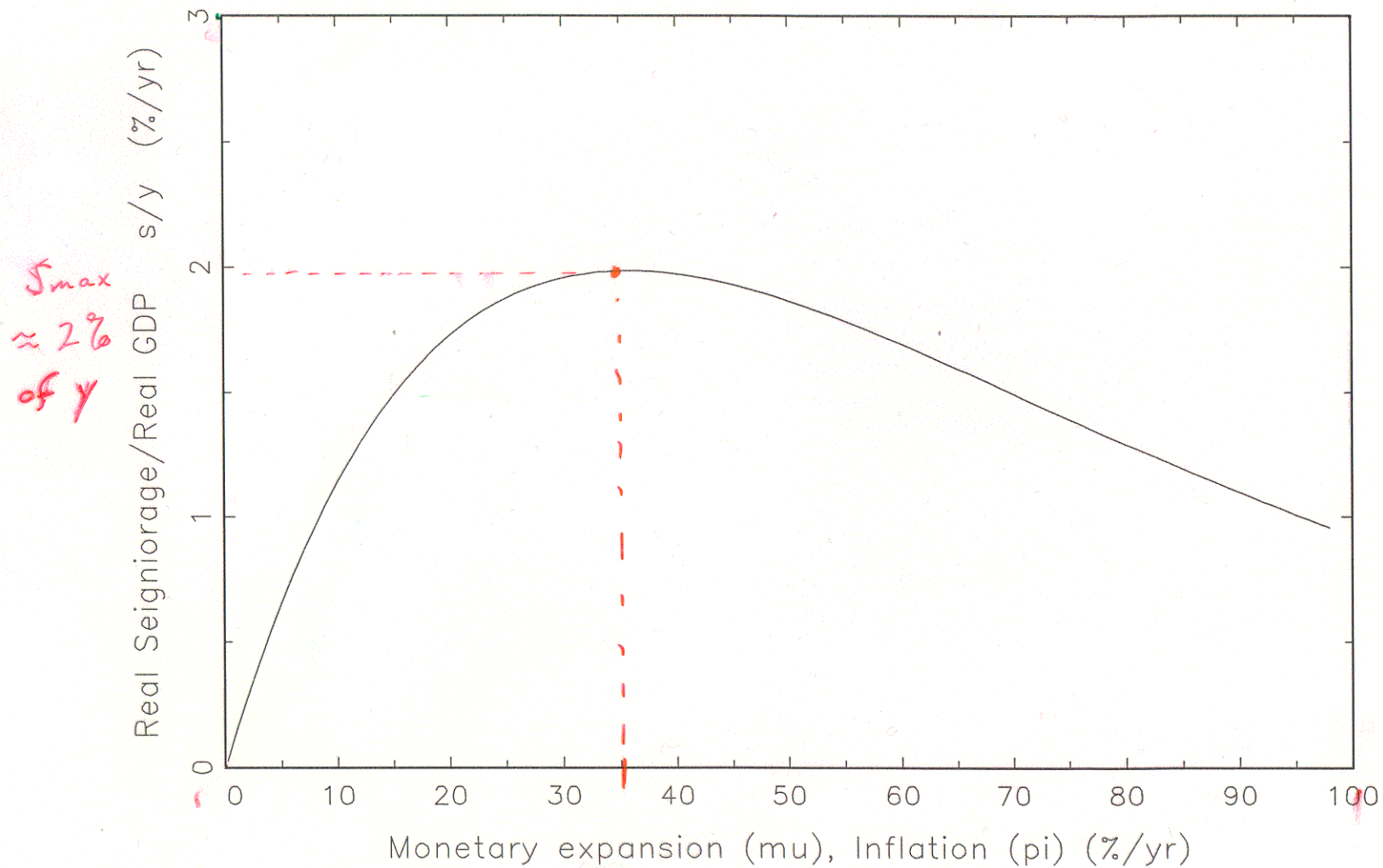
- Top Rate 70% → 28%
- Clinton → 39.6%
- GwB → 35%



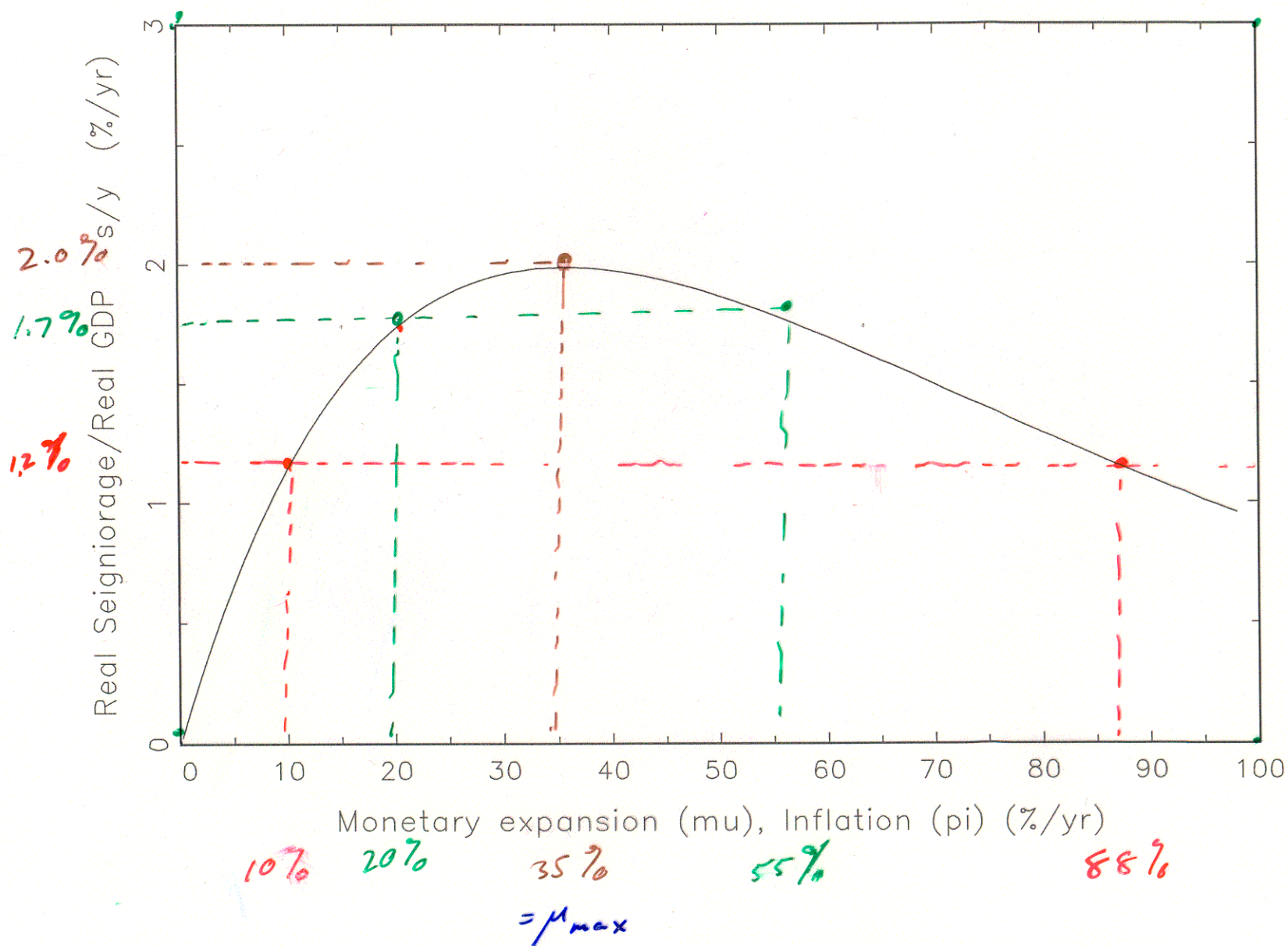
1996.IV real money demand



US Monetary Laffer Curve (1996.IV money demand)



US Monetary Laffer Curve (1996.IV money demand)



Inflation acts as a tax on $m = M/P$

Gov't gains $\mu \cdot m = S$

Public loses $\pi \cdot m$

$$\underline{\pi} = \mu + \frac{\Delta V}{V} - \frac{\Delta Y}{Y}$$

$$\underline{\approx \mu \quad \text{if } V, Y = \text{const.}}$$

So $\pi \cdot m \approx \mu \cdot m$

Transfer:

<u>Public</u>	\rightarrow	<u>Gov't</u>
$-\pi \cdot m$		$+\mu \cdot m$

3 Income transfers from π :

1. Inflationary finance ✓

gov't gains $\mu.m$

public loses $\pi.m \approx \mu.m$

public \rightarrow gov't.

2. Debtor - Creditor ✓

IF $\pi \neq \pi^e$ and debt not indexed.

3. Ripple Effect ✓

Last in Line \rightarrow First in Line

May be comparable in size.

Hyperinflation

Germany 8/22 - 11/23

$$\frac{P}{P_0} = 1.02 \times 10^{10}$$

Greece 11/43 - 11/44

$$\frac{P}{P_0} = 4.70 \times 10^8$$

Russia 12/21 - 1/24

$$\frac{P}{P_0} = 1.24 \times 10^5$$

Yugoslavia 1991 - 99

$$\frac{P}{P_0} \approx 1 \times 10^{22}$$

Jan 1994 - 313,000,000 %

Zimbabwe 1/2007 - 11/2008

$$\frac{P}{P_0} = 8.53 \times 10^{23}!$$

These rates exceed estimates of μ_{max} - WHY?

Reichsbanknote



wei Millionen Mark

zahlt die Reichsbankhauptkassa in Berlin gegen diese Banknote dem Einlieferer. Vom 1. September 1923 ab kann diese Banknote aufgerufen und unter Umtausch gegen andere gesetzlich Zahlungsmittel einzugezogen werden

Berlin, den 9. August 1923

WK

Reichsbankdirektorium



Handwritten signatures:
Hans Scharpff, Heinrich Scharpff, Hermann Scharpff, Hermann Scharpff, Hermann Scharpff, Hermann Scharpff, Hermann Scharpff, Hermann Scharpff, Hermann Scharpff, Hermann Scharpff



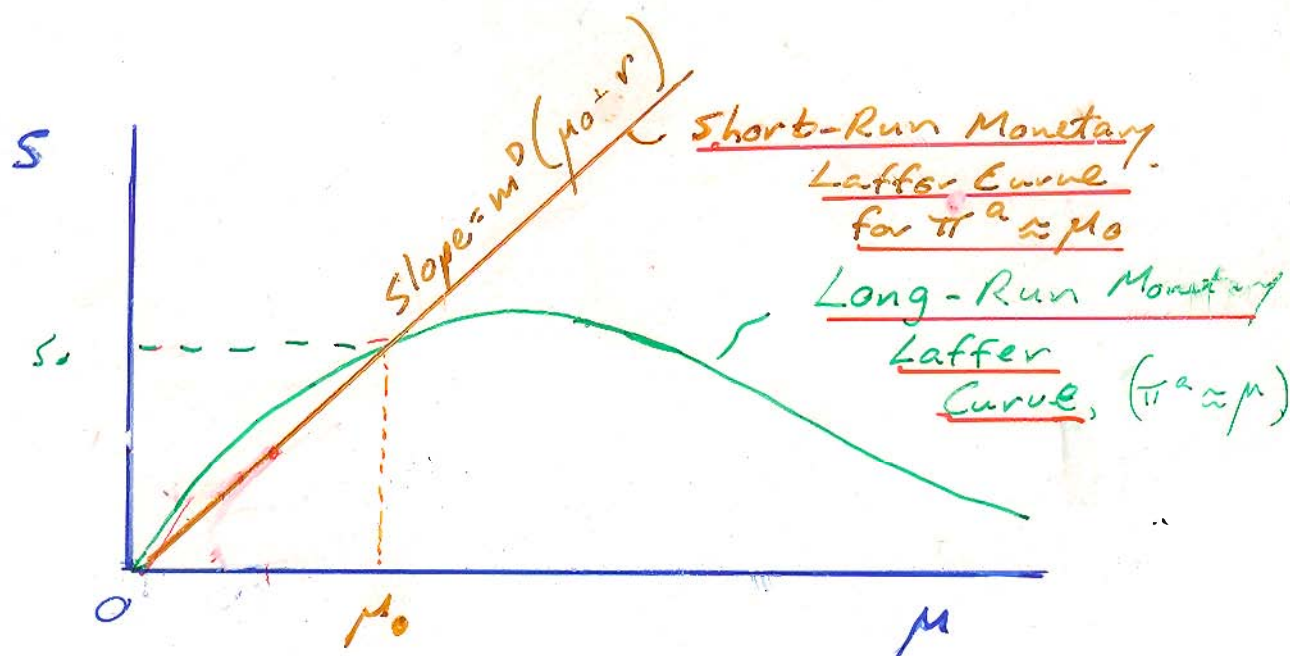
Der Banknoten nachmacht oder verfälscht oder nachgemacht oder verfälschte sich verschafft und in Verkehr bringt, wird mit Zuchthaus nicht unter zwei Jahren bestraft

Runaway Inflation (Hyperinflation)

$$S = \mu \cdot m$$

In Short Run, π^e , m^D , m are given,
do not depend on μ .

\Rightarrow Short Run Laffer curve is a straight line, with slope $m = m^D(\pi^e + r)$.



Target Seigniorage

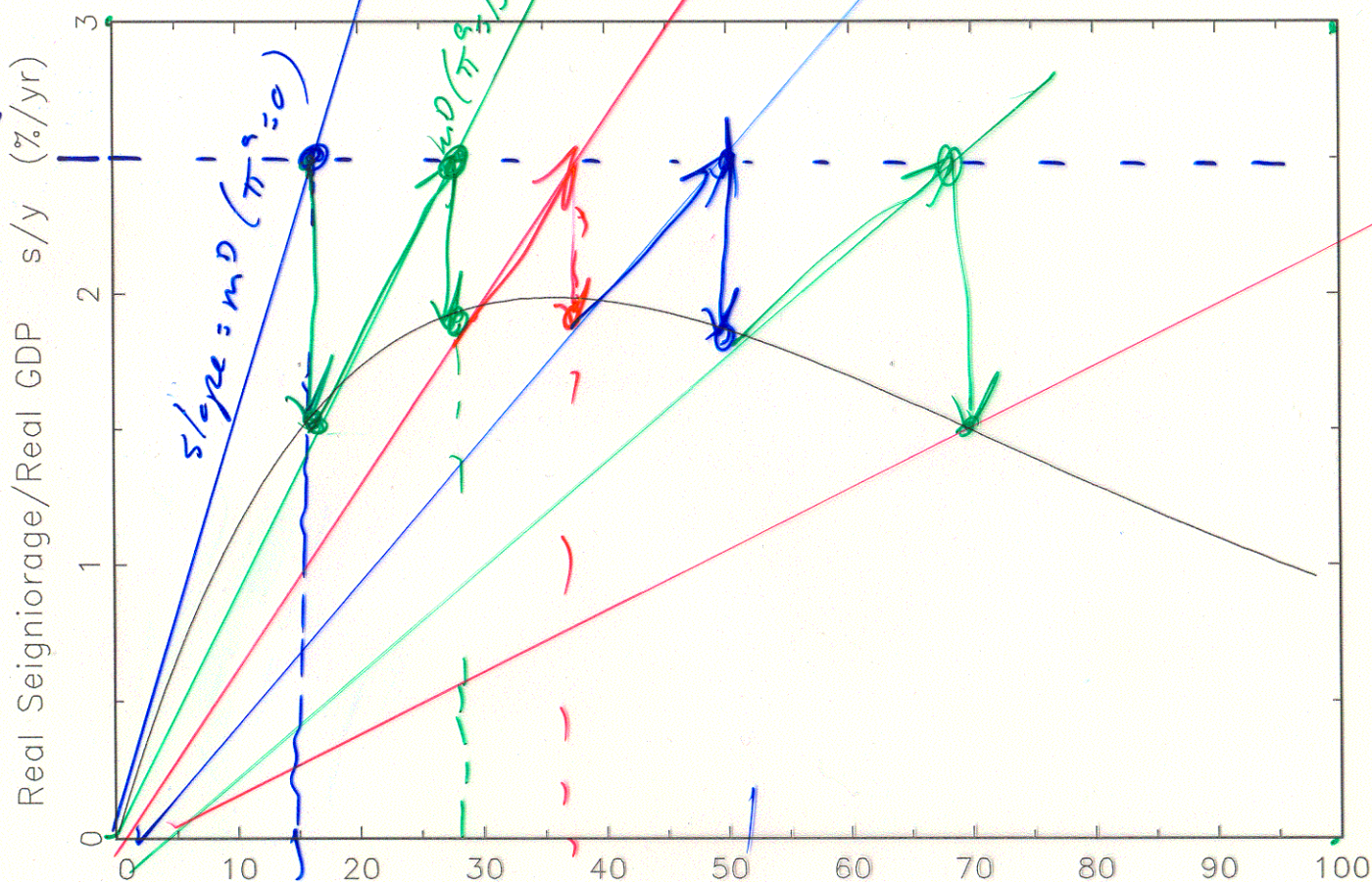
$$S^* = \text{Seigniorage target} \\ = \mu \cdot m$$

\Rightarrow $\mu = \frac{S^*}{m}$ obtains S^* in S.R.

$s^* > s_{max}$

$s^*, 25\%$
 π

US Monetary Laffer Curve (1996.IV money demand)



$\mu_0 = 0$

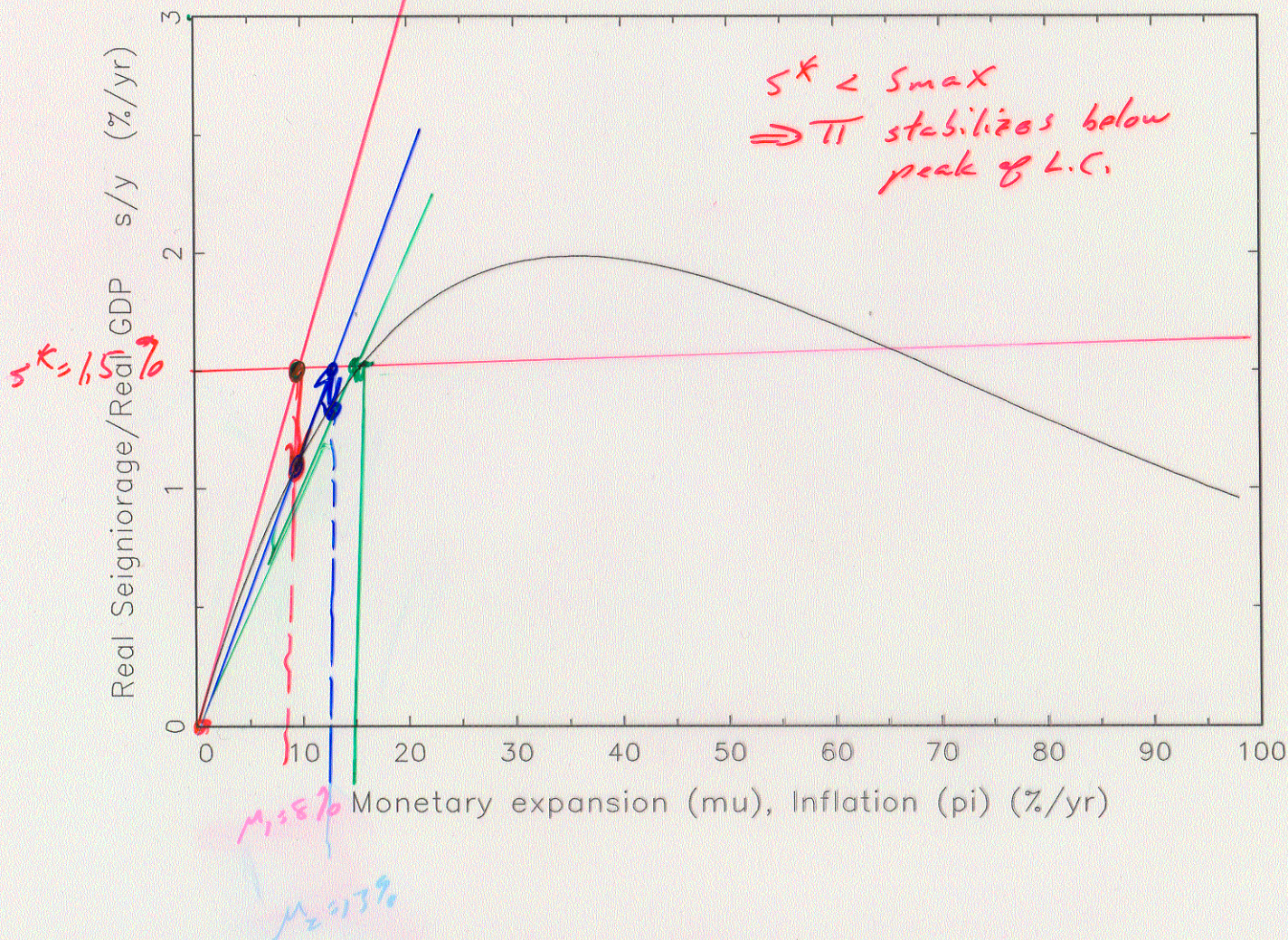
$\mu_1 = 15\%$

$\mu_2 = 28\%$

$\mu_3 = 37\%$

$s^* < s_{max}$
 $\Rightarrow \pi$ stabilizes below peak.

US Monetary Laffer Curve (1996.IV money demand)



Summary

$$\underline{s^* < s_{max}}$$

→ rapid but steady π on
Long-Run Laffer Curve.

$$\underline{s^* > s_{max}}$$

→ unbounded π

- Iraq War?
- Subprime Mortgage Bailout?
- Social Security?

Indirect Fiscal Effects of Inflation

1. Taxation of Capital

2. Bracket Creep

1. Inflation-induced taxation of capital

r = before tax real return
on capital investment

τ = income tax rate

($\tau = \text{tau}$)

r_{AT} = after tax real return

No inflation:

$$r_{AT} = r(1 - \tau)$$

With inflation π :

Nominal rate of return

$$= r + \pi$$

$$\text{tax} = \tau(r + \pi)$$

Nominal after tax rate of return

$$= r + \pi - \tau(r + \pi)$$

Real after tax rate of return:

$$r_{AT} = r + \cancel{\pi} - \tau(r + \pi) - \cancel{\pi}$$

$$r_{AT} = r(1 - \tau) - \pi\tau$$

Example

$$\underline{r = 4\%} \quad \text{Real return before Tax}$$

$$\tau = 50\%$$

$$\pi = 10\%$$

$$r + \pi = 14\% \quad \text{Nominal Return}$$

$$-\tau(14\%) = -7\% \quad \text{taxes}$$

$$7\% \quad \text{After tax Nominal Return}$$

$$-\pi = -10\%$$

$$\underline{r_{AT} = -3\%} \quad \text{Real After Tax Return}$$

By Formula:

$$r_{AT} = r(1 - \tau) - \pi\tau$$

$$= (4\%)(1 - .5) - (10\%)(.5)$$

$$= 2\% - 5\%$$

$$= -3\%$$

2. Bracket Creep

- Federal, State Income Tax
 "Graduated" ("Progressive")
 Marginal Tax rates \uparrow with
 income.

$P \uparrow \Rightarrow$ same real income taxed
at higher rate, unless
brackets indexed.

Federal brackets, personal exemptions
indexed since 1981.

Ohio taxes indexed only since 2010.
(New!)

Local taxes proportional (Franklin Co.)
- No creep.

Marginal Tax Rates US Single

<u>2003</u>	<u>2010</u>	<u>Marginal Rate</u>
0 - \$7,000	0 - \$8,375	10 %
- 28,400	- 34,000	15 %
- 68,800	- 82,400	25 %
- 143,500	- 171,850	28 %
- 311,950	- 373,650	33 %
\$311,950 up	\$373,650 up	35 %

Ohio

<u>2008, 2009</u>	<u>2010</u>	<u>Marginal Rate</u>
0 - \$5,000	0 - \$5,050	0.6 %
- 10,000	- 10,100	1.2 %
- 15,000	- 15,150	2.5 %
- 20,000	- 20,200	3.1 %
- 40,000	- 40,350	3.7 %
- 80,000	- 80,700	4.3 %
- 100,000	- 100,900	4.9 %
- 200,000	- 201,800	5.7 %
200,000 up	201,800 up	6.2 %