A fogyasztói és munkavállalói preferenciák hatása a gazdasági stabilitásra

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Korábbi eredmények:

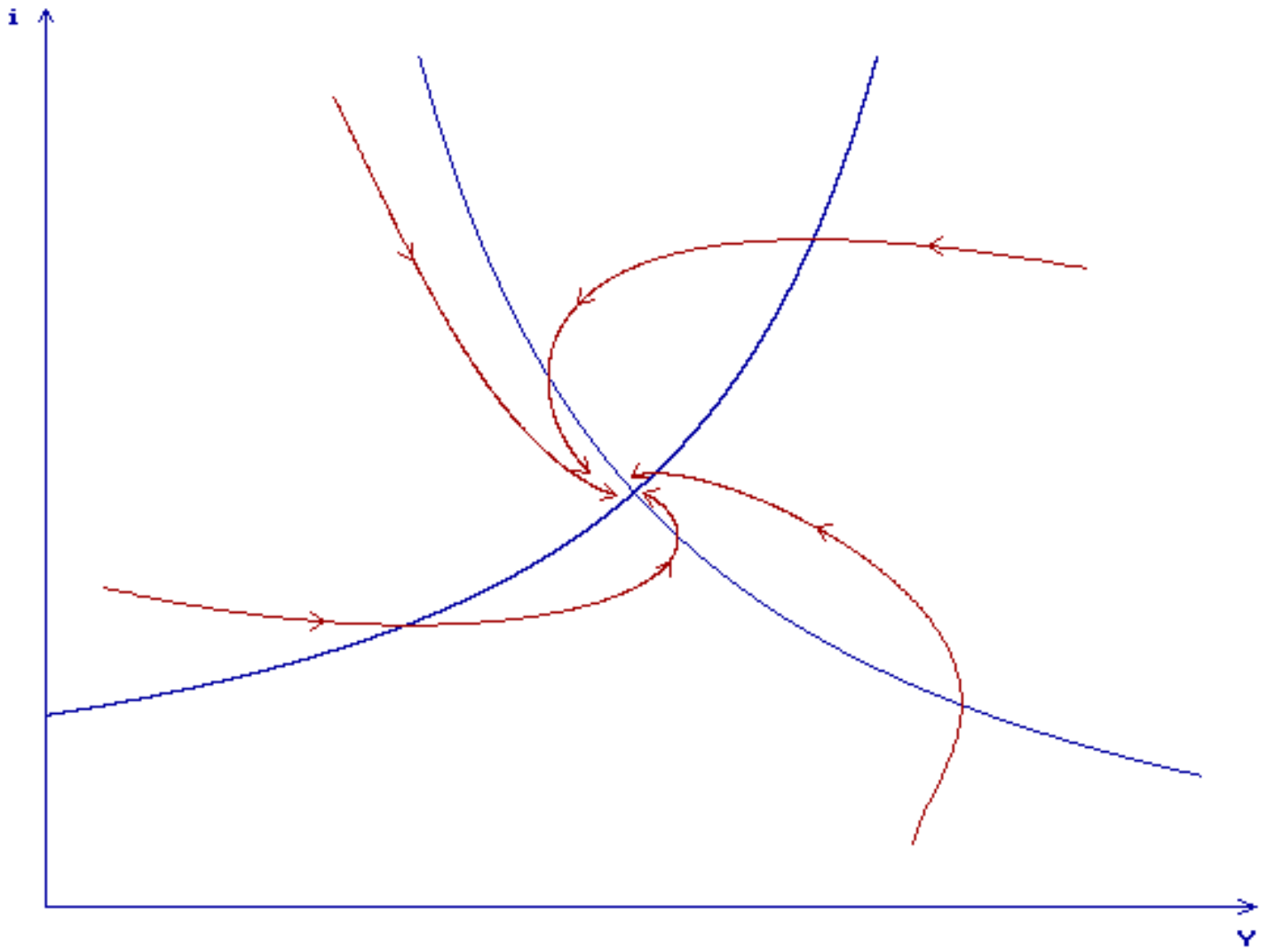
- Luciano Fanti, Piero Manfredi (2007) Chaotic business cycles and fiscal poicy: An IS-LM model with distributed tax collection lags, Chaos, Solitons and Fractals 32, 736–744
- A. Abta, A. Kaddar and H. Talibi Alaoui (2008) Stability of Limit Cycle in a Delayed IS-LM Business Cycle model, Applied Mathematical Sciences, Vol. 2, no. 50, 2459 - 2471

$$\frac{dY}{dt} = \alpha \left[I(i) - S(Y) \right]$$

$$\frac{di}{dt} = \beta \left[L(Y, i) - \frac{M}{P} \right]$$

Poincaré - Ljapunov - Perron:

$$\begin{pmatrix} \frac{dY}{dt} \\ \frac{di}{dt} \end{pmatrix} = \begin{bmatrix} -\alpha s & \alpha I' \\ \beta L_1' & \beta L_2' \end{bmatrix} \begin{pmatrix} Y - Y^* \\ i - i^* \end{pmatrix}$$


i
Y

$I' < 0$, $L'_1 > 0$, $L'_2 < 0$, $S' = s > 0$ Routh-Hurwitz:

$$\mathbf{A} = \begin{bmatrix} -\alpha s & \alpha I' \\ \beta L'_1 & \beta L'_2 \end{bmatrix}$$

$$tr(\mathbf{A}) = \alpha s - \beta L'_2 > 0$$

$$|\mathbf{A}| = -\alpha\beta s L'_2 - \alpha\beta I' L'_1 = -\alpha\beta \left[s L'_2 + I' L'_1 \right] > 0$$

$$\begin{array}{c} ? \\ s \ < \ 0 \end{array}$$

$$\frac{PC + \Delta M_h = wN^s + \pi}{U\left(C, 1 - N^s, \frac{\Delta M_h}{P}\right) \to \max}$$

Beágyazott hasznossági függvény:

$$U\left(C, 1 - N^s, \frac{wN^s + \pi - PC}{P}\right) = \tilde{U}(C, N^s) \to \max$$

Bevezetjük az $S = \Delta M_h / P$ jelölést:

$$d\tilde{U} = \frac{\partial U}{\partial C} dC + \frac{\partial U}{\partial (1 - N^s)} d(1 - N^s) + \frac{\partial U}{\partial S}\left(\frac{W}{P} dN^s - dC\right)$$

$$d\tilde{U} = \frac{\partial U}{\partial C}dC + \frac{\partial U}{\partial (1-N^s)}d(1-N^s) + \frac{\partial U}{\partial S}\left(\frac{W}{P}dN^s - dC\right)$$

Legyen $dN^s = 0$, ekkor:

$$\frac{d\tilde{U}}{dC} = \frac{\partial U}{\partial C} - \frac{\partial U}{\partial S}$$

Legyen most $dC = 0$, ekkor:

$$\frac{d\tilde{U}}{dN^S} = -\frac{\partial U}{\partial Z} + \frac{W}{P} \cdot \frac{\partial U}{\partial S}$$

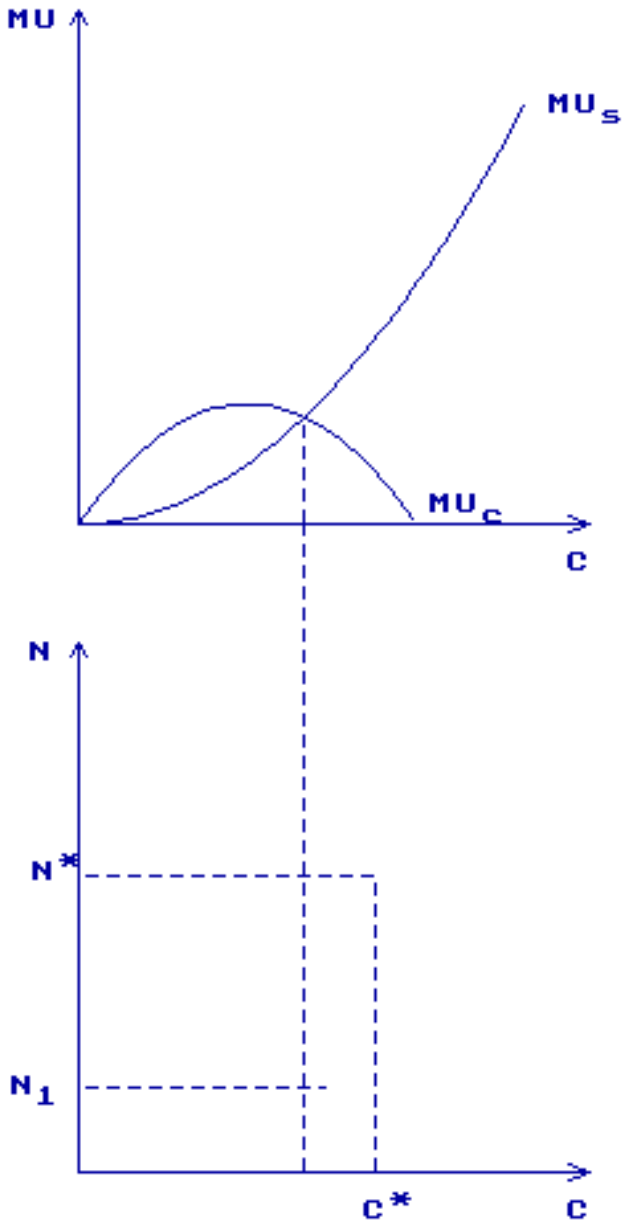
$$\frac{dN^s}{dC} = \frac{\frac{\partial U}{\partial C} - \frac{\partial U}{\partial S}}{\frac{W}{P} \cdot \frac{\partial U}{\partial S} - \frac{\partial U}{\partial Z}}$$

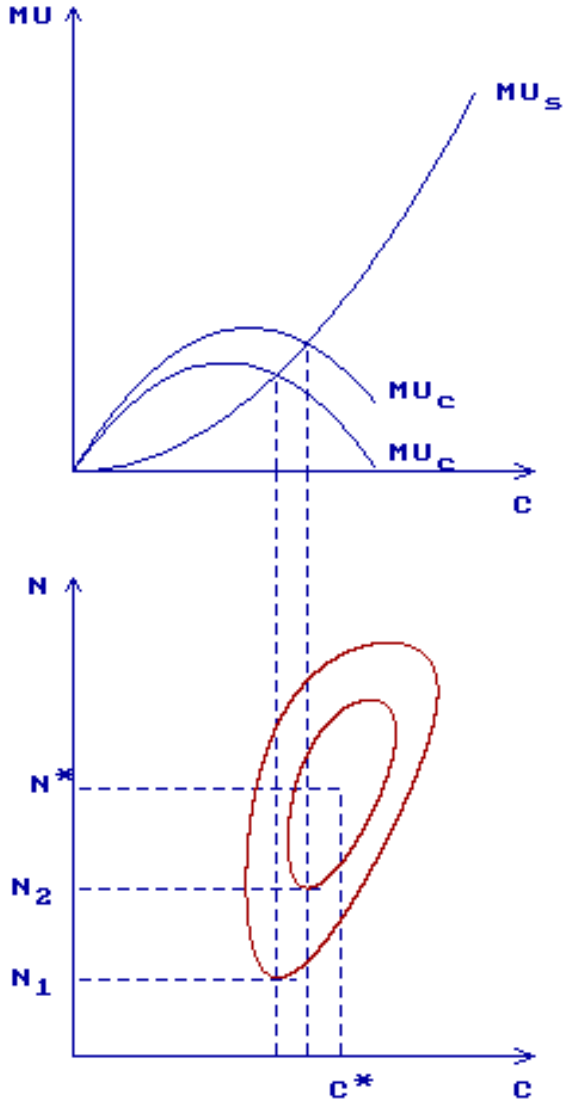
Kényszerű munkanélküliség: $N^s = \bar{N}$

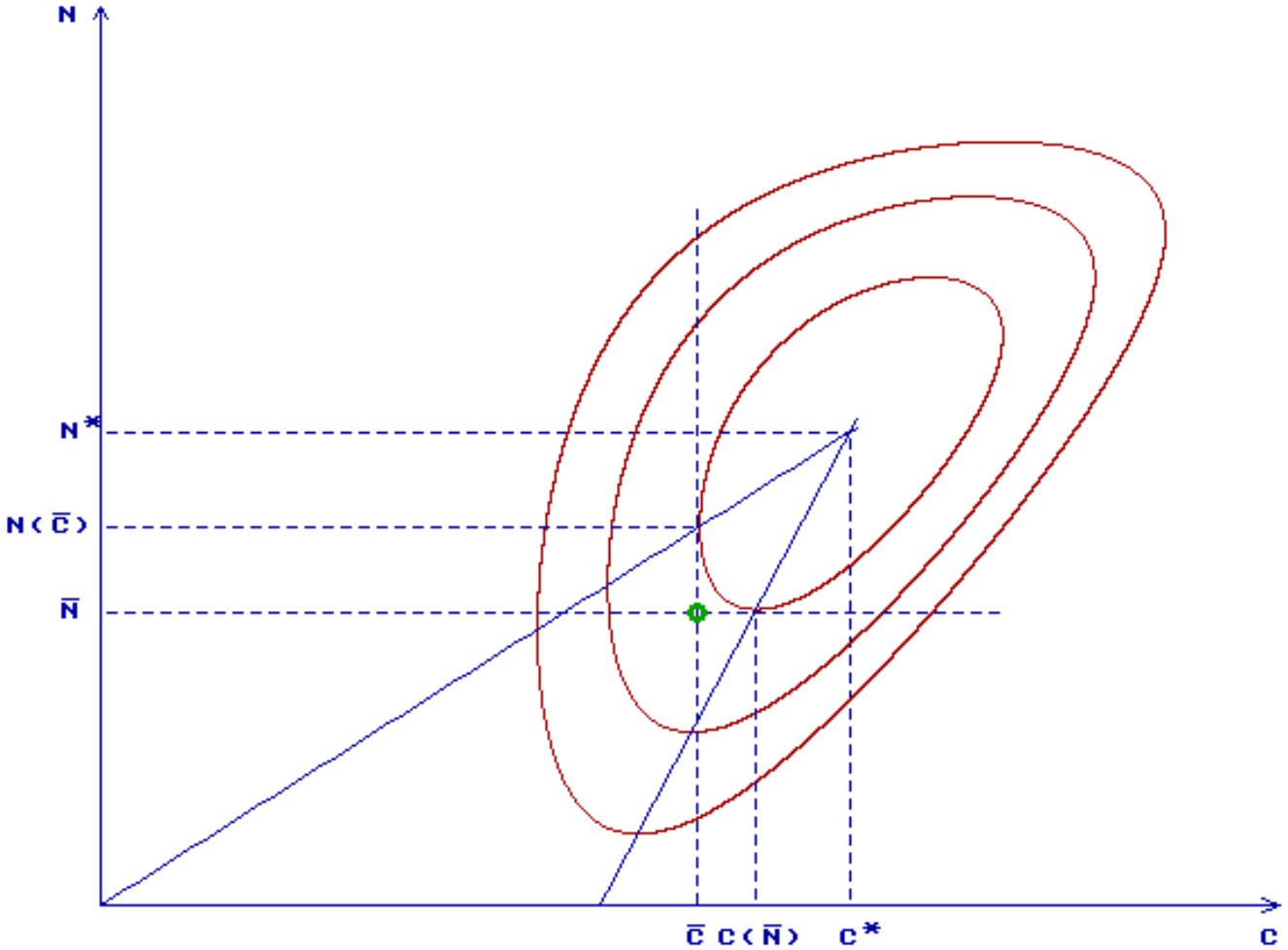
$$\frac{\partial U}{\partial C} = \frac{\partial U}{\partial S}$$

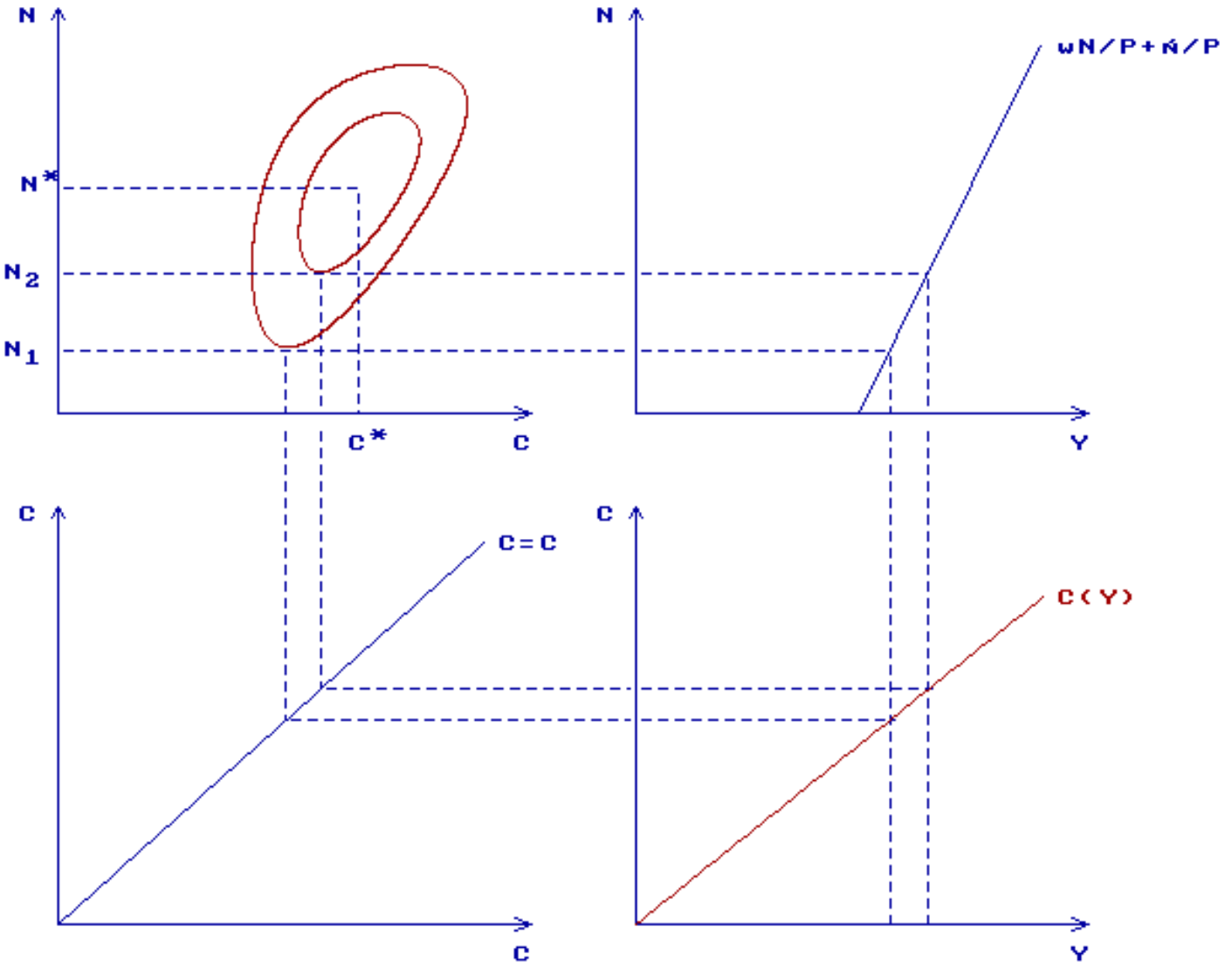
1. A fogyasztás és a szabadidő helyettesítő javak.

2. A megtakarítás és a szabadidő független javak.


MU
MU_S
MU_C
C
N
N*
N_1
C*
C


MU
MU_S
MU_C
MU_C
C
N
N*
N_2
N_1
C*
C


N
N*
N(C̄)
N̄
C̄
C(N̄)
C*
C

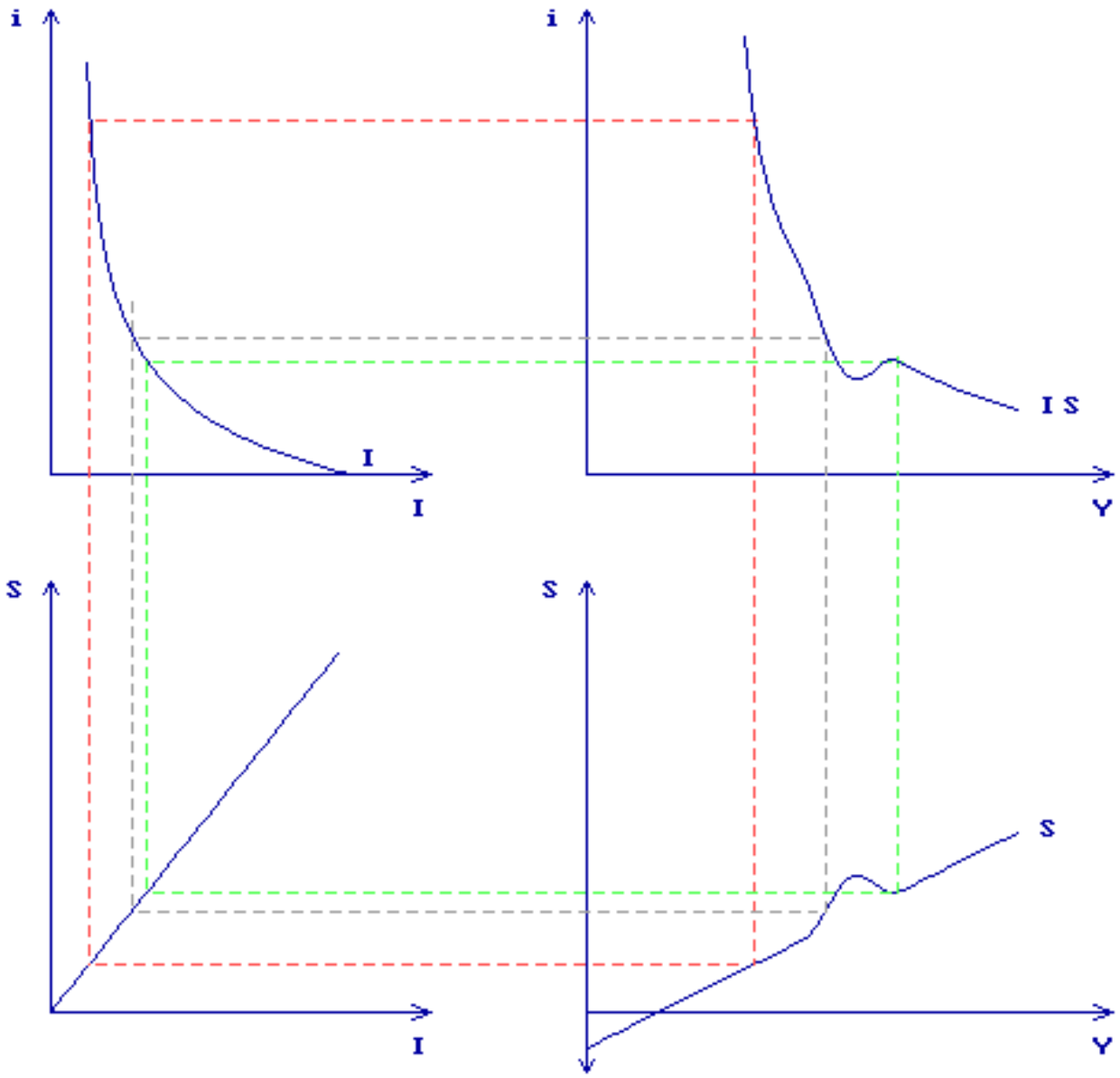

N
N*
N2
N1
C*
C
N
ωN/P+Ñ/P
Y
C
C=C
C
C
C(Y)
Y

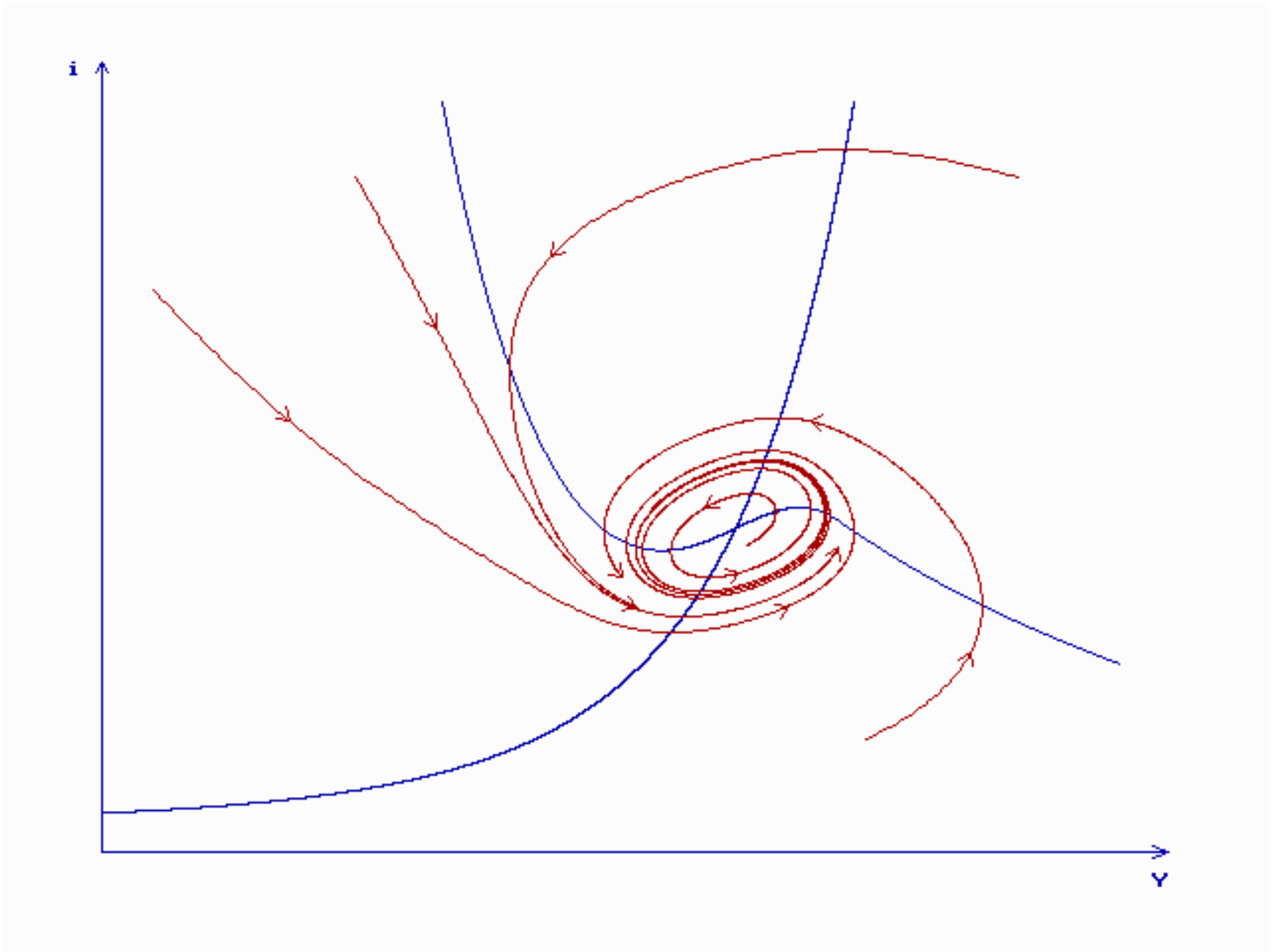
$$C = C\left(\bar{N}\right)$$

$$Y = \frac{W}{P}\bar{N} + \frac{\pi}{P}$$

$$C = C\left(\frac{P \cdot Y - \pi}{W}\right)$$

$$C = C(Y)$$


i
I
I
i
I S
Y
S
I
S
S
Y


i
Y

Poincaré-Bendixson:

Legyenek C_1 és C_2 zárt görbék a fázisískon, és D a köztük lévő tartomány. Ha

1. Ezeken nincs fixpont, és

2. A C_1-et és C_2-t keresztező pályagörbék belépnek D-be,

akkor D legalább egy határciklust tartalmaz.