

Endogenous money: a missing step in the Keynesian revolution

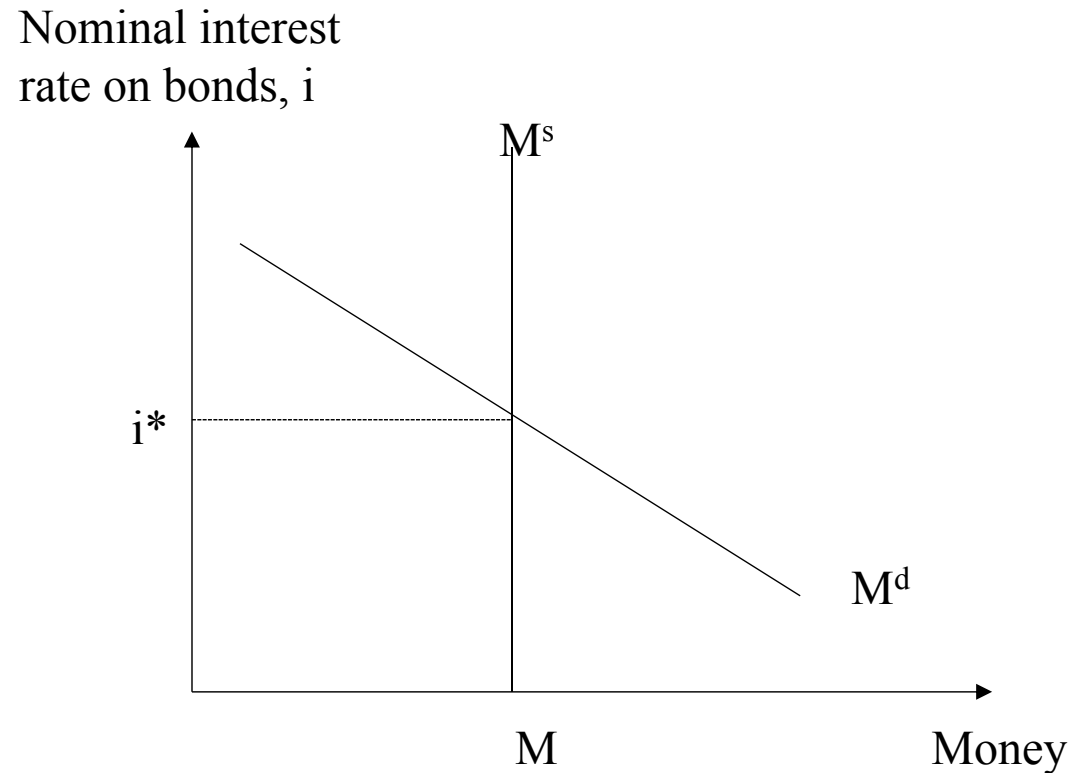
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Keynesian monetary theory reconsidered

Figure 1. Keynes' *General Theory* model of interest rate determination.

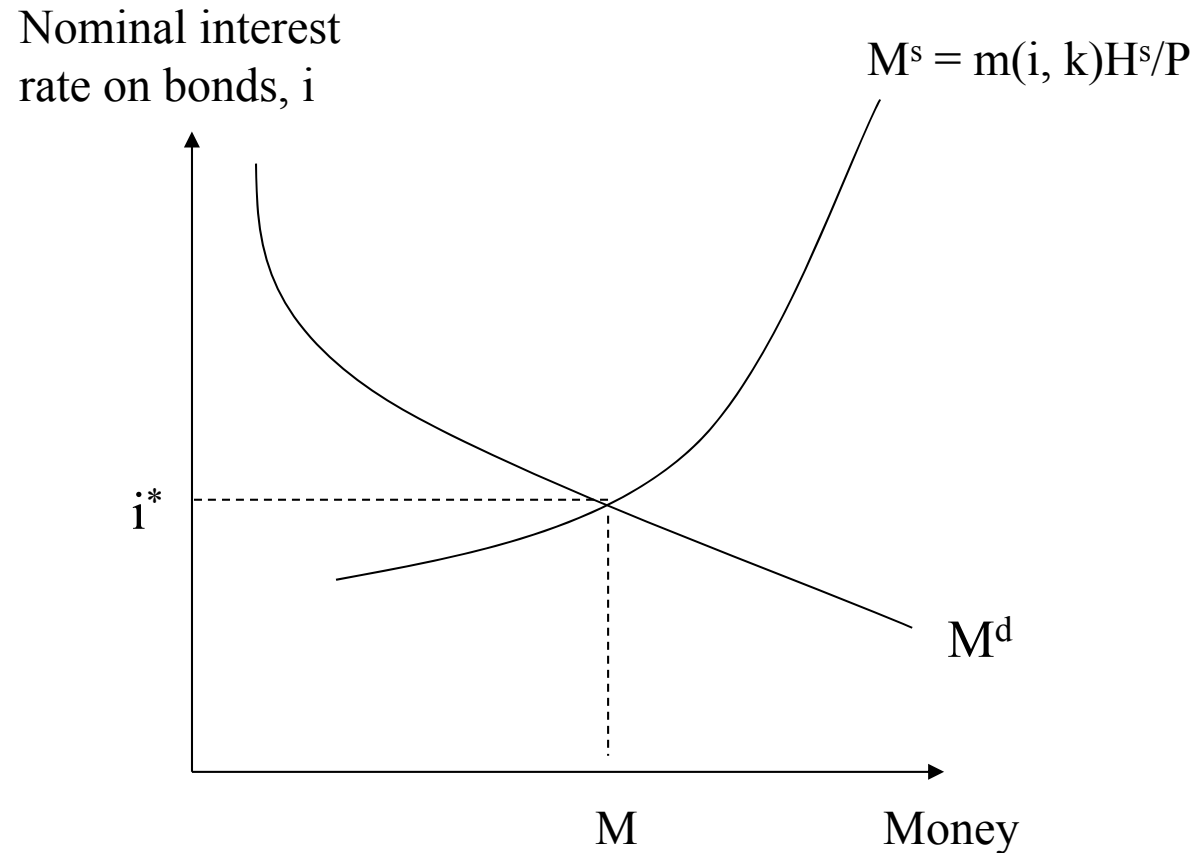


$$(1) M^s = M/P \quad (2) M^d = M(i, y, X) \quad (3) M^s = M^d \quad M_i < 0, M_y > 0, M_X > 0$$

M^s = real money supply, M = exogenous nominal money supply, P = general price level,

M^d = real money demand, i = nominal interest rate on bonds, y = real income, X = state of bearishness.

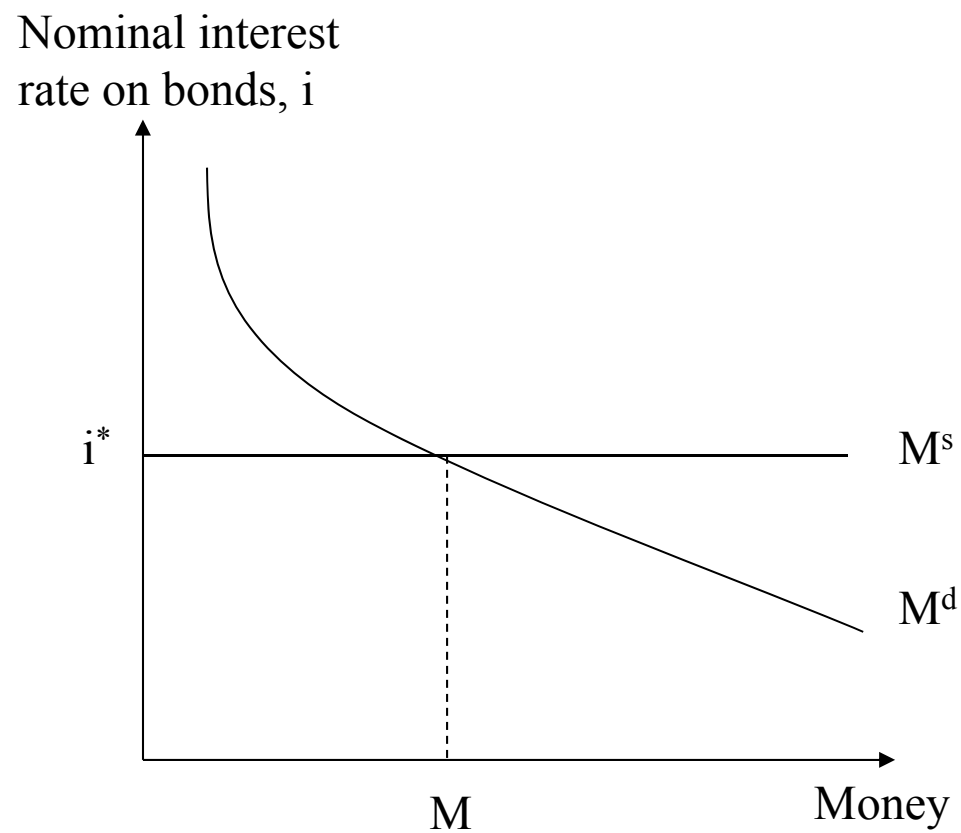
Figure 2. The neo-Keynesian model of the money supply process.



(5) $H^s = H/P$ (6) $M^s = m(i, k)H^s$ (7) $M^d = M(i, y, X)$ (8) $M^s = M^d$

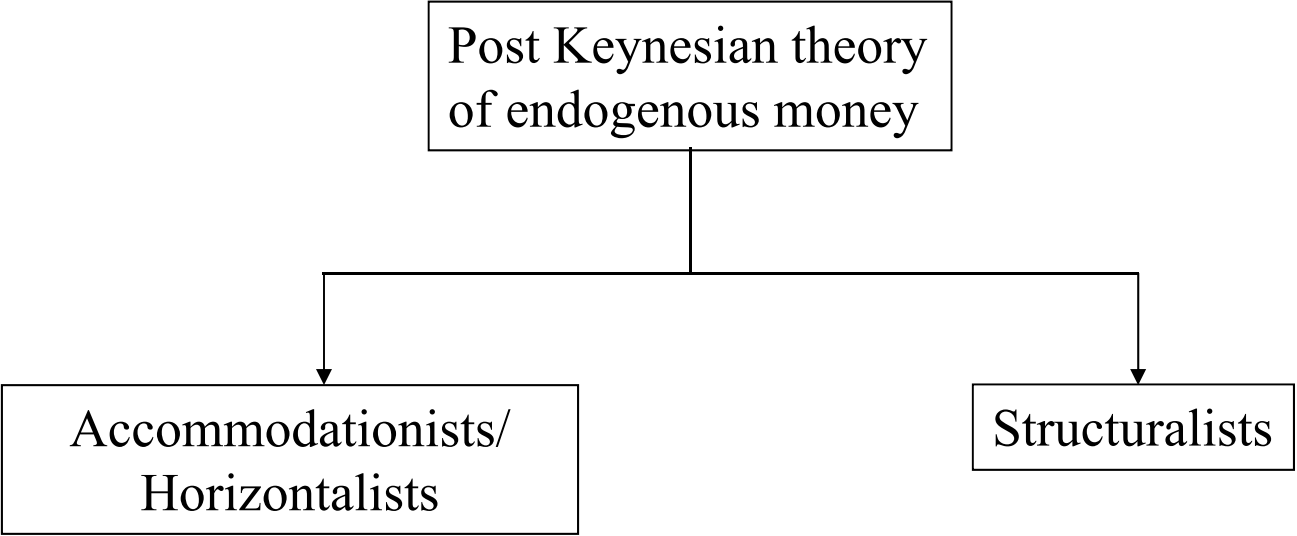
$m_i > 0$, $m_k < 0$, $M_i < 0$, $M_y > 0$, $M_X > 0$. H^s = real supply of outside money (liabilities of the central bank), H = exogenous nominal outside money supply, $m(\cdot)$ = money multiplier, k = reserve requirement ratio for inside money (bank deposits).

Figure 3. The neo-Keynesian model of the money supply process with interest rate targeting by the central bank.



Against monetarism: the origins of endogenous
money theory

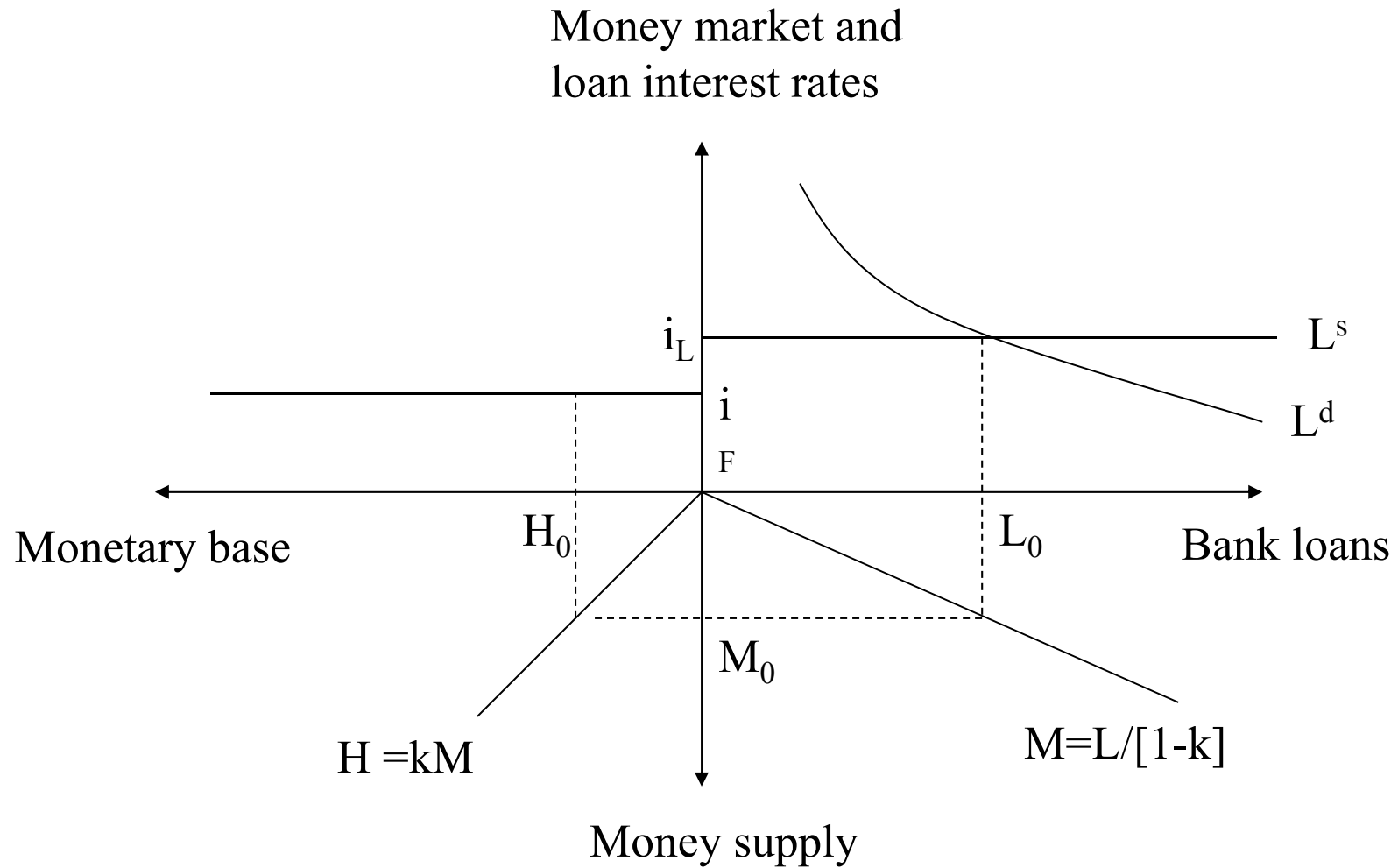
Figure 4. Competing approaches in the Post Keynesian theory of endogenous money supply.



The Horizontalist model

- (9) $i_L = [1 + m]i_F$
- (10) $L^d = L(i_L, \dots)$ $L_{i_L} < 0$
- (11) $L^s = L^d$
- (12) $L^s + R = M$
- (13) $R = kM$ $0 < k < 1$
- (14) $H = R$
- i_L = loan rate, m = bank mark-up, i_F = money market rate set by policy, L^d = loan demand, L^s = loan supply, R = required reserves, k = required reserve ratio.
- The solutions are:
- (15) $L = L([1+m]i_F, \dots)$
- (16) $M = L/[1-k]$
- (17) $H = kL/[1-k]$

Figure 5. The horizontalist model of the money supply process.



The structuralist model

- (20) $M^d = M(i_M, i_B, y, E, X)$
- $M_{i_M} > 0, M_{i_B} < 0, M_y > 0, M_X > 0, M_E > 0$
- (21) $L = L(i_L, y, A)$ $L_{i_L} < 0, L_{y-T} > 0, L_A > 0$
- (22) $L + kM = M + B$
- (23) $i_L = [1 + m(L)]i_F + c$ $m_L \geq 0$
- (24) $i_M = [1-k]i_F - z$
- (25) $H = N + B = kM$
- M = demand for real money balances (bank deposits), i_M = deposit interest rate, i_B = bond interest rate, y = real income, E = vector of expected future interest rates, X = state of bearishness (liquidity preference shift factor), H = supply of real high powered money, L = real loan demand, k = reserve requirement on deposits, N = non-borrowed reserves, B = borrowed reserves, i_L = loan interest rate, c = banks' cost per dollar of making loans, and z = cost per dollar of supplying deposits.
- Solutions are:
- (26) $M([1-k]i_F - z, i_B, y, X) = [L([1+m(L)]i_F + c, y, A) - B] / [1-k]$
- (27) $H = k[L(i_F + c, y, A) - B] / [1 - k]$

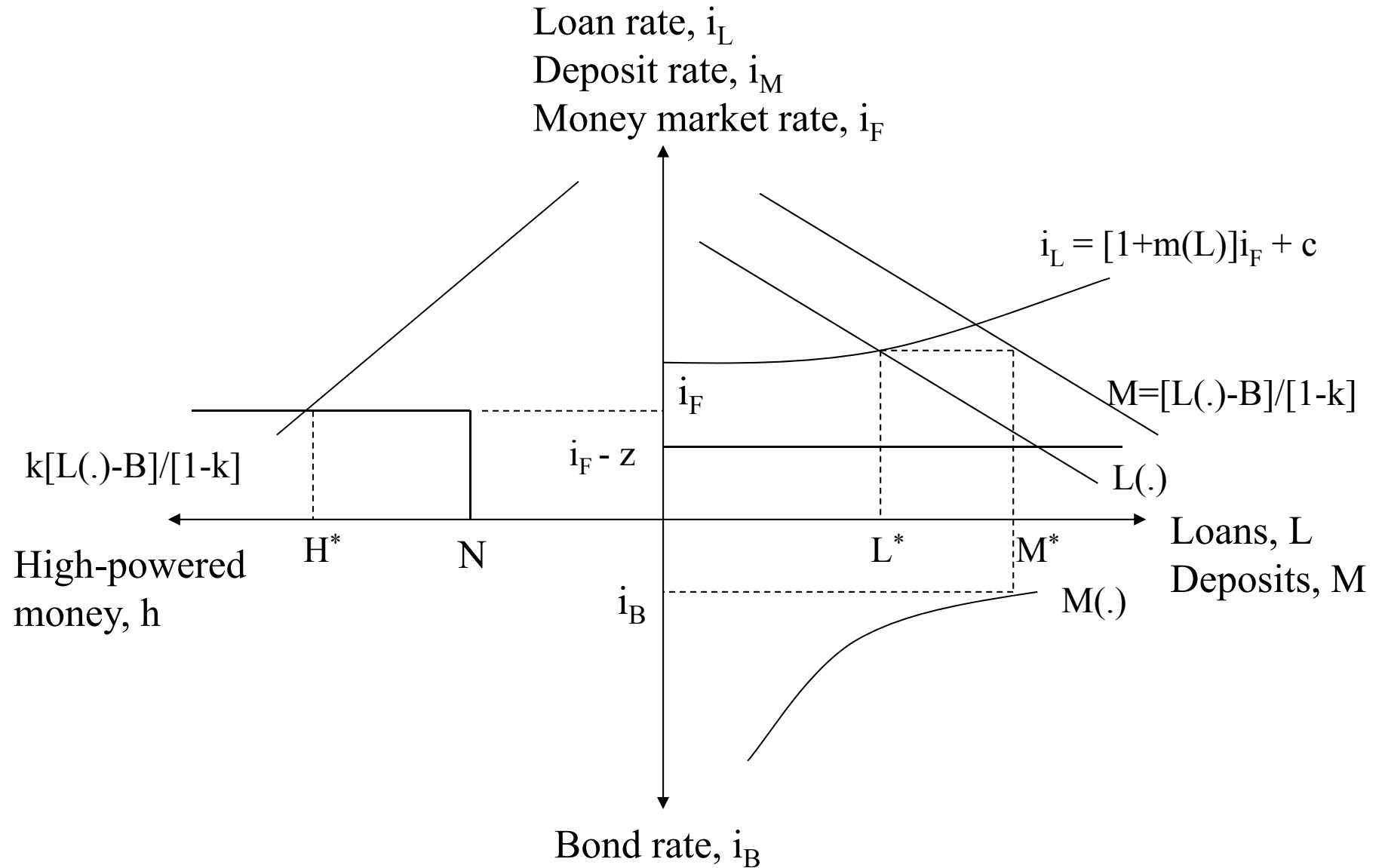
Refining the model - 29

- ***[A] Make loan demand a positive function of the bond rate:***
- (21.1) $L = L(i_L, i_B, y, A)$
- $L_{i_L} < 0, L_{i_B} < 0, L_{y-T} > 0, L_A > 0$
- ***[B] Credit rationing:***
- (21.2) $L = \theta(L/E, B/L, \dots)L(i_L, i_B, y, A)$
- $\theta =$ rationing coefficient $0 < \theta < 1, \theta_{L/E} < 0, \theta_{B/L} < 0.$
- ***[C] Endogenize the target interest rate:***

Monetary policy

- Arena #1 = the short-term interest rate (NW quadrant).
- Arena #2 = the long-term interest rate (SE quadrant).
- Arena #3 = credit markets (NE quadrant).

Figure 6. Determination of the supply of high-powered money, the money supply, bank lending, and interest rates.

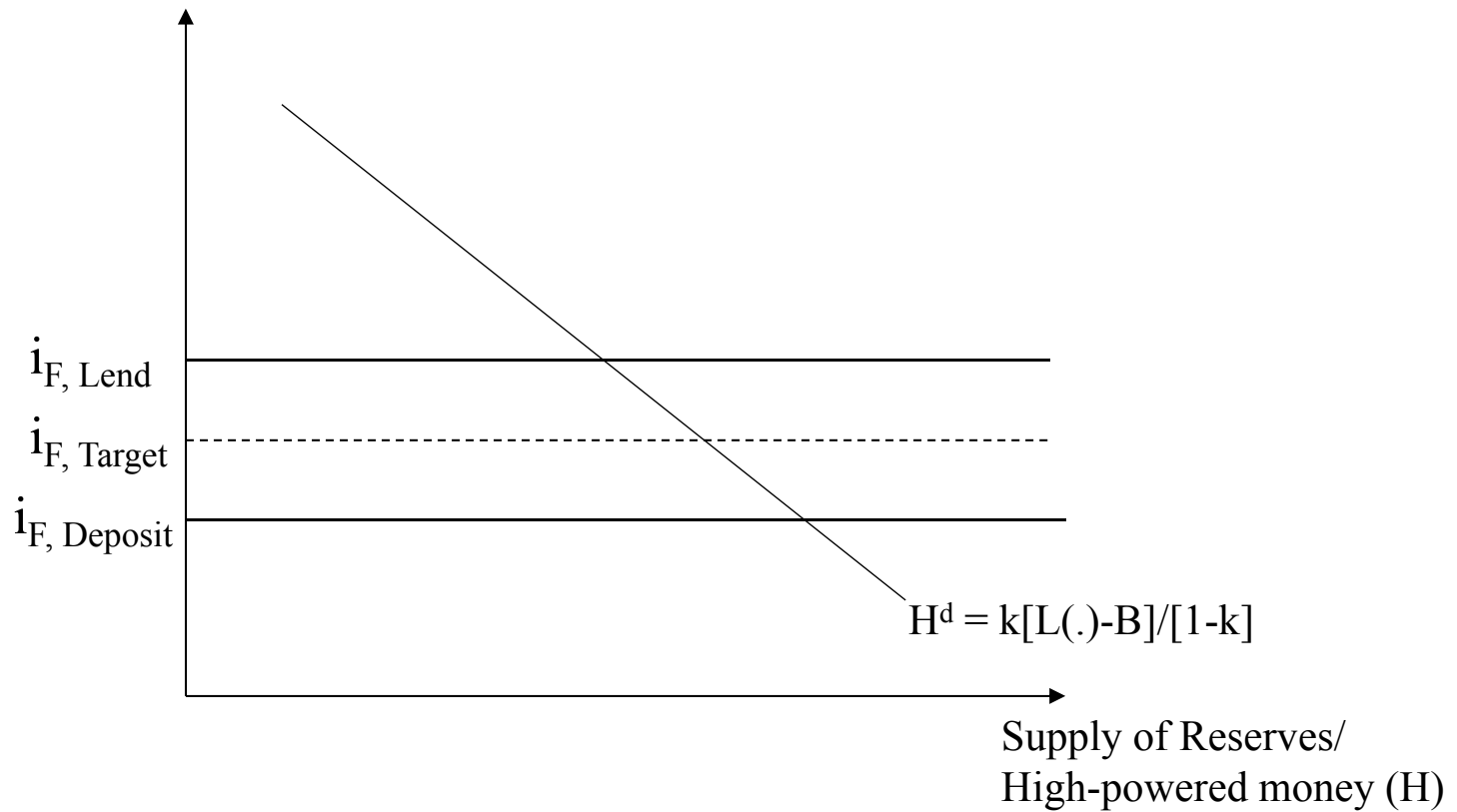


Arena #1

Short-term interest rate management:
the new corridor model

Figure 7. The “corridor” model of short-term interest rate management.

Central bank short-term interest rates



Arena #2

Long-term interest rate management:
permanent QE

Arena #3

Credit markets and Asset Based Reserve Requirements (ABRR)

- (1) What are ABRR?
- (2) How do ABRR improve monetary policy?
- (3) How can ABRR improve monetary policy in a currency union?
- (4) How can ABRR provide a superior exit strategy from QE?