

MR. KEYNES AND THE NEOCLASSICS: EQUATIONS
GEORGE H. BLACKFORD

I. Keynes' Aggregate Model

a. Behavioral Equations

- (1) $Y_t^w = P_t^c C_t / W_t + P_t^i I_t / W_t$
 $= C_t^w + I_t^w,$
- (2) $M_t^{wd} = m^d(Y_t^w, R_t), \quad m_1^d > 0, \quad m_2^d < 0,$
- (3) $M_t^{ws} = M_t / W_t$
 $= M_t^w.$
- (4) $A_t^{ws} = P_t^a A_t / W_t$
 $= A_t^w,$
- (5) $A_t^{wd} = a^d(P_t^a, R_t), \quad a_1^d, a_2^d < 0.$
- (6) $A_t^w = a^d(P_t^a, R_t),$
- (7) $P_t^a = a(R_t, A_t^w), \quad a_1, a_2 < 0.$
- (8) $P_t^{is} = i^s(I_t^w), \quad i^{s'} > 0.$
- (9) $P_t^{id} = i^d(I_t^w, R_t, P_t^a), \quad i_1^d, i_2^d < 0, \quad i_3^d > 0.$
- (10) $i^s(I_t^w) = i^{ad}(I_t^w, R_t, P_t^a) = P_t^i,$
- (11) $I_t^{wd} = i(R_t, P_t^a), \quad i_1 < 0, \quad i_2 > 0,$
- (12) $P_t^{cs} = c^s(C_t^w), \quad c^{s'} > 0.$
- (13) $P_t^{cd} = c^d(C_t^w, Y_t^w), \quad c_1^d < 0, \quad c_2^d > 0.$
- (14) $c^s(C_t^w) = c^d(C_t^w, Y_t^w) = P_t^c,$
- (15) $C_t^{wd} = c(Y_t^w), \quad 0 < c' < 1,$
- (16) $S_t^{wd} = Y_t^w - c(Y_t^w)$
 $= s(Y_t^w), \quad 0 < s' < 1,$
- (17) $Y_t^{wd} = C_t^{wd} + I_t^{wd}$
 $= c(Y_t^w) + i(R_t, P_t^a),$
- (18) $N_t^{wid} = n^{id}(I_t^{we}), \quad n^{id'} > 0,$
- (19) $N_t^{wcd} = n^{cd}(C_t^{we}), \quad n^{cd'} > 0,$

$$(20) \quad N_t^w = n^{id}(Y_t^{we}) + n^{cd}(Y_t^{we}) \\ = n(Y_t^{we}), \quad n' = 1,$$

$$(21) \quad Y_t^{we} = C_t^{we} + I_t^{we}.$$

$$(22) \quad Y_t^{ws} = n^{-1}(N_t^w), \quad n^{-1'} = 1,$$

$$(23) \quad Y_t^{wd} = c(n^{-1}(N_t^w)) + i(R_t, P_t^a) \\ = y^d(N_t^w, R_t, P_t^a), \quad y_1^d, y_3^d > 0, y_2^d < 0,$$

b. Dynamic Adjustment Functions

$$(24) \quad dR_t = g^r(M_t^{wd} - M_t^w) \\ = g^r(m^d(Y_t^w, R_t) - M_t^w),$$

$$(25) \quad dP_t^a = g^{pa}(A_t^{wd} - A_t^{sw}) \\ = g^{pa}(a^d(P_t^a, R_t) - A_t^w).$$

$$(26) \quad dC_t^{we} = g^{ec}(C_t^{wd} - C_t^{we}) \\ = g^{ec}(c^{d-1}(Y_t^w, P_t^{cs}) - C_t^{we})$$

$$(27) \quad dI_t^{we} = g^{ei}(I_t^{wd} - I_t^{we}) \\ = g^{ei}(i^{d-1}(P_t^i, R_t, P_t^a) - I_t^{we}),$$

$$(28) \quad dC_t^w = g^c(C_t^{we} - C_t^w)$$

$$(29) \quad dI_t^w = g^i(I_t^{we} - I_t^w)$$

$$(30) \quad dP_t^i = g^{pi}(P_t^{id} - P_t^{is}) \\ = g^{is}(i^d(I_t^w, R_t, P_t^a) - i^s(I_t^w)),$$

$$(31) \quad dP_t^c = g^{pc}(P_t^{cd} - P_t^{cs}) \\ = g^{pc}(c^d(C_t^w, Y_t^w) - c^s(C_t^w)).$$

$$(32) \quad dN_t^w = g^{nd}(Y_t^{we} - Y_t^{ws}) \\ = g^{nd}(Y_t^{we} - n^{-1}(N_t^w)),$$

$$(33) \quad dY_t^{we} = dC_t^{we} + dI_t^{we} \\ = g^{ec}(c^{d-1}(Y_t^w, P_t^{cs}) - C_t^{we}) + g^{ei}(i^{d-1}(P_t^i, R_t, P_t^a) - I_t^{we}),$$

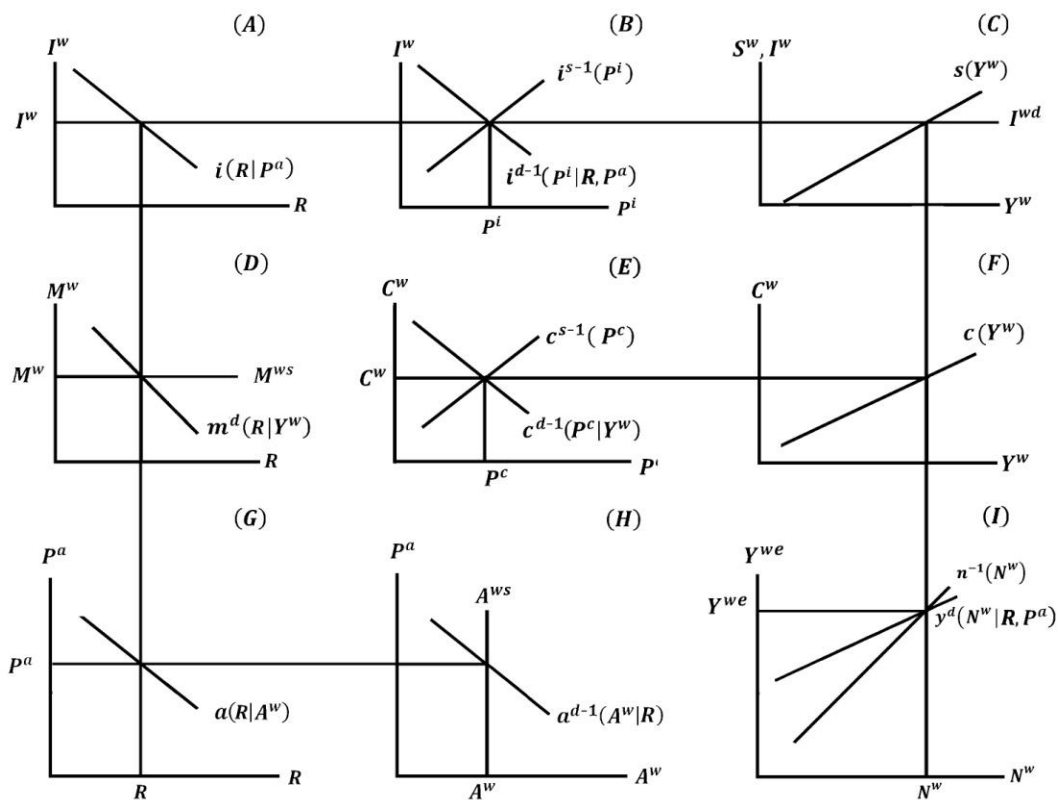
$$(34) \quad dY_t^w = dC_t^w + dI_t^w$$

$$= g^c(C_t^{we} - C_t^w) + g^i(I_t^{we} - I_t^w).$$

c. Structure of Keynes' Aggregate Model

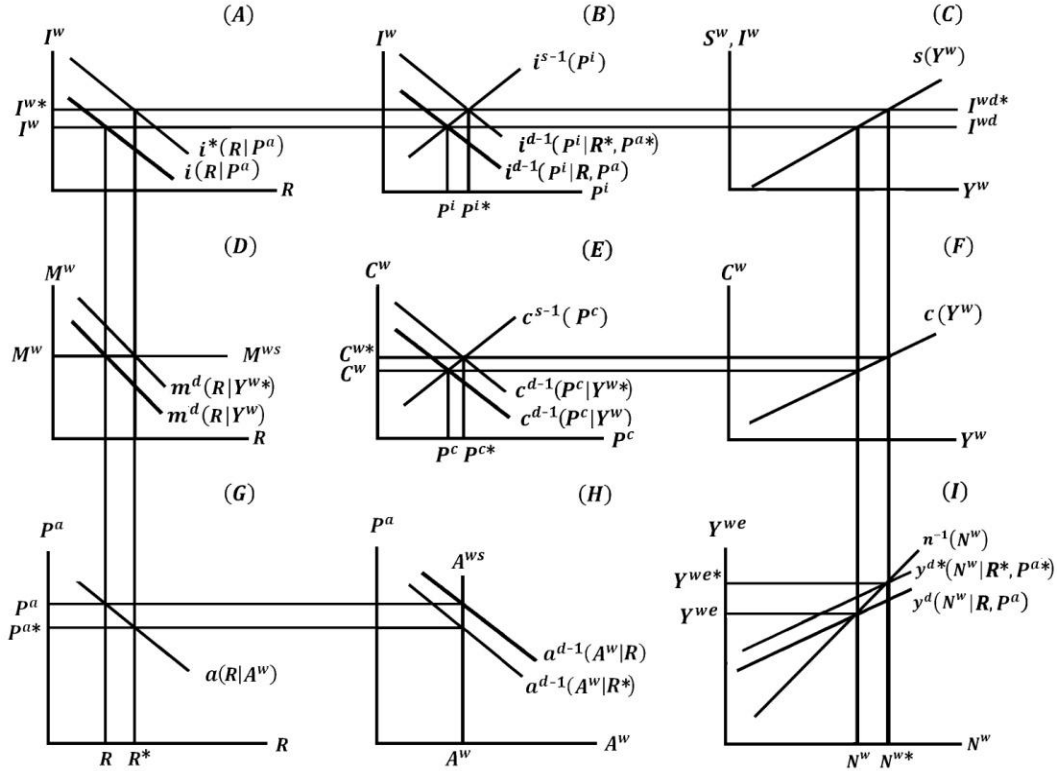
Table 1: Structure of Keynes' Aggregate Model				
Market	Equilibrium Conditions		Behavioral Variables	Endogenous Variables
Assets	$M_t^{wd} = M_t^w$	$A_t^{wd} = A_t^w$	M_t^{wd}, A_t^{wd}	R_t, P_t^a
Investment	$I_t^{we} = I_t^{wd}$	$I_t^{we} = I_t^w$	$I_t^{wd}, P_t^{id}, P_t^{is}$	I_t^{we}, I_t^w, P_t^i
	$P_t^{id} = P_t^{is}$			
Consumption	$C_t^{we} = C_t^{wd}$	$C_t^{we} = C_t^w$	$C_t^{wd}, P_t^{cd}, P_t^{cs}$	C_t^{we}, C_t^w, P_t^c
	$P_t^{cd} = P_t^{cs}$			
Labor	$Y_t^{ws} = Y_t^{we}$		Y_t^{ws}	N_t^w
Identities	$Y_t^{we} = C_t^{we} + I_t^{we}$			Y_t^{we}
	$Y_t^w = C_t^w + I_t^w$			Y_t^w

Figure 1: Short-Run Equilibrium.



d. Causality and Dynamics in Keynes' General Theory

Figure 2: Achieving Short-Run Equilibrium.



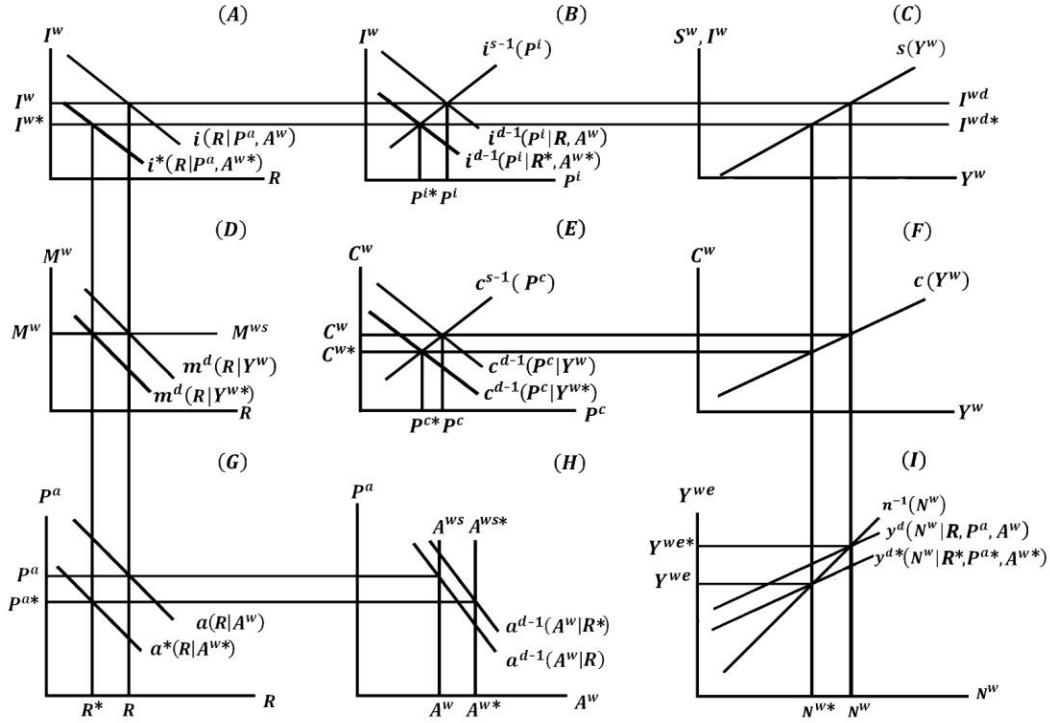
II. Long-Run Equilibrium

(9a) $P_t^{id} = i^d(I_t^w, R_t, P_t^a, A_t^w)$, $i_1^d, i_2^d, i_4^d < 0, i_3^d > 0$

(11a) $I_t^{wd} = i(R_t, P_t^a, A_t^w)$, $i_1, i_2, i_3 < 0$,

(23a) $Y_t^{wd} = y^d(N_t^w, R_t, P_t^a, A_t^w)$, $y_1^d, y_3^d > 0, y_2^d, y_4^d < 0$.

Figure 3: Toward Long-Run Equilibrium.



III. Mr. Keynes and the 'NeoClassics'

a. Hicks' Two-Good Model

$$(35) \quad C = f^c(N^c), \quad f^{c'} > 0, \quad f^{c''} < 0$$

$$(36) \quad I = f^i(N^i), \quad f^{i'} > 0, \quad f^{i''} < 0,$$

$$(37) \quad P^c = W/f^{c'}(N^c), \quad \partial P^c / \partial N^c > 0$$

$$(38) \quad P^i = W/f^{i'}(N^i), \quad \partial P^i / \partial N^i > 0.$$

$$(39) \quad Y^c = P^c f^c(N^c)$$

$$= W f^c(N^c) / f^{c'}(N^c), \quad \partial Y^c / \partial N^c > 0$$

$$(40) \quad Y^i = P^i f^i(N^i)$$

$$= W f^i(N^i) / f^{i'}(N^i), \quad \partial Y^i / \partial N^i > 0$$

$$(41) \quad Y = P^c f^c(N^c) + P^i f^i(N^i) \\ = W f^c(N^c)/f^{c'}(N^c) + W f^i(N^i)/f^{i'}(N^i),$$

$$(42) \quad M = kY,$$

$$(43) \quad Y^i = i(R), \quad i' < 0,$$

$$(44) \quad Y^i = s(Y, R), \quad s_1 > 0, \quad s_2 < 0,$$

$$(45) \quad M = m^d(Y, R), \quad m_1^d > 0, \quad m_2^d < 0.$$

$$(46) \quad Y^i = i^*(Y, R), \quad i_1^* > 0, \quad i_2^* < 0.$$

$$(47) \quad i^*(Y, R) = s(Y, R).$$

b. Keynesian One-Good Model

$$(48) \quad Q = f(N), \quad f' > 0, \quad f'' < 0$$

$$(49) \quad P = W/f'(N), \quad \partial P/\partial N > 0$$

$$(52) \quad Y = Pf(N) \\ = Wf(N)/f'(N), \quad \partial Y/\partial N > 0,$$

c. Deriving Hicks' Model from Keynes' Model

$$(51) \quad s(Y_t^w) = i(R_t, P_t^a).$$

$$(52) \quad M_t^w = m^d(Y_t^w, R_t).$$

IV. NeoClassics on Changes in the Money Wage

V. Keynes on Changes in the Money Wage

Figure 4: Equilibrium Employment and Output.

