The Classical Model versus the Keynesian Model of Income and Interest Rate Determination

	Classical	Keynesian
goods market	$I(r) = S(r)$	$I(r) = S(Y)$
	or $I(r) = Y - C(r)$	or $I(r) = Y - C(Y)$
money market	$M = kPY$	$\overline{M} = kPY + L(r)$
production function	$Y = Y(N, \overline{K})$	$Y = Y(N, K)$
labour market	$D(\frac{W}{P}) = S(\frac{W}{P})$	$N^D(\frac{W}{P}) = N^S(\frac{W}{P})$

Three major differences:

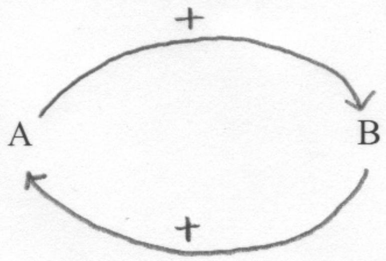
	Classical	Keynesian
	(1) no induced consumption (consumption as a residual decision after saving)	**induced consumption** (positive **"feedback"** between C and Y)
	reflecting behaviour of different income groups?	
	feedback ***CYBERNETICS***	
	(2) no multiplier effect	**multiplier effect**
	important implications for autonomous expenditure including G	
	(3) "classical dichotomy" between the goods and the money markets	**interaction between the goods and the money markets**

*Read Brian Morgan, chapter 2.

2

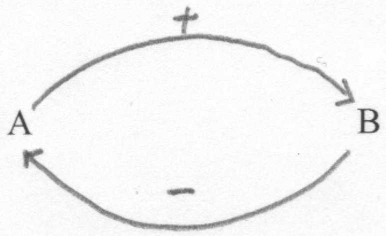
Cybernetics: Different forms of Feedback

Positive feedback



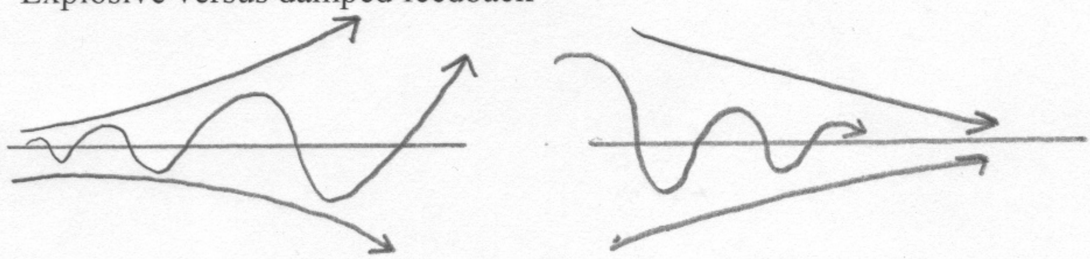
e.g.

Negative feedback



e.g.

Explosive versus damped feedback



Keynesian multiplier effect as a damped positive feedback: the multiplier is $> 1 < \infty$.

2

National Income Determination and the Wealth Effect: the IS-LM Model

The IS-LM model is a behavioural model with an identity and separate functions for key variables, some of which are endogenous (determined within the model) while others are exogenous (not determined by the model and therefore assumed to be independent).

IS

(1) IS curve: the equilibrium locus of the goods market, tracing out the relationship between income Y and interest rate r.

$Y \equiv C + I + G$	(identity)
$C = c_0 + c(Y - T)$	(endogenous)
$T = t_0 + tY$	(endogenous)
$G = \overline{G}$	(exogenous)
$I = i_0 - fr$	(endogenous)

By substitution

$$Y = c_0 + c[Y - (t_0 + tY)] + i_0 - fr + \overline{G}$$

$$r = \frac{c_0 - ct_0 + i_0 + \overline{G} - Y[1 - c(1 - t)]}{f}$$ **(IS curve without wealth effect)**

$$Y = \frac{1}{1 - c(1 - t)}(c_0 - ct_0 + i_0 + \overline{G}) - \frac{f}{1 - c(1 - t)} r$$

(IS curve without wealth effect)

Multiplier: $\frac{1}{1 - c(1 - t)} = \frac{1}{1 - c + ct}$

When tax is imposed lump-sum, i.e. $T = t_0$:

$$Y = C + I + G$$

$$= c_0 + c(Y - t_0) + i_0 - fr + \overline{G}$$

r = $\frac{c_0 - ct_0 + i_0 + \overline{G} - Y(1-c)}{f}$

Y = $\frac{1}{1-c}(c_0 - ct_0 + i_0 + \overline{G}) - \frac{f}{1-c} r$

Multiplier: $\frac{1}{1-c}$, which is greater than $\frac{1}{1-c+ct}$. So lump-sum tax produces a larger multiplier.

(2) Wealth augmented consumption function:

C = $c_o + c\,(Y - T) + jW$

working out: r = $\frac{1}{f}(c_0 - ct_0 + i_0 + \overline{G} + jW) - \frac{1-c(1-t)}{f} Y$

Y = $\frac{1}{1-c(1-t)}(c_0 - ct_0 + i_0 + \overline{G} + jW) - \frac{f}{1-c(1-t)} r$

(IS curve <u>with</u> wealth effect)

LM

(2) LM curve: the equilibrium locus of the money market, tracing out the relationship between income Y and interest rate r.

<u>Neglecting the price and the Pigou (price) Effect</u>

$M_s \equiv M_d$	(identity—equilibrium condition)
$M_d = hY - lr + gW$	(endogenous)
$M_s = \overline{M}$	(exogenous)
r = $-\frac{1}{l}\overline{M} + \frac{h}{l} Y$	**(LM curve without wealth effect)**

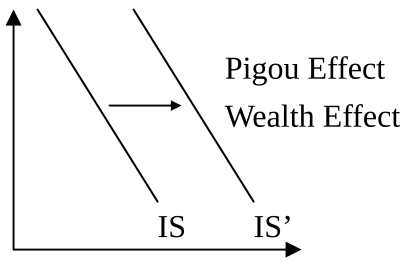
$$Y = \frac{1}{h}\overline{M} + \frac{l}{h}r$$ **(LM curve without wealth effect)**

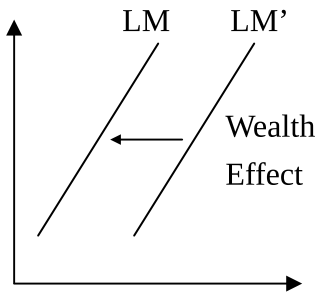
Adding the wealth effect to the money demand
Function:

$$M_d = hY - lr + gW$$

$$r = \frac{g}{l}W - \frac{1}{l}\overline{M} + \frac{h}{l}Y$$ **(LM curve <u>with</u> wealth effect)**

$$Y = \frac{1}{h}\overline{M} - \frac{g}{h}W + \frac{l}{h}r$$ **(LM curve <u>with</u> wealth effect)**





Saving the inadequacy
of Keynesian effect in
face of wage rigidity

<u>IS-LM equilibrium with wealth effect</u>

$$\frac{1}{f}(c_0 - ct_0 + i_0 + \overline{G} + jW) - \frac{1-c(1-t)}{f}Y = \frac{g}{l}W - \frac{1}{l}\overline{M} + \frac{h}{l}Y$$

$$\left[\frac{h}{l} + \frac{1-c(1-t)}{f}\right]Y = \frac{1}{f}(c_0 - ct_0 + i_0 + \overline{G} + jW) + \frac{1}{l}\overline{M} - \frac{g}{l}W$$

$$\frac{hf + l[1-c(1-t)]}{lf}Y = \frac{1}{f}(c_0 - ct_0 + i_0 + \overline{G} + jW) + \frac{1}{l}\overline{M} - \frac{g}{l}W$$

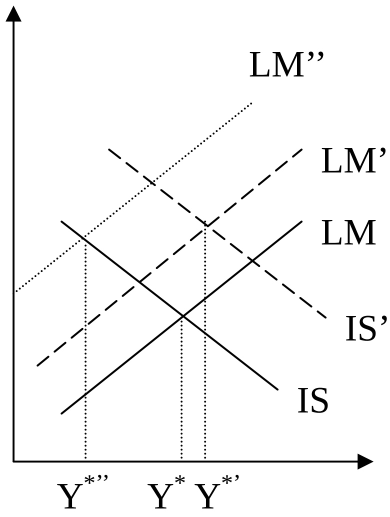
$$Y = \frac{lf}{hf + l[1 - c(1-t)]}\frac{1}{f}(c_0 - ct_0 + i_0 + \overline{G} + jW) +$$

$$\frac{lf}{hf + l[1 - c(1-t)]}\frac{1}{l}\overline{M} - \frac{lf}{hf + l[1 - c(1-t)]}\frac{g}{l}W$$

$Y^* =$

$$\frac{l}{hf + l[1 - c(1-t)]}(c_0 - ct_0 + i_0 + \overline{G} + jW) -$$

$$\frac{f}{hf + l[1 - c(1-t)]}gW + \frac{f}{hf + l[1 - c(1-t)]}\overline{M}$$



The relative effectiveness of fiscal versus monetary policy (i.e. the relative size of the fiscal multiplier versus the monetary multiplier) depends on the size of $l \gtreqless f$?

Repeat: the multiplier is a kind of damped positive feedback.