

IS-LM模型與總合需求*

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*授課講義非經同意請勿引用
[主要取材自Mishkin (2019)
chp.21 & 22、李榮謙(2019)第
十六章、Mankiw (2019) chp.13]

2021/8/17

IS-LM模型與總合需求

3

0 前言

- the Great Depression of the 1930s... the recession of 2007–2009都跟總合需求(aggregate demand, AD)大幅收縮有關
 - **John Maynard Keynes** in his revolutionary book *The General Theory of Employment, Interest, and Money*, published in 1936, in which he argued that short-run changes in aggregate output, such as the decline in output that occurred during the Great Depression, are determined by changes in **aggregate demand**
- IS-LM模型係架構與了解AD曲線的基礎
 - The concept of aggregate demand is a central element in the *aggregate demand–aggregate supply (AD/AS) model*, ... used to explain short-run fluctuations in aggregate output
 - Make use of the *IS* curve to understand the role played by monetary policy in economic fluctuations (短期經濟現象)

2021/8/17

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2

1 計畫(預擬)支出與總合需求

- **planned expenditure**, the total amount that households, businesses, the government (居民), and foreigners (非居民) **want to** spend on domestically produced goods and services
 - in contrast, **actual expenditure** (實際支出) is the amount that these entities actually do spend, which equals the total amount of output produced in the economy (總支出=總所得=總產出)
 - Note: all of the analysis... refers to **expenditure in real terms**, that is, in terms of actual physical amounts of goods and services
 - Keynes viewed **aggregate demand**, the total amount of output demanded in the economy, as **being the same as planned expenditure**
 - ... the goods (含服務) **market is in equilibrium**, that is, when aggregate demand for goods and services is equal to the actual amount of goods and services produced

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3

1

- The total amount of aggregate demand (planned expenditure) is the sum of four types of spending:
 - **1.** Consumption expenditure (*C*), the total demand for consumer goods and services (e.g., hamburgers, iPhones, ... , visits to the doctor, etc.)
 - **2.** Planned investment spending (*I*), the total planned spending by businesses on new physical capital (e.g., machines, computers, factories), plus planned spending on new homes
 - **3.** Government purchases (*G*), the spending by all levels of government on goods and services (e.g., aircraft carriers, salaries of government employees, red tape), not including transfer payments (which redistribute income from one person to another)
 - **4.** Net exports (*NX*), the net foreign spending on domestic goods and services, equal to exports minus imports

$$Y^{ad} = C + I + G + NX \quad (1)$$

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4

2 總合需求的組成項目

- 2-1 消費支出(consumption expenditure)
- 消費函數
 - Keynes called the relationship between disposable income YD and consumption expenditure C the consumption function
 - $$C = \bar{C} + mpc \times (Y - T) \quad (3)$$
 - 其中，可支配所得 $YD = Y - T$ ； \bar{C} 為自發性消費支出，屬外生變數； \bar{C} is related to consumers' optimism about their future income and household wealth, both of which are positively related to consumer spending
 - mpc , the marginal propensity to consume, reflects the change in C that results from an additional dollar of YD
 - Keynes assumed that mpc was a constant between the values of 0 and 1

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5

2-2 計畫投資支出

- 2-2.1 固定投資(或稱固定資本形成)
 - Fixed investment is planned spending by firms on equipment (machines, computers, airplanes) and structures (factories, office buildings, shopping centers), plus planned spending on new residential housing
- 2-2.2 存貨投資(即存貨變動)
 - Inventory investment is spending by firms on additional holdings of raw materials, parts, and finished goods, calculated as the change in holdings of these items in a given time period—say, a year
 - some inventory investment can be unplanned (in contrast, fixed investment is always planned)
 - The act of adjusting production to eliminate unplanned inventory investment plays a key role in the determination of aggregate output

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6

2-2.3 計畫投資支出與實質利率

- Keynes considered the level of **the real interest rate** for investments as a key determinant of planned investment spending
 - 融通投資的資金皆須負擔利率成本(無論是自有資金或借貸自市場與銀行的資金)
 - when the real interest rate for investments and hence the cost of borrowing are low, business firms are more likely to undertake investments in physical capital, and planned investment spending increases (利率相對低，則可能獲利的投資選擇也變多)
 - Even if a company has surplus funds... its planned investment spending still will be affected by the real interest rate for investments
 - If the real interest rate on this security were high—say, 10%—the **opportunity cost** (forgone interest earnings) of an investment in physical capital would be high... Planned investment spending would then be low

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7

2-2.4 計畫投資支出與預期心理(經濟展望)

- Keynes also believed that planned investment spending is heavily influenced by business expectations about the future
 - Businesses that are optimistic about future profit opportunities are willing to spend more, whereas pessimistic businesses cut back their spending
 - Thus Keynes posited a component of planned investment spending, which he called **autonomous investment**, I -bar (外生，無關 Y 或 r)
 - Keynes believed that changes in autonomous spending are dominated by these unstable exogenous fluctuations... , which are influenced by emotional waves of optimism and pessimism—factors he labeled “**animal spirits**” (動物本能)
 - His view was colored by the collapse in investment spending during the Great Depression, which he saw as the primary reason for the economic contraction

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8

2-2.5 投資函數

$$I = \bar{I} - d(r + \bar{f}) \quad (6)$$

- 其中， d 為給定的參數， r 為實質利率(note: 短期物價僵固下， r 無異於名目利率 i)， \bar{f} 為金融摩擦(financial frictions)參數
- the real interest rate r on short-term, safe, debt instruments, which is controlled by the **central bank**
- **financial frictions**, ... which are additions to the real cost of borrowing caused by barriers to the efficient functioning of financial markets (the origins of these frictions—the **asymmetric information problems of adverse selection and moral hazard**)
- Financial frictions make it harder for lenders to ascertain the creditworthiness of a borrower... which leads to an increase in the **credit spread**, the difference between the interest rate on loans to businesses and the interest rate on completely safe assets that are sure to be paid back

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9

2-3 政府購買支出與課稅收入

• 2-3.1 政府購買支出

- assume that government purchases are exogenous

$$G = \bar{G} \quad (7)$$

• 2-3.2 課稅

- The government affects spending through taxes because, ... disposable income is equal to income minus taxes, $Y - T$, and disposable income affects consumption expenditure
- to keep the model simple, we assume that government taxes are exogenous

$$T = \bar{T} \quad (8)$$

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10

2-4 淨輸出

• 2-4.1 利率、匯率與淨輸出(NX)

• Real interest rates influence the amount of net exports through the exchange rate

- 例如When U.S. real interest rates **rise**, U.S. dollar assets earn higher returns relative to foreign assets \Rightarrow People then want to hold more dollars (deposits) \Rightarrow they bid up the value of a dollar ... relative to the values of other currencies (利率平價機制)
- A rise in the value of the dollar makes U.S. exports more expensive in foreign currencies... $\Rightarrow NX \downarrow$

• 利率、匯率與資本移動(CF=NX)

- 已知衍生性外匯市場均衡: $NX(e) = CF(r)$
- **Note:** 在短期物價僵固下， $e = \varepsilon$ (即名目與實質匯率無異)

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11

2-4.1

- 若本國 $r \uparrow \Rightarrow CF \downarrow$ 、外匯衍生淨需求 $\downarrow \Rightarrow e \uparrow$ (即本幣升值) $\Rightarrow NX \downarrow$
- 結果同前，亦即**利率與淨輸出呈反相關**

• 2-4.2 自發性淨輸出

- 淨輸出中，跟利率與匯率無直接關係的部分
- 該部分可能受季節因素或外國景氣與所得變化的影響，為外生變數，用 $NX\text{-bar}$ 表示

• 2-4.3 淨輸出函數

$$NX = \bar{NX} - xr \quad (9)$$

- where x is a parameter that indicates how net exports respond to the real interest rate

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12

3 商品市場均衡

- Note: 「商品」意指「商品與服務」(goods and services)
 - 服務係供消費；勞務(labor)則供生產用
- Keynes recognized that equilibrium will occur in the economy when the total quantity of output is equal to the total amount of aggregate demand (planned expenditure)
- $Y = Y^{ad}$ (10)
- 商品市場均衡關係
- $Y = C + I + G + NX$ (11)
- 將(3)(6)(7)(8)(9)等式帶入(11)式導出:

$$Y = [\bar{C} + \bar{I} - \bar{d}\bar{f} + \bar{G} + \bar{NX} - mpc \times \bar{T}] \times \frac{1}{1 - mpc} - \frac{d + x}{1 - mpc} \times r \quad (12)$$

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13

4 IS曲線

- We refer to (12) as the *IS curve*,
- and it shows the relationship between aggregate output (Y) and the real interest rate (r) when the goods market is in equilibrium
 - the first term tells us about shifts in the *IS curve* (跟自發性支出等外生變數有關)
 - The second term tells us that an increase in real interest rates results in a decrease in output, which can be shown as a **movement along the IS curve**
- the *IS curve is downward-sloping*
 - As the r rises, planned investment spending and net exports fall, which in turn lowers AD ; aggregate output Y must be lower if it is to equal aggregate demand and satisfy goods market equilibrium

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14

4-1 IS曲線－數值例子

- 數值如左⇒IS曲線如下:

$$Y = \frac{4.8}{0.4} - \frac{0.4}{0.4} \times r = 12 - r$$

- 如次圖...

$$(13) \begin{aligned} \bar{C} &= \$1.4 \text{ trillion} \\ \bar{I} &= \$1.2 \text{ trillion} \\ \bar{G} &= \$3.0 \text{ trillion} \\ \bar{T} &= \$3.0 \text{ trillion} \\ \bar{NX} &= \$1.3 \text{ trillion} \\ \bar{f} &= 1 \\ mpc &= 0.6 \\ d &= 0.3 \\ x &= 0.1 \end{aligned}$$

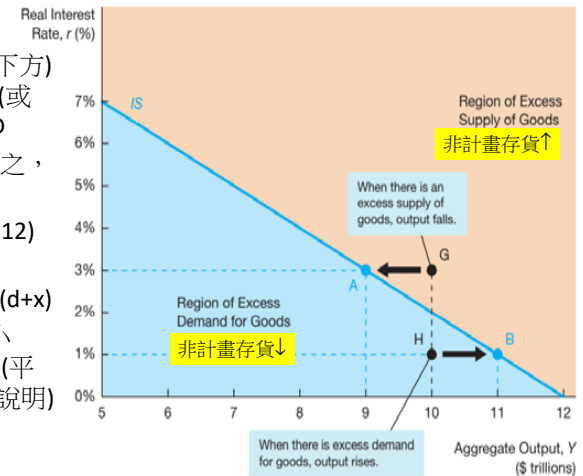
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15

IS曲線

- IS曲線的左邊(或下方)反映Y<AD；右邊(或上方)則表示Y>AD
- 若Y<AD，Y↑；反之，若Y>AD，Y↓
- IS曲線的斜率(見(12)式)：
- $\Delta r/\Delta Y = -(1-mpc)/(d+x)$
- 若mpc、d或x愈小(大)，IS曲線愈陡(平坦)(見次頁: 補充說明)



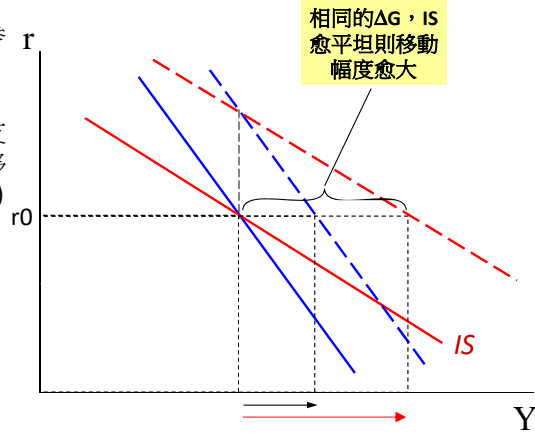
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16

補充說明－ IS斜率與財政政策效果

- Mpc 愈大，IS愈平坦 (如圖紅色IS曲線，參見(12)式)
- 在既定 $r=r_0$ ，IS因 $\Delta(G\text{-bar})>0$ (即政府支出增加)而使IS向右移動幅度等於(參見(12)式)
- $\Delta Y/\Delta(G\text{-bar})=1/(1-mpc)$
- 當 mpc 愈大，該移動幅度愈大
 - 比較紅色與藍色IS曲線如圖



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17

4-2 商品市場均衡及其調整機制

- Note: 短期物價僵固，須賴數量調整來達成市場均衡
- The concept of **equilibrium** is useful only if there is a tendency for the economy to settle there
- 若 $Y > Y^{ad}$ (如前途G點)，非計畫存貨 \uparrow ， $Y \downarrow$ (直到A點)
- 若 $Y < Y^{ad}$ (如前途H點)，非計畫存貨 \downarrow ， $Y \uparrow$ (直到B點)

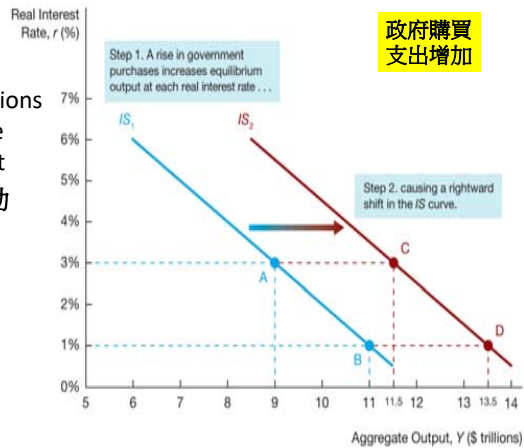
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18

5 影響IS曲線移動的因子

- Note: the IS curve describes equilibrium points in the goods market—the combinations of the real interest rate and equilibrium output
- 5-1 政府購買支出變動



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19

5

- 5-2 課稅變動
 - 若 $T \uparrow$ ，IS左移；反之，若 $T \downarrow$ ，IS右移(類似前圖)
- 5-3 自發性支出變動

Variable	Change in Variable	Shift in IS Curve	Reason
Autonomous consumption expenditure, \bar{C}	\uparrow		$C \uparrow Y \uparrow$
Autonomous investment, \bar{I}	\uparrow		$I \uparrow Y \uparrow$
Government spending, \bar{G}	\uparrow		$G \uparrow Y \uparrow$

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20

5

• 5-3 自發性支出變動(cont.)

Taxes, \bar{T}	↑		$T \uparrow \Rightarrow C \downarrow Y \downarrow$
Autonomous net exports, \bar{NX}	↑		$\bar{NX} \uparrow Y \uparrow$
Financial frictions, \bar{f}	↑		$f \uparrow Y \downarrow$

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5-4 IS曲線與可貸資金市場*

(a) 可貸資金市場 (b) IS 曲線

Why? $Y \downarrow \Rightarrow S \downarrow \Rightarrow S < I+CF \Rightarrow r \uparrow$

030111 總合需求(I) 22

5-4.1 財政擴張政策($\Delta G > 0$)、可貸資金與IS曲線移動

相較於IS₂, $S < I+CF$

IS曲線右移

030111 總合需求(I) 23

6 LM曲線與貨幣政策

- LM曲線表示貨幣市場上利率與所得水準(即總需求)的關係
 - 說明貨幣市場對總合需求的影響

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6 LM曲線與貨幣政策

6-1 貨幣需求

- 兩種類型的貨幣需求
- (1) 交易性需求(transactions demand for money): 主要受所得Y大小的影響；AEE，Y愈大(小)，交易性需求愈大(小)
- 影響交易性需求的其他因素: 機會成本、其他可行支付方式
- (2) 資產組合需求(portfolio demand for money): 受利率i (即r)低的影响；AEE，i↓(or↑) ⇒ 資產組合(貨幣)需求
- Note: 當i↓(or↑)，表示債券價格↑(or↓)，債券需求↓(or↑)
- 影響資產組合(貨幣)需求的其他因素: 財富、預期利率(若預期未來利率↑，債券需求↓，則貨幣需求↑)、其他資產的流動性

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25

6-2 貨幣需求函數與貨幣市場均衡

- 貨幣供給(以實質表示)： $M_s/(P\text{-bar})$
- 貨幣需求(或稱實質餘額需求)函數： $(M/P)d = L(r, Y)$,
 $\Delta L/\Delta r < 0, \Delta L/\Delta Y > 0$
 - Note: 物價僵固下， $i = r$
 - 除利率與所得外，影響貨幣需求其他因素：財富等(參見前頁)
- 貨幣市場均衡(參見次圖)

$$\frac{M^S}{P} = L(r, Y)$$

- 貨幣市場均衡的調整機制...

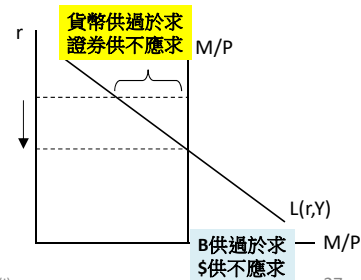
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26

6-2.1 貨幣與證券市場—貨幣市場調整機制

- 如果利率偏高(亦即高於市場均衡)，表示實質貨幣餘額的數量將**供過於求**
 - ⇒ 經濟個體調整其資產組合
- ⇒ 其他金融工具需求↑(例如債券)、**證券市場供不應求**
- ⇒ 證券價格↑、利率↓
- 反之，同理...



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總合需求(I)

27

6-2.2 LM曲線與貨幣政策目標

- 央行採何種貨幣政策目標攸關LM曲線的型態
 - (1) 若採數量目標(如控制貨幣供給 M_s)，則LM為正斜率
 - (2) 若採定住利率策略，則LM為水平線
 - (3) 若採泰勒法則，LM型態同(1)

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28

6-3 LM曲線－央行採控制Ms策略

- 若貨幣數量由央行掌控： $M_s = \bar{M}$
- 則貨幣市場均衡條件為：

$$\bar{M}/\bar{P} = L(r, Y)$$

• 此即LM曲線

- **LM曲線為正斜率(?)**

$$-Y \uparrow \Rightarrow L(r, Y) \uparrow \Rightarrow r \uparrow$$

$$(or\ r \downarrow \Rightarrow L(r, Y) \uparrow \Rightarrow Y \downarrow)$$

以維持貨幣市場均衡 (note: LM曲線的定義)

– (見次圖)

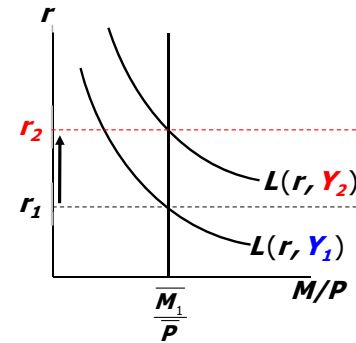
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29

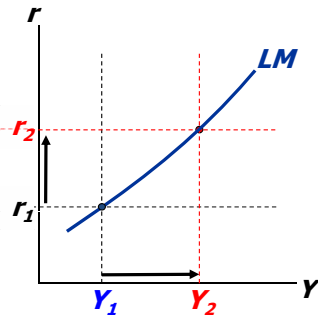
6-3.1 導出 LM 曲線

(a) 貨幣市場



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(b) LM 曲線

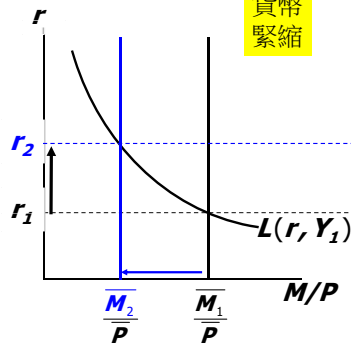


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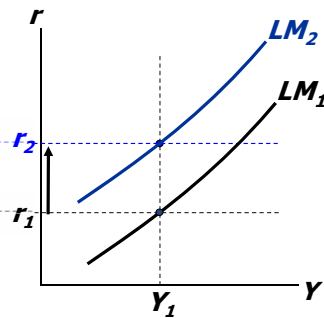
30

6-3.2 $\Delta M < 0$ 使 LM 曲線如何移動

(a) 貨幣市場

貨幣
緊縮

(b) LM 曲線



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總合需求(I)

31

習題: LM 曲線的移動

- 假設信用卡盜刷事件頻傳使得消費者較為經常使用現金來交易. (hint: 交易性貨幣需求增加)
- 利用流動性偏好理論來分析此事件使 LM 曲線如何移動.

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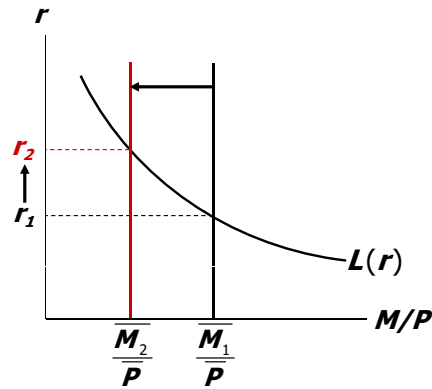
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32

...央行係以調節M來調控利率

為調高 r , 央行減少 M

$\bar{M}_1 > \bar{M}_2$



*貨幣緊縮的兩個個案...

個案研究 1:
美國七〇年代末期的貨幣緊縮與利率

- 1970年代晚期: $\pi > 10\%$
- 1979年10月: 聯準會主席 Paul Volcker 宣布貨幣政策的目標為降低通貨膨脹
- 1979年8月 - 1980年4月: Fed 減少 M/P 8.0%
- 1983年1月: $\pi = 3.7\%$

你認為此項政策變動如何影響名目利率?

貨幣緊縮與利率

貨幣緊縮對名目利率之效果

	短期	長期
模型	流動性偏好理論 (凱因斯學派)	貨幣數量說, 費雪效果 (古典學派)
物價	僵硬的	有彈性的
模型預期	$\Delta i > 0$	$\Delta i < 0$
實際結果	8/1979: $i = 10.4\%$ 4/1980: $i = 15.8\%$	8/1979: $i = 10.4\%$ 1/1983: $i = 8.2\%$

個案比較:
台灣80年代末期之強力緊縮貨幣政策

	通膨率 (CPI)	利率 (cp rates)	m1b	m2	重貼現 率	貨幣成 長目標	
1987	0.52	3.74	37.74	23.00	4.50		張繼正
1988	1.29	4.66	24.44	20.30	4.50		
1989	4.41	8.08	6.05	18.36	7.75		
1990	4.13	9.57	-6.65	10.96	7.75		謝森中
1991	3.62	7.58	12.09	19.37	6.25		
1992	4.47	7.16	12.39	19.06	5.63	10-15	
1993	2.94	6.78	15.31	15.39	5.50	10-15	梁國樹
1994	4.10	6.77	12.23	15.07	5.50	10-15	
1995	3.67	6.66	0.76	9.42	5.50	10-15	
1996	3.07	5.79	8.31	9.13	5.00	9-14	許遠東
1997	0.90	6.83	8.44	8.02	5.25	9-14	

6-3.3 通貨膨脹率與LM曲線

- 實質餘額效果
- Note: 實際 $\pi \equiv (P - P(-1))/P(-1)$
- 前期物價水準 $P(-1)$ 為給定， $\pi \uparrow$ or $\downarrow \Leftrightarrow P \uparrow$ or \downarrow
- 若 $P \uparrow$ 表示 $(M/P) \downarrow$ 、 $r \uparrow$ (AEE)，則LM上移(即左移)
 - 類似貨幣緊縮(如前述)
- 因此， $\pi \uparrow \Rightarrow$ LM上移(即左移)
 - 反之，若 $\pi \downarrow$...
- 預期通膨對LM的影響...

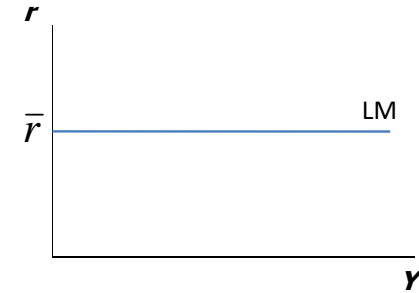
2021/8/17

IS-LM模型與總合需求

37

6-4 LM曲線－央行採釘住利率策略

- 央行若採釘住利率策略
- $r = r\text{-bar}$ (not: $i = r + \pi e$ ，其中 $\pi e = 0$)
- 則貨幣市場均衡條件為：
- $M/P = L(r\text{-bar}, Y)$
- 此時LM曲線為位於利率目標的水平線
 - 若 $Y \uparrow$ ， $L(., Y) \uparrow$ ；為釘住利率 $r=r\text{-bar}$ ，央行勢須讓 $M \uparrow$ (M相當於內生變數)
 - 反之，若 $Y \downarrow$...



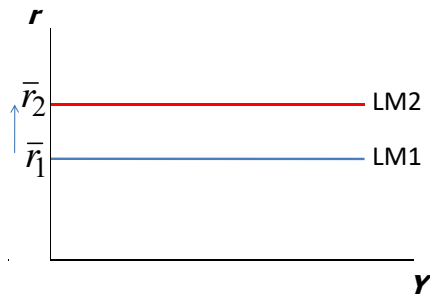
2021/8/17

IS-LM模型與總合需求

38

6-4.1 釘住利率政策的LM曲線移動

- 央行採釘住利率政策，意味放棄自主的貨幣數量調控
- 至於貨幣需求變動的影響，並不能移動LM曲線(如前述)
- 利率政策的效果
 - 央行調升利率目標：LM曲線上移(如右圖)
 - 反之，央行調降利率目標...



2021/8/17

IS-LM模型與總合需求

39

6-5 LM曲線－央行採泰勒法則

- 若央行的利率政策採泰勒法則，表示利率 i 將設為
- $i = \text{inflation rate} + \text{equilibrium real rate} + \lambda(\text{inflation gap}) + \alpha(\text{output gap})$ ，亦即(λ 與 α 皆 >0)

$$i = \pi + r^* + \lambda(\pi - \bar{\pi}) + \alpha(Y - Y^P)$$
- 泰勒法則以實質利率表示

$$r (= i - \pi) = r^* + \lambda(\pi - \bar{\pi}) + \alpha(Y - Y^P)$$
- 將之整理簡化寫成

$$r = \kappa + \alpha Y, \quad \kappa = r^* + \lambda(\pi - \bar{\pi}) - \alpha Y^P$$
- 此即LM曲線...
 - 為正斜率，因 $\alpha > 0$

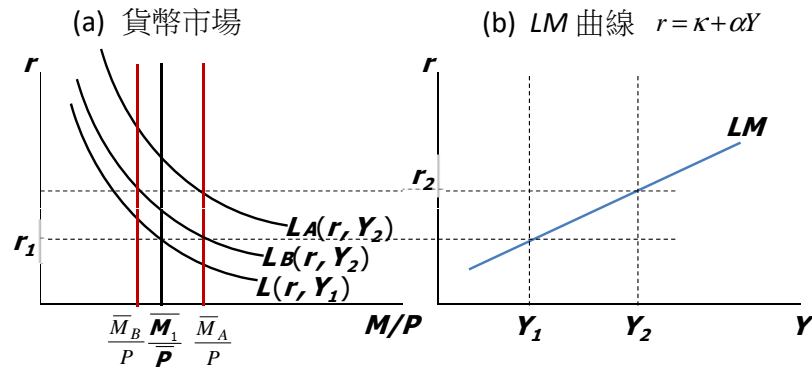
2021/8/17

IS-LM模型與總合需求

40

6-5.1 LM曲線與央行貨幣(即公開市場)操作

*若 $Y \uparrow$ (form 1 to 2), 央行依據其Taylor法則, 將利率升至 r_2
因 $Y \uparrow$, 貨幣需求上移: 兩種情境使央行有不同的貨幣操作



2021/8/17

IS-LM模型與總合需求

41

6-5.1

- 情境(1) 若貨幣需求的所得彈性較大
 - 如圖貨幣需求上移至 LA , 央行為維持既定利率目標 r_2 (根據泰勒法則), 勢須讓**貨幣寬鬆**至 $M\text{-bar}A$, 應付增幅較大的貨幣需求
 - 央行貨幣寬鬆與調升利率, 對市場傳達的訊息似乎不一致, 可能讓市場解讀政策立場產生混淆, 增加市場的不確定性
- 情境(2) 若貨幣需求的所得彈性較小
 - 如圖貨幣需求上移至 LB (幅度較 LA 小), 央行為維持既定利率目標 r_2 (根據泰勒法則), 則勢須**緊縮貨幣**至 $M\text{-bar}B$

2021/8/17

IS-LM模型與總合需求

42

6-5.2 LM曲線的移動

- 泰勒法則下的LM曲線：
$$r = \kappa + \alpha Y, \quad \kappa = r^* + \lambda(\pi - \bar{\pi}) - \alpha Y^P$$
- 因之, κ 等號右邊各項變動皆會使LM曲線移動
 - 若央行估算均衡實質利率偏高, 則LM上移...
 - 若**實際通脹 $\pi \uparrow$ 或調降通脹目標 $\bar{\pi}$** , 則LM上移...
(Note: 該結果跟前述貨幣操作下LM曲線的行為類似)
 - 若央行估算的充分就業或潛在產出水準 Y^P 較低, 則LM上移...
- LM曲線隨實際通脹 π 變化而移動, 係反映央行政策遵循所謂的泰勒原則(Taylor principle) (Mishkin (.))
 - 其他則屬央行**自發性行為**(包括估算均衡利率、設定通脹目標與潛在產出的估算等等)所導致的LM曲線移動

2021/8/17

IS-LM模型與總合需求

43

6-5.3 泰勒原則與貨幣控制

- 央行採控制貨幣操作策略在面對 $\pi \uparrow$ 時, 也會有類似泰勒原則的反應, 即 $r \uparrow$
- 跟採泰勒法則的利率操作策略比較, 其主要差異在於, 在泰勒法則下, 利率變動的反應是來自央行主動式政策(active policy)行為
- 在貨幣操作策略下, 利率變動係市場機制的結果, 央行並未主動調節貨幣數量, 此時在貨幣操控下, 展現的泰勒原則, 較類似一個**自動穩定因子(automatic stabilizer)**
- **Note:** 在釘住利率政策下, 並無泰勒原則或穩定因子的政策行為

2021/8/17

IS-LM模型與總合需求

44

7 總合需求曲線

- AD曲線：the **inflation rate** and aggregate output when the goods market is in equilibrium
 - Note: AD也可用物價水準與產出的關係來表示(參見Mankiw (2019)與李(2019))
- With these two curves (IS and LM), we can now link the quantity of aggregate output demanded with the inflation rate, given the public's expectations of inflation and the stance of monetary policy
- The aggregate demand curve is central to AD/AS analysis..., which will enable us to explain **short-run fluctuations** in both aggregate output and inflation

2021/8/17

IS-LM模型與總合需求

45

7-1 求導AD曲線

- IS曲線：
- $$Y = [\bar{C} + \bar{I} - \bar{d}\bar{f} + \bar{G} + \bar{N}\bar{X} - mpc \times \bar{T}] \times \frac{1}{1 - mpc} - \frac{d + x}{1 - mpc} \times r \quad (12)$$
- LM曲線：
 - (1) $\bar{M}/\bar{P} = L(r, Y)$
 - (2) $r = \kappa + \alpha Y$, $\kappa = r^* + \lambda(\pi - \bar{\pi}) - \alpha Y^P$
 - Note: 無論是(1)或(2), π 與LM曲線呈正相關, 亦即若 $\pi \uparrow$, LM上(或左)移
 - 反之, 若 $\pi \downarrow$, LM下(或右)移

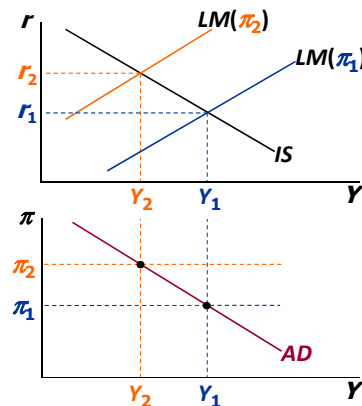
2021/8/17

IS-LM模型與總合需求

46

7-1

- π 與 Y —從IS/LM模型導出AD曲線
- AD 曲線為負斜率：
 - 通膨率由 π_1 升至 π_2
 - \Rightarrow LM 左移(上移)
 - $\Rightarrow \uparrow r$
 - $\Rightarrow \downarrow I$ 、 $\downarrow NX$
 - $\Rightarrow \downarrow Y$



2021/8/17

IS-LM模型與總合需求

47

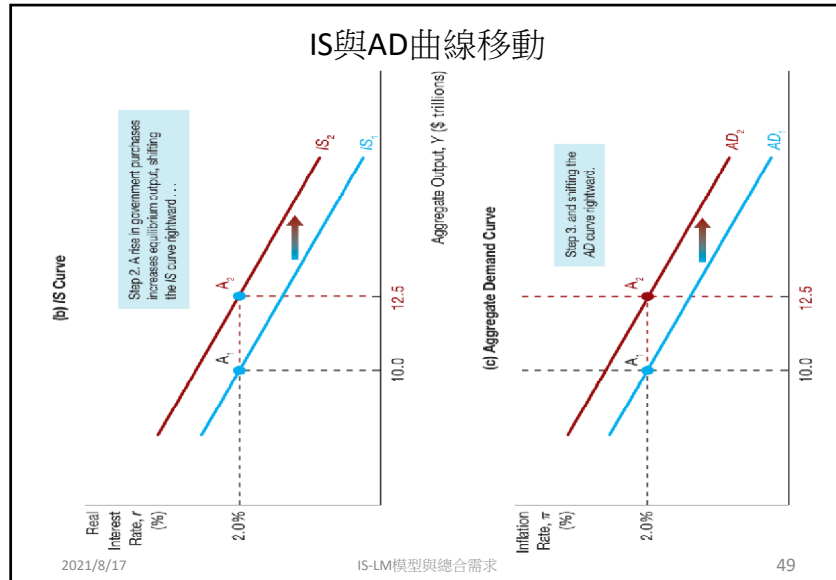
7-2 影響AD曲線移動的因素

- 7-2.1 IS曲線：any factor that shifts the IS curve shifts the aggregate demand curve in the same direction
- 1. Autonomous consumption expenditure
- 2. Autonomous investment spending
- 3. Government purchases
- 4. Taxes
- 5. Autonomous net exports
- 6. Financial frictions
- (次圖)

2021/8/17

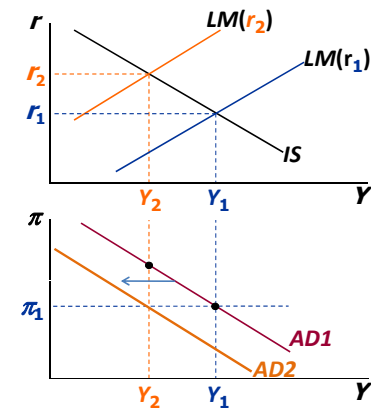
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48



7-2.2 來自LM曲線變動的因素

- Suppose the Federal Reserve (央行) is worried about the economy overheating and so decides to ... raising the real interest rate \Rightarrow LM上移(即左移) · $Y \downarrow \Rightarrow$ AD左移(即下移)



7-2.2

- ...an autonomous (自發性) tightening of monetary policy—that is, a rise in the real interest rate at any given inflation rate—shifts the aggregate demand curve to the left.
- Conversely, an autonomous easing of monetary policy shifts the aggregate demand curve to the right

FIN

補充說明：「自發性」？

FYI What Does *Autonomous* Mean?

When economists use the word *autonomous*, they mean that this component of the variable is exogenous (independent of other variables in the model). For example, autonomous monetary policy is the component of the real interest rate set by the central bank that is unrelated to inflation or to any other

variable in the model. Changes in autonomous components therefore are never associated with *movements along a curve*, but rather are associated with *shifts in the curve*. Hence a change in autonomous monetary policy shifts the AD curve but is never a movement along the curve.