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Bachelor of Commerce (B2001) | Level 1 • Part B Major | Monash University

Principles of macroeconomics

Course Code: ECC1100 • Module 2 Notes

Module 2: Aggregate Expenditure, Business Cycles, Money, Banking & Monetary Policy

Chapter 1: Business Cycles, Fluctuations & the Keynesian Cross Model

1.1 Characteristics of Business Cycles and the Output Gap

Although long-run growth trends upward over decades, real GDP fluctuates around its long-run path over horizons of one to eight years. These recurring, non-periodic expansions and contractions in aggregate economic activity are termed **business cycles**. A typical business cycle progresses through four phases: *expansion* (rising real output, employment, and corporate profits), *peak* (upper turning point where capacity utilisation is stretched), *contraction* or *recession* (broad-based decline in output, investment, and employment—commonly identified in policy commentary as two consecutive quarters of negative real GDP growth, alongside broader labour-market deterioration), and *trough* (lower turning point preceding recovery).

To evaluate cyclical pressure relative to sustainable productive capacity, macroeconomists compare actual real GDP (Y) with **potential output (Y^*)**, defined as the level of real GDP attainable when capital and labour are utilised at non-inflationary sustainable rates (consistent with the NAIRU). The percentage difference defines the **output gap**:

$$\text{Output Gap} = \left(\frac{Y - Y^*}{Y^*}\right) \times 100$$

Where:

- Y is actual real GDP observed in the current quarter or year.
- Y^* is potential (full-employment) real GDP determined by capital, labour supply, and technology.

When $Y > Y^*$, the economy exhibits a positive (inflationary) output gap, placing upward pressure on wages and prices. When $Y < Y^*$, the economy exhibits a negative (recessionary) output gap, characterised by spare industrial capacity, elevated unemployment, and disinflationary pressure.

Economic analysts track business cycle turning points using three indicator classes published by the ABS, RBA, and private surveys (such as NAB Monthly Business Survey and Westpac-Melbourne Institute Consumer Sentiment):

- **Leading Indicators:** Shift ahead of aggregate output (building approvals, ASX 200 equity index, job advertisements, yield-curve spreads, business confidence).
- **Coincident Indicators:** Move simultaneously with aggregate activity (real GDP, retail sales volumes, total employment, industrial production).
- **Lagging Indicators:** Confirm cycles after turning points occur (unemployment rate, average duration of unemployment, business loan defaults, underlying CPI inflation).

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1.2 Consumption, Saving Functions, and Planned Aggregate Expenditure

In the short run, when nominal prices and wages adjust slowly, aggregate output is constrained primarily by aggregate spending rather than productive capacity. John Maynard Keynes modelled short-run expenditure determination by separating planned spending from actual output. In the **Keynesian Cross** framework, household consumption depends linearly on **disposable income ($Y_d = Y - T$)**:

$$C = C_0 + c(Y - T)$$

Where:

- C is planned household consumption expenditure.
- $C_0 > 0$ is **autonomous consumption**—spending financed out of wealth or borrowing even when current disposable income is zero, shifting with household net worth, housing equity, and consumer confidence.
- $c \in (0, 1)$ is the **Marginal Propensity to Consume (MPC)**, measuring the fraction of each additional dollar of disposable income spent on consumption ($c = \frac{\Delta C}{\Delta Y_d}$).
- $Y - T$ is aggregate disposable income (national income Y minus net taxes T).

Because disposable income not consumed is saved ($S = Y_d - C$), the private **saving function** follows directly as:

$$S = -C_0 + (1 - c)(Y - T) = -C_0 + s(Y - T)$$

Where:

- $s = 1 - c$ is the **Marginal Propensity to Save (MPS)**, satisfying $MPC + MPS = 1$.

Summing across all domestic and foreign spending components yields **Planned Aggregate Expenditure (AE)**:

$$AE = C + I + G + (X - M)$$

In a standard open-economy short-run specification, taxes depend proportionally on income ($T = T_0 + tY$), planned investment ($I = I_0$), government purchases ($G = G_0$), and exports ($X = X_0$) are treated as autonomous with respect to current domestic income, while imports rise with domestic income via the **Marginal Propensity to Import (m)**, so $M = M_0 + mY$. Substituting these behavioural equations yields:

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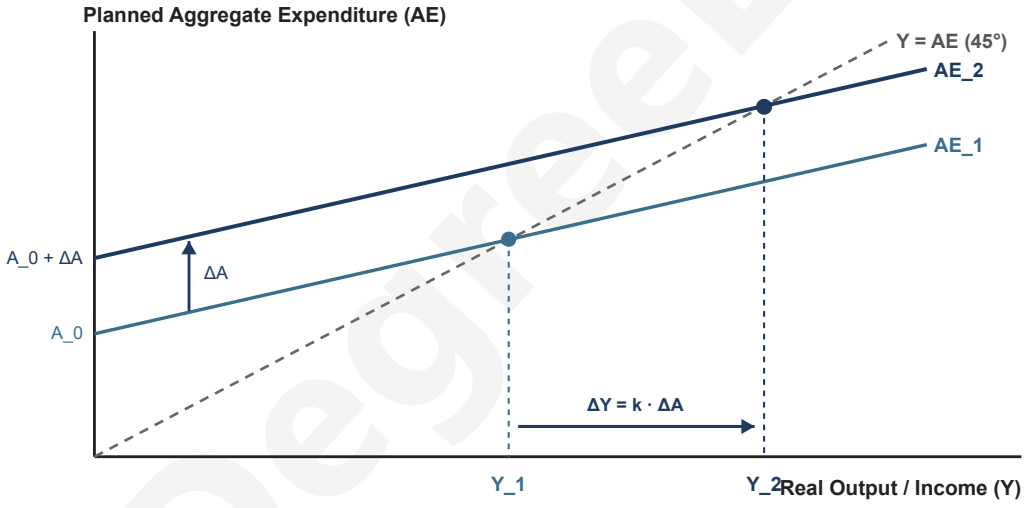
$$AE = \underbrace{[C_0 - cT_0 + I_0 + G_0 + X_0 - M_0]}_{A_0 \text{ (Autonomous Expenditure)}} + \underbrace{[c(1-t) - m]}_{\text{Slope of } AE} Y$$

Where:

- A_0 is total autonomous expenditure independent of current income Y.
- t is the marginal net tax rate ($t \in [0, 1)$).
- m is the marginal propensity to import ($m \in [0, 1)$), reflecting how much of each additional dollar of Australian income leaks into imported goods and overseas travel.
- $c(1-t) - m$ is the marginal propensity to spend on domestically produced goods out of gross income Y.

1.3 Goods Market Equilibrium and Inventory Adjustment

Short-run goods market equilibrium occurs where actual production equals planned aggregate expenditure ($Y = AE$). Geometrically, this is the intersection of the upward-sloping AE schedule with the 45° line ($Y = AE$).



Whenever actual output differs from planned aggregate expenditure, **unplanned inventory investment ($\Delta Inv_{unplanned} = Y - AE$)** signals firms to adjust production:

- If $Y > AE$, firms produce more than households, firms, governments, and foreigners wish to buy. Unsold goods accumulate in warehouses ($\Delta Inv_{unplanned} > 0$), prompting firms to cut production and lay off workers until Y falls back to equilibrium.
- If $Y < AE$, planned spending exceeds current output. Retailers and manufacturers draw down inventories faster than intended ($\Delta Inv_{unplanned} < 0$), prompting firms to expand output and hiring until Y rises to equilibrium.

Chapter 2: The Keynesian Multiplier, Paradox of Thrift & Short-Run

Dynamics

2.1 Derivation of the Autonomous Spending and Tax Multipliers

Solving the equilibrium condition $Y = AE$ algebraically yields equilibrium real GDP:

$$Y = A_0 + [c(1-t) - m]\,Y \implies Y^* = \frac{1}{1 - c(1-t) + m} A_0$$

Consequently, any autonomous change ΔA_0—such as an infrastructure project (ΔG_0), an upswing in mining capital expenditure (ΔI_0), or higher Asian demand for Australian LNG (ΔX_0)—generates a magnified change in equilibrium output:

$$\Delta Y = k_A \cdot \Delta A_0, \qquad \text{where} \qquad k_A = \frac{1}{1 - c(1-t) + m}$$

Where:

- k_A is the **open-economy autonomous spending multiplier** (always smaller than the closed-economy lump-sum multiplier $\frac{1}{1-c}$ because income taxes t and imports m leak out of domestic circulation in every spending round).
- c is the marginal propensity to consume out of disposable income.
- t is the marginal income tax rate.
- m is the marginal propensity to import.

Why does output expand by more than the initial \$1 of spending? Because one agent's expenditure becomes another agent's income. An initial \$1.00 billion public rail investment in Melbourne generates \$1.00 billion in factor income for engineers, contractors, and suppliers. After paying proportional taxes (t) and buying some imported goods (m), recipients spend the remaining fraction $c(1-t) - m$ on domestic goods and services, creating a second round of income, which fuels a third round, forming a convergent geometric series $\sum_{j=0}^{\infty} [c(1-t) - m]^j = \frac{1}{1 - c(1-t) + m}$.

For a lump-sum tax cut ($-\Delta T_0$), households save a fraction $(1 - c)$ of the initial tax relief rather than spending 100% in round one. Hence, the **lump-sum tax multiplier** is smaller in absolute magnitude than the government spending multiplier:

$$k_T = \frac{-c}{1 - c(1-t) + m}$$

Where:

- k_T measures the change in equilibrium GDP per \$1 increase in lump-sum taxes T_0.

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- Notice that in a closed economy with lump-sum taxes ($t = 0, m = 0$), $k_G + k_T = \frac{1}{1-c} - \frac{c}{1-c} = 1$, which is the **balanced-budget multiplier**: equal increases in G and T_0 raise equilibrium GDP by exactly ΔG.

Worked Example 2.1: Calculating Open-Economy Equilibrium and Multiplier Effects

Suppose the Australian macroeconomy is represented (in billions of dollars) by the following short-run parameters: $C = 140 + 0.75Y_d$, $T = 0.20Y$ ($t = 0.20, T_0 = 0$), $I_0 = 320$, $G_0 = 400$, $X_0 = 380$, and $M = 40 + 0.15Y$ ($M_0 = 40, m = 0.15$).

1. **Autonomous Expenditure (A_0):**

$$A_0 = C_0 + I_0 + G_0 + X_0 - M_0 = 140 + 320 + 400 + 380 - 40 = \$1,200 \text{ billion}$$

2. **Slope of the AE Schedule:**

$$c(1 - t) - m = 0.75(1 - 0.20) - 0.15 = 0.60 - 0.15 = 0.45$$

3. **Open-Economy Multiplier (k_A):**

$$k_A = \frac{1}{1 - 0.45} = \frac{1}{0.55} \approx 1.818$$

4. **Equilibrium Output (Y^*):**

$$Y^* = 1.818 \times 1,200 = \$2,181.82 \text{ billion}$$

5. **Impact of a \$55 Billion Fiscal Infrastructure Stimulus ($\Delta G_0 = +55$):**

$$\Delta Y = 1.818 \times 55 = +\$100.00 \text{ billion}$$

Equilibrium GDP rises to \$2,281.82 billion. Notice that if the economy had been closed with zero income tax ($t = 0, m = 0$), the multiplier would have been $\frac{1}{1-0.75} = 4.0$, illustrating why automatic tax and import leakages dampen Australian fiscal multipliers significantly.

2.2 The Paradox of Thrift and Multiplier Limitations

In classical long-run growth theory (Module 1), higher saving raises steady-state capital per worker (k^*) and output (y^*). In the Keynesian short run, however, if households simultaneously attempt to save more by cutting autonomous consumption ($-\Delta C_0$) during a downturn when investment is fixed,

aggregate demand drops. Equilibrium output falls by $\Delta Y = -k_A \Delta C_0$. Because total income falls, actual aggregate saving ($S = Y - C - T$) either remains unchanged (if investment is purely autonomous) or even declines if lower output depresses business investment. This counterintuitive outcome is the **paradox of thrift**: individually prudent saving behaviour can depress aggregate demand and leave society poorer in the short run.

In practice, real-world multipliers are state-dependent rather than constant. They are larger during deep recessions with idle capacity and constrained household liquidity, and much smaller (approaching zero) when the economy operates near full employment ($Y \approx Y^*$), where higher spending bids up prices and interest rates rather than real output.

Chapter 3: Money, Commercial Banking & Credit Creation

3.1 Functions of Money and RBA Monetary Aggregates

Money is any asset widely accepted in payment for goods, services, and debt obligations. Money performs three distinct economic functions:

- **Medium of Exchange:** Eliminates the double coincidence of wants required under barter, dramatically lowering transaction costs.
- **Unit of Account:** Provides a common monetary yardstick for quoting prices, recording AASB financial statements, and comparing relative values.
- **Store of Value:** Transfers purchasing power across time, though imperfectly when inflation erodes real purchasing power.

Modern economies use **fiat money**—currency declared legal tender by government statute without intrinsic commodity backing (such as gold), whose value derives from general acceptability, central bank credibility, and legal settlement of taxes. In Australia, the RBA compiles several nested monetary aggregates reflecting decreasing liquidity:

RBA Aggregate	Primary Components	Economic Significance
Currency	Polymer banknotes and coins held by the non-bank public.	Most liquid physical settlement asset (~4–5% of broad money).
Monetary Base ($M0$ / Base Money)	Currency in circulation plus commercial bank Exchange Settlement (ES) balances held at the RBA.	Direct liabilities of the RBA; raw liquidity controlled by central bank operations.
$M1$	Currency held by the public plus transaction (current) deposits at Authorised Deposit-taking Institutions (ADIs).	Transactions money immediately spendable via debit cards, EFTPOS, or NPP transfers.
$M3$	$M1$ plus all other deposits of the private non-bank sector at ADIs (term deposits, savings accounts, certificates of deposit).	Key broad deposit measure tracked by the RBA alongside total private credit.

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RBA Aggregate	Primary Components	Economic Significance
Broad Money	$M3$ plus non-deposit borrowings from the private sector by financial intermediaries less their holdings of currency and bank deposits.	Most comprehensive gauge of liquid financial claims held by Australian households and firms.

3.2 Commercial Bank Balance Sheets and Prudential Regulation

Australian commercial banks—including the major retail banks regulated by the **Australian Prudential Regulation Authority (APRA)** as Authorised Deposit-taking Institutions (ADIs)—operate via fractional-reserve maturity transformation. On a bank's balance sheet:

- **Assets (Uses of Funds):** Reserves (vault cash plus Exchange Settlement balances at the RBA), liquid government securities (Australian Government Bonds and semi-government debt), residential mortgages, commercial loans, and fixed assets.
- **Liabilities (Sources of Funds):** Household and business transaction/savings deposits, term deposits, wholesale short-term and offshore bond funding, and borrowings from the RBA.
- **Shareholders' Equity (Bank Capital):** Assets minus Liabilities, serving as a loss-absorbing buffer against loan defaults under Basel III capital adequacy standards enforced by APRA.

3.3 Fractional Reserve Deposit Multiplier Versus Endogenous Money Creation

Traditional textbook expositions illustrate credit expansion through the **simple deposit multiplier**. Suppose banks hold a desired or required reserve-to-deposit ratio rr and the non-bank public holds zero cash ($c_{pub} = 0$). When an initial D_0 of new reserves enters the banking system, banks retain $rr \cdot D_0$ in reserves and lend out $(1 - rr)D_0$. As borrowers spend those loans and recipients redeposit them into other banks, total deposits expand as an infinite geometric series:

$$m_{deposit} = \frac{1}{rr}, \qquad \Delta\text{Deposits} = \frac{1}{rr} \cdot \Delta R$$

When households hold a positive currency-to-deposit ratio $cr = \frac{C}{D}$ alongside banks' reserve ratio $rr = \frac{R}{D}$, the broader **money multiplier (m_M)** linking the Monetary Base ($B = C + R$) to the money supply ($M = C + D$) is:

$$M = m_M \cdot B, \qquad \text{where} \qquad m_M = \frac{1 + cr}{cr + rr}$$

Where:

- m_M is the money multiplier showing total broad transactions money created per dollar of central bank base money.
- cr is the public's desired currency-to-deposit ratio.
- rr is commercial banks' reserve-to-deposit ratio.

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- B is the monetary base (currency plus bank reserves).

While the money multiplier provides valuable intuition on how banks create deposits, central banks such as the RBA emphasise an important operational reality: in modern inflation-targeting regimes, **loans create deposits** rather than reserves constraining lending mechanically. When a Melbourne homebuyer signs a $700,000 mortgage with an Australian bank, the bank simultaneously credits a $700,000 deposit to the vendor's account (expanding broad money $M3$ immediately) and then acquires any needed Exchange Settlement balances at the RBA's target cash rate. Thus, the binding constraints on credit creation are profitable loan demand, borrower creditworthiness, APRA capital and serviceability buffers, and the RBA's price of liquidity (the cash rate).

Worked Example 3.1: Money Multiplier and Reserve Expansion

Suppose in a simplified banking system the public holds $cr = 0.15$ of deposits in cash and banks maintain a reserve ratio of $rr = 0.10$. The central bank injects $\Delta B = \$200$ million in new reserves via bond purchases.

1. **Money Multiplier (m_M):**

$$m_M = \frac{1 + 0.15}{0.15 + 0.10} = \frac{1.15}{0.25} = 4.60$$

2. **Maximum Expansion in Money Supply (ΔM):**

$$\Delta M = 4.60 \times \$200 \text{ million} = \$920 \text{ million}$$

3. **Effect of Higher Precautionary Reserves:** If banks become risk-averse during a financial shock and raise their desired reserve ratio from $rr = 0.10$ to $rr = 0.25$ while cr rises to 0.25, the multiplier collapses to $\frac{1.25}{0.50} = 2.50$. Unless the central bank supplies additional liquidity, broad money contracts sharply—demonstrating why central banks act as lender of last resort during banking panics.

Chapter 4: The Reserve Bank of Australia (RBA), Cash Rate Corridor & Monetary Transmission

4.1 The RBA Mandate and Flexible Inflation Targeting

Under the *Reserve Bank Act 1959 (Cth)* and the Statement on the Conduct of Monetary Policy agreed between the RBA Governor and the Commonwealth Treasurer, the RBA Board is tasked with contributing to three statutory objectives: (1) stability of the currency of Australia (price stability), (2) maintenance of full employment in Australia, and (3) economic prosperity and welfare of the Australian people. Since 1993, Australia has operationalised price stability through a **flexible inflation target**: keeping CPI inflation between **2% and 3% on average over time** (focused on the midpoint around 2.5% while looking through temporary supply-side price spikes).

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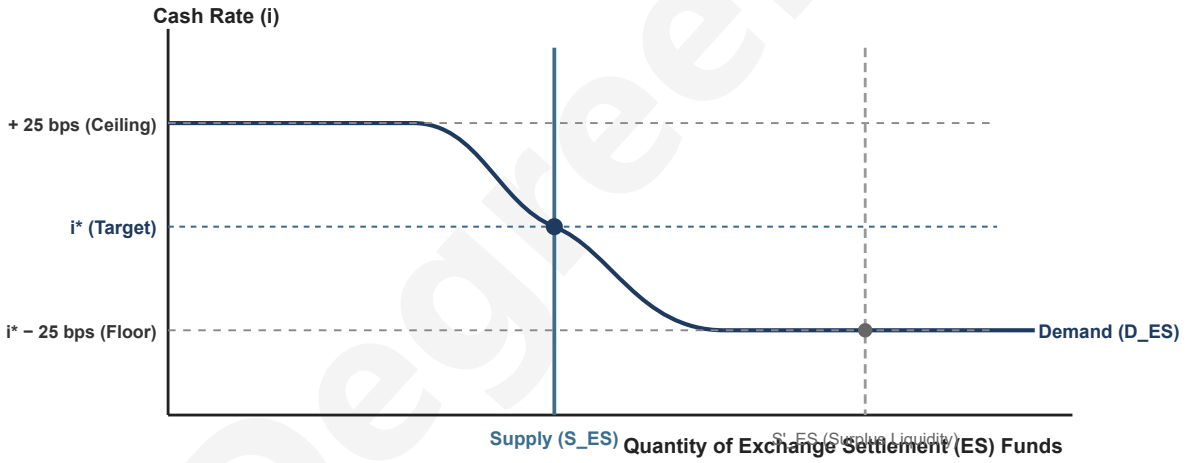
Inflation targeting anchors long-term wage and price expectations, preventing temporary cost shocks from embedding into self-fulfilling inflation spirals, while flexibility allows the RBA to support employment when spare capacity emerges.

4.2 Exchange Settlement (ES) Accounts and the RBA Cash Rate Corridor

The RBA's primary monetary policy instrument is the target for the **overnight cash rate**—the interest rate charged on unsecured overnight loans of Exchange Settlement (ES) funds between commercial banks in Australia's interbank market. Every major bank holds an ES account at the RBA to settle interbank payments (cheques, EFTPOS, NPP, and property settlements).

The RBA enforces its target cash rate (i^*) without needing to ration reserves strictly by operating a symmetric **corridor system** around i^*:

- **Corridor Ceiling (RBA Lending Rate):** Banks facing an end-of-day ES shortfall can borrow overnight from the RBA via repurchase agreements (repos) at $i^* + 0.25\%$ (25 basis points above target). No rational bank will pay another bank more than $i^* + 0.25\%$ overnight.
- **Corridor Floor (ES Deposit Rate):** Banks holding surplus ES balances earn interest from the RBA at $i^* - 0.10\%$ or $i^* - 0.25\%$ (historically 25 bps below target, narrowed to 10 bps during ample-reserves phases). No rational bank will lend overnight to another bank below the risk-free RBA deposit floor.



When the RBA wishes to tighten policy (raise i^*) or ease policy (cut i^*), it announces the new target cash rate and shifts the entire floor-and-ceiling corridor accordingly, while using daily **Open Market Operations (OMOs)**—buying or selling Commonwealth Government Securities (CGS) under repurchase agreements—to calibrate ES supply (S_{ES}) so the market clears at target. Notably, when the RBA injects massive surplus ES liquidity (such as during quantitative easing in 2020–2021, shifting S_{ES} far right to S'_{ES}), the actual cash rate settles near the corridor floor rather than the exact midpoint.

4.3 The Monetary Policy Transmission Mechanism in Australia

Changes in the RBA cash rate propagate to aggregate demand, real output, and inflation over a 12-to-24-month lag through five primary transmission channels:

1. **Intertemporal Saving and Investment Channel:** Higher real interest rates raise the opportunity cost of current consumption relative to future consumption and raise the user cost of capital, dampening business equipment investment and residential construction.
2. **Household Cash-Flow Channel:** Particularly potent in Australia because a high share of household mortgages carry variable interest rates or short fixed terms. When the RBA raises the cash rate, commercial banks lift standard variable mortgage rates almost immediately, reducing disposable cash flow available for discretionary spending among indebted households (which outweighs the higher interest income received by net savers, whose MPC is typically lower).
3. **Asset-Price and Wealth Channel:** Higher discount rates reduce the present value of future dividends and rents, putting downward pressure on ASX equity prices and Sydney/Melbourne dwelling values. Lower household net worth reduces autonomous consumption (C_0) and shrinks collateral available for small-business borrowing.
4. **Exchange-Rate Channel:** Higher Australian interest rates relative to US, European, or Japanese rates attract foreign portfolio inflows, appreciating the Australian dollar (AUD). A stronger AUD makes Australian exports dearer in foreign currency and imports cheaper in AUD, reducing net exports ($X - M$) and directly lowering import price inflation.
5. **Expectations Channel:** Credible RBA tightening signals commitment to the 2–3% target, restraining forward-looking wage claims and price-setting behaviour by firms.

Worked Example 4.1: Cash Rate Transmission to Household Mortgage Cash Flow and AD

Consider a Melbourne household carrying a variable-rate mortgage of $600,000 on a 25-year principal-and-interest schedule. Suppose the RBA raises the target cash rate by 1.00 percentage point (100 basis points), from 3.35% to 4.35%, and commercial banks pass through the full increase so the household's variable mortgage rate rises from 5.60% to 6.60% per annum (monthly rate $r_m = i/12$).

Using the standard annuity mortgage payment formula $PMT = P\,\frac{r_m(1+r_m)^N}{(1+r_m)^N - 1}$ with $P = \$600{,}000$ and $N = 300$ months:

- **At 5.60% ($r_m = 0.004667$):** Monthly repayment is $3,719.72 ($44,636.64 per year).
- **At 6.60% ($r_m = 0.005500$):** Monthly repayment rises to $4,091.16 ($49,093.92 per year).
- **Cash-Flow Squeeze:** Annual disposable cash flow falls by $4,457.28 (+$371.44 per month). If the household's marginal propensity to consume out of disposable cash flow is $c = 0.80$, direct annual consumption falls by $\Delta C = 0.80 \times 4,457.28 = \$3{,}565.82$ per mortgaged household—before accounting for multiplier rounds across the broader economy.

4.4 Taylor-Rule Intuition and Unconventional Monetary Policy

Monetary economists often summarise systematic central bank rate-setting using a **Taylor-type reaction function**:

$$i_t = r^* + \pi_t + \phi_\pi(\pi_t - \pi^*) + \phi_y\left(\frac{Y_t - Y_t^*}{Y_t^*}\right)$$

Where:

- i_t is the target nominal cash rate.
- r^* is the neutral real interest rate consistent with output at potential and stable inflation.
- π_t and π^* are current (or forecast) inflation and the target inflation midpoint (2.5% in Australia).
- $\phi_\pi > 0$ and $\phi_y > 0$ measure the central bank's responsiveness to inflation deviations and the output gap, respectively (requiring $\phi_\pi > 0$, the **Taylor Principle**, so real interest rates rise more than one-for-one with inflation to stabilise the economy).

When a severe downturn pushes the nominal cash rate near the **effective lower bound (ELB)**—as occurred in Australia in November 2020 when the RBA lowered the cash rate target to 0.10%—conventional rate cuts become exhausted. Central banks then deploy **unconventional monetary policy** tools: (1) **Forward Guidance** committing to keep the cash rate low until actual inflation and employment reach defined thresholds; (2) **Quantitative Easing (QE) / Bond Purchase Programs** purchasing longer-dated government bonds in secondary markets to compress long-term yields and flatten the yield curve; and (3) targeted liquidity facilities such as the RBA's **Term Funding Facility (TFF)**, which supplied low-cost 3-year funding to commercial banks to support small and medium enterprise lending.

4.5 Round-by-Round Multiplier Convergence and Commercial Bank T-Account Mechanics

To solidify the analytical link between autonomous spending shocks and real output expansion, it is instructive to trace the round-by-round convergence of the open-economy multiplier derived in Chapter 2. Consider a \$10.00 billion Commonwealth infrastructure injection ($\Delta G_0 = +10.00$ billion AUD) into transport and clean-energy grids in Victoria and New South Wales, under parameters $c = 0.75$, $t = 0.20$, and $m = 0.15$. Each dollar of domestic income yields induced domestic re-spending at the marginal rate $z = c(1 - t) - m = 0.75(0.80) - 0.15 = 0.45$, while 55% of every dollar leaks out across private saving ($s(1 - t) = 0.25 \times 0.80 = 0.20$), income taxation ($t = 0.20$), and imports ($m = 0.15$).

Spending Round	Induced Domestic Demand (ΔY_j, AUD bn)	Income Tax Leakage ($t\Delta Y_j$, AUD bn)	Private Saving Leakage ($s(1-t)\Delta Y_j$, AUD bn)	Import Leakage ($m\Delta Y_j$, AUD bn)	Cumulative GDP Impact (AUD bn)
Round 1 (Initial ΔG_0)	10.000	2.000	2.000	1.500	10.000
Round 2 (0.45 × 10.000)	4.500	0.900	0.900	0.675	14.500
Round 3 (0.45 × 4.500)	2.025	0.405	0.405	0.304	16.525
Round 4 (0.45 × 2.025)	0.911	0.182	0.182	0.137	17.436
Round 5 (0.45 × 0.911)	0.410	0.082	0.082	0.062	17.846

Spending Round	Induced Domestic Demand (ΔY_j, AUD bn)	Income Tax Leakage ($t\Delta Y_j$, AUD bn)	Private Saving Leakage ($s(1-t)\Delta Y_j$, AUD bn)	Import Leakage ($m\Delta Y_j$, AUD bn)	Cumulative GDP Impact (AUD bn)
All Remaining Rounds (6 to ∞)	0.336	0.067	0.067	0.050	18.182
Total Equilibrium Sum	**18.182**	**3.636**	**3.636**	**2.727**	**18.182**

Notice the accounting closure across all leakages: total taxes (3.636 billion) plus total private saving (3.636 billion) plus total imports (2.727 billion) sum exactly to \$10.000 billion, matching the initial autonomous injection ΔG_0. Equilibrium is restored precisely when cumulative induced leakages equal the original autonomous injection.

Similarly, bank credit expansion and RBA liquidity operations are recorded on commercial bank T-accounts. When the RBA purchases \$500 million of Commonwealth Government Securities (CGS) from a commercial bank under an open market operation, the commercial bank's holdings of CGS (Assets) fall by \$500 million while its Exchange Settlement (ES) balance at the RBA (Assets) rises by \$500 million. If the RBA instead purchases \$500 million of CGS from a superannuation fund that banks with a major ADI, the ADI's ES balance (Assets) and the fund's customer deposit (Liabilities) both rise by \$500 million, immediately increasing $M3$. Under APRA prudential supervision, ADIs must simultaneously hold High-Quality Liquid Assets (HQLA) sufficient to satisfy a Liquidity Coverage Ratio ($LCR \geq 100\%$) over a 30-day stress scenario and maintain Common Equity Tier 1 (CET1) capital buffers well above statutory minima.

4.6 Central Bank Independence, Time Inconsistency, and the 2023 RBA Reforms

Why do modern advanced economies delegate monetary policy to an operationally independent central bank rather than leaving interest rate decisions to elected ministers? The theoretical answer lies in the **time-inconsistency problem** formalised by Finn Kydland and Edward Prescott (1977) and Robert Barro and David Gordon (1983). Even when a government announces a low-inflation commitment prior to wage negotiations, once nominal wage contracts are signed, a short-term political incentive emerges to surprise the economy with expansionary policy to push unemployment temporarily below the NAIRU before an election. Rational wage-setters anticipate this temptation and build an inflation premium into wage contracts from the outset, producing an **inflation bias**—higher inflation with zero systematic gain in employment.

Granting statutory operational independence to a central bank with an explicit inflation mandate (a form of institutional pre-commitment) eliminates this inflation bias and lowers borrowing risk premiums on government and corporate bonds. Following the 2023 independent Review of the Reserve Bank of Australia and subsequent legislative amendments, Australia reinforced this framework by establishing a dedicated specialist **Monetary Policy Board** (distinct from an internal Governance Board), publishing unattributed board voting records and post-meeting press conferences, and reaffirming the flexible 2–3% inflation target alongside full employment as dual overarching objectives.