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

Principles of macroeconomics

Course Code: ECC1100 • Module 4 Notes

Module 4: Open-Economy Macroeconomics: Exchange Rates, Balance of Payments & Global Shocks

Chapter 1: Balance of Payments Accounting & International Capital Flows

1.1 Structure of the Australian Balance of Payments (ABS BPM6)

Australia is a small, trade-exposed, capital-importing open economy whose macroeconomic outcomes depend heavily on international goods trade, cross-border investment flows, and commodity prices. The **Balance of Payments (BoP)**—published quarterly by the ABS (Catalogue 5302.0) in accordance with the IMF *Balance of Payments Manual (BPM6)*—records all economic transactions between Australian residents and non-residents during a given period.

Under double-entry bookkeeping, every international transaction generates both a credit (inflow of foreign currency / positive entry) and a debit (outflow of foreign currency / negative entry). The BoP comprises three principal accounts:

BoP Account	Sub-Components (ABS Classification)	Credit (+) Example	Debit (−) Example
1. Current Account (CAB)	Balance on Goods (merchandise), Balance on Services, Primary Income (dividends, interest, reinvested earnings), Secondary Income (foreign aid, remittances).	Pilbara iron ore exported to China; international students studying at Monash University; dividends earned by AustralianSuper on US equities.	Imported German machinery; Australians holidaying in Japan; interest paid on offshore wholesale bonds issued by Australian banks.
2. Capital Account (KA)	Capital transfers (migrant asset transfers, debt forgiveness) and acquisition/disposal of non-produced, non-financial assets (patents, spectrum licences).	Capital transfers brought by skilled migrants settling in Australia.	Australian foreign aid grants designated strictly for overseas infrastructure capital.
3. Financial Account (FAB)	Foreign Direct Investment (FDI, $\geq 10\%$ equity stake), Portfolio Investment (equities < 10%, government/corporate bonds), Financial Derivatives, Other Investment (bank loans/deposits), RBA Reserve Assets.	Japanese conglomerate acquiring a 25% equity stake in an Australian LNG project; foreign pension fund buying Commonwealth Government Bonds.	Australian mining firm building a lithium refinery in Canada; RBA increasing foreign-currency reserve assets.

Because every real or income transaction must be financed by either a change in net financial claims or reserve assets, the three accounts obey the fundamental accounting identity (up to a minor statistical discrepancy for unrecorded flows, *Net Errors and Omissions*):

$$CAB + KA + FAB + \text{Net Errors \& Omissions} = 0$$

Where:

- CAB is the Current Account Balance (net exports NX plus Net Primary Income NPI plus Net Secondary Income NSI).
- KA is the Capital Account balance (typically negligible in Australia).

- FAB is the Financial Account Balance (net capital inflow from abroad: foreign purchases of Australian assets minus Australian purchases of foreign assets).

Ignoring KA and measurement errors, a **Current Account Deficit ($CAB < 0$)** is identically matched by a **Financial Account Surplus ($FAB = -CAB > 0$)**—net borrowing or net equity inflow from the rest of the world. Conversely, a **Current Account Surplus ($CAB > 0$)** implies a **Financial Account Deficit ($FAB < 0$)**, meaning the domestic economy is a net lender acquiring net foreign assets abroad.

1.2 The Saving–Investment Identity and the "Twin Deficits" Insight

National income accounting links the Current Account directly to domestic saving and investment. Starting from $Y = C + I + G + NX$ and adding Net Primary and Secondary Income (NY) to obtain Gross National Disposable Income ($Y + NY = C + S_{private} + T$), rearranging terms yields:

$$CAB = NX + NY = (S_{private} + S_{public}) - I = S_{national} - I$$

Where:

- $S_{private} = Y + NY - T - C$ is private household and corporate saving.
- $S_{public} = T - G$ is government (public) saving—positive in a budget surplus, negative in a budget deficit.
- $S_{national} = S_{private} + S_{public}$ is total national saving.
- I is gross domestic investment.

This identity illuminates Australia's macroeconomic history. For most of the century preceding 2019, Australia ran persistent Current Account Deficits averaging 3% to 5% of GDP—not because Australian exports were uncompetitive, but because rich mineral, agricultural, and urban infrastructure opportunities made domestic investment (I) consistently exceed national saving ($S_{national}$), attracting productive foreign direct and portfolio capital ($FAB > 0$). Following the 2019–2023 surge in iron ore, coal, and LNG export prices alongside higher household saving and compulsory superannuation accumulation, Australia swung into substantial Current Account Surpluses ($S_{national} > I$).

The identity also explains the **twin deficits hypothesis**: holding private saving ($S_{private}$) and domestic investment (I) constant, an expansion in the government budget deficit ($S_{public} \downarrow$) lowers national saving and pushes the Current Account toward deficit ($CAB \downarrow$), financed by higher net capital inflows from abroad.

Worked Example 1.1: Reconciling ABS Balance of Payments and Saving–Investment

Suppose in a given year an open economy records (in billions of dollars): Goods Exports $X_G = 480$, Services Exports $X_S = 110$, Goods Imports $M_G = 390$, Services Imports $M_S = 105$, Net Primary Income $NPI = -65$ (net dividends and interest paid to foreign investors), Net Secondary Income $NSI = -5$, Capital Account $KA = 0$, and Net Errors and Omissions $= 0$. Meanwhile, Private Saving $S_{private} = 520$ and Domestic Investment $I = 460$.

1. **Balance on Goods and Services (NX):**

$$NX = (480 + 110) - (390 + 105) = 590 - 495 = +\$95 \text{ billion}$$

2. **Current Account Balance (CAB):**

> $$CAB = NX + NPI + NSI = 95 + (-65) + (-5) = +\$25 \text{ billion (Current Account Surplus)}$$

3. **Financial Account Balance (FAB):**

> $$FAB = -CAB - KA = -\$25 \text{ billion (Net Capital Outflow / Net Foreign Asset Accumulation)}$$

4. **Implied Government Budget Balance ($S_{public} = T - G$):** From $CAB = S_{private} + S_{public} - I$, we have $(25 = 520 + S_{public} - 460 = 60 + S_{public})$, giving S_{public} = -$35 billion (a Commonwealth budget deficit of $35 billion offset by a $60 billion excess of private saving over investment).

1.3 Intertemporal Current Account Theory: Consumption Smoothing and Demographics

From an intertemporal perspective, the Current Account is not merely a scorecard of trade competitiveness; it is an optimal borrowing and lending vehicle across time. Under the **permanent income / intertemporal approach to the current account**, an economy facing temporary output shocks or abundant high-return domestic investment opportunities optimally runs a Current Account Deficit today—borrowing from international capital markets to finance capital formation and smooth household consumption—and repays those obligations via future Current Account Surpluses once projects mature.

Demographic structure also drives persistent external balances. Rapidly ageing industrial economies with high retirement saving and slower domestic labour-force growth (such as Japan and Germany) tend to generate excess national saving over domestic investment ($S > I$) and run structural Current Account Surpluses, exporting capital abroad. Conversely, resource-rich economies with high population growth via skilled migration and capital-intensive infrastructure needs (historically Australia, Canada, and New Zealand) exhibit high marginal returns to domestic capital ($I > S$) and sustainably absorb foreign saving through Financial Account Surpluses.

Chapter 2: Foreign Exchange Markets, Floating AUD & Real Exchange Rate

2.1 Nominal Exchange Rates and the Trade-Weighted Index (TWI)

Since December 1983, the Australian dollar (AUD) has operated under a **floating exchange rate regime**, meaning its price is determined continuously in global foreign exchange (FX) markets without a fixed peg or systematic currency intervention by the RBA. Following Australian market convention, the **nominal bilateral exchange rate (E)** is quoted in indirect (price-of-domestic-currency) terms—the number of units of foreign currency per 1 AUD (for example, $E = 0.66$ USD/AUD, meaning 1 AUD buys 0.66 US dollars). Under this convention:

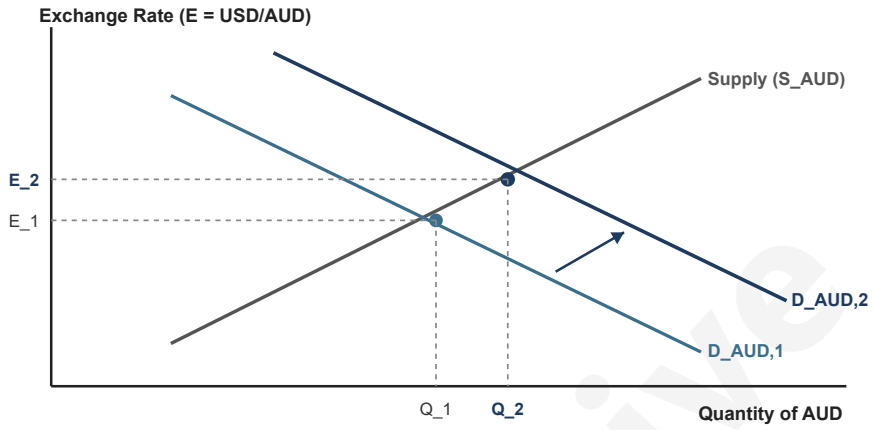
- An increase in E (e.g., from 0.66 to 0.72 USD/AUD) represents an **appreciation** of the AUD (each AUD buys more foreign currency).
- A decrease in E (e.g., from 0.66 to 0.60 USD/AUD) represents a **depreciation** of the AUD.

Because Australia trades across Asia, Europe, and North America—with China, Japan, the United States, South Korea, and Singapore among its largest trading partners—movements against the US dollar alone can misrepresent overall currency competitiveness. Accordingly, the RBA publishes the **Trade-Weighted Index (TWI)**, a geometric weighted average of bilateral AUD exchange rates against a basket of Australia's major trading partners weighted by their share in two-way merchandise and services trade.

2.2 Supply and Demand in the AUD Foreign Exchange Market

In the spot market for Australian dollars:

- **Demand for AUD (Downward-Sloping in E):** Generated by foreign buyers purchasing Australian exports (iron ore, education, tourism) and foreign investors acquiring Australian financial or real assets (ASX equities, CGS bonds, commercial real estate). A lower E (cheaper AUD) makes Australian exports and assets cheaper in foreign currency, increasing the quantity of AUD demanded.
- **Supply of AUD (Upward-Sloping in E):** Generated by Australian residents importing foreign goods and services and Australian superannuation funds or firms investing in overseas assets. A higher E (stronger AUD) makes foreign goods and overseas assets cheaper in AUD terms, increasing the quantity of AUD supplied.



2.3 Real Exchange Rate (RER) and Purchasing Power Parity (PPP)

Nominal exchange rates alone do not determine international price competitiveness; what matters for exporters and import-competing firms is the relative price of domestic versus foreign goods expressed in a common currency. This is the **Real Exchange Rate (RER)**:

$$RER = \frac{E \cdot P}{P^*}$$

Where:

- RER is the real exchange rate (foreign goods basket per domestic goods basket; higher RER means a *real appreciation*, reducing domestic price competitiveness).
- E is the nominal exchange rate (foreign currency per unit of AUD).
- P is the domestic price index (Australian CPI or GDP deflator).
- P^* is the foreign price index (e.g., US or trade-weighted CPI).

In the very long run, the **Law of One Price** and arbitrage across tradable goods motivate **Purchasing Power Parity (PPP)**: $E_{PPP} = \frac{P^*}{P}$, implying $RER = 1$ (or in *relative PPP* form, $\%\Delta E \approx \pi^* - \pi$). Under relative PPP, countries experiencing persistently higher domestic inflation than trading partners ($\pi > \pi^*$) tend to experience nominal currency depreciation ($\Delta E < 0$) over multi-year horizons to preserve competitiveness.

In practice, PPP holds poorly in the short run and exhibits systematic long-run deviations due to trade barriers, transport costs, non-tradable services (haircuts, childcare, housing), and the **Balassa–Samuelson effect** (countries with rapid productivity growth in tradable manufacturing experience rising wages across non-tradables too, pushing their overall price level P and real exchange rate upward).

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Worked Example 2.1: Real Exchange Rate, Relative PPP, and Price Competitiveness

Suppose in 2024 the nominal AUD/USD exchange rate is $E_1 = 0.65$, Australia's price index is $P_1 = 100$, and the US price index is $P_1^* = 100$, giving $RER_1 = \frac{0.65 \times 100}{100} = 0.65$. Between 2024 and 2026, Australian prices rise by 8% ($P_2 = 108$), US prices rise by 4% ($P_2^* = 104$), and the nominal AUD appreciates slightly to $E_2 = 0.67$.

1. **New Real Exchange Rate (RER_2):**

$$RER_2 = \frac{0.67 \times 108}{104} = \frac{72.36}{104} \approx 0.6958$$

2. **Percentage Real Appreciation:**

$$\frac{0.6958 - 0.6500}{0.6500} \times 100 = +7.04\%$$

   Even though the nominal AUD rose by only 3.08% (from 0.65 to 0.67), faster domestic inflation in Australia added roughly 4% more to real appreciation, eroding the price competitiveness of Australian tourism and manufacturing exporters by 7.04% in real terms.

3. **Relative PPP Long-Run Benchmark:** Under relative PPP (RER returning to 0.65), the nominal exchange rate consistent with unchanged competitiveness would instead be $E_{PPP} = 0.65 \times \frac{104}{108} \approx 0.6259$ USD/AUD, representing a -3.70% nominal depreciation to offset Australia's cumulative $+4\%$ inflation differential relative to the United States.

Chapter 3: Interest Rate Parity, Capital Mobility & the Mundell–Fleming Framework

3.1 Uncovered Interest Parity (UIP) and Capital Flows

With open capital accounts and electronic FX trading, daily currency movements are dominated by international portfolio capital flows rather than merchandise trade invoices. Global institutional investors compare expected returns on domestic Australian bonds (i) against foreign bonds (i^*) adjusted for expected currency depreciation or appreciation over the holding period.

Absence of risk-neutral arbitrage yields **Uncovered Interest Parity (UIP)**:

$$i \approx i^* + \frac{E - E^e}{E} = i^* - \frac{E^e - E}{E}$$

Where (under indirect AUD quotation, foreign currency per 1 AUD):

- i is the domestic Australian nominal interest rate (e.g., 1-year government bond or cash rate).
- i^* is the foreign nominal interest rate (e.g., US Federal Funds or Treasury rate).
- E is the current spot exchange rate (USD per AUD).
- E^e is the expected future spot exchange rate (USD per AUD); thus $\frac{E^e - E}{E}$ is the expected rate of AUD appreciation.

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Intuitively, if Australian interest rates exceed US rates ($i > i^*$), investors will only hold US bonds in equilibrium if the AUD is expected to *depreciate* ($E^e < E$) by roughly the interest differential ($i - i^*$), wiping out the yield advantage. Equivalently, solving for the current spot rate $E \approx \frac{E^e}{1+i-i^*}$ shows that an unexpected RBA rate hike ($i \uparrow$) immediately causes an **instantaneous spot appreciation of the AUD ($E \uparrow$)** so that from its newly elevated level, the AUD is expected to drift back down toward E^e.

When investors eliminate currency risk simultaneously using a forward exchange contract (F), no-arbitrage requires **Covered Interest Parity (CIP)**: $\frac{F-E}{E} \approx i^* - i$, which holds tightly in deep interbank markets except during acute global dollar-funding crises.

Worked Example 3.1: Applying Uncovered Interest Parity to an RBA Rate Decision

Suppose the 1-year US interest rate is $i^* = 4.50\%$, the 1-year Australian interest rate is $i = 4.50\%$, and the expected 1-year-ahead spot exchange rate is anchored at $E^e = 0.6800$ USD/AUD, so currently $E = 0.6800$.

Now suppose the RBA surprises markets by raising Australian interest rates to $i = 5.50\%$ ($+100$ basis points) while US rates remain at 4.50% and E^e remains unchanged at 0.6800.

1. **Spot Rate Adjustment via UIP:** Under indirect quotation ($E = \text{USD per 1 AUD}$), investing \$1 USD buys $\frac{1}{E}$ AUD, grows to $\frac{1+i}{E}$ AUD, and converts back to $\frac{E^e}{E}(1+i)$ USD. Equating this expected USD return to $(1+i^*)$ yields the exact Uncovered Interest Parity condition:

$$(1+i)\frac{E^e}{E} = 1 + i^* \implies E = E^e\left(\frac{1+i}{1+i^*}\right)$$

   Substituting $i = 0.055$, $i^* = 0.045$, and $E^e = 0.6800$:

$$E = 0.6800 \times \left(\frac{1.055}{1.045}\right) = 0.6800 \times 1.009569 = 0.6865 \text{ USD/AUD}$$

2. **Verification of Return Equivalence:** At $E = 0.6865$, an investor converting \$1,000 USD receives $\frac{1{,}000}{0.6865} = 1{,}456.66$ AUD, earns 5.50% in Australia (1,536.78 AUD), and expects to convert back at $E^e = 0.6800$ to receive $(1{,}536.78 \times 0.6800) =$ \$1,045.01 USD—matching the 4.50% US return (\$1,045.00 USD). Thus, the higher Australian interest rate causes an immediate $+0.96\%$ appreciation of the AUD today.

Worked Example 3.2: Covered Interest Parity (CIP) Arbitrage Check

Suppose the spot exchange rate is $E = 0.6800$ USD/AUD, the 1-year Australian interest rate is $i = 5.00\%$, the 1-year US interest rate is $i^* = 4.20\%$, and the 1-year forward exchange rate quoted by FX dealers is $F = 0.6748$ USD/AUD. Does Covered Interest Parity hold, and what is the hedged AUD return in USD terms?

Converting \$1,000,000 USD into AUD at spot yields $\frac{1{,}000{,}000}{0.6800} = 1{,}470{,}588.24$ AUD. Investing at 5.00% for one year produces $(1{,}470{,}588.24 \times 1.05) = 1{,}544{,}117.65$ AUD. Selling those AUD forward at $F = 0.6748$ USD/AUD locks in $(1{,}544{,}117.65 \times 0.6748) =$ \$1,041,970.59 USD—an annualised hedged USD return of 4.197%, matching the US rate $i^* = 4.20\%$ within tiny bid-ask transaction costs. If the forward rate had instead been mispriced at $F = 0.6800$, arbitrageurs could earn a risk-free 0.80% profit by borrowing USD, converting to AUD, and selling forward until F falls back to $E\frac{1+i^*}{1+i} = 0.6800 \times \frac{1.042}{1.050} = 0.6748$.

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3.2 Currency Risk Premia and Real Interest Parity

In empirical FX markets, investors are typically risk-averse rather than risk-neutral, meaning Uncovered Interest Parity includes a time-varying **currency risk premium (ρ_t)** reflecting exposure to global risk aversion, commodity volatility, and sovereign liquidity:

$$i_t - i_t^* = \frac{E_t - E_{t+1}^e}{E_t} + \rho_t$$

Where:

- $i_t - i_t^*$ is the nominal interest rate differential between Australia and the foreign benchmark (such as the United States).
- $\frac{E_t - E_{t+1}^e}{E_t}$ is the expected rate of AUD depreciation over the holding horizon (under indirect USD/AUD quotation).
- ρ_t is the excess return demanded by global investors to hold unhedged AUD assets relative to US Treasury benchmarks.

Combining this risk-adjusted UIP condition with the Fisher equations ($r_t \approx i_t - \pi_t^e$ and $r_t^* \approx i_t^* - \pi_t^{*e}$) and the percentage change in the Real Exchange Rate ($\frac{\Delta RER^e}{RER} \approx \frac{\Delta E^e}{E} + \pi^e - \pi^{*e}$) yields **Real Interest Parity**:

$$r_t - r_t^* = -\frac{\Delta RER_{t+1}^e}{RER_t} + \rho_t$$

Where:

- $r_t - r_t^*$ is the domestic-versus-foreign ex-ante real interest rate differential.
- $\Delta RER_{t+1}^e / RER_t$ is the expected real appreciation of the domestic currency.
- ρ_t is the currency risk premium.

Thus, free international capital mobility equalises real interest rates across countries ($r_t = r_t^*$) only in the long-run benchmark where real exchange rates are stationary ($\Delta RER^e = 0$) and currency risk premia vanish ($\rho_t = 0$). In the short to medium run, expected real mean-reversion of the AUD after Terms of Trade shocks allows Australian real yields to diverge temporarily from US or European real yields without triggering infinite capital flows.

Worked Example 3.3: Extracting the Implied Currency Risk Premium

Suppose the 1-year Australian government bond yield is $i = 4.90\%$, the 1-year US Treasury yield is $i^* = 4.10\%$, the current spot rate is $E_t = 0.6600$ USD/AUD, and market consensus expects the AUD to appreciate modestly over the next year to $E_{t+1}^e = 0.6666$ USD/AUD (an expected appreciation of $\frac{0.6666 - 0.6600}{0.6600} = +1.00\%$, meaning expected depreciation is -1.00%).

Substituting into $i_t - i_t^* = \frac{E_t - E_{t+1}^e}{E_t} + \rho_t$:

$$0.049 - 0.041 = -0.010 + \rho_t \implies 0.008 = -0.010 + \rho_t \implies \rho_t = +0.018 \text{ (or } +1.80\%)$$

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Because AUD investors earn both a $+0.80\%$ nominal yield advantage and a $+1.00\%$ expected currency gain, global investors are pricing an annualised currency risk premium of $+1.80\%$ to compensate for holding cyclical commodity-linked AUD exposure during a period of elevated global uncertainty.

3.3 Mundell–Fleming Intuition and the Impossible Trinity

Developed by Robert Mundell and Marcus Fleming in the 1960s, the open-economy IS–LM–BP model reveals how exchange rate regimes dramatically alter the effectiveness of monetary and fiscal policy under high international capital mobility:

- **Monetary Policy under a Floating Exchange Rate (Amplified):** When the RBA cuts the cash rate to stimulate a slowing economy, lower Australian yields trigger capital outflows and depreciate the AUD ($E \downarrow$). Alongside lower domestic borrowing costs boosting C and I, the weaker AUD boosts export competitiveness ($X \uparrow$) and shifts domestic demand away from dearer imports ($M \downarrow$). Thus, the exchange rate channel *reinforces* expansionary monetary policy.
- **Fiscal Policy under a Floating Exchange Rate (Exchange-Rate Crowding Out):** When the Commonwealth Government runs a debt-financed fiscal expansion ($G \uparrow$) while the economy operates near normal monetary conditions, higher domestic output and upward pressure on Australian interest rates attract foreign capital inflows, appreciating the AUD ($E \uparrow$). The stronger AUD depresses net exports ($NX \downarrow$), partially offsetting ("crowding out") the fiscal stimulus—unless monetary policy sits passively at the zero lower bound and accommodates the expansion.
- **The Macroeconomic Trilemma (Impossible Trinity):** A country cannot simultaneously maintain all three of (1) free international capital mobility, (2) a fixed exchange rate, and (3) independent domestic monetary policy. Australia chose (1) open capital markets and (3) independent inflation-targeting monetary policy by adopting (2) a floating exchange rate in 1983.

Policy / Regime (High Capital Mobility)	Floating Exchange Rate (Australia)	Fixed Exchange Rate
Expansionary Monetary Policy	**Highly Effective:** Lower i depreciates currency ($E \downarrow$), boosting both domestic investment ($I \uparrow$) and net exports ($NX \uparrow$).	**Ineffective:** Capital outflows force central bank to sell foreign reserves and buy domestic money, reversing monetary expansion (Y unchanged).
Expansionary Fiscal Policy	**Partially Crowded Out:** Higher i attracts foreign capital and appreciates currency ($E \uparrow$), reducing NX (unless at effective lower bound).	**Highly Effective:** Upward pressure on i and currency forces central bank to expand money supply to defend peg, accommodating fiscal stimulus ($Y \uparrow\uparrow$).
Foreign Interest Rate Hike ($i^* \uparrow$)	**Expansionary via FX:** Capital outflow depreciates domestic currency ($E \downarrow$), raising NX and cushioning domestic output.	**Contractionary:** Capital outflow forces domestic central bank to raise i to match i^* and defend peg, contracting I and Y.
Adverse Export / ToT Shock	**Self-Stabilising:** Currency depreciates ($E \downarrow$), restoring competitiveness for non-resource exports and buffering domestic income.	**Protracted Deflation:** Rigid peg blocks currency adjustment, forcing painful domestic wage and price deflation or reserve depletion.

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Chapter 4: Terms of Trade, Commodity Cycles & Global Shocks in Australia

4.1 Terms of Trade and Real Income Effects

Because Australia's export basket is concentrated in bulk resources (iron ore, metallurgical and thermal coal, liquefied natural gas, gold, and critical minerals such as lithium) as well as agriculture and education/tourism services, while its import basket consists largely of manufactured capital equipment, vehicles, electronics, and refined fuels, Australia experiences pronounced swings in its **Terms of Trade (ToT)**:

$$ToT = \left(\frac{P_X}{P_M}\right) \times 100$$

Where:

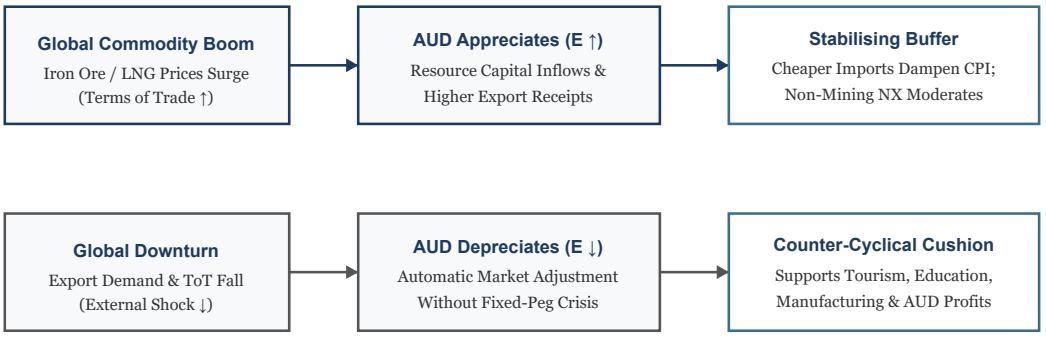
- ToT is the Terms of Trade index (equal to 100 in the base year).
- P_X is the export price index (prices received for Australian exports).
- P_M is the import price index (prices paid for Australian imports).

A rise in the Terms of Trade means each tonne of Australian iron ore or coal exported pays for a larger volume of imported machinery and consumer goods. Even if physical real GDP quantities remain unchanged initially, higher ToT boosts **Real Gross Domestic Income (RGDI)**, national purchasing power, corporate mining profits, and federal/state royalty and company tax revenues.

4.2 The Floating AUD as a Macroeconomic Shock Absorber

Empirically, the AUD behaves as a **commodity currency**: global industrial booms (such as rapid Chinese steel and infrastructure expansion) lift world commodity prices and Australia's Terms of Trade, driving an appreciation of the AUD. Conversely, global recessions or commodity price slumps trigger sharp AUD depreciations.

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This floating-rate mechanism acts as an automatic macroeconomic stabiliser. During Australia's 2004–2012 mining investment boom, the Terms of Trade reached record highs and the AUD rose above parity with the US dollar ($E > 1.00$). That appreciation shifted resources into Western Australian and Queensland mining construction while cooling non-mining tradables (manufacturing, inbound tourism, international education) and restraining imported goods inflation—a structural reallocation closely related to the **Gregory thesis / Dutch Disease** (a "two-speed economy" between booming resource regions and trade-exposed non-resource states). Under a fixed exchange rate, the same commodity boom would have caused massive domestic money inflows and severe CPI overheating rather than smooth relative-price adjustment.

Conversely, when commodity prices retreated after 2012 or during global financial downturns (such as the 2008 Global Financial Crisis and early 2020), the AUD depreciated sharply. A weaker AUD shielded Australian exporters' AUD-denominated revenues, restored competitiveness for domestic tourism, agriculture, and services, and cushioned employment without requiring painful domestic wage deflation.

Worked Example 4.1: Terms of Trade Shock and Export Revenue Buffer

Suppose an Australian iron ore producer exports 10 million tonnes per quarter at a benchmark global USD price of 120 USD/tonne when the exchange rate is $E_1 = 0.75$ USD/AUD, and Australia's import price index is $P_M = 100$ (with export price index $P_{X,1} = 150$, so $ToT_1 = 150$).

1. **Initial Quarterly AUD Export Revenue:**

$$\text{USD Revenue} = 10 \text{ million} \times 120 = \$1,200 \text{ million USD}$$

$$\text{AUD Revenue}_1 = \frac{1,200}{0.75} = \$1,600 \text{ million AUD}$$

2. **Global Commodity Downturn with Fixed Exchange Rate:** Suppose global steel demand slows, dropping iron ore prices by 25% to \$90 USD/tonne ($P_{X,2} = 112.5$, so $ToT_2 = 112.5$). If the AUD remained rigidly pegged at 0.75, AUD revenue would plunge 25% to $\frac{900}{0.75} = \$1{,}200$ million AUD, triggering abrupt layoffs and fiscal strain.
3. **With Floating AUD Shock Absorber:** If the weaker Terms of Trade simultaneously depreciates the floating AUD by 16.7% to $E_2 = 0.625$ USD/AUD, AUD export revenue becomes:

$$\text{AUD Revenue}_2 = \frac{900}{0.625} = \$1,440 \text{ million AUD}$$

Thus, exchange rate depreciation absorbs more than half of the $400 million AUD revenue shock, while simultaneously making Australian services and manufactured goods 16.7% cheaper for overseas buyers—illustrating why Australia's floating exchange rate and credible inflation-targeting RBA regime form the cornerstone of open-economy macroeconomic resilience.

4.3 Net Foreign Liabilities, Currency Valuation Effects, and External Resilience

A country's cumulative Current Account Deficits over time build up its stock of **Net Foreign Liabilities (NFL)**, defined as the difference between gross foreign-owned liabilities in Australia (foreign holdings of Australian bonds, bank wholesale debt, and ASX/FDI equity) and gross Australian-owned assets abroad (such as AustralianSuper offshore equity portfolios, mining FDI overseas, and RBA official reserve assets). Crucially, NFL evolves not only through new net financial flows (FAB), but also through **valuation effects** arising from changes in global asset prices and the exchange rate:

$$\Delta NFL_t = FAB_t + \text{Valuation Changes}_t$$

Where:

- NFL_t is the net stock of foreign liabilities at period-end t.
- FAB_t is the net financial account inflow during period t (approximately $-CAB_t$).
- $\text{Valuation Changes}_t$ captures capital gains/losses on external assets and liabilities plus exchange-rate revaluations.

In many emerging-market economies, foreign borrowing is denominated in US dollars while domestic revenues are earned in local currency—a vulnerability known as *original sin*. When their local currency depreciates, the domestic-currency value of foreign debt balloons, triggering corporate insolvencies and banking crises. Australia avoids this currency-mismatch trap: Australia's external liabilities are overwhelmingly denominated in AUD (or hedged back into AUD via deep cross-currency swap markets), whereas Australian residents' gross foreign assets (offshore equities and direct investments) are largely denominated in USD, EUR, and other foreign currencies. Consequently, when the AUD depreciates during a global downturn, the AUD value of Australia's foreign assets rises while AUD-denominated liabilities remain stable, generating a **favourable net valuation gain** that automatically reduces Australia's NFL-to-GDP ratio.

4.4 Global Financial Contagion, Carry-Trade Unwinds, and Policy Coordination

High capital mobility exposes Australia not only to real trade shocks (Chinese steel demand, tourism, education), but also to global financial conditions driven by the US Federal Reserve, the European Central Bank, and global risk sentiment. Two transmission mechanisms merit particular emphasis:

1. **Global Yield-Curve Comovement and Wholesale Funding Costs:** Long-term Australian Government Bond yields (such as the 10-year CGS yield) move closely with 10-year US Treasury yields due to global portfolio arbitrage. Even if the RBA holds the domestic cash rate steady, a sharp rise in US Treasury yields raises long-term fixed mortgage and corporate bond rates in Australia, tightening domestic financial conditions.
2. **Carry-Trade Dynamics and "Risk-Off" Unwinds:** Because Australia historically maintained higher short-term interest rates than Japan or Switzerland, international leveraged funds engaged in **carry trades**—

borrowing in low-yield Japanese yen (JPY) to invest in higher-yield AUD assets. Under normal low-volatility conditions, carry inflows push the AUD slightly above levels implied by current fundamentals. During acute global financial stress (such as March 2020 or global equity sell-offs), investors rapidly unwind carry trades to repay JPY debt, causing sudden, sharp AUD depreciations even before domestic Australian fundamentals deteriorate.

External Shock	Primary Channel into Australia	Floating AUD Response	RBA & Treasury Stabilisation Role
Chinese Infrastructure / Steel Slowdown	Lower iron ore & coal prices ($ToT \downarrow$); mining investment & royalty revenues fall.	AUD depreciates ($E \downarrow$), cushioning AUD mining profits and boosting tourism/education exports.	Automatic fiscal stabilisers absorb revenue drop; RBA eases cash rate if domestic unemployment rises.
US Federal Reserve Rate Tightening	Lower interest differential ($i - i^* \downarrow$); higher global long-term bond yields.	AUD depreciates ($E \downarrow$), raising imported tradable prices and net exports ($NX \uparrow$).	RBA weighs stimulative $E \downarrow$ and imported inflation against tighter global financial conditions.
Global Energy Supply Shock	Higher world LNG/coal prices ($P_X \uparrow$) alongside higher imported fuel prices ($P_M \uparrow$).	AUD appreciates moderately if Australia's net energy exporter ToT improves on balance.	RBA monitors second-round wage/CPI spillovers while fiscal policy avoids broad demand-stoking subsidies.

An open economy operating under free capital mobility achieves internal and external stability through the coordination of three institutional pillars: a credible floating exchange rate that absorbs external relative-price shocks, an independent inflation-targeting central bank anchoring domestic expectations, and a sound medium-term fiscal framework backed by prudential banking regulation.

4.5 The Two-Speed Economy (Dutch Disease) and Structural Adjustment in Australia

Sustained Terms of Trade booms do not benefit every region and industry uniformly. Building on the classic model developed by Australian economist Max Corden and J. Peter Neary (1982), a major commodity price boom induces structural reallocation across three domestic sectors—booming resources (B, e.g., Pilbara iron ore and Queensland LNG), lagging non-resource tradables (L, e.g., Victorian automotive and specialised manufacturing, inbound tourism), and non-tradables (N, e.g., residential construction, healthcare, retail, and urban services)—via two distinct mechanisms:

- **Resource Movement Effect:** Rising marginal productivity and profits in booming mining and energy projects push up nominal and real wages for engineers, tradespeople, and heavy-equipment operators, drawing labour and capital out of non-resource manufacturing and agriculture.
- **Spending Effect:** Higher national income from elevated export prices raises domestic spending on both tradable and non-tradable goods. Because non-tradable prices are set domestically while tradable goods prices are disciplined by world markets, the relative price of non-tradables rises—equivalent to a **real exchange rate appreciation ($RER \uparrow$)**—reinforcing nominal AUD strength and compressing profit margins in non-mining export and import-competing industries.

Worked Example 4.2: Sectoral Wage and Competitiveness Shift During a Mining Boom

Suppose prior to a commodity boom, an Australian precision-engineering manufacturer sells machinery at a world-fixed USD price of \$100,000 USD when the exchange rate is $E_1 = 0.70$ USD/AUD, receiving $\frac{100{,}000}{0.70} =$ \$142,857 AUD per unit against unit domestic labour and input costs of \$125,000 AUD (a 12.5% operating margin). Suppose a global iron ore boom lifts Australia's Terms of Trade by 35%, appreciating the floating AUD to $E_2 = 0.90$ USD/AUD while surging construction and mining demand bids up domestic skilled engineering wages by

8%, raising unit costs to \$135,000 AUD. The manufacturer's AUD revenue per exported machine falls to $\frac{100{,}000}{0.90} =$ \$111,111 AUD—turning a \$17,857 profit per unit into a -\$23,889 loss. Without productivity upgrades or niche specialisation, non-mining tradable firms contract while resources and non-tradable construction expand—illustrating why Australia's post-2004 mining boom generated a pronounced two-speed regional economy and why productivity-enhancing microeconomic reforms remain essential once commodity cycles normalise.

4.6 Foreign Exchange Intervention, Sovereign Wealth Funds, and Open-Economy Risk Management

Although the RBA allows the AUD to float freely in response to fundamental macroeconomic and Terms of Trade shifts, the central bank retains authority to conduct **sterilised foreign exchange intervention** in exceptional circumstances of severe market illiquidity or disorderly overshooting (as occurred briefly in late 2008 during the Global Financial Crisis). Unlike unsterilised intervention—which alters the domestic monetary base and cash rate—sterilised intervention pairs an FX purchase or sale with an offsetting domestic Open Market Operation in Commonwealth Government Securities so that Exchange Settlement balances and the RBA cash rate target remain unchanged.

From a long-run fiscal perspective, resource-exporting economies also manage commodity-cycle volatility through sovereign wealth funds and medium-term fiscal rules. Norway channels petroleum surpluses into its Government Pension Fund Global offshore to prevent excessive real exchange rate appreciation and preserve intergenerational wealth; Australia similarly established the **Future Fund** in 2006 using mining-boom budget surpluses to pre-fund unfunded Commonwealth public-sector superannuation liabilities, investing globally across equities, private markets, and fixed income while strengthening the nation's gross external asset position.

Open-Economy Indicator	Formula / Definition	Australian Institutional Benchmark
Current Account Balance (CAB)	$NX + NPI + NSI = S_{national} - I$	Published quarterly by ABS (Cat. 5302.0) under BPM6 standards.
Trade-Weighted Index (TWI)	Trade-weighted geometric average of bilateral AUD rates.	Compiled daily by the RBA (May 1970 = 100.0).
Real Exchange Rate (RER)	$(E \cdot P)/P^*$ (adjusted for domestic vs foreign inflation).	Key RBA competitiveness metric across trading partners.
Terms of Trade (ToT)	$(P_X/P_M) \times 100$	Drives RGDI, mining royalties, and commodity-currency AUD swings.

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