ECON1002 Introductory Macroeconomics

UNIVERSITY OF SYDNEY · ECONOMICS · SEMESTER 2, 2026

Full guide + ask Sia about ECON1002

SIDE 1/2 DEFINITIONS · FORMULAS · DECISION RULES · DIAGRAMS

EXAM REVISION SHEET

Final 50% · all material · more focus Weeks 8–13

01 · Exam map COURSE.JSON · BRIEF

8 | 15 | 25 | FINAL 50%

ASSESSMENT	WT	FORMAT / SCOPE
Early Feedback Task	2%	Online quiz; Week 1
Online quizzes (4 × 2%)	8%	10 MCQ each
Tutorial participation + team quizzes + presentation	15%	In tutorial
In-Semester Test	25%	60 min; Weeks 1–6
Final exam	**50%**	2 h + 10 min reading; 20 MCQ = 40 marks; analytical/essay = 60; all material, more focus Weeks 8–13

Permitted materials: not confirmed for this offering in the course materials we hold — check the exam instructions on the LMS. *Source: BRIEF.md; course.json.*

DEFINE → CALCULATE → INTERPRET

MCQ: setup → sign/unit check → option
Analytical: labelled diagram → shift → short run → adjustment → long run

Answer architecture: number-work must end in meaning; diagrams must narrate the adjustment path.

02 · GDP: three equal cuts CH 1

EXPENDITURE

$$Y = C + I + G + X - M = C + I + G + NX$$

INCOME

$$Y = \text{compensation} + \text{gross operating surplus} + \text{net indirect taxes}$$

VALUE ADDED

$$Y = \Sigma(\text{revenue} - \text{intermediate inputs})$$

Final goods count; intermediate goods do not. Imports are subtracted because C, I and G already include them, while GDP measures domestic production. The three approaches must reconcile.

DISTINCTION	RULE
Nominal	Σ(current P × current Q)
Real	Σ(base-year P × current Q)
Deflator	(Nominal/Real) × 100
GNI	GDP + net factor income from non-residents

Welfare limit: GDP omits leisure, household and volunteer work, environmental damage and distribution. It can rise after destructive rebuilding. Real GDP per person tracks material living standards, not complete welfare.

CHECK *Real GDP fixes prices; CPI fixes quantities. A negative NX belongs inside brackets when solving a missing component.*

03 · Prices & real rates CH 2

PRICE ARITHMETIC

$$\text{Inflation}_t = (CPI_t - CPI_{t-1})/CPI_{t-1} \times 100$$
$$\text{Item contribution} = \text{expenditure share} \times \text{its \% price change}$$
$$\text{Real value} = \text{nominal} \div (CPI/100)$$

FISHER

$$i \approx r + \pi \Rightarrow r \approx i - \pi$$
$$\text{Exact: } (1+i) = (1+r)(1+\pi)$$

IF THE PROMPT SAYS…	DO THIS
Fixed household basket	CPI / Laspeyres
All domestic output	GDP deflator
Protect future payment	Index it
Compare purchasing power	Deflate it
Unexpected π rises	Real return falls; borrowers gain, lenders lose

CPI bias: fixed quantities miss substitution toward cheaper goods and quality improvement, so CPI overstates the true cost-of-living rise. At the zero lower bound, deflation makes r = i − π rise.

INFLATION COST	MECHANISM
Menu / shoe-leather	Repricing and economising on cash
Redistribution	Unexpected π moves real wealth between creditors and debtors
Bracket creep	Nominal income enters higher non-indexed tax brackets

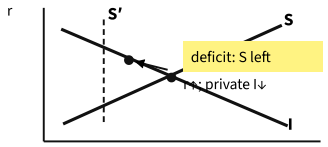
04 · Saving, wealth & investment CH 3

IDENTITIES

$$S = Y - C - G$$
$$S = (Y - T - C) + (T - G)$$
$$\text{closed economy: } S = I$$

FLOW: PER PERIOD	STOCK: AT A POINT
saving, income, deficit, hires, investment	wealth, capital, public debt, bank balance

Firm rule: invest while marginal benefit (VMPK/MPK value) ≥ marginal cost (real interest rate). Higher r rejects more projects.



Budget deficit → public saving falls → national saving shifts left → real rate rises → private investment is crowded out.

CHECK *T > G is positive public saving; T < G is a deficit. Always test that private + public = national saving.*

05 · Labour decision rules CH 4

HIRING

$$MPL = \Delta\text{output from next worker}$$
$$VMP = MPL \times \text{output price}$$

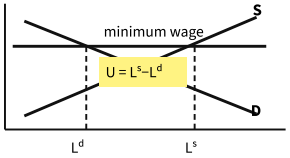
Hire through the last worker with VMP ≥ wage.

LABOUR-FORCE RATES

$$LF = \text{employed} + \text{unemployed}$$
$$u = U/LF \times 100$$
$$\text{Participation} = LF/\text{working-age population} \times 100$$

TYPE	CAUSE / STATUS
Frictional	Normal search and matching
Structural	Skills/location mismatch
Cyclical	Weak demand in downturn
Natural u*	Frictional + structural; cyclical = 0

Discouraged workers leave LF; measured u may fall without job creation. Underemployment is also missed by the headline rate.



A floor above equilibrium binds: employment is labour demanded (short side); unemployment is supply minus demand, not the fall in employment.

06 · Output gaps & Okun CH 5

GAP

$$\text{gap} = 100 \times (Y - Y^*)/Y^*$$
$$\text{Okun: gap} = -\beta(u - u^*),\ \beta \approx 2 \text{ in Australia}$$

GAP	RESOURCES	DIRECTION
Y < Y*	Slack	u > u*; inflation tends to fall
Y > Y*	Over-use	u < u*; inflation tends to rise

gap +4 ⇒ u−u* = −2 | gap −4 ⇒ u−u* = +2



The minus sign is the mark: output and unemployment deviations move in opposite directions.

Technical recession: two consecutive quarters of negative real-GDP growth. A growth recession can have positive but below-trend growth. On a log-GDP plot, slope ≈ growth rate.

DEFINITION CHECK *Potential output Y* is output at normal resource use, not a ceiling. A growth recession can still have positive GDP growth: it is below trend, so slack rises. Peaks and troughs are turning points; cycles are irregular.*

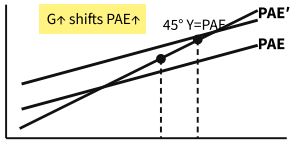
07 · Keynesian short-run model CH 6

BUILD PLANNED EXPENDITURE

$$PAE = C + I^P + G + NX$$
$$C = \bar{C} + c(Y - T)$$
$$T = \bar{T} + tY; \quad M = mY$$

SLOPE, MULTIPLIER, EQUILIBRIUM

$$\text{slope} = c(1-t) - m$$
$$K = 1/[1 - \text{slope}]$$
$$Y = \text{autonomous} \times K$$
$$\Delta Y = K \times \Delta\text{autonomous}$$



Autonomous spending shifts PAE vertically; the horizontal output change is K times the shift.

POSITION	INVENTORY SIGNAL	FIRM RESPONSE
Y > PAE	Unplanned accumulation	Cut Y
Y < PAE	Unplanned rundown	Raise Y
Y = PAE	Planned = produced	Equilibrium

ROUTINE *Substitute functions → collect intercept and slope → form K → solve Y → interpret. Taxes and imports are leakages: higher t or m lowers K.*

08 · Fiscal policy CH 7

MULTIPLIERS

$$K^G = 1/[1 - c(1-t)]$$
$$K^T = -c/[1 - c(1-t)]$$
$$\text{Balanced budget: } K^{BB} = K^G + K^T$$

For matched ΔG = ΔT, first compute Δautonomous = ΔG − cΔT, then multiply. Spending enters demand fully; only the consumed share of a tax change does.

CONCEPT	DECISION RULE
Automatic stabilisers	Downturn: taxes fall, transfers rise without new legislation
Gini	A ÷ (A + B); 0 equality, 1 inequality
Debt sustainability	Worsens when real r > growth g, especially with primary deficit
Crowding out	Borrowing raises r and lowers private I

POLICY SIZE *Translate the gap into required ΔY. Divide by the relevant multiplier to obtain the autonomous change; then select G or T and retain the tax multiplier's negative sign.*

DEBT TEST *A balanced primary budget may not stabilise debt. If real r > growth g, interest compounds faster than output; a primary deficit makes the debt ratio rise still faster.*

09 · Money, bonds & policy CH 8

MONEY

$$MV = PY$$
$$\text{With V,Y fixed in long run: } \%\Delta M \approx \%\Delta P$$
$$\text{Money multiplier} = 1/rr$$
$$\Delta M = (1/rr) \times \Delta\text{reserves}$$

OBJECT	RULE
M1	Currency + current deposits
M3	M1 + other bank deposits
Asset purchase	Reserves ↑; cash rate ↓
Asset sale	Reserves ↓; cash rate ↑
Bond	P = payoff/(1+i); i↑ ⇒ P↓

POLICY REACTION FUNCTION

$$r = 0.01 + 0.5(\text{output gap}) + 0.5(\pi - \pi^T)$$
$$\text{nominal } i = r + \text{actual } \pi$$

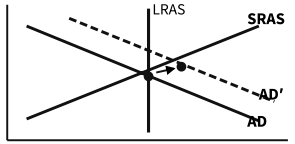
10 · AD-AS: draw, shift, finish CH 9

AD slopes down in (π,Y): π↑ → policy r↑ → PAE↓ → Y↓. Higher G or a higher inflation target shifts AD right; the reverse shifts it left. ***LRAS*** is vertical at Y*.

INFLATION INERTIA

$$\pi_t = \pi_{t-1} + \text{output-gap effect} + \text{supply shock}$$
$$\text{gap} + \Rightarrow \Delta\pi > 0; \quad \text{gap} - \Rightarrow \Delta\pi < 0$$

11 · AD-AS judgement paths CH 9



G↑: Y>Y*, π↑ → SRAS drifts up → Y*

Demand-pull: short-run output rises above potential; the positive gap raises inflation until output returns to Y* at higher inflation.

SHOCK	SHORT RUN	ADJUSTMENT / FINISH
AD right	Y↑, π↑; positive gap	SRAS up; Y→Y*, π permanently higher
AD left	Y↓, π↓; negative gap	SRAS down; Y→Y*, π lower
Adverse supply	Y↓, π↑	Stagflation dilemma; state policy response
Credible lower target	AD left	Anchored expectations reduce output cost of disinflation

DIAGRAM MARKS *Label axes π and Y, AD/SRAS/LRAS, Y*, initial and new equilibria, arrows, gap, adjustment, final point. Never stop at the short-run point.*

12 · Growth accounting CH 10

PRODUCTION & DECOMPOSITION

$$Y = AK^aL^{1-a}; \quad y = Ak^a$$
$$\Delta Y/Y = \Delta A/A + a\Delta K/K + (1-a)\Delta L/L$$
$$\%\Delta y = \%\Delta A + a \cdot \%\Delta k$$

PHRASE	MEANING
Constant returns	Scale K and L together → Y scales equally
Diminishing MP	Raise one input holding the other fixed → smaller additions
Solow residual	ΔA/A: output growth unexplained by measured K,L
Rule of 70	Doubling time ≈ 70/growth %

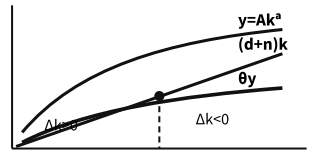
13 · Solow-Swan CH 11

DYNAMIC SYSTEM

$$\text{saving per worker} = \theta y = \theta Ak^a$$
$$\text{break-even} = (d+n)k$$
$$\Delta k = \theta Ak^a - (d+n)k$$

STEADY STATE

$$\theta A(k*)^a = (d+n)k*$$
$$k* = [\theta A/(d+n)]^{1/(1-a)}$$
$$y* = A(k*)^a$$



k* is stable: left of it saving exceeds break-even so k rises; right of it saving falls short so k falls.

CHANGE	DIAGRAM	STEADY-STATE EFFECT
θ↑	Saving curve up	k*, y* ↑; long-run per-worker growth returns to 0
n↑	Break-even steeper	k*, y* ↓
A↑	Production and saving up	k*, y* ↑; sustained growth needs continuing A growth

Conditional convergence: economies with the same θ, n, d and A converge to the same steady state; different fundamentals imply different destinations.

14 · Open-economy core CH 12

EXCHANGE RATES & ACCOUNTS

$$rer = eP/P^f \quad (e = \text{foreign per domestic})$$
$$\%\Delta e = \%\Delta P^f - \%\Delta P \quad (PPP)$$
$$CAB + KAB = 0 \quad (\text{floating})$$
$$NS - I = NX; \quad NS + KI = I$$

TRIGGER	RESULT
e↑	Nominal appreciation
rer↓	Real depreciation: competitiveness ↑, X↑, M↓
Domestic inflation > foreign	PPP predicts e↓
Domestic policy rate ↑	Capital inflow; A$ demand ↑; appreciation
NS < I	NX < 0, financed by net capital inflow

Semester 2 formal examination period, from 16 November 2026 (the Exams Office publishes the exact date).
Check your exam instructions on the LMS for what you may bring; use this sheet to revise and self-test.

ECON1002 Introductory Macroeconomics · Worked self-test drills

UNIVERSITY OF SYDNEY · ANSWER PATHS · JUDGEMENT CARDS · CLASSIC TRAPS

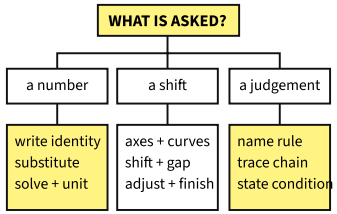
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SIDE 2/2 FIVE WORKED DRILLS · IF X → DO Y · TRAPS · EXAM-MORNING PLAN

SELF-TEST BEFORE READING

Show setup · signs · units · one-sentence meaning

15 · Method chooser CH 1–12



INTERPRET THE ECONOMICS

Use the prompt's output type to select a calculation, a diagram path, or a conditional judgement.

IF YOU SEE…	START WITH…
Current P,Q versus base year	Nominal/real GDP table; deflator last
Basket share + price change	share × % change
u versus u*	gap = −β(u−u*)
C,T,I^P,G,X,M	Collect PAE intercept and slope
θ,d,n,A,a	θAk^a = (d+n)k
e,P,P^f	rer = eP/P^f
Inflation + output shock	AD-AS; state short and long run

16 · Worked drill 1: GDP CH 1 WE

Given: C=620, G=180, NX=−10; compensation=540, operating surplus=300, net indirect taxes=60. Find I.

ANSWER PATH

```
Income GDP = 540+300+60 = 900
I = Y - (C+G+NX)
= 900 - [620+180+(-10)]
= 900 - 790 = 110
```

TRAP *NX is already −10. Keeping brackets shows that subtracting the negative adds 10; treating NX as +10 would give 90.*

FAST RECONCILIATION TESTS

- Expenditure, income and value added must return the same Y.
- Inventory change belongs in I; transfer payments are not G purchases.
- GDP is domestic production; GNI follows resident income.

27 · Exam-morning plan BRIEF · GUIDE



Final recall loop: write the relationship, draw the mechanism, then name the sign trap.

17 · Price & saving micro-drills CH 2–3

PROMPT	SETUP	ANSWER
Electricity weight 8%; price ↑50%	0.08×50%	+4 percentage points
$200 loan; real return 8%; π=5%	200×1.08×1.05	$226.80 exact; $226 approx.
Y=1000,C=620,G=180,T=200	S=Y−C−G; private=Y−T−C; public=T−G	S=200; 180; +20; closed I=200

TRAP SET *Use decimal share 0.08, not 8. Exact Fisher compounds. Saving is a flow; wealth is a stock. Private + public must equal national.*

ONE-LINE CHECK	CORRECT RESPONSE
Inflation above expectation	Real lender return falls.
Deflate nominal N at CPI p	N ÷ (p/100), not N×p.
Government deficit widens	Public and national saving fall.
Closed economy	S=I is an accounting identity.

18 · Worked drill 2: labour CH 4 WE

Part A. Output by 0–5 baristas: 0, 6, 11, 15, 18, 20 coffees/hour; price $4; wage $10/hour.

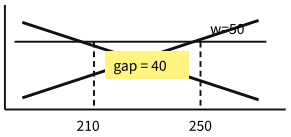
WORKER	MPL	VMP = MPL×4	HIRE?
1	6	24	Yes
2	5	20	Yes
3	4	16	Yes
4	3	12	Yes
5	2	8	No

Hire 4 : the fifth worker's VMP is below the wage.

Part B. N^d=360−3w, N^s=200+w; minimum w=50.

ANSWER PATH

```
Free market: 360-3w=200+w
w*=40; N*=240
At 50: N^d=210; N^s=250
Employment = 210; unemployment =
250-210 = 40
Employment falls 240→210 = 30.
```



Unemployment created (40) differs from the fall in employment (30).

PRICE-CHANGE DRILL *If output price falls to $3, VMP becomes 18, 15, 12, 9, 6. Hiring exactly 3 requires worker 3 to clear the wage and worker 4 to fail: $9 < wage ≤ $12. Equality hires the worker, so include $12 but exclude $9.*

19 · Worked drill 3: Keynesian CH 6 WE

Given: C=40+0.8(Y−T), T=50, I^P=250, G=350, X=60, M=0.1Y. Find K, autonomous expenditure, equilibrium Y and ΔG to close a 40 gap.

1 · BUILD PAE

```
PAE = 40+0.8(Y-50)+250+350+60-0.1Y
= 660 + 0.7Y
```

2 · MULTIPLIER

```
K = 1/(1-0.7) = 3.33
```

3 · EQUILIBRIUM

```
Y = 660+0.7Y ⇒ 0.3Y=660
Y = 660×3.33 = 2200
```

4 · CLOSE GAP

```
ΔG = target ΔY/K = 40/3.33 = 12
```

slope .7 — K 3.33 — Y 2200

target ΔY 40 ÷ 3.33 = ΔG 12

imports are a leakage: do not omit m

The computation is one chain: intercept + slope → multiplier → equilibrium → policy size.

CLASSIC ERROR *Using 1/(1−c)=5 ignores import leakage. The multiplier uses the complete PAE slope, not the MPC alone.*

20 · Fiscal judgement cards CH 7

IF YOU SEE X…	DO Y…
Equal ΔG and ΔT	Do not cancel. Compute ΔG−cΔT, then ×K.
c=.8, K=3.33, ΔG=ΔT=80	Δautonomous=80−64=16; ΔY=16×3.33=53.3.
Recession, no new law	Name automatic stabilisers: taxes↓, transfers↑.
Debt question	Compare real r with output growth g and note primary balance.
Lorenz curve bows farther	Area A and Gini rise: inequality increases.

OUTPUT-GAP SIGN SPRINT

GIVEN	WRITE	CONCLUDE
gap +4, β=2	4=−2(u−u*)	u is 2 points below u*
Y<Y*	gap negative	Slack; u>u*; inflation tends to fall
Y>Y*	gap positive	Over-use; u<u*; inflation tends to rise

MULTIPLIER CHECK *Dollar-for-dollar, $|K^T| > |K^I|$: G enters PAE fully, while a tax change affects demand only through the consumed share c. For equal ΔG=ΔT, compute Δautonomous=(1−c)ΔG, so output rises; do not cancel the two policy changes.*

21 · Monetary policy drill card CH 8 WE

Given rule: r=0.01+0.5(output gap)+0.5(π−$π^T$); gap=+1%=0.01, π=6%=0.06, target=2.5%=0.025.

SUBSTITUTE IN DECIMALS

```
r=.01+.5(.01)+.5(.06-.025)
=.01+.005+.0175=.0325=3.25%
i=r+actual π=3.25%+6%=9.25%
```

gap + inflation gap → REAL r

0.5×.01=.005 — 0.5×.035=.0175

r 3.25% → +π → i 9.25%

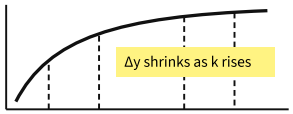
The inflation-gap term uses π−$π^T$; conversion to nominal uses actual π.

POLICY PROMPT	CHAIN
RBA buys assets	Exchange-settlement funds ↑ → cash rate ↓ → spending ↑
Cash rate rises	Bond yield ↑ → existing bond price ↓
Domestic rate rises	A$ assets more attractive → A$ demand ↑ → e↑
M rises, V and Y fixed	P rises proportionally in long run

22 · Growth rapid tests CH 10 WE

GIVEN	PATH	RESULT
a=1/3; k growth 6%; A unchanged	%Δy=a×%Δk	2%
Add TFP growth 1.5%	1.5%+ (1/3×6%)	3.5%
g=2%	70/2	doubling ≈35 years
Observed Y growth less weighted K,L contributions	Residual	TFP growth

TRAP *Capital deepening is weighted by a; TFP adds one-for-one. Constant returns scales all inputs together; diminishing marginal product changes one with the other fixed.*



Concavity of y=Ak^a: equal additions to capital deliver smaller output gains at higher k.

AGGREGATE GROWTH *$ΔY/Y = ΔA/A + a(ΔK/K) + (1−a)(ΔL/L)$. To solve for TFP, move both share-weighted input-growth terms to the other side; ΔA/A is the Solow residual.*

23 · Worked drill 4: Solow-Swan CH 11 WE

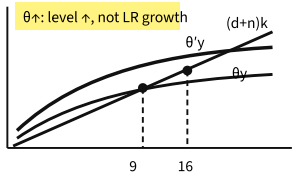
Given: y=A$k^{0.5}$, A=1, θ=.3, d=.05, n=.05. Find k*, y*; then raise θ to .4.

ORIGINAL STEADY STATE

```
.3k^0.5=(.05+.05)k=.10k
Divide by k^0.5: .3=.10k^0.5
k^0.5=3 ⇒ k*=9
y*=1×9^0.5=3
```

HIGHER SAVING RATE

```
.4k^0.5=.10k ⇒ k^0.5=4
k*=16; y*=4
Long-run growth of y per worker = 0 at
the new steady state.
```



A higher θ raises the saving curve and steady-state levels; it does not remove diminishing returns.

CLASSIC TRAP	REPAIR
Use dk only	Break-even is (d+n)k: equip new workers too.
Set y=(d+n)k	Set saving θy equal to break-even.
Report k* but not y*	Substitute k* back into y=Ak^a.
Claim θ raises permanent growth	Say level rises; transition growth ends at new k*.

Direction check: n↑ steepens break-even and lowers k*. A↑ lifts production and saving; k* and y* rise. Below k*, Δk>0; above k*, Δk<0.

24 · AD-AS narration drill CH 9 WE

1. **Shock:** G↑ shifts AD right.
2. **Short run:** Y>Y* and π↑; expansionary gap.
3. **Mechanism:** positive gap raises expected/actual inflation; SRAS drifts up.
4. **Long run:** Y returns to Y*; inflation remains higher.

SIX-MARK HABIT *Allocate words to shift, short-run point, gap, inflation inertia, self-correction and final comparison. A labelled diagram alone does not state the mechanism.*

SOLOW JUDGEMENT	REQUIRED PHRASE
θ↑	Higher level; only transitional growth
n↑	Steeper break-even; lower k* and y*
A rises once	Curves and levels rise
A keeps growing	Sustained output-per-worker growth
Poorer economy catches up	Only conditionally: same θ,n,d,A

25 · Worked drill 5: open economy CH 12 WE

(a) P=12, P^f=30, e=2 foreign per domestic.

```
rer=eP/P^f=(2×12)/30=0.8
```

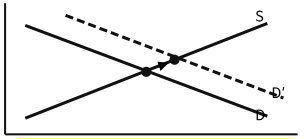
(b) Domestic inflation 7%; foreign inflation 3%.

```
%Δe=%ΔP^f-%ΔP=3%-7%=-4%
Domestic currency depreciates about 4%.
```

(c) Budget deficit falls $12bn, so Δ(T−G)=+12; private saving +8; exports +5; imports +9. Find ΔI.

USE CHANGES IN NS−I=NX

```
[8+12]-ΔI = 5-9 = -4
20-ΔI=-4 ⇒ ΔI=+24bn
```



domestic rate↑ → A$ demand↑ → e↑

Tighter domestic monetary policy attracts capital and appreciates the dollar when e is foreign currency per A$.

SIGN DISCIPLINE *With this e convention, appreciation is e↑. A smaller budget deficit means public saving T−G rises. Calculate ΔNX as ΔX−ΔM.*

26 · Trap matrix ALL CHAPTERS

WRONG MOVE	CORRECT MOVE
Count intermediate + final output	Count final only or sum value added.
Use nominal rate as real	Subtract π; compound if precision asked.
Call discouraged worker unemployed	Not in LF once no longer searching.
Drop minus in Okun	Positive gap means u below u*.
Use c alone as PAE slope	Use c(1−t)−m.
Cancel equal G and T	Tax effect carries weight c.
Money multiplier × rr	Multiply reserves by 1/rr.
Stop AD-AS at short run	Move SRAS and finish at Y*.
Forget a in growth accounting	Weight capital growth by a.
Higher θ ⇒ permanent growth	Higher level; long-run growth needs A.
PPP sign reversed	Foreign π minus domestic π.

EXTERNAL-ACCOUNT JUDGEMENTS

IF…	THEN…
CAB<0 under a float	KAB>0: net capital inflow finances it.
NS−I<0	NX<0; investment exceeds saving.
Budget deficit widens, other terms fixed	NS falls; external deficit widens.
Overvalued fixed rate	Excess supply drains reserves; defence requires tighter policy.
Fixed rate + free capital	No independent monetary policy.

Semester 2 formal examination period, from 16 November 2026 (the Exams Office publishes the exact date).
Check your exam instructions on the LMS for what you may bring; use this sheet to revise and self-test.