BANK3011 Bank Financial Management

UNIVERSITY OF SYDNEY · SEMESTER 2, 2026

Full guide + ask Sia about BANK3011

SIDE 1 · WHAT THE FINAL REWARDS

EXAM REVISION SHEET · definitions → formulas → decisions → checks

S2 2026

1 · Exam map

COURSE.JSON · BRIEF

Project 25 | Other weights: confirm

Research Project (final report): 25 marks (≈25%), individual. Mid-semester and final assessment weights are subject to confirmation in the course data.

Permitted materials: not confirmed for this offering in the course materials we hold — check the exam instructions on the LMS.

PROMPT SIGNAL	FIRST MOVE
NII / items reset inside horizon	Repricing GAP
Market value / equity after ΔR	Duration gap
Trading loss / tail / horizon	DEAR → VaR
Loan accept/reject	RAROC vs hurdle
Correlated loans/desks	Variance + ρ
Capital ratios	Build RWA first

2 · FI function → risk

C1

TIMING different dates → **LIQUIDITY**

MATURITY short v long → **RATE RISK**

DIVERSIFY allocate credit → **CREDIT**

The three high-yield function–risk links (C1 diagram redrawn).

Seven functions: timing; maturity; diversification/credit allocation; lower transaction and information costs; payments; monetary-policy transmission; risk intermediation. Keep all seven distinct.

Brokerage moves an unchanged claim and reduces search/monitoring cost. ***Asset transformation*** issues the FI's secondary securities to buy borrowers' primary securities, changing size, maturity and risk.

MECHANISM	BALANCE-SHEET RESULT
Asset transformation	FI holds primary claims; issues secondary claims; exposure sits with FI
Brokerage	Intermediary matches parties; underlying claim unchanged
Funds management	Invests on behalf of client; client owns portfolio risk

Primary security is issued by the ultimate borrower (loan/bond); ***secondary security*** is the FI's own funding claim (deposit/policy). **Delegated monitoring** pools savers and gives the FI scale and incentive to screen, monitor and enforce, reducing agency cost.

Modern risk-management loop: identify the exposure → quantify its effect on *earnings and value* → choose transfer/hedge/capital → monitor. A bank does not eliminate risk: it transforms, transfers and manages the residual.

ANSWER SCAFFOLD

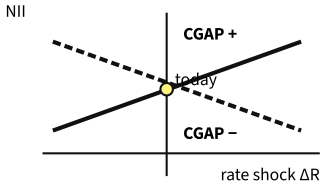
3 · Repricing / GAP

C2

Rate-sensitive means the rate resets inside the chosen planning horizon: maturity/rollover or a floating reset. Stated final maturity alone is not the test.

EARNINGS VIEW · BOOK VALUES

```
GAP = RSA - RSL (per bucket)
CGAP = Σ gaps inside horizon
ΔNII = CGAP × ΔR
Unequal moves:
ΔNII = RSA·ΔR_A - RSL·ΔR_L
```



Slope = CGAP: positive gains on a rise; negative loses (C2 figure redrawn).

POSITION	HURT WHEN	NAME
GAP < 0: assets longer	Rates rise	Refinancing
GAP > 0: liabilities longer	Rates fall	Reinvestment

ONE-YEAR ITEM	RSA/RSL?	WHY
4-month fixed Treasury	RSA	Matures/rolls inside year
25-year fixed mortgage	No	Rate fixed beyond window
15-year loan repriced yearly	RSA	Reset occurs inside window
Floating deposit reset quarterly	RSL	Funding rate resets

Spread effect: even CGAP=0 does not immunise NII when asset and liability rates move differently. Treat income and expense as separate lines; check the answer against the sign of each leg.

Limits: book-value/earnings only; wide buckets hide within-bucket mismatch; runoffs and off-balance-sheet exposure may be omitted; equal-shock shortcut misses spread changes.

4 · Duration logic

C3

Macaulay D = PV-weighted average time. Zero coupon: D = maturity; coupon bond: D < maturity; higher coupon or yield → lower D; consol D = (1+R)/R.

```
MD = D/(1+R) · dollar D = MD·P
ΔP = -MD·ΔR·P
D_p = Σ(MV_i D_i)/ΣMV_i
```

Single-security routine: list cash flows → discount to price → multiply each PV by time → divide the weighted sum by price → modify D → apply the signed yield shock. State that D is in years and ΔP in dollars.

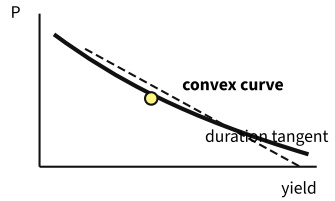
4b · Bank duration gap

C3

VALUE VIEW · MARKET VALUES

```
k = L/A
DGAP = D_A - kD_L
ΔE = -DGAP·A·[ΔR/(1+R)]
Immunise: set DGAP = 0
```

For DGAP > 0, a rate rise makes ΔE negative. Shorten asset duration, lengthen liability duration or change leverage to close the gap. Match *durations*, not maturities.



Duration is a tangent: good for small parallel moves; convexity is the gap (C3 figure redrawn).

REPRICING	DURATION
Δ earnings/NII	Δ market value/equity
Book values	Market values
Planning horizon	Cash-flow timing
Bucket mismatch	Parallel-shift approximation

DURATION AUDIT

- Compute portfolio D with **market-value weights**; do not average maturities.
- Compute k=L/A before netting liability duration; omitting k overstates the liability hedge.
- Keep ΔR in decimal form and retain the (1+R) denominator when using Macaulay D.
- Positive DGAP × positive ΔR must produce negative ΔE.

Convexity limitation: duration is linear through a curved price–yield relation. It overstates the loss for a yield rise and understates the gain for a fall; error grows with the size of the shock and with non-parallel curve moves.

5 · DEAR / VaR

C4

DEAR is one-day VaR: a tail loss quantile, not a maximum possible loss. It applies to the marked-to-market trading book.

```
DEAR = market value × price sensitivity × adverse move
Equity: P × zσ (β ≈ 1)
Bond: P × [D/(1+R)] × adverse ΔR
N-day VaR = DEAR × √N
```

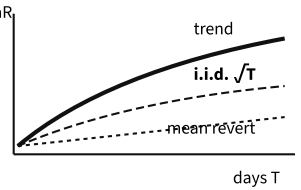
Tail multipliers: 5% one-tail = 1.65σ; 1% one-tail = 2.33σ. Do not use the two-sided 1.96.

5b · Portfolio VaR

C4

```
DEAR_p = √(D₁² + D₂² + 2ρD₁D₂)
Diversification benefit = D₁ + D₂ - D_p
```

If ρ < 1, portfolio DEAR must be below the simple sum; if ρ = 1, add directly. √N assumes i.i.d. daily returns: trend makes it understate; mean reversion makes it overstate.



Time scaling and its assumption (C4 figure redrawn).

VAR METHOD	USE / LIMIT
RiskMetrics	Normal, mean-zero; quick, fat-tail blind
Historic	Empirical tail; history-limited
Monte Carlo	Flexible/non-linear; computation-heavy

RiskMetrics converts σ into a parametric tail using z. **Historic simulation** re-prices today's position through actual past returns and ranks the loss tail. **Monte Carlo** generates synthetic correlated paths and handles options/non-linearity, at model and computation cost.

Portfolio check: ρ=+1 gives the arithmetic sum; falling ρ increases the benefit. Correlation is not an optional narrative term—it is the cross-term that determines whether desk risks offset.

CHECK → *Report horizon, confidence, dollar loss and the distribution/time-scaling assumption in the same sentence.*

6 · Individual credit

C5

Credit risk includes default and value loss from migration. Borrower-specific reputation, leverage, collateral and covenants diversify; cycle and rate effects are systematic.

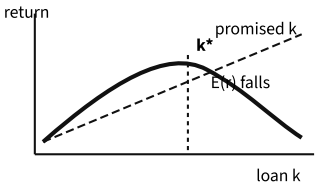
```
1+k = 1 + [of + (BR+φ)]/[1-b(1-RR)]
E(1+r) = p(1+k) [zero recovery]
E(1+r) = (1+k)[p+(1-p)γ]
p = (1+i)/(1+k); default = 1-p
R = AIS - EDF·LGD
```

EDF is a probability; LGD is a loss rate. Recovery γ makes LGD = 1−γ.

INPUT	MEANING / PLACEMENT
of	Origination fee; numerator
BR + φ	Base rate plus risk premium
b	Compensating-balance fraction
RR	Reserve requirement inside denominator
p / γ	Repayment probability / recovery

6b · Price, then decide

C5



Beyond k*, adverse selection raises default faster than price (C5 figure redrawn).

RAROC GATE

```
ΔL = -D·L·ΔR/(1+R)
RAROC = PV(one-year net income)/|ΔL|
Approve only if RAROC > hurdle.
```

Numerator = interest + fees − funding cost, discounted one year. Denominator is capital at risk, *not loan size*. Rescue a weak deal by shorter duration, higher fee or wider risk premium, then re-test.

Backward bend: before k*, price compensation dominates; beyond k*, high rates repel safer borrowers and worsen incentives, so p falls faster than promised k rises. "Charge more" can therefore reduce expected return.

SCORING FAMILY	WHAT IT SUPPLIES
Linear probability	Direct default-probability estimate
Logit / probit	Bounded non-linear probability
Altman Z	Linear discriminant score
EDF / spreads	Market-based default signal

7 · Portfolio credit

C6

```
Limit = max loss (% capital) × 1/loss rate
loss rate = 1 - recovery
E(R_p) = ΣX_i R_i
σ²_p = X₁²σ₁² + X₂²σ₂² + 2X₁X₂ρσ₁σ₂
```

Take one square root only after summing the whole variance. Diversification works only when ρ < 1; systematic risk remains. Migration matrices track one-year grade changes; each row sums to 1.

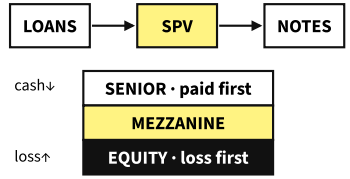
CONTROL	WHAT IT CATCHES
Concentration limit	Hard borrower/sector exposure cap
Migration analysis	Downgrades faster than history
MPT/KMV	Return, σ and default correlation

Concentration intuition: at the same tolerated loss to capital, a higher sector loss rate forces a smaller exposure cap. Rearranged, maximum loss share = concentration limit × loss rate.

Migration rule: read a transition matrix from current grade (row) to grade one year later (column). An unusual rise in downgrade/default entries is an early signal to curtail lending before realised losses arrive.

8 · Securitisation

C7



True-sale chain and bottom-up loss waterfall (C7 figure redrawn).

Without recourse: buyer bears default; loan and risk leave seller. **With recourse:** seller retains contingent risk; buyer can return defaulted loan; no genuine capital relief.

Pool loans → bankruptcy-remote SPV → marketable securities. Effects: cash replaces loans; RWA/capital charge and asset duration fall; liquidity rises; servicing fees may remain. **Pass-through** gives pro-rata cash; **CMO/CDO** tranches priority. Synthetic structure transfers risk by CDS while loans stay.

Distinctions: participation = economic share/limited control; assignment = all rights. True sale moves assets; synthetic uses CDS while loans stay. Cash pays Senior first; credit losses hit Equity first. Motives: risk and RWA relief, liquidity, shorter duration and servicing fees.

9 · Sovereign risk

C8

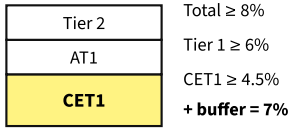
Two-step: assess borrower credit, then whether the host government allows hard-currency payment. Sovereign normally caps local issuer rating; multinational parent is the usual exception.

SIGNAL	RISK DIRECTION
Debt service / exports ↑	More risk
Imports / FX reserves ↑	More risk
Real investment / GNP ↑	Usually less

```
Concessionality = PV(original promise) - PV(restructured cash flows), using the same required rate.
```

10 · Liquidity + capital

C9–C11



Capital-quality stack and hard minima (C11 figure redrawn).

Forward this to your tutorial group

SHARED BY _____

Check your exam instructions on the LMS for what you may bring; use this sheet to revise and self-test.

Semester 2 formal examination period, from 16 November 2026 (the Exams Office publishes the exact date).

BANK3011 Bank Financial Management

WORKED DRILLS · JUDGEMENT CARDS · CLASSIC TRAPS

Full guide + ask Sia about BANK3011

SIDE 2 · SELF-TEST DRILLS

EXAM REVISION SHEET · write the path before the answer

5 WORKED DRILLS

1 · Worked: GAP

C2 EXAMPLE

Given: one-year RSA $80m, RSL $120m.

```
GAP = 80 - 120 = -$40m
Rates +1%: ΔNII = -40(.01) = -$0.40m
Rates -0.5%: ΔNII = -40(-.005) = +$0.20m
```

Unequal moves: RSA rates +1%, RSL +0.4% → ΔNII = 80(.01) − 120(.004) = 0.80 − 0.48 = +$0.32m. Spread widening overrides the negative CGAP. Exposure: refinancing risk.

CGAP −
rise → NII ↓
refinance

CGAP +
fall → NII ↓
reinvest

Sign compass: compute CGAP before narrating the direction.

CHECK → *If asset and liability shocks differ, abandon CGAP·ΔR and use the spread form.*

MARK-BY-MARK AUDIT

- State the one-year horizon; classify the reset, not merely maturity.
- Write RSA and RSL before netting; keep $m units throughout.
- Read the negative sign economically: more funding reprices than assets.
- For unequal moves, calculate asset-income and liability-cost changes separately.

Failure test: a negative GAP does not guarantee NII falls if rates rise by different amounts; part (d) proves the spread effect can reverse the CGAP effect.

2 · Worked: duration bond

C3 EXAMPLE

$100,000 face; 5% annual coupon; yield 7%; two years; yield rises 25 bp.

```
CF₁=5,000; CF₂=105,000
PV₁=5,000/1.07=4,672.90
PV₂=105,000/1.07²=91,711.07
P=$96,383.96
```

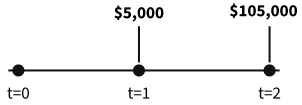
```
D=
[1(4,672.90)+2(91,711.07)]/96,383.96=1.952 yr
MD=1.952/1.07=1.824
ΔP=-1.824(.0025)(96,383.96)=-$439
```

Reasonableness: the coupon arrives early, so D must be below the two-year maturity. A 25 bp rise must lower price; the approximate percentage change is −1.824(.0025)=−0.456%.

GAP AND DURATION CROSS-CHECK	QUESTION ANSWERED
CGAP·ΔR	How does NII change inside the horizon?
−MD·ΔR·P	How does one security's value change?

2b · Duration answer path

C3



discount → weight time → divide by P

Cash flow → price → weighted time → D → MD → ΔP.

LINE	MARKER CHECK
Price	Discount every cash flow at 7%
D	Weight time by PV; D < 2
MD	Divide by 1+R
ΔP	Rate rise → negative price change

Duration is an approximation; exact re-pricing gives a slightly smaller fall because of convexity. For a whole bank, compute k=L/A before DGAP, use market values, then sign ΔE.

WHOLE-BANK RECALL CARD

```
market-value weights → D_A, D_L
k=L/A → DGAP=D_A-kD_L
DGAP × A × rate shock → ΔE
```

If DGAP is positive, a rise hurts equity; if negative, a rise helps. Immunisation targets DGAP=0 by shortening assets, lengthening liabilities or changing leverage. It does not guarantee protection against large or non-parallel shifts.

SILENT ERROR	DETECTION
Book values used	Duration needs market values
k omitted	Liability hedge too large
ΔR entered as 25	25 bp = .0025
Positive ΔP on rise	Leading minus sign lost

3 · Worked: DEAR / VaR

C4 EXAMPLE

Equity $40m; daily σ=1.8%; z=1.65; FX DEAR $700,000; ρ=.2.

```
Equity DEAR = 40m(1.65)(.018)=$1.188m
10-day VaR = 1.188m√10 = $3.757m
```

```
D_p=√[1.188²+.700²+2(.2)(1.188)(.700)]m
=$1.495m
Benefit = 1.888-1.495 = $0.393m
```

Sanity: ρ<1, so portfolio DEAR must be below $1.888m. Apply √N once, at the end.

Interpret: under the stated normal/i.i.d. setup, the equity desk's one-day loss exceeds $1.188m only in the 5% adverse tail; the ten-day figure is not a guaranteed ceiling.

CHECKPOINT	VALUE
Simple sum	$1.888m
ρ=.2 portfolio	$1.495m

3b · DEAR assembly

C4

POSITION $ value × **SENSITIVITY** β or MD × **ADVERSE** zσ or ΔR → **ONE-DAY DEAR**

Three pieces first; horizon and correlation come afterwards.

IF YOU SEE…	DO…
5% one-tail	Use 1.65σ
1% one-tail	Use 2.33σ
N days	×√N under i.i.d.
Two desks + ρ	Square-root aggregation
Bond face value	Price first; then MD

Method chooser: roughly Normal linear exposure → variance–covariance/RiskMetrics; representative return history → historic simulation; options or non-linear payoffs → Monte Carlo or delta-gamma. Every choice still needs horizon, confidence and current position.

Tail caveats: fat tails make the Normal model optimistic; a trending market can grow faster than √T; mean reversion can grow slower. State the assumption before defending the scaling.

4 · Worked: RAROC

C5 EXAMPLE

Loan $10m; D=7; rate 11%; service fee .3%; funding 9%; adverse spread +4.5%; hurdle 10%.

```
|ΔL|⊨7(10m)(.045/1.11)=$2,837,838
Income=1.10m+.03m-.90m=$230,000
PV income=230,000/1.09=$211,009
RAROC=211,009/2,837,838=7.44%
```

Decision: 7.44% < 10% → reject as structured. Shorter duration attacks the large capital-at-risk denominator most directly.

PV NET INCOME ÷ **CAPITAL |ΔL|**

RAROC vs HURDLE

above: approve

below: restructure/reject

Never divide by loan size: the denominator is value at risk.

RAROC AUDIT

STAGE	WHAT EARNS THE MARK
Capital at risk	D·L·adverse spread/(1+R), absolute value
Net income	Interest + fee − funding cost
Timing	Discount one-year income at 9%
Decision	Compare 7.44% with 10%; state reject

5 · Portfolio credit drill

C6

Two equal $50,000 loans: A return 7%, σ 9%; B return 11%, σ 15%; ρ=.25.

```
E(R_p)=.5(7%)+.5(11%)=9%
σ²_p=.25(.09²)+.25(.15²)+2(.5)(.5)(.25)(.09)(.15)
=.00765+.0016875=.0093375
σ_p=√.0093375=9.66%
```

Weighted-average σ is 12%; 9.66% < 12%, so diversification helped because ρ<1. Do not omit the covariance term or square-root pieces separately.

SELF-TEST	ANSWER CUE
ρ becomes +1?	Diversification benefit disappears
Recovery rises?	Loss rate falls; limit can rise
Matrix row totals?	Must equal 1

Variance discipline: square each weight and σ in the own-risk terms; include $2X_AX_B\rho\sigma_A\sigma_B$; take one square root at the end. Portfolio return is a weighted average; portfolio risk is not.

Concentration card: limit = tolerated capital-loss share ÷ loss rate. A higher recovery lowers LGD/loss rate, so the same tolerated capital loss supports a larger limit.

Migration card: current grade labels rows, next-year grade labels columns; default is absorbing. Faster-than-history downgrades signal the bank should reduce new sector lending before default occurs.

6 · Tranche loss drill

C7

$500m pool: Senior $400m; Mezzanine $75m; Equity $25m; realised losses $60m.

TRANCHE	LOSS	RATE
Equity	$25m	100%
Mezzanine	$35m	46.7%
Senior	$0	0%

Losses fill bottom-up; cash pays top-down. Senior attachment = Equity + Mezz = $100m = 20% of pool. A 12% pool loss is fully absorbed below Senior.

SENIOR $400m · loss $0

MEZZ $75m · loss $35m

EQUITY $25m · WIPED

losses rise ↑

Subordination protects Senior until pool losses exceed $100m.

JUDGEMENT CARD	ANSWER
Sale with recourse	Seller retains contingent credit risk; no true relief
Pass-through	Every investor receives pro-rata pool cash

9 · Worked: capital ratios

C11 EXAMPLE

On-BS: cash $30m (0%); Treasuries $70m (0%); mortgages $200m (35%); corporate loans $250m (100%). **OBS:** undrawn $60m, CCF 50%, counterparty weight 100%. Capital: CET1 $24m; AT1 $4m; Tier 2 $7m.

NOTIONAL $60m → **× CCF** 50% → **CREDIT-EQ** $30m → ×100% → **$30m RWA**

convert first

weight second

Off-balance-sheet order: notional → CCF → credit-equivalent → weight.

```
On-BS RWA =
30(0)+70(0)+200(.35)+250(1) = $320m
OBS RWA = 60(.50)(1) = $30m
Total RWA = $350m
```

```
Tier 1=24+4=$28m; Total=28+7=$35m
CET1=24/350=6.86%
Tier 1=28/350=8.00%
Total=35/350=10.00%
```

```
Exposure=550+30=$580m
Leverage=28/580=4.83%
```

Hard minima met: CET1 4.5%, Tier 1 6%, Total 8%, leverage 3%. But CET1 6.86% < 7% including conservation buffer → distributions restricted.

RATIO	NUMERATOR	DENOMINATOR
CET1	$24m	$350m RWA
Tier 1	$28m	$350m RWA
Total	$35m	$350m RWA
Leverage	$28m	$580m exposure

Free checks: CET1 ≤ Tier 1 ≤ Total because one denominator is shared and capital layers accumulate. Cash/Treasuries add zero RWA but still count in unweighted leverage exposure. Off-BS notional is never risk-weighted before applying CCF.

BUFFERS AND JUDGEMENT

The 4.5% CET1 level is a hard minimum. Adding the 2.5% conservation buffer creates a 7% effective threshold; a bank between them is above the minimum but must restrict dividends/buybacks. Countercyclical buffer may add CET1 in credit booms; the leverage ratio is the backstop when risk weights look too low.

SOVEREIGN + LIQUIDITY CARDS

IF YOU SEE…	JUDGEMENT
Solvent foreign borrower; FX blocked	Sovereign risk overrides credit
Debt-service or import ratio ↑	Country risk rises
Original vs MYRA cash flows	Discount both at same required rate

10 · If you see X → do Y

ALL CHAPTERS

X	Y
Rate reset inside window	Classify RSA/RSL
Book value + NII	Repricing model
Market value + ΔE	Duration model
Different rate shocks	Spread formula
Tail loss over days	DEAR then √N
Two risks + correlation	Keep covariance term
Loan choice	RAROC against hurdle
Cross-border payment block	Borrower then sovereign
Cash drain	Purchased vs stored
OBS commitment	CCF before risk weight
Leverage ratio	Total exposure, not RWA

WHAT CHANGES?

EARNINGS GAP | **VALUE** duration | **TAIL LOSS** DEAR

name denominator · show sign · interpret

Method choice starts from the quantity the question asks to change.

11 · Classic traps

SOURCE FAQS

- Rate sensitivity is about reset within horizon, not final maturity.
- Duration and RAROC use market-value sensitivity; GAP uses book-value earnings.
- VaR is a quantile, not the worst possible loss; 1.65 is one-tail 5%.
- LGD ≠ EDF; loss rate ≠ default probability.
- With recourse, risk stays with seller; loss waterfall runs Equity upward.
- Higher liquidity index means smaller haircut; financing requirement ≠ gap.
- Deposit insurance: name both run prevention and moral hazard.
- CET1 ≤ Tier 1 ≤ Total because the denominator is the same RWA.

CONCEPT PAIR	FAST DISTINCTION
Timing / maturity	Different dates / different terms
Purchased / stored	Borrow, same size / sell, shrink
Repudiate / reschedule	Cancel / re-term
Flat / risk-based	Risk subsidy / fairer charge
Regulatory / economic capital	Rule floor / modelled need

12 · Exam-morning plan

STUDY STRATEGY

1. Recite the six setups: GAP, DGAP, DEAR, RAROC, portfolio variance, RWA.

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