NOVA SCHOOL OF
BUSINESS & ECONOMICS

**Course: Banking [2206]** **Fall Semester 2024**

**Exam** **December 12, 2024**

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**Student number: _____**

**Instructions for the exam:**

- You have 1h30 (one and a half hours) to complete the exam
- The exam is worth 20 points
- You are not allowed to have anything with you, except for pen/pencil, drinks/snacks and a non-graphic calculator
- You should try your best to express your ideas clearly and concisely, and to highlight key arguments.

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**Part I [7/20]**

In this first part of the exam, you need to select a single answer in each of the 10 questions presented below. You will not be penalized for wrong answers.

**1.** What is the role of the European Systemic Risk Board (ESRB) in the European financial system?

a) Supervising the 109 most significant banks across the Eurozone.

b) Overseeing micro-prudential risks and ensuring compliance with the Single Rulebook.

**c) Overseeing the financial system of the European Union and preventing and mitigating systemic risk.**

d) Implementing anti-money laundering policies at the EU level.

**2.** A bank supervised by the SSM is found to have significantly lower capital levels than required. Which of the following is the MOST likely initial response from the SSM and the subsequent potential consequence for the bank if the situation doesn't improve?

a) The SSM immediately initiates a bail-in procedure through the SRB.

b) The SSM issues a public reprimand, and the bank faces no further consequences.

**c) The SSM initiates corrective actions, such as requiring the bank to increase its capital or restrict its activities. If these actions prove insufficient, the bank could ultimately be resolved by the SRB under the SRM.**

d) The ECB immediately provides additional liquidity to the bank to ensure its stability.

**3.** What differentiates "inside money" from "outside money" in the context of banking and monetary theory?

a) Inside money is created by central banks, while outside money is created by private financial institutions.

**b) Inside money represents credit created within the banking system, while outside money refers to money issued by a trusted authority like a central bank.**

c) Inside money is a liability of the central bank, whereas outside money is backed by gold reserves.

d) Inside money includes physical cash, while outside money includes all forms of digital currency.

**4.** Bank A and Bank B have the same Return on Assets (ROA) of 1%. Consider leverage, defined as assets over equity: Bank A has a ratio of 15:1, while Bank B has 10:1. Assuming no other factors affect profitability, what can be inferred about their Return on Equity (ROE)?

**a) Bank A's ROE is higher than Bank B's.**

b) Bank B's ROE is higher than Bank A's.

c) Both banks have the same ROE.

d) ROE cannot be determined without net income data.

**5.** What is the key limitation of using diversification as a risk management strategy during a financial crisis?

a) It requires excessive regulatory oversight.

**b) Correlations between asset classes increase, reducing its effectiveness.**

c) It is limited to only high-risk portfolios.

d) It cannot be applied to credit portfolios.

**6.** What distinguishes Expected Loss (EL) from Unexpected Loss (UL) in credit risk?

**a) EL is covered by provisions, while UL is addressed through regulatory capital.**

b) EL is measured during default events, while UL is estimated before defaults.

c) EL is an accounting measure, while UL is unrelated to financial metrics.

d) EL reflects extreme losses, while UL accounts for average losses.

**7.** What does the Duration Gap Model primarily measure?

a) The sensitivity of a bank's income to interest rate fluctuations.

**b) The impact of interest rate changes on the capital value of financial institutions.**

c) The risk of customer default due to higher rates.

d) The cost of refinancing fixed-rate loans.

**8.** A bank has total assets of $500 million with an average duration of 5 years and total liabilities of $400 million with an average duration of 3 years. What is the capital duration for the bank? How might an interest rate increase impact the bank's economic value?

a) The capital duration is 10 years; thus, if interest rates rise by 1%, the bank's economic value will decrease by approximately $5 million, signifying that the bank is exposed to interest rate risk.

**b) The capital duration is 13 years; thus, if interest rates rise by 1%, the bank's economic value would decrease by approximately $13 million, signifying that the bank is exposed to interest rate risk.**

c) The capital duration is 5 years; thus, if interest rates rise by 1% the bank's economic value would increase by approximately $12.5 million.

d) None of the above.

**9.** What is the primary objective of a Risk Appetite Framework (RAF)?

a) To set precise financial targets for the bank's profitability.

**b) To define and monitor the types and levels of risk the bank is willing to assume.**

c) To eliminate all material risks through mitigation strategies.

d) To ensure compliance with stress testing requirements.

**10.** What is the main focus of the Supervisory Review and Evaluation Process (SREP)?

a) Assessing liquidity adequacy for financial institutions.

b) Ensuring effective implementation of stress testing across banks.

**c) Evaluating a bank’s risk profile, internal governance, and capital adequacy.**

d) Monitoring customer satisfaction with financial services.

**Part II [9/20]**

In this second part of the exam, you must answer **three questions** out of the five presented below. You are free to choose the three that you want to answer. Each question is worth 1/3 of the 9 points assigned to this group. If you reply to more than three questions, only the first three answered will be considered for grading purposes. Please answer the questions chosen in a maximum of 200 words.

**1.** Explain the 3-line defence model as applied in banking risk management. How does this framework ensure effective risk governance, and what are the roles of each line of defence? You may support your answer with examples.

The 3-line of defence model is a cornerstone of risk management in banking, providing a structured approach to identifying, managing, and mitigating risks.

First Line of Defence: Business units, such as front-office staff, are directly responsible for identifying, assessing, and managing risks. For example, a loan officer ensures creditworthiness before approving loans.

Second Line of Defence: Risk management and compliance functions oversee and support the first line, developing frameworks and policies for risk control. In particular, the risk officer facilitates implementation of the risk management framework and is responsible for further identifying, monitoring, analysing and managing risks through a holistic view, while the compliance officer monitors compliance with legal and regulatory requirements and internal policies, providing advice on compliance to the management body and other relevant personnel. For example, a risk officer may analyse credit portfolios to ensure adherence to limits.

Third Line of Defence: Internal audit provides independent assurance, reviewing processes and controls across the first and second lines. They may audit the credit approval process to verify compliance with policies.

This framework ensures accountability, segregation of duties, and comprehensive risk coverage, aligning with governance principles and regulatory requirement

**2.** Compare and contrast bottom-up and top-down approaches to stress testing. Discuss the advantages and disadvantages of each approach, considering factors such as data availability, model complexity, and consistency across the banking system. You may provide specific examples of situations where one approach might be preferred over the other.

Bottom-up stress testing as a bank-performed exercise using its own framework, often part of a broader regulatory exercise with common features provided by authorities. Top-down stress testing is performed by an authority using its own framework.

Bottom-up offers detailed institution-specific insights, but lacks consistency across the banking system. Top-down ensures consistency and allows for system-wide risk assessment, but may oversimplify individual bank specifics. Bottom-up is preferred when granular data is available and detailed internal risk profiles are needed. Top-down is better for macroprudential oversight and identifying systemic vulnerabilities. The optimal approach depends on the specific goals of the stress test.

**3.** A regional bank holds the following portfolio for Ms. Silva: 12 000 euros in deposits earning 1.5% interest, a loan of 15 000 euros with a 6% interest rate, and incurs 15 euros/month in fees and commissions. Credit analysis estimates a 2% probability of default for Ms. Silva, with a 50% loss given default on the loan. The bank faces 120 euros annually in operating costs associated with Ms. Silva. Regulatory requirements mandate 2% cash reserves on deposits and 10% equity on risk-weighted assets. The risk weight for Ms. Silva's loan is 80%. The bank's cost of equity is 8.5%. The treasury department quotes liquidity at a bid/ask spread of 3.0%/3.5%. Please build the Balance Sheet and the Profit & Loss statement of the bank associated with Ms. Silva, filling the gaps in the tables (if you want to justify your choices, you may use the space available). What is the economic value associated with Ms. Silva?

| **Balance sheet** | | |
|---|---|---|
| **Assets** | | |
| Cash Reserves | =12000*0.02 | 240 |
| Pool Funds | =12000-240 | 11760 |
| Loan | | 15000 |
| **Total assets** | **=240+11760+15000** | **27000** |
| **Liabilities** | | |
| Deposits | | 12000 |
| Pool Funds | =15000-1200 | 13800 |
| Capital | =0.1*0.8*15000 | 1200 |
| **Total liabilities + Capital** | **=12000+13800+1200** | **27000** |

| **P&L** | | |
|---|---|---|
| **Income** | | |
| Interest on the loan | =0.06*0.99*15000 | 891 |
| Fees | =15*12 | 180 |
| Selling liquidity to pool | =11760*0.03 | 352.8 |
| **Total income** | **=891+180+352.8** | **1423.8** |
| **Cost** | | |
| Interest on deposit | =0.015*12000 | 180 |
| Expected loss | =0.01*15000 | 150 |
| Operating costs | | 120 |
| Cost of liquidity | =0.035*13800 | 483 |
| Cost of capital | =0.085*1200 | 102 |
| **Total cost** | **=180+150+120+483+102** | **1035** |

| | | |
|---|---|---|
| **Economic value** | =1423.8-1035 | 388.8 |

**4.** Compare and contrast recovery, early intervention, and resolution phases in addressing bank distress. In addition, describe the four primary bank resolution techniques and analyse the feasibility of combining them in a single resolution strategy.

Recovery is triggered by the institution's risk of or situation of financial distress. The measures implemented are those foreseen in the recovery plan prepared by the institution. These measures are characterised by being voluntary and private and the credit institution is responsible for their implementation.

Early intervention is characterised by the non compliance with legal or/and regulatory provisions (deterioration of the financial situation: own funds, liquidity…). Here, the supervisory authority is responsible for the implementation of measures which may include the following: restructuring plan, restrictions on the activity, removal or replacement of members of the management body, temporary administration, contacts with potential acquirers…

Resolution is triggered by three conditions: (i) the institution's status of gone concern is failing or likely to fail (FOLTF); (ii) there is an absence of other measures that could avoid failure; and (iii) there is a public interest in avoiding liquidation. The resolution authority is responsible for measure implementation such as: (i) Sale of business; (ii) Bridge institution; (iii) Asset separation, and (iv) Bail-in

The four primary bank resolution techniques are:

1. Sale of business - allows for the sale, total or partial, of the credit institution under resolution (or its business to a private purchaser).

2. Bridge institution – the activity of the institution (or the institution itself) is transferred, in whole or in part, to an entity incorporated for this purpose.

3. Asset separation – allows the transfer of assets to an asset management vehicle with the objective of maximising their value (can only be used in combination with another resolution measure).

4. Bail-in – shareholders and creditors are written down and converted for the institution to be recapitalised to the extent necessary to restore its ability to comply with the conditions for authorization, continue to carry out its activities and sustain sufficient market confidence.

**5.** Explain the roles of the Financial Stability Board (FSB) and the Basel Committee on Banking Supervision (BCBS) in global banking regulation. Briefly describe the Basel Accords, including their three pillars and main changes across different versions. Analyse how these accords are implemented and enforced at the European and national levels.

The FSB is a global body promoting international financial stability, setting high-level policy and coordinating responses to systemic risks. The BCBS, under the FSB, develops specific banking regulations — the Basel Accords. These accords aim to enhance banking safety and soundness globally.

Basel I focused primarily on credit risk, requiring a minimum capital ratio. Basel II introduced three pillars: minimum capital requirements, supervisory review, and market discipline, incorporating operational and market risks. Basel III, responding to the 2008 crisis, significantly increased capital requirements, introduced liquidity ratios (LCR and NSFR), and addressed systemic risk.

Enforcement varies. At the EU level, Basel Accords are incorporated into legally binding directives and regulations (e.g., CRR/CRD). Nationally, these are transposed into domestic law, with supervisory authorities responsible for ensuring compliance. Variations in implementation can arise due to differences in national contexts and priorities.

**Part III [2/20]**

In this third part of the exam, please answer the following question in a maximum of 200 words.

Referencing the Financial Times article discussing the resurgence of an *old strategy being reinvented on Wall Street*, critically analyse the role of credit risk transfer (CRT) mechanisms in managing systemic risks within the banking sector. How do these mechanisms balance risk mitigation with the potential for creating new vulnerabilities? Support your discussion with references to risk, risk concentration, impact on capital and lending capacity, excessive risk-taking and the role of supervision/regulatory requirements.

FINANCIAL TIMES

# An old strategy is being reinvented on Wall St

A growing market for credit risk transfers is drawing a debate over potential hazards and benefits

William Cohan DECEMBER 7 2024 38

There is an old idea making new waves on Wall Street. Banks of all stripes are once again moving risk off their balance sheets, in line with the demands of their prudential regulators, to make room for taking on more risk.

These so-called "credit risk transfers," or CRTs, enable banks to sell only the risks associated with various loans, or pools of loans — but not the loans themselves — to third-parties willing to assume those risks and take the associated rewards, or so they hope. They are also known as "significant risk transfer" or SRTs. "One of the major growing pains for this market is that no one can decide on a name. The product is known by different names in different places," notes law firm A & O Shearman.

Since 2017, the global market has grown by 20 to 25 per cent a year, reaching a record $24bn in 2023, according to data from credit investor Chorus Capital. It says there have been $16.6bn of deals this year up to September 30 involving 44 banks.

The idea is to free up regulatory capital placed against loans to allow for new loans to be made. Hopefully, it's a virtuous cycle of reducing risk at depository institutions and housing it at other financial behemoths.

But just because risk is being removed from the balance sheets of the big Wall Street banks doesn't mean that risk disappears from the system; it just means that it gets pushed around to others willing to assume it. The risk remains. The question always is whether the risk taken can be managed or contained, or whether it will soon explode in our faces.

And this is what worries people like Sheila Bair, the former chair of the Federal Deposit Insurance Corporation, and Simon Johnson, the newly-crowned Nobel laureate and MIT professor of entrepreneurship, who remember all too well how the promise of risk containment, using another creative financial product — "credit default swaps" — nearly blew the financial world to smithereens back in 2008.

Are CRTs another such ticking time bomb? Its proponents say no, of course, that CRTs could not be more different from credit default swaps. In an August interview with Bloomberg, Michael Shemi, the head of North America Structured Credit at Guy Carpenter, said that the collective experience of credit default swaps in 2008 "informed" the creation of the CRT market today — the aim is to not let the same thing happen again.

Credit risk transfer (CRT) mechanisms, such as securitizations and credit default swaps, aim to mitigate systemic risks by redistributing credit exposures from banks to investors with higher risk tolerance or diversified portfolios. This can reduce concentration risk and free up bank capital, enhancing lending capacity. However, CRT also carries significant hazards. Its complexity and opacity can obscure the true location of risks, as seen during the 2008 financial crisis, where securitized mortgage assets contributed to market collapse.

Recent revival of CRT on Wall Street underscores its ongoing relevance but also its potential for misuse. Weak incentives for diligent underwriting and misaligned interests between banks and investors could lead to excessive risk-taking. Effective CRT depends on rigorous transparency, regulatory oversight, and ensuring risk

transfers are accompanied by adequate due diligence. While CRT offers systemic benefits, its improper use can exacerbate instability, making balanced application crucial.

**Part IV [2/20]**

In this fourth part of the exam, you must answer **one question** out of the six presented below, related to the case studies that have been analysed during the semester. You are free to choose the one you prefer to answer to, being that respective to the case you delivered a report on, or not. If you reply to more than one question, only the first one answered will be considered for grading purposes. Please answer the question chosen in a maximum of 150 words.

**1. Investment Banking in 2008 | Rise and Fall of the Bear.** Discuss whether Bear's failure undermined the viability of the so-called "pure-play" investment banks. You may want to refer to the policy/regulation response after the great financial crisis.

Bear's collapse represented the first crack in the dam for the future of pure-play banks. Bear exhibits all the characteristics that undermine the other pure-play banks later in the fall of 2008: extreme leverage, excessive exposure to the mortgage market, a growing reliance on proprietary trading profits that made its risk profile more closely resemble that of a hedge fund and improper risk management given the insufficient level of capital combined with the excessive risk taking. This lead to the implementation of regulation following the great financial crisis that included, for example, stricter requirements for the quality and quantity of regulatory capital, the introduction of liquidity requirements, like the Net Stable Funding Ratio (NSFR) and the Liquidity Coverage Ratio (LCR), and of additional buffers, such as the capital conservation buffer, countercyclical capital buffer and additional requirements for systemically important banks.

**2. Blackstone and the Sale of Citigroup's Loan Portfolio.** Discuss whether this transaction benefits Blackstone and why Citigroup is seeking to sell the portfolio of leveraged loans.

The transaction benefits Blackstone as:

· Citigroup's leveraged loan portfolio, used to mostly finance LBOs, was perceived by Blackstone as being undervalued (i.e., market price < fundamental value), which enabled the potential to generate superior risk-adjusted returns. This was due to the unfavourable market conditions (i.e., subprime mortgage crisis), investors' excessive risk aversion assuming too high default probabilities and lack of liquidity in financial markets.

· Blackstone carefully selected the portfolio so that the expected default rates would be smaller than those for average B-rated securities.

· The financing conditions provided by Citigroup were very favourable. E.g.: the cost of financing, was 100bps above the LIBOR.

Citigroup was a motivated seller, seeking to sell its portfolio of leveraged loans because:

· Leveraged loans were costly from a regulatory capital point-of-view, as they had a RWA of 100%. Selling them would enable Citigroup to continue to be regulation complient.

· Leveraged loans accounting treatment wasn't favourable, most of the loans were included in the trading book and their value was marked-to-market adjustments.

**3. Le Taux Modèle: ING Direct, A Growing Success Story.** Discuss the several factors that could reduce the level of interest rate risk.

Possible factors include:

· Additional income from cross-selling services.

· Interest rate risk diversification, as ING Direct is facing five sources of interest rate risk: volatility of interest rates in euros, US dollars, Canadian dollars, Australian dollars, and sterling. It is unlikely that all interest rates will increase at the same time.

· Additional mitigating factors could be opposite maturity mismatches at ING Bank or ING Insurance.

· Maturity matching as they are funded by short-term liabilities with long-term assets, subject to refinancing risk. Further incentives could be provided to clients to engage in long-term deposits.

**4. Wells Fargo Bank, N.A. The Fake Accounts Scandal.** Discuss the possible factors that explain why Wells Fargo ended up cheating its customers by opening fake accounts. Enumerate three possible factors.

The three possible factors are:

· "Bad apples" (individual factors): cheating within Wells Fargo was the fault of a few employees (as Wells Fargo claimed):

E.g.: greed, financial/other rewards for business results leading to wrong incentives combined with unrealistic objectives, unaware of violating a standard, cognitive biases that influence decision-making, covering up mistakes on the job.

· "Bad barrels" (organizational factors): poor management controls and the wider corporate culture:

E.g.: lack of controls, failure to promote ethical standards, focus on results and growth (not how they were achieved), tone from the top, a hierarchical/authoritarian culture where it is difficult to speak up.

· "Bar orchards" (industry/broader factors): poor regulation and industry practice:

E.g.: inherent conflicts of interest (e.g., in auditing), lack of enforcement of regulations, weak/poor regulations, misconduct is pervasive in the sector.

**5. JP Morgan and the London Whale.** Consider the organizational structure and processes at JP Morgan in early 2011. If you were to re-design the risk management policy for the CIO, what would be your top 3 changes?

Possible suggestions include:

· Have the CIO risk team report directly to firm-wide risk instead of Ina Drew, decreasing the existent conflict of interest. This was implemented as part of the review.

· Separate the functions of risk management from the investment function, which would, for example, increase accountability.

· Create a separate risk analysis report on the SCP which would be included in Ina Drew's daily reports.

· Enable firm-wide risk to handle risk limit excesses more forcefully instead of relying on the CIO investment team.

· More granular risk limits at the SCP level, since limits applied at the CIO portfolio level (only), allowing too much freedom (i.e. implementing stricter policies/regulations)

· Ask an independent party to certify the portfolio marks, similar to the rules for selected investment fund managers. Conduct a liquidity analysis on the portfolio to give portfolio managers a sense of how readily it can be rebalanced.

· No provisional approvals of risk models. Both models should be run simultaneously, with more conservative reading being the one that determine the limits.

**6. Citibank: Weathering the Commercial Real Estate Crisis of the Early 1990s.** Discuss whether internal governance and misaligned incentives had hampered bank's performance and whether they were central to the solution for a successful turnaround.

Although internal governance and misaligned incentives hampered the bank's performance, both played a central role in becoming the solution to a successful turnaround.

Factors that hampered the bank's performance included:

· Decentralized management and autonomy (i.e., the competitive environment and filled with redundancies).

· Ineffective oversight due to high disorganization.

· Failures in risk management, leading to excessive risk-taking. E.g.: issues in identifying change in macroeconomic conditions or bad investments like Quotron or excessive exposure to least developed country loans and to real estate market.

· High operating costs due to employees abusing firm benefits to finance a lavish lifestyle.

· Misaligned incentives, as managers were incentivised to think about the profitability of each business unit and not the bank's aggregate bottom-line and financial health. This amplified the risk-taking culture and the lack of cooperation.

Factors that promoted the bank's turnaround included:

· Streamlining of administrative duties (identifying and eliminating double efforts and redundancies).

· Cost reduction by, for example, firing of personnel, creating rules to control travel and entertainment expenses or achieving economies of scale by centralising purchases to secure better deals.

· Creation of the G15 which centralised management through the creation of G15 (where top executives cooperated together, diminishing autonomy) and aligning incentives, changing bank culture from one focused on the business unit perspective to the overall performance of the bank.

· Diminished bureaucracy.

· Bank recapitalization through the issuance of preferred stock.

· Recommitting to the core business, i.e., consumer banking.