MMF2000 RISK MANAGEMENT ASSIGNMENT 4

Treasury and Liquidity Risk

Xinyi (Cynthia) Shen, 1005778428
xinyi.shen@mail.utoronto.ca

Due Date: December 6, 2024

The assignment will be based on the public available information on Fiscal 2024 Q3 financial report to shareholders for the big-five Canadian banks: RBC, TD, BMO, BNS, CIBC.

Question 1: Compare Q3 2024 vs Q2 2024 and Year-to-Date Q3 2024 vs Year-to-Date Q3 2023 Net Interest Income for the five banks. Describe drivers of quarterly change for each bank (consolidated bank level).

Comparison of Net Interest Income

1. RBC:

(1) Q3 2024 vs. Q2 2024: from $6,623 millions to $7,327 millions

Net interest income increased $704 millions or 11%, of which $390 millions reflects the inclusion of HSBC Canada net interest income. The remaining increase of $314 millions or 5% was primarily due to average volume growth, the impact of two more days in the current quarter and higher spreads in Canadian Banking.

(2) Year-to-Date Q3 2024 vs. Year-to-Date Q3 2023: from $18,587 millions to $20,282 millions

Net interest income increased $1,695 millions or 9%, of which $748 millions reflects the inclusion of HSBC Canada net interest income. The remaining increase of $947 millions or 5% was largely due to higher spreads and average volume growth in Canadian Banking.

2. TD:

(1) Q3 2024 vs. Q2 2024: from $7,465 millions to $7,579 millions

Reported net interest income for the quarter increased $114 millions, or 2%, compared with the prior quarter, primarily reflecting volume growth in Canadian Personal and Commercial Banking, and the impact of fewer days in the prior quarter, partially offset by lower net interest income in Wholesale Banking. On an adjusted basis, net interest income increased $112 millions, or 1%.

By segment, the increase in reported net interest income reflects increases in Canadian Personal and Commercial Banking of $182 millions, in U.S. Retail of $95 millions, in the Corporate segment of $40 millions, and in Wealth Management and Insurance of $12 millions, partially offset by a decrease in Wholesale Banking of $215 millions.

(2) Year-to-Date Q3 2024 vs. Year-to-Date Q3 2023: from $22,450 millions to $22,532 millions

Reported net interest income was $22,532 millions, an increase of $82 millions, compared with the same period last year, reflecting volume growth and higher deposit margins in Canadian Personal and Commercial Banking, higher loan volumes in U.S. Retail, and higher deposit margins in Wealth Management, partially offset by lower net interest income in Wholesale Banking, lower deposit volumes in U.S. Retail, and the prior period impact of the terminated FHN acquisition related capital hedging strategy in the Corporate segment. On an adjusted basis, net interest income was $22,715 millions, a decrease of $121 millions, or 1%.

By segment, the increase in reported net interest income reflects increases in Canadian Personal and Commercial Banking of $1,152 millions, in the Corporate segment of $158 millions, and in Wealth Management and Insurance of $106 millions, partially offset by decreases in Wholesale Banking of $932 millions and in U.S. Retail of $402 millions.

3. BMO:

(1) Q3 2024 vs. Q2 2024: from $4,515 millions to $4,794 millions

Reported net interest income increased $279 millions or 6% from the prior quarter, driven by two additional days in the current quarter, higher net interest income in the P&C businesses, higher trading-related net interest income and higher non-trading net interest income in BMO Capital Markets.

(2) Year-to-Date Q3 2024 vs. Year-to-Date Q3 2023: from $13,740 millions to $14,030 millions

Reported net interest income was $14,030 millions, an increase of $290 millions or 2% from the prior year, and adjusted net interest income was $14,072 millions, relatively unchanged. Higher net interest income in the P&C businesses was offset by a decrease in Corporate Services and lower trading-related net interest income. Trading-related net interest income was $224 millions, a decrease of $463 millions from the prior year, and was largely offset in trading non-interest revenue.

4. BNS:

(1) Q3 2024 vs. Q2 2024: from $4,694 millions to $4,862 millions

Net interest income increased $168 millions or 4%, driven primarily by asset growth inclusive of the conversion of bankers' acceptances to loans due to the cessation of CDOR in June 2024, and the impact of two additional days in the quarter, partly offset by a lower interest margin.

(2) Year-to-Date Q3 2024 vs. Year-to-Date Q3 2023: from $13,596 millions to $14,329 millions

Net interest income was $14,329 millions, an increase of $733 millions or 5%, due primarily to a higher net interest margin and asset growth inclusive of the conversion of bankers' acceptances to loans due to the cessation of CDOR in June 2024.

5. CIBC:

(1) Q3 2024 vs. Q2 2024: from $3,281 millions to $3,532 millions

Net interest income was up $251 millions or 8% from the prior quarter, primarily due to the impact of additional days in the current quarter, volume growth across the businesses, higher treasury revenue, the conversion of bankers' acceptances to CORRA loans, and higher net interest margin in the non-trading businesses, partially offset by lower trading net interest income.

(2) Year-to-Date Q3 2024 vs. Year-to-Date Q3 2023: from $9,628 millions to $10,062 millions

Net interest income for the nine months ended July 31, 2024 was up $434 millions or 5% from the same period in 2023, primarily due to volume growth across the businesses, higher net interest margin in the non-trading businesses and the conversion of bankers' acceptances to CORRA loans, partially offset by lower trading net interest income.

Drivers of Quarterly Change of Net Interest Income

For RBC, the drivers of quarterly increased net interest income include the inclusion of HSBC Canada net interest income, average volume growth, the impact of two more days in the current quarter and higher spreads in Canadian Banking.

For TD, the drivers of quarterly increased net interest income include volume growth in Canadian Personal and Commercial Banking and the impact of more days in the current quarter. By segment, TD's increase in reported net interest income comes from the increases in the Canadian Personal and Commercial Banking segment, in the U.S. Retail segment, in the Corporate segment, and in the Wealth Management and Insurance segment.

For BMO, the drivers of quarterly increased net interest income include two additional days in the current quarter, higher net interest income in the P&C businesses, higher trading-related net interest income, and higher non-trading net interest income in BMO Capital Markets.

For BNS, the drivers of quarterly increased net interest income include asset growth inclusive of the conversion of bankers' acceptance to loans due to the cessation of CDOR in June 2024, and the impact of two additional days in the quarter.

For CIBC, the drivers of quarterly increased net interest income include the impact of two additional days in the current quarter, volume growth, higher treasury revenue, the conversion of bankers' acceptance to CORRA loans, and higher net interest margin in the non-trading businesses.

Question 2: Compare Q3 2024 vs Q2 2024 and Year-to-Date Q3 2024 vs Year-to-Date Q3 2023 Net Interest Margin for the five banks. Describe drivers of quarterly change for each bank (consolidated bank level).

Comparison of Net Interest Margin

1. RBC:

(1) Q3 2024 vs. Q2 2024: from 1.50% to 1.58%

Net interest margin was up 8 bps compared to last quarter, mainly driven by the acquisition of HSBC Canada including the accretion of fair value adjustments, as well as higher interest rates and changes in product mix in Canadian Banking. This was partially offset by competitive pricing pressures in Canadian Banking and higher funding costs in Capital Markets.

(2) Year-to-Date Q3 2024 vs. Year-to-Date Q3 2023: from 1.50% to 1.50%

Net interest margin for nine months ended was unchanged compared to prior year.

2. TD:

(1) Q3 2024 vs. Q2 2024: from 1.73% to 1.70%

Canadian Personal and Commercial Banking: Net interest margin was 2.81%, a decrease of 3 bps, primarily due to balance sheet mix, reflecting the transition of Bankers' Acceptances to CORRA-based loans.

U.S. Retail: Net interest margin of 3.02% increased 3 bps quarter over quarter due to higher deposit margins.

(2) Year-to-Date Q3 2024 vs. Year-to-Date Q3 2023: from 1.74% to 1.71%

TD did not provide Year-to-Date Q3 2024 and Year-to-Date Q3 2023 Net Interest Margin. I calculated:

$$Year\ to\ Date\ Q3\ Net\ Interst\ Margin = \frac{sum(Q3 + Q2 + Q1\ Net\ Interest\ Income)}{sum(Q3 + Q2 + Q1\ Average\ Interest\ Earning\ Assets)} \times 4$$

Results are as follows:

	Q3 2024	Q2 2024	Q1 2024	YTD Q3 2024	Q3 2023	Q2 2023	Q1 2023	YTD Q3 2023
Net Interest Income	7579	7465	7488	22532	7289	7428	7733	22450
Average Interest-Earning Assets	1778	1754	1729	5261	1716	1728	1715	5159
Net Interest Margin	1.71%	1.70%	1.73%	1.71%	1.70%	1.72%	1.80%	1.74%

Canadian Personal and Commercial Banking: Net interest margin was 2.83%, an increase of 7 bps, primarily due to higher margins on deposits, partially offset by changes to balance sheet mix reflecting the transition of Bankers' Acceptances to CORRA-based loans and lower margins on loans.

U.S. Retail: Net interest margin of 3.01%, decreased 17 bps, due to lower deposit margins reflecting higher deposit costs.

3. BMO:

(1) Q3 2024 vs. Q2 2024: from 1.51% to 1.51%

BMO's overall reported net interest margin was unchanged from the prior quarter. Adjusted net interest margin, excluding trading-related net interest income, and trading and insurance assets, increased 1 basis point, primarily due to higher non-trading net interest income in BMO Capital Markets.

(2) Year-to-Date Q3 2024 vs. Year-to-Date Q3 2023: from 1.62% to 1.53%

BMO's overall reported net interest margin of 1.53% decreased 9 basis points from the prior year. Adjusted net interest margin, excluding trading related net interest income, and trading and insurance assets was 1.83%, a decrease of 5 basis points, primarily due to lower net interest income and higher low-yielding assets in Corporate Services, partially offset by higher margins in Canadian P&C and BMO Capital Markets.

4. BNS:

(1) Q3 2024 vs. Q2 2024: from 2.17% to 2.14%

The net interest margin decreased three basis points driven mainly by lower margins in International Banking and Canadian Banking, as well as higher levels of high quality, lower yielding liquid assets.

(2) Year-to-Date Q3 2024 vs. Year-to-Date Q3 2023: from 2.11% to 2.17%

The net interest margin was 2.17%, an increase of six basis points, driven primarily by higher margins in Canadian Banking and International Banking. This was partly offset by a lower contribution from asset/liability management activities, as well as increased levels of high quality, lower yielding liquid assets.

5. CIBC:

(1) Q3 2024 vs. Q2 2024: from 1.35 % to 1.39%

The net interest margin was 1.39%, increased by 4 basis points from prior quarter, driven by the changes in net interest margin on average interest-earning assets in different segments.

Canadian Personal and Business Banking: Net interest margin on average interest-earning assets was up 7 basis points from the prior quarter, mainly due to higher relative growth in higher margin products.

Canadian Commercial Banking and Wealth Management: Net interest margin on average interest-earning assets was down 18 basis points from the prior quarter, primarily due to the impact from the conversion of bankers' acceptances to CORRA loans resulting from the cessation of CDOR.

U.S. Commercial Banking and Wealth Management: Net interest margin on average interest-earning assets was down 1 basis point from the prior quarter.

Corporate and Other: Corporate and Other included the impact of higher net interest margins in international banking from rising interest rates.

(2) Year-to-Date Q3 2024 vs. Year-to-Date Q3 2023: from 1.36% to 1.35%

The nine months ended net interest margin was 1.35%, a drop of 1 basis point from prior year, driven by the changes in net interest margin on average interest-earning assets in different segments.

Canadian Personal and Business Banking: Net interest margin on average interest-earning assets for the nine months ended July 31, 2024 was up 18 basis points from the same period in 2023, mainly due to higher deposit margins and favourable asset mix, partially offset by lower loan margins.

Canadian Commercial Banking and Wealth Management: Net interest margin on average interest-earning assets for the nine months ended July 31, 2024 was down 49 basis points from the same period in 2023, primarily due to the cessation of CDOR as noted above, and lower deposit and loan margins.

U.S. Commercial Banking and Wealth Management: Net interest margin on average interest-earning assets for the nine months ended July 31, 2024 was down 3 basis points from the same period in 2023, primarily due to lower deposit margins, partially offset by higher loan margins.

Drivers of Quarterly Change of Net Interest Margin

For RBC, the drivers of quarterly increased net interest margin include the acquisition of HSBC Canada including the accretion of fair value adjustments, as well as higher interest rates and changes in product mix in Canadian Banking.

For TD, the drivers of quarterly decreased net interest margin include balance sheet mix, reflecting the transition of Bankers' Acceptances to CORRA-based loans in the Canadian Personal and Commercial Banking.

For BMO, the overall reported net interest margin was unchanged from the prior quarter. The drivers of quarterly increased adjusted net interest margin include higher non-trading net interest income in BMO Capital Markets.

For BNS, the drivers of quarterly decreased net interest margin include lower margins in International Banking and Canadian Banking, as well as higher levels of high quality and thus lower yielding liquid assets.

For CIBC, the drivers of quarterly increased net interest margin include higher relative growth in higher margin products and the impact of higher net interest margins in international banking from rising interest rates.

Question 3: Why would the direction of change between net interest income and net interest margin be different for some banks?

Comparison of Direction of Change between Net Interest Income and Net Interest Margin

Below is a summary table of comparisons of net interest income and net interest margin for five banks.

RBC			
Net Interest Income ($ millions)		**Net Interest Margin (%)**	
Q3 2024	**YTD Q3 2024**	**Q3 2024**	**YTD Q3 2024**
$ 7,327	$ 20,282	1.50%	1.58%
Q2 2024	**YTD Q3 2023**	**Q2 2024**	**YTD Q3 2023**
$ 6,623	$ 18,587	1.50%	1.50%
Change	**Change**	**Change**	**Change**
$ 704	$ 1,695	0.00%	0.08%
TD			
Net Interest Income ($ millions)		**Net Interest Margin (%)**	
Q3 2024	**YTD Q3 2024**	**Q3 2024**	**YTD Q3 2024**
$ 7,579	$ 22,532	1.70%	1.71%
Q2 2024	**YTD Q3 2023**	**Q2 2024**	**YTD Q3 2023**
$ 7,465	$ 22,450	1.73%	1.74%
Change	**Change**	**Change**	**Change**
$ 114	$ 82	-0.03%	-0.03%
BMO			
Net Interest Income ($ millions)		**Net Interest Margin (%)**	
Q3 2024	**YTD Q3 2024**	**Q3 2024**	**YTD Q3 2024**
$ 4,794	$ 14,030	1.51%	1.53%
Q2 2024	**YTD Q3 2023**	**Q2 2024**	**YTD Q3 2023**
$ 4,515	$ 13,740	1.51%	1.62%
Change	**Change**	**Change**	**Change**
$ 279	$ 290	0.00%	-0.09%
BNS			
Net Interest Income ($ millions)		**Net Interest Margin (%)**	
Q3 2024	**YTD Q3 2024**	**Q3 2024**	**YTD Q3 2024**
$ 4,862	$ 14,329	2.14%	2.17%
Q2 2024	**YTD Q3 2023**	**Q2 2024**	**YTD Q3 2023**
$ 4,694	$ 13,596	2.17%	2.11%
Change	**Change**	**Change**	**Change**
$ 168	$ 733	-0.03%	0.06%
CIBC			
Net Interest Income ($ millions)		**Net Interest Margin (%)**	
Q3 2024	**YTD Q3 2024**	**Q3 2024**	**YTD Q3 2024**
$ 3,532	$ 10,062	1.39%	1.35%
Q2 2024	**YTD Q3 2023**	**Q2 2024**	**YTD Q3 2023**
$ 3,281	$ 9,628	1.35%	1.36%
Change	**Change**	**Change**	**Change**
$ 251	$ 434	0.04%	-0.01%

We notice that:

For TD, while the net interest income from Q2 2024 to Q3 2024 increased, the net interest margin from Q2 2024 to Q3 2024 decreased; while the net interest income from Year-to-Date Q3 2023 to Year-to-Date Q3 2024 increased, the net interest margin from Year-to-Date Q3 2023 to Year-to-Date Q2 2023 decreased.

For BMO, while the net interest income from Year-to-Date Q3 2023 to Year-to-Date Q3 2024 increased, the net interest margin from Year-to-Date Q3 2023 to Year-to-Date Q3 2024 decreased.

For BNS, while the net interest income from Q2 2024 to Q3 2024 increased, the net interest margin from Q2 2024 to Q3 2024 decreased.

For CIBC, while the net interest income from Year-to-Date Q3 2023 to Year-to-Date Q3 2024 increased, the net interest margin from Year-to-Date Q3 2023 to Year-to-Date Q3 2024 decreased.

1. TD Q3 2024 vs. Q2 2024:

(1) Net interest income increased due to volume growth in Canadian Personal and Commercial Banking.

(2) Net interest margin decreased due to balance sheet mix, reflecting the transition of Bankers' Acceptances to CORRA-based loans.

2. TD YTD Q3 2024 vs. YTD Q3 2023:

(1) Net interest income increased due to volume growth and higher deposit margins in Canadian Personal and Commercial Banking, higher loan volumes in U.S. Retail, and higher deposit margins in Wealth Management.

(2) Net interest margin decreased due to balance sheet mix reflecting the transition of Bankers' Acceptances to CORRA-based loans and lower margins on loans in Canadian Personal and Commercial Banking, as well as lower deposit margins reflecting higher deposit costs in U.S. Retail.

3. BMO YTD Q3 2024 vs. Q3 2023:

(1) Net interest income increased due to higher net interest income in P&C businesses and trading non-interest revenue.

(2) Net interest margin decreased due to lower net interest income and higher low-yielding asset in Corporate Services.

4. BNS Q3 2024 vs. Q2 2024:

(1) Net interest income increased due to asset growth inclusive of the conversion of bankers' acceptances to loans due to the cessation of CDOR in June 2024.

(2) Net interest margin decreased due to lower margins in International Banking and Canadian Banking, as well as higher levels of high quality, lower yielding liquid assets.

5. CIBC YTD Q3 2024 vs. YTD Q3 2023:

(1) Net interest income increased due to volume growth across businesses, higher net interest margin in the non-trading businesses and the conversion of bankers' acceptances to CORRA loans.

(2) Net interest margin decreased due to the cessation of CDOR, and lower deposit and loan margins in Canadian and U.S. Commercial Banking and Wealth Management.

Reasons

1. Volume Growth:

   Net interest income measures the total dollar differences between interest earned and interest paid, and it increases with loan and deposit volume growth, even if margins narrow.

   Net interest margin, on the other hand, reflects the efficiency of earning interest income relative to the size of interest-earning assets. Rapid volume growth in lower-margin products or assets can dilute net interest margin.

   For example, when it comes to TD Q3 2024 vs. Q2 2024 and CIBC YTD Q3 2024 vs. YTD Q2 2024, net interest income increased due to volume growth while net interest margin decreased.

2. Balance Sheet Mix:

   A shift in the composition of a bank's asset and liabilities can disproportionately affect net interest margin. For instance, adding low yielding liquid asset such as HQLA and transitioning to products with narrower spreads like CORRA loans dilutes net interest margin.

   For example, when it comes to TD Q3 2024 vs. Q2 2024 and TD YTD Q3 2024 vs. YTD Q3 2023, net interest margin decreased due to balance sheet mix while net interest income increased. Also, when it comes to BNS Q3 2024 vs. Q2 2024, net interest margin decreased due to lower yielding liquid asset while net interest income increased.

3. Funding Costs:

   Rising deposit costs compress net interest margin even when net interest income benefits from higher loan yields because the increase in the cost of funding (deposits and borrowings) often outpaces the increase in the yields banks earn on loans and other interest-earning assets.

   For example, when it comes to TD YTD Q3 2024 vs. YTD Q3 2023 and CIBC YTD Q3 2024 vs. YTD Q3 2023, net interest margin decreased due to lower deposit margin, i.e., higher deposit costs, while net interest income increased.

4. Competitive Pressures:

   Intense competition for loans or deposits can lead to narrower spreads and reduced margins, even when absolute volumes increase.

   For example, when it comes to BNS Q3 2024 vs. Q2 2024, net interest margin decreased due to lower margins in International Banking and Canadian Banking, which reflects pricing pressures, while net interest income increased.

5. Regulatory and Structural Changes:

   Regulatory changes, such as the cessation of CDOR and transition to CORRA-based loans, would introduce structural shifts in asset-liability pricing, often lowering spreads and compressing net interest margin.

   For example, when it comes to TD Q3 2024 vs. Q2 2024 and TD YTD Q3 2024 vs. YTD Q3 2023, net interest margin decreased due to acceptance of CORRA-based loans while net interest income increased. Also, when it comes to BNS Q3 2024 vs. Q2 2024 and CIBC YTD Q3 2024 vs. YTD Q3 2023, net interest margin decreased while net interest income increased due to the cessation of CDOR.

Question 4: Compare Q3 2024 vs Q2 2024 Net Interest Income (NII) Sensitivity to +100bps for the five banks.

1. RBC:

(1) Q3 2024 Net Interest Income (NII) Sensitivity to +100 bps: $325 millions

(2) Q2 2024 Net Interest Income (NII) Sensitivity to +100 bps: $325 millions

An immediate and sustained +100 bps shock as at July 31, 2024 would have had a positive impact to the bank's NII of $325 millions, unchanged from last quarter.

2. TD:

(1) Q3 2024 Net Interest Income (NII) Sensitivity to +100 bps: $785 millions

(2) Q2 2024 Net Interest Income (NII) Sensitivity to +100 bps: $875 millions

An immediate and sustained +100 bps shock as at July 31, 2024 would have had a positive impact to the bank's NII of $785 millions, a $90 millions decrease from last quarter.

3. BMO:

(1) Q3 2024 Net Interest Income (NII) Sensitivity to +100 bps: $309 millions

(2) Q2 2024 Net Interest Income (NII) Sensitivity to +100 bps: $257 millions

An immediate and sustained +100 bps shock as at July 31, 2024 would have had a positive impact to the bank's NII of $309 millions, a $52 millions increase from last quarter.

4. BNS:

(1) Q3 2024 Net Interest Income (NII) Sensitivity to +100 bps: $(54) millions

(2) Q2 2024 Net Interest Income (NII) Sensitivity to +100 bps: $(25) millions

An immediate and sustained +100 bps shock as at July 31, 2024 would have had a negative impact to the bank's NII of $54 millions, up from $25 millions last quarter. According to BNS's report, this negative impact remained within the bank's approved consolidated limits.

5. CIBC:

(1) Q3 2024 Net Interest Income (NII) Sensitivity to +100 bps: $224 millions

(2) Q2 2024 Net Interest Income (NII) Sensitivity to +100 bps: $305 millions

An immediate and sustained +100 bps shock as at July 31, 2024 would have had a positive impact to the bank's NII of $224 millions, a $81 millions decrease from last quarter.

Question 5: Compare Q3 2024 vs Q2 2024 Economic Value of Equity (EVE) Sensitivity to +100bps for the five banks.

1. RBC:

(1) Q3 2024 Economic Value of Equity (EVE) Sensitivity to +100 bps: $(1,822) millions

(2) Q2 2024 Economic Value of Equity (EVE) Sensitivity to +100 bps: $(2,149) millions

An immediate and sustained +100 bps shock as at July 31, 2024 would have had a negative impact to the bank's EVE of $1,822 millions, down from $2,149 millions last quarter. Quarter-over-quarter EVE sensitivity decreased primarily in response to a marginal reduction in net fixed rate assets, remained within approved limits.

2. TD:

(1) Q3 2024 Economic Value of Equity (EVE) Sensitivity to +100 bps: $(2,485) millions

(2) Q2 2024 Economic Value of Equity (EVE) Sensitivity to +100 bps: $(2,312) millions

An immediate and sustained +100 bps shock as at July 31, 2024 would have had a negative impact to the bank's EVE of $2,485 millions, up from $2,312 millions last quarter. The quarter-over-quarter increase in EVE Sensitivity is primarily attributed to growth in fixed rate assets funded by equity, mainly in Canada.

3. BMO:

(1) Q3 2024 Economic Value of Equity (EVE) Sensitivity to +100 bps: $(1,629) millions

(2) Q2 2024 Economic Value of Equity (EVE) Sensitivity to +100 bps: $(2,008) millions

An immediate and sustained +100 bps shock as at July 31, 2024 would have had a negative impact to the bank's EVE of $1,629 millions, down from $2,008 millions last quarter. Structural economic value exposure to rising rates decreased relative to April 30, 2024, primarily due to modelled deposit pricing being less rate-sensitive at lower projected interest rate levels following the increase in term market rates during the current quarter.

4. BNS:

(1) Q3 2024 Economic Value of Equity (EVE) Sensitivity to +100 bps: $(1,427) millions

(2) Q2 2024 Economic Value of Equity (EVE) Sensitivity to +100 bps: $(1,587) millions

An immediate and sustained +100 bps shock as at July 31, 2024 would have had a negative impact to the bank's EVE of $1,427 millions, down from $1,587 millions last quarter. The EVE sensitivity also remained within the Bank's approved consolidated limits.

5. CIBC:

(1) Q3 2024 Economic Value of Equity (EVE) Sensitivity to +100 bps: $(1,325) millions

(2) Q2 2024 Economic Value of Equity (EVE) Sensitivity to +100 bps: $(1,187) millions

An immediate and sustained +100 bps shock as at July 31, 2024 would have had a negative impact to the bank's EVE of $1,325 millions, up from $1,187 millions last quarter.

Question 6: What explains NII and EVE sensitivity to +100bps being of opposite sign for a given bank?

Metric	NII Sensitivity ($ millions)			EVE Sensitivity ($ millions)		
Quarter	Q3 2024 July 31, 2024	Q2 2024 April 30, 2024	Change	Q3 2024 July 31, 2024	Q2 2024 April 30, 2024	Change
RBC	$325	$325	$0	-$1,822	-$2,149	$327
TD	$785	$875	-$90	-$2,485	-$2,312	-$173
BMO	$309	$257	$52	-$1,629	-$2,008	$379
BNS	-$54	-$25	-$29	-$1,427	-$1,587	$160
CIBC	$224	$305	-$81	-$1,325	-$1,187	-$138

For RBC, TD, BMO, and CIBC, the NII and EVE sensitivity to +100 bps are of opposite sign.

1. Definitions:

   Net Interest Income (NII) sensitivity is defined as the impact to the bank's income stream for the next 12 months assuming an immediate and sustained shock of ±100 bps to interest rates

   Economic Value of Equity (EVE) sensitivity is defined as the impact to the present value of asset and liabilities in bank's balance sheet due to a static interest shock to the interest rate. It is measured as the change in economic value of equity market to market after an interest rate shock of ±100 bps.

2. Time Horizon and Impact of Yield Curve Shape:

   NII sensitivity depends on the short-term part of the yield curve, where steep yield curves amplify income benefits from short-term rate increases.

   EVE sensitivity depends on the long-term part of the yield curve, where small changes in rates have large effect on present value do to the exponential nature of discounting.

3. Interest Rate Sensitivity:

   A rise in interest rates (+100 bps) typically increases NII if the bank's rate-sensitive assets (e.g., floating rate loans) reprice faster or more significantly than the liabilities (e.g., fixed rate deposits).

   However, the same rise in interest rates reduces EVE, as the present value of fixed rate assets decreases more significantly than fixed rate liabilities, particularly for long-duration instruments.

4. Duration Mismatches and Dynamic vs. Static Balance Sheet Assumptions:

   NII sensitivity assumes that the bank will continue operating normally over the next 12 months. The dynamic balance sheet assumption allow the bank to operate flexibly and set higher short-term spreads. In this case, it is less likely to have duration mismatches. The bank may benefit from higher asset yields relative to liability costs, leading to positive NII sensitivity.

   EVE sensitivity assumes a static balance sheet, where no adjustments to interest rate shocks can be made. This means long-term structural mismatches dominate, that is, the bank holds long-duration fixed-rate assets funded by short-duration liabilities. This leads to significant decreases in economic value when rate rise, and the value of assets will drop more sharply than liabilities in response to a +100 bps shock. This results in a negative EVE sensitivity.

Question 7: Recently banks report customer shift to fixed rate for new mortgages. How do you think this will affect the NII and EVE sensitivity for a bank if this trend continues?

The shift to fixed-rate mortgages for new customers can significantly impact both Net Interest Income (NII) and Economic Value of Equity (EVE) sensitivities for a bank, namely by decreasing positive NII sensitivity and increasing negative EVE sensitivity.

1. Decrease in Positive NII Sensitivity:

   Fixed-rate mortgages reduce the proportion of rate-sensitive assets on the bank's balance sheet. As a result, when interest rates change, the immediate impact on NII is muted because fewer assets will reprice in the short term.

   The bank's ability to benefit from rising interest rates is reduced, as new fixed-rate loans lock in yields for the term of the loan.

   The shift limits the bank's flexibility to capitalize on short-term interest rate increases, especially if its liabilities (e.g., deposits) remain rate-sensitive.

2. Increase in Negative EVE Sensitivity:

   Fixed-rate mortgages are typically long-duration assets. A rise in interest rates would reduce the present value of these assets more significantly compared to shorter-term or variable-rate loans.

   If the trend continues, the bank's asset duration increases, amplifying the mismatch with typically shorter-duration liabilities and leading to greater sensitivity in EVE.

   With more fixed-rate mortgages on the balance sheet, the bank becomes more exposed to interest rate shocks, as these assets lock in lower returns in a rising rate environment.

Question 8: Compare LCR for Q3 2024 and Q2 2024 for the five banks.

1. RBC:

(1) Q3 2024 LCR: 126%

(2) Q2 2024 LCR: 128%

From Q2 2024 to Q3 2024, LCR decreased by 2%.

2. TD:

(1) Q3 2024 LCR: 129%

(2) Q2 2024 LCR: 126%

From Q2 2024 to Q3 2024, LCR increased by 3%.

3. BMO:

(1) Q3 2024 LCR: 129%

(2) Q2 2024 LCR: 128%

From Q2 2024 to Q3 2024, LCR increased by 1%.

4. BNS:

(1) Q3 2024 LCR: 133%

(2) Q2 2024 LCR: 129%

From Q2 2024 to Q3 2024, LCR increased by 4%.

5. CIBC:

(1) Q3 2024 LCR: 126%

(2) Q2 2024 LCR: 129%

From Q2 2024 to Q3 2024, LCR decreased by 3%.

Question 9: For each bank, is the quarterly change in LCR driven from change in HQLA balances or Net Cash Outflows?

Information Collection from Report

1. RBC:

(1) Q3 2024 vs. Q2 2024 HQLA: from $382,663 millions to $389,190 millions

(2) Q3 2024 vs. Q2 2024 Net Cash Outflows: from $299,253 millions to $308,325 millions

The average LCR for the quarter ended July 31, 2024 was 126%, which translates into a surplus of approximately $81 billion, compared to 128% and a surplus of approximately $83 billion in the prior quarter. Average LCR remained relatively stable from the prior quarter reflecting loan growth and an increase in on-balance sheet securities, largely offset by growth in retail deposits.

2. TD:

(1) Q3 2024 vs. Q2 2024 HQLA: from $332,676 millions to $337,631 millions

(2) Q3 2024 vs. Q2 2024 Net Cash Outflows: from $264,950 millions to $262,308 millions

The Bank's average LCR was 129% representing a surplus of $75 billion for the quarter ended July 31, 2024 and continues to meet regulatory requirements.

The Bank holds a variety of liquid assets commensurate with the liquidity needs of the organization majority of which also qualify as HQLA under the OSFI LAR guideline. The average HQLA of the Bank for the quarter ended July 31, 2024 was $338 billion (April 30, 2024 – $333 billion), with Level 1 assets representing 84% (April 30, 2024 – 83%). The Bank's reported HQLA excludes excess HQLA from the U.S. Retail operations, reflecting liquidity transfer limitations from U.S. Retail and its affiliates which adheres to OSFI LAR and Federal Reserve Board guidelines.

As described in the "How TD Manages Liquidity Risk" section of the Bank's 2023 Annual Report, the Bank manages its HQLA and other liquidity buffers to the higher of TD's internal 90-day surplus requirement and its target buffers over regulatory requirements from including the LCR, NSFR, and the Net Cumulative Cash Flow metrics.

3. BMO:

(1) Q3 2024 vs. Q2 2024 HQLA: from $241.9 billions to $244.1 billions

(2) Q3 2024 vs. Q2 2024 Net Cash Outflows: from $189.6 billions to $189.7 billions

The Liquidity Coverage Ratio (LCR) is calculated in accordance with the OSFI's LAR Guideline and is summarized in the following table. The LCR is calculated on a daily basis as the ratio of the stock of High-Quality Liquid Assets (HQLA) held to total net stressed cash outflows over the next 30 calendar days.

BMO's HQLA primarily comprises cash, highly-rated debt issued or backed by governments, highly-rated covered bonds and nonfinancial corporate debt, and non-financial equities that are part of a major stock index.

Net cash flows include outflows from deposits, secured and unsecured wholesale funding, commitments and potential collateral requirements, offset by permitted inflows from loans, securities lending activities and other non-HQLA debt maturing over a 30-day horizon.

Weightings prescribed by OSFI are applied to cash flows and HQLA to arrive at the weighted values and the LCR. The LCR does not reflect liquidity in BMO Financial Corp. (BFC) in excess of 100%, because of limitations on the transfer of liquidity between BFC and the parent bank. Canadian domestic systemically important banks (D-SIBs), including BMO, are required to maintain a minimum LCR of 100%.

The average daily LCR for the quarter ended July 31, 2024 was 129%, equivalent to a surplus of $54 billion above the regulatory minimum. The LCR increased 1% from 128% in the prior quarter, due to higher HQLA.

While banks are required to maintain an LCR of greater than 100% in normal conditions, they are also expected to be able to utilize HQLA during a period of stress, which may result in an LCR of less than 100% during such a period. The LCR is only one measure of a bank's liquidity position and does not fully capture all of its liquid assets or the funding alternatives that may be available during a period of stress. BMO's total liquid assets are shown in the Liquid Assets table.

4. BNS:

(1) Q3 2024 vs. Q2 2024 HQLA: from $277,412 millions to $271,540 millions

(2) Q3 2024 vs. Q2 2024 Net Cash Outflows: from $214,333 millions to $204,037 millions

HQLA is substantially comprised of Level 1 assets (as defined in the LAR Guideline), such as cash, deposits with central banks available to the Bank in times of stress, and highly rated securities issued or guaranteed by governments, central banks and supranational entities.

The increase in the Bank's average LCR for the quarter ended July 31, 2024 versus the average of the previous quarter was mainly attributable to lower cash outflows from unsecured wholesale funding, derivative exposures and other collateral requirements; and higher cash inflows from fully performing exposures, partly offset by lower HQLA. That is, the increased LCR mainly due to lower net cash outflows less offset by lower HQLA.

The Bank monitors its significant currency exposures, Canadian and U.S. dollars, in accordance with its liquidity risk management framework and risk appetite.

5. CIBC:

(1) Q3 2024 vs. Q2 2024 HQLA: from $193,672 millions to $187,428 millions

(2) Q3 2024 vs. Q2 2024 Net Cash Outflows: from $149,599 millions to $148,338 millions

The average LCR as at July 31, 2024 decreased to 126% from 129% in the prior quarter, due to a reduction in HQLA, partially offset by decrease in net cash outflow. The decrease in HQLA is mainly due to a decrease in government securities.

Conclusion

Metrics	LCR			HQLA			Net Cash Outflows		
Quarter	Q3 2024	Q2 2024	Change	Q3 2024	Q2 2024	Change	Q3 2024	Q2 2024	Change
RBC	126%	128%	-2%	$389,190	$382,663	$6,527	$308,325	$299,253	$9,072
TD	129%	126%	3%	$337,631	$332,676	$4,955	$262,308	$264,950	-$2,642
BMO	129%	128%	1%	$244,100	$241,900	$2,200	$189,700	$189,600	$100
BNS	133%	129%	4%	$271,540	$277,412	-$5,872	$204,037	$214,333	-$10,296
CIBC	126%	129%	-3%	$187,428	$193,672	-$6,244	$148,338	$149,599	-$1,261

For RBC, the quarterly decrease in LCR was driven from higher Net Cash Outflows, which outweighed the numerator of higher HQLA.

For TD, the quarterly increase in LCR was driven from higher HQLA and lower Net Cash Outflows.

For BMO, the quarterly increase in LCR was driven from higher HQLA, which outweighed the denominator of higher Net Cash Outflows.

For BNS, the quarterly increase in LCR was driven from lower Net Cash Outflows, which outweighed the numerator of lower HQLA.

For CIBC, the quarterly decrease in LCR was driven from lower HQLA, which outweighed the denominator of lower Net Cash Outflows.

Question 10: Compare NSFR for Q3 2024 and Q2 2024 for the five banks.

1. RBC:

(1) Q3 2024 NSFR: 114%

(2) Q2 2024 NSFR: 111%

From Q2 2024 to Q3 2024, NSFR increased by 3%.

2. TD:

(1) Q3 2024 NSFR: 115%

(2) Q2 2024 NSFR: 114%

From Q2 2024 to Q3 2024, NSFR increased by 1%.

3. BMO:

(1) Q3 2024 NSFR: 116%

(2) Q2 2024 NSFR: 115%

From Q2 2024 to Q3 2024, NSFR increased by 1%.

4. BNS:

(1) Q3 2024 NSFR: 117%

(2) Q2 2024 NSFR: 117%

From Q2 2024 to Q3 2024, NSFR remained unchanged.

5. CIBC:

(1) Q3 2024 NSFR: 116%

(2) Q2 2024 NSFR: 115%

From Q2 2024 to Q3 2024, NSFR increased by 1%.

Question 11: For each bank, is the quarterly change in NSFR driven from change Available Stable Funding or Required Stable Funding?

Information Collection from Report

1. RBC:

(1) Q3 2024 vs. Q2 2024 Available Stable Funding (ASF): from $1,045,019 millions to $1,077,002 millions

(2) Q3 2024 vs. Q2 2024 Required Stable Funding (RSF): from $940,401 millions to $941,437 millions

The NSFR as at July 31, 2024 was 114%, which translates into a surplus of approximately $136 billion, compared to 111% and a surplus of approximately $105 billion in the prior quarter. NSFR increased compared to the previous quarter, mainly due to higher available stable funding driven by an increase in the weighted value of retail deposits and wholesale funding.

2. TD:

(1) Q3 2024 vs. Q4 2023 Available Stable Funding (ASF): from $1,123,816 millions (October 31, 2023) to $1,117,781 millions

(2) Q3 2024 vs. Q4 2023 Required Stable Funding (RSF): from $960,590 millions (October 31, 2023) to $969,654 millions

The NSFR remained relatively stable to the previous quarter (April 30, 2024 – 114%), as the Bank's funding programs continued to meet funding requirements in the quarter. TD did not provided Q2 2024 ASF and RSF information, so we can only extract the most recent ASF and RSF numbers it provided.

3. BMO:

(1) Q3 2024 vs. Q2 2024 Available Stable Funding (ASF): from $753.5 billions to $777.7 billions

(2) Q3 2024 vs. Q2 2024 Required Stable Funding (RSF): from $653.7 billions to $671.4 billions

The Net Stable Funding Ratio (NSFR) is a regulatory liquidity metric that assesses the stability of a bank's funding profile in relation to the liquidity value of its assets and is calculated in accordance with OSFI's LAR Guideline. Unlike the LCR, which is a short-term metric, the NSFR assesses a bank's medium-term and long-term resilience. The NSFR is defined as the ratio of the amount of available stable funding (ASF) to the amount of required stable funding (RSF). ASF represents the proportion of own and third-party resources that are expected to be reliably available over a one-year horizon (including customer deposits, long-term wholesale funding, and capital). The stable funding requirements for each institution are set by OSFI based on the liquidity and maturity characteristics of its on-balance sheet assets and off-balance sheet exposures. Weightings prescribed by OSFI are applied to notional asset and liability balances to determine ASF and RSF and the NSFR. Canadian domestic systemically important banks (D-SIBs), including BMO, are required to maintain a minimum NSFR of 100%. BMO's NSFR was 116% as at July 31, 2024, equivalent to a surplus of $106 billion above the regulatory minimum. The NSFR increased from 115% in the prior quarter, as higher required stable funding was more than offset by higher available stable funding.

4. BNS:

(1) Q3 2024 vs. Q2 2024 Available Stable Funding (ASF): from $773,065 millions to $777,391 millions

(2) Q3 2024 vs. Q2 2024 Required Stable Funding (RSF): from $661,869 millions to $662,163 millions

Available stable funding is primarily provided by the Bank's large pool of retail, small business and corporate customer deposits; secured and unsecured wholesale funding and capital. Required stable funding primarily originates from the Bank's loan and mortgage portfolio, securities holdings, off-balance sheet items and other assets.

The Bank's NSFR as at July 31, 2024 was unchanged versus the previous quarter as higher ASF from retail deposits and deposits from small business customers were partially offset by lower ASF from wholesale funding.

5. CIBC:

(1) Q3 2024 vs. Q2 2024 Available Stable Funding (ASF): from $557,287 millions to $569,690 millions

(2) Q3 2024 vs. Q2 2024 Required Stable Funding (RSF): from $484,671 millions to $491,722 millions

The NSFR as at July 31, 2024 increased to 116% from 115% in the prior quarter, mainly due to an increase in wholesale funding and an increase in deposits, which come from ASF.

Conclusion

Metrics	NSFR			Availabel Stable Funding			Required Stable Funding		
Quarter	Q3 2024	Q2 2024	Change	Q3 2024	Q2 2024	Change	Q3 2024	Q2 2024	Change
RBC	114%	111%	3%	$1,077,002	$1,045,019	$31,983	$941,437	$940,401	$1,036
TD	115%	114%	1%	-	-	-	-	-	-
BMO	116%	115%	1%	$777,700	$753,500	$24,200	$671,400	$653,700	$17,700
BNS	117%	117%	0%	$777,391	$773,065	$4,326	$662,163	$661,869	$294
CIBC	116%	115%	1%	$569,690	$557,287	$12,403	$491,722	$484,671	$7,051

For RBC, the quarterly increase in NSFR was driven from higher ASF, which outweighed the denominator of higher RSF.

For TD, the Q3 2024 and Q2 2024 ASF and RSF were not provided; instead, we were only provided Q3 2024 and Q4 2023 ASF and RSF, so we can compare this. From Q4 2023 to Q3 2024, NSFR decreases from 117% to 115% by 2%. This was driven by lower ASF (from $1,123,816 millions in Q4 2023 to $1,117,781 millions in Q3 2023, with a negative change of $6,035 millions) and a higher RSF.

For BMO, the quarterly increase in NSFR was driven from higher ASF, which outweighed the denominator of higher RSF.

For BNS, the bank's NSFR as at July 31, 2024 was unchanged versus the previous quarter as higher ASF from retail deposits and deposits from small business customers were partially offset by lower ASF from wholesale funding.

For CIBC, the quarterly increase in NSFR was drive from higher ASF, which outweighed the denominator of higher RSF.