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Liquidity and funding risk management in the post-SVB social media age: Implications for “Pillar 2” liquidity and ALM best-practice governance

Presentation to BACEN, Sao Paulo

Thought Leadership Series #11

Professor Moorad Choudhry
Faculty BTRM

17th April 2024

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Implications for "Pillar 2" liquidity and ALM best-practice governance

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Nubank

Presentation Agenda

- Liquidity risk
  - Traditional
  - The universal standard ("LCR")
  - "Pillar 2" liquidity
- "Lessons learned" for liquidity risk from 2023
- ALM governance framework and ALCO lessons learned from 2023

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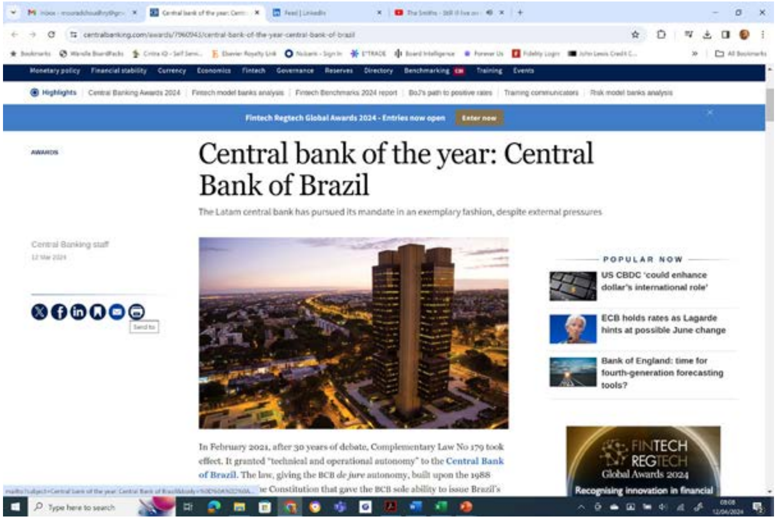
Before I start....

Clearly I’m in esteemed company ☺



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Liquidity Risk: Definition

- Liquidity risk exposure arises from normal banking operations. It exists irrespective of the type of funding gap, be it excess assets over liabilities for any particular time bucket or an excess of liabilities over assets

- I define liquidity risk as the risk arising from an inability to maintain funding of assets and liabilities – indeed all obligations – at all times and under all conditions

- Liquidity risk can be managed by matching assets and liabilities or….

- because matching assets and liabilities would not enable “maturity transformation”, by
  - holding liquid assets to address the “gap” or “mismatch” profile
  - modelling of non-defined maturity products and determining their behavioural nature and using them accordingly to fund assets
  - not having all their deposit eggs in one basket

- Additionally, banks have a view of future market funding conditions and manage the ALM book in line with this view

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Liquidity Risk Management

- Managing liquidity in banks is a "time-honoured" art
- Modern banking as we recognise it dates back at least 500 years, and managing liquidity risk in banks is as old as that
- Banks seek to measure liquidity risk by identifying when assets and liabilities are likely to mature and by generating a forecast of expected future cash flows:
  - Cash outflows generally arise from new lending and withdrawn / maturing deposits
  - Cash inflows generally arise from loan repayments and new deposits
- **Liquidity risk is measured** using a range of proxy "key risk indicators" to give an overall picture of exposure today and likely exposure in the near future
  - For example, take a look at the ALM chart overleaf
  - The difference between the assets and liabilities maturing in a particular time period, is known as the *'net maturity gap'* (i.e., assets minus liabilities)
  - A *'cumulative cashflow maturity gap'* is calculated by taking the sum of the 'net maturity gaps' up to the period in question. For example, the cumulative cashflow maturity gap for 1 month would be the sum of the net maturity gaps for overnight (the next working day), 2-7 days and 8 days to 1 month
- **Liquidity risk is managed** by…being aware of one's exposure and holding sufficient genuinely liquid assets to match that exposure, in stable and stressed environments
- Is that sufficient?

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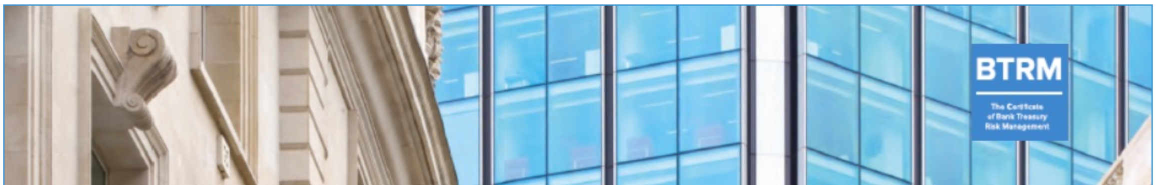

Specimen Liquidity Report

Beta Development Bank - Simplified Liquidity Report - 31 January 2019

	€m		Overnight	2-7 Days	8 Days - 1 Month	1-3 Months	3-6 Months	6 Months - 1 Year	1-3 Years	3-5 Years	5 Years +	Maturity Undefined	Total
Assets	Cash in hand and with Central Banks		10										10
	Short-term Loans to Credit Institutions		4	43	121	26							194
	Loans to Customers		1	5	15	20	41	80	276	284	46		768
	Loans to Credit Institutions			2	8	10	23	39	143	129	21		375
	Other Assets											53	53
	Total Cash Assets		**15**	**50**	**144**	**56**	**64**	**119**	**419**	**413**	**67**	**53**	**1,600**
Liabilities													
	Short-term Borrowings from Credit Institutions		-30	-46	-200	-38							-314
	Debt Securities Issued		-10	-12	-26	-47	-54	-86	-180	-167			-582
	Private Placements		-1	-6	-14	-26	-37	-67	-109	-171			-431
	Capital and Reserves											-150	-150
	Other Liabilities											-123	-123
	Total Cash Liabilities		**-41**	**-64**	**-240**	**-111**	**-91**	**-153**	**-289**	**-338**	**0**	**-273**	**-1,600**
	Net Maturity Gap		-26	-14	-96	-55	-27	-34	130	75	67	-220	
	Cumulative Cashflow Maturity Gap		-26	-40	-136	-191	-218	-252					
	Liquid Assets	200											
Liquid Assets/Cumulative Cashflow (%)			**769%**	**500%**	**147%**	**105%**	**92%**	**79%**					

Cash outflows are scheduled to exceed cash inflows by €252m over the next 12m

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Traditional Liquidity Metrics

Many proxies used to measure liquidity risk are also time-honoured. For example:

Metric	Explanation
Loan-Deposit Ratio	The relationship between customer lending and deposits. Measure of the self-sustainability of the bank (or each branch / subsidiary). A very common metric, usually reported monthly. Target 85%-95%
Funding Concentration	Reports extent of reliance on single sources of funds (e.g., top 20 biggest single sources, by sector and individual firm/customer). Lack of a diversified funding base highlights a liquidity risk that a bank would need to address *
Liquidity Risk Factor	Shows the aggregate size of the liquidity gap in each branch / sub. Compares average remaining duration of assets to average tenor of liabilities. Reported monthly.

** This text dates from 2006. It pre-dates SVB ☺*

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For Reference: Additional Liquidity Risk Monitoring Metrics Required by Basel III/EU Regulation

Metric	Explanation	Why it is Useful?
A contractual maturity ladder	Provides insight into the extent to which a bank relies on maturity transformation	Advanced warning of potential future liquidity stress
Concentration of funding by counterparty	The top 10 largest counterparties from which funding obtained exceeds a threshold of 1% of total liabilities	Identification of those sources of wholesale and retail funding of such significance that their withdrawal could trigger liquidity problems.
Concentration of funding by product type	the total amount of funding received from each product category when it exceeds a threshold of 1% of total liabilities	Identification of those sources of wholesale and retail funding of such significance that their withdrawal could trigger liquidity problems

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For Reference: Additional Liquidity Risk Monitoring Metrics Required by Basel III/EU Regulation

Metric	Explanation	Why it is Useful?
Concentration of counterbalancing capacity by issuer/counterparty	The 10 largest holdings of assets or liquidity lines granted	Potential borrowing capacity in a stress
Prices for various lengths of funding	Average transaction volume and prices paid by institutions for funding with different maturities	Advanced warning of deteriorating liquidity position. Peer Group comparison
Rollover of funding	Volume of funds maturing and new funding obtained, on a daily basis over a monthly time horizon	Validation of behavioural assumptions. Advanced warning of deteriorating liquidity position. Peer Group comparison

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"Basel III" introduced a universal liquidity risk standard

The Basel Committee for Banking Supervision published guidance on managing liquidity risk in 2010 that has, more or less, been adopted universally…in response to weakness in managing liquidity risk ***by some banks*** that were evident during the financial crisis

There are two quantitative calculations, the **Liquidity Coverage Ratio** and the **Net Stable Funding Ratio**

So that's that then…!

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For reference: The Liquidity Coverage Ratio (LCR)

The LCR is calculated as follows:

$$\frac{\text{Stock of high quality liquid assets}}{\text{Total net cash outflows over the next 30 calendar days}} \geqslant 100\%$$

It is designed to ensure that a financial institution has sufficient unencumbered , high quality liquid resources to survive a severe liquidity stress scenario lasting for one month.

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For reference: Simplified Overview of LCR (per BCBS 2013)

LCR – maintain enough liquid assets for 30 days under stress scenario specified by supervisor

Liquid Assets

	Haircut
Level 1 - Cash and Central Bank reserves	0%
Level 2A – Sovereign Assets 20% RWA	15%
Level 2B - Qualifying RMBS and equity shares	25-50%

> or = 100%

Net cash outflows over 30 days

	Run-off factor
Retail and SME deposits	3-10%
Wholesale deposits	
• Financial and others	100%
• Non-financial corporate, sovereigns, central Banks and PSEs (20% if Deposit Protection)	40%
• Operational, inc. custody and clearing (5% if Deposit Protection)	25%
Secured funding	
• By level 1 and level 2 assets	0-50%
• By assets not included in stock of liquid assets	100%
Undrawn commitments	
• Retail and SMEs	5-10%
• Liquidity and FI commitments	100%

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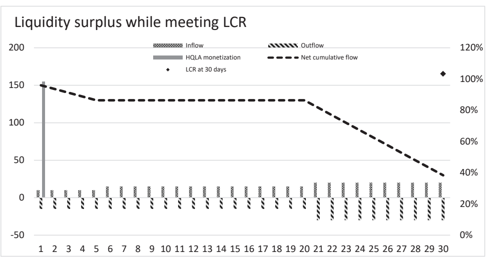
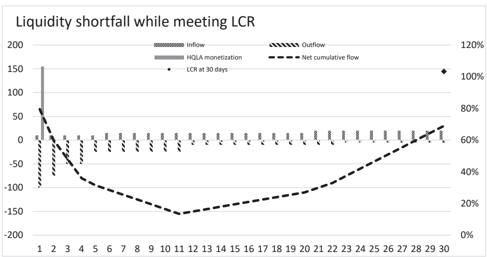
The concept of “Pillar 2” liquidity

Pillar 2 Liquidity

- LCR does not cover all liquidity risk types…
    - One can be above 100% but not show the “cliff risk” should such be the case after 30 days
    - One can be below the minimum during the 30-day period
    - The UK regulator (PRA) assesses the possibility of how a firm may meet its LCR requirement at the end of the 30 day period but has fallen significantly below that standard at some point within that period. The two graphs below summarise the issue – both firms have the same LCR (103%) and HQLA but the right-hand graph shows a net cumulative liquidity shortfall throughout most of the LCR period
    - And there are other risk exposures that it doesn’t capture…





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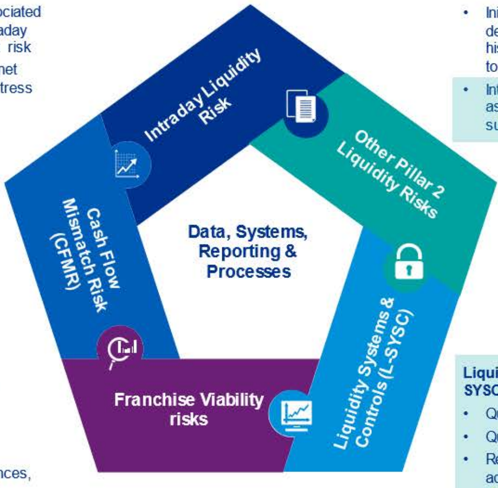
The Pillar 2 Liquidity Framework

Intraday Liquidity Risk
- Mitigation of double duty risk associated with LAB held to support both intraday payment and securities settlement risk
- Use of "mean average maximum net debit measure, combined with a stress uplift"

Cash Flow Mismatch Risk (CFMR)
- New liquidity reporting template (PRA110) from 1 January 2019
- Granular LCR stress scenario
- Benchmark retail and wholesale stress scenarios with 90-day horizon
- Enhanced stress tools
- Assessment of non-cash HQLAs monetisation speed

Franchise Viability risks
- Recording of debt buybacks instances, early termination of non-margined derivatives requests
- Risk associated with prime brokerage clients as part of L-SREP



Other Pillar 2 Liquidity Risks
- Initial margin (IM) risk from on derivatives contracts include historical average of IM posted to counterparties with a stress
- Intragroup liquidity risk assessment subject to supervisory judgement

This chart has missed out funding concentration risk…!! The ***biggest*** Pillar 2 risk ☺ ☺ ☺ ☺ ☺

Liquidity Systems & Controls (L-SYSC)
- Quantitative risk assessment
- Qualitative risks assessment
- Remediation plan and liquidity add-on subject to supervisory judgement

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Pillar 2 Liquidity

- "Pillar2 Liquidity" aim is to ensure that firms retain sufficient available liquidity to cover risks that are not covered or only partially covered by the Liquidity Coverage Ratio (LCR), which is the "Pillar 1 Liquidity" requirement.
- In other words, analogous with capital, "Pillar 1" is LCR and "Pillar 2" is those liquidity risk types not covered by LCR – and which require additional liquidity reserve provision
- The UK PRA divides these uncovered risks into two categories:
  - Risks not covered by the LCR that were not previously covered by the UK liquidity regime
  - Risks not covered by the LCR that were previously covered by UK rules
- In practice this means certain banks will have a liquidity add-on, commonly in the form of a higher HQLA requirement than that implied by LCR
- *In essence the PRA in effect desires to reconstitute some of the requirements previously embodied: daily cumulative cash flow metrics under stressed assumptions for a minimum 30 days and informally for a longer, minimum 90-day, period.*

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Pillar 2 Liquidity…

- Risks not covered by the LCR that were previously covered by UK liquidity rules
  - ***Funding risks,*** including "cliff" risk – the risk that outflows beyond the 30 day LCR horizon systematically exceed inflows, leading to liquidity shortfalls outside of the LCR window; "cliff" risk refers to a subset of this risk where the risk is that outflows (usually deposit maturities) cluster or concentrate around single dates (e.g. month-ends, quarter ends) beyond the 30 day LCR window (usually due to firms "terming out" liabilities) leading to liquidity shortages that cannot be met with available liquidity resources.
  - ***Cash flow mismatch risk*** – the risk generated by using a "point-in-time" approach in the LCR against the maximum net cumulative outflow i.e. a firm may meet the LCR requirement at 30 days but fall below that requirement at some point within that 30 day period.
  - ***Liquid asset management risk*** – the risk generated by widening the definition of "liquid assets" to include assets that in reality cannot be monetised as quickly as those defined as liquid under regulation; essentially this is the risk that the firm will not or cannot actively manage the liquid assets it holds to ensure that at any given moment they can be turned promptly into cash.
  - ***Funding concentration risks*** – the risk of over-reliance on a single source or restricted sources of funding (where source can be very broadly defined as counterparty/customer name, industry, region, customer type, product or maturity etc.) leading to liquidity shortages if this funding is withdrawn or interrupted
    - See overleaf…

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Funding concentration

- "…risk of lack of diversity in funding sources…"
  - Choudhry (2007), *Bank Asset Liability Management*, Wiley
- This would go beyond a simple "Top 20 biggest depositors" metric and address:
  - Concentration by deposit product (outside of "competitively priced, very short-term retail deposits")
  - Concentration by contractual by tenor
  - Concentration by customer franchise within the retail space (types of retail and SME customer)
  - Diversify into wholesale funding sources (short term and long term) beyond money markets (local authorities, universities, etc)
  - Diversify into capital markets (see over)

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Pillar 2 liquidity and UK PRA PS13/19

- The PRA focus ultimately revolves around guidance called ***Overall Liquidity Adequacy Requirement*** ("OLAR")
  - This is a function of the Board Risk Appetite Statement
  - The Board approves its appetite for liquidity risk, perhaps in the form of a minimum Survival Days number
  - The ILAAP worst case stress scenario must show the bank holding sufficient liquidity reserves (with or without credible management actions) for a period at least equal to the approved risk appetite level

The paper states a 90-day "monitoring" horizon by the regulator without an explicit legal requirement to be survivable for 90 days minimum (ie LCR 30-day is still the legal requirement). IE., it is bank-specific!

What is your appetite for minimum survival under any stress scenario?

My recommendation: adopt a "Stressed Liquidity Ratio" (SLR) as an internal metric for RAS, this being a [90]-day horizon as opposed to 30-day LCR. The calculation is identical, but simply over a 90-day period (or the time horizon of the bank's choice that aligns with the RAS)

$$SLR(\%) = \frac{HQLA}{\sum(90day\ liquidity\ outflows - 90day\ liquidity\ inflows)}$$

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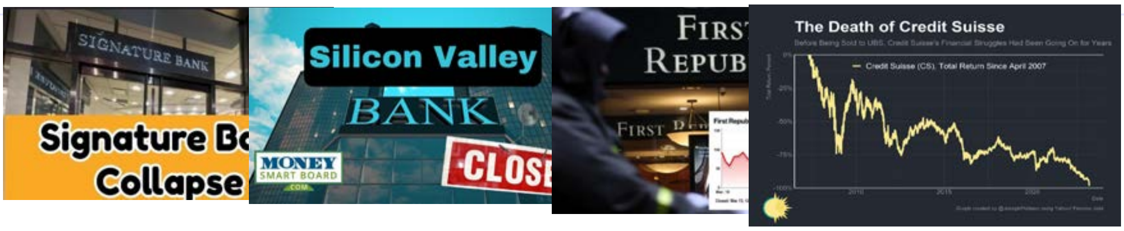
Liquidity risk management post-2023

2023: a new kind of bank collapse….?



….or did their failure all have AT LEAST ONE THING in common?

….Are there any genuinely new risks / lessons we can learn from them?

- *"Do you remember the case, Gregson?"*
- *"No, sir."*
- *"Read it up - you really should. There is nothing new under the sun. It has all been done before."*

--- Sherlock Holmes, *A Study in Scarlet*, 1887 (Sir Arthur Conan Doyle)

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SVB's Investment Strategy for Excess Funds

- Like many banks, SVB found itself having an abundance of excess deposits. However, it decided to adopt an approach that differed from the strategies of most other institutions, both in the US and in Europe.
- Rather than investing in their customer assets that generate yield in line with their established business model, such as commercial loans, they chose to explore alternative avenues for revenue generation, specifically by investing in bonds.
- SVB made the decision to invest in fixed-rate Agency MBS bonds, with the ***average*** fixed repricing date of 4.6 years for the bond portfolio. Many bonds were repricing up to a maturity of 10 years. This investment strategy resulted in a higher interest income of approximately 1.6% annually for SVB. This was in contrast to the prevailing low rates that were obtainable from keeping funds in a current account or central bank account, which hovered around 0% during the 2020/2021 period.
- At the end of 2022, the total assets held by SVB amounted to $211 billion, with securities representing $117 billion of this figure – ***IE., over half its balance sheet in non-customer assets***
- It is worth highlighting that SVB operated primarily as a banking book rather than a trading book. As such, the notable proportion of assets held in securities, while not unknown, may be considered somewhat unusual for a "banking" institution.
- It's b/s was closet to a leveraged investment fund b/s than a commercial bank b/s

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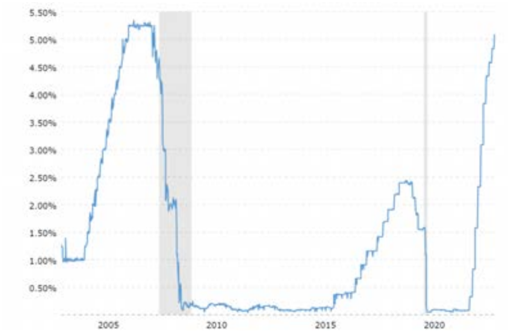
These banks’ failure was blamed by some on the rise in interest rates…

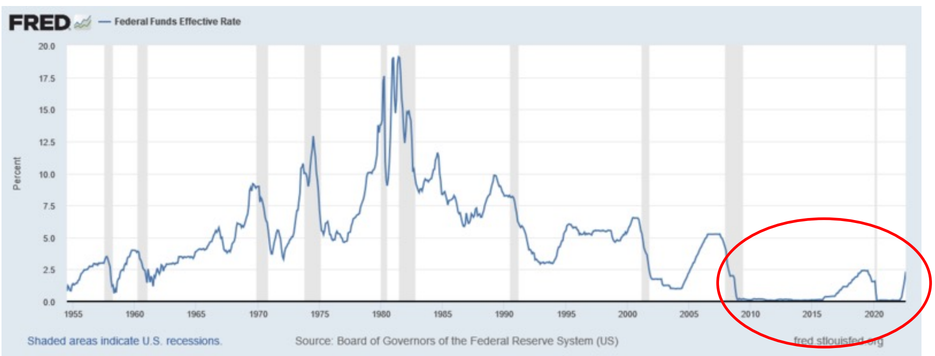
- Commentators used this chart seems to suggest the rise in rates was implying something scary and “unprecedented”….
- Fed Funds Rate: 20-year view:



Source: ICAEW 2023

But it wasn't “unprecedented”…!

- Fed Funds rate: 40-, 50- and 60-year history



Source: Wikipedia.

Bank run comparisons…

- From the BIS paper assessing 2023 bank failures

Table A.1: Deposit outflow of distressed banks

Bank	Deposit outflow	Number of days
SVB (2023)[a]	85%	2
FRC (2023)[a]	57%	90
SVB UK (2023)	30%	1
CS (2023)	21%	90
SBNY (2023)	20%	1
Icesave (2008)	20%	75
Northern Rock (2007)	20%	4
WaMu (2008)	10%	10
IndyMac (2008)	8%	14
LCR[b]	3% - 40%	30

Sources: FRB (2023), NAO (2009), Rose (2015), Zeissler et al (2019), published accounts and Secretariat calculations.

(a) FRC deposit outflows excludes $30bn of deposits placed by banks during Q1 23. SVB outflows include expected outflows by management for 10 March.

(b) LCR outflow rates are the range for retail, SME, operational and corporate deposits.

Graph A.1: Distressed banks and LCR outflows[a]

Sources: FRB (2023), NAO (2009), Rose (2015), Zeissler et al (2019) published accounts and Secretariat calculations.

(a) FRC deposit outflows excludes $30bn of deposits placed by banks during Q1 23. SVB outflows include expected outflows by management for 10 March.

*I'm not convinced that 85% figure is correct…!

The original sin

- Every bank in the USA (not to mention in UK and EU) had to deal with and manage the rise in interest rates during 2022 and 2023
- The large majority of them didn't go bust!
- The impact of rising rates exposed a flawed funding model at Silicon Valley Bank (as it did at Signature Bank and was shortly to at First Republic Bank)…

Concentrated funding structure

- SVB deposit customers were concentrated excessively in what the UK FSA used to call “Type A” deposits and depositors
  - Large corporates, often non-bank FI entities
  - High proportion of “uninsured” deposits
- These are not to be considered as “stable” funding
- But let’s take a step back…

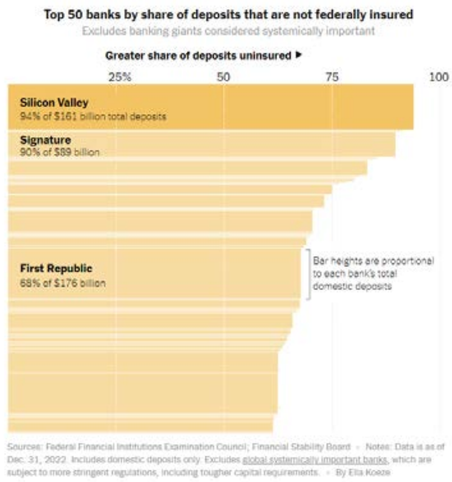


Image source: ICAEW 2023

Liquidity risk management

- I showed the UK PRA concept of “Pillar 2 liquidity” guidance
- There was no “Pillar 2” or equivalence for non-systemic banks in the USA
- (Not that that is any kind of excuse for SVB’s Board and ALCO…!)
- SVB had a high concentration of funding:
  - Concentration by depositor type (all non-bank FIs)
  - Concentration by contractual maturity
  - Concentration by product type
- SVB was not obliged to report NSFR and LCR
- In any case, we note that SVB’s LCR at the time it attempted a Rights Issue was ~71%...below the 100% Basel III minimum
- Once the bank run started, the bank was doomed
- ***But the funding structure itself was always more vulnerable to a bank run following loss of confidence than a bank that followed “Pillar 2” discipline***
- ***This caused the failure…the loss of confidence that leads to a bank run was not mitigated in any way***

A new "LCR"

Today, an LCR for the "social media" age

- SVB case study has highlighted the existence of "social media risk" when it comes to Liquidity Risk Management
  - ***Silicon Valley Bank suffered a $35bln outflow in under 48 hours!***
  - Negative social media commentary "spread like wildfire" and hastened the elimination of confidence in the bank
  - In any future firm-specific stress event, this "bad news" doesn't even need to be true. A viral spread of "fake news" can be as damaging
- LCR ("Pillar 1 liquidity") does not capture this risk speedily enough
- Author's takeaway from the 2023 failures (there is no regulation on this – this is a personal opinion!):
  - ***A 3- or 7-day LCR metric*** alongside the regulator 30-day one where the numerator is composed of cash only
  - Set your assumed % outflow in first 72 hours
  - Set your assumed outflow for days 3-7 (higher outflow earlier)
    - The first 48 hours is crucial (especially if it's over a weekend)
  - The ratio keeps the >100% standard LCR requirement but with the HQLA cover being held entirely in cash instant access (essentially cash at central bank but also nostro at SIFI banks)
  - Hence, "Liquid Cash Ratio"….a minimum liquidity standard
  - Any resemblance to the Basel LCR acronym is purely coincidental ☺

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An example stress scenario

- Customers withdraw 36% in 7 days..
  - Day 1: 18%
  - Day 2: 9%
  - Days 3-7: 1.8%
- 2-day LCR:
  - 27% outflow assumption

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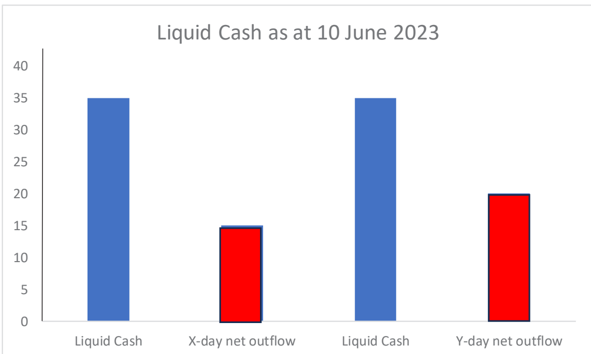
A picture is worth a "thousand" metrics...



The assumptions behind this outflow number are key…

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Pillar 2 liquidity risk: concentration risk…
…and "social media risk" impacting reputation

- Concentration in funding is perhaps the most significant "Pillar 2" liquidity risk
  - Concentration by product type (EG., instant access deposits)
  - Concentration by customer type (EG., large corporates or non-bank financial institutions)
  - Concentration across tenor points (EG., overnight contractual tenor)
- Banks that exhibit funding concentration would benefit more from the "3-day or 7-day Liquid Cash Ratio" (LCR) measure
- The 3-day or 7-day LCR is a response to "social media risk"
- It isn't a panacea, and it isn't an alternative to sound overall asset-liability management discipline. It isn't a metric that is meant to address all ALM risks!
  - But some banks will benefit from maintain it.
- At the same time, this risk must be addressed by rapid and open language responses to negative social media comment…..…see next slide

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Social media and reputational risk

- Good-practice would be to have a policy on how the bank addresses, and responds to, "social media risk"
- The policy should address:
  - Monitoring of negative mentions on social media (these may be true or fake)
  - How to respond to them and in what way
  - Communications protocol and format

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Managing Social Media Risk


and respond to it," one of the executives said.

"NIP IT IN THE BUD"

Banks are also contacting customers who complain on social media to address their issues quickly.

"We want to nip it in the bud," the second executive said.

What played out at SVB could easily happen elsewhere, said Greg Hertrich, head of U.S. depository strategies at Nomura.

"Any bank that doesn't pay attention to their social media presence, and the effect it might have on deposit behavior is doing themselves, their stakeholders and most importantly, their depositors, a pretty significant disservice," Hertrich said.

...ller lenders are focused on identifying

Source: Risk.net May 2023

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ALCO Governance Framework

ALCO: UK Regulator guidance

- The FSA's "Dear CEO" letter from January 2011 was formalised in a PRA "Legacy Supervisory Statement" published in 2013:
- LSS1/13
- It remains a very interesting and valuable document

ALCO best-practice guidelines

- January 2011 "Dear CEO" letter UK FSA guidelines for the structure, ToR and process of ALCO:
  - Proactively controls the business in line with firms objectives; focuses on entire balance sheet
  - Ensures risks remain within risk appetite
  - Considers impact on earnings volatility of changing economic and market conditions
  - Ensures an appropriate funds transfer pricing mechanism that aligns to the firms strategic objectives and risk appetite, and regularly reviews this mechanism
  - Acts as the arbitrator in the debate and challenge process between business lines
  - Attended by CEO, chaired by CFO, includes Head of Treasury, all business group heads, chief economist and Head of Internal Audit

ALCO best-practice guidelines…

- Focuses on effects of future plans / strategy at bank and business line level
  - *Asset and liability impacts of current operating plans, and market update*;
- Takes decisions to manage ALM risks or escalates issues to ExCo, rather than simply 'observing' the risks
  - Critique this
- Ensures issues are fully articulated and debated
- Considers recommendations from a tactical sub-committee that excludes the CEO and other ExCo members
- AND
- Engages in active dialogue amongst various members
- Displays strong degree of challenge
- Minutes give insight into the discussions and extent of challenge, and do not only list action points
  - *The minutes should give non-attendees — including non-executive directors — an insight into the discussion and the extent of any challenge that took place and not merely list the action points*.

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ALCO MI Deck good practice

- Is it succinct, accessible, easy to read?
- Does it give, within the first 12-20 pages, the latest balance sheet information in a way that enables the reader to ascertain quickly what the current balance sheet risks are?
- "Does it help ALCO do its job?"
- "Does it help the Board do its job?"
- ***"Does it help me do my job?"***
- Is it accessible enough so that it helps ALCO members to actually read it and understand it?
- Is it forward-looking enough? Does it enable reader to assess granular (BUs) KPIs?
- Does it link to stress / scenario analysis and impacts going forward, such that it aids decision making today?
- Is every item within it completely relevant and completely necessary?
- Is it completely bereft of spurious or surplus-to-requirement content?
- Is the summary risk metrics still fit-for-purpose? (Regularly updated as relevant to bank business model and its current and expected environment)

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1-page summary Dashboard at start is very helpful for all readers from Board downwards…

- Three examples….
- ….actually, four examples ☺

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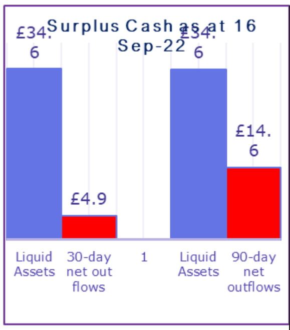
ALCO 1-pager



- **Key observations**
- We are long on survival days due to continued savings in flows and a static pipeline
- ChoudWest Bank account has been closed, with no impact on the business

Treasury Dash Board

		Operational Minimum	Operational trigger	Board Minimum	Regulatory or Risk Appetite breach	16/09/2022	Change fr End of La month
Capital	Tier 1 CET Ratio	<16%		<18%		48%	48%
Liquidity	OLAR (SLR Survival days)	≥110-days	≥90-days	<90-days		516	217
	Operational Buffer	≤ £10m		<£0m		2,500,000	2,500,00
	LCR	≥120%	≥110%	≥100%	<100%	749%	1310%
	NSFR	≥110%	≥100%	≥100%	<100%	214%	207%
	Worst outcome stress test	≥110-days	≥90-days	<90-days		298	226
Tier 2 KRI	Loans to Deposit Ratio	<115%	119% to ≥115%	>120%		92%	99%
	Proportion of deposits maturing in any one year	<30%		>30%		17%	17%
Savings	On-notice amount % savings book	≤ 15%	15% to 20%	≥20%	20%	6%	7.7%
	30-day Easy Access outflow	5% - 9.9%		≥10%	≥10%	X	X
	90-day cum. Deposit outflow	≤ 25%	25% to 30%	>30%		X	X
Margin	Net Interest Margin	3.79%	3%	<3%	<3%	4.0%	3.9%
Asset Encumberance		25%		0.25	25%	X	X

IRRBB		Limit	Actual	Headroom
	VaR £m	2991	-299	2692
	VaR %		0.20%	
	EaR - NII £m	x	X	x

Lending - Actual vs Target	Plan target	Actual
	805,344	5,543

Pipeline	
September-22	£ 4,760,250
October-22	£ 4,585,900
November-22	£ 1,206,400
Total	£10,552,550

	Amount	Ave. rate	Prev Ra
Easy Access	32,082,387	1.48%	1.50%
35-day	416,196	1.12%	1.12%
95-day	31,105,766	1.97%	1.98%
1-year	26,422,283	1.76%	1.60%
5-year	32,151,623	1.99%	1.99%
Total	**122,178,255**	**1.80%**	**1.80%**

Banks	Limit	Actual	Headroom
ClearBank	20,000,000	13,073,655	6,926,345
NatWest	20,000,000	817,420	19,182,580
Coventry	20,000,000	-	20,000,000

Large Exposures			
Aggregated CET 1		X	
Maximum large exposure		X	

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ALCO 1-pager

Key observations

Next capital injection of £25m has been dialled into the cash flow in September 2023

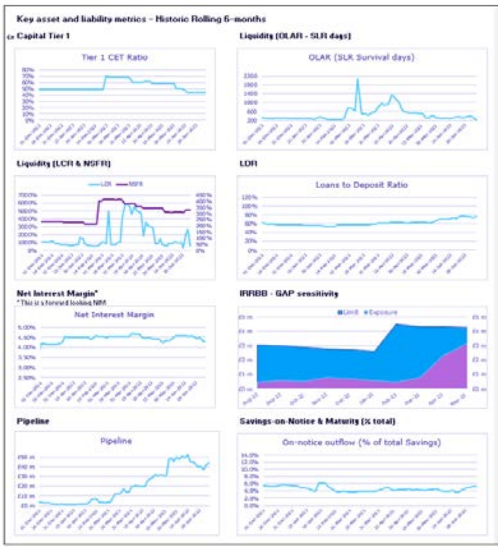
The high liquidity levels we have been running with for some time are now starting to reduce.

NIM is stable

IRRBB risk is rising on the back of the resumption in lending being almost all in fixed rate products

Loan pipeline is growing = £44.5m plus WIP applications = £38.9m.

Total on-notice amount is slightly increased by £3.8m to £12.0m, which is 5.3% from total Savings.



ChoudWest BANK

Board / ALCO 1-pager

Key observations

We remain long on survival days due to continued savings in flows and a static loan pipeline

IRRBB EVE Delta and NII Delta are "green" (see page 4)

www.mc.financial 21st August 2023 - Since 2014

18-Aug-2023 Treasury Dashboard, Ratios & Cash

			Ops min.	Ops trigger	Board min.
Capital Tier 1	40%	✓	<16%		<18%
LCR (Liquidity coverage ratio)	358%	✓	>125%	>110%	<110%
NSFR (Net stable funding ratio)	319%	✓	>110%	≥110%	<100%
OLAR (SLR Survival days)	183	✓	≥110 days	≥90 days	<90 days
LDR (loan-to-deposit ratio)	72%	✓	<115%	≥115%, ≤120%	>120%

Weighted Average Rate

Lending inc. Asset Financ		7.66%				
Savings		3.94%				
Net Wght Avr Rate		3.72%				
on-Notice Outflow & % from total Savings	£12.2m	4.4%	✓	≤15%	>15%, <20%	≥20%

Cash Position £140m

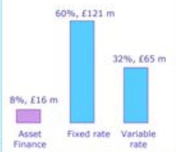
Bank of England £125m

BoE rate = 5.25%

Lending book =£202m

Credit approved Pipeline =£54m

WIP HoT's accepted, 75% =£16m



Savings =£280m

on-Notice Outflow=£12m

ALCO 1-pager

- Nubank's ALM Forum pack page 1 dashboard at the start – love that! ☺

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Nubank BACEN presentation 2024 45

SVB ALCO Governance structure

- SVB's asset-liability committee (ALCO) reported into the "Finance Committee"
- The Finance Committee reported into the Board, or, depending on your media source, the Board Risk Sub-Committee
- As we have observed with bank failures in 2007-09, this (orthodox and very common) operating model ***places genuine understanding of the balance sheet – and its risk sensitivity to changes in market factors – too far away from the Board***
- Every failed bank in 2007-08 and 2023 exhibited this similar balance sheet management governance framework (which is one that most regulatory authorities expect to see)…
- …the orthodox governance framework for managing the balance sheet ***doesn't really have a very good track record!***
- See a reference from 2017 that highlights this….

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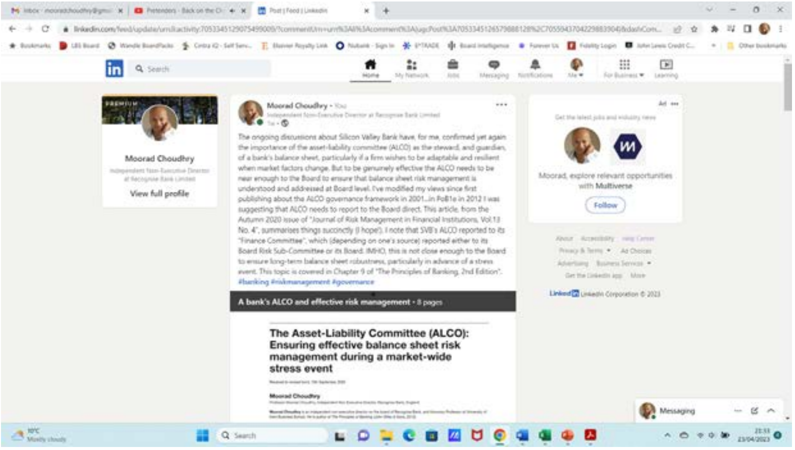
Nubank BACEN presentation 2024 46

ALCO and distance from the Board



Article from European Financial Review (2017): http://www.europeanfinancialreview.com/?p=17469

Forthcoming in JoRMFI…

"Bank liquidity risk management through stable and volatile markets: the role of the ALCO and lessons learned for the balance sheet governance operating model"

(Choudhry / Trythall / Abu Labaan)

Journal of Risk Management in Financial Institutions, vol. 18 June 2024

Bank	Failure date	ALM or ALCO reporting line	Levels below Board	Remarks	Reference
Bear Stearns	2007	Finance and Risk Committee > Board of Directors	2	ALCo sits within the "Finance and Risk Committee of the Board of Directors, to assist in the oversight of the Board" (p.1)	DocuMatrix print job for "FCIC\sknaus" (Part 1) (stanford.edu)
Northern Rock	2007	Risk Committee > Board	2	The Management Board Asset and Liability Committee remains responsible for overseeing the management and review of the Company's risk profile and processes, including the composition of the balance sheet and the liquidity profile. The minutes of these meetings are reported to the Risk Committee. (Page 5)	106363 ARA Cover Artwork (nram.co.uk)
				To assist the Board in discharging its responsibilities for the setting of risk policy, the Risk Committee periodically reviews the Group's credit risk, interest rate risk, liquidity risk and operational risk exposures in relation to the Board's risk appetite and the Group's capital adequacy (Page 5)	
Washington Mutual	2008	ALM Risks > Exco > Finance Committee > Board	3	"Governance and oversight of credit, liquidity and market risks are provided by the Finance Committee of the Board of Directors" (Page 50).	http://investing.businessweek.com/research/stocks/financials/drawFiling.asp?docKey=136-000104746908002083-234EUAGBP81JFCKEHDIBS (stanford.edu)
				Asset/liability management is governed by a policy reviewed and approved annually by the Board. The Board has delegated the oversight of the administration of this policy to the Finance Committee of the Board. (Page 70)	
				ALM risk was managed by the ExCo (establshed 1990 to "facilitate strategic direction")	
Lehman Brothers	2008	ALM Risk > Finance & Risk Committee > Board of Directors	2	"In Lehman, 8 out of 10 directors met the independence of standards of the NYSE in 2006, but they lacked the financial expertise and failed to reliably monitor Lehman. For example, ***the finance & risk committee met only two times a year*** and the compensation committee met more times (eight) than the audit committee (seven)."	https://publish.illinois.edu/illinoisblj/2016/04/28/the-agency-problem-of-lehman-brothers-board-of-directors/
Citibank	2008	No Asset-Liability Committee	N/A	In theory, the Audit & Risk Committee of the Board of Directors managed balance sheet risk (p.88)	https://www.sec.gov/Archives/edgar/data/831001/000104746908011506/a2188770z10-q.html
				In practice, to quote: "The Board and ARMC were not provided meaningful or systematic information on material risk and compliance with limits, controls, or concentrations. The Citibank, N.A. Board had no effective oversight role specific to the risk profile of the bank." (Page 2)	2008-02-14_OCC_Letter_from_John_C_Lyons_to_Vikram_Pandit_Serious_Problems_at_Citibank.pdf (stanford.edu)
HBOS	2008	Liquidity & Capital Risk* > Group Capital Committee > Group Finance Director > ExCo	3	*Liquidity and market risk reported into two different committees, hence not grouped as "ALM Risk". The Group Capital Committee managed part of ALM risk and was three levels below the Board (diagram on page 15, reproduced below)	https://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwia0Z2doJP_AhWMQcAKHfNXCiAQFnoECBwQAQ&url=https%3A%2F%2Fwww.globenewswire.com%2Fnews-release%2F2009%2F04%2F09%2F7376%2F0%2Fen%2Ffiles%2F122833%2F0%2Fhbos%2520plc%252
		Market Risk* > Group Risk Director > Executive Committee	3		
Royal Bank of Scotland	2008	Group Asset and Liability Management Committee > Executive Risk Forum > Group Executive Management Committee > Group Board of Directors	4	Diagram on page 78	https://investors.natwestgroup.com/~/media/Files/R/RBS-IR-V2/annual-reports/rbs-group-accounts-2008.pdf
UBS	2008	ALM Risk > Risk Committee > Executive Committee of GEB > Board	3	Diagram on page 122. "These limits are monitored by Group Treasury, who reports the results and trends on a regular basis to the BoD risk committee and the Executive Committee of the GEB. Contingency plans for a liquidity crisis are incorporated into UBS's wider crisis management process. The liquidity position and asset and liability profile are continuously tracked." (Page 152).	https://www.ubs.com/global/en/investor-relations/financial-information/annual-reporting/ar-archive/_jcr_content/mainpar/toplevelgrid/col1/accordionbox/accordionsplit_1370822007/table_409745089.0209542875.file/dGFibGVUZXh0PS9jb250ZW50L2RhbS91YnMvZ2xvYmFsL2
KBC Bank	2009	Group ALCo > Group Executive Committee > Audit Committee > Board	4	Diagram on page 49	2009_JVS_KBC_Groep_en.pdf
Silicon Valley Bank	2023	ALCo > Finance Committee & Risk Committee > Board of Directors	2	ALCO provides oversight to the liquidity management process and recommends policy guidelines for the approval of the Finance Committee and Risk Committee of our Board of Directors, and courses of action to address our actual and projected liquidity needs. Additionally, we routinely conduct liquidity stress testing as part of our liquidity management practice (page 87)	0000719739-23-000021 (d18rn0p25nwr6d.cloudfront.net)
				CEO was not a member of ALCO (CEO testimony to Senate Committee)	
Credit Suisse	2023	ALM Risk > Group Capital Allocation and Liability Management Committee > Executive Board	2	No specific entity level ALCO. "Our liquidity and funding profile is regularly reported to Group CALMC and the Board of Directors, who define our risk tolerance, including liquidity risk, and set parameters for the balance sheet and funding usage of our businesses. The Board of Directors is responsible for defining our overall risk tolerance in the form of a risk appetite statement (page 106)	https://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwix18f1pJP_AhVcTkEAHdirBSAQFnoECAkQAQ&url=https%3A%2F%2Fwww.credit-suisse.com%2Fmedia%2Fassets%2Fcorporate%2Fdocs%2Fabout-us%2Finvestor-relations%2Ffinancial-disclosures%2Ffinancia
First Republic Bank	2023	ALM Risk > Bank Enterprise Risk Management Committee > Directors' Enterprise Risk Management Committee > Board	3	No specific "ALCO" forum. "Liquidity risk is actively monitored and managed by the Treasury department, Chief Financial Officer and senior management through the Bank Enterprise Risk Management Committee, with independent oversight provided by the Board through the Directors' Enterprise Risk Management Committee. (page 123)	printmgr file (firstrepublic.com)

Conclusions

- Traditional liquidity risk measures and processes are more than enough to ensure b/s robustness and viability for most banks
- A bank that ignores them may fail a la Northern Rock 2007 and SVB 2023
- The ALCO is the ultimate owner of the balance sheet and responsible for ensuring long-term robustness and viability of the balance sheet
  - Hence its genuine authority and seniority is vital to ensure continuous b/s robustness and viability

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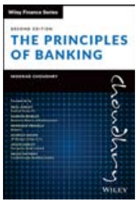
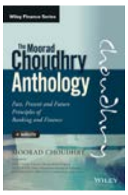
Further reading



The Principles of Banking, 2nd Edition, Singapore: John Wiley & Sons Ltd 2022, chapters 11-15



Moorad Choudhry Anthology: Past, Present and Future Principles of Banking and Finance, Singapore: John Wiley & Sons Ltd 2018, chapters 8, 10-14

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Presenter

- Professor Moorad Choudhry is a Non-Executive Director at Recognise Bank Limited, in London, and an independent advisor attendee on the Risk Committee at Nubank, in Sao Paolo. He is Honorary Professor at University of Kent Business School. He was latterly Treasurer, Corporate Banking Division at The Royal Bank of Scotland, Head of Treasury at Europe Arab Bank, Global Head of Treasury at KBC Financial Products and a vice-president in structured finance at JPMorgan Chase Bank. He began his career at the London Stock Exchange in 1989.
- Moorad is a Fellow of the Chartered Institute for Securities & Investment, a Fellow of the London Institute of Banking and Finance, a Fellow of the Global Association of Risk Professionals, and a Liveryman of The Worshipful Company of International Bankers. He is author of *The Principles of Banking* (John Wiley & Sons 2012, 2023).

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