

Liquidity Management

Risk & Opportunity

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2 April 2019





Agenda

What is Liquidity Risk?

Should we worry about it?

How is Liquidity Risk Managed?

Benefits of Tiering Liquid Assets



What is Liquidity Risk?

Should we worry about it?

How is Liquidity Risk Managed?

Benefits of Tiering Liquid Assets



Peak Lenin, Kyrgyzstan (7,134m)



- Altitude of 7,134m
- Part of Pamir mountain range on border of Tajikistan & Kyrgyzstan
- One of the 5 snow leopards
- First successful summit in 1928 by Soviet-German expedition
- 1990 Peak Lenin Disaster







Objective vs Subjective Risk

- Mountaineers classify risk according to
 - *Objective hazards*
 - *Subjective hazards*
- **Objective Hazards** arise from the environment
 - *Avalanches, rock falls, lightning*
- **Subjective Hazards** are human-caused incidents
 - *AMS, Dehydration, Overexertion, personal error*

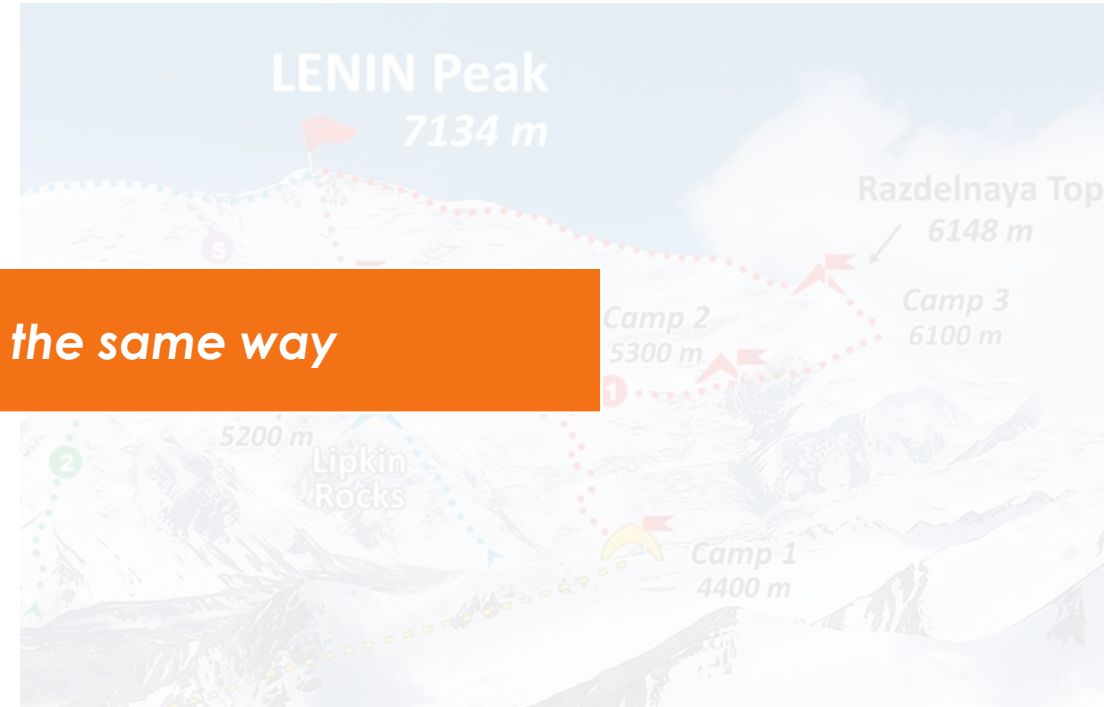




Objective vs Subjective Risk

- Mountaineers classify risk as
 - Objective hazards
 - Subjective hazards
- Objective Hazards
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Liquidity Risk behaves in the same way





What is Liquidity Risk?

Defining Liquidity Risk

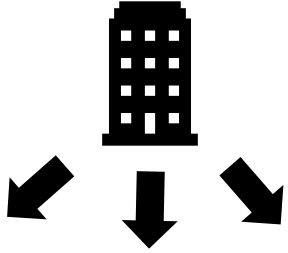
Liquidity Risk is exposure to loss in the event that *insufficient liquid assets are available to meet the cash flow requirements when they are due* - or that *assets may be available, but only at excessive cost*.



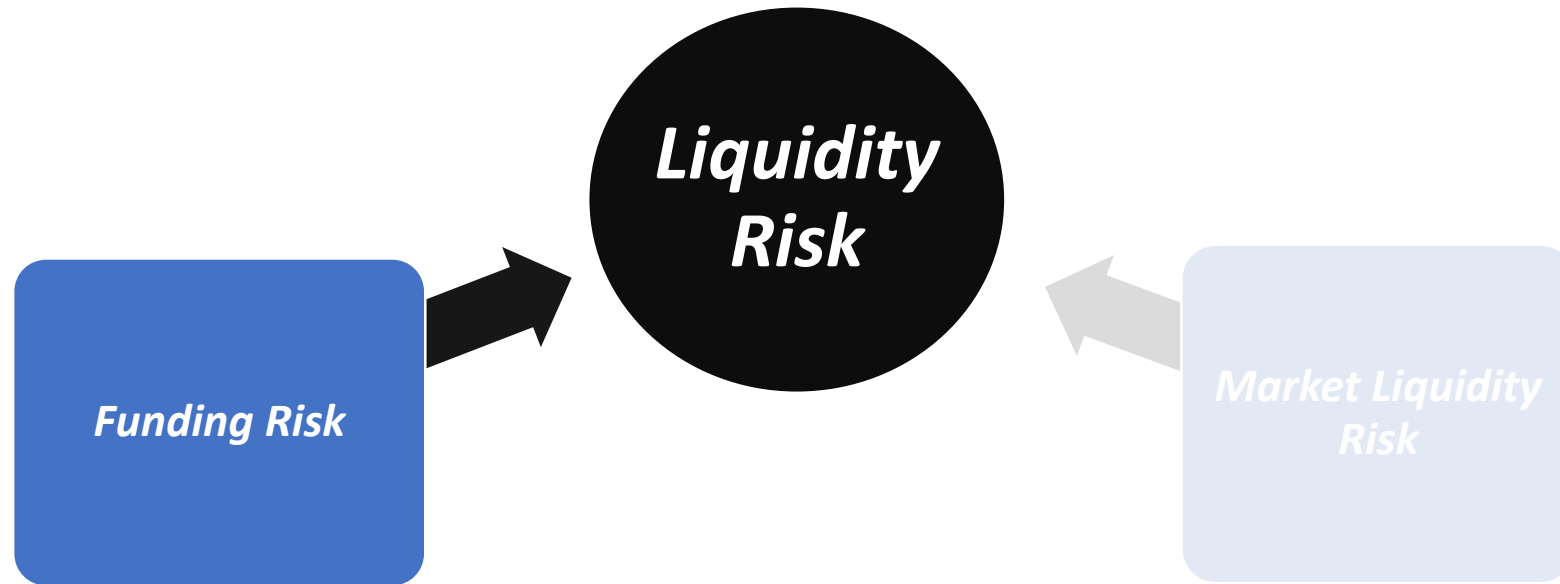


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Defining Liquidity Risk



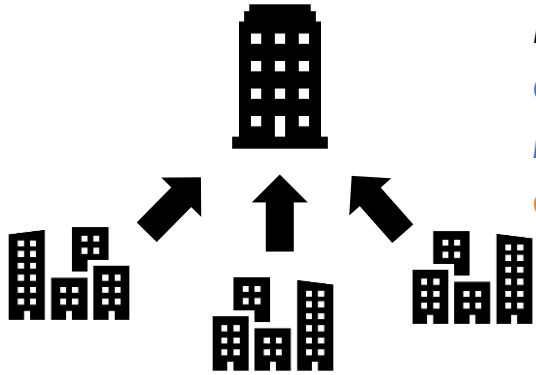
Funding Liquidity Risk: A type of liquidity risk that refers to the risk arising from the *difficulty in raising funding to meet obligations when they fall due*, or that the *available funding can only be raised at excessive cost*



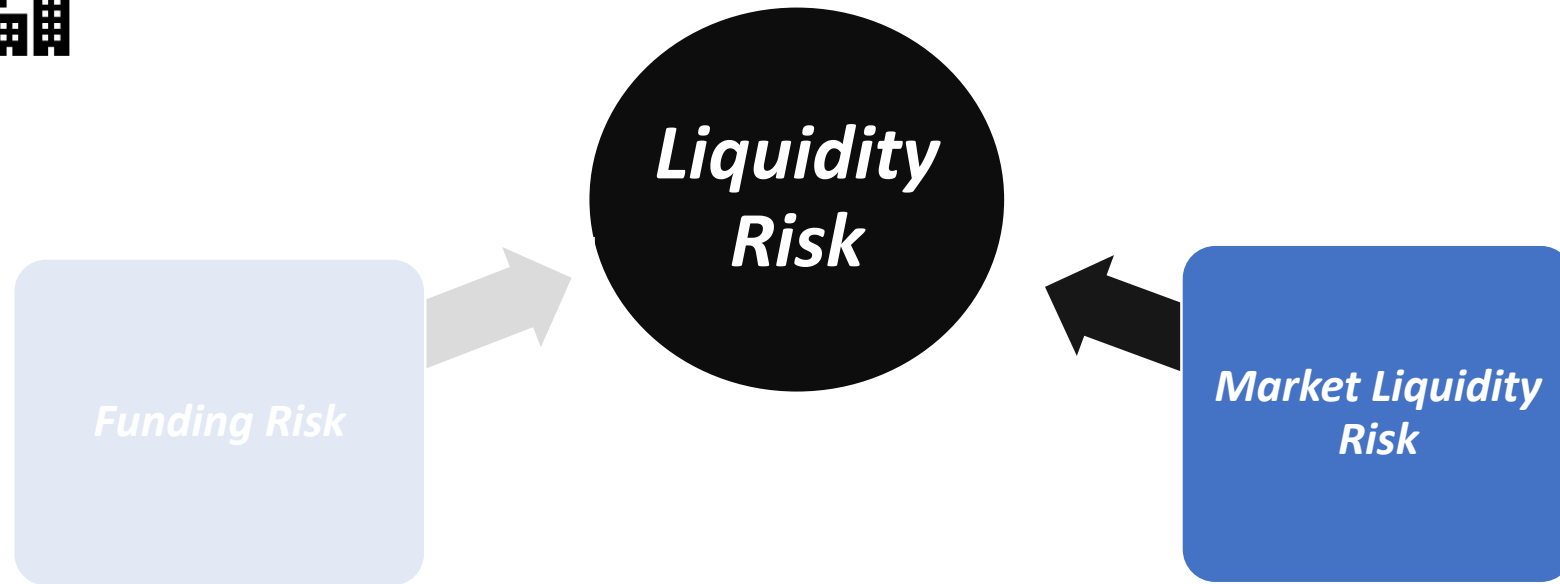


What is Liquidity Risk?

Defining Liquidity Risk



Market Liquidity Risk: A type of liquidity risk that refers to the risk arising from difficulty in transacting financial instruments or in realising assets at prevailing market prices due to an *inadequate market depth/breadth* and/or **market disruption**





What is Liquidity Risk?

Principles



What is Liquidity Risk?

Principles

1

Its not your fault, but its still your problem
(Okay, sometimes it is your fault)



What is Liquidity Risk?

Principles

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Its not your fault, but its still your problem
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2

You have more than you need, until you don't



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Too little Liquidity kills you quickly - too much, slowly



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Liquidity Risk is operational and consequential



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Confidence is the lifeblood of liquidity



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Liquidity Risk is heterogeneous



What is Liquidity Risk?

Should we worry about it?

How is Liquidity Risk Managed?

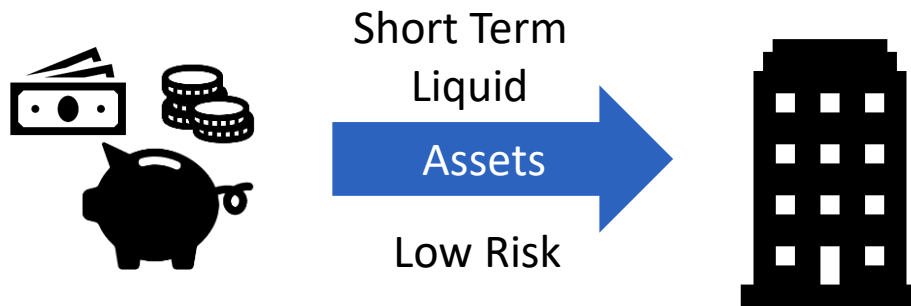
Benefits of Tiering Liquid Assets



Should we be concerned?

Banks vs Insurers

Banks

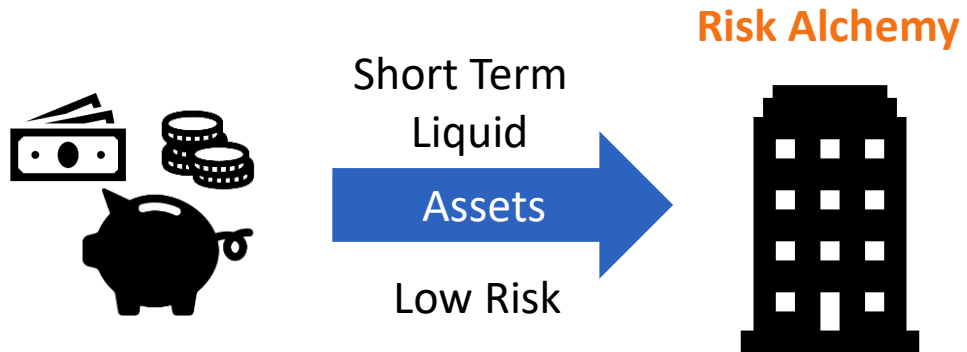




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Banks vs Insurers

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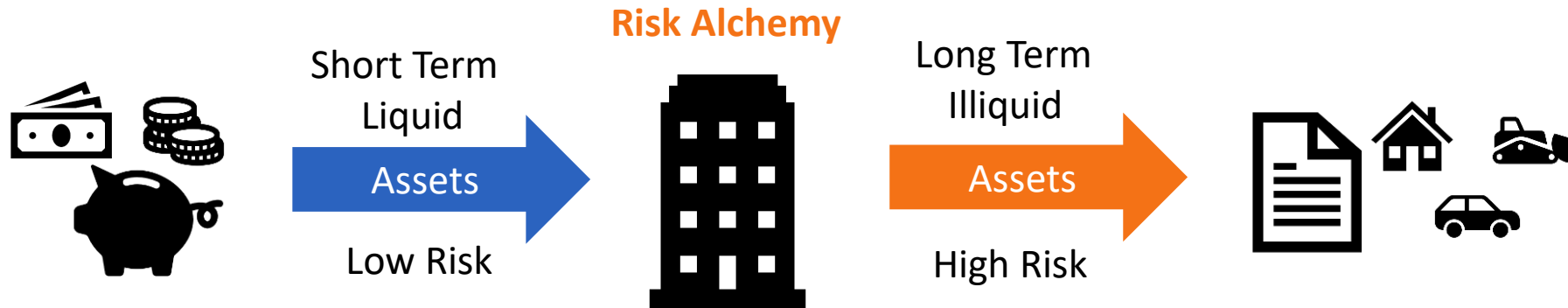




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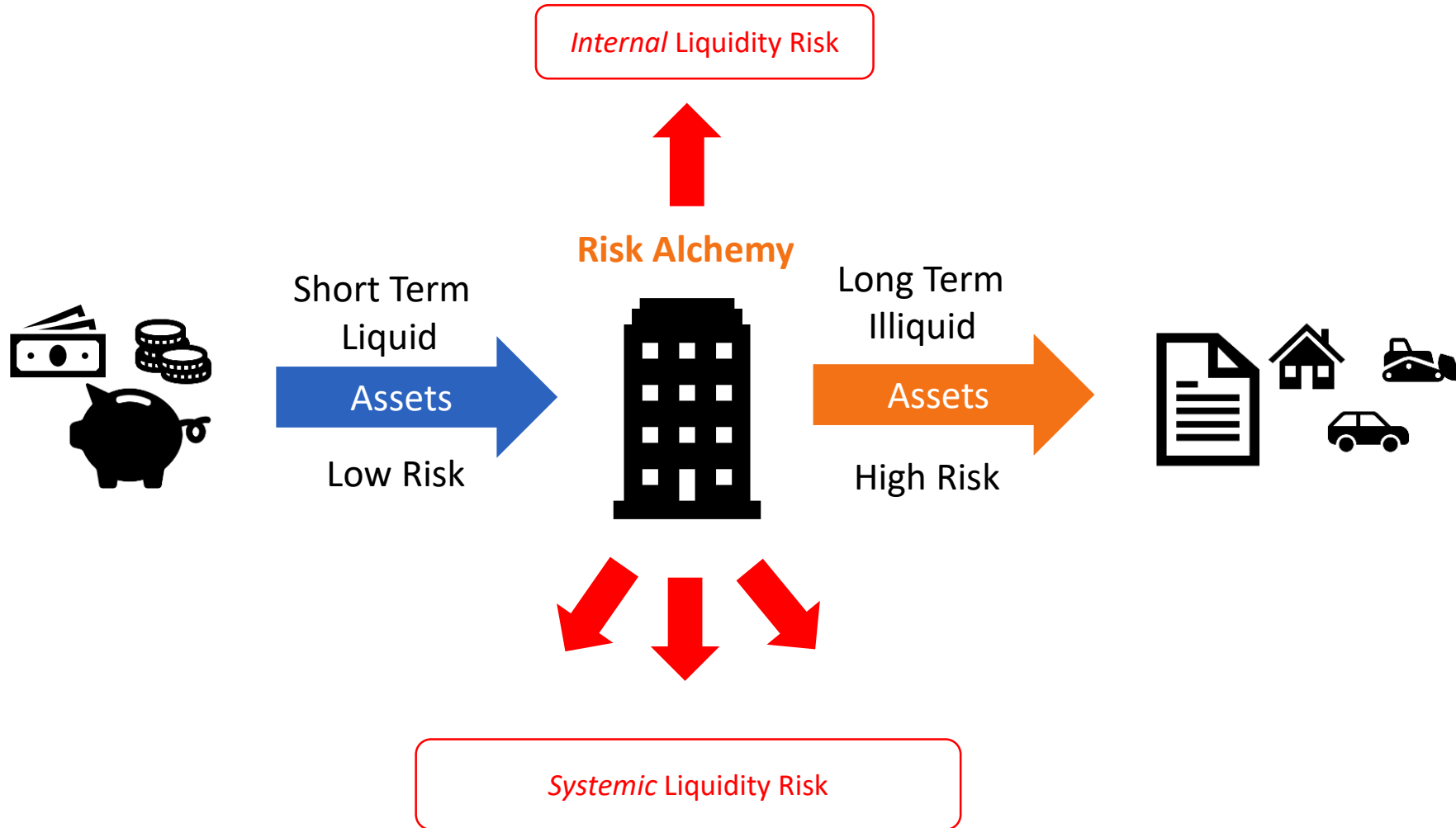




Should we be concerned?

Transformation into Liquidity Risk

Banks

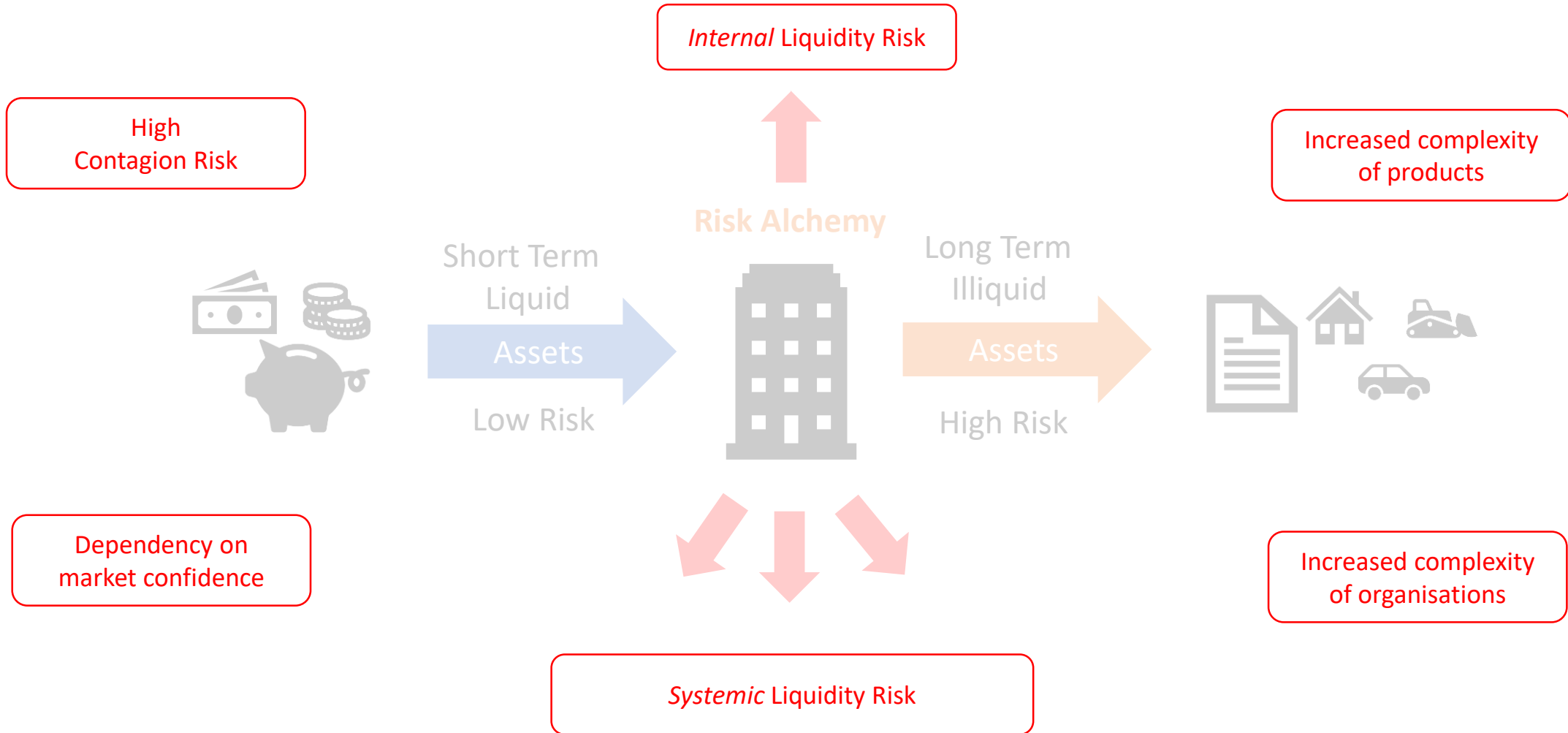




Should we be concerned?

Other factors

Banks





Should we be concerned?

Banks vs Insurers

Traditional
Insurers

- More stable as premiums received in advance...
- ... and payments only made if contingent event occurs
- “Earned premiums” cannot be recouped
- Use of leverage to enhance returns usually not practiced



Should we be concerned?

Banks vs Insurers

*General
Insurers*

- Cover mostly annual
- Large portion of assets in highly liquid assets...
- ... providing matching in terms of cash outflows
- **Liquidity Risk** from:
 - *Catastrophe events*
 - *Large single losses*
 - *Concentration of investments*
- Managed via reinsurance and risk transfer
 - *Risk of default or delayed payment*



Should we be concerned?

Banks vs Insurers

Life
Insurers

- Cover long term
- Lower proportion of liquid assets
- **Liquidity Risk** mainly from:
 - *Ease at which policies can be surrendered*
 - *Mass Lapse from reputational risk*
 - *Investment activities*
 - *Reinsurance dependency*
 - *Concentration of investments*



Should we be concerned?

Banks vs Insurers

*Recent
Developments*

- Increased complexity of business model and group structure
- Leverage used to enhance returns (i.e. “Debt Capital”)
- Insurance on credit risk
- Exposure to external environment....



“No Insurer is an Island”

External Environment



- Exposure to:
 - *Banking System (through deposits, affiliation etc.)*
 - *Reinsurance Industry**
 - *Monetary policy and exchange rates***
- Other events that could generate liquidity risk:
 - *Political instability*
 - *Another financial crises or prolonged financial depression*
 - *Debasement of USD as global reserve currency*



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External Environment



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 - *Banking System (through deposits, affiliation etc.)*
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Significant portion of
liquidity risk
outside insurer
(if not most)



Regulators are concerned

- 2008 crisis mainly viewed as a *“liquidity crisis”*
- Prudential Regulation traditionally weighted towards *solvency* 
- Liquidity crises threaten:
 - *Going concern* of institutions
 - Stability of entire *financial system*
- Liquidity Risk *“known unknown”* within most insurers
- Recent system wide stress testing by SA regulator*



Regulation of Liquidity Risk

Regulatory Measures

- Reserve Banks:
 - “Lender of Last Resort”
 - *Monitoring* of aggregate Liquidity Risk in financial system
 - Liquidity requirements introduced under *Basel III* (e.g LCR and NSFR)
- FSA Liquidity Framework requirements (*Liquidity Asset Buffers, governance etc*)
- Expanding Scope of ORSA to include Liquidity Risk* (*Solvency 2, SAM*)



Regulation of Liquidity Risk

Regulatory Measures

- SA Prudential Authority:
 - Dedicated *Liquidity Risk Assessment division*
 - Industry wide *stress testing*
 - *Liquidity shortfall* measure for Insurers
 - *Liquidity framework* requirements



What is Liquidity Risk?

Should we worry about it?

How is Liquidity Risk Managed?

Benefits of Tiering Liquid Assets



Risk Identification



Key Processes to assist with the identification

•*Risk Control Self Assessment*

•*Cash Flow Analysis*



Risk Identification



RCSA focusses on operations

• Risk Control Self Assessment

CFA focusses on consequences

• Cash Flow Analysis



Cash Flow Analysis

CFA assesses adequacy of **liquid assets** currently available ...
to meet *future* **liquidity strain** under **expected** and **stressed** conditions

Expressed as

1. Liquidity Shortfall Indicator - *LSI* (\$)

$$LSI = ALA - FR_{12m} | Stress_n$$

Where

- *ALA:* Available Liquid Assets
- *FR12m:* Funding Requirement forecasted over a 12month period
- *Stress_n:* One of the stress scenarios under which the LSI is calculated



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2. Liquidity Coverage Ratio - *LCR* (%)

$$LCR = \frac{ALA}{FR_{12m} | Stress_n}$$

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$$LCR' = \frac{ALA + CIF_{12m} | Stress_n}{COF_{12m} | Stress_n}$$

Where

- *ALA*: Available Liquid Assets
- *FR12m*: Funding Requirement forecasted over a 12month period
- *Stress_n*: One of the stress scenarios under which the LSI is calculated

And

- *FR12m*: *COF12m* - *CIF12m*
- *CIF12m*: Cash inflows forecasted over a 12month period
- *COF12m*: Cash outflows forecasted over a 12month period



Liquidity Coverage Ratio

$$LCR = \frac{ALA}{FR_{12m} | Stress_n}$$



Liquidity Coverage Ratio

Available Liquid Assets



i.e. “Liquidity Buffer”

$$LCR = \frac{ALA}{FR_{12m} | Stress_n}$$



Liquidity Buffer

Available Liquid Assets

*"Amount of assets Company is confident it can sell / pledge in an adverse liquidity scenario, ...
... and wants to maintain to act as a buffer against possible future liquidity strains"*





Liquidity Buffer

Allocating Assets



Liquidity Buffer Includes:



Cash



Liquidity Buffer

Allocating Assets



Liquidity Buffer Includes:



Cash

And:



Bonds



Equities



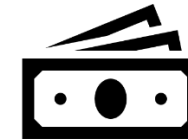


Liquidity Buffer

Allocating Assets



Liquidity Buffer Includes:



Cash

And:



Bonds



Equities



 After allowing for conservative haircuts



Liquidity Coverage Ratio

Funding Requirement

$$LCR = \frac{ALA}{FR_{12m} | Stress_n}$$



Funding Requirement

Liquidity Gap Analysis

"Refers to the expected funding requirements over the projection period. Calculated as the cash inflows minus cash outflows"

Liquidity Gap Analysis used to determine funding requirement:

- **Funding matrix** populated
- Details **funding requirements** for **various maturities** and **cumulative** funding requirement
- Constructed with asset and liability **cash flows** for each maturity
- All expected cash flows included (incl. off balance sheet items)
- **Net funding gap** calculated for each period (and cumulative)...
- ... based on **anticipated mismatches** between CIFs and COFs ...



Funding Matrix

Projected Cashflows

Projected Cash Flows	M0	M1	M2	M3	...	M12	Total
CIF1		+	+	+	+	+	+
...		+	+	+	+	+	+
CIFn		+	+	+	+	+	+
Total Cash Inflows		+	+	+	+	+	+
COF1		-	-	-	-	-	-
...		-	-	-	-	-	-
COFm		-	-	-	-	-	-
Total Cash Outflows		-	-	-	-	-	-



Projected Cash Flows
= key input



Funding Matrix

Funding Requirement

Projected Cash Flows	M ₀	M ₁	M ₂	M ₃	...	M ₁₂	Total
CIF1		+	+	+	+	+	+
...		+	+	+	+	+	+
CIF _n		+	+	+	+	+	+
Total Cash Inflows		+	+	+	+	+	+
COF1		-	-	-	-	-	-
...		-	-	-	-	-	-
COF _n		-	-	-	-	-	-
Total Cash Outflows		-	-	-	-	-	-
Funding Requirement		-	+	-	-	+	-



Funding Requirement
calculated for each
period



Funding Matrix

Total Funding Requirement

Projected Cash Flows	M0	M1	M2	M3	...	M12	Total
CIF1		+	+	+	+	+	+
...		+	+	+	+	+	+
CIFn		+	+	+	+	+	+
Total Cash Inflows		+	+	+	+	+	+
COF1		-	-	-	-	-	-
...		-	-	-	-	-	-
COFn		-	-	-	-	-	-
Total Cash Outflows		-	-	-	-	-	-
Funding Requirement		-	+	-	-	+	TFR

Total Funding
Requirement used in
LCR



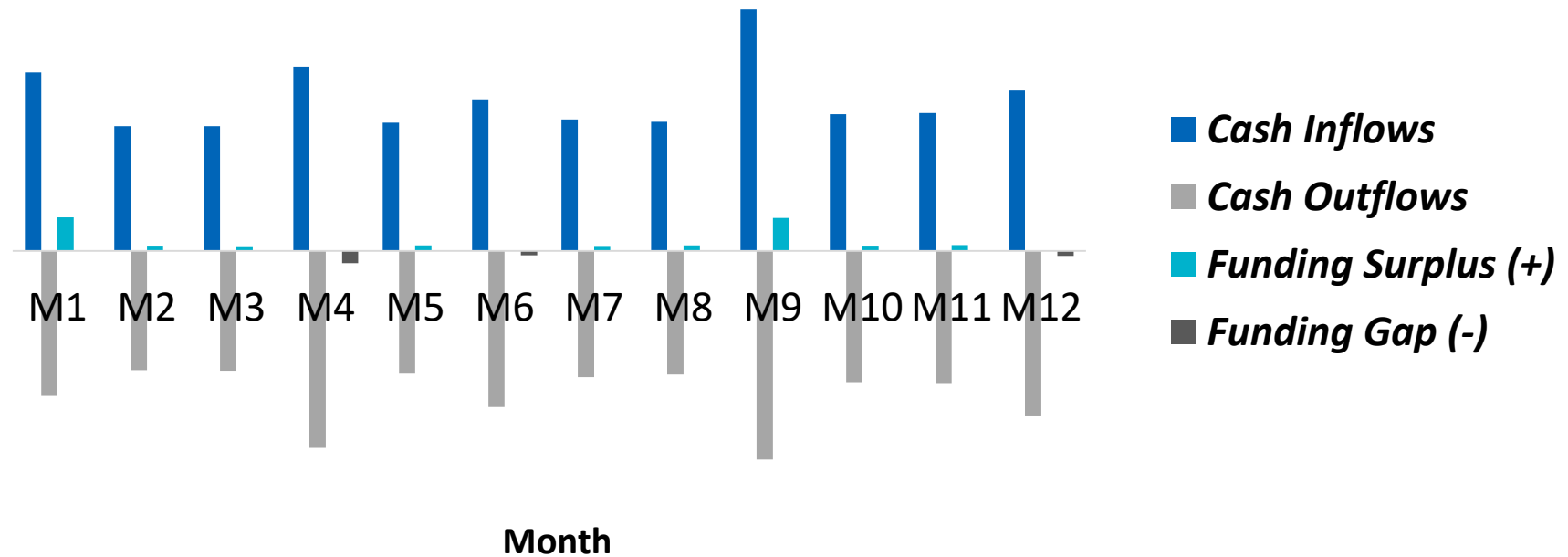


Funding Matrix

Funding Requirement

Funding Gap

Projected Budget Period ending 2019





Funding Matrix

Available Liquid Assets

Projected Cash Flows	M0	M1	M2	M3	...	M12	Total
CIF1		+	+	+	+	+	+
...		+	+	+	+	+	+
CIFn		+	+	+	+	+	+
Total Cash Inflows		+	+	+	+	+	+
COF1		-	-	-	-	-	-
...		-	-	-	-	-	-
COFm		-	-	-	-	-	-
Total Cash Outflows		-	-	-	-	-	-
Funding Requirement		-	+	-	-	+	-
Liquid Assets	M0	M1	M2	M3	...	M12	Total
Cash	+						+
Bonds	+	+	+				+
Total LA per month	+	+	+				+



Liquid Assets
allocated according
to Maturity



Funding Matrix

Available Liquid Assets

Projected Cash Flows	M0	M1	M2	M3	...	M12	Total
CIF1		+	+	+	+	+	+
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CIFn		+	+	+	+	+	+
Total Cash Inflows		+	+	+	+	+	+
COF1		-	-	-	-	-	-
...		-	-	-	-	-	-
COFm		-	-	-	-	-	-
Total Cash Outflows		-	-	-	-	-	-
Funding Requirement		-	+	-	-	+	-

Liquid Assets	M0	M1	M2	M3	...	M12	Total
Cash	+						+
Bonds	+	+	+				+
Total LA per month	+	+	+				+



Cash allocated to $t = 0$



Liquid Assets
allocated according
to Maturity



Funding Matrix

Net Funding Requirement

Projected Cash Flows	M0	M1	M2	M3	...	M12	Total
CIF1		+	+	+	+	+	+
...		+	+	+	+	+	+
CIFn		+	+	+	+	+	+
Total Cash Inflows		+	+	+	+	+	+

COF1		-	-	-	-	-	-
...		-	-	-	-	-	-
COFm		-	-	-	-	-	-
Total Cash Outflows		-	-	-	-	-	-

Funding Requirement		-	+	-	-	+	-
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Liquid Assets	M0	M1	M2	M3	...	M12	Total
Cash	+						+
Bonds	+	+	+				+
Total LA per month	+	+	+				+

Net Funding Requirement	M0	M1	M2	M3	...	M12	Total
Net Funding Gap	+	+	-	-		-	-



Net Funding Gap
calculated as
PCFs - LA



Stressed Funding Matrix

Funding Matrix needs to be populated for **each stress**

Projected Cash Flows	M0	M1	M2	M3	...	M12	Total
CIF1		+	+	+	+	+	+
...		+	+	+	+	+	+
CIFn		+	+	+	+	+	+
Total Cash Inflows		+	+	+	+	+	+

COF1		-	-	-	-	-	-
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Funding Requirement		-	+	-	-	+	-
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Cash	+						+
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Total LA per month	+	+	+				+

Net Funding Requirement	M0	M1	M2	M3	...	M12	Total
Net Funding Gap	+	+	-	-		-	-



Stressed Funding Matrix

Stressed Cash Flows

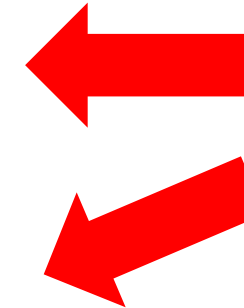
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...		-	-	-	-	-	-
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Funding Requirement		-	+	-	-	+	-
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Bonds	+	+	+				+
Total LA per month	+	+	+				+

Net Funding Requirement	M0	M1	M2	M3	...	M12	Total
Net Funding Gap	+	+	-	-		-	-



Stress impacts on cash flows calculated



Stressed Funding Matrix

Net Funding Requirement

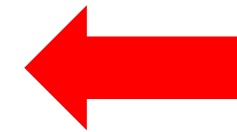
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Net Funding Requirement	M0	M1	M2	M3	...	M12	Total
Net Funding Gap	+	+	-	-		-	-



Stressed Funding Requirement calculated per stress



Stressed Funding Matrix

Liquid Asset Stress

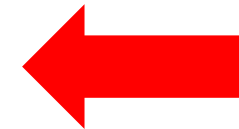
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Net Funding Gap	+	+	-	-		-	-

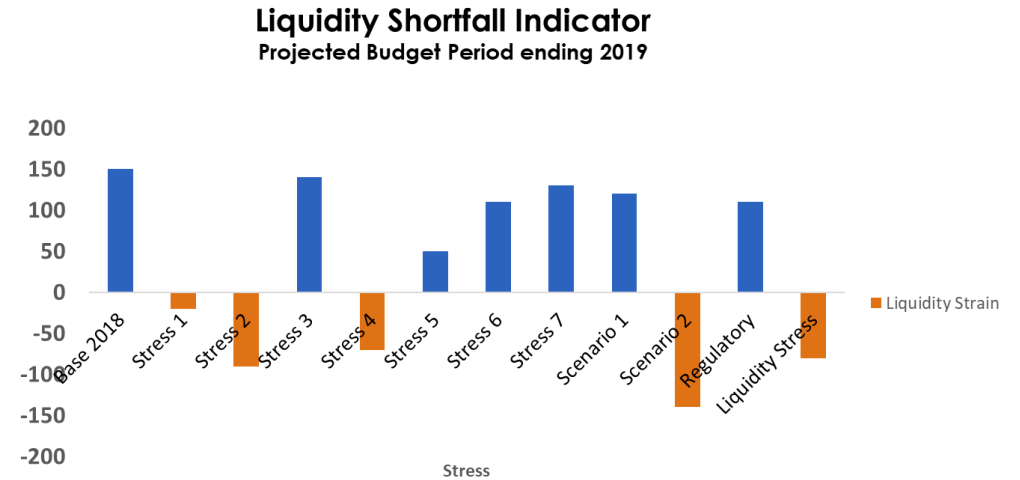
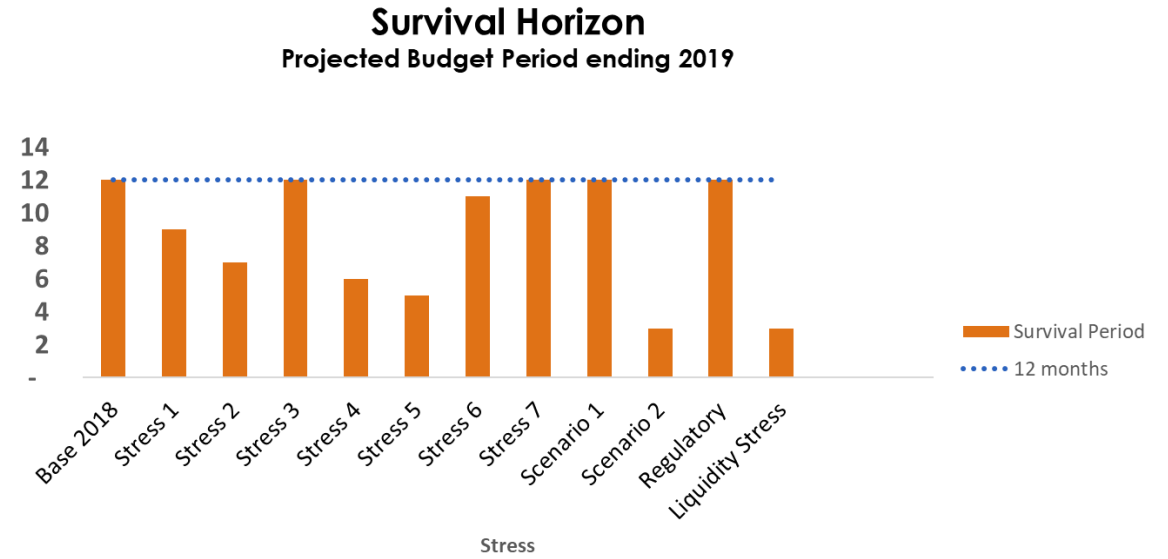
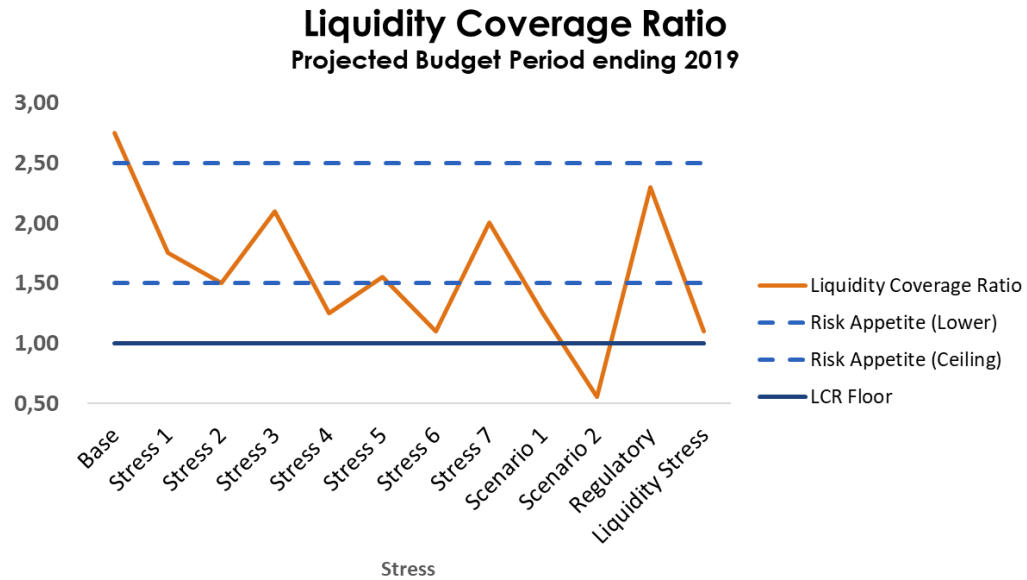


Separate stress required
that applies to **liquid
assets***



Liquidity Risk Profile

Key Measures





What is Liquidity Risk?

Should we worry about it?

How is Liquidity Risk Managed?

Benefits of Tiering Liquid Assets



Tiering of Liquidity

After Liquidity Buffer quantified, **tiering** required to:

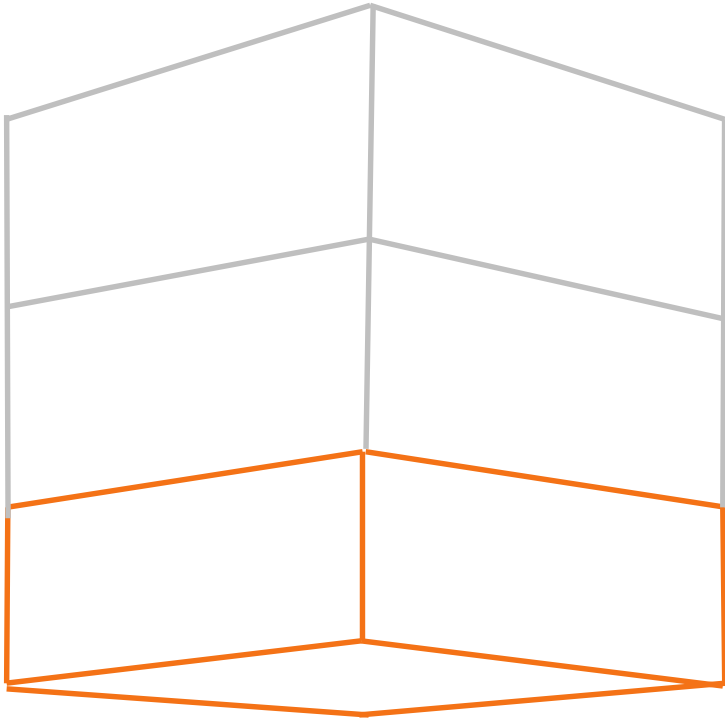
- 1 Calculate **Required vs Excess Liquidity**
- 2 Assess **cost and opportunity** of Dormant Liquidity
- 3 Inform **asset composition** of the Liquidity Buffer
- 4 Derive **Liquidity Risk Appetite**
- 5 Determine if **liquidity injection** required and size



Required and Excess Liquidity

Expected Liquidity Requirement

Expected liquidity requirement refers to liquid assets required to meet
expected projected net cash outflows



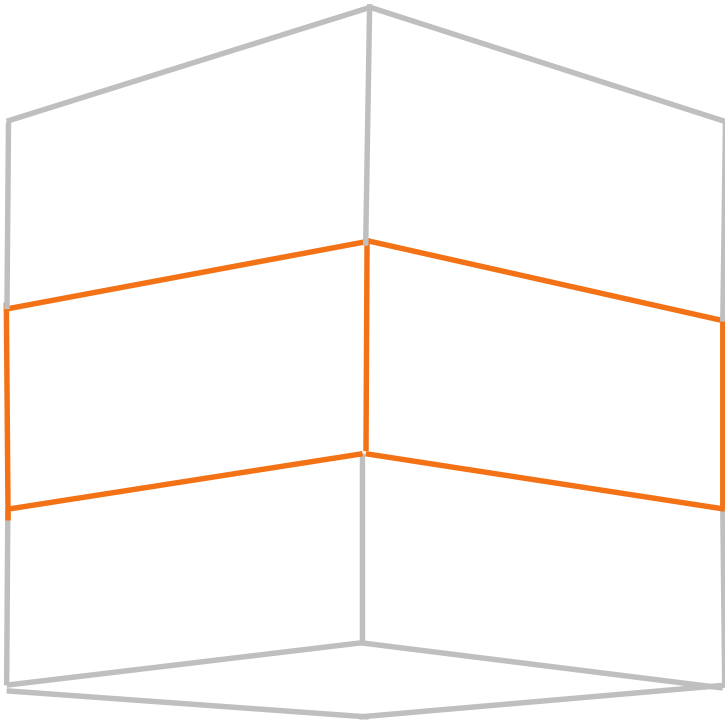
*Expected Liquidity
Requirement**



Required and Excess Liquidity

Stressed Liquidity Requirement

Stressed liquidity requirement refers to **additional** liquid assets required to meet projected net cash outflows under **the stress scenario**



Stressed Liquidity Requirement



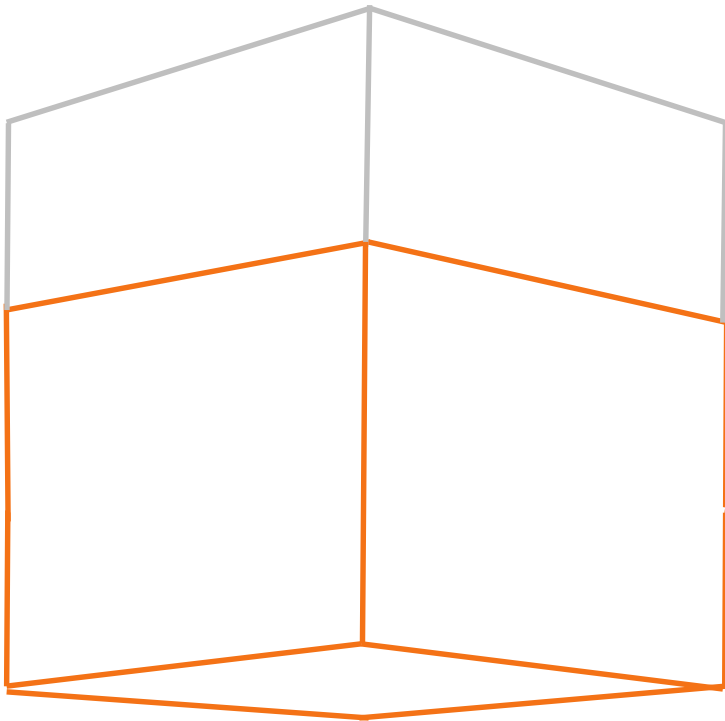
Expected Liquidity Requirement



Required and Excess Liquidity

Stressed Liquidity Requirement

Liquidity requirement refers to liquid assets required to meet projected expected net cash outflows and additional cashflows from scenario



Stressed Liquidity Requirement



Expected Liquidity Requirement



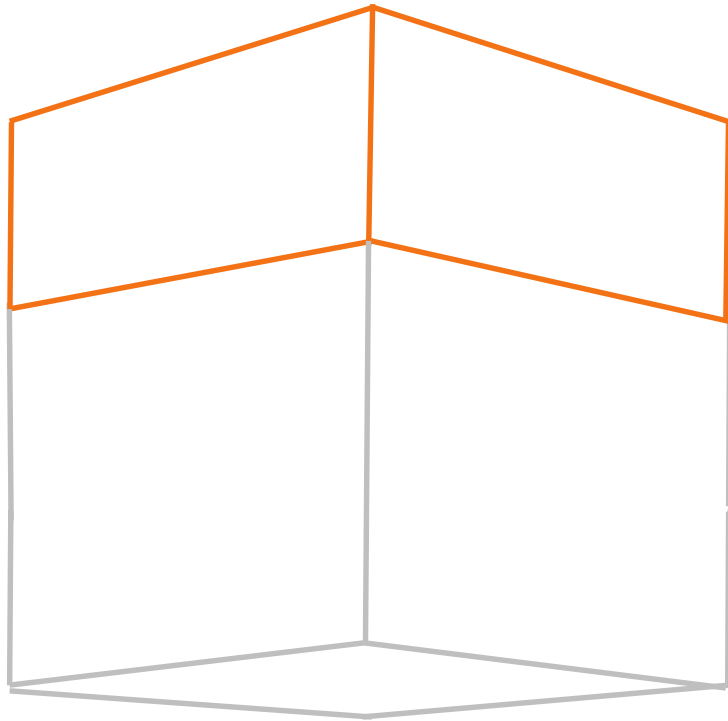
Liquidity Requirement



Required and Excess Liquidity

Stressed Liquidity Requirement

Excess liquidity refers to available liquid assets not required to meet liquidity needs



**Excess
Liquidity**



**Liquidity
Requirement**



Tiering of Liquidity

- **Exercise performed for each scenario**
- **Consolidated view** still needed to determine
 - *Need for (and size of) any **Liquidity Injections***
 - *Size and impact of **Dormant Liquid Assets***
 - ***Optimal Liquid Assets** for Liquidity Buffer*



Tiering of Liquidity

Liquidity Risk Appetite = key enabler for the tiering exercise

- **Exercise performed for each scenario**
- **Consolidated view** still needed to determine
 - *Need for (and size of) any **Liquidity Injections***
 - *Size and impact of **Dormant Liquid Assets***
 - ***Optimal Liquid Assets** for Liquidity Buffer*



Liquidity Risk Appetite

Risk Appetite Statement

Risk Appetite Statement	
Qualitative RAS	<i>"ABC Insurer should have adequate liquidity to meet its liquidity requirements under all stress scenarios"</i>
<i>Metrics used</i>	LCR Generalised LCR ("GLCR")
Quantitative RAS	????
<i>Frequency</i>	<i>Quarterly</i>



Liquidity Risk Appetite

LCR Recap

$$LCR_n = \frac{ALA}{FR_{12m} | Stress_n}$$



Liquidity Risk Appetite

Generalised LCR

GLCR refers to “the minimum LCR under all scenarios”

$$GLCR = \text{Min}((LCR_1, LCR_2 \dots LCR_n), LCR_e, LCR_r)$$

Where

- LCR_n : *LCR under Stress_n*
- LCR_e : *LCR under base projections*
- LCR_r : *LCR as required by the Regulator*



Liquidity Risk Appetite

Risk Appetite Statement

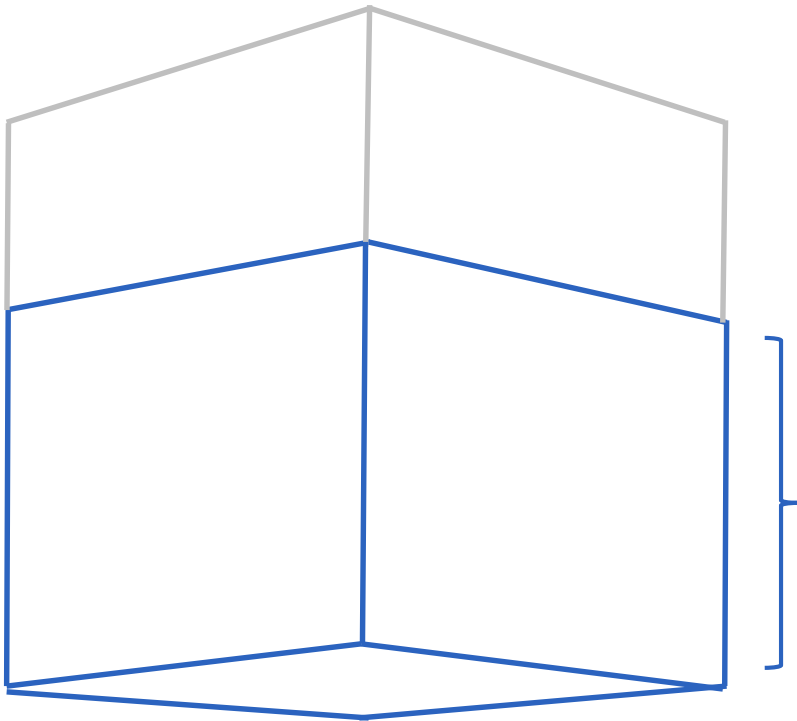
Risk Appetite Statement	
Qualitative RAS	<i>"Company should have adequate liquidity to meet its liquidity requirements under all stress scenarios"</i>
Metrics used	LCR Generalised LCR ("GLCR")
Quantitative RAS	<i>"Company should ensure that $GLCR > 1$"</i> OR <i>"Company should ensure that the $LCR > 1$ under all stress scenarios"</i>
Frequency	Quarterly



Liquidity Risk Appetite

LRA informs Overall Liquidity Requirement

Liquidity Risk Appetite informs Company's overall liquidity requirement



Overall Liquidity
Requirement



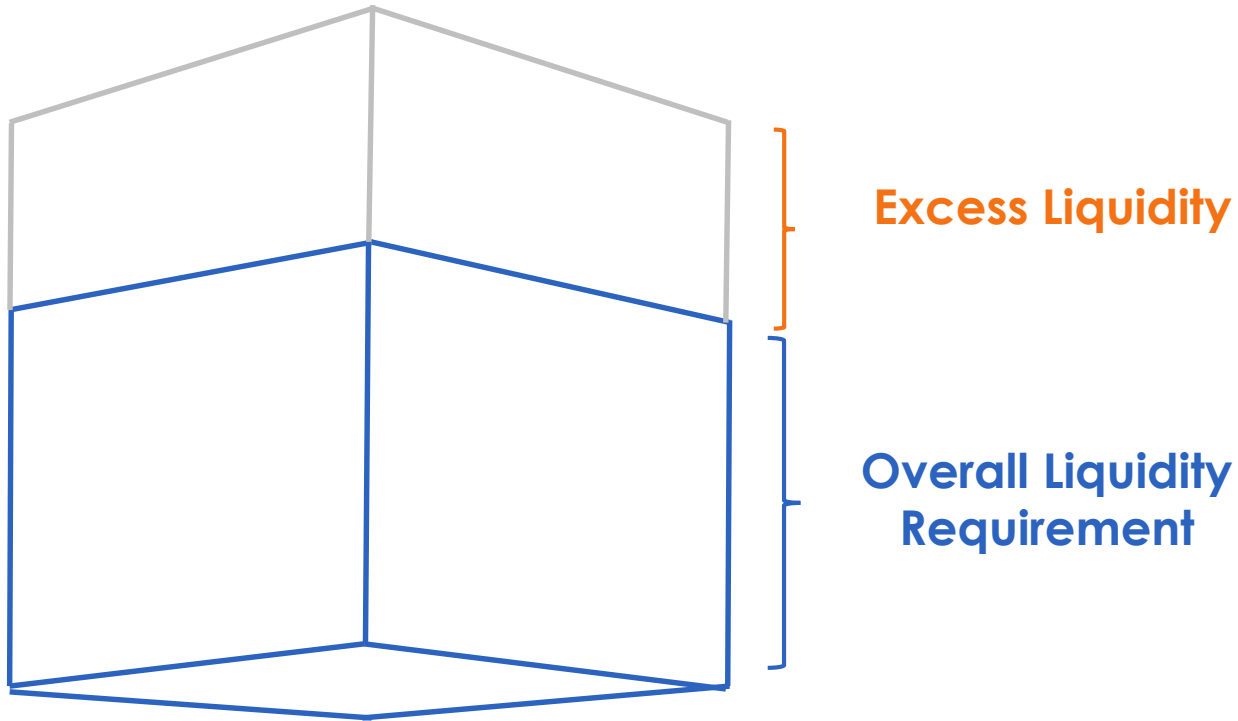
*Liquidity Risk
Appetite*



Liquidity Risk Appetite

LRA informs Overall Liquidity Requirement

Company has **Excess Liquidity** if Liquidity Requirement < Liquidity Buffer

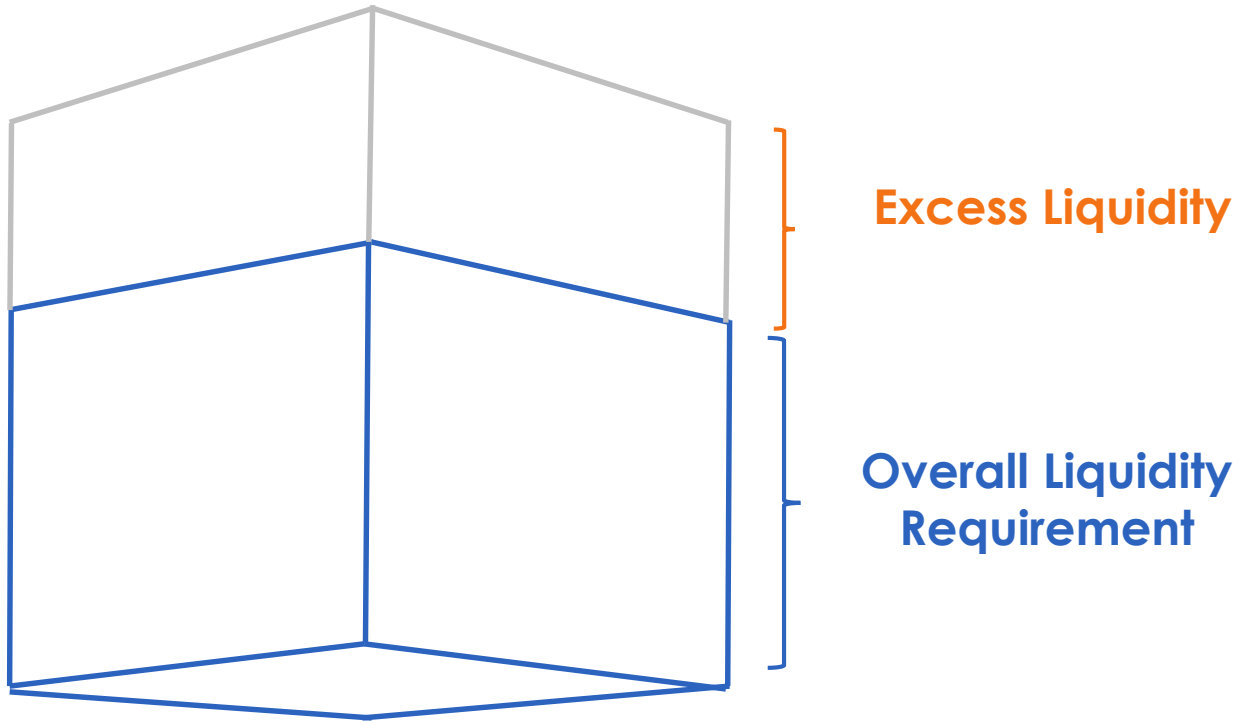




Liquidity Risk Appetite

LRA informs Overall Liquidity Requirement

Company has **Excess Liquidity** if Liquidity Requirement < Liquidity Buffer



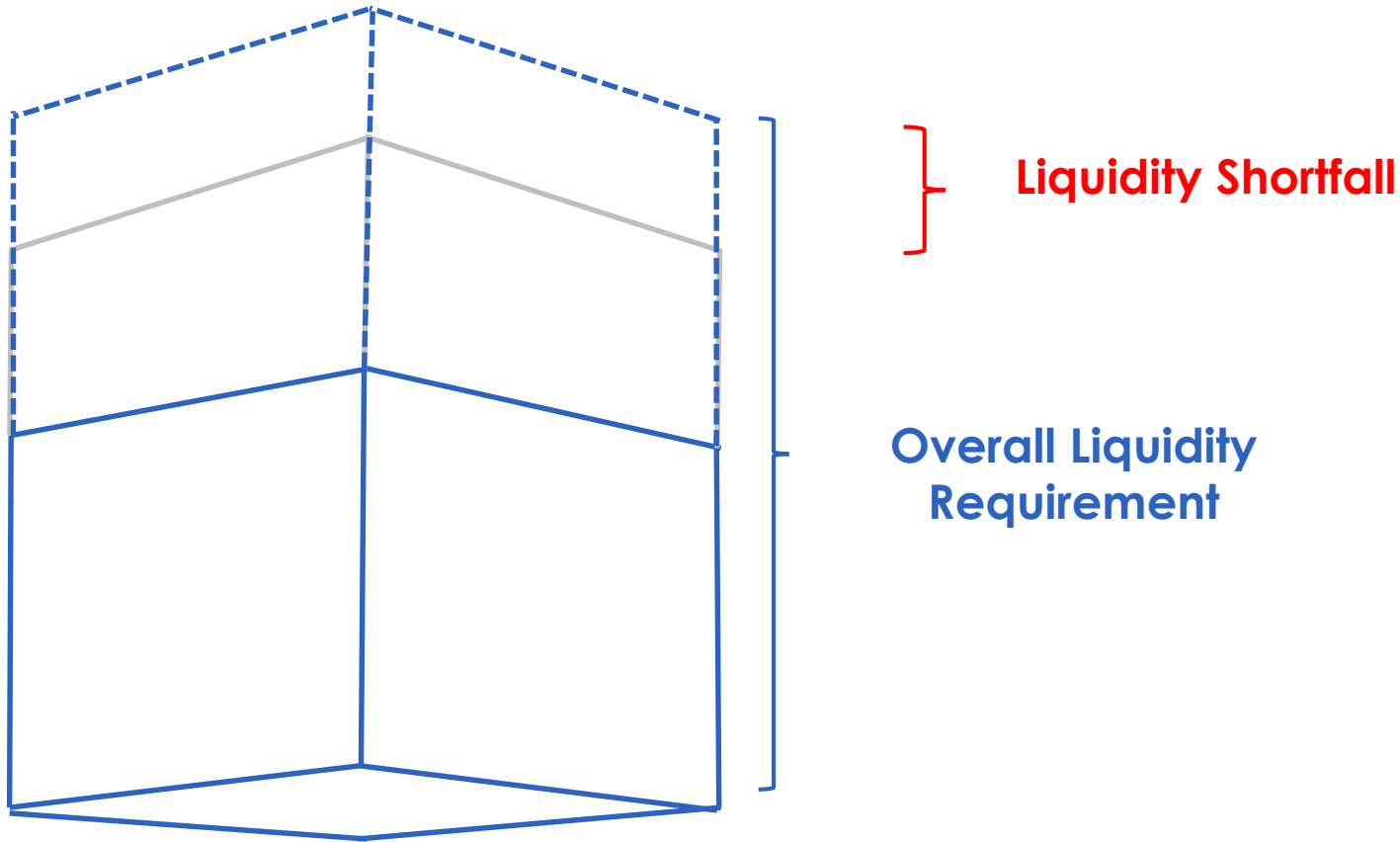
Excess Liquidity needs to
be assessed for
cost of
“Dormant Liquidity”



Liquidity Risk Appetite

LRA informs Overall Liquidity Requirement

Company has a **Liquidity Shortfall** if Liquidity Requirement > Liquidity Buffer

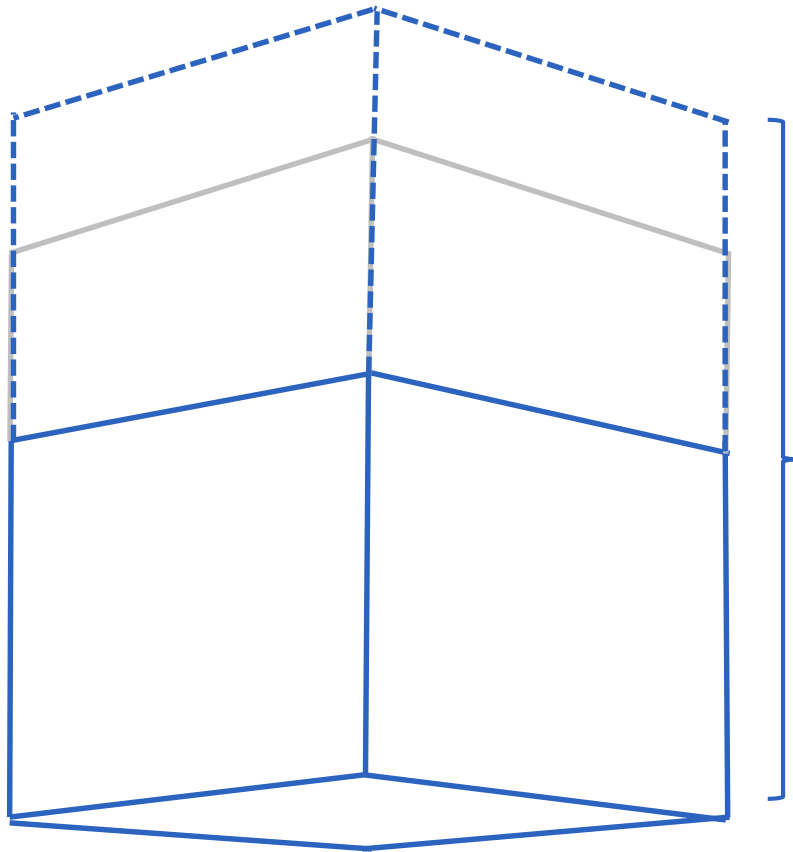




Liquidity Risk Appetite

LRA informs Overall Liquidity Requirement

Company has a **Liquidity Shortfall** if Liquidity Requirement $>$ Liquidity Buffer



Overall Liquidity
Requirement

Liquidity Shortfall

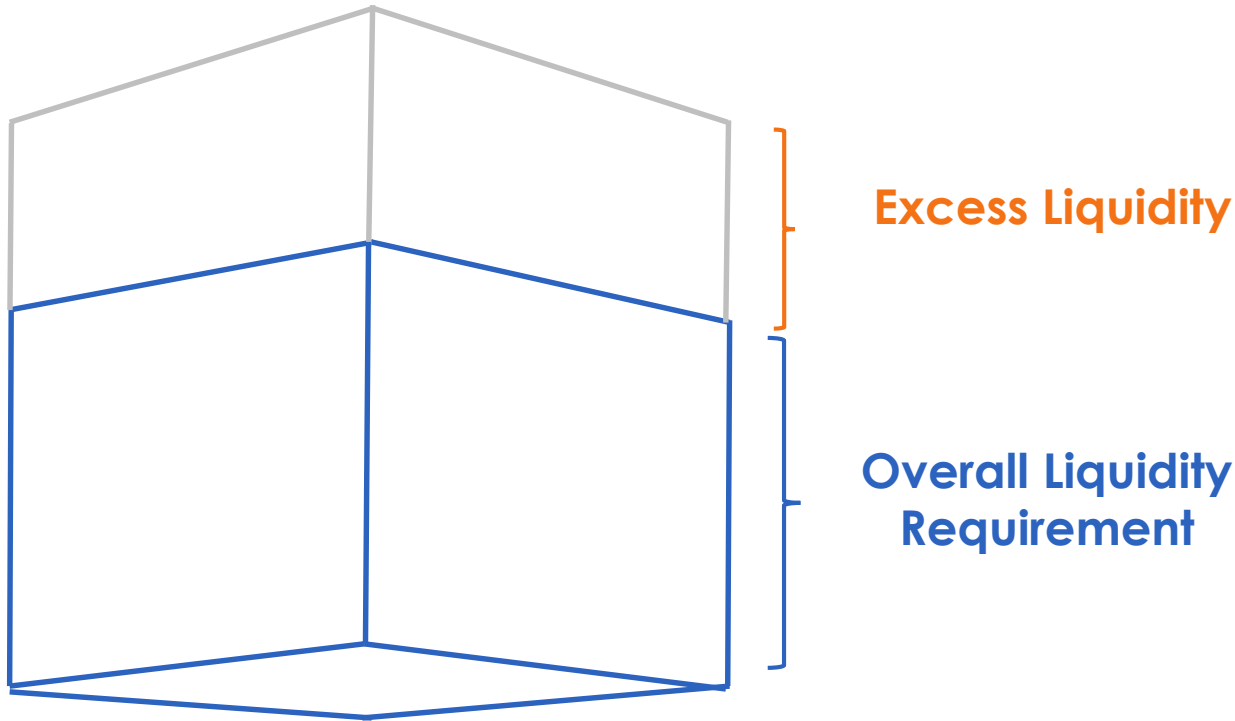
Liquidity Injection =
Amount Required to
ensure **GLCR ≥ 1**
(i.e. minimum LCR ≥ 1)



Liquidity Risk Appetite

LRA informs Overall Liquidity Requirement

Company has **Excess Liquidity** if Liquidity Requirement < Liquidity Buffer



Excess Liquidity needs to
be assessed for
cost of
“Dormant Liquidity”



Dormant Liquidity

Real and Opportunity Cost

**What are the expected earnings
from investing in cash?**



R100m

2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019



Dormant Liquidity

Real and Opportunity Cost

What we should be asking is:

1. What are the expected *Real Earnings*?
2. What is the *Opportunity Cost*?



R100m

2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019



Dormant Liquidity

Real and Opportunity Cost

Example:

- Assume SA Insurer invested 100% of Excess Liquidity in cash over last 10 years (R100m)



R100m

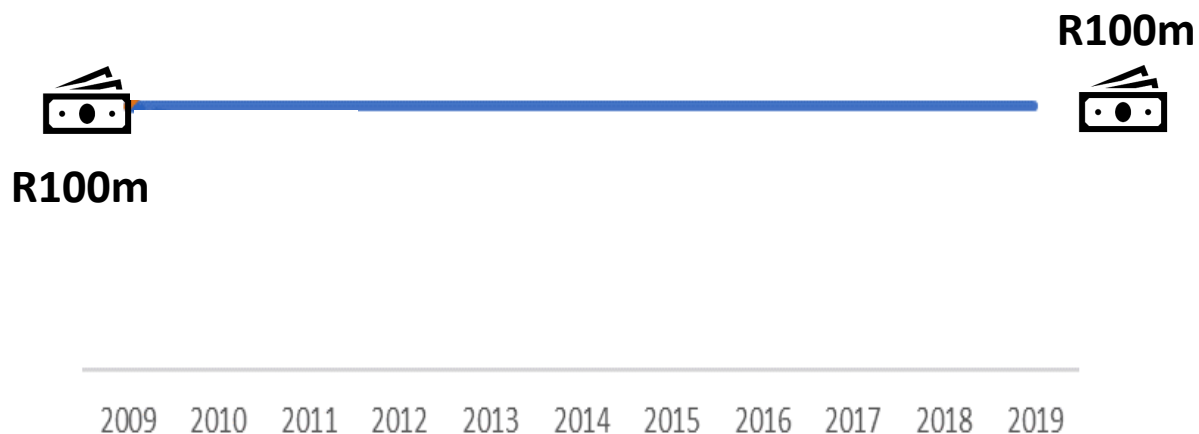


Dormant Liquidity

Real and Opportunity Cost

Example:

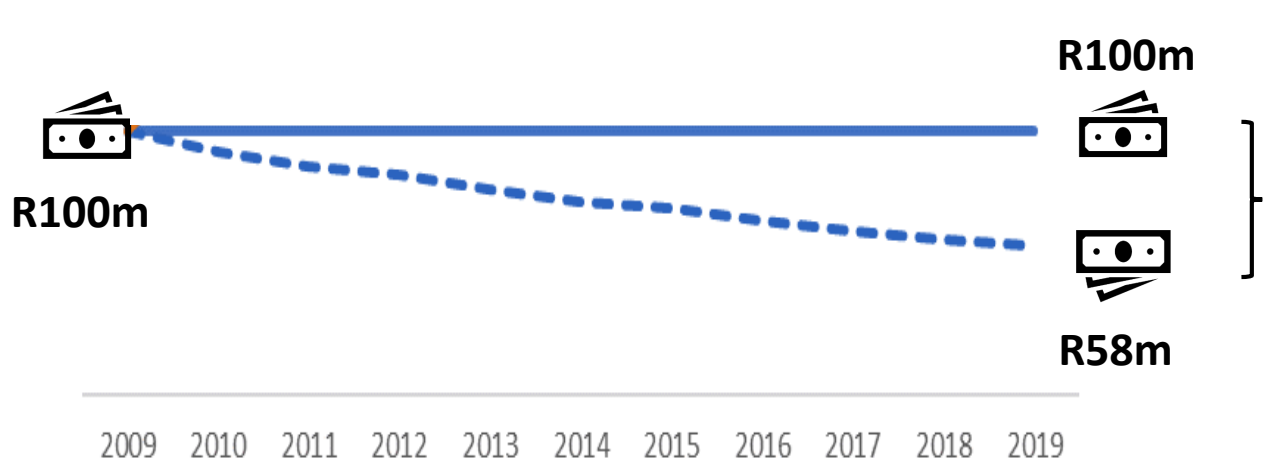
- Assume SA Insurer invested 100% of Excess Liquidity in cash over last 10 years (R100m)
- Value of cash investment unchanged after 10 years





Dormant Liquidity

Real and Opportunity Cost



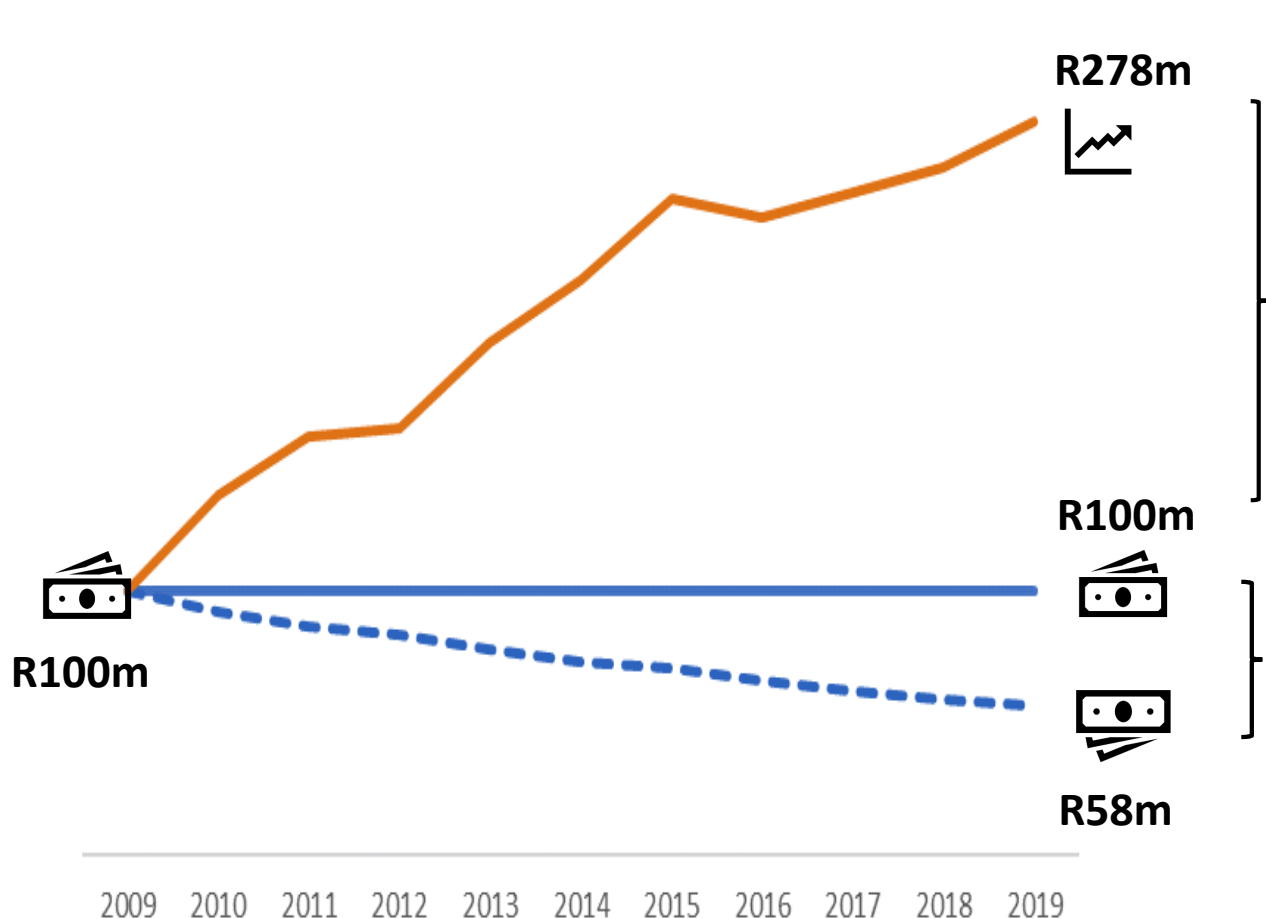
Real Cost

- Year on year inflation $\approx 5,5\%$
- Total inflation $\approx 72\%$
- Real Value = R58million
- ***Real Value destroyed = R42m***



Dormant Liquidity

Real and Opportunity Cost



Opportunity Cost

- Cost of not investing in JSE ALSI
- Year on year return $\approx 10,8\%$
- Would have earned $\approx 278\%$
- **Opportunity Cost paid = R178m**

Real Cost

- Year on year inflation $\approx 5,5\%$
- Total inflation $\approx 72\%$
- Real Value = R58million
- **Real Value destroyed = R42m**



Dormant Liquidity

Conclusion

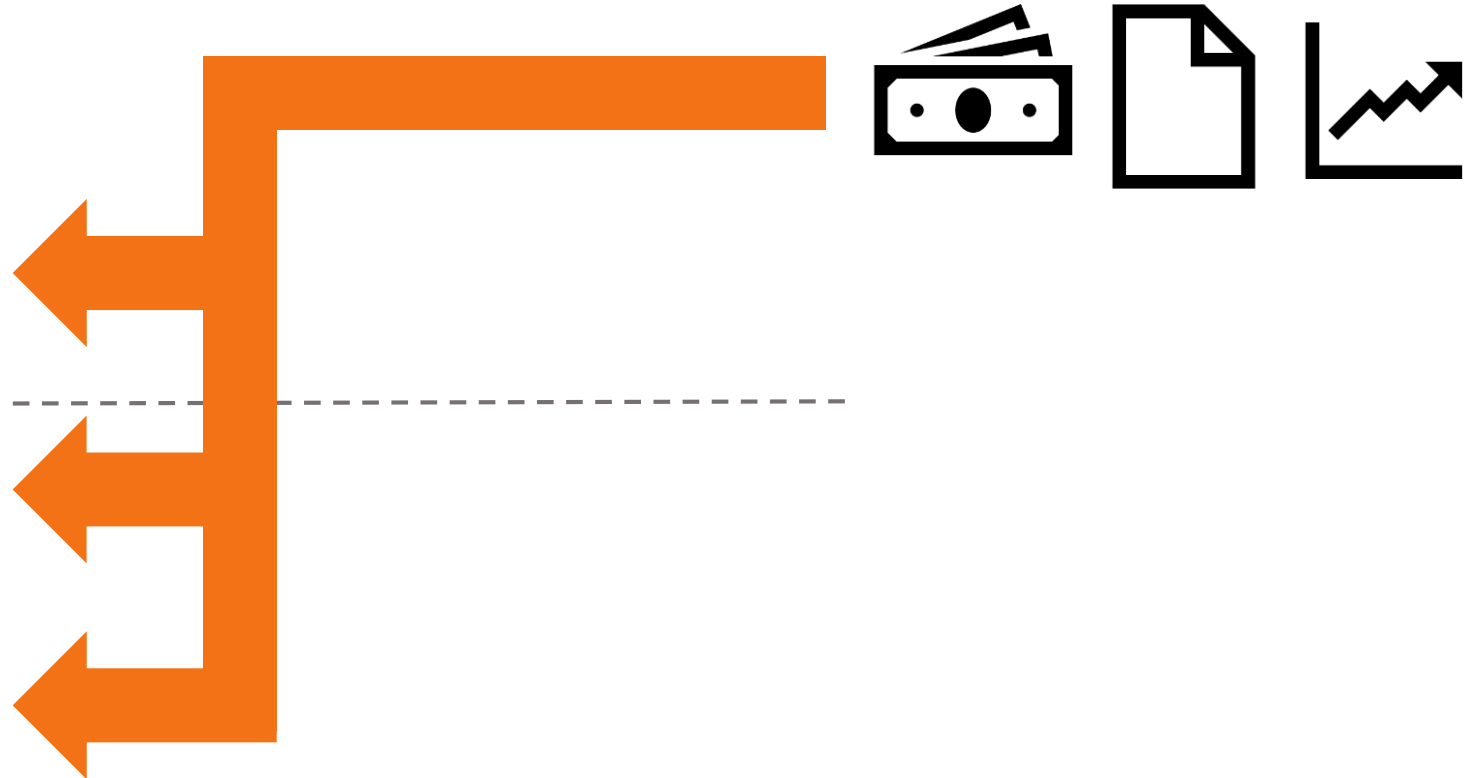
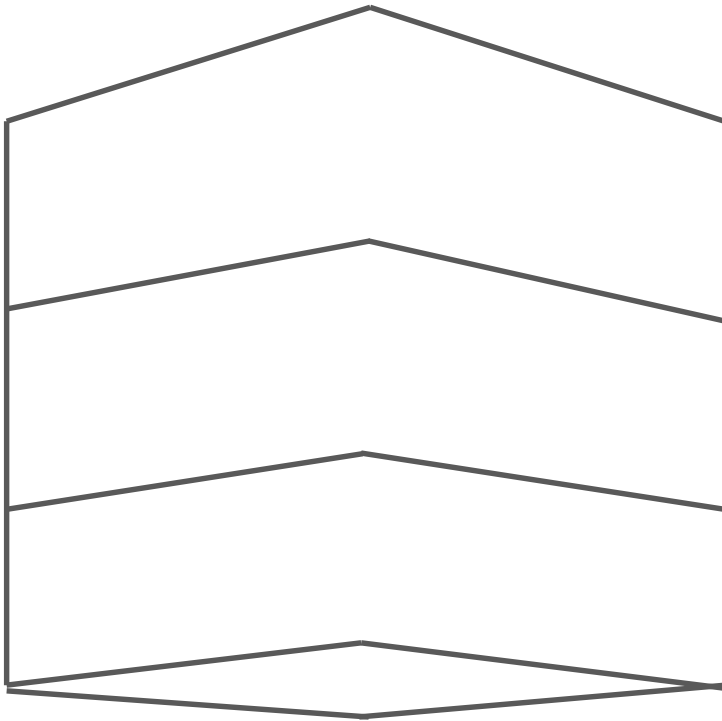




Ideal Liquid Asset Types

Allocation tiers

Tiering informs the ideal **liquid asset allocation** to the Liquidity Buffer

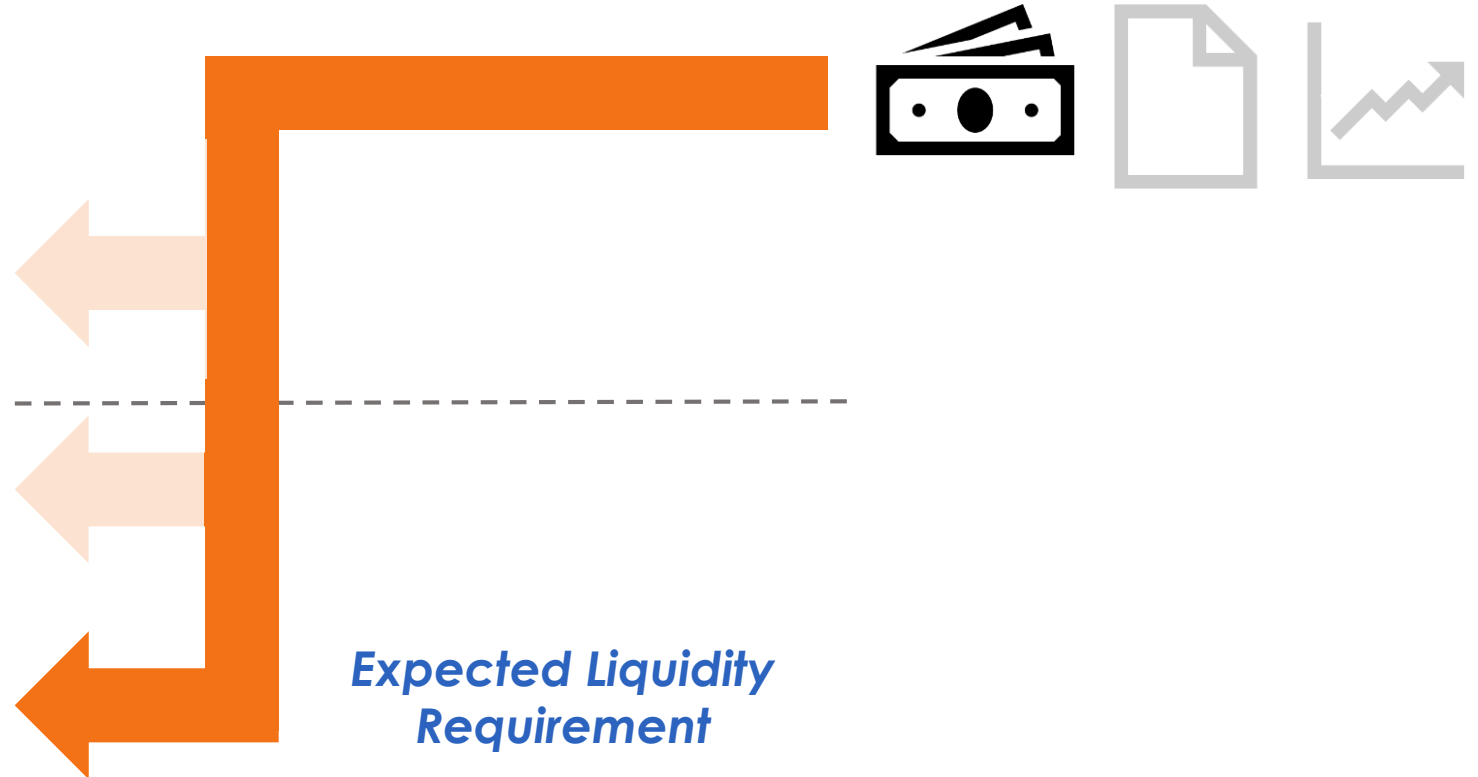
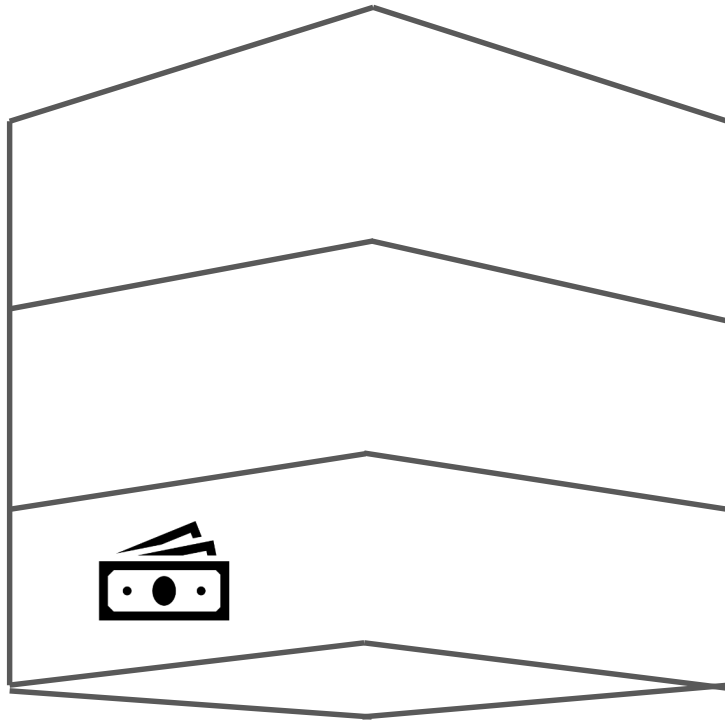




Ideal Liquid Asset Types

Expected Liquidity Requirement

Mainly **cash** held in ELR to meet **expected cash outflows**

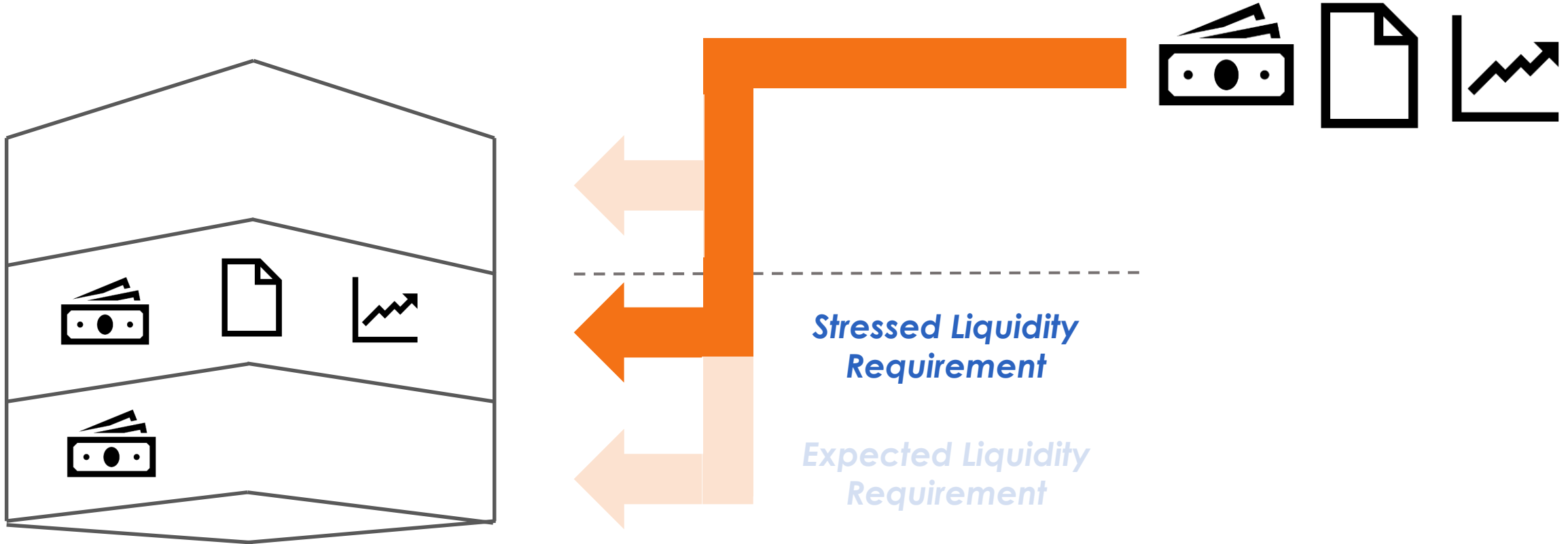




Ideal Liquid Asset Types

Stressed Liquidity Requirement

Combination of **cash and near liquid assets** held in SLR

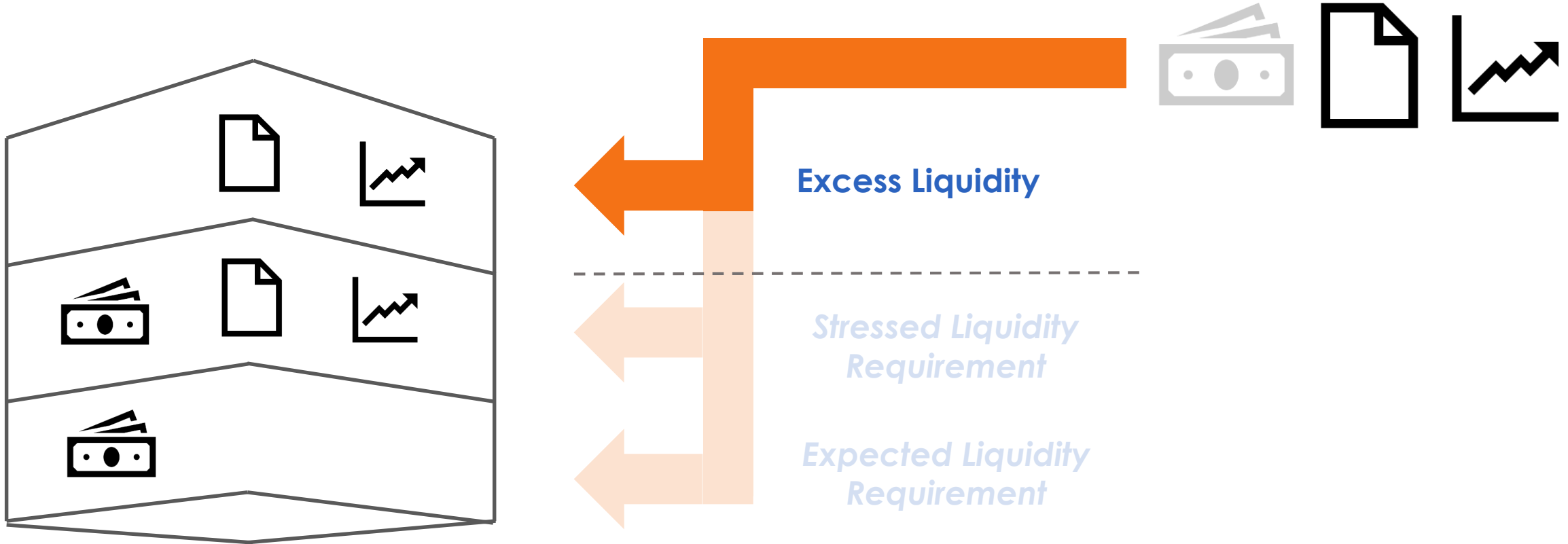




Ideal Liquid Asset Types

Excess Liquidity

Excluding cash from EL minimises (cost of liquidity)

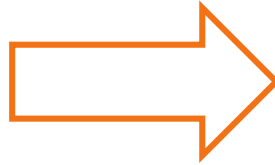
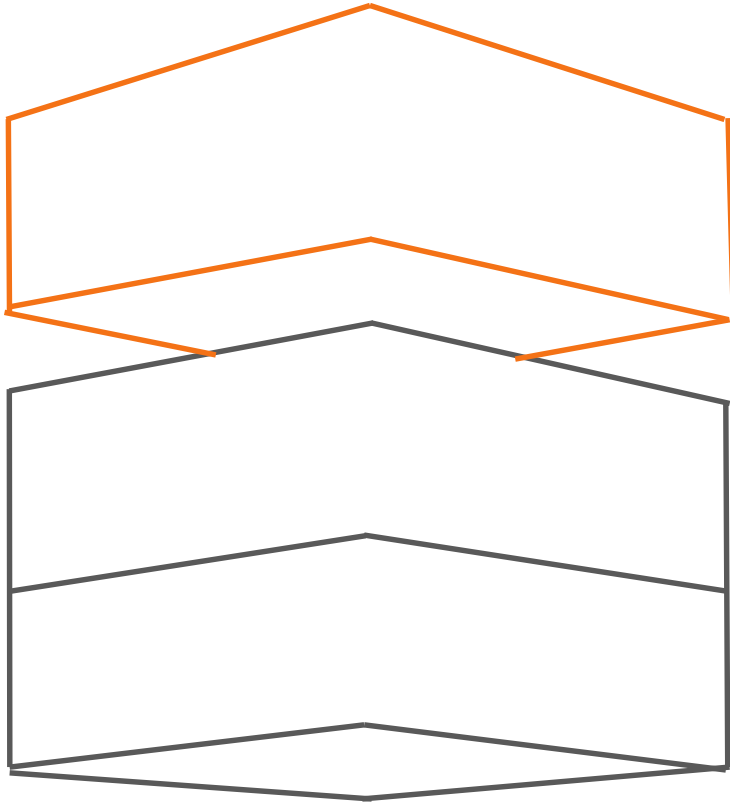




Ideal Liquid Asset Types

Excess Liquidity

Alternatively, excess liquidity can be **returned to shareholders**





Summarising





Summarising



- Liquidity should be managed:
 - *From risk and opportunity perspective*
 - *Operationally and Consequentially*
 - *Under Stressed Conditions*
 - *On a projected basis*
- Tiering requires Liquidity Risk Appetite...
- ... and informs ideal composition of Liquidity Buffer



Summarising



- Liquidity should be managed:

- From

- Op

- Und

- On

Should we be concerned about Liquidity Risk?

Flying blindly in terms of our **exposure to Liquidity Risk** can either:

- Threaten our **going concern**

- Result in an excessive “**cost of liquidity**” and loss of opportunity

- Tiering requires Liquidity Risk Appetite...

- ... and informs ideal composition of Liquidity Buffer



Questions



?