The New Investment Regime

(1) Peer Benchmarking against scenarios

(2) Peer Benchmarking against Minimum capital Requirements

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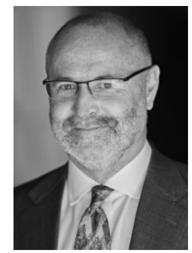
About us

- Monte Carlo simulation software for modelling risk scenarios
- Validation and audit for risk models including ML and AI

- Senior Team>

Mustafa Çavuş PhD
Managing Director

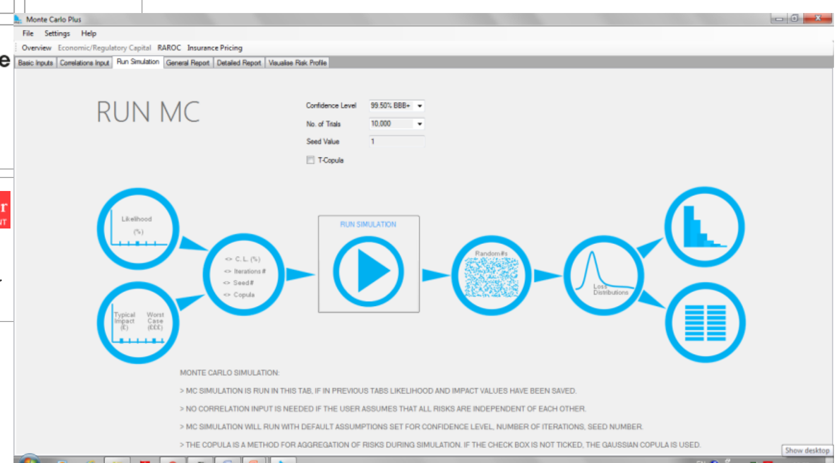


Peter Bonisch
Director

- List of references and clients >

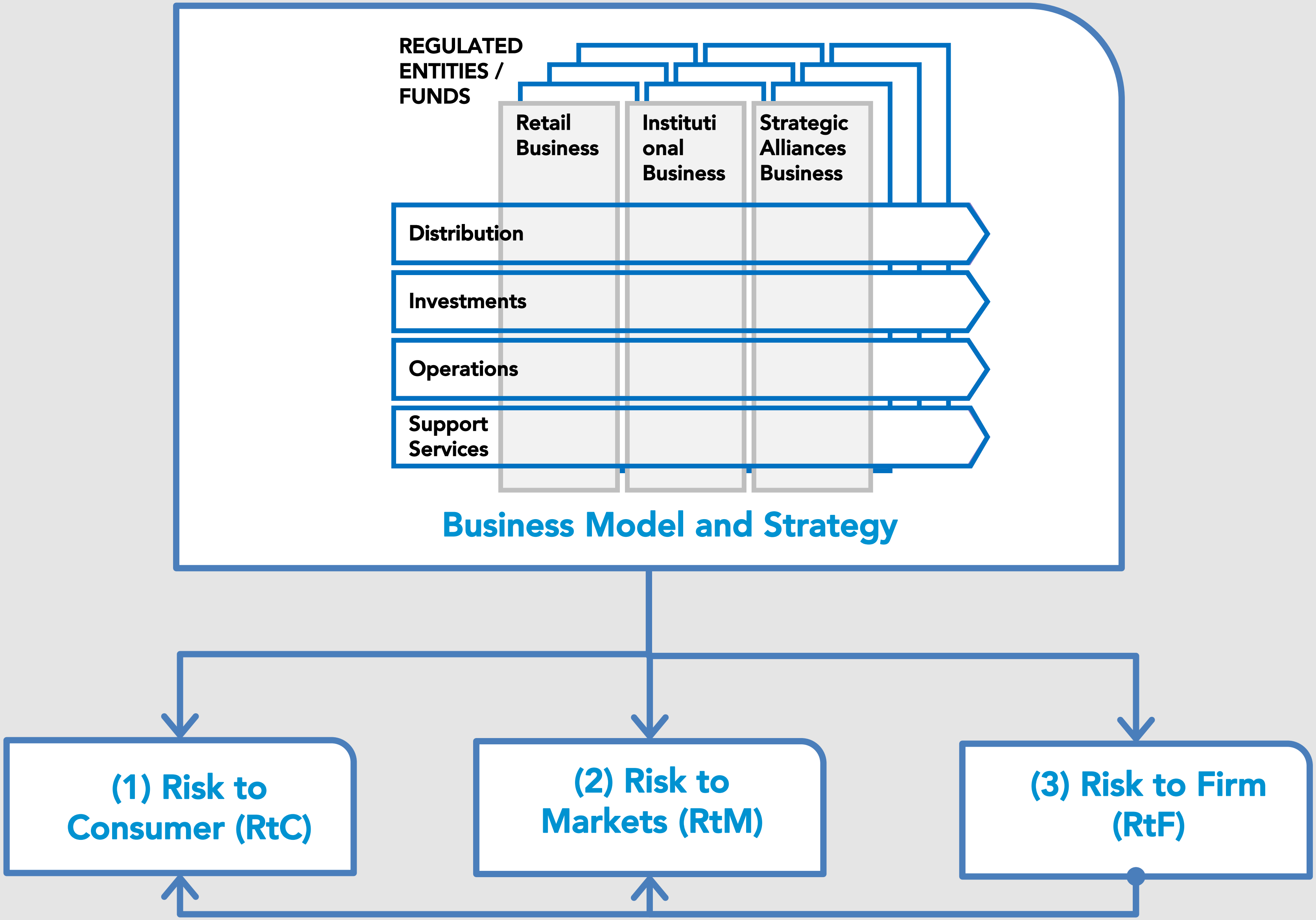
ARTEMIS The Profit Hunter *Asset Management:*	CMC cmc markets *Broker:*	MARTIN CURRIE A Legg Mason Company *Asset Management:*	UBS *International Banking:*	Tradition *Broker:*	COLUMBIA THREADNEEDLE INVESTMENTS *Asset Management:*
[XTX] MARKETS *HF Trader:*	Invesco Perpetual *Asset Management:*	Standard Chartered *Bank:*	JUST. *Insurance:*	Aldermore *Bank:*	
GAM *Asset Management:*	CAPITAL GROUP *Asset Management:*	Close Brothers Modern Merchant Banking *Bank:*	HERMES INVESTMENT MANAGEMENT *Asset Management:*	Santander ASSET MANAGEMENT *Asset Management:*	

Easy to use software >



New Regime for Investment Firms: Reg'y Background

- FCA: Key priorities outlined in the FCA Business Plan 2019/2020, April 2019
- FCA: Our framework: assessing adequate financial resources, Finalised Guidance, FG 20/1, June 2020
- FCA: A new UK prudential regime for MiFID investment firms, Discussion Paper, DP 20/2, June 2020
  - "Our supervision work aims to minimise harm to consumers or to the integrity of the UK financial system. Disorderly failure can cause harm… Understanding a firm's financial risks, its *proximity to failure* and how harm is minimised in failure is an important component of our supervisory work …we accept that some firms will fail, but this should be as orderly as possible".
- EBA: Issued a roadmap for the implementation and Consultation Paper which contain draft Regulatory Technical Standards (RTS) on prudential requirements, June 2020.
  - 2. CP will be on reporting requirements and disclosures on the levels of capital, concentration risk, liquidity, the level of activities as well as disclosure of own funds.
  - 3. and 4. CP will be on remuneration requirements.


REGULATED ENTITIES / FUNDS
Retail Business
Instituti onal Business
Strategic Alliances Business
Distribution
Investments
Operations
Support Services
Business Model and Strategy
(1) Risk to Consumer (RtC)
(2) Risk to Markets (RtM)
(3) Risk to Firm (RtF)

The FCA expectation on assessment of harm:

- [ ] What-if scenarios for the activities undertaken & the harms that can be caused
- [ ] Likelihood of events, that all events might occur at the same time
- [ ] Potential impact on financial resources
- [ ] Supported by statistical models

FCA Checklist:

- [ ] have a risk management framework which includes a clear risk appetite?
- [ ] adequately identify and quantify the material risks?
- [ ] have adequate systems and controls in place?
- [ ] use adequate stress testing?
- [ ] meet the 'use test' i.e. day-to-day decision making?
- [ ] have adequate financial resources based on the risk profile?

The 'Process Chain' from Business Model to Capital Required

Risk Appetite

Business Model

Forward looking scenarios reflecting potential harm to C/M/F

Likelihood and Impact from material risks

Systems, controls & actions
- .Remediate Ctrl
- .Add new Ctrl
- .Enhance Ctrl
- .Remove Ctrl

'Use-test' - day to day risk-based decisions:

Cost of Control

Risk Before

Risk After

Amount of Risk

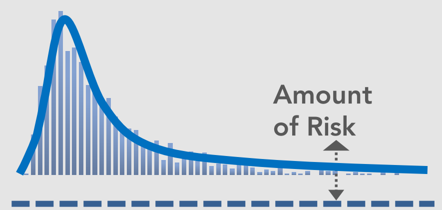
Required Capital & Liquidity

Template 1: Risk-based Decision Making – e.g. RaRoC

A new proposed product/project has a number of potential harms to C, M and F

Risk	RtC	RtM	RtF
BCP incidence	x	x	x
Business systems error	x	x	x
Client reporting	x		x
Contractual breach			x
Cyber security	x	x	x

Estimate amount of risk using internal knowledge & experience and well generally accepted statistical models

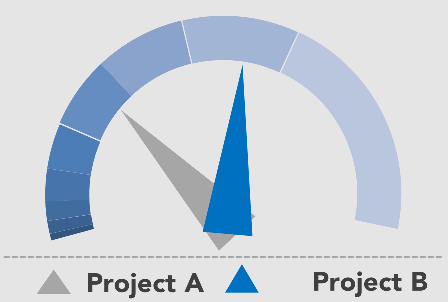


Risk profile of the new product/project

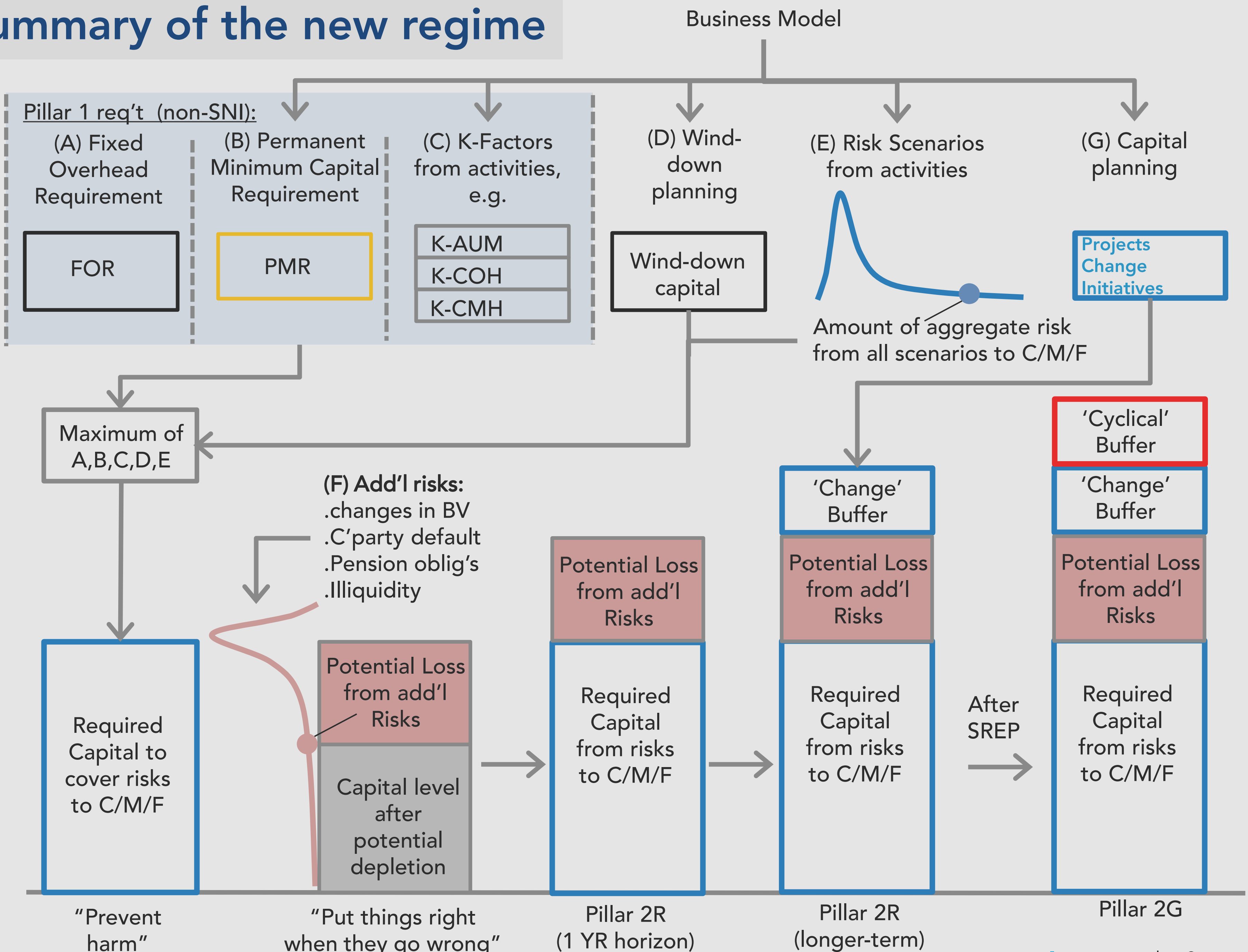
Risk adjusted Return on Risk Capital (RaRoC) = Income / amount of risk

$$\text{RaRoC} = \frac{\text{Expected Income}}{\text{Risk to C, M and F}}$$

RaRoC then becomes objective measure of return between different projects



Summary of the new regime



Insight 1: Potential for overestimating Pillar 2R if methods are too simple (especially for scenarios)

'Change' Buffer

Potential Loss from add'l Risks

Required Capital from risks to C/M/F

Pillar 2R (longer-term)

C'party default
Changes in BV

Concentration risk ?
Liquidity risk?

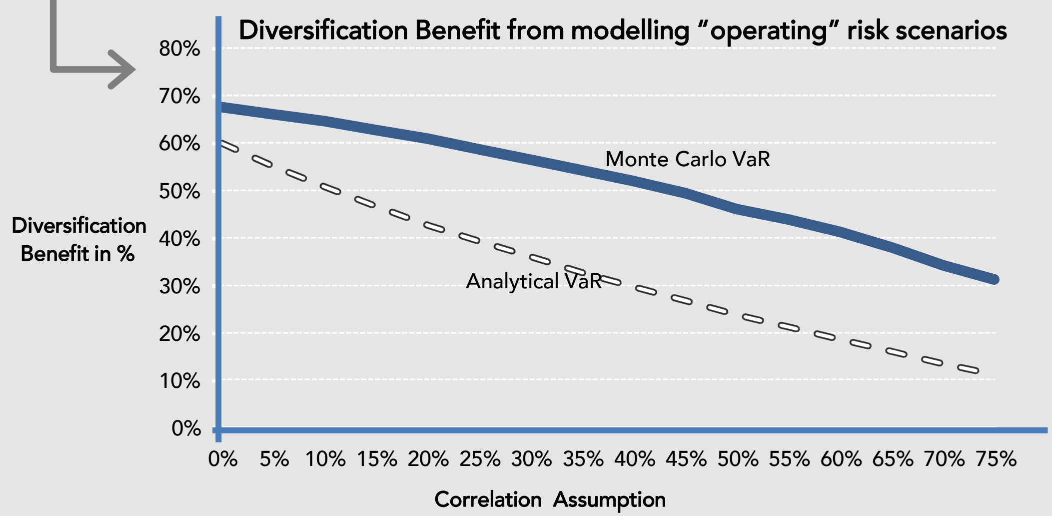
Simple addition of extreme but plausible scenarios implies 100% correlation between events' likelihoods and impacts. However, in reality not all events will happen in the same year and even if they did their impacts will not be at the same tale end. → Overestimation up to 60-70%.

Credit risk (Simple 8% - vs CVaR)

PD:	1%	2%	3%	4%
LGD:	100%	100%	100%	100%
Potential Loss in %:	3.23%	5.82%	8.17%	10.37%

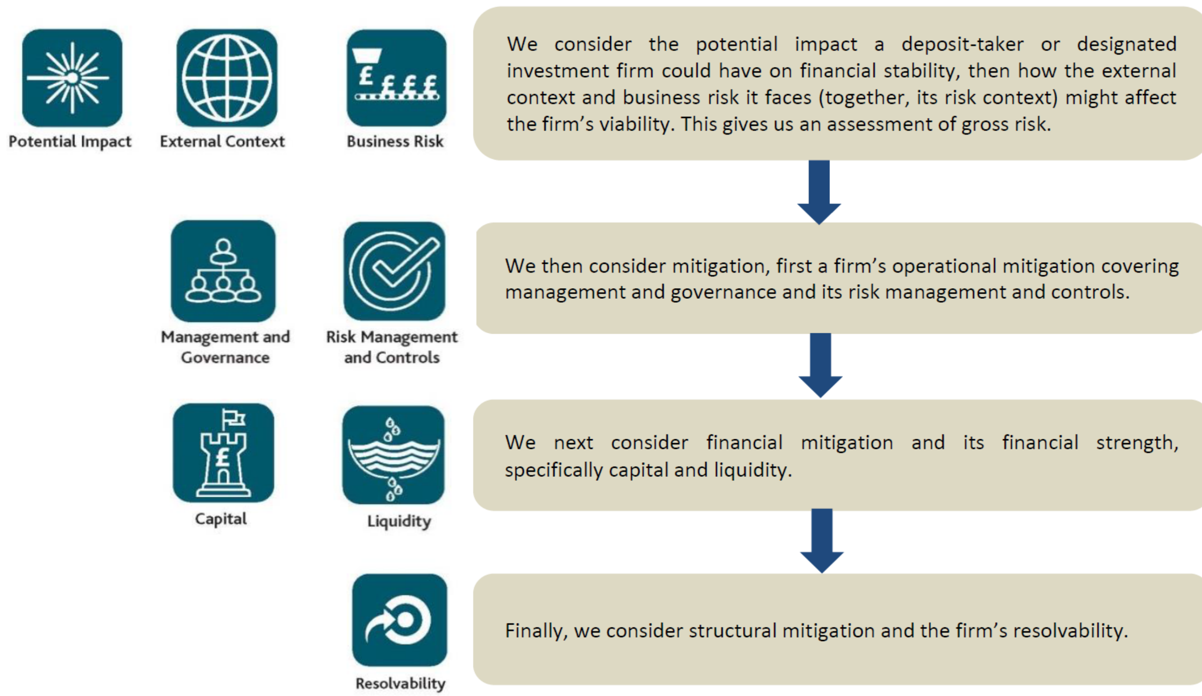
Market risk (Simple 8% vs VaR)

Volatility:	22%	22%	22%	22%
Holding period in days:	20	10	5	1
Potential Loss in %:	16.0%	11.3%	8.0%	3.6%



Excurse to PRA's Approach to Banking Supervision (2018) - PRA computes for each firm a "proximity to failure" measure expressed as PIF (see next page)

Figure 2: Our risk assessment framework



Gross risk			Mitigating factors				
Potential impact	Risk context		Operational mitigation		Financial mitigation		Structural mitigation
Potential impact	External context	Business risk	Management and governance	Risk management and controls	Capital	Liquidity	Resolvability

P. 11: "The intensity of our supervisory activity varies across firms. The level of supervision principally reflects our judgement of a firm's potential impact on the stability of the financial system, its *proximity to failure* (as encapsulated in the Proactive Intervention Framework, described later), its resolvability, and our statutory obligations. Other factors that play a part include the type of business carried out by the firm, and the complexity of the firm's business and organisation.

Our risk assessment framework. We take a structured approach when forming our judgements. To do this we use a risk assessment framework (see Figure 2).

PRA's Proactive Intervention Framework (PIF)

- Supervisors consider a firm's proximity to failure when drawing up its supervisory plan. Our judgement about proximity to failure is captured in a firm's position within the PIF.
- Judgements about a firm's proximity to failure are derived from those elements of the supervisory assessment framework that reflect the risks faced by a firm and its ability to manage them, namely, external context, business risk, management and governance, risk management and controls, capital, and liquidity.
- The PIF is designed to ensure that we put into effect our aim to identify and respond to emerging risks at an early stage. There are five PIF stages, each denoting a different proximity to failure, and every firm sits in a particular stage at each point in time (see Figure 4). When a firm moves to a higher PIF stage (ie as we determine the firm's viability has deteriorated), supervisors will review their supervisory actions accordingly.
- A firm's PIF stage is reviewed at least annually and in response to relevant, material developments. We consider it important for markets and counterparties to make their own judgements on the viability of a firm. We will not therefore routinely disclose to the market our own judgement on a firm's proximity to failure, not least given the possible risk that such disclosures could act to destabilise in times of stress.

Insight 2: Peer benchmarking could serve as a risk-radar to Investment Firms

From "Key priorities outlined in the FCA Business Plan 2019/2020, April 2019":

"*Based on an understanding of today's business models we look at possible scenarios and preemptively identify risks of harm to consumers and to markets*"

"To develop this view, we divide the system into sectors and monitor and regularly analyse the trends. We use these Sector Views to inform our proactive supervision, and feed insights from this supervisory work back into the production of Sector Views … We also divide each sector into a series of portfolios, with each portfolio comprising firms with similar business models."

"Supported by our sector experts and other specialists we use a combination of business model analyses, firm regulatory histories and assessments of their financial soundness to regularly develop portfolio analyses. In some cases, we may ask for additional information from firms to support these. We identify the key risks of harm in each portfolio and individual outlier firms which may present a heightened risk of harm and warrant direct supervisory engagement."

"Peer analysis is an important component of our review as it provides a 'sense check' of our judgements and conclusions. This includes comparison of

- business models, strength of governance and controls and levels of financial resources
- judgements and decisions being made throughout the assessment"

Chapter 3 FG 20/1 : Our expectations of firms to reduce potential to cause harm

FCA' expectations for assessing the likelihood and impact of harm

- consider 'what-if' scenarios for the activities undertaken taking into consideration the *likelihood of events*, that all events *might (not) occur at the same time*

- estimate the potential impact on their financial resources based on their knowledge and experience, may be further supported by statistical models if control framework is sophisticated enough
  - "we expect firms to understand how appropriate the inputs and outputs of the model are (i.e. the scenarios and assumptions)".

Insight 3: We need to map scenarios to RtC, RtM, RtF

	Risk Name (from FG 20/1)	RtC	RtM	RtF
1	Mandate breach by portfolio managers	x		x
2	System outages by platform and custody firms	x	x	x
3	Unsuitable advice by financial advisors	x	x	
4	Unsuitable investments by SIPP operators	x		
5	Poor outcomes for investors by advising firms due to insufficient due	x	x	
6	System outages by exchanges		x	x
7	Failure to check costumer's affordability	x		
8	Disruption to continuity of service by payment services firms	x	x	x
9	Market disruption due to rogue algorithms by principal trading firms	x	x	x
10	Market abuse		x	
11	Unreliable performance	x	x	x
12	Disruption to continuity of service	x	x	x

>Is there a 'list' of scenarios?
>For each scenario we need an *impact* and *likelihood*
>Any other assumptions?

Scenarios from our 2019 Benchmarking Study

	Risks Name (from benchmarking study 2019)	RtC	RtM	RtF
1	BCP incidence	x	x	x
2	Business systems error	x	x	x
3	Client reporting	x		x
4	Contractual breach			x
5	Cyber security	x	x	x
6	Damage to physical assets		x	x
7	Data breach	x	x	x
8	Employee dispute			x
9	External fraud		x	x
10	FX error			x
11	Improper business or market practices	x	x	x
12	Internal fraud		x	x
13	Key people risk			x
14	Key vendor or supplier failure	x	x	x
15	Mandate breach	x		x
16	Manual processing error			x
17	Pricing error	x		x
18	Product flaw	x		x
19	Regulatory breach			x
20	System outage			x
21	Trading error		x	x
22	Unauthorised trading			x
23	Vendor dispute		x	x

Template 2: Potential Impact from a scenario

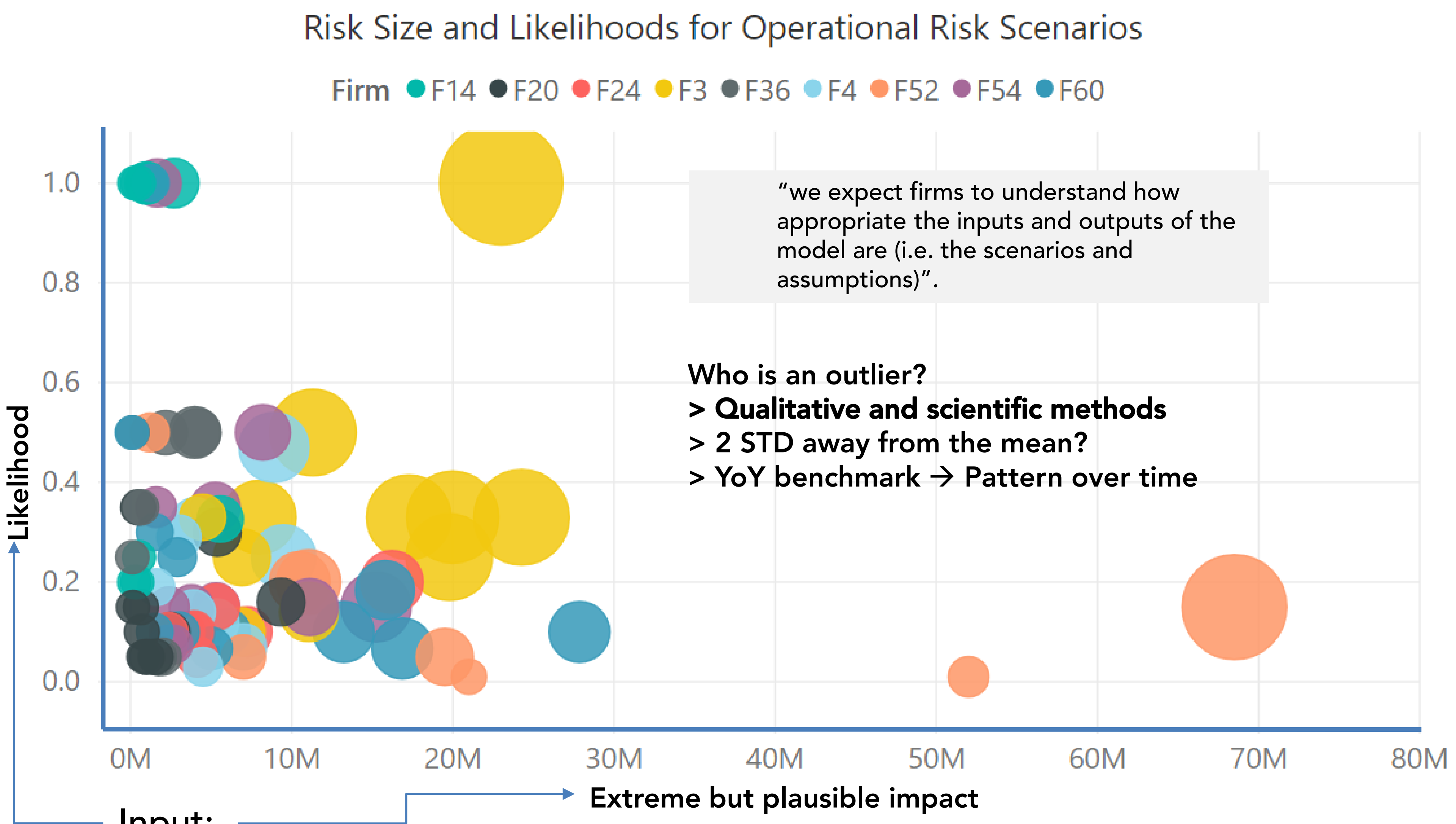
Impact		Extreme but plausible case (£)	Typical case (£)
Remedial costs	Direct cost of 'making good' the effects of the scenario		
Client compensation	Cost of compensating the client(s) and putting them in the position they should have been in		
Legal liability	Judgements, settlements and other legal costs		
Regulatory fines	Transaction reporting requirements and basis for fines set out on FCA website: https://www.fca.org.uk/markets/transaction-reporting		
Impact on revenue	Lost revenue should typically be included if the reduction means that revenues would not cover costs for the duration of the scenario. The inclusion of lost revenues where revenue would still cover costs is discretionary and needs to be assessed on a case by case basis		
Impact on brand value	If possible, estimate the likely impact in monetary terms of any damage to the brand. Be careful not to double-count on lost revenues		

From FCA FG 20/1:
- Compensation & redress schemes for misconduct (part voluntary redress scheme)
- Enforcement and fines (investigations or enforcement actions by the FCA, which might result in fine)
- Direct and indirect litigation costs – (to compensate consumers or other firms seeking redress through legal action)
- payments to protect its franchise and reputation to stay in business.-

Template 3: Likelihood for a scenario

How often do you think that an event of this type may occur:		
Highly possible	50% chance of happening in the next 12 months or occurs at least once every 2 years	
Possible	20% – 50% chance of happening in the next 12 months or occurs once in every 2 to 5 years	
Unlikely	10% - 20% chance of happening in the next 12 months or occurs once in every 5 to 10 years	
Remote	less than 10% chance of happening in the next 12 months or occurs less than once in every 10 to 20 years	
Very remote	less than 5% chance of happening in the next 12 months or occurs less than once in every 20 to 100 years	x
Extremely remote	less than 1% chance of happening in the next 12 months or occurs no more than once in every 100 to 200 years or less	
Justification for the frequency assessment		

Our Scenario Benchmarking exercise from 2019

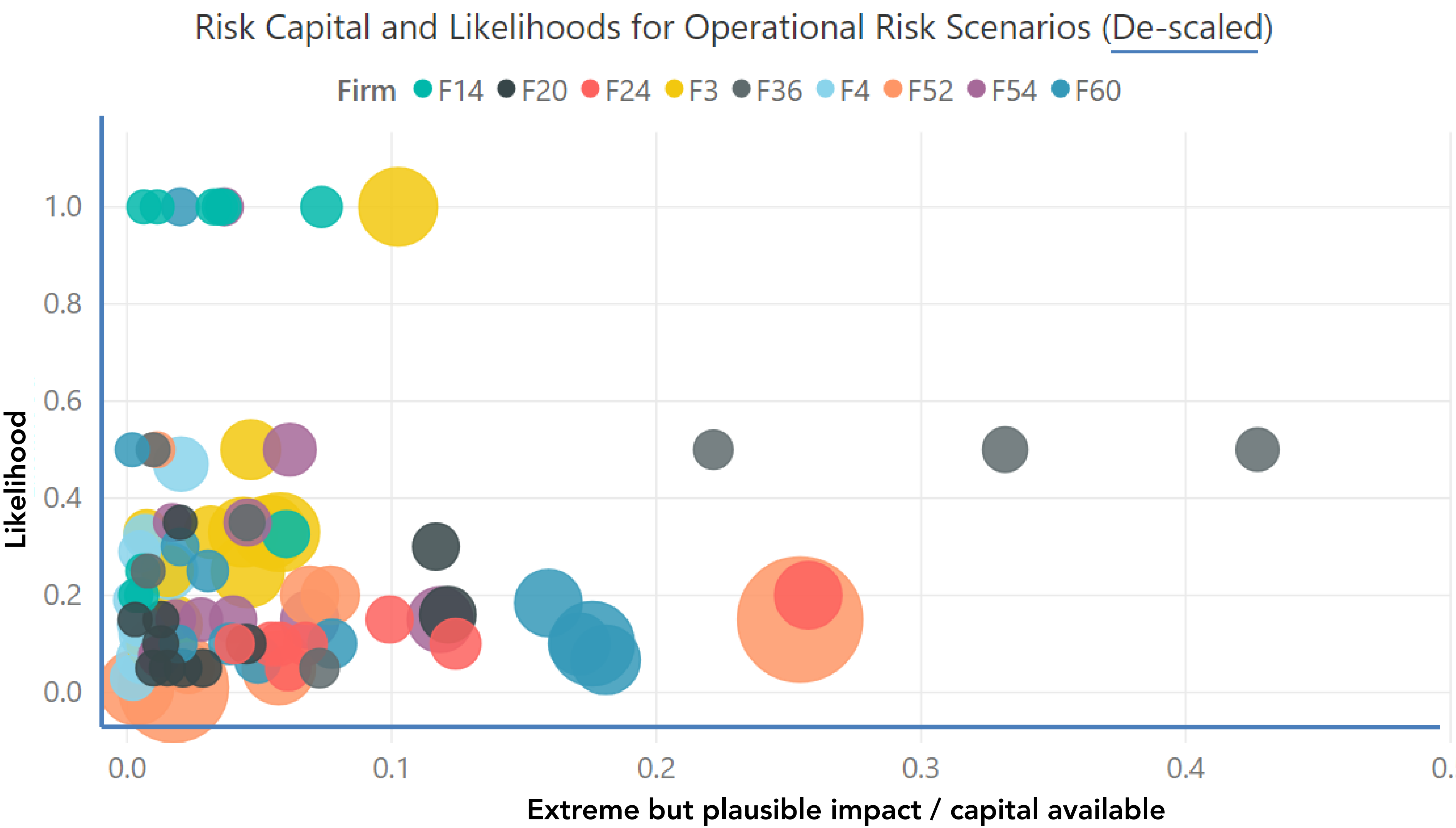


"we expect firms to understand how appropriate the inputs and outputs of the model are (i.e. the scenarios and assumptions)".

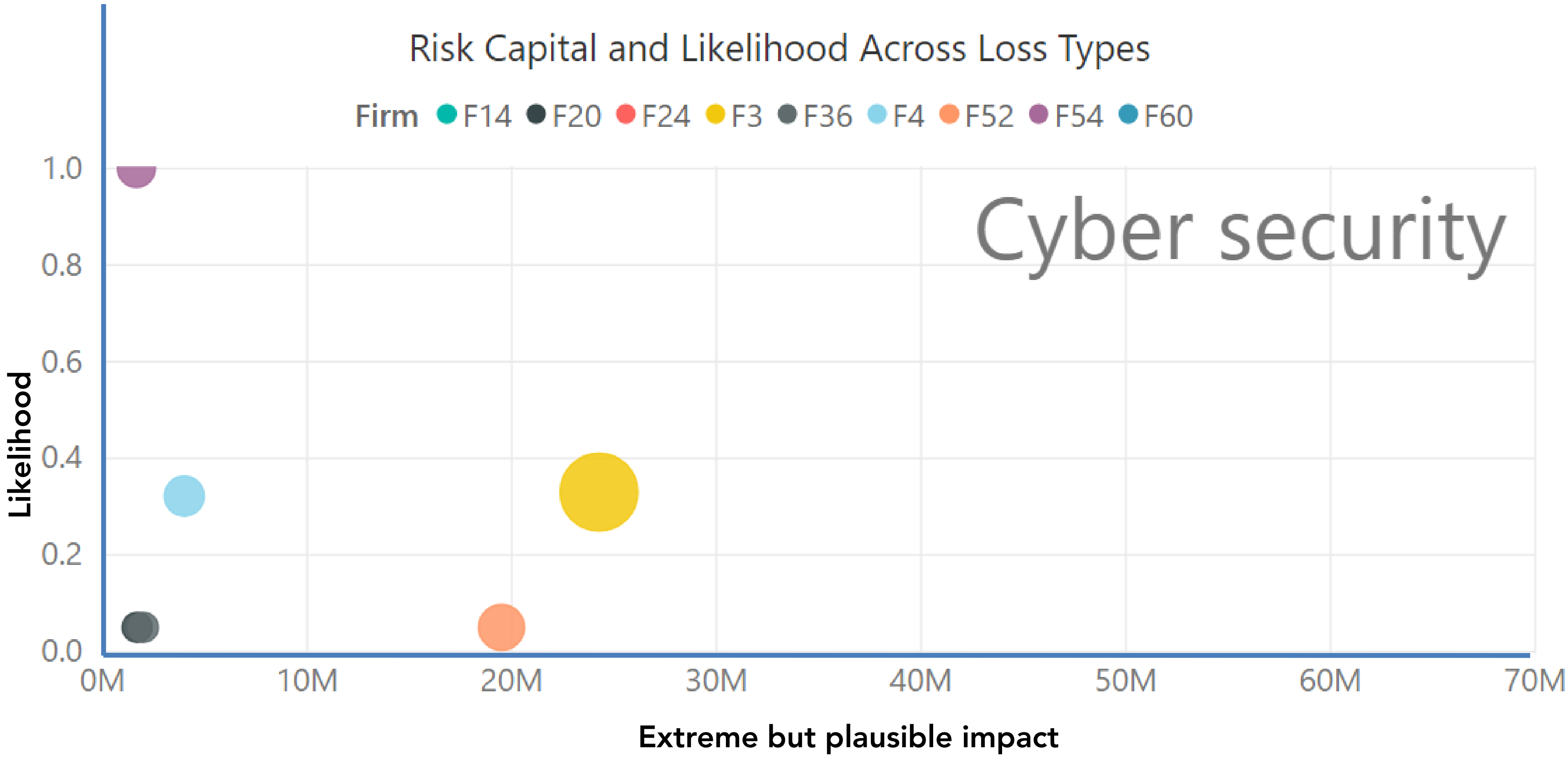
Who is an outlier?
> Qualitative and scientific methods
> 2 STD away from the mean?
> YoY benchmark → Pattern over time

Input:
Output: Amount of risk (bubble size)

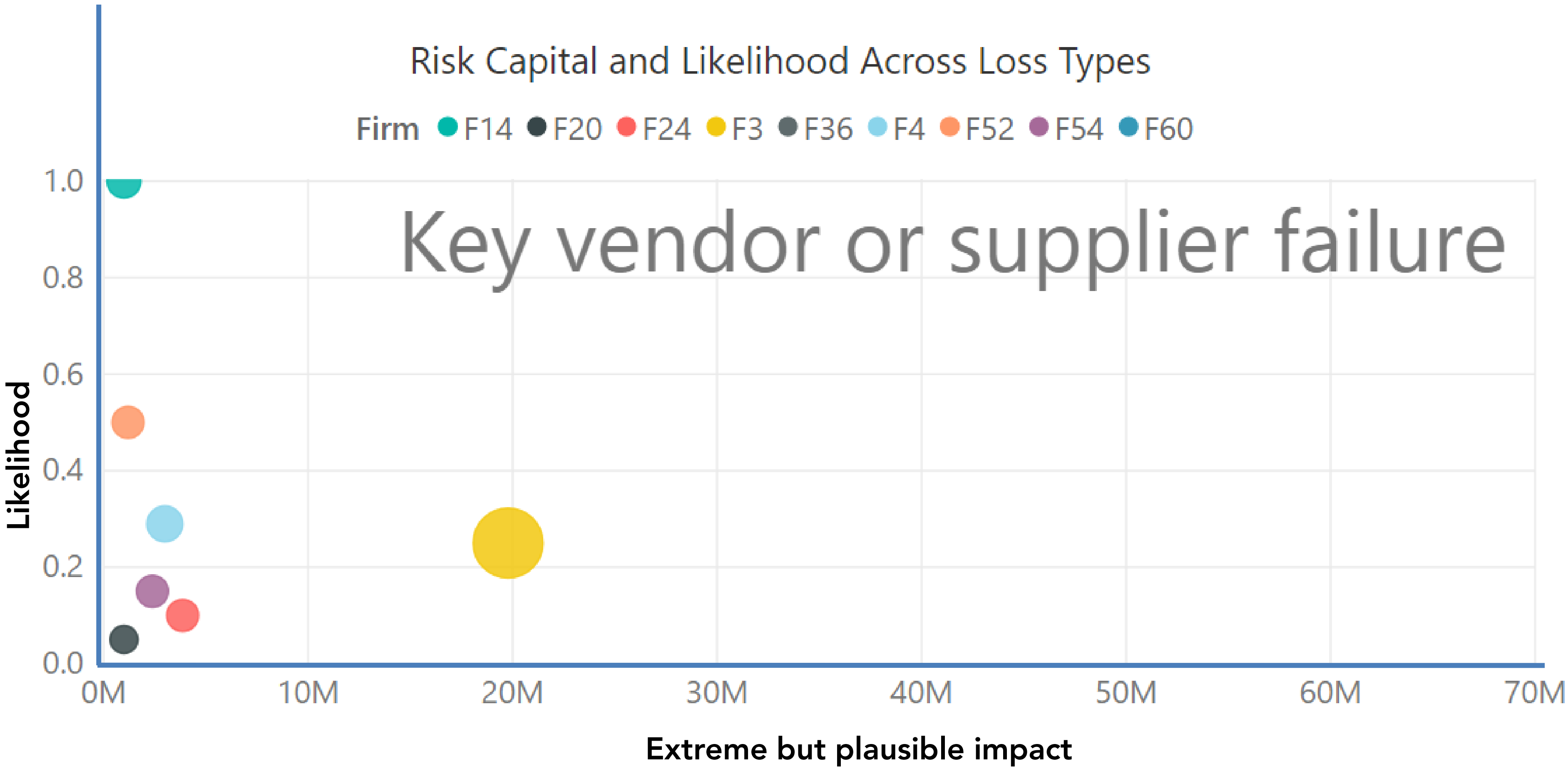
Our Scenario Benchmarking exercise from 2019



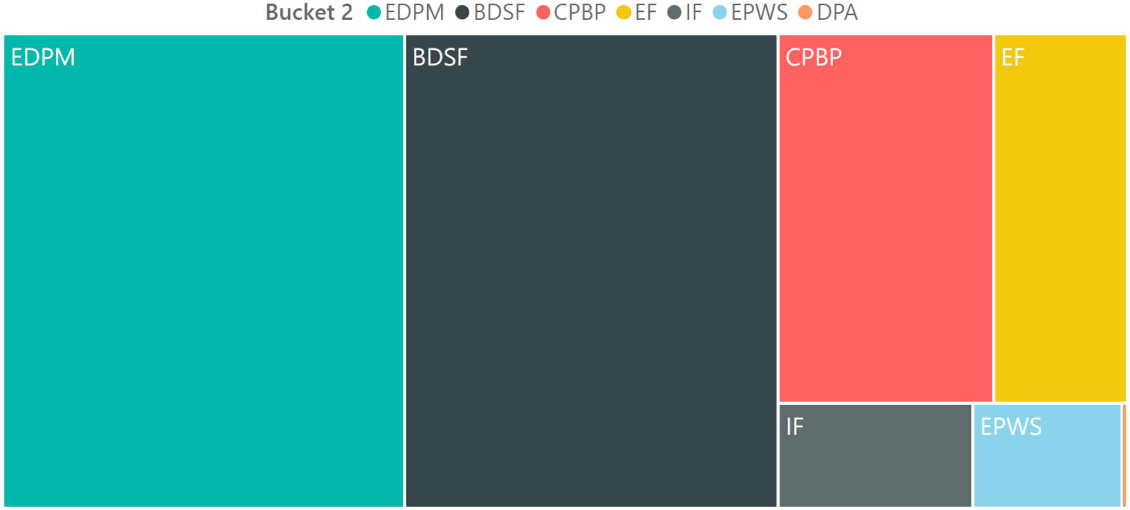
Our Scenario Benchmarking exercise from 2019



Our Scenario Benchmarking exercise from 2019

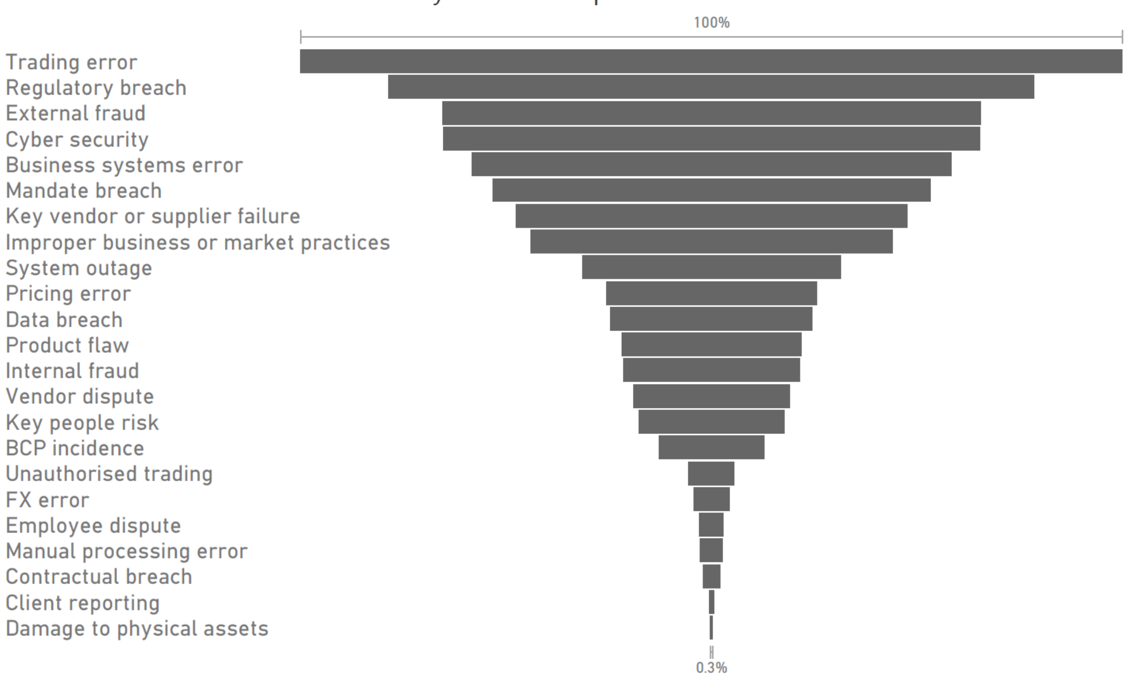


Distribution of Operational Risks across Basel Loss Types

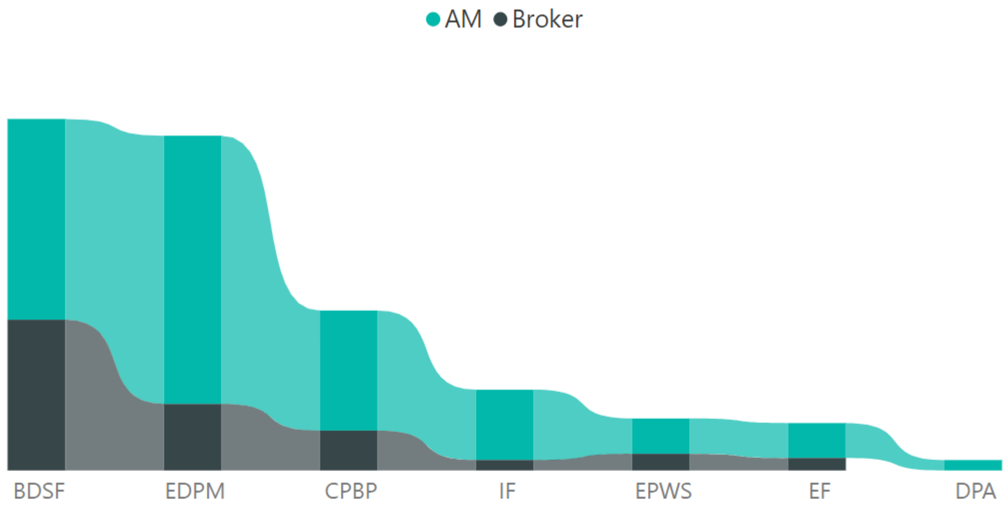


>We may need an allocation of risk amount to RtC, RtM and RtF

Most Commonly Observed Operational Risk Scenarios

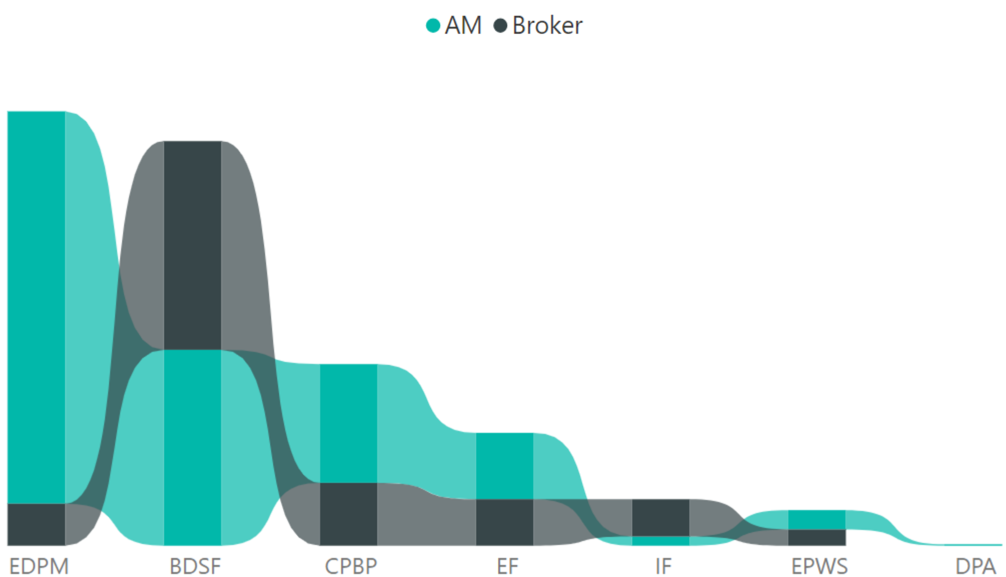


Likelihood



>We may need an allocation of risk amount to RtC, RtM and RtF

Extreme but plausible impact



DP : Disclosure Requirements

- IFs should also disclose their KFR and FOR
- If requested by the FCA > result of its ICARA process, including the composition of any additional own funds requirement set as a result of the SREP
- To be published on the same date annual financial statements (exception: ESG disclosure biannually) as well as same medium and location.

Article number of disclosure requirement	SNIs that have issued AT1	Non-SNIs
47 – Risk management objectives	√	√
48 – Governance		√
49 – Own funds	√	√
50 – Own funds requirement	√	√
51 – Remuneration policy and practices		√
52 – Investment policy		√[1]
53 – Environmental, social and governance risks		√[2]

Collected Information from Pillar 3 Disclosures

	Firm
Collected	Name
	Type
	Licence
	Web
	Date
	CapAv
	MR
	CR
	MRCR
	FOR
	P1OpRisk
	Pillar1
	Wind Down
	ICG in Ptage
	ICG
	P2 Add-on
	Pillar 2
	P2OpRisk
	TotalRisk
	Surplus
	Solvency
	Code Staff
	Rem. Total
	Rem. Fixed
	Rem. Var.
	AverageRem
	AUM

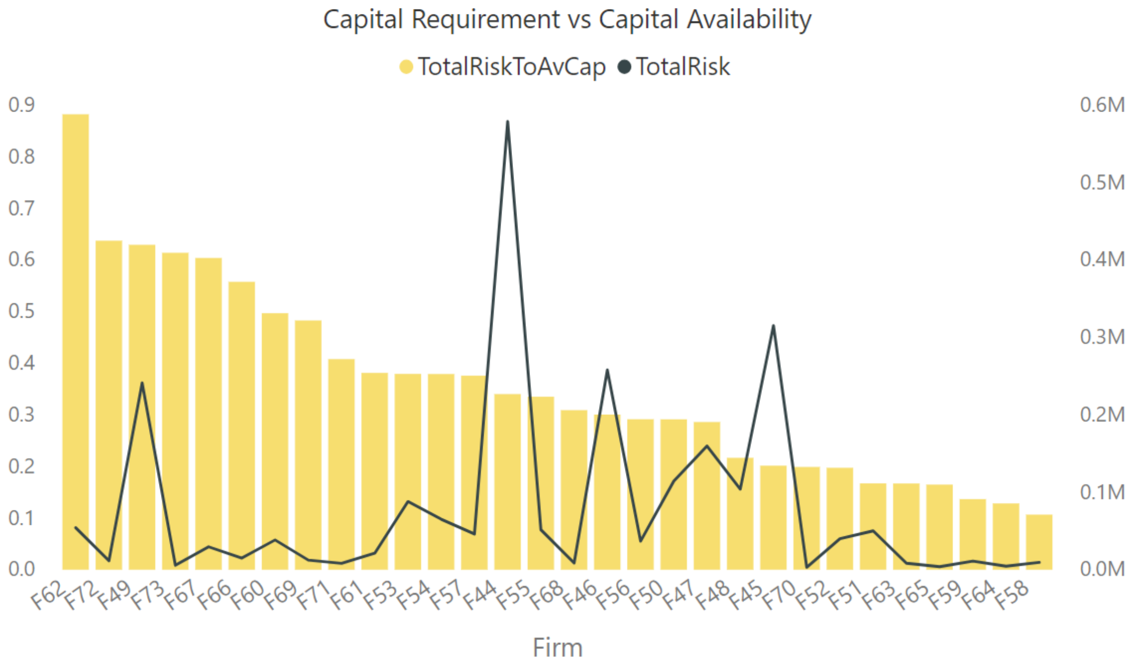
Calculated	MRToAvCap
	CRToAvCap
	CRMRToAvCap
	FORToAvCap
	P1OpRiskToAvCap
	TotalRiskToAvCap
	TotalRiskToAuM
	TotalRiskToRem
	ICGtoAvCap
	P2vsP1
	P2OpRiskToAvCap
	TotalRemToAum
	FixedToVariableRem

A snapshot from our database

1.2 CapAv	1.2 MR	1.2 CR	1.2 MRCR	1.2 FOR	1.2 P1OpRisk	1.2
122671	19574	19222	null	null	7321	
89000	300	7200	null	2000	null	
81900	7600	2900	null	null	11200	
77399	1302.88	6712.56	null	30444.56	null	
55920	712	4952	null	15656	null	
61458	138	23578	null	21004	null	
50365	152	1944.8	null	2451.2	null	
35069	null	4502.96	null	null	null	
23820	60	983	null	null	null	

Firm	F63
Name	Renessaince Capital
Type	Broker
Licence	null
Web	file:///C:/Users/m_cav/Downloads/ae2d4888-d159-46ba-ac2c-9a57f49e2139.pdf
Date	01/11/2018
CapAv	50365
MR	152
CR	1944.8
MRCR	null
FOR	2451.2
P1OpRisk	null
Pillar1	4548
Wind Down	null
ICG in Ptage	1.85
ICG	8413.8
P2 Add-on	null
Pillar 2	null
P2OpRisk	null
TotalRisk	8413.8
Surplus	41951.2
Solvency	5.985999192
Code Staff	21
Rem. Total	7320.8
Rem. Fixed	3359.2
Rem. Var	3961.6

Excerpt from our Pillar 3 Benchmarking report



Average of Capital Available
263,950.00

Average of total Risk
79,865.82

Average of Surplus
184,084.18

37,024.89
Average of FOR

22,123....
Average of MR

31,017.69
Average of CR

3.72
Average of Solvency

14,226.23
Average of Rem. Total

8,283.21
AverageRem

6,338.23
Average of Rem. Fixed

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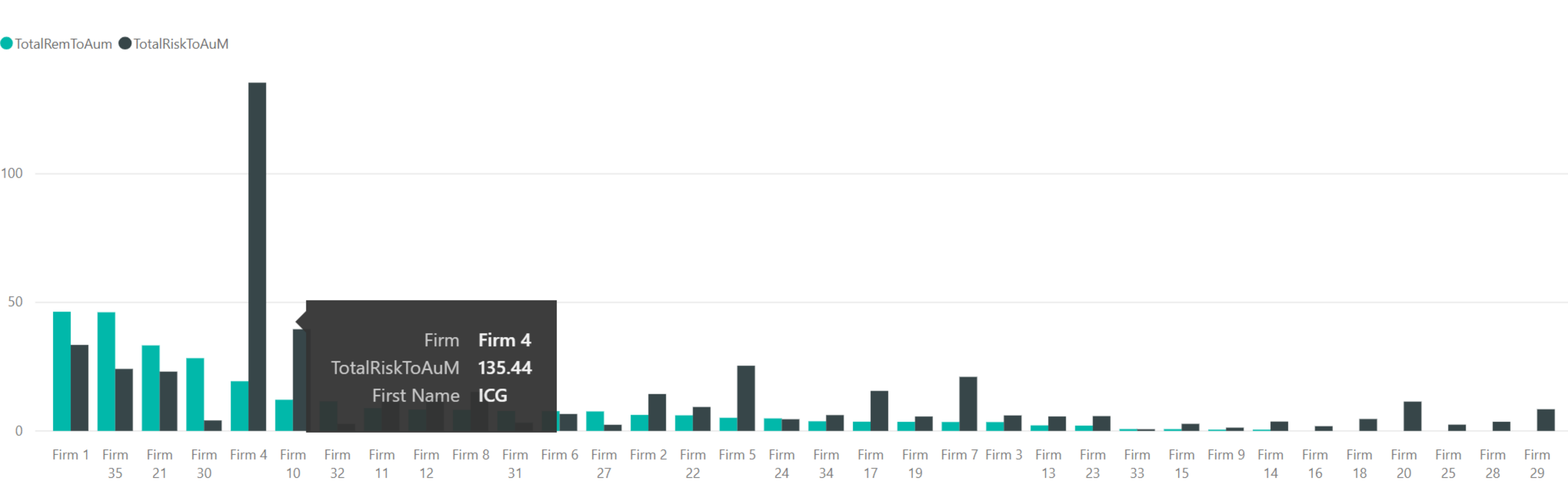

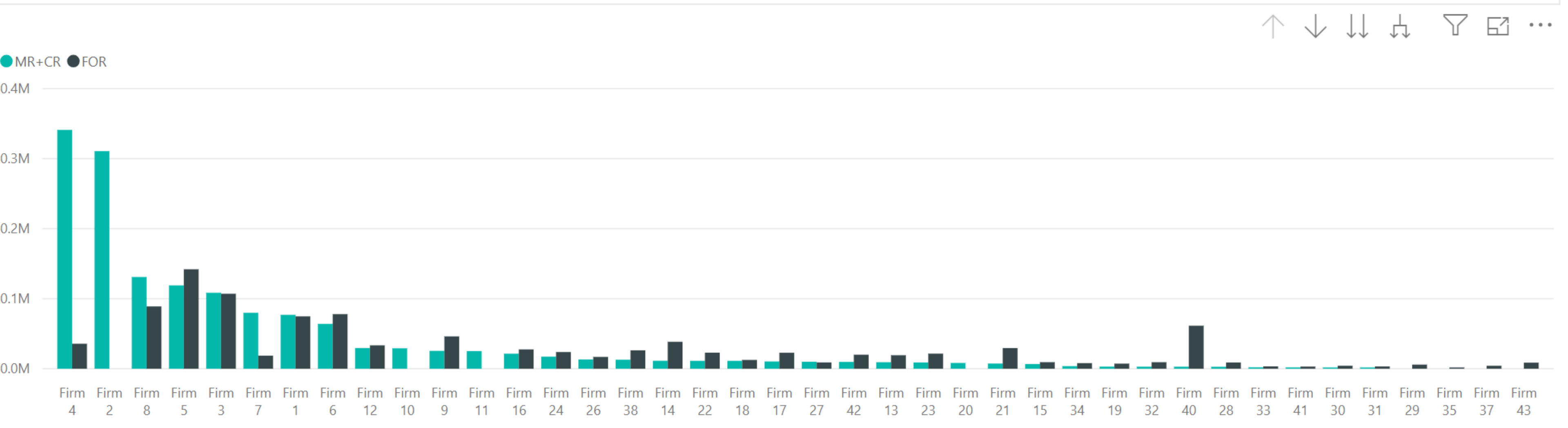

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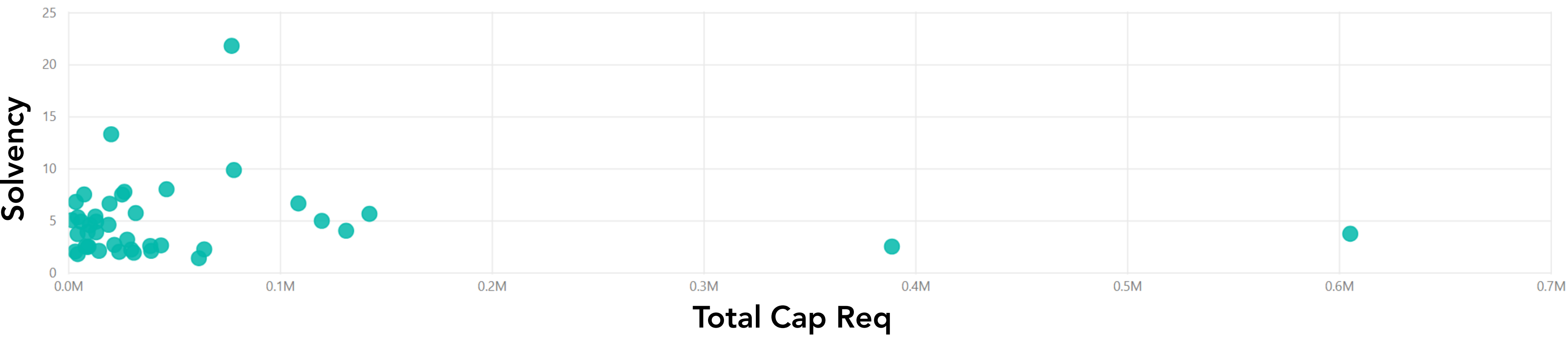

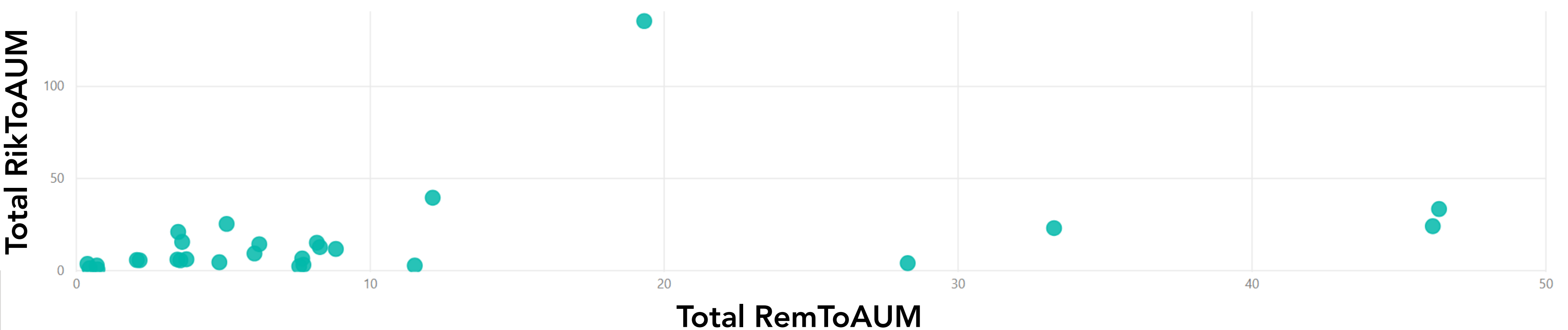

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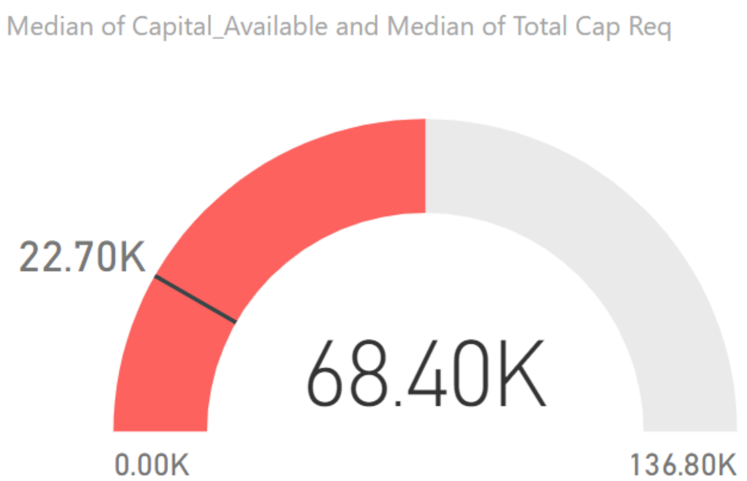

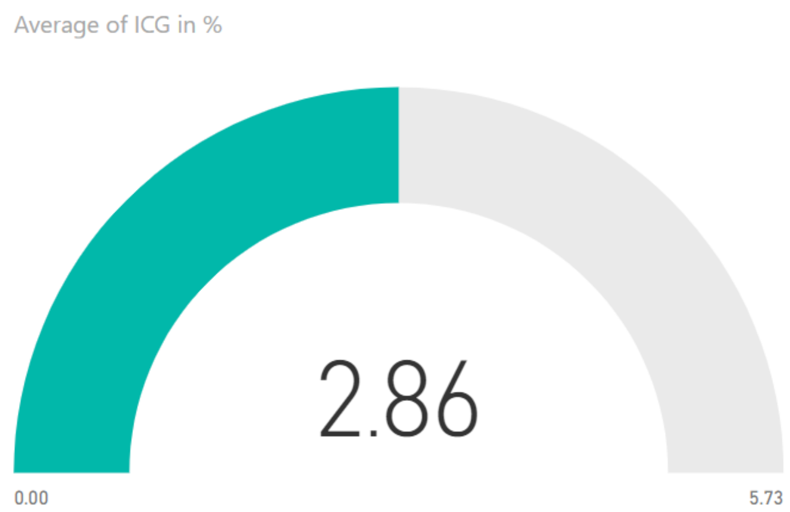

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