MFSA MALTA FINANCIAL SERVICES AUTHORITY

Geopolitical Risk Framework

Financial Stability Conference

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Overview

1. Introduction and MFSA GPR Framework
2. Financial Stability Approach: Trade Exposure and Countries Identification
3. Banks Vulnerability Index
4. Outcome of Hormuz Crisis on Maltese Banking Sector
5. The Way Forward and MFSA Expectations

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Introduction and MFSA GPR Framework

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Geopolitical Risk Framework background and MFSA approach

Geopolitical risk is defined as the "threat, realisation, and escalation of adverse events associated with wars, terrorism, and any tensions among states and political actors that affect the peaceful course of international relations"*

GPR as a Cross-Cutting Risk Driver

- Geopolitical risk operates as a **systemic amplifier** across an institution's traditional risk categories.
- Contagion manifests through three interdependent principal channels:



Regulatory Context

- Geopolitical risk features among the SSM's key supervisory priorities for 2026-2028.
- In this context, the MFSA has developed this analytical framework to assess the exposure of its supervised institutions to geopolitical disruption.
- The first scenario analysed has been the **Strait of Hormuz closure scenario** and the implication on our 17 banks (3 SIs and 14 LSIs).

MFSA Approach

- Through its broader application and combining qualitative and quantitative KRIs we can get a **comprehensive view on economic value and ratio deterioration, relative and absolute exposure.**
- This framework proposes to be for Central Banks and NCA a **replicable instrument to assess the exposure of supervised financial institutions to specific geopolitical scenarios.**

*Caldara, D. & Iacoviello, M. (2022). Measuring Geopolitical Risk. American Economic Review, 112(4), 1194-1225

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Transmission Channels

- Following the ECB transmission channel framework, we **adopt an integrated approach in analysing GPR through the Financial Markets, Real Economy, and Safety and Security channels**.
- These channels are inherently **interconnected to each other and with public policy reactions**, allowing geopolitical shocks to **propagate across the financial system and broader economy** through multiple transmission mechanisms.



Financial Markets

Capital flows, asset prices, credit spreads

Contagion transmits through repricing of sovereign and corporate risk, tightening of credit spreads, capital flow reversals, and heightened market volatility.
Banking impacts: asset quality deterioration, profitability compression, and funding cost increases.



Real Economy

GDP, trade, investment, inflation

Supply-side shocks translate into reduced GDP growth, trade contraction, investment deferral, and imported inflation.
Banking impacts: declining loan demand, rising NPLs, funding pressure, and solvency risk for exposed counterparties.



Safety & Security Channel

Cyber threats, operational disruption

Geopolitical escalation increases exposure to state-sponsored cyberattacks, infrastructure targeting, and sanctions-related operational constraints.
Banking impacts: operational resilience failures, reputational damage, and legal and compliance risk.

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Financial Stability Approach: Countries Identification and Selection

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Scoring method to identify country exposure to specific scenario

Identified 3 parameters that are scored from 1 to 10. While **exposure** and **vulnerability** are **negatively correlated** to the composite score, **resilience is correlated positively.**

Exposure

The scoring reflects a country's **direct or indirect exposure to the identified geopolitical shock**, taking into account among others, its role as the epicentre of the event, geographic proximity, and the presence of critical economic or strategic dependencies coupled with its diversification.

Weight 40%

+

Vulnerability

The scoring is derived from qualitative and quantitative indicators **assessing a country's economic and financial strength**, **resilience, and structural vulnerabilities**, which may increase the likelihood of widespread economic and financial instability under stress conditions.

Weight 35%

+

Resilience

The score reflects an assessment of **robustness, diversification, and coping capacity, alongside financial resilience**, which collectively mitigate the impact of the identified shock event.

Resilience is defined as the inverse of vulnerability and aims to eventually decrease the overall score given by exposure and vulnerability

Weight 25%

=

Composite Score

$$E \times 0.4 + V \times 0.35 + (11 - R) \times 0.25$$

**Where 11 is the inverse resilient score*

- The weighting structure reflects a supervisory assessment of the relative importance of each factor in determining a bank's sensitivity to geopolitical shocks.
- **Exposure** receives the highest weight at **40**% because geopolitical events **cannot materially affect an institution without a direct or indirect exposure channel**.
- **Vulnerability** receives a slightly lower but still significant weight at **35**% as it **captures the extent to which identified exposures may translate into financial or operational impacts under stress.**
- **Resilience** is weighted at **25**% since it acts as a **mitigating factor rather than a primary driver of risk**.
- The weighting structure was established through **supervisory judgement and can be calibrated according to the specific scenario** the supervisor wants to analyse and can rely on stress test outcome, macro- economic assumptions and risk assessments

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Methodology behind the current model

The current model **rests on supervisory judgement and expertise** and will be further improved in the next releases. At the current stage, the structure is:

- **Risk-based selection:** Countries were assessed on their direct or indirect involvement in the conflict, complemented by geographical proximity, following a defined rationale rather than an indiscriminate approach.
- **Four risk categories:** Critical, High, Medium and Low, reflecting each country's assessed relevance to the geopolitical shock.
- **Evidence-informed assessment:** WTO, UN and World Bank data (trade variables, GDP growth, sovereign credit ratings) support an initial view of country exposure, economic impact and potential implications for banks through the three transmission channels.
- **Current stage:** The framework is progressively incorporating the outputs of the Financial Stability function's quantitative models, starting with direct and indirect trade exposures and later extending to additional dimensions.

COUNTRY	REGION	CATEGORY	RISK SCORES				TRADE & ENERGY RESILIENCE						
			Exposure (1-10)	Vulnerability (1-10)	Resilience (1-10)	Composite Score (0-100)	Direct TPI (Baseline)	Indirect TPI (Baseline)	Direct TPI (Shocked)	Inirect TPI (Shocked)	Oil Production Category	Renew Production Tot Generation (TWh)	% Share Of World Ren Energy Supply
Iran	Middle East	CATEGORY 1 - CRITICAL Directly exposed or main actor / severely vulnerable	10	10	5	90	48	82	31	61	TIER 1	15.21	0.20%
Oman	Middle East	CATEGORY 1 - CRITICAL Directly exposed or main actor / severely vulnerable	10	8	5	83	66	91	60	88	TIER 1	23.43	0.20%
Israel	Middle East	CATEGORY 1 - CRITICAL Directly exposed or main actor / severely vulnerable	10	7	4	82	76	98	75	98	TIER 3	13.9	0.10%
United Arab Emirates	Middle East	CATEGORY 1 - CRITICAL Directly exposed or main actor / severely vulnerable	10	9	8	79	87	99	84	98	TIER 1	15.62	0.10%
Saudi Arabia	Middle East	CATEGORY 1 - CRITICAL Directly exposed or main actor / severely vulnerable	8	8	4	78	83	29	78	26	TIER 1	9.82	0.10%
Jordan	Middle East	CATEGORY 2 - HIGH Highly exposed / structurally vulnerable	8	8	5	75	54	74	54	73	TIER 4	5.7	Not Scored
Bahrain	Middle East	CATEGORY 2 - HIGH Highly exposed / structurally vulnerable	8	8	7	70	53	84	39	73	TIER 3	0.1	Not Scored
United States	North America	CATEGORY 1 - CRITICAL Directly exposed or main actor / severely vulnerable	9	7	8	68	100	37	100	38	TIER 4	1,158.80	10.90%
Iraq	Middle East	CATEGORY 2 - HIGH Highly exposed / structurally vulnerable	8	5	5	65	71	96	56	85	TIER 1	2.43	0.00%
Turkey	Europe	CATEGORY 2 - HIGH Highly exposed / structurally vulnerable	7	6	5	64	88	21	87	24	TIER 2	153.07	2.30%
India	South Asia	CATEGORY 2 - HIGH Highly exposed / structurally vulnerable	7	7	7	63	94	19	93	22	TIER 2	500.98	3.60%
Germany	Europe	CATEGORY 3 -MEDIUM Indirectly exposed / moderately vulnerable	7	6	6	62	99	38	99	39	TIER 3	295.74	3.20%
Kuwait	Middle East	CATEGORY 2 - HIGH Highly exposed / structurally vulnerable	6	5	4	59	62	36	39	11	TIER 1	2.07	0.00%
China	East Asia	CATEGORY 3 -MEDIUM Indirectly exposed / moderately vulnerable	7	7	9	58	99	100	99	100	TIER 1	3912.68	31.40%
Russia	Europe	CATEGORY 3 -MEDIUM Indirectly exposed / moderately vulnerable	6	5	8	49	82	97	82	97	TIER 1	206.98	1.80%
Malta	Europe	CATEGORY 3 -MEDIUM Indirectly exposed / moderately vulnerable	3	6	5	48	51	4	50	6	TIER 4	0.35	Not Scored
Italy	Europe	CATEGORY 3 -MEDIUM Indirectly exposed / moderately vulnerable	5	5	7	48	96	31	95	34	TIER 3	129.11	1.70%

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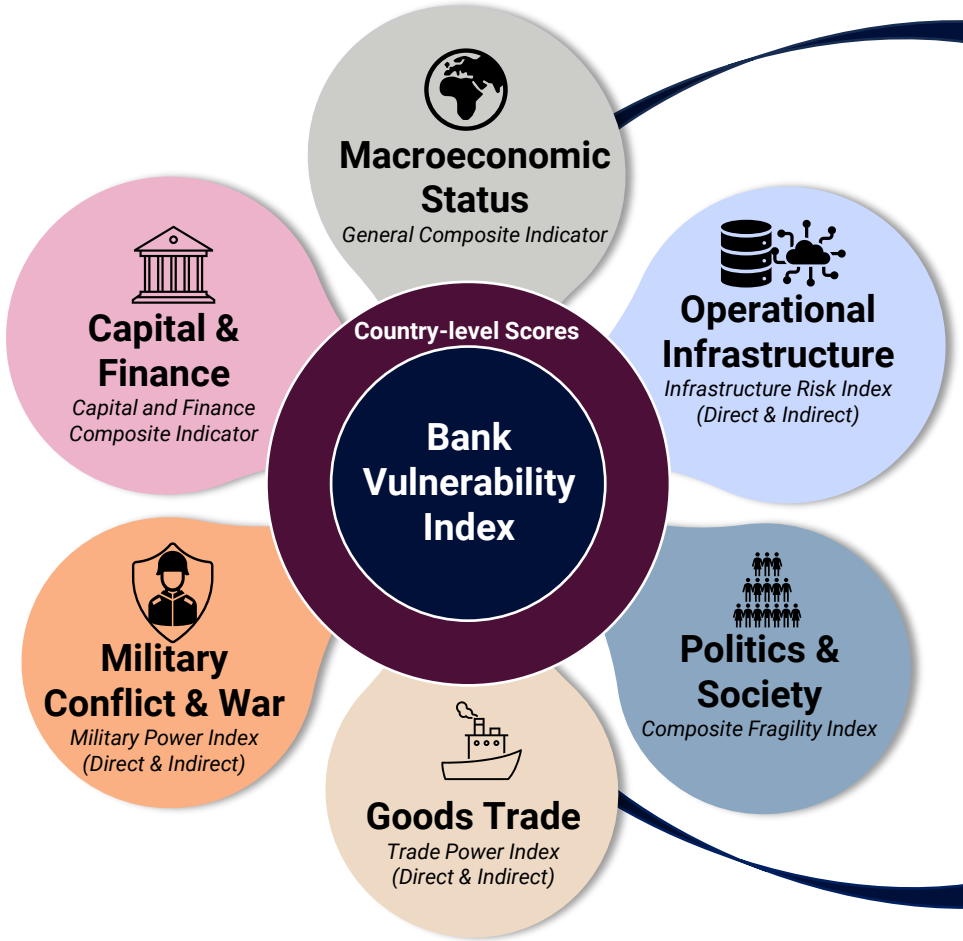
Tackling the Dimensions of Geopolitical Risk



Objective:

- ✓ Strengthen the Authority's ability to systematically monitor and assess impact from geopolitical development.
- ✓ This will be done at entity level and industry level.

Supervision

- Additional risk indicators for SREP assessments
- BVI would be a crucial input in capital cushioning and resilience under adverse geopolitical scenarios.

Financial Stability

- Supports forward-looking vulnerability assessment, shock simulations and stress testing, and contagion analysis.

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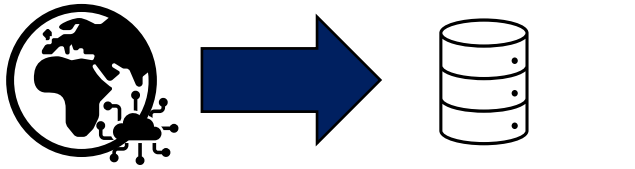
Current Stage Framework on Goods Trade

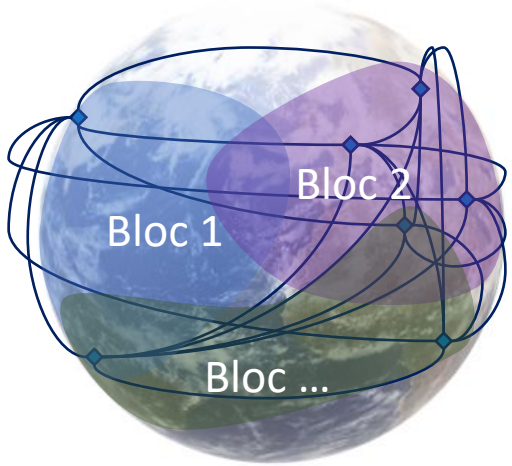
Stage 1
Pre-Processing



Methodology: Poisson Pseudo-Maximum Likelihood with High Dimensional Fixed Effects– PPML-HDFE (Gravity Removal)

- Goods trade is heavily influenced by **gravity factors** such as **economic size and distance**.
- If these are left, the constructed network would highlight the **largest economies** rather than deeper structural relationships.
- Resultant network allows analysis to **identify latent trade systems**, **supply-chain linkages** and **network structures**.

Stage 2
Trade-Network Modelling (Latent Blocs)



Methodology: Gravity-Removal Mixed-Membership Stochastic Bloc Model (GR-MMSBM)

- Network is constructed on the globe to split it **not geographically**, but **through trade blocs**.
  - A trade bloc represents a group of countries who **trade with** similar countries.
- **One country can be related to more than one trade bloc – multi-membership.**

Stage 3
Country-level Scores & Shock Simulation

Direct Trade Power Index (TPI)
Measures trade capacity (including gravity)

Indirect Trade Power Index (TPI)
Measures network structural importance and influence

Shock simulation on TPI
Conduct scenario design, sensitivity analysis and stress testing to observe effects on TPI

Methodology: PPML-HDFE, Weighted HITS Centrality, Equal Weights Aggregation

- Country-level indices for direct and indirect TPIs are extracted from the data and network model
  - **Direct TPI** measures **trade mass**.
  - **Indirect TPI** measures **structural position within the network.**
- TPI itself **does not simulate the shock**. Rather, for each scenario considered, **unique TPIs** are extracted from the framework
  - E.g. rising tensions between EU and US, Strait of Hormuz Crisis

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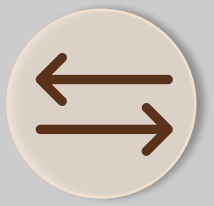
Trade Power Indices

1 Direct TPI

Observed Trade Scale

Captures the **scale** of a country's observed international goods trade.

How large is a country's goods trade footprint?



Exports + Imports

Percentile Index (0 - 100)

2 Indirect TPI

Size-Adjusted Structural Network Position

Stage 3: Trade-Network Model Structure

Export Influence

How important is the country as an exporter beyond trade size?

Import Influence

How important is the country as an importer beyond trade size?

Cross-bloc Influence

How interconnected is a country across latent trade blocs?

Size-Adjusted Indirect TPI – Equal Weight Composite

Direct - Trade Magnitude

Indirect – Structural Positioning (Conditional on Trade Scale)

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Shock Simulation

Define Scenario

Specify the geopolitical shock and affected countries through supervisory judgement.

Define the transmission mechanism and severity.

Quantifying Exposures

Calibrate country-specific exposures.

Translate exposures into realistic trade shocks on aggregate goods trade.

Simulate Trade Shocks

Two alternative scenarios can be considered:

1. Immediate trade **losses without substitution** of goods trade.
2. Allow for **partial redistribution** - certain countries absorbing lost trade.

Post-Shock Results

Re-estimate the trade network structure to assess post-shock changes:

- Shocked trade Latent Blocs
- Shock-simulated Direct and Indirect TPIs

These metrics are then fed in the BVI tool to capture the levels and effects of exposure of this scenario.

- Compare Baseline and Post-Shock TPI:

Δ TPI = Post-Shock TPI – Baseline TPI

Example: Strait of Hormuz Disruption

Extreme - 90% disruption of assumed exposed trade; country-specific bilateral shocks applied to aggregate merchandise flows.

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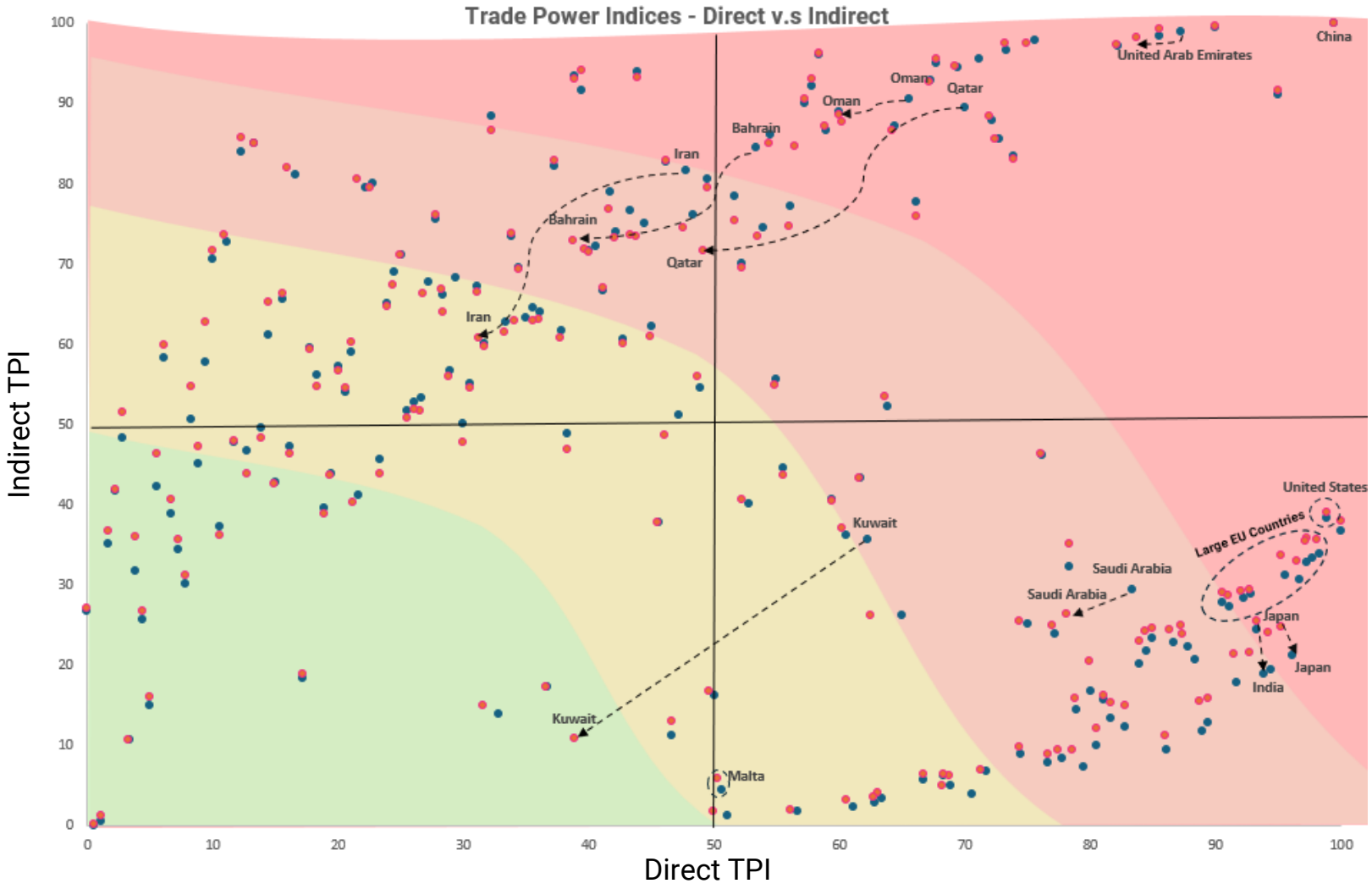
Baseline and Shocked TPI's



- Baseline Scenario
- Shocked Scenario (Strait of Hormuz)

ΔTPI Classification *Quartiles of TPI change*		
1±	*Critical*	***75-100%***
2±	*High*	***50-75%***
3±	*Medium*	***25-50%***
4±	*Low*	***0-25%***

Composite Category

$$C_{Priority} = \min\left(C_{Direct}, \max(3, C_{Indirect})\right)$$

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Bank Vulnerability Index

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BVI composition and characteristics

- The Index is based on **3 pillars** comprising **18 qualitative and quantitative variables** that give supervisor a **baseline scenario** to measure **exposure, vulnerability, and resilience** of institutions to specific geopolitical risk scenarios after **applying specific haircut**.
- By generating **a composite score**, the methodology delivers **a structured, transparent, and repeatable framework** for bank-level and sector-wide vulnerability assessments, supporting the MFSA **in identifying emerging risks, assessing sector resilience, and providing an early warning mechanism** for geopolitical shocks.

PILLAR 1



Exposure

1. Off-balance sheet
2. Government bonds
3. Debt securities
4. Loans and advances
5. Funding
6. Domestic & Non-Domestic Activities

PILLAR 2



Vulnerability

1. Unrealised losses (before and after)
2. ROA / ROE / Cost-To-Income
3. LCR (before and after)
4. Type of Business Model
5. Shareholder presence
6. ICT & Outsourcing
7. Strength of governance (SREP Score)

PILLAR 3



Resilience

1. Leverage ratio
2. LCR
3. Capital headroom
4. CET1 over total capital
5. Tier1/RWA

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Methodology and Tools

TOOL KIT

Data Acquisition

Collect and consolidate institutions' submission reporting data to build the KRIs for Exposure, Vulnerability and Resilience pillars

Analytical Processing

Excel is used to **extract**, **consolidate** and **analyse** data reported through FINREP and preliminary assess the risk indicators

Dynamic Monitoring

The dataset is then integrated into Power BI, where KRIs and dashboards facilitate the monitoring and risk developments across our Banks

Key Takeaways

1. Data from ITS are analysed at the individual bank level and benchmarked against peers
2. The resulting analysis is used to develop Key Risk Indicators, which feed the BVI
3. By combining complementary metrics, the BVIs provide both an absolute and a relative view of a bank's exposure across the different vulnerability areas

Not Exposed	🟢	0 - 5%
Partially Exposed	🟡	5 - 10%
Significantly Exposed	🔴	≥ 10%

Simplified picture

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Outcome of Hormuz Crisis on Maltese Banking Sector

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Insights of Hormuz Crisis Analysis for Maltese Banks

KEY FINDINGS

MOST EXPOSED BANKS

- Limited number of LSIs display the highest exposure scores under the Hormuz Crisis scenario, primarily **driven by cross-border business activities and lending or investment concentrations**.
- Banks with lending, securities portfolios or off-balance sheet commitments **linked to foreign counterparties tend to be more sensitive to geopolitical disruptions**.

PEER COMPARISON

- Internationally active and specialised institutions are typically more exposed than domestically focused retail and consumer-oriented banks.

MAIN EXPOSURE DRIVERS

- Under the "Hormuz Crisis" scenario, the main driver of the Pillar 1 scores is **exposure to the United States**, particularly **through Loans & Advances**.
- The principal source of risk stems from **concentrated exposures to a limited number of foreign jurisdictions**, particularly through loans and investment portfolios.

SUPERVISORY IMPLICATIONS

- Elevated scores may indicate **concentration** towards specific countries, counterparties or business sectors, requiring **a deeper assessment of the underlying exposures** to better understand the **nature** and **materiality** of the associated risks.

KEY TAKEWAYS

EXPOSURE CONCENTRATION

- The assessment identifies **pockets of concentrated exposure rather than a broad-based vulnerability** across the Maltese banking sector that show otherwise a low exposure overall.
- Elevated scores appear linked to **institution-specific business models and geographic concentrations rather than to a common sector-wide weakness**.

RESILIENCE CONCENTRATION

- Overall, the **Maltese Banking sector resulted to be resilient enough** to the recent middle east crisis with very few outliers.
- As expectable, Institutions combining strong capital metrics with conservative balance sheet structures demonstrate a greater capacity to withstand severe stress scenarios.

PRINCIPAL VULNERABILITIES

- Vulnerabilities are mainly linked to **concentrated lending, investment portfolios** and international counterparties exposed to adverse macro-financial developments (US).
- Institutions with **limited diversification may experience a more pronounced impact** from severe stress events and ongoing disruptions of certain sectors.

SUPERVISORY FOCUS AREA

- Assess the **sustainability and risk concentration of material cross-border exposures**, including potential second-round effects under stressed conditions.
- **Evaluate whether existing capital, liquidity and risk management frameworks remain adequate** to absorb severe but plausible geopolitical shocks.

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The Way Forward and MFSA Expectations

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Current and future development

ONGOING INITIATIVES

1. Further development of scenarios such as a possible debt crisis in Europe or a new military action.
2. Cross Collaboration with other MFSA functions. The framework has been presented to the ECB Middle-East Contact Group.
3. Ongoing enhancement of the assessment methodology and automation framework.

PLANNED DEVELOPMENTS

4. The framework will be presented to external stakeholders, including international and EU institutions such as the IMF, ESRB, and ESAs.
5. Country-level scores for the remaining geopolitical risk dimensions will be developed and integrated into the BVI.
6. Finalise calibration criteria and expand the assessment to other components.

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MFSA Expectations and…

Geopolitical risk has been confirmed as one of the **ECB's supervisory priorities for 2026–28**, reflecting prevailing geopolitical tensions and the associated **macro-financial uncertainty** and confirming the **materiality of the risk** and the need for institutions **to embed it structurally into their risk management**.

1. **Apply a 3 Pillar Risk Framework**

   Using a structured framework to assess the three pillars of bank risk will supports C-suites, board members, analysts, and the broader value chain in anticipating how an unpredictable event could directly or indirectly affect financial institutions, the economy, and ultimately people's lives, the true fuel of the economic ecosystem.

2. **Adopt a reverse stress testing lens**

   Banks are encouraged to work backwards from a plausible capital depletion target to identify which geopolitical developments could materially affect their solvency. This strengthens institutions' own risk management capabilities and their ability to design credible capital and recovery plans.

3. **Plan credible mitigating actions**

   Banks cite capital raising, business line sales, cost reduction, credit exposure mitigation, and payout adjustments as mitigants; institutions should document and quantify such actions to ensure they can meaningfully offset potential capital depletion.

4. **Consider the full transmission chain**

   Real economy channel as the dominant transmission mechanism, with **financial markets** as a secondary pathway; for conflict/cyber scenarios, the **safety and security channel** is also highly relevant. Sectors most exposed included manufacturing, energy, transport, agriculture, construction, and accommodation/food services.

5. **Integration into internal discussion and STE**

   Market participants must embed geopolitical risk assessment both into stress tests and into day-to-day decision-making, to understand and mitigate exposures and vulnerabilities. **In an increasingly interconnected and uncertain world, this prudential approach helps institutions stay prepared for the next macro-financial shock.**

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…Suggestion for the Industry

Hints for the Industry

Treat geopolitical **risk not as a tail-risk afterthought**, but as a **cross-cutting driver** amplifying traditional risk categories embedding it into: ICAAP, recovery planning, and governance processes.

*This is now **a clear supervisory expectation**, not merely good practice.*

Ensure geopolitical risks are **translated into measurable impacts** through scenario analysis and stress testing, assessing consequences for capital, liquidity, profitability, operational resilience, and business continuity.

*Boards should be able to **evidence how geopolitical scenarios influence strategic and risk management decisions**.*

Develop a **comprehensive view of direct and indirect exposures to geopolitical developments**, including geographical, sectoral, funding, outsourcing, and third-party dependencies.

*Understanding **concentration risk is essential** to identifying **vulnerabilities before stress materialises**.*

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