



საქართველოს ეროვნული ბანკი
National Bank of Georgia

Risk Management Framework

Erekle Tsivtsivadze

Deputy Head of Financial Markets Department

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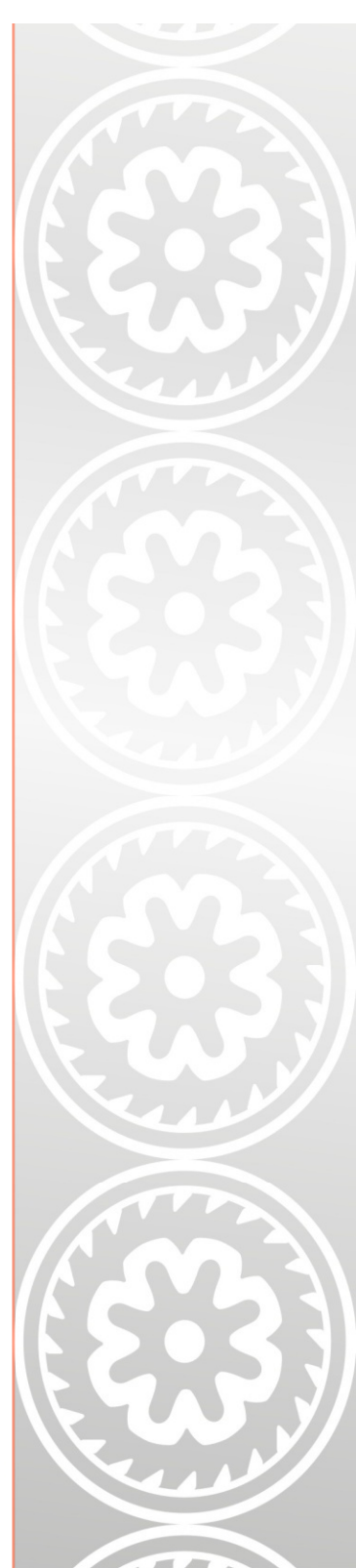


Financial Risk Management



Risk Taxonomy

- ⊗ FX Risk
- ⊗ Interest Rate Risk
- ⊗ Credit Risk
- ⊗ Liquidity Risk
- ⊗ Active Risk



Governance Structure

NBG Board:

- Approves investment strategy - Defines risk appetite, Reserves Structure & Rebalancing Rules, Trench sizes, Benchmarks, Market & Credit Risk Limits, Currency & Instrumental Composition
- Strategic Decisions

Reserves Management Committee

- Responsible for control and monitoring the process of implementation of investment strategy
- Approves List of Counterparties
- Tactical Decisions

Financial Markets Department

- Acts according to the requirements established by the board and committee
- Investment Decisions



Strategic Asset Allocation Process

- ⊗ Determine Risk Tolerance Level
 - **How much risk can we tolerate (afford to lose?)**
- ⊗ Liquidity Tranche (low risk tolerance)
 - **Max (X)% loss with 99% Confidence Level**
- ⊗ Investment Tranche, moderate risk tolerance
 - **Max (X)% loss with 95% Confidence Level**
- ⊗ Investment Horizon: 1 Month; 12 months; >1 year;
- ⊗ Risk Measure:
 - **Expected Return/Duration**
- ⊗ Rule of Decision Making:
 - **Maximize Expected Returns Subject to Constraint on Maximum Losses given a Specified Confidence Level over Investment Horizon**

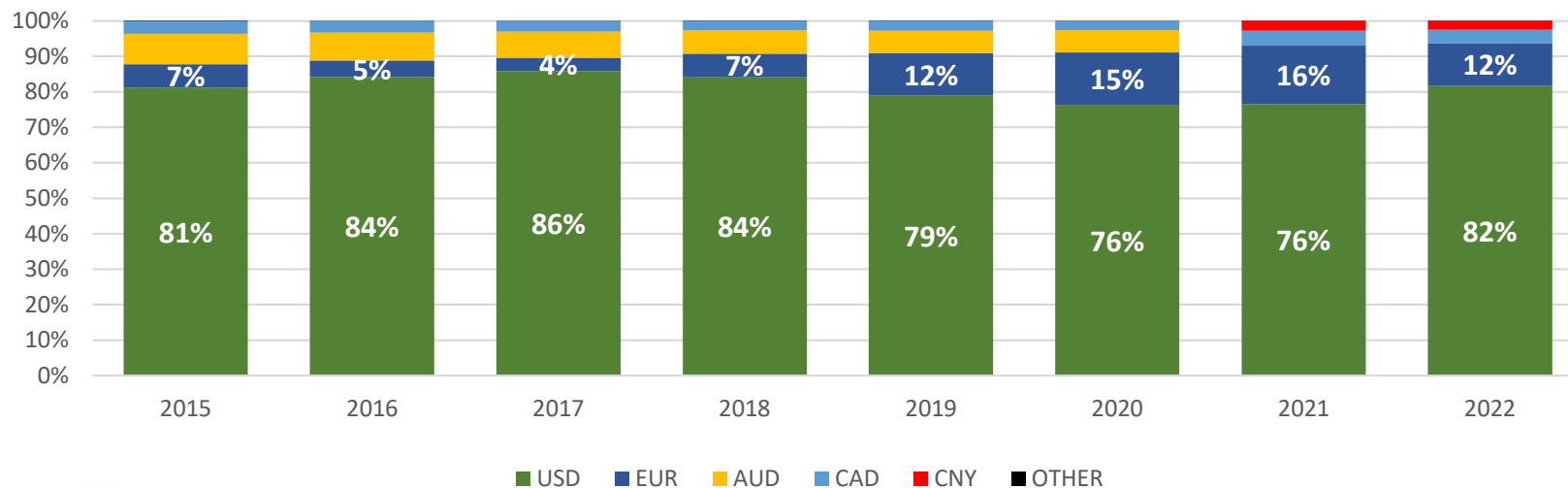


FX Risk Management

FX risk is mostly managed through Strategic Asset Allocation process

- Defines neutral FX currency composition with broad passive deviation limits approved by the Reserve Management Committee and the board
- ALM approach
- Analyzing FX Liability composition of NBG, Government and Economy
- FX rebalancing is seldom – long term shifts in IR or global developments
- Most recent rebalancing – adding limited exposure to CNY via BISIP.CNY

NBG Currency Composition



Interest Rate Risk Management

- ⊗ IR risk is managed mostly through Strategic Asset Allocation framework conducted annually
- ⊗ Defined IR risk appetite
 - -0,5% annual CVaR over 1Y horizon 95%(LIQ), 99% (INV) cl.
- ⊗ Risk/Return modeling using quantitative tools
 - SAA Workbench provided through WB RAMP
 - SAA Tool develop in-house with WB assistance
- ⊗ Strategic Benchmarks approved by the board
- ⊗ Active management of portfolio duration
 - Defined duration deviation limits vs benchmarks
 - Ex-ante tracking error limits
 - Active use of futures/options for duration hedging



Credit Risk Management

- ⊗ Monitoring credit risk of FX reserves via Credit VaR metric based on Credit Metrics methodology
- ⊗ Initial review / approval monitoring of issuers and counterparties
- ⊗ Limiting credit exposure
 - Limits exposure to bonds below AA- rating
 - Max concertation in a single issuer – 5% of FX reserves
 - Spread Duration and TE deviation limits vs benchmarks
- ⊗ Verifying credit ratings using in-house methodology:
 - Mostly uses on ratios: size, debt/equity, etc
 - Includes assessment of govt support, economy
- ⊗ Monitoring of credit ratings and market data
 - Live alerts for Credit Rating
 - Live alerts if significant changes occur in stock prices, spreads, CDS, Bloomberg DRSK



Liquidity Risk Management

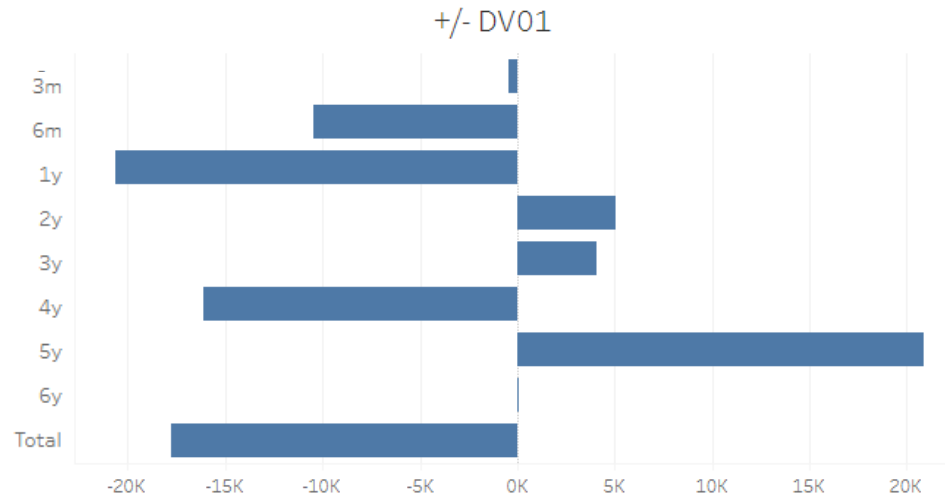
- ⊗ Division of FX reserves into tranches
 - Working capital tranche – 1 month of cash outflows (Cash, MM, Bills, Short term Treasury notes, FixBIS)
 - Liquidity Tranche – size defined by projects 12 month outflows (Exposure to less liquid instruments up to 25%)
 - Investment Tranche – size defined (Exposure to less liquid instruments up to 50%)
- ⊗ Limit investments into less liquid instruments:
 - Minimum issue size requirement - \$500M
 - Max concertation in a single issue - 5% of an issue
- ⊗ Proactive forecast of liquidity needs and accumulation of cash in Working capital tranche when market turbulence is expected
- ⊗ Swap/Repo facilities in place in the case of liquidity crisis
- ⊗ Bloomberg Liquidity Score – not reliable during liquidity crisis



Active Risk Limits

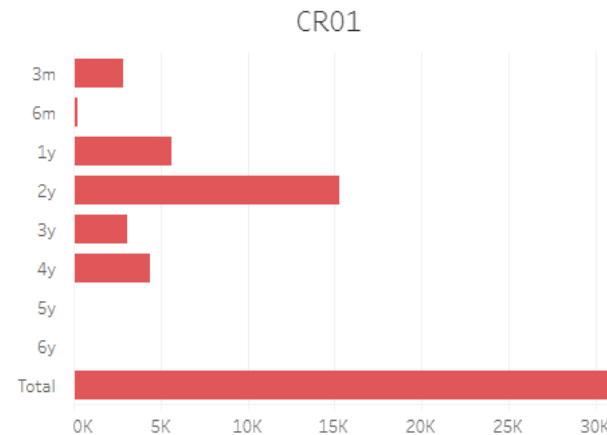
DV01	PORT	BEN	+/-
3m	6,403	6,884	-481
6m	10,935	21,390	-10,455
1y	48,032	68,701	-20,669
2y	19,842	14,806	5,036
3y	4,035	0	4,035
4y	-16,107	0	-16,107
5y	20,900	0	20,900
6y	0	0	0
Total	94,040	111,782	-17,742
Dur(y)	0.65	0.77	-0.12
Dur(m)	7.79	9.26	-1.47
Dur(d)	237	281.53	-44.71

Relative Duration Limit $\pm 3m$



CR01	SUPRA	Agency	Reg.Gov	COVERED	FUTURES	Total	OPTIONS
3m	37	1,286	0	0	1,522	2,845	0
6m	0	842	0	0	-782	263	0
1y	1,569	3,360	40	0	-1,443	5,603	0
2y	9,278	11,355	5,330	0	-10,692	15,271	0
3y	1,295	6,691	2,685	0	-7,592	3,079	0
4y	0	21,634	2,103	0	-19,324	4,414	0
5y	0	3,200	0	0	-3,132	68	0
6y	0	0	0	0	0	0	0
Total	12,179	48,368	10,158	0	-41,442	31,543	0
Spr. Dur(y)	0.08	0.33	0.07	0.00	-0.29	0.22	0.00
Spr. Dur(m)	1.01	4.00	0.84	0.00	-3.43	2.61	0.00
Spr. Dur(d)	30.67	121.81	25.58	0.00	-104.37	79.43	0.00

Spread Duration Limit - 9m



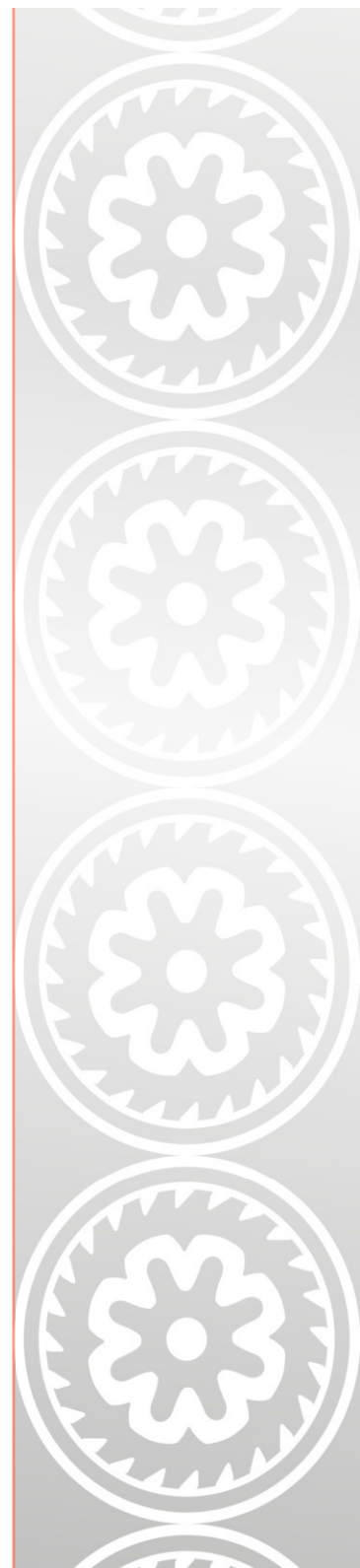
Tr. Error (bps)

Factor	8.1
Non-Factor	3.5
Yield Curve	6.6
Spread	4.5
Total Risk	8.8

TE limit 30bps

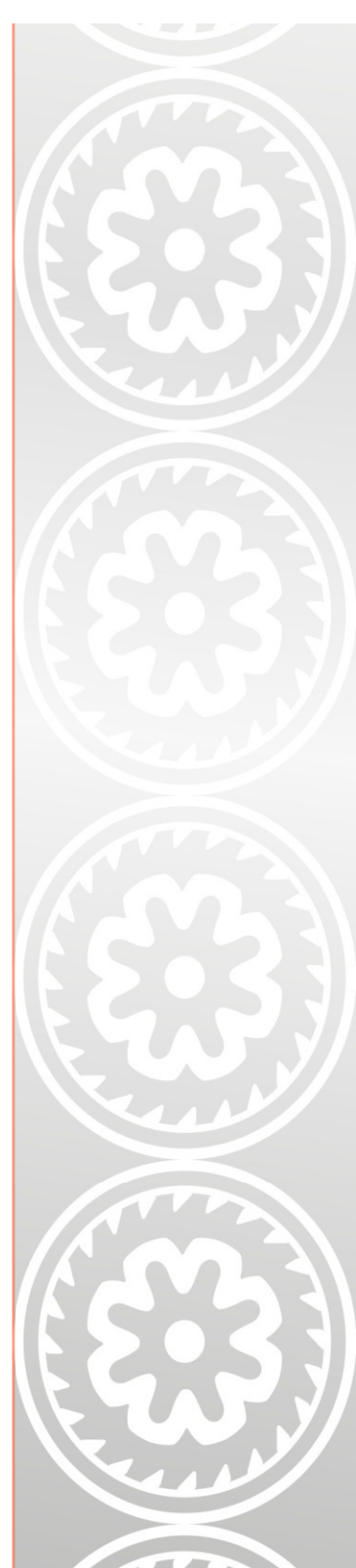


Operational Risk Management



Risk Taxonomy

- ⊗ **Reputational Risk**
- ⊗ **Fraud risk**
- ⊗ **HR risk**
- ⊗ **BCP risk**
- ⊗ **3rd Party risk**
- ⊗ **Information security risk**
- ⊗ **IT risk**
- ⊗ **Physical security risk**
- ⊗ **Legal risk**
- ⊗ **Compliance risk**



Governance Structure

⊗ NBG Centralized Risk Management Department (CRMD):

- Accountable to the Governor
- Reporting to the Board Audit Committee
- Reporting to the Risk Management Committee
- Coordinates:
 - Business Continuity Committee
 - Internal Procedures Committee
 - Risk Management Committee



Risk management Framework

⊗ Risk Management framework based on:

- COSO ERM
- ISO 31000
- IIA's Three Lines Model
- Basel – Documents related to Op. risks
- Board of Governors of the Federal Reserve System - SR 11-7: Guidance on Model Risk Management
- Experience of the International Operational Risk Working Group (IORWG)
- Experience of the World Bank and the International Monetary Fund

⊗ Main objectives & Functions

Risk Management	Business Continuity Management	Processes and Procedures
<ul style="list-style-type: none"> • Risk register • RCSA • Incident management • Model Risk Management • Project Risk Management • Risk appetite statement • Risk reporting • Risk awareness 	<ul style="list-style-type: none"> • Coordination of BCM • Scenario development • Business Continuity Planning • Testing and exercise • Business Impact Analysis • Self Assessment • Awareness 	<ul style="list-style-type: none"> • Formalization of business processes (procedures) • Business process mapping • Procedures' system management
Coordination of pandemic measures at the Bank		



Incident management

Incident Management framework

- Define Business Processes for all business areas
- Define KRIs (Key Risk Indicators); Benchmarks and thresholds (MAP (maximum acceptable performance))

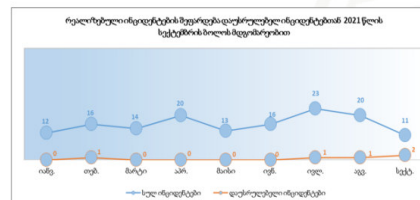
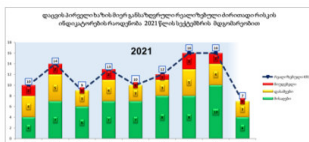
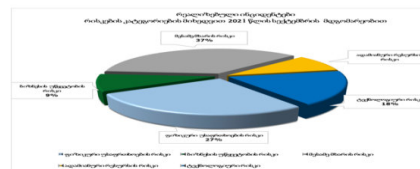
Main objectives & Functions

- Each business unit nominates Risk Champion - one or two person. Risk champion(s) – is (are) responsible for communication with CRM Department. Risk champion(s) are responsible for:
 - Investigate detailed data of each Incident;
 - Escalate activities to incidents (when needed);
 - Communicate and coordinate the information about incident within business unit;
 - Timely register in centralized location;
 - Follow up the incident;
 - Increase the awareness of risk and incident management within BU.

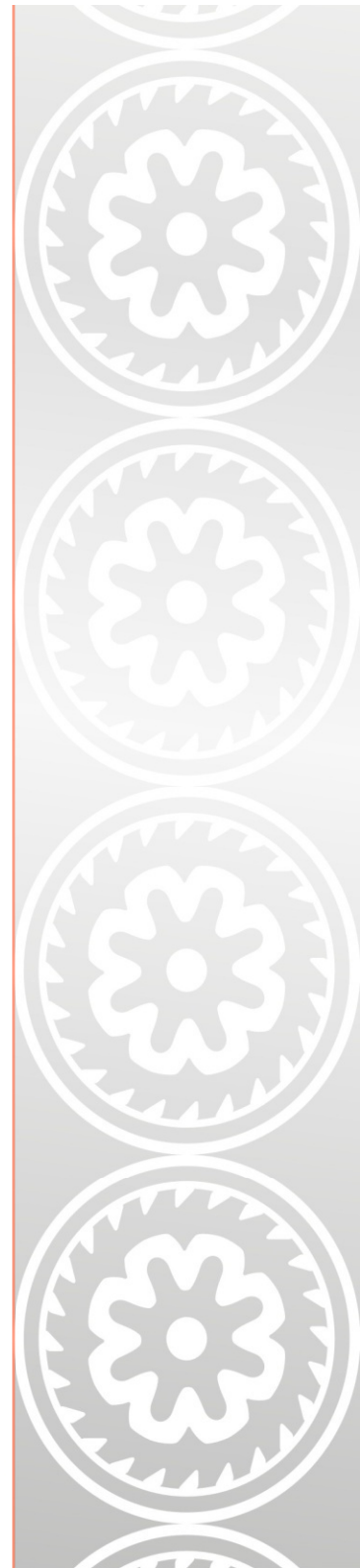
No	What Happened and Why	Impact	Responsible Person	Date of Registration	Created by	Preventive Actions	End Date
1							
2							
3							

KRI	Jan	Feb	Mar	Apr	May	Jun	Jul	Benchmark	MAP
1. Leakage of Confidential Information	0	0	0	0	1	0	0	0	0
2. System interruption for more than 15 min.	1	0	2	0	0	0	0	1	5

Example, not the real data



Cyber-Security framework



Governance Structure

NBG Information Security Management Committee:

- Approves strategy - Defines risks, Categorize Information Systems, Select Security Controls
- Members:
 - Executive Director (Head)
 - Critical Systems owner departments
 - Payment department (RTGS)
 - Financial Markets Department (Bloomberg, WSS, SWIFT, GSSS)
 - Accounting Department (General Ledger)
 - IT
 - Security Department
- Strategic Decisions



Governance Structure

IT department & Security Department

- Responsible for control and monitoring the process of implementation of strategy
 - Implement Security Controls.
 - Assess Security Controls
 - Monitor Security Controls
- Leading Incident Management Process
- Tactical Decisions

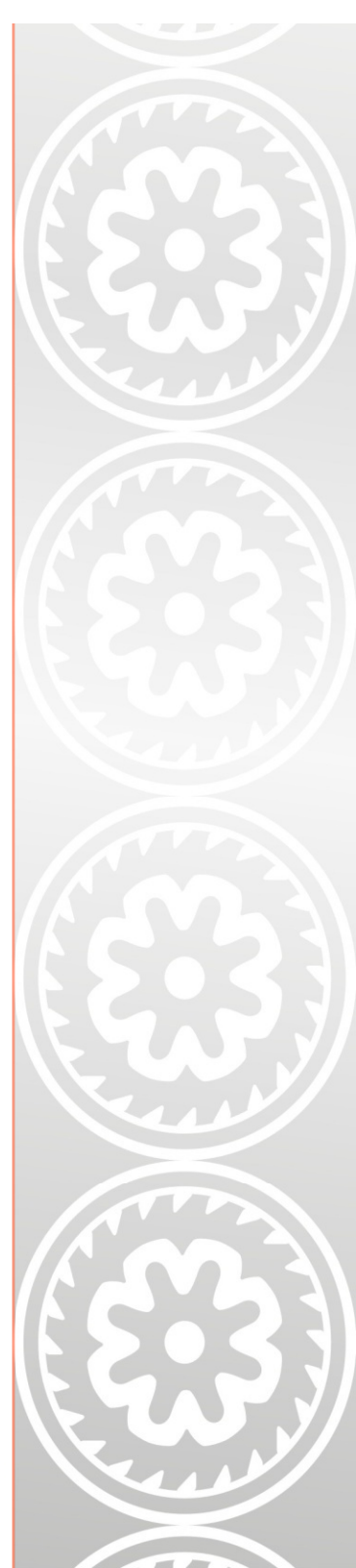
System owner Departments

- Acts according to the requirements established by the committee and implements tactical decisions
- Incident detection process (identification, reporting, actions)
- Operational Decisions



Framework and Controls

- ⊗ **Specific system rules**
- ⊗ **Segregation of roles**
 - Within IT department
 - Within system owner departments
 - Within system users
- ⊗ **Server & IT infrastructure security controls**
 - Specific protocols
 - Firewalls
 - Specific rules for 3rd party users (Cyber Arc)
 - Specific rules for privileged (IT) users (2 step approval)
 - Specific rules for business users (VPN, 2 step verification, Tokens, One time password generation)
- ⊗ **Quarterly screening of critical systems and it's components**
- ⊗ **Annual vulnerability tests**
 - Black box scenario
 - Grey box scenario
 - White box scenario
- ⊗ **Implementation of global requirements and industry standards**
- ⊗ **External audit (SWIFT CSP) & Internal Audit**



Thank you for Attention

Questions ?

