

Banco de Cabo Verde

THE PFMI ASSESSMENT MODEL

2024

AFRITAC West 2

Interregional Hybrid Workshop on Compliance with CPMI-IOSCO Principles for
Financial Market Infrastructures

January 29 - February 2, 2024
Accra, Ghana

MANDATORY METHODOLOGY RECOMMENDED BY BIS

Committee on Payment and
Settlement Systems

Board of the International
Organization of Securities
Commissions



Principles for financial market infrastructures:

Disclosure framework and Assessment methodology

December 2012



BANK FOR INTERNATIONAL SETTLEMENTS



OICU-IOSCO

Committee on Payment and
Settlement Systems

Technical Committee of the
International Organization of
Securities Commissions



Principles for financial market infrastructures

April 2012



BANK FOR INTERNATIONAL SETTLEMENTS



OICU-IOSCO

MANDATORY METHODOLOGY RECOMMENDED BY BIS

According to the **Bank for International Settlements (BIS)**, the FMI assessment process consists of six steps:



Step 1: Determine the appropriate scope of the assessment.



Step 2: Gather facts on each applicable key consideration.



Step 3: Develop key conclusions for each principle.



Step 4: Assign a rating for each principle.



Step 5: Indicate the appropriate time frame for addressing each issue of concern.



Step 6: Prepare an assessment report.

The PFMI Assessment Model is an additional method for Step 4 that will assist assessors in measuring and rating PFMI.

IMPORTANCE OF MEASURING FMI ASSESSMENT

In this presentation, we'll analyze why it's critical to measure FMI assessments and how the **PFMI Assessment Model** can help.

We will discuss the following questions:

- 1) What are the advantages of measuring FMI assessments?
- 2) How can the model be used to efficiently assess all types of FMIs?
- 3) How does the **PFMI Assessment Model** combine qualitative and quantitative analysis?
- 4) How does the model assist Oversight Authorities in monitoring and tracking the progress of FMIs in achieving higher observance levels?
- 5) How does the **PFMI Assessment Model** contribute to improve the stability and resilience of financial systems?





THE PFMI ASSESSMENT MODEL

Definition:

- The **PFMI Assessment Model** is a structured and standardized tool that allows for precise and objective measurement of the level of observance of PFMIIs.
- Through clear and objective criteria for assessing each principle, the model increase transparency and consistency in the process.
- It allows for validation and comparison of the level of observance across different FMIs and countries, contributing to the improvement of FMIs at the national and regional levels.



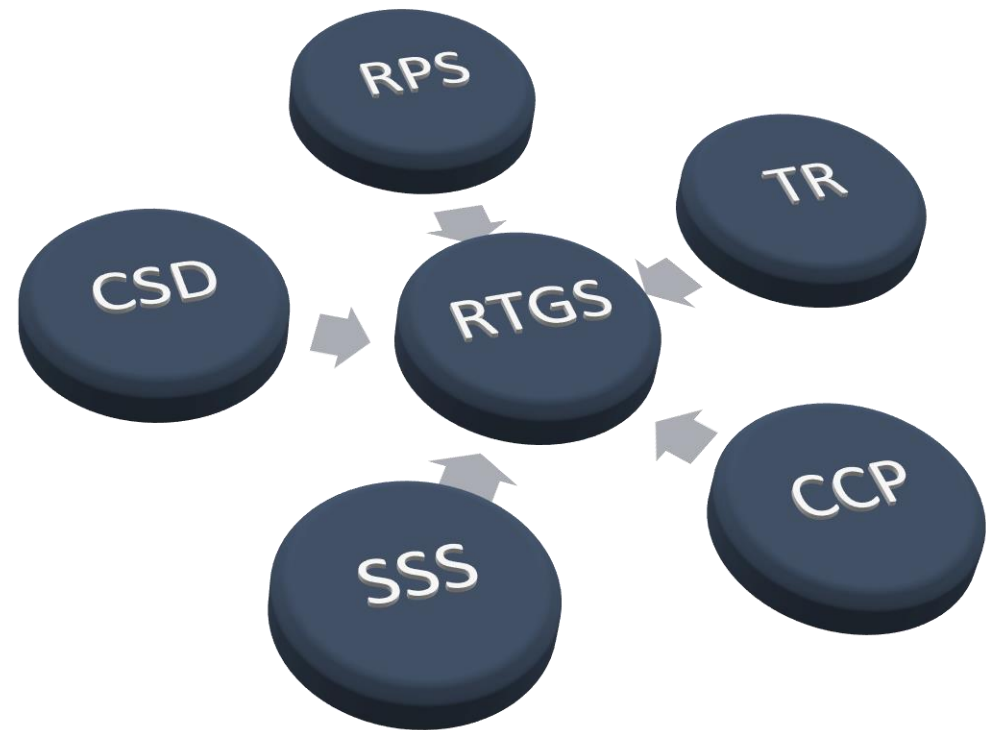
THE PFMI ASSESSMENT MODEL

Main characteristics of the PFMI Assessment Model:

1. Flexible to assess all types of FMIs;
2. Weighing of key considerations;
3. Classifying the level of compliance for each key question;
4. Automatic assessment of each principle's level of observance;
5. Overview of the FMI assessment process;
6. Ideal for validation by relevant authorities;
7. Panoramic view of CPSS-IOSCO PFMI Assessment's.

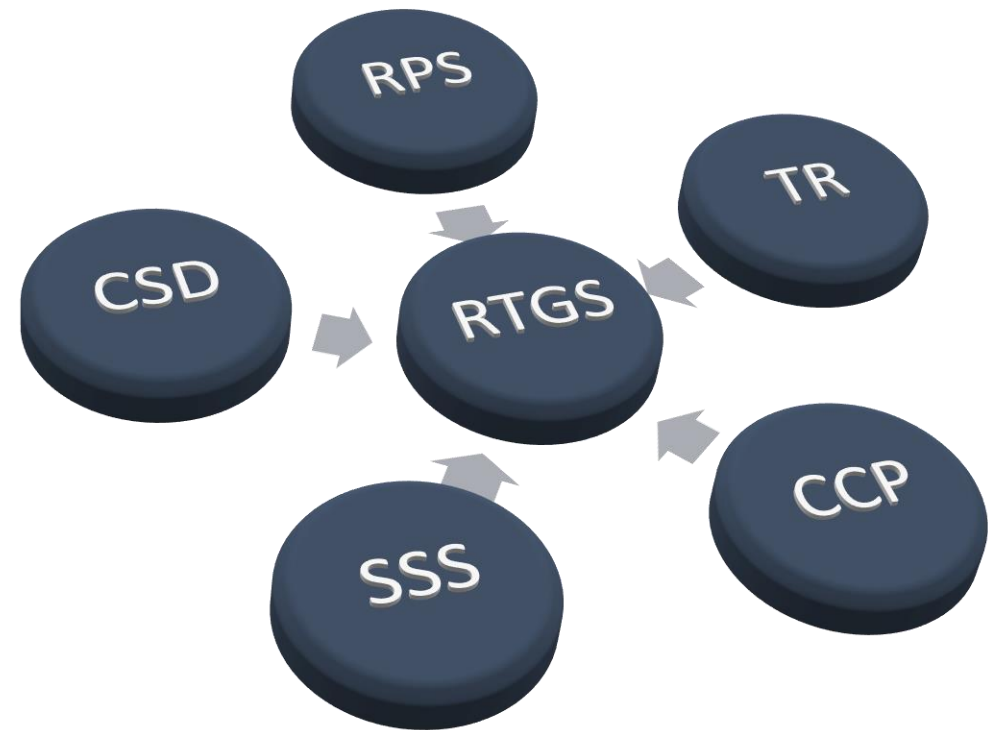
1.1. FLEXIBLE TO ASSESS ALL TYPES OF FMI

- To assist Oversight Authorities (Central Banks, Market Regulators, and other relevant authorities), the **PFMI Assessment Model** was developed to be flexible and adapt to the particularities of each type of FMIs and its jurisdiction.
- This flexibility makes the model adaptable to diverse local realities and regulations, allowing assessments to be carried out more precise and realistically.



1.2. FLEXIBLE TO ASSESS ALL TYPES OF FMI

- The initial version of the model was designed to assess just retail payment systems.
- Due the need to assess other FMIs, the model had to be reformulated to ensure it was flexible enough to cover all types of FMIs, whether they are RTGS, RPS, CSD, SSS, CCP or TR.



1.3. FLEXIBLE TO ASSESS ALL TYPES OF FMI

Name the FMI.

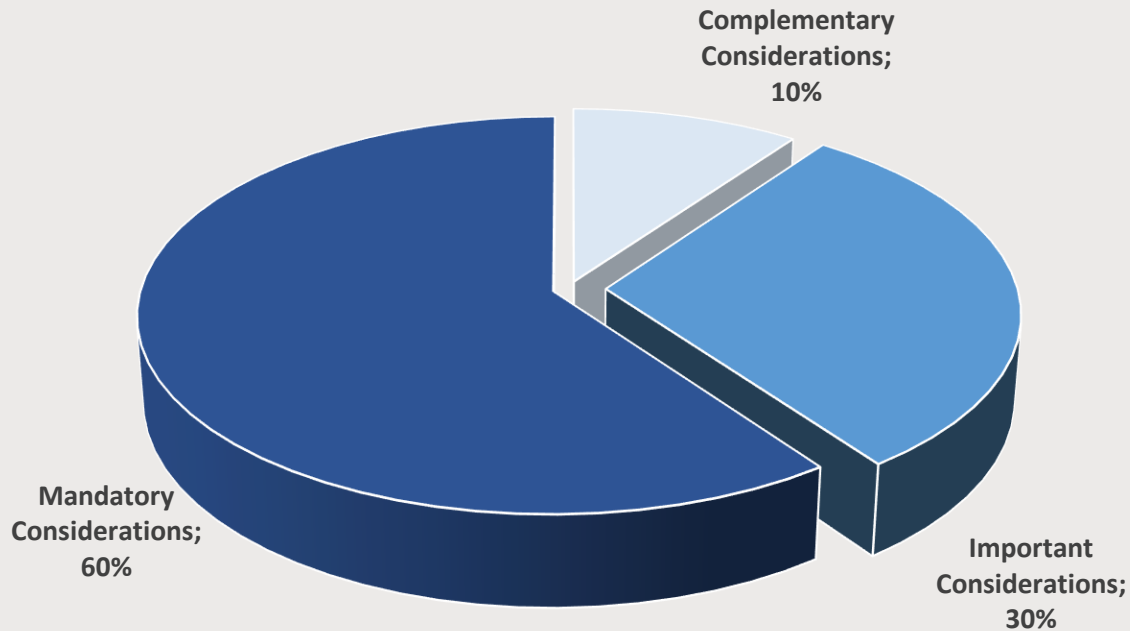
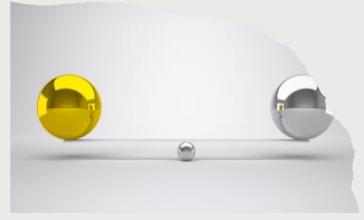
Select the type of FMI.

The applicability of the principles can be found on page 14 of the document Principles for Financial Market Infrastructures, 2012.

Name the Financial Market Infrastructures (FMI) →		CPSS-IOSCO Principles for Financial Market Infrastructures (PFMI) - TARGET (RTGS)				
Select the type of FMI →	RTGS	Principles	English	Applicability	Key Considerations	Key Questions
Real-Time Gross Settlement	RTGS	A	General Organisation	3	16	56
	RPS	Principle 1	Legal Basis	It Applies!	5	11
	CSD	Principle 2	Governance	It Applies!	7	26
PFMI Rating:	SSS	Principle 3	Framework for the Comprehensive Management of Risks	It Applies!	4	19
	CCP	B	Credit and Liquidity Risk	3	23	79
	TR	Principle 4	Credit Risk	It Applies!	7	24
Assessment:		Principle 5	Collateral	It Applies!	6	16
		Principle 6	Margin	Not Applicable!		
		Principle 7	Liquidity Risk	It Applies!	10	39
PARTIALLY OBSERVED		C	Settlement	2	8	25
		Principle 8	Settlement Finality	It Applies!	3	13
		Principle 9	Money Settlements	It Applies!	5	12
		Principle 10	Physical Deliveries	Not Applicable!		
		D	CSDs and Exchange Value Settlements	1	1	4

When the principle does not apply to the FMI, it does not affect the assessment.

2.1. WEIGHTING OF KEY CONSIDERATIONS



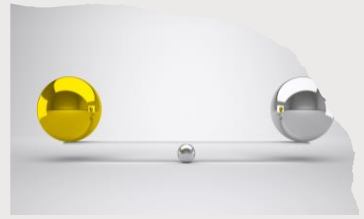
The **PFMI Assessment Model** allows weighting of key considerations, according to the importance of each of them, in relation to the requirements and standards that surround the principle is being assessed.

The key considerations can be classified according to the following options:

- **Mandatory Key Considerations:** represent 60% of the principle;
- **Important Key Considerations:** represent 30% of the principle;
- **Complementary Key Considerations:** represent 10% of the principle;
- **Not Applicable:** do not have weight, therefore, do not affect the result.

This weighting approach provides the opportunity to give more weight to key considerations that are more relevant to the effectiveness of the principle.

2.2. WEIGHTING OF KEY CONSIDERATIONS



How is the process of classifying key considerations?

1. Determine whether the key consideration is directly related to the principle or is an additional aspect of the subject.
2. Assess whether it constitutes an urgent condition or an important aspect that can be implemented in the medium or long term.
3. Analyze whether the key consideration aims to mitigate risks. What kind of risk? Operational, legal, credit, liquidity, or systemic?



2.3. WEIGHTING OF KEY CONSIDERATIONS

Classify all Key Consideration as Mandatory, Important, Complementary or N/A.

Key consideration 2.5:	The roles and responsibilities of management should be clearly specified. An FMI's management should have the appropriate experience, a mix of skills, and the integrity necessary to discharge their responsibilities for the operation and risk management of the FMI.	Questions:	4
		Classify:	Rating:
		IC	8,4%
Q.2.5.1:	What are the roles and responsibilities of management, and are they clearly specified?	N/A MC IC	A
Q.2.5.2:	How are the roles and objectives of management set and evaluated?	CC	E
Q.2.5.3:	To what extent does the FMI's management have the appropriate experience, mix of skills and the integrity necessary for the operation and risk management of the FMI? How does the FMI ensure that this is the case?		C
Q.2.5.4:	What is the process to remove management if necessary?		B

After classifying all the key considerations, the model will distribute the weight for each group of Key consideration.

Key Consideration	Classification	Weight	Rating
KC 2.1	MC	20,0%	20,0%
KC 2.2	IC	15,0%	12,2%
KC 2.3	MC	20,0%	16,3%
KC 2.4	CC	10,0%	10,0%
KC 2.5	IC	15,0%	8,4%
KC 2.6	MC	20,0%	18,8%
KC 2.7	N/A		
Principle 2	It Applies!	100%	85,6%

Key Consideration Rating.

Not Applicable Key Consideration do not have weight, therefore, do not affect the result.

Note: For all Key considerations, the model has a classification recommendation, based on the process of classifying the key considerations.

3.1. CLASSIFICATION OF KEY QUESTION COMPLIANCE



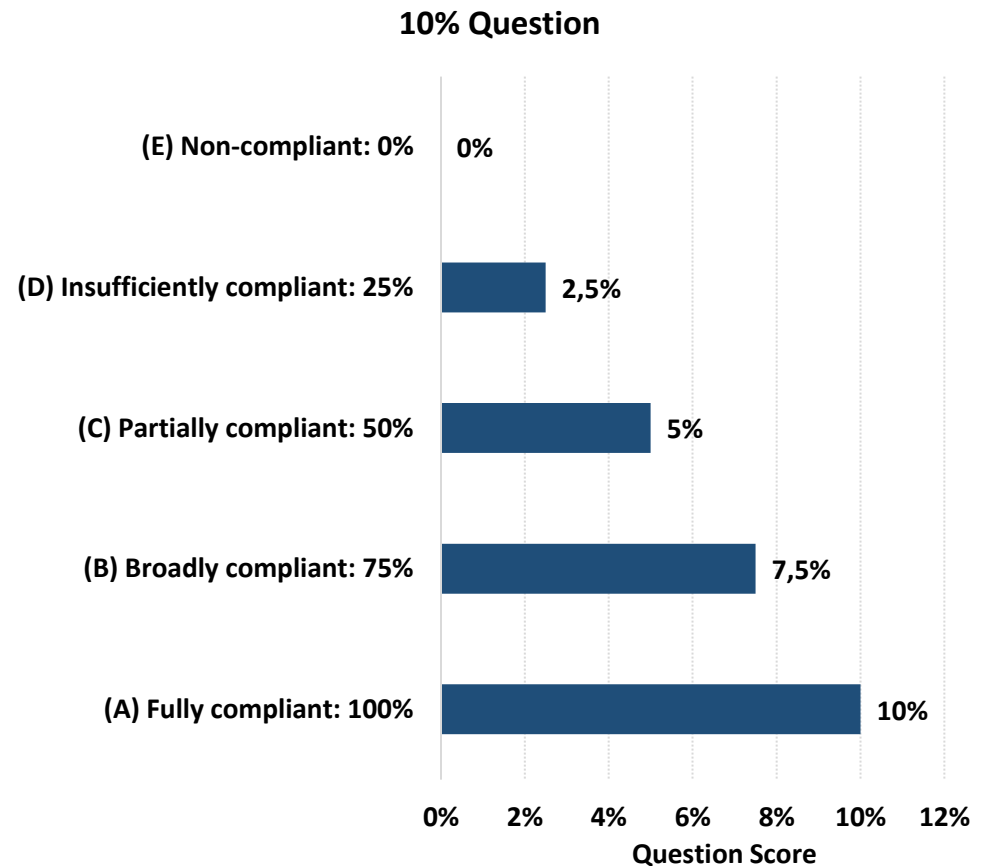
The **PFMI Assessment Model** allows for the precise assessment of each key question, with a score assigned indicating the level of compliance of the corresponding answer and qualitative analysis.

The answers and qualitative analysis can be classified according to the following criteria:

- **(A) Fully Compliant:** 100% of the question score;
- **(B) Broadly Compliant:** 75% of the question score;
- **(C) Partially Compliant:** 50% of the question score;
- **(D) Insufficiently Compliant:** 25% of the question score;
- **(E) Non-Compliant:** 0% of the question score;
- **(N/A) Not Applicable:** has no score, therefore, does not affect the result.

Instead of a binary answer - Yes (100%) or No (0%) -, the model allows a more precise assessment of the qualitative analysis, considering the options A, B, C, D and E.

With this method, the **PFMI Assessment Model** allows for the combination of qualitative analysis (documentation and evidence) and quantitative analysis (assignment of question score), providing a more objective and realistic assessment of each key question.



3.2. CLASSIFICATION OF KEY QUESTION COMPLIANCE



- The classification of the level of compliance of each key question should be based on the answers of the operators (Self-Assessment), evidence gathered from documentation, interviews between the assessors and the assessed operators, and the opinion of other experts such as IT, Legal, Auditors, International Advisors, etc.

Key question compliance can be classified according to the following criteria: A, B, C, D, E and N/A.

Key consideration 23.1:	An FMI should adopt clear and comprehensive rules and procedures that are fully disclosed to participants. Relevant rules and key procedures should also be publicly disclosed.	Questions:	5
		Classify:	Rating:
		MC	22,5%
Q.23.1.1:	What documents comprise the FMI's rules and procedures? How are these documents disclosed to participants?		A
Q.23.1.2:	How does the FMI determine that its rules and procedures are clear and comprehensive?		A
Q.23.1.3:	What information do the FMI's rules and procedures contain on the procedures it will follow in non-routine, though foreseeable, events?		B
Q.23.1.4:	How and to whom does the FMI disclose the processes it follows for changing its rules and procedures?		C
Q.23.1.5:	How does the FMI disclose relevant rules and key procedures to the public?		D

NARRATIVE



QUANTITATIVE ANALYSIS
(ASSIGNMENT OF QUESTION SCORE)



QUALITATIVE ANALYSIS
(DOCUMENTATION AND EVIDENCE)

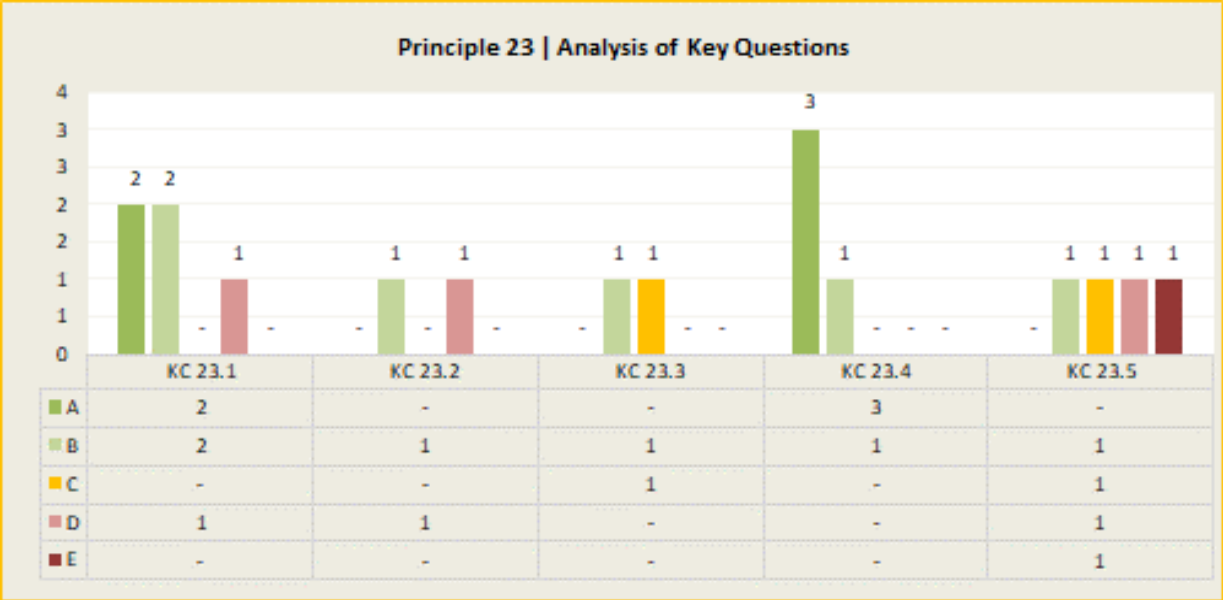
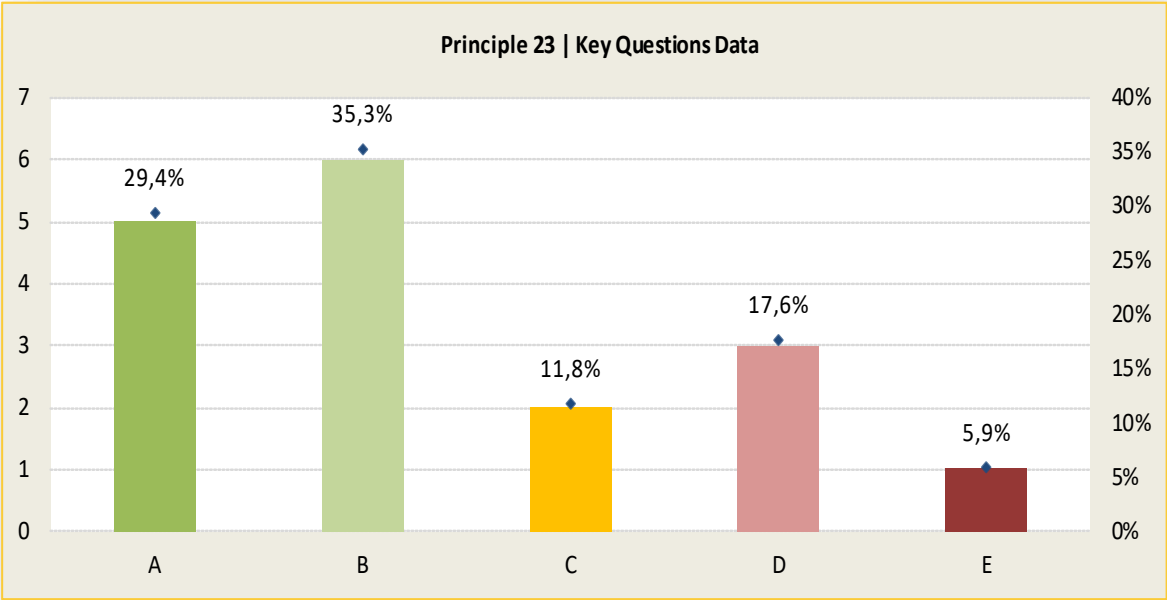
3.3. CLASSIFICATION OF KEY QUESTION COMPLIANCE



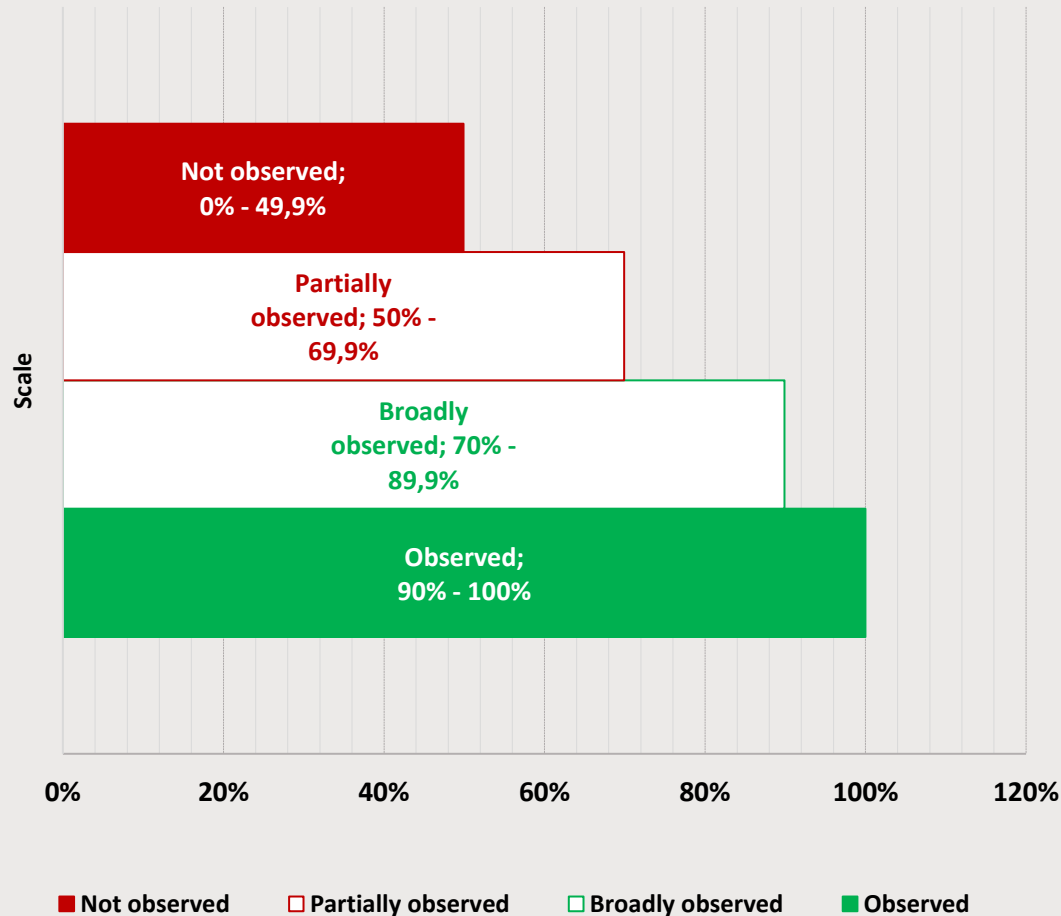
- After classifying all the key questions, the model provides more details about the assessment.

Principle 23	KC 23.1	KC 23.2	KC 23.3	KC 23.4	KC 23.5	Key Questions	[%]
A	2	-	-	3	-	5	29,4%
B	2	1	1	1	1	6	35,3%
C	-	-	1	-	1	2	11,8%
D	1	1	-	-	1	3	17,6%
E	-	-	-	-	1	1	5,9%
Total [Σ]	5	2	2	4	4	17	100%

More details and data regarding the key questions.



4.1. MEASURING THE LEVEL OF PRINCIPLE OBSERVATION



One of the features of the **PFMI Assessment Model** is the automatic measurement and classification of the level of observation of each principle.

According to the accumulated score (0% to 100%), the model classifies each principle into one of the following categories:

- **Observed:** when the principle is satisfactorily fulfilled, achieving between 90% and 100% of its observance;
- **Broadly Observed:** when the principle is satisfactorily fulfilled, but does not reach the maximum level of observance, scoring between 70% and 89.9%;
- **Partially Observed:** when the principle is only partially fulfilled, achieving between 50% and 69.9% of its observance;
- **Not Observed:** when the principle is not fulfilled or is insufficiently fulfilled, scoring between 0% and 49.9% of its observance;
- **Not Applicable:** when the principle does not apply to the FMI, therefore, it does not affect the result.


4.2. MEASURING THE LEVEL OF PRINCIPLE OBSERVATION



- With this characteristic, the assessors must concentrate only on the microprocesses (analyzing the key questions), while the model automatically performs the macroprocesses that consist of classifying the level of observance of the principles.

After classifying all the key considerations and key questions, the model assesses the principle.

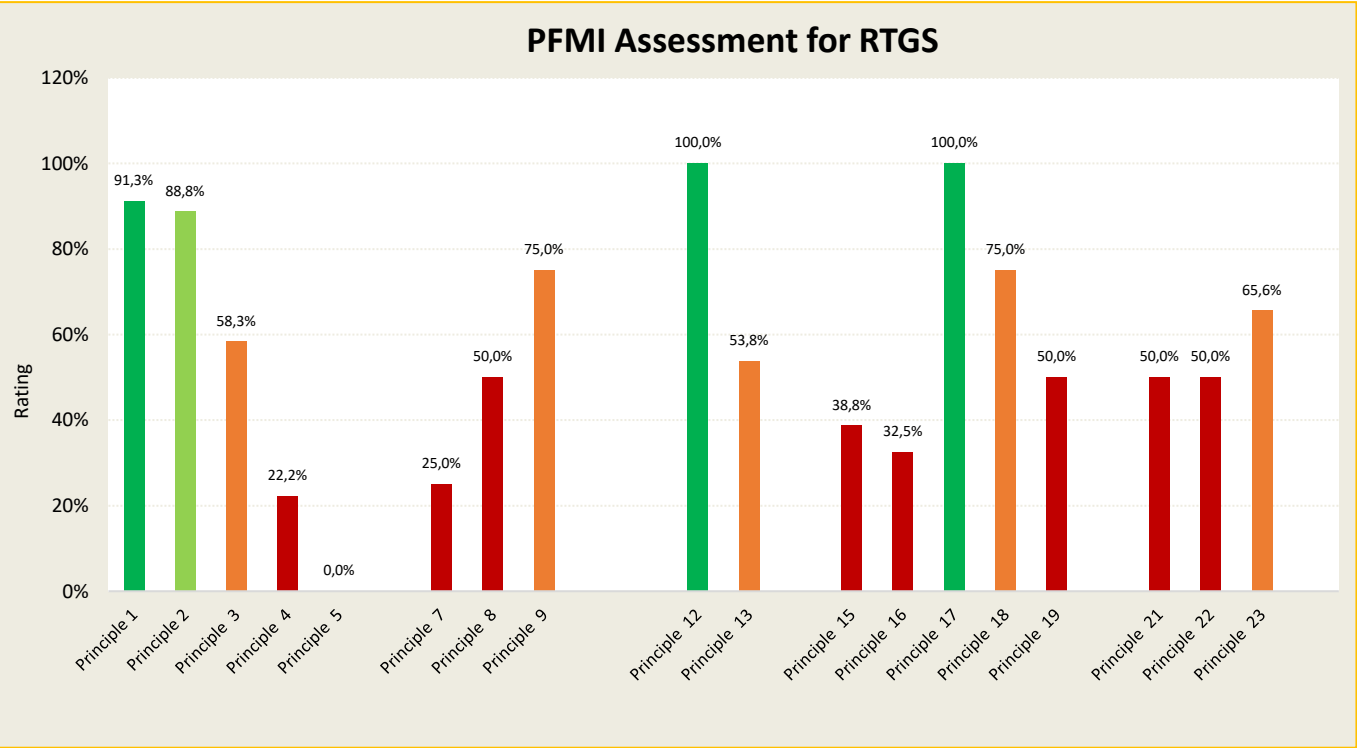
According to the accumulated score (0% to 100%), the model classifies automatically the principle.

Principle 21 - Efficiency and Effectiveness		It Applies!	Type:	RTGS	FMI:	TARGET	Rating:	 50,0%	Assessment:	Partially observed	Questions:	-
Group H - Efficiency											Weighting	[%]
<u>Principle 21 - Efficiency and Effectiveness</u> applies to PS, CSD, SSS, CCP and TR: An FMI should be efficient and effective in meeting the requirements of its participants and the markets it serves.											MC	60%
											IC	30%
											CC	10%
											Total [Σ]	100%
											Adjusted Weighting	
Key consideration 21.1:	An FMI should be designed to meet the needs of its participants and the markets it serves, in particular, with regard to choice of a clearing and settlement arrangement; operating structure; scope of products cleared, settled, or recorded; and use of technology and procedures.										Questions:	2
											Classify:	Rating:
											MC	30,0%
Key consideration 21.2:	An FMI should have clearly defined goals and objectives that are measurable and achievable, such as in the areas of minimum service levels, risk-management expectations, and business priorities.										Questions:	2
											Classify:	Rating:
											IC	15,0%
Key consideration 21.3:	An FMI should have established mechanisms for the regular review of its efficiency and effectiveness.										Questions:	2
											Classify:	Rating:
											CC	5,0%

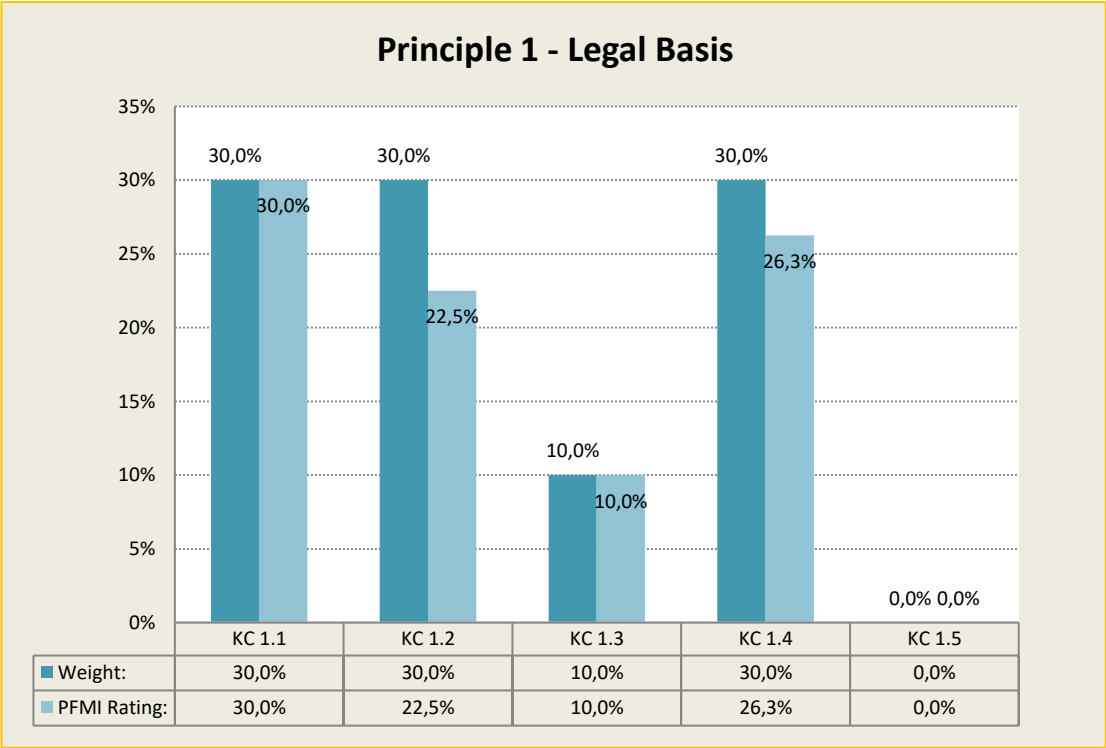
5.1. OVERVIEW OF FMI ASSESSMENT PROCESS



The **PFMI Assessment Model** provides an overview of FMI assessment, allowing assessors to clearly identify the strengths and weaknesses of the assessed payment platforms.



OVERVIEW OF FMI ASSESSMENT








DETAILS IN THE PRINCIPLES ASSESSMENT

5.2. OVERVIEW OF FMI ASSESSMENT PROCESS



Through the average assessment of each assessed principle, the **PFMI Rating** is generated that reflects the level of adherence to PFMI for the assessed platform.

CPSS-IOSCO PFMI - TARGET (RTGS)		PFMI Rating:	Assessment:
Principle 1		88,8%	Broadly observed
Principle 2		85,6%	Broadly observed
Principle 3		58,3%	Partially observed
Principle 4		20,0%	Not observed
Principle 5		0,0%	Not observed
Principle 7		25,0%	Not observed
Principle 8		50,0%	Partially observed
Principle 9		75,0%	Broadly observed
Principle 12		100,0%	Observed
Principle 13		53,8%	Partially observed
Principle 15		47,5%	Not observed
Principle 16		58,8%	Partially observed
Principle 17		100,0%	Observed
Principle 18		75,0%	Broadly observed
Principle 19		50,0%	Partially observed
Principle 21		50,0%	Partially observed
Principle 22		50,0%	Partially observed
Principle 23		60,9%	Partially observed
PFMI Rating:		 58,3%	Partially observed
CPSS-IOSCO PFMI - TARGET (RTGS)			
Observance:	Quantity	Percentage [%]	
Not observed	4		22,2%
Partially observed	8		44,4%
Broadly observed	4		22,2%
Observed	2		11,1%
CPSS-IOSCO PFMI:		18	100%

When the principle does not apply to the FMI, it does not affect the result.

More assessment data.

5.3. OVERVIEW OF FMI ASSESSMENT PROCESS

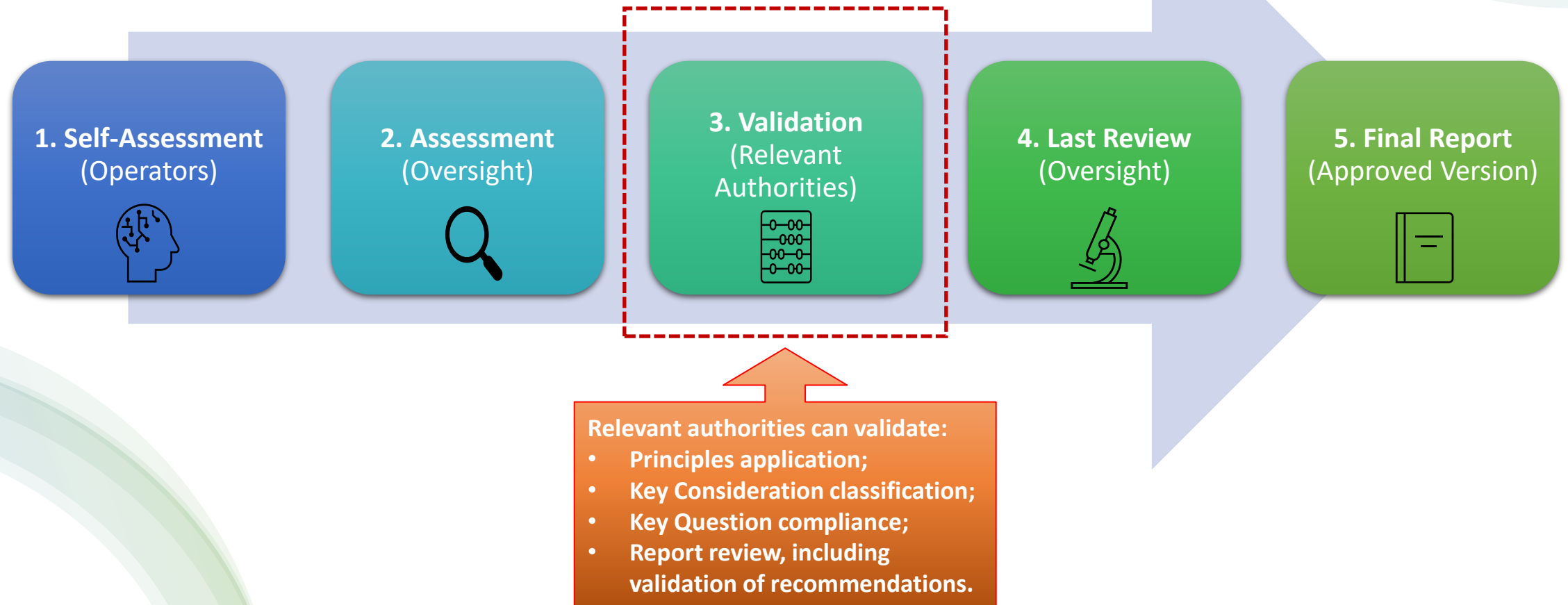


Name the Financial Market Infrastructures (FMI) →	TARGET
Select the type of FMI →	RTGS
Real-Time Gross Settlement	
PFMI Rating:	
58,37%	
Assessment:	
PARTIALLY OBSERVED	
Conclusion:	
The FMI partly observes the PFMI. The assessment has identified one or more issues of concern that could become serious if not addressed promptly. The FMI should accord a high priority to addressing these issues.	

The **PFMI Rating** is an indicator that points to the level of safety and efficiency of Financial Market Infrastructures.

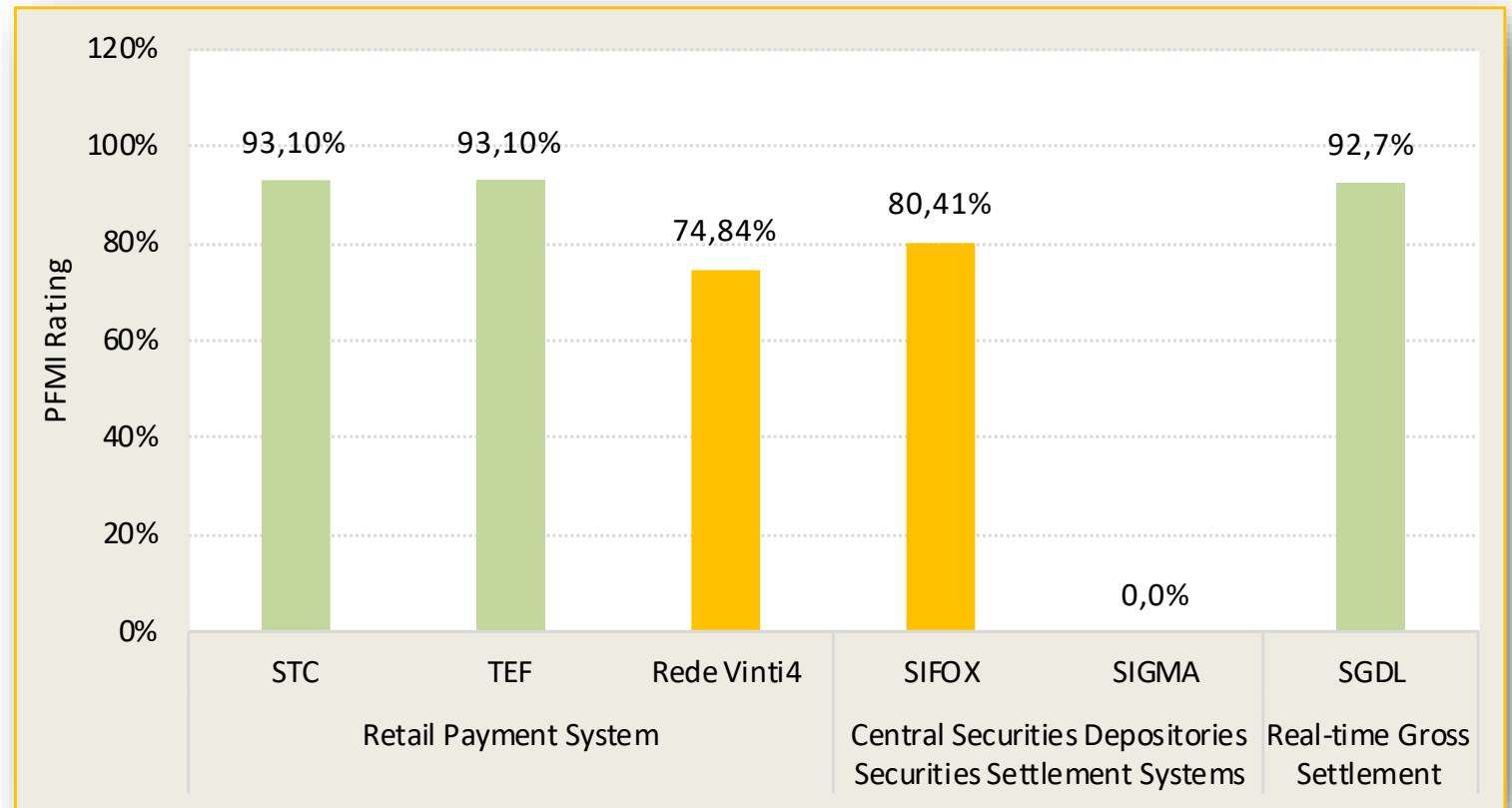


6. VALIDATION PROCESS FOR FMI ASSESSMENTS



THE CASE OF BANCO DE CABO VERDE

7.1. PANORAMIC VIEW OF CPSS-IOSCO PFMI ASSESSMENT'S



The **PFMI Assessment Model** has been applied by the **Banco de Cabo Verde** to assess five of six payment systems operating in the country over the past seven years.

To comply with the PFMI, **recommendations** were submitted to the entities responsible for the FMIs, including **Banco de Cabo Verde**.

7.2. PANORAMIC VIEW OF CPSS-IOSCO PFMI ASSESSMENT'S

24 Principles for Financial Market Infrastructures.

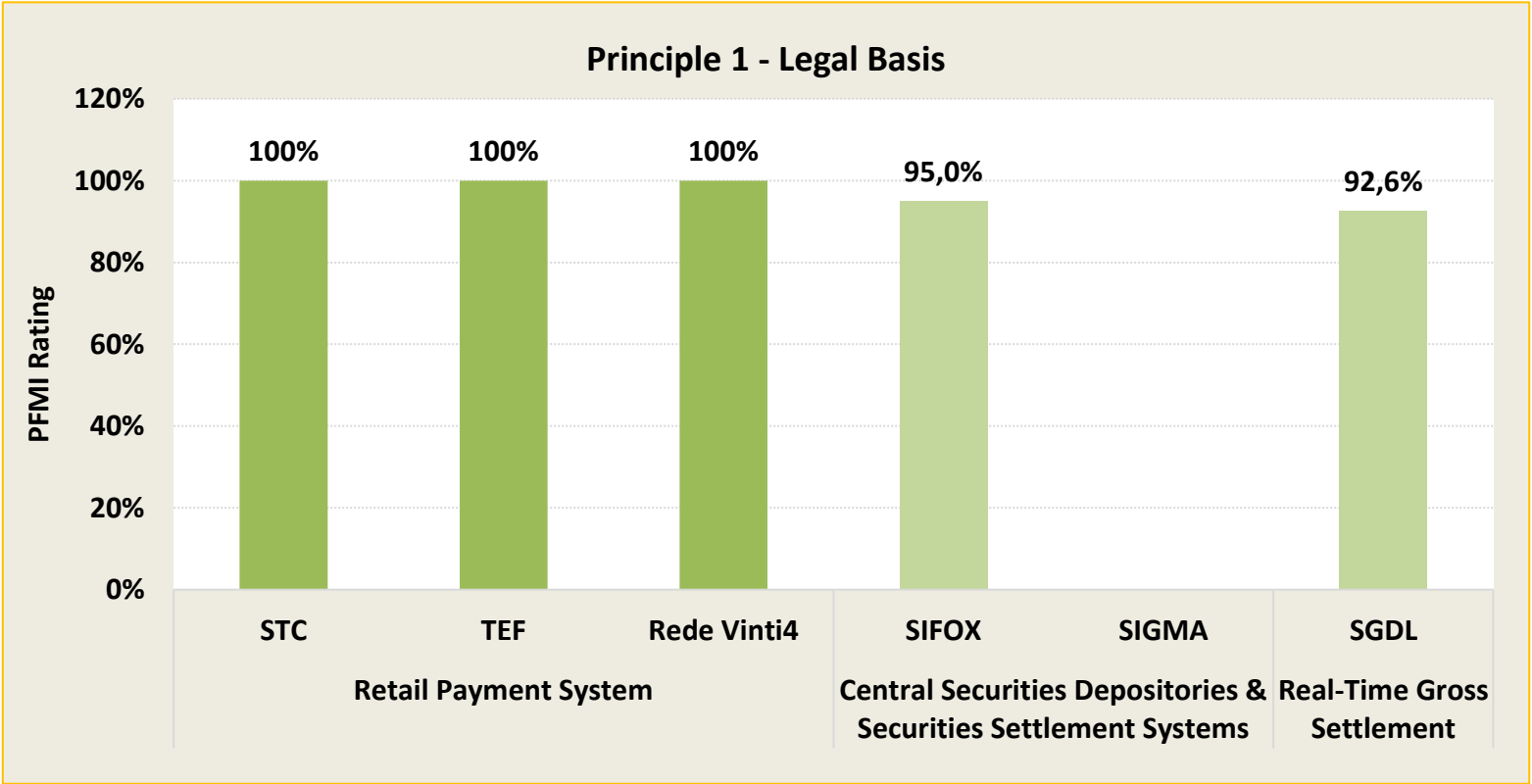
6 FMIs operating in Cabo Verde.

CPMI-IOSCO Principles for Financial Market Infrastructures	PANORAMIC VIEW OF CPMI-IOSCO PFMI ASSESSMENT'S					
	STC	TEF	Rede Vinti4	SIFOX	SIGMA	SGDL
Principle 1 - Legal Basis	100%	100%	100%	95,0%		92,6%
Principle 2 - Governance	100%	100%	100%	87,0%		96,3%
Principle 3 - Framework for the Comprehensive Management of Risks	67,9%	67,9%	71,4%	74,0%		93,6%
Principle 4 - Credit Risk	n.a.	n.a.	n.a.	n.a.		96,3%
Principle 5 - Collateral	n.a.	n.a.	n.a.	n.a.		100%
Principle 6 - Margin	n.a.	n.a.	n.a.	n.a.		n.a.
Principle 7 - Liquidity Risk	n.a.	n.a.	n.a.	n.a.		77,5%
Principle 8 - Settlement Finality	100%	100%	100%	94,4%		100%
Principle 9 - Money Settlements	100%	100%	n.a.	100%		100%
Principle 10 - Physical Deliveries	n.a.	n.a.	n.a.	n.a.		n.a.
Principle 11 - Central Securities Depositories	n.a.	n.a.	n.a.	95,5%		n.a.
Principle 12 - Exchange-of-value Settlement Systems	n.a.	n.a.	n.a.	100%		n.a.
Principle 13 - Participant-default Rules and Procedures	100%	100%	0,0%	11,0%		67,5%
Principle 14 - Segregation and Portability	n.a.	n.a.	n.a.	n.a.		n.a.
Principle 15 - General Business Risk	100%	100%	n.a.	52,6%		100%
Principle 16 - Custody and Investment Risks	n.a.	n.a.	n.a.	n.a.		100%
Principle 17 - Operational Risk	49,4%	49,4%	42,1%	45,8%		71,6%
Principle 18 - Access and Participation Requirements	100%	100%	60,0%	72,8%		100%
Principle 19 - Tiered Participation Arrangements	n.a.	n.a.	n.a.	n.a.		n.a.
Principle 20 - FMI Links	n.a.	n.a.	n.a.	n.a.		n.a.
Principle 21 - Efficiency and Effectiveness	100%	100%	100%	100%		100%
Principle 22 - Communication Procedures and Standards	100%	100%	n.a.	100%		100%
Principle 23 - Disclosure of Rules, Key Procedures, and Market Data	100%	100%	100%	97,7%		87,8%
Principle 24 - Disclosure of Market Data by Trade Repositories	n.a.	n.a.	n.a.	n.a.		n.a.
PFMI Rating:	93,10%	93,10%	74,84%	80,41%		92,7%

Cabo Verde's **PFMI Rating** is 86.83%, considering the average rating of the FMI assessment's.

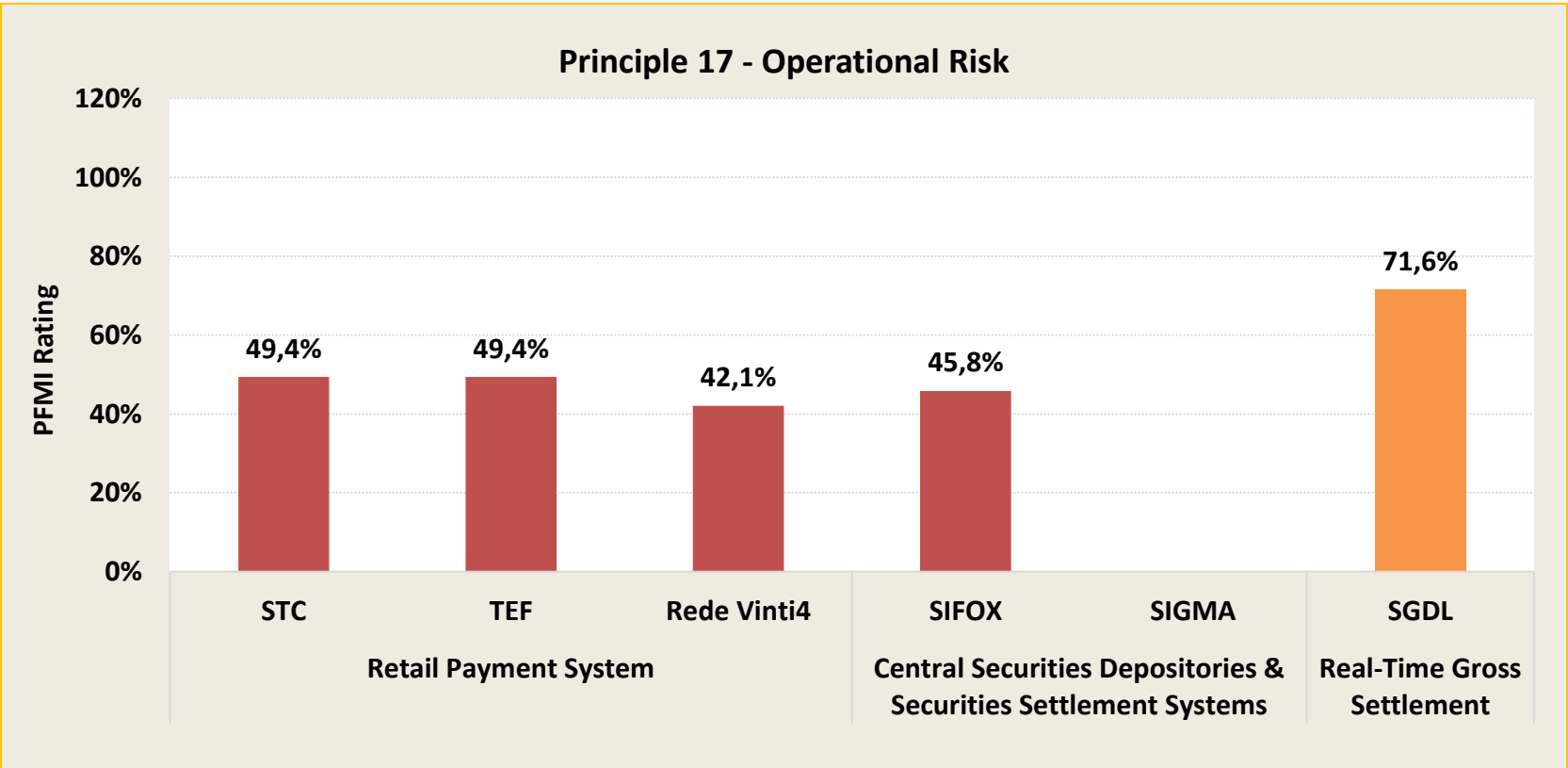
7.3. PANORAMIC VIEW OF CPSS-IOSCO PFMI ASSESSMENT’S

PFMI Rating Comparison (Principle 1 – Legal Basis): The legal foundation of FMIs is strong, clear, and compliant with national laws and regulations.



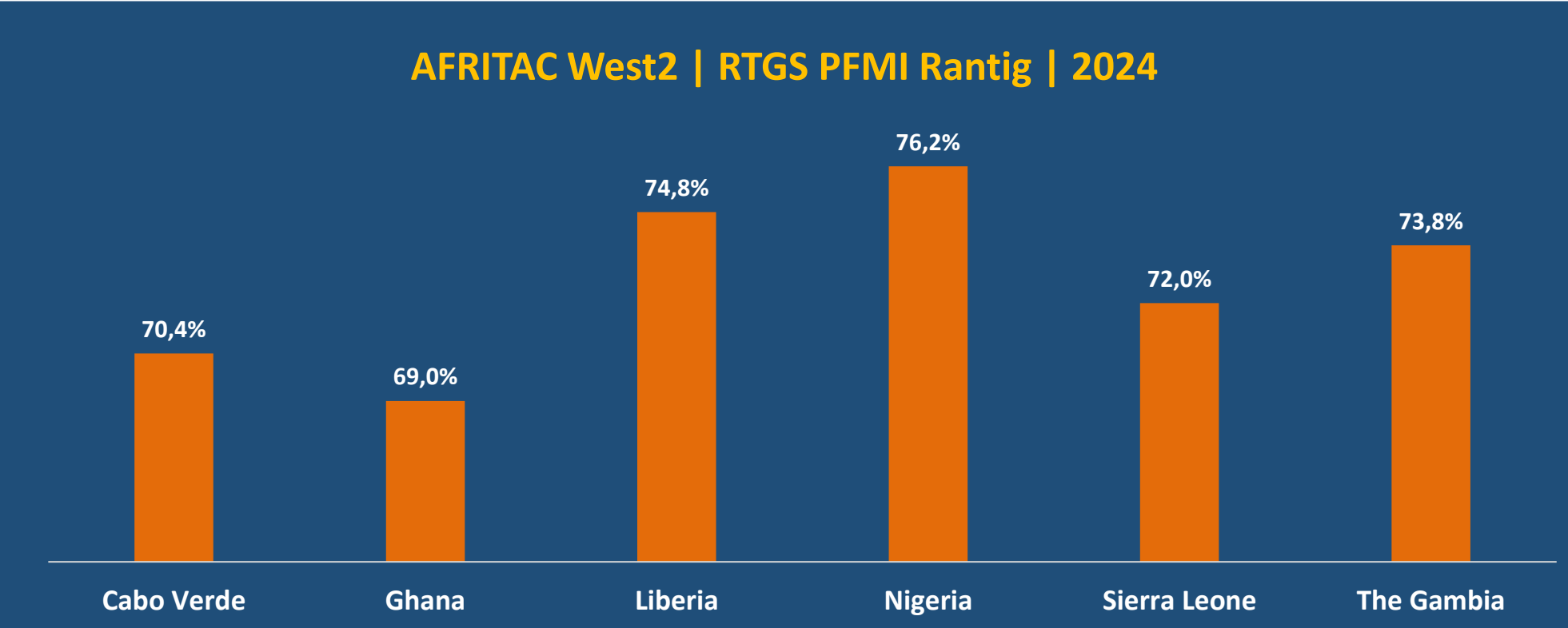
7.4. PANORAMIC VIEW OF CPSS-IOSCO PFMI ASSESSMENT’S

PFMI Rating Comparison (Principle 17 – Operational Risk): FMIs contain a few gaps and deficiencies that deserve attention, and which could become serious if not addressed immediately and with high priority.



7.5. PANORAMIC VIEW OF CPSS-IOSCO PFMI ASSESSMENT'S

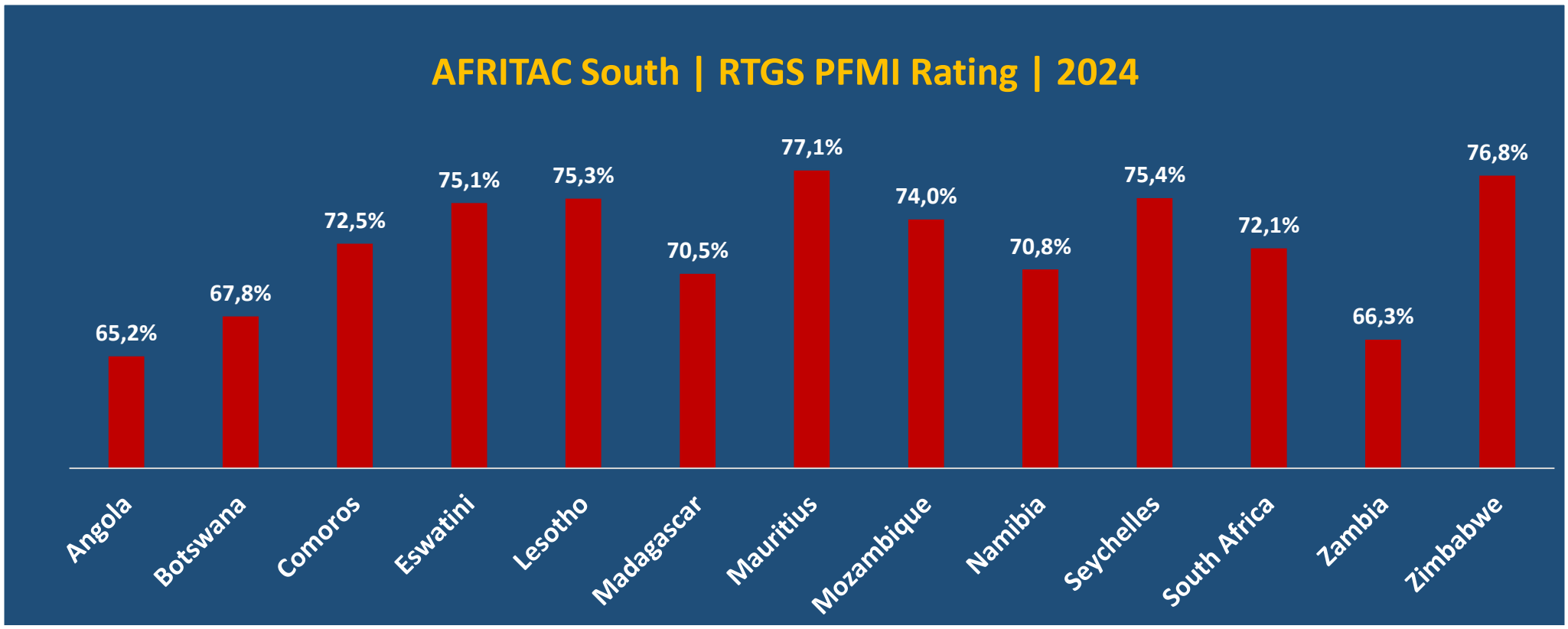
PFMI Rating Comparison: AFRITAC West2



*Note: Made-up data, intended mainly for demonstration.

7.6. PANORAMIC VIEW OF CPSS-IOSCO PFMI ASSESSMENT'S

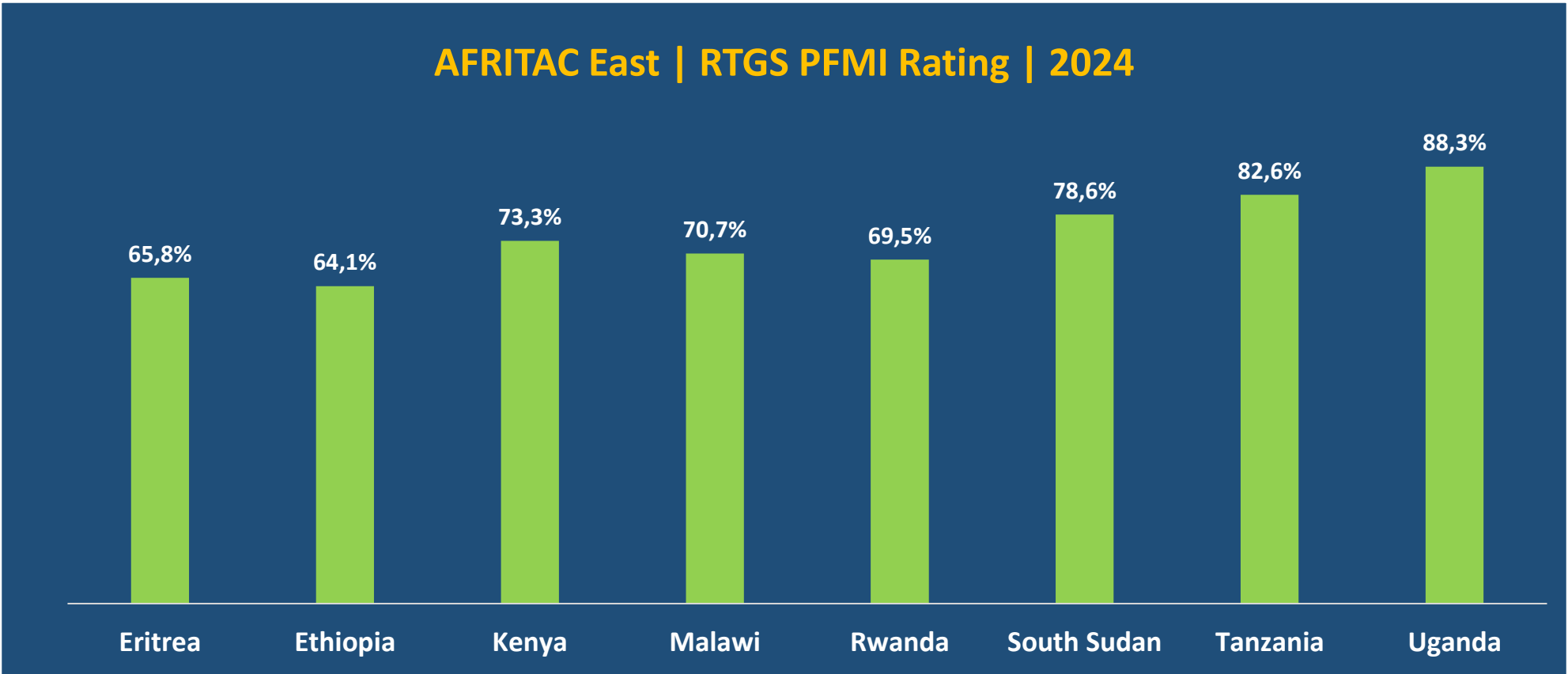
PFMI Rating Comparison: **AFRITAC South**



**Note: Made-up data, intended mainly for demonstration.*

7.7. PANORAMIC VIEW OF CPSS-IOSCO PFMI ASSESSMENT'S

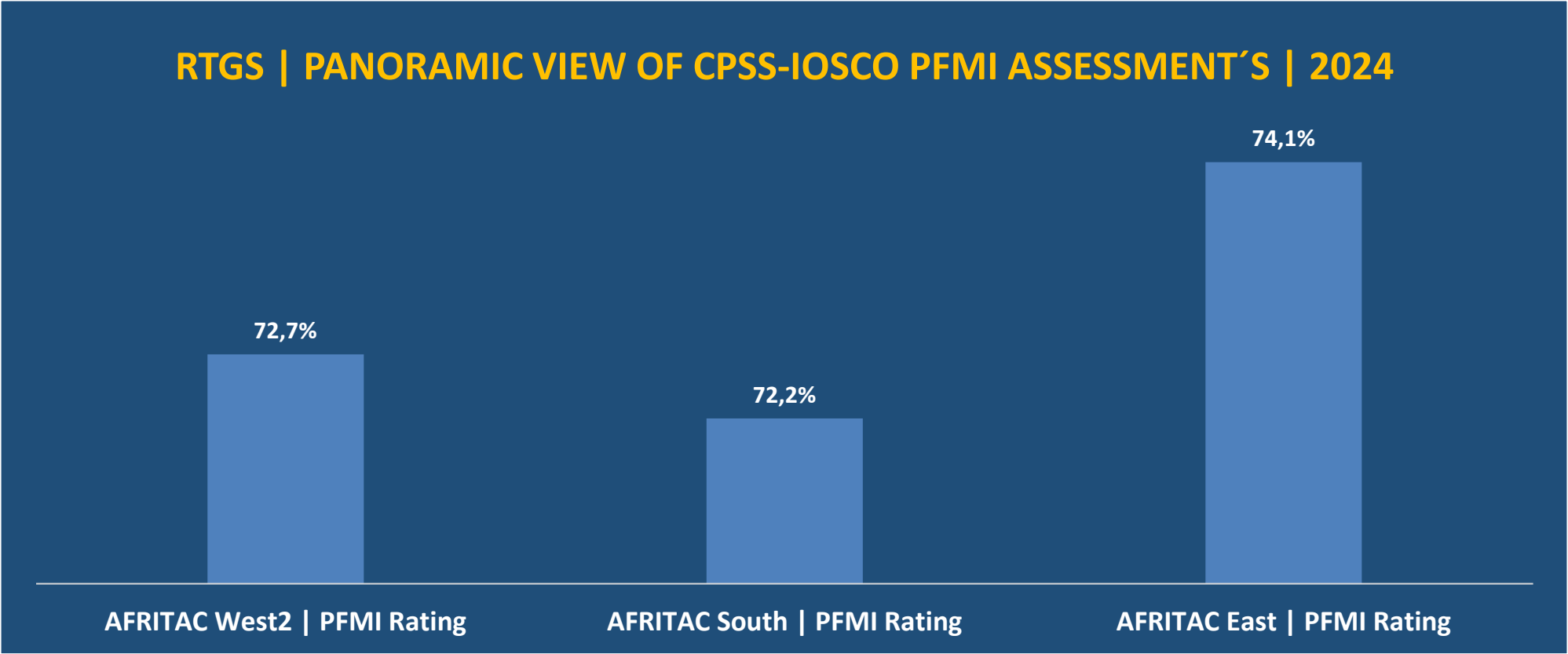
PFMI Rating Comparison: AFRITAC East



*Note: Made-up data, intended mainly for demonstration.

7.8. PANORAMIC VIEW OF CPSS-IOSCO PFMI ASSESSMENT'S

PFMI Rating Comparison: Regional



*Note: Made-up data, intended mainly for demonstration.



ADVANTAGES OF THE PFM ASSESSMENT MODEL

Measurement of FMI Assessment

Combination of Qualitative and Quantitative Analysis

Systematization of the Assessment Process

Faster Assessment Process

Ideal for Validation by Relevant Authorities

Allows for Comparison of FMI Compliance Levels

ADVANTAGES OF THE PFMI ASSESSMENT MODEL

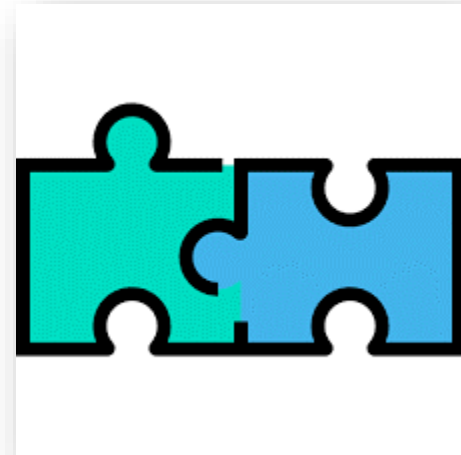
Measurement of FMI Assessment



The methodology allows for a more accurate and objective assessment of the level of compliance with PFMI, reducing [subjectivity](#) in the assessment process.

ADVANTAGES OF THE PFM ASSESSMENT MODEL

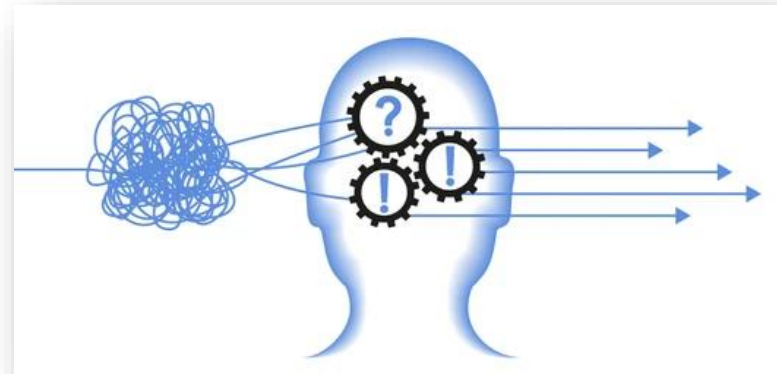
Combination of Qualitative and Quantitative Analysis



This approach allows the combination of qualitative analysis (documentation and evidence) and quantitative analysis (assignment of question score), providing a more [objective](#) assessment of PFM.

ADVANTAGES OF THE PFM ASSESSMENT MODEL

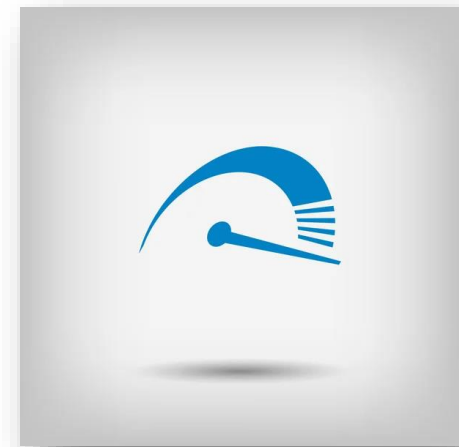
Systematization of the Assessment Process



The proposed model presents a clear and structured methodology, with objective and standardized criteria for the assessment of each principle, increasing the [transparency](#) and [consistency](#) of the process.

ADVANTAGES OF THE PFM ASSESSMENT MODEL

Faster Assessment Process



The systematization of the assessment process allows for more efficient assessments and shorter duration.

ADVANTAGES OF THE PFM ASSESSMENT MODEL

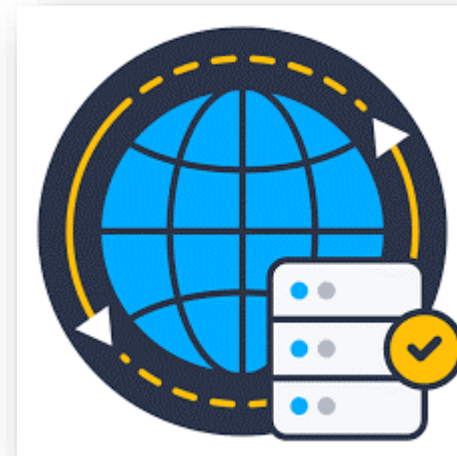
Ideal for Validation by Relevant Authorities



The model allows for greater [transparency](#) in the [validation](#) process by international and regional financial authorities, internal and external auditors, central bank boards, considering the clarity in identifying [strengths](#) and [gaps](#) in the process.

ADVANTAGES OF THE PFMi ASSESSMENT MODEL

Allows for Comparison of FMI Compliance Levels



The proposed model allows for the [comparison](#) of [compliance](#) levels with principles across different FMI and countries, which can contribute to the identification of [best practices](#) and the [improvement](#) of FMI at national and regional levels.



PREVENTION OF RISKS INHERENT TO FMI



The **PFMI Assessment Model** can help Oversight Authorities (Central Banks, Market Regulators, and other relevant authorities) avoid a series of risks inherent to FMIs that can negatively impact financial stability and the economy.



OPERATIONAL RISKS: Failure in the settlement system can lead to delays in transactions.



CYBERSECURITY RISKS: A successful attack can result in data loss and damage the institution's reputation.



LIQUIDITY RISKS: Liquidity risk of a bank that is unable to honor its financial commitments.



CREDIT RISKS: If a bank that participates in the payment system fails, this can affect the ability of other banks to honor their commitments.



LEGAL AND REGULATORY RISKS: If a financial institution does not comply with compliance standards, it may be subject to regulatory sanctions.



SYSTEMIC RISK: High exposure to credit and liquidity risk of different banks and financial institutions led to the 2008 financial crisis.

IN THE NEAR FUTURE

- **Model Evolution:** The **PFMI Assessment Model** may be created as software or as a platform, allowing central banks and international financial authorities to conduct assessments, validate evaluation procedures, and reinforce regional collaboration and networks.
- **Accelerate Improvements:** Continually looking for ways to strengthen regional platforms and reduce risks to increase the effectiveness and security of our payment systems.
- **Human Capacity:** Ongoing identification of training and workshop opportunities covering areas such as Risk Management, Operational Risk, Business Continuity Plan and Cybersecurity.





IN THE NEAR FUTURE

- **Increase “Responsibility D - Application of the principles for FMIs”:** Central banks and other relevant authorities should adopt the CPSS-IOSCO Principles for financial market infrastructures and apply them consistently.
- **Increase “Responsibility E: Cooperation with other authorities”:** Central banks and other relevant authorities should cooperate with each other, both domestically and internationally, as appropriate, in promoting the safety and efficiency of FMIs.
- **We can set Goals:** By 2030, the PFMI Rating for **Real-Time Gross Settlement** and **Cross-border Payment System** in the region should be equal or higher than 98%.

Thank you for your attention!



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QUESTIONS

