DEBT DATA QUALITY ASSESSMENT FRAMEWORK

(Debt-DQA)

Developed in joint collaboration between

UNITED NATIONS
UNCTAD

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Acknowledgments

Abstract

Reliable debt data is key to economic analysis and financial transactions. However, many debt management offices (DMOs) continue to face challenges in recording, monitoring, and disseminating debt data free from errors or omissions with a deleterious impact on the quality of subsequent statistics and analysis.

This document introduces the Debt-DQA framework and how it can be used to identify debt data quality gaps in order to reduce errors. Specifically, the framework aims to enhance the data validation process with a 'tool' embedded in the COMSEC and DMFAS debt management software which measures and assesses data errors and information gaps.

Debt management solutions and training from the international technical cooperation partners, COMSEC (Commonwealth Secretariat) and DMFAS Programme (UNCTAD), have been central to helping DMOs in numerous countries to record and monitor data in their respective debt software for decades. With the six- (6) step Debt-DQA framework, debt managers can perform a self-assessment of their debt databases to identify quality gap levels and to then implement corrective plans and measures to improve the reliability, transparency and efficiency of their debt data. Both COMSEC and DMFAS are available to provide technical assistance and to work with DMOs toward this aim.

Background Note

The key objective of both the Commonwealth Secretariat (COMSEC) and the United Nations Conference on Trade and Development (UNCTAD) is to promote practical and sustainable debt management practices by providing member countries with advisory support and tools in developing sound debt management policies, strategies and operations.

About the COMSEC

At the core of the COMSEC's debt management programme is the provision of its debt management software. The Secretariat is in the process of rolling out a new debt management software (Commonwealth Meridian) to replace the existing Commonwealth Secretariat Debt Recording and Management System (CS-DRMS). Both software consists of modules forming a suite of applications for monitoring and managing a sovereign debt portfolio. Commonwealth debt management software is installed in 60 countries across the globe (see list of countries in Annex 1).

About the DMFAS Programme

Within the Debt and Development Finance Branch of the Globalization and Development Strategies Division, the Debt Management and Financial Analysis System (DMFAS) Programme forms an integral part of UNCTAD. The Programme's core product is its software which can be used for recording, monitoring, reporting and analyzing debt information. Currently the latest version of the software is DMFAS 6 and the Programme is in the stages of developing a new version DMFAS 7. The software is currently used by 58 countries, mostly low and lower-middle income (see list in Annex 1).

Through a collaborative effort, UNCTAD and COMSEC have joined forces to develop a framework to validate the debt database and assess the quality of data recorded in their respective debt management software: DMFAS and Commonwealth Meridian.

A technical committee made up of experts from both institutions was constituted in 2017 to design and develop this framework known as the Debt Data Quality Assessment henceforth referred to as *Debt-DQA*. Its objective is to validate, assess and monitor debt data. Endorsed by the Task Force on Finance Statistics (TFFS), the framework adopts the same approach to instrument and sector classification used in international guidelines for debt data compilation and dissemination such as those found in the *External Debt Statistics: Guide for Compilers and Users* as well as the *Public Sector Debt Statistics: Guide for Compiler and Users.* [1]

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[1] The two guides are available at the TFFS website: http://www.tffs.org/. These guides do not present specific "best practices" for quality assessment related to debt data. Chapter 11 in the *EDS Guide* examines possible data sources and methods that can be used by the statistical agencies to compile public debt statistics. Table 11.2 includes the main characteristics of computer-based debt management systems. Also, this chapter in paragraphs 11.33-34 includes some procedures and actions that can support data validation in debt management systems.

Abbreviations

COMSEC	Commonwealth Secretariat
CS-DRMS	Commonwealth Secretariat Debt Recording and Management System
DeMPA	Debt Management Performance Assessment
DMFAS	Debt Management Financial Analysis System
DMO	Debt Management Office
DQAF	Data Quality Assessment Framework
DRS	World Bank's Debt Reporting System
DSA	Debt Sustainability Analysis
GL1	Budgetary Central Government
IFMIS	Integrated Financial Management and Information System
IMF	International Monetary Fund
MTDS	Medium-term Debt Strategy
OECD	Organization for Economic Co-operation and Development
PEFA	Public Expenditure and Financial Accountability
QEDS	Quarterly External Debt Statistics
QPSD	Quarterly Public Sector Debt statistics
TFFS	Task Force on Finance Statistics
UNCTAD	United Nations Conference on Trade and Development
UNFD	United Nations Fund for Development

1. Introduction

This paper presents the Debt-DQA framework, its structure and composition including a conceptual background and guidance to assess the quality of data in debt databases.

Structure of this document

This document is made up of the following seven sections:

Section 1	• Introduction
Section 2	• The data validation process
Section 3	• The database quality assessment process
Section 4	• How is quality measured in Debt-DQA?
Section 5	• How is the quality gap calculated?
Section 6	• Concluding remarks
Section 7	• Glossary and useful links
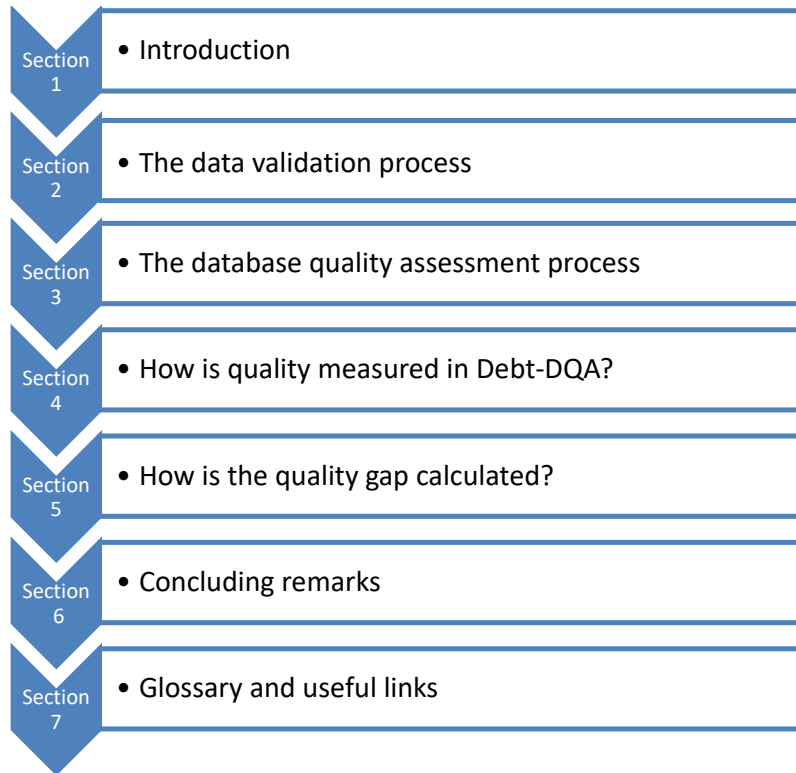
The following annexes complement the sections above**:**

Annex 1 lists the user countries of the debt management software of both COMSEC and the DMFAS Programme.
Annex 2 provides a template of a questionnaire to be submitted to DMOs as a first step in doing an assessment.
Annex 3 provides information on the structure and content of the reports on data coverage including core debt data and reference data.
Annex 4 includes an example of the Debt-DQA tool measurement for a loan instrument data and exchange rates data.

1.1 What is data quality?

1. Data quality may have several definitions depending on the context but usually refers to the fitness of data to meet its objectives in terms of reliability, comprehensiveness, timeliness and accuracy.
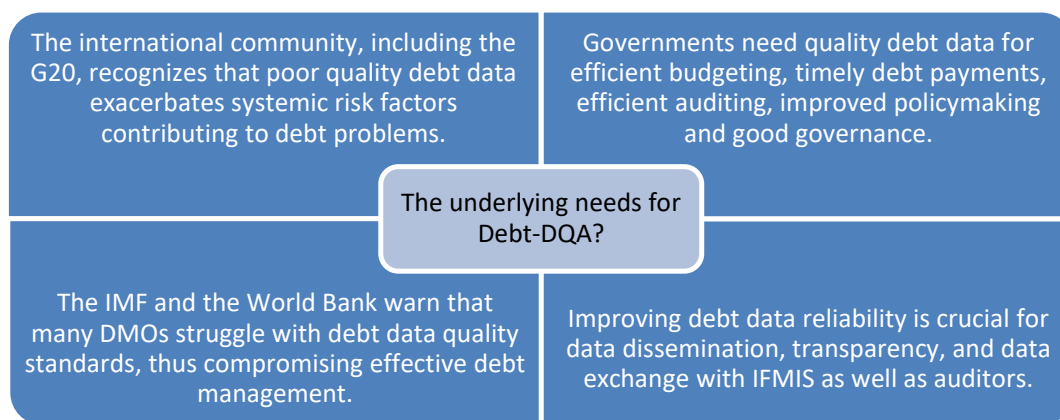
> ISO 9000, published in 2015, defines data quality as "the degree to which a set of characteristics of data fulfills requirements". Examples of characteristics are completeness, validity, accuracy, consistency, availability and timeliness. Requirements are defined as the need or expectation that is stated, generally implied or obligatory.

2. In the context of this paper, data quality refers to the reliability of debt data collected and compiled by the debt offices for reporting, dissemination, analysis and policymaking. With Debt-DQA, data quality is assessed at the recording level of each debt instrument and transaction. *Quality assessment is the part of quality assurance that focuses on an assessment of how well quality requirements (the stated needs or expectations) are fulfilled*[2].

1.2   Why debt data quality?

3. Public debt is one of the largest portfolios of a country's economy forming an integral part of its overall development. Public debt management plays a significant role in economic and financial stability.

The international community, including the G20, recognizes that poor quality debt data exacerbates systemic risk factors contributing to debt problems.	Governments need quality debt data for efficient budgeting, timely debt payments, efficient auditing, improved policymaking and good governance.
The underlying needs for Debt-DQA?	
The IMF and the World Bank warn that many DMOs struggle with debt data quality standards, thus compromising effective debt management.	Improving debt data reliability is crucial for data dissemination, transparency, and data exchange with IFMIS as well as auditors.

4. The importance of debt data transparency and availability is acknowledged by the international community[3] through several forums and initiatives including the Addis Ababa Agenda for Action [4](UNFD 2015), and G20[5] note (June 2018). Both highlight the critical role of debt transparency to evaluate the sustainability of public debt and monitor emerging risks. Improving transparency in public debt management ensures timely, reliable and

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[2] https://unstats.un.org/unsd/methodology/dataquality/references/1902216-UNNQAFManual-WEB.pdf

[3] In 2018, the G20 shared its concern about the rising debt levels and debt vulnerabilities in Low Income Countries (LICs) economies and concluded that enhancing information sharing could assist in preventing future debt distress in LICs. It called for greater transparency, both on the side of debtors and creditors. Similarly, the United Nations General Assembly reiterated that timely and comprehensive data on the level and composition of debt are necessary for, inter alia, building early warning systems aimed at limiting the impact of debt crises, and called for debtor and creditor countries to intensify their efforts to collect and release data.
See Communiqué, G20 Finance Ministers and Central Bank Governors Meeting, Buenos Aires. (Mar.19-20,2018) at https://www.g20.org/en/news/communique-first-g20-meeting-finance-ministers-and-central-bank-governors-2018
See Resolution adopted by the United Nations General Assembly on 20 December 2018 A/Res/73/221

[4] https://www.un.org/esa/ffd/wp-content/uploads/2015/08/AAAA_Outcome.pdf

[5] https://www.imf.org/external/np/g20/pdf/2018/072718.pdf

complete debt data. Moreover, the G20[6] note (June 2018) particularly stresses the need for the international community to help low and lower middle-income countries build capacity in the area of debt recording and reporting.

5. At the national government level, a comprehensive and quality debt database is essential for effective budgeting, timely debt service operations, reliable figures of debt stocks and flows as well as for more successful auditing. Moreover, the availability of reliable and timely debt statistics impacts the quality of debt analysis and policymaking for achieving sustainable debt levels. Therefore, as governments strive for higher efficiency, transparency and good governance, DMOs require tools and resources to ensure the highest levels of debt data quality standards.

6. Achieving high quality of debt recording remains a key challenge[7] for most DMOs. The International Monetary Fund and the World Bank conducted a study[8] on the issues related to the compilation of debt data in a number of countries. It reviewed the results of DeMPA[9] (Debt Management Performance Assessment) up to the year 2016 and concentrated on the evolution of five main areas of the DeMPA methodology related to debt management. Among its findings, the report mentions that "debt recording and operational risk management … remain one of the weaker core functions across several debt offices".

7. Weakness in debt recording may lead to erroneous debt data, which can easily flow from one system to another, degrading the quality of data across all financial systems and subsequent operations and reporting. As debt databases integrate with other financial management information systems known as an Integrated Financial Management System (IFMIS) electronic data exchange has to be assessed and checked otherwise it generates a high operational risk for the overall system. At the same time, new and complex debt instruments and debt dissemination requirements concerning debt coverage are continuously leading to larger and complex amounts of data being recorded and maintained in debt databases. This increase in the size and complexity of debt databases combined with the proliferation of information systems has amplified the magnitude of data quality issues and its associated risks.

8. Implementing sound policies and processes to continuously assess and monitor the quality of debt data leads to improved data availability and transparency.

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[6] https://www.imf.org/external/np/g20/pdf/2018/072718.pdf

[7] For some financial institutions, managing data quality is a requirement: for example, data quality is an explicit requirement for Basel II compliance and banks must follow robust data management practices to ensure the underlying data quality.

[8] *IMF (2017). The Medium-term Debt Strategy: An Assessment of Recent Capacity Building*, IMF Policy Paper. The IMF's and World Bank's Medium-term Debt Strategy (MTDS) helps governments to implement sound debt management for the three-to-five-year horizon.

[9] DeMPA is a methodology for assessing public debt management performance through a comprehensive set of indicators spanning the full range of government debt management functions. It was initially developed by the World Bank in cooperation with its international partners during 2007–2008.

1.3 What is Debt-DQA?

9. The Debt-DQA in essence aims to identify data errors, gaps or "bad data" and to measure their impact on the overall data quality of the database. This information is of value to all stakeholders and pinpoints areas needing improvement, especially but not exclusively, in the back office.

| Duplicate data | Missing data | Inaccurate data | Incorrect data |

10. The Debt-DQA framework assesses and monitors the quality of data recorded in the database throughout the entire life cycle of a debt instrument, from its inception to maturity, in addition to its related reference data. It consists of:

   a. The data validation process: an ongoing, comprehensive process to review and correct the recording and monitoring function of a DMO and to ensure the reliability of data. It consists of data cleansing and reconciliation. It ultimately reveals the status of the database in terms of completeness, accuracy and timeliness.
   b. Database quality assessment: an important sub-activity of the data validation process via the Debt-DQA tool integrated in the debt management software. The Debt-DQA tool offers a structured approach to data validation. Based on a set of components and indicators, it measures the accuracy, timeliness and coherence of the data recorded in the database.

11. Database quality assessment via the Debt-DQA tool can be considered a necessary condition but not a guarantee for reliable data given that its assessment is performed strictly on the data recorded in COMSEC or DMFAS software. Consequently, data validation, as a more comprehensive process, plays a vital role through systematic checks of the information going to and coming from lenders, the treasury unit, the accountant general and even the front office. An example is a debt instrument recorded in Excel outside the COMSEC or DMFAS software.

12. Reliability is best evidenced with an analysis of the quality of the statistical bulletin and other institutional publications. For instance, estimated data fits closer to the actual data in the following period and is coherent with data published in other reputable sources, such as the World Bank and IMF. Because the debt statistical bulletin is the primary and trusted source of debt information for all stakeholders, any small discrepancies or variations can easily be rectified.

1.4 Objectives and benefits

13. The Debt-DQA framework focuses strictly on the recording and monitoring aspects of the debt management unit, unlike other assessment methodologies (such as DeMPA and

DQAF[10]) which encompass debt management performance, procedures, standards and practices that can go beyond the DMO's mandate and control. Debt-DQA assesses data in more detail than other assessment methodologies.

14. The Debt-DQA framework enables countries to:

a) detect and quantify errors and gaps in debt databases
b) highlight the amplitude and risks these errors and gaps represent to the debt database
c) facilitate the design of a work plan and calendar of activities, with the provision of technical assistance, to remedy the problems identified
d) monitor the progress of debt data quality over time
e) provide a basis for the cross-country comparison of debt data quality, regardless of the debt management software used[11].

15. Consequently, DMOs will benefit from Debt-DQA in order to:

a) maintain a reliable debt database for comprehensive reporting, quality debt statistics[12] and analysis[13], improved data transparency and data exchange with other systems such as IFMIS
b) build internal capacity to perform debt data quality control to ensure the reliability of debt data in the long run
c) foster data recording and validation procedures, which they can share with internal and external auditors or use for a DeMPA assessment

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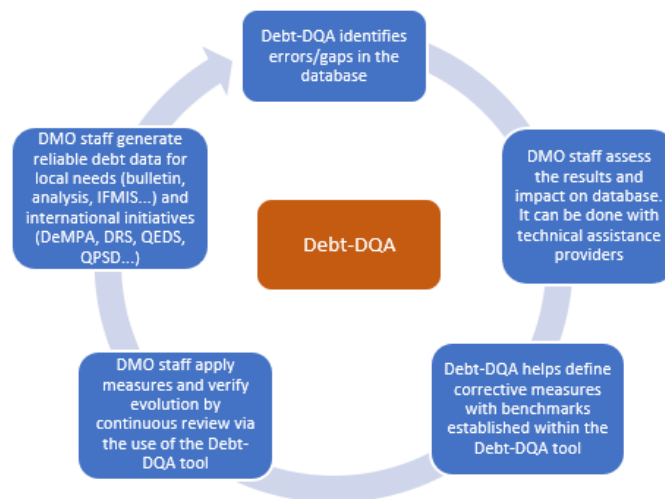
[10] The Data Quality Assessment Framework (DQAF) developed by the IMF with the help of the global statistical community. It is a framework of internationally accepted statistical practices against which to assess the quality of data.

[11] Depending on whether the country wishes to share results of the debt data quality assessment.

[12] Debt statistics includes reports produced internally and with international initiatives (example: the World Bank's Debt Reporting System (DRS), the Quarterly External Debt Statistics (QEDS) and Quarterly Public Sector Debt statistics (QPSD)).

[13] Debt analysis consists of reports for debt sustainability and preparation of debt strategy (for example, DSA[13] and MTDS) and borrowing plan.

1.5   Outputs

16. The application of Debt-DQA framework within a DMO provides two main outputs:
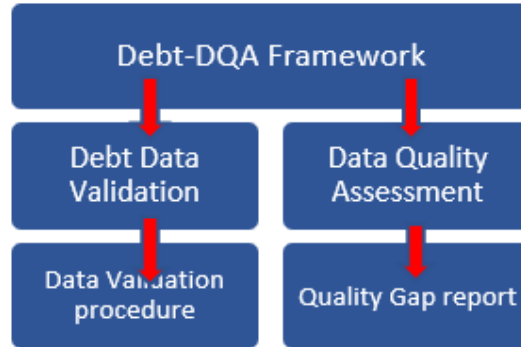
- Debt data validation procedure including a calendar of actions to be executed by the DMO to ensure the reliability of data.

- Quality assessment reports with detailed and aggregated results revealing the quality gaps in the debt database. These results are based on predefined tolerance limits and corresponding quality levels for a determined period.

1.6   Outcomes

17. Debt-DQA will afford better conditions for the DMO to improve its capacity for recording, processing and monitoring debt data. This will in turn contribute to improving debt operations, debt statistics[14] and analysis for better decision-making. In addition, it will lead to a strengthened capacity to manage debt more effectively, transparently and sustainably thereby contributing towards the global development objectives of good governance, poverty reduction and economic development.

18. Another major outcome is that Debt-DQA, a powerful tool, assists and facilitates the auditing process. Many DMOs are subject to internal audits within their own Ministry or Central Bank, or external audits from another institution such as the General Accounts Office or the Court of Auditors.

19. Audits can focus on compliance (Is debt within limits, codes or policy?), financial data (Is the database free from fraud or error?), and/or performance (Is the DMO upholding principles, efficiency, effectiveness and international best practices?). The data validation process can answer most of the queries auditors may have during an audit. Debt-DQA will respond to specific requests such as how free the database is of errors and whether the debt management is within international standards. Through customization of its settings, the framework can also analyze whether the DMO is achieving its thresholds as well as assess certain risks in the data that may under- or overestimate stocks and flows.

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[14] Improving the capacity of countries to produce high-quality statistics is covered under SDG 17.18, *Data, monitoring and accountability*.

1.7   Conditions for the implementation of Debt-DQA

20. A key strength of Debt-DQA is its simplicity. It allows DMO staff to easily undertake the assessment on their own. However, a DMO may be operating under less than ideal conditions or staff experience may be limited or hampered by the high expectations of authorities. In that case, it is recommended to implement Debt-DQA in collaboration with a technical assistance provider such as the DMFAS Programme or COMSEC.

21. Applying Debt-DQA is not a one-off exercise. DMOs should be prepared to implement it repeatedly and periodically to monitor progress and to evaluate the database status with regard to gaps and problem areas. This analysis is complemented by a detailed corrective action plan to be executed by the DMO.

1.8   Debt-DQA and other international assessment initiatives

22. Debt-DQA complements other international assessment initiatives on debt management and public financial management performance (DeMPA and PEFA), and institutional environment and statistics (DQAF). Table 1 below offers an overview of the objectives, structure, scope, outcomes etc. of these initiatives.

23. The Debt-DQA tool adds granularity to these initiatives by specifically targeting the data recorded in a country's debt management software. The Debt-DQA tool provides a distinctly automated assessment based on algorithms developed by COMSEC and UNCTAD as opposed to other tools which offer merely manual assessment.

Table 1
Overview of Some International Assessment Initiatives

	DeMPA	DQAF	PEFA	Debt-DQA
Brief Description	The Debt Management Performance Assessment (DeMPA) is a methodology for assessing public debt management performance through a comprehensive set of indicators spanning the full range of government debt management functions (https://www.worldbank.org/en/topic/debt/brief/dempa-2015)	The IMF's Data Quality Assessment Framework (DQAF), which is used for comprehensive assessments of countries' data quality, covers institutional environments, statistical processes, and other characteristics (https://dsbb.imf.org/dqrs/DQAF)	PEFA is a methodology for assessing public financial management performance. It identifies 94 characteristics (dimensions) across 31 key components of public financial management (indicators) in 7 broad areas of activity (pillars). (https://www.pefa.org/)	The Debt Data Quality Assessment (Debt-DQA) framework is a quality assessment tool to measure the quality of the data recorded in the debt recording software. It also complements the Data Validation process.
Structure	DeMPA comprises 5 core areas, which are applied to evaluate the capacity of the sovereign borrower to manage the government debt portfolio.	DQAF's coverage includes institutional environments, statistical processes, and characteristics of statistical products.	PEFA identifies 7 pillars of performance that are essential to achieving the objectives.	Debt-DQA consists of a Data validation process complemented by a quality assessment process with 6 steps and an automated tool within the debt management software.
Scope	Government debt management operations and the overall environment in which these operations occur.	National statistical systems including statistical processes and products	Public Financial Management systems, processes, and institutions.	Debt-DQA is based on the coverage of data recorded in the debt management systems.
Indicator Categories	DeMPA comprises 14 debt performance indicators and 33 dimensions.	DQAF is organized around a set of prerequisites and 5 dimensions of data quality.	PEFA defines 31 specific indicators disaggregated into 94 dimensions that focus on key measurable aspects of the PFM system.	Debt-DQA is based on 3 quality dimensions and a set of predefined components and indicators.
Outcome	DeMPA highlights strengths and weaknesses in government debt management practices.	DQAF guides IMF staff on the use of data in policy evaluation, guides country efforts to prepare self-assessment and guides data users in evaluating data for policy analysis, forecasts, and economic performance.	PEFA enables governments to identify how PFM systems can be improved in a way that encourages countries to achieve their development goals.	Debt-DQA identifies potential area of data improvement in the debt management software based on analysis and investigations of issued detected.
Scoring Method	Scores by A, B, C and D on the various DeMPA dimensions	Results by Practice (O, LO, LNO, NO, NA)	Scores by A, B, C and D on the various PEFA dimensions	Results showing the gaps are expressed in percentages with three levels of corrective measure urgency.
Application	Self-assessment and/or assisted	Self-assessment and/or assisted	Self-assessment and/or assisted	Self-assessment and/or assisted
Assessment Method	Manual by use of documentation	Manual by use of documentation	Manual by use of documentation	Automatic assessment embedded in the debt management software

2. The data validation process

24. Debt data validation is an ongoing process of ensuring that data is complete, accurate and consistent within the DMO and beyond. A database quality assessment via the Debt-DQA tool is part of this process and is designed to complement data validation for optimal results.

25. Data validation centers on the assessment and reconciliation of the data entered in the debt management software which includes scrutinizing source documents such as the following:

Table 2: Source Document Examples

Examples of Debt Data	Examples of Source Document
Terms & Conditions of a Loan	Loan agreements and amendments
Actual Transactions	Creditor's advice, billing statement, treasury account statements
Reorganization Terms	Agreed minutes of the Paris Club, bilateral agreements, etc.
Reference Information	Source information for exchange rates and variable interest rates

2.1   The data validation dimensions

26. Data validation addresses three dimensions: completeness, accuracy and consistency based on the premise: "What can go wrong when recording and maintaining a debt database?" This question can be answered with these three points:

   a) Agreements and/or transactions may be missing (**completeness**). Some examples: unrecorded" hidden" debt, guaranteed loans not reported and missing from the database, and changes or amendments not captured.
   b) Agreements and/or transactions recorded erroneously (**accuracy**). Some examples: mistakes in classification, misinterpretation of characteristics, or data entry errors etc.
   c) Conflicting information about the same debt (**consistency**). For example: Data series, charts and reports regarding outstanding amounts, stock of arrears, penalty etc. may be different. However, in some cases, depending on context and definitions, inconsistency can occur and co-exist only if these figures are clearly indicated and explained.

27. Table 3 summarizes each of the dimensions of data validation:

Table 3: Dimensions of Data Validation

Dimension	Description
Completeness	**Having all its necessary parts and elements.** All debt information in the database at a specific point in time, taking into account the time-lag.
Accuracy	**Correct, free from error or defect.** All information entered into, processed and reported from the debt recording system meeting the determined standards of accuracy.
Consistency	**Differences can be explained.** Data series and reports may be different. Any differences in timing, methodology, coverage, etc. must be indicated.

2.2   Data validation checks

28. Debt data validation is an ongoing exercise, which requires collecting data from various sources. It involves cross-checks to detect bad data so that any necessary adjustments can be made. The checks address the following questions:

   a. Which debt data needs to be validated? (With whom? When? How?)

   b. What needs to be prepared in terms of reports?

   c. What can one expect to get from the other departments?

   d. With what frequency should validation be undertaken with different institutions?

29. These checks should be based on written procedures (data validation procedures). These should include a calendar of actions and checks to be regularly executed by the back-office. Each check should be done according an assigned periodicity (for example, submit a formal request for reconciliation of data with known creditors and debtors on a yearly basis).

30. There are three modalities of implementation which are complementary. First do a *complete data validation* of the database to assess its reliability, discover problems and draft solutions for the work plan and calendar to correct the errors. Afterwards, *specific periodic checks* to be performed daily, weekly, monthly, and quarterly/annually depending on the type of checks. Finally, a complete validation can be done at least once a year to achieve excellent "database hygiene" (see below).
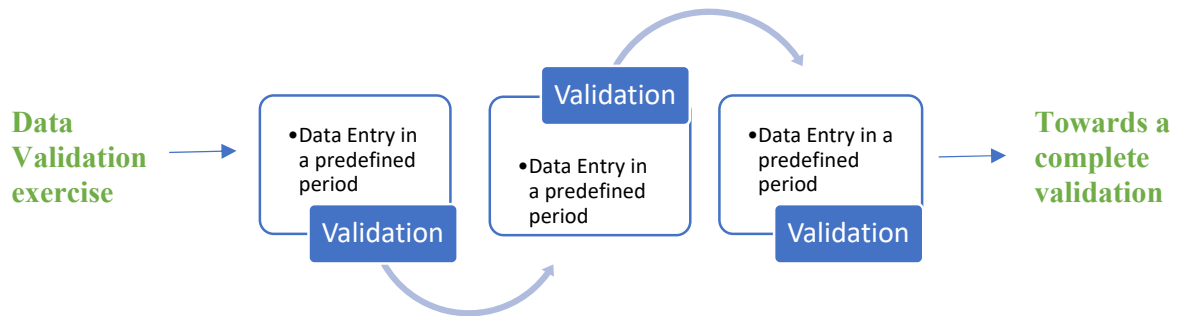
31. Checks should be done in the following sequence:

Step 1	**Request information from outside sources** (example: notifications sent to creditors for debt position reconciliation)
Step 2	**Collect source data** (example: copies of loan agreements)
Step 3	**Perform cross checks** (example, loan details, outstanding balances, drawings, payments)
Step 4	**Find mismatches** (example: outstanding balance recorded < outstanding reported by creditor or actual drawings amounts recorded < amounts reported by the creditor)
Step 5	**Apply necessary changes** (example: record missing actual drawings)

32. In practice, successful implementation of the data validation procedure depends highly on the skills and experience of the national debt officers in charge of its implementation and the approval of the procedure by well-informed authorities in the debt office.

33. The success of the debt data validation process is especially determined by the will of senior management and their support for improving the skill set of the DMO staff.
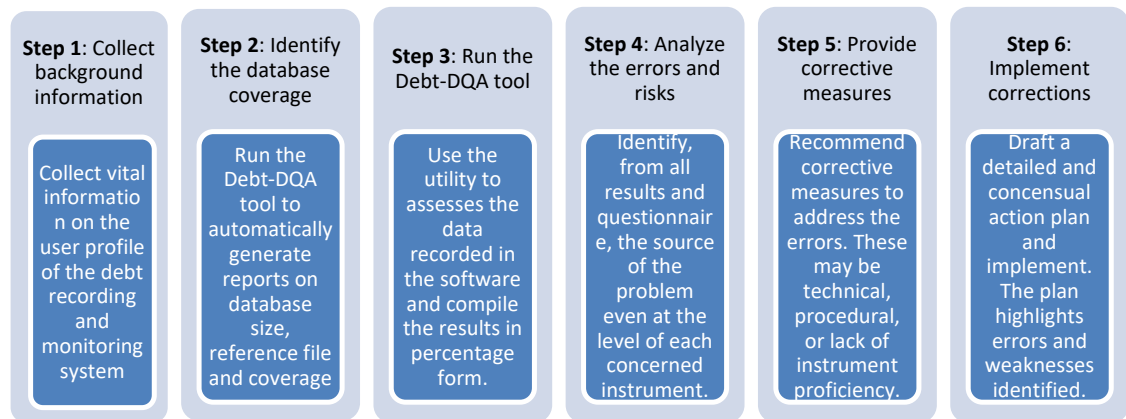
3. The database quality assessment process

34. An assessment of the quality of the data recorded in the database detects "bad data" and identifies areas for improvements. It is designed to cover "critical data". Critical data consists of any data that has an impact on the instrument flows/transactions and/or stocks/balances.

35. The Debt-DQA tool embedded in the debt recording software automatically performs an assessment of the data recorded in the database.

36. The Debt-DQA tool is a standalone utility integrated with the two most commonly used debt management software: DMFAS and Meridian. Designed to be automatic, rapid, and simple to apply, it enhances internal recording and monitoring procedures thereby improving data reliability.

3.1   The 6 steps of the quality assessment process

37. The Debt-DQA assessment process is done in six steps. This process offers a full diagnosis of the practices of the DMO with respect to the recording and monitoring of their debt data. It can be carried out as a self-assessment activity or with assistance from a technical provider. It should be repeated periodically to monitor progress. A prerequisite to conducting the quality assessment is the implementation of at least one data validation.

38. The six steps of the quality assessment process are described below:

Step 1: Collect background information	**Step 2**: Identify the database coverage	**Step 3**: Run the Debt-DQA tool	**Step 4**: Analyze the errors and risks	**Step 5**: Provide corrective measures	**Step 6**: Implement corrections
Collect vital information on the user profile of the debt recording and monitoring system	Run the Debt-DQA tool to automatically generate reports on database size, reference file and coverage	Use the utility to assesses the data recorded in the software and compile the results in percentage form.	Identify, from all results and questionnaire, the source of the problem even at the level of each concerned instrument.	Recommend corrective measures to address the errors. These may be technical, procedural, or lack of instrument proficiency.	Draft a detailed and concensual action plan and implement. The plan highlights errors and weaknesses identified.

3.2   Step 1: Collect background information

39. The first step consists of collecting vital information on the user profile of the debt recording and monitoring software. A questionnaire is available in Annex 2. DMOs can adapt it, as required, to do this task. The answers obtained provide an overview of the environment in which the system is operating and provide valuable clues in identifying the sources of problems.

3.3   Step 2: Identify the database coverage

40. After completing the first step, the user runs the Debt-DQA tool in the debt management system: Commonwealth Meridian or DMFAS. Two reports are generated showing the total number of recorded instruments and reference files as well as the data coverage. Quality assessment reports are limited to key data recorded in the software.

41. The first report (Debt Data Coverage) presents the type of debt data recorded in the system (external, domestic, private external debt, external guaranteed debt, etc.), institutional coverage and type of instruments. This report can be mapped to both the External and the Public Sector Debt Guides to assess conformity and identify gaps. The second report

(Reference Data Coverage) provides information on participants[15], interest rates and exchange rates.

3.4   Step 3: Run the Debt-DQA tool

42. Once the Debt-DQA tool is activated in the debt recording software, it is then parameterized to measure all indicators according to predefined tolerance limits. It automatically calculates quality gaps displaying the results on a detailed and aggregated basis.

43. The quality dimensions measured by the tool are the "accuracy" of the data, the "timeliness" of the recording and the "coherence" of amounts and figures (see Table 4). For example, it complements the internal validation [16] embedded in the software by revealing and highlighting potential errors such as missing data. It also indicates whether data recorded lacks timeliness. In addition, it checks for any divergence between the estimated and actual amounts of the debt service.

Table 4: Debt-DQA Quality Dimensions

Dimension	Description
Accuracy	Assesses the exactness of all the critical data that has been recorded in the debt management software so that it may be free of errors[17].
Timeliness	Assesses the extent to which the critical data recorded in the debt management software is made within an appropriate time lag.
Coherence	Assesses the extent to which the critical data recorded in the debt management software equals and gives the same result all across the database.

44. For each dimension, five (5) elements are considered for generating the assessment results. These elements are Components, Indicators, Tolerance Limit, Quality Gap, and Quality Level, defined below:

a. *Components*: these are the parts corresponding to a phase in the life cycle of the instrument (i.e., recording, drawings, debt service).
b. *Indicators:* these are the items within the component to be measured. For example, an indicator can measure the number of transactions, related to interest, that have passed the due date and not updated in the system. Another example is the number of active instruments with an undisbursed balance and an expired drawing limit date.
c. *Tolerance Limit:* the limit or predefined benchmark accepted on the measurement of each indicator based on best practices in data validation.

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[15] It is the economic agent who intervenes in the contracting of a debt or non-debt instrument. For example, the participants of a loan contract can include the debtor, the creditor, the guarantor and the beneficiary. The participants can be given one or more roles.

[16] The process of checking that a software system meets specifications and that it fulfills its intended purpose, for example all mandatory fields are filled or contain no null values.

[17] In Debt-DQA, unlike the data validation process, the discrepancies detected with creditor dates are dealt with under the *timeliness* dimension so as to highlight the punctuality of the operation.

d. *Quality Gap*: refers to the percentage result deviating in excess of the tolerance limit.
e. *Quality Level:* indicates the magnitude of corrective measures required.

The assessment is organized by component and measured through indicators. The assessment detects and quantifies quality gaps for a specified data coverage and period. Quality gaps are measured at each indicator, then aggregated and presented in percentage form for each of the components and each of the three dimensions (details about the measurement methodology applied in Debt-DQA are available in section 4).

45. Quality gaps are classified according to three quality levels. These levels correspond to the magnitude of errors requiring corrective measures described in Table 5 below:

Table 5: Debt-DQA Quality Levels

Quality Level	Magnitude of Corrective Measures (Gap)	Description
Level 1	Minor (5% error)	High quality database
Level 2	Moderate (10% error)	Medium quality database
Level 3	Major (11% error or more)	Low quality database

Standard Quality Gap Levels
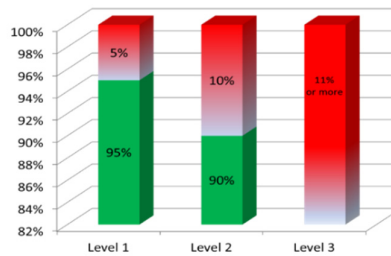
46. Quality gaps are expressed in percentages on the three dimensions: accuracy, timeliness and coherence. The results are summarized by both institution and debt instrument classification based on international standards[18] using the GL1-GL4 and D1-D4 approach. The Debt-DQA tool is flexible enough to allow other classifications required by countries such as by lender category or instrument type. Here is an example that shows the gaps in the various dimensions (for a more detailed presentation See Annex 4):

Institutional Sector	Instrument Type	Accuracy	Timeliness	Coherence
GL1 (Budgetary Central Government)	D1 (Loans and Debt securities)	10% (Level 2)	44% (Level 3)	22% (Level 3)

47. The summary results will allow drilling down to obtain information on quality gaps by instrument types. Further drilling down provides detailed information by instrument. Using the above example, clicking on Instrument Type may lead to the following results:

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[18] https://www.imf.org/en/Publications/Manuals-Guides/Issues/2016/12/31/Public-Sector-Debt-Statistics-Guide-for-Compilers-and-Users-Guide-for-Compilers-and-Users-24905

Institutional Sector	Instrument Type	Accuracy	Timeliness	Coherence
GL1 (Budgetary Central Government)	Loans	11% (Level 3)	48% (Level 3)	39% (Level 3)
	Debt Securities	9% (Level 2)	40% (Level 3)	5% (Level 1)

48. The summary results also reveal specific gaps in the types of instruments recorded. The report will indicate Not Available (NA) for instrument types not found in the database as in the example below, "debt securities" are not available in the database.

Institutional Sector	Instrument Type	Accuracy	Timeliness	Coherence
GL1 (Budgetary Central Government)	Loans	10% (Level 2)	44% (Level 3)	22% (Level 3)
	Debt Securities	NA*	NA*	NA*

*NA - Not applicable may mean that the data on data security might be recorded in a different system or that the country does not issue such instruments. The same applies to missing institutional sectors as recommended by international standards.

49. The above scoring offers the following advantages:

a. It is easy to read and understand.
b. It can accurately identify gaps in the quality of the debt data at the institutional and instrument type level.
c. It makes it possible to plot scores to show progress over time.
d. As measurements are in percentages, it provides granularity and avoids value judgments (as opposed to letter ratings such as A, B, C, etc.).
e. It promotes standardized measurement.

Useful tips for implementing steps 1, 2 and 3
1- Organize a team of experienced users to draft a calendar for implementing the tasks regarding these three steps.
2- Detect errors and gaps and prepare a report of the findings for steps 4 and 5 only stating facts.
3- Reporting during these steps should only include errors and gaps yet never specific staff members.
4- Show preliminary results to the persons concerned, particularly debt officers for feedback as this will help with later steps.
5- Remember to take into account those areas where errors were least problematic to reveal the strengths of the DMO.

3.5 Step 4: Analyze the errors and risks

50. The scoring results produced by the Debt-DQA tool are first considered. The various errors, flaws and gaps are then analyzed by the staff. This analysis consists of identifying the source of the problem for each instrument assessed; for example, a case where debt service

is not updated because payment confirmation was not received from the Central Bank, or because an error in the system did not allow the recording process. This gives rise to a formal discussion to fully grasp the implications of the results and the potential impact on current operations. (See tips below).

51. The errors are then grouped by risk and gravity. The assessment team analyses a number of questions such as which errors are easy to resolve with current capacity. The risk and gravity level are best identified by staff.

52. Which of them may take more time to fix? Which of them require further investigation? Do any of them require high-level managerial intervention? At this step, the debt officers may also reflect on the risks posed by such issues to the overall quality of the debt data. Staff must ultimately look for the errors and gaps with highest negative impact and understand their source. Resolving some errors and gaps may be beyond the immediate reach of the DMO staff. Nonetheless, they may be worked on in creative ways and in collaboration with other entities such as external technical providers.

53. A high score does not imply that most risks have been averted. Scores must be correlated with an analysis of the environment in which the database is located. For example, if the country is mostly recording external loans but domestic debt is increasing rapidly, the analysis must consider this information for processing in Step 5.

54. At this stage, if the institution does not have a skilled validation officer or team, then an external technical provider becomes essential to guide the debt officers in interpreting the results and in clearly pinpointing the problems. The external technical provider would be in a position to offer practical recommendations, suggestions and advice based on best practices and international standards.

3.6   Step 5: Provide corrective measures

55. The various sources of the problems and risks are examined in order to conclude whether they are structural, organizational or technical in nature.

56. There are *at least* three kinds of corrective classes: (a) procedural issues (b) technical errors and (c) insufficient recording and monitoring proficiency. They involve consulting the procedures manuals and tasks which may have led to such anomalies (such as delays in receiving and processing information on actual drawings or payments). These procedures must be verified to determine whether they require revision to reflect reality. A technical error may be a glitch in the system or its data source. A lack of proficiency in the debt management software or the interpretation of loan instruments may also be problematic, requiring additional training or technical support. A set of recommendations must be drafted with feedback from colleagues in order to take corrective actions. This may encompass widening the scope of instruments types recorded in the system. Finally, a technical assistance provider could also guide the debt officers in drafting these recommendations.

> **Useful tips for implementing steps 4, 5 and 6:**
>
> 1. Organize an analysis team that includes debt management software users and experienced staff from other areas (middle office, internal auditing, etc.). Focus on producing a realistic calendar of tasks for presenting the findings and proposing a strategy to correct these errors and omissions.
> 2. Begin analysis of results in the areas with the least errors to emphasize the strengths of the DMO. Working from strengths may come in useful for finding solutions to the most problematic errors.
> 3. Prioritize solutions which reduce *recurrent* errors with a high impact such as overestimating or underestimating the size of debt stocks and flows.
> 4. Present the results to the DMO authorities and to the persons concerned to receive feedback on how to refine the work plan for corrective actions.
> 5. Use the results as the baseline benchmark so that the team can establish realistic reduction targets staggered over several weeks or months.
> 6. Focus the priorities on the specific issues that can be corrected (and not on what should be corrected). This requires a consensual plan to be reviewed and adapted periodically.
> 7. Select a data validation coordinator to coordinate (but not do) the corrections, to facilitate the activity and to report activities.
> 8. Consider the involvement of your technical cooperation service providers (COMSEC or DMFAS) should you face increasing challenges or persistent problems.

3.7   Step 6: Implement corrections

57. A detailed action plan must be drafted after all the recommendations have been made. This action plan highlights all the errors and weaknesses identified. It also specifies in detail as many corrective actions or reforms as possible to be undertaken by the DMO with an estimate of the time, resources and level of complexity involved. In summary, the plan of action is used to:

    a. define the problems and risks involved
    b. set priorities for resolving the immediate concerns
    c. set priorities for complex issues requiring a longer time frame to resolve
    d. assign a coordinator to follow up and meet calendar milestones
    e. provide regular updates on the progress of the plan and the database status

58. For a successful action plan, it is highly advised to organize a final peer review by staff before it is officially accepted by the authorities.

3.8   Special considerations and the maximum validity of a Debt-DQA assessment

59. The value of an assessment is entirely contingent upon the nature of the data in a given debt database and the level of exposure to capital markets. Furthermore, the maximum validity of any assessment is limited to a cycle of one year.

3.9   The structure of Debt-DQA

60. As described in the previous sections, assessment under each of the three dimensions is organized into components. Each component is then measured through indicators. Table 6 presents the Debt-DQA structure of dimensions, components and related indicators for core debt data and reference data.

Table 6
Structure of Debt-DQA

Dimension	Component	Indicator's number	Indicator
Core Debt Data			
Accuracy	Recording of Instruments	1	Active Instruments showing error messages. This includes incorrect calculation of amortization table, duplication of agreements, missing/inconsistency in repayment terms, missing/inconsistency of drawing terms
	Drawings	2	Active instruments with undisbursed balance and an expired drawing limit date
	Debt Service	3	Transactions of interest that have exceeded the due date and have not been updated
		4	Total interest payments (in domestic currency or USD) that have exceeded the due date and have not been updated
		5	Transactions of commission/fees/charges that have passed the due date and have not been updated
		6	Total amount of commissions/fees/charges payments (in domestic currency or USD) that have exceeded the due date and have not been updated
		7	Transactions of principal that have passed the due date and have not been updated
		8	Total amount of principal payments (in domestic currency or USD) that have passed the due date and have not been updated
	Reports	9	Active instruments showing negative outstanding
Timeliness	Instrument	10	Instruments with time lag between agreement signature date and date of recording in the software
	Drawings	11	Drawings with time lag between creditor's value date and date of recording in the software
	Debt Service	12	Debt service transactions (principal, interest and commissions) with time lag between payment value date and date of recording in the software
Coherence	Debt Service	13	Interest transactions with difference between scheduled amount and actual amount.
		14	Commission/fees/charges transactions with difference between scheduled amount and actual amount
		15	Principal transactions with difference between scheduled amount and actual amount
Reference Data			
Timeliness	Exchange rates	1	Time lag between exchange rate date and date of recording in the software
		2	Time lag between last exchange rate date recorded and assessment date
		3	Time lag between each exchange rate record during a period of 1 year
	Floating rates	4	Time lag to reset (periodicity) of floating interest rates

4. How is quality measured in Debt-DQA?

61. The assessment detects and quantifies quality gaps for the specified data coverage and period. Quality gaps are measured at each indicator, then aggregated and presented in percentage form for each of the components and each of the three dimensions. At the component group, the aggregate gap is derived from an average of all the indicators within the component. Similarly, at the dimension group, the aggregate gap is derived from an average of all the components within a dimension. The measurement and calculations are based on a simple average and not a weighted average, based on the fact that all the indicators equally affect the quality dimensions of the database. At the end, quality gaps are classified according to three quality levels. The three levels with their corresponding ranges of quality gaps 19 and corrective measures are as follows:

Quality Level	Quality Gap
Level 1	Less than or equal to 5%
Level 2	Between 5 and 10 %
Level 3	More than 10%

62. Tables 7 and 8 below illustrate how an assessment on data accuracy is made for a central government and for a specific subset of debt data. Let's also consider that the assessment will cover two years from 1 January 2017 until 31 December 2018.

Table 7
Data Coverage

Institu-tional Sector	Institutional Sub-Sector	Instrument Type	Debt Source	Instru-ment Status	Number of Instru-ments	Number of Tranches
General Government	GL1 (Budgetary Central Government)	Loans	External	Active	120	290

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[19] These quality gaps ranges are based on experience and on the fact that perfection or zero percent gap on all dimensions is not realistic and is practically unattainable in data quality. These ranges will be assessed and adjusted over time to take account of any change, if needed.

Table 8
Assessment on Accuracy

Assessment date: 31/12/2018
Period coverage: 01/01/2017 to 31/12/2018

Dimension	Component	Indica-tor's number	Indicator	Indicator Quality Gap	Component Quality Gap	Dimension Quality Gap	Quality Level Assessment
Accuracy	Instruments	1	Active Instruments with "error" messages	4%			
					4%		Level 1
	Drawings	2	Active instruments with undisbursed balance and expired date drawing limit	11%			
					11%		Level 3
	Debt Service	3	Transactions of Interest that have passed the due and have not been updated	87%			
		4	Total Interest payments (in domestic currency or USD) that have passed the due date and have not been updated	67%			
		5	Transactions of commission/fees/charges that have passed the due date and have not been updated	25%			
		6	Total amount of commissions/fees/charges payments (in domestic currency or USD) that have passed the due date and have not been updated	78%			
		7	Transactions of principal that have passed the due date and have not been updated	67%			
		8	Total amount of principal payments (in domestic currency or USD) that have passed the due date and have not been updated	69%			
	Reports	9	Active instruments showing negative outstanding	0%			
					68%		Level 3
						27%	Level 3

5. How is the quality gap calculated?

63. The software calculates the number of instruments or transactions meeting the criteria for each indicator. It then compares the results against a "tolerance limit" and classifies them as either "passed" or "failed". The quality gap represents the percentage deviating in excess of the tolerance limit. Set by UNCTAD and COMSEC, tolerance limits indicate the default benchmarks on each indicator based on best practices in data recording and validation.

64. These standard limits are set based on DMFAS Programme and COMSEC working over 3 decades with around 120 DMOs on the development of debt databases, implementation of debt data validation, debt statistics, procedures and information flows, and integrating the software with local payment systems. These limits take into account the delays in data collection that are beyond the control of the DMO such as data on actual drawings and payment confirmations.

65. These standard benchmarks will continue to be assessed and adjusted over time in light of the Debt-DQA implementation, if needed.

66. These limits can also be adjusted and configured according to the DMO's target set during data quality assessment. For example, an institution can set its data quality targets, based on the first assessment, and then regularly update them based on the latest improvements. In this case, results cannot be cross checked with other DMOs and any Debt-DQA reporting must mention that non-default values are being used.

67. Explanations of these tolerance limits are listed in Table 9:

Table 9 Debt-DQA Standard Tolerance limits

Dimension	Indicator	Tolerance Limit	Explanation
Accuracy	Active Instruments showing error messages	**0%**	There is no tolerance on this indicator because it is purely related to data recording and is within the control of the back-office. The errors can easily be detected by running data validation reports which are available in the software.
	Active instruments with undisbursed balance and expired drawing limit date	**90 days**	A maximum of 90 days is a reasonable time for a DMO to get information on either an extension of a drawing limit date or a notification of a possible cancellation of the amount undisbursed. Alternatively, if it is not about modification of the drawing limit date or cancellation of the undisbursed amount, 90 days also allows obtaining any missing information on actual drawings not received at the DMO. Beyond this limit, the data is considered incorrect.
	Transactions of principal-interest-commission that have passed the due date and have not been updated	**30 days**	A maximum of 30 days is a reasonable time for the back office to update the status of a debt service operation in the database after having received it at the DMO (status as paid/ arrear/ rescheduled or forgiven).Beyond this limit, the status of the operation is considered incorrect.
Timeliness	Instruments with a time lag between the agreement's signature date and the date of recording in the software	**90 days**	A maximum of 90 days is a reasonable time to receive the agreement after its signature at the DMO and then record it in the software. From the signature date, the agreement will go through the validation process and parliament ratification before reaching the DMO where it logged, recorded and archived at the back office. Beyond this time lag, the data is considered untimely.
	Drawings with a time lag between the creditor value date and the date of recording in the software	**90 days**	A maximum of 90 days is a reasonable time for the DMO to receive information about an actual drawing and to have it validated and gone through the internal procedures for recoding in the software by the back office. Beyond this time lag, the data is considered untimely.
	Debt service transactions (principal, interest and commissions) with time lag between payment value date and date of recording in the software	**30 days**	A maximum of 30 days is a reasonable time for a DMO to receive information about an actual payment and to have it validated and gone through the internal procedures to be recorded in the software by the back-office. Beyond this time lag, the data is considered untimely.
Coherence	Interest transactions with difference between scheduled amount and actual amount	**1%**	A maximum of 1% divergence between estimated and actual amount of interest payment is reasonable. This could be due to change in dates or difference in decimal points in spread or variable rates, etc. which can be justified. A bigger discrepancy reveals inaccurate data and needs analysis to see what went wrong.
	Transactions of commission/fees/ charges with difference between scheduled amount and actual amount	**5%**	A maximum 5% divergence between estimated and actual amount of commission/fees payment is reasonable. This could be due to a change in dates or difference in decimal points etc. which can be justified. A bigger discrepancy reveals inaccurate data and needs analysis to see what went wrong.
	Principal transactions with difference between scheduled amount and actual amount	**0%**	There is no tolerance for any discrepancy on this indicator, given that the principal amount affects the coherence of the outstanding debt. Normally in any debt agreement, the DMO receives a schedule with exact amounts of principal to be reimbursed and can be changed only by an amendment.

68. Let's take as example Indicator 5 (under Debt Service as Component and Correctness as Dimension). Suppose that the number of transactions meeting the criteria is 300. With a tolerance of 30 days (i.e. 30 days from the due date to the assessment date), this means that any interest transaction due for payment in the last 30 days and with the "waiting payment" status is still within the allowed tolerance and therefore does not require any corrective measures. On the other hand, all interest transactions due over 30 days and with the "waiting payment" status reveal a quality gap and are classified as requiring corrective measures. Thus, the results are as follows:

    a.   Total number of transactions meeting the criteria: 300
    b.   Total number of transactions meeting the criteria and below tolerance limit: 40 (Passed)
    c.   Total number of transactions meeting the criteria and above tolerance limit: 260 (Failed)

69. The number above the tolerance limit, in percentage terms, constitutes a quality gap in the database and therefore, requires corrective measures. Again, from the example given above, 87% of the interest transaction exceed the tolerance limit of 30 days and therefore have an impact on the quality of the database. In this case, this indicator shows 87% as the quality gap. An important consideration is that exceeding beyond 30 days by 1 day or 100 days is treated equally by the Debt-DQA functionality and must be assessed by staff.

70. Detailed measurements for each indicator (debt core data) and (reference data) are presented in Annex 2 and 3.

6. Concluding remarks

71. As a conclusion, the main objective of the framework is to provide a tool of self-assessment to reveal the level of reliability and quality of the debt database of the DMO and provide valuable information to all stakeholders. It also detects and quantifies data gaps in countries' debt databases and highlights their amplitude and risks on the performance of the DMO. In addition, a DMO self-assessment can be useful to measure the progress of the quality in their debt database and consequently in debt reports and statistics on a continuous basis.

72. The automated assessment of the database through the Debt-DQA tool simplifies the data validation process. It offers clear advantages mainly in the rapid and simplified monitoring of the progress of data quality within the software.

73. Among the outcomes, the DMO produces several documents:

- an **initial report** on the results of the Debt-DQA assessing the size and indicators of the database complemented with the answers to the questionnaire
 - a **second report** where staff assess the results and submit a proposal to correct errors and bridge the gaps.
- a **third document** which is the adopted plan reached through consensus and that would be updated by the coordinator of the exercise. A final annual report with a new Debt-DQA to measure the progress of the validation and corrections. This figure summarizes the documents mentioned:

74. The assessment should be performed by the DMO staff; however, where the capacity does not exist, the recommendation is to conduct it in collaboration with technical assistance providers such as UNCTAD and COMSEC.

75. The value of an assessment relies entirely on the nature of the data stored in a given debt database. Furthermore, the assessment remains valid up to a one-year cycle.

76. The implementation of Debt-DQA is continuously evaluated and adjusted over time by both COMSEC and UNCTAD to take account any needed changes.

7. Glossary and useful links

Active loan or security: An active loan is a signed and activated loan where all prerequisites for disbursements have been met and which is still in the pre-disbursement, disbursement or repayment stage. An active debt security is a signed and activated security where all prerequisites for issuance have been met and which is at the presubscription, subscription or redemption stage. Once the loan or security is paid off and closed it becomes non-active (historical).

Budgetary Central Government: The budgetary central government is a single unit of the central government that encompasses the fundamental activities of the national executive, legislative, and judiciary powers. This component of general government is usually covered by the main (or general) budget. The debt related to the budgetary central government sub-sector is the dominant unit most DMOs cover. For more information, see the Public Sector Debt Statistics: Guide for Compilers and Users at https://www.imf.org/en/Publications/Manuals-Guides/Issues/2016/12/31/Public-Sector-Debt-Statistics-Guide-for-Compilers-and-Users-Guide-for-Compilers-and-Users-24905

Components: These are the parts that correspond to a phase in the life cycle of the instrument (i.e.. recording, disbursements (drawings), debt service).

Coverage or assessment coverage: Is the sectorial and sub-sectorial presentation indicating the institutional coverage for debt statistics. For example, the most known and relevant for Debt -DQA are *general government* sector and *public financial corporations* sector. The subsector of *central government debt* is usually the one that is covered by most DMO's in the ministry of finance or the central bank. For more information see the Public Sector Debt Statistics : Guide for Compilers and Users: Guide for Compilers and User at https://www.imf.org/en/Publications/Manuals-Guides/Issues/2016/12/31/Public-Sector-Debt-Statistics-Guide-for-Compilers-and-Users-Guide-for-Compilers-and-Users-24905

Data quality: in the context of this paper refers to the reliability of debt data gathered and used by the debt offices for the generation of debt figures for dissemination, analysis and policymaking.

Debt Service: The actual repayment of principal, payment of interest and the payment of commission/fees and other charges as well as late interest. A debt service payment is a type of debt service operation.

Debt-DQA: The Debt Data Quality Assessment (Debt-DQA) is a to measure the quality of the data recorded in the debt recording software. It complements the data validation process.

DeMPA: The Debt Management Performance Assessment (DeMPA) is a methodology for assessing public debt management performance through a comprehensive set of indicators spanning the full range of government debt management function (https://www.worldbank.org/en/topic/debt/brief/dempa-2015)

Disbursement: The placement of resources such as goods, services or funds at the disposal of the borrower or beneficiary country and taken against a loan agreement. In debt management software, disbursements can be registered either in cash or in kind and the value of a disbursement is equal to the real disbursements plus the direct payments.

DQAF: The IMF's Data Quality Assessment Framework (DQAF), which is used for comprehensive assessments of countries' data quality. It covers institutional environments, statistical processes, and other characteristics (https://dsbb.imf.org/dqrs/DQAF).

Drawings: The placement of resources such as goods, services or funds at the disposal of the borrower or beneficiary country taken against a loan agreement. A "drawing" is the same thing as a "disbursement" from the point of view of the borrower. Drawing can be registered either in cash or in kind.

DSA and DSF: The Debt Sustainability Framework (LIC DSF) is a tool developed jointly by IMF and World Bank staff to conduct public and external debt sustainability analysis in low-income countries. The MAC DSA (Debt Sustainability Analysis) is another tool also developed by IMF staff to conduct public debt sustainability analysis in market-access countries.

Hypothetical status: A loan or a debt security registered in DMFAS for the long-term analysis of different borrowing strategies. This loan (or debt security) is purely for sensitivity analysis of the effect of different borrowing scenarios on the future debt service profile and is not yet under negotiation with potential creditors (or available for subscription).

Indicators: These represent the items within the component that will be measured. For example, an indicator can give a measure of the number of transactions, related to interest, that have passed the due date and not been updated in the system. Another example is the measure and extent of active instruments with an undisbursed balance and an expired drawing limit date.

MTDS: The Medium-term Debt Strategy: An Assessment of Recent Capacity Building, IMF Policy Paper. The World Bank's Medium-term Debt Strategy (MTDS) helps governments to implement sound debt management for a three-to-five-year horizon.

PEFA: Public Expenditure and Financial Accountability (PEFA) is a methodology for assessing public financial management performance. It identifies 94 characteristics (dimensions) across 31 key components of public financial management (indicators) in 7 broad areas of activity (pillars). (https://www.pefa.org/)

Quality gap: Refers to the percentage result deviating in excess of the tolerance limit.

Quality level: indicates the magnitude of corrective measures required which in Debt-DQA is expressed in three levels: minor, moderate or major errors.

Technical assistance providers: These are institutions, such as COMSEC and the DMFAS Programme, that provide technical assistance products and services to the borrower to build institutional capacity, with a focus on organizational arrangements, staffing methods, and technical, physical, or financial resources in key agencies.

TFFS: The Task Force on Finance Statistics (TFFS): The TFFS was created in 1992 under the auspices of the United Nations Statistical Commission. It is chaired by the Statistics Department of the IMF. It sets methodological standards for statistics on external debt, and on public sector debt; promotes data availability on financial stocks, particularly external and public sector debt; encourages internationally accepted statistical practices to enhance data quality; and fosters inter-agency collaboration in statistical capacity building.

Tolerance limit: This is the limit or predefined benchmark accepted on the measurement of each indicator based on best practices in data validation.

ANNEXES

Annex 1: List of countries using Commonwealth Secretariat or UNCTAD software

CS-DRMS or Meridian

Low Income	Lower Middle Income	Upper Middle Income	High Income
Mozambique	India	Belize	Antigua & Barbuda
Sierra Leone	Ghana	Botswana	Cyprus
Tanzania	Kenya	Dominica	The Bahamas
Malawi	Lesotho	Fiji	Barbados
The Gambia	Nigeria	Grenada	British Virgin Islands
Afghanistan	Papua New Guinea	Guyana	Seychelles
Liberia	Samoa	Jamaica	St Kitts and Nevis
Somalia	Solomon Islands	Mauritius	Trinidad & Tobago
South Sudan	Eswatini	Namibia	
Mali	Tonga	St Lucia	
Republic of Benin	Cameroon	St Vincent & the Grenadines	
Niger	Vanuatu	Sri Lanka	
Equatorial Guinea	Myanmar	South Africa	
Guinea Conakry	Sao Tome	Samoa	
	Bhutan	Tonga	
	Cape Verde	Suriname	
		Kosovo	
		Maldives	

DMFAS

Low Income	Lower Middle Income	Upper Middle Income	High Income
Burkina Faso (HIPC)	Angola	Albania	Chile
Burundi (HIPC)	Bangladesh	Algeria	Oman
Central African Republic(HIPC)	Bolivia (Plurinational State of) (HIPC)	Argentina	Panama
Chad (HIPC)	Cambodia	Armenia	
Democratic Republic of the Congo (HIPC)	Congo (HIPC)	Azerbaijan	
Eritrea (HIPC)	Côte d'Ivoire (HIPC)	Costa Rica	
Ethiopia (HIPC)	Djibouti	Dominican Republic	
Guinea-Bissau (HIPC)	Egypt	Ecuador	
Haiti (HIPC)	El Salvador	Gabon	
Madagascar (HIPC)	Honduras (HIPC)	Georgia	
Rwanda (HIPC)	Indonesia	Guatemala	
Syrian Arab Republic	Lao People's Democratic Republic	Iran (Islamic Republic of)	
Togo (HIPC)	Mauritania (HIPC)	Iraq	
Uganda (HIPC)	Mongolia	Jordan	
	Nicaragua (HIPC)	Lebanon	
	Pakistan	Paraguay	
	Philippines	Romania	
	Republic of Moldova	Venezuela (Bolivarian Republic of)	
	Sudan (HIPC)		
	Uzbekistan		
	Viet Nam		
	Zambia (HIPC)		
	Zimbabwe		

Annex 2: Example Questionnaire (Version 1)

Software:

1. What software is used to manage the debt instruments?
   ☐ DMFAS, which version? _____
   ☐ Commonwealth software, which version? CS-DRMS or Commonwealth
   Meridian_____
   ☐ Other, Specify _____

2. Since when? _____

3. When was the current version of the software installed or last updated?
   _____

4. Indicate whether or not these system parameters are activated in the software: Security, Audit, Workflow, and Budget Lines.

5. Is there any debt data recorded outside the DMFAS or COMSEC debt management software and why?_____

Links and Interface:

6. Is the software used linked to an integrated financial management information system (IFMIS)?
   ☐ Yes   No ☐
   If not, is it planned and for when? _____

7. Is there other links such as exchange rates, auctions etc.? Please describe:
   _____

Users of the software

8. How many departments or units are connected to the debt database within or outside of the Debt Management Office (DMO)?
   _____

9. How many users have access to the system? How many are from the back office, middle office and front office?
   Back office: _____
   Middle office: _____
   Front office: _____
   Others? Please describe: _____

10. Indicate how many have full, restricted or read-only access?
    Full access: _____
    Restricted access: _____
    Read-only access: _____

11. When was the last time staff received formal training on the software?

_____

12. Was it internal or from an external provider?

_____

13. When was the last time staff received training in data validation or debt statistics? Others?

_____

14. From the perspective of the back office, which are perceived to be the most complex debt instruments to manage?

Data Validation

15. Do you have a data validation procedure?
    ☐ Yes   No ☐

16. If yes, when was the last time you have implemented a full data validation including reconciliation with creditors?

17. Do you have dedicated staff for operational debt management?
    If yes, how many?

18. Is there a procedures manual for data compilation?

19. Is debt-related documentation adequately managed (safekeeping originals and easy access to copies by the compilers)? Is the instrument documentation filed and stored? Select 10 random instruments from the physical files and check the data against the system.

Annex 3: Core Debt Data Coverage-Report 1and 2

	Debt Type	Instrument Type	Status	No. of Instruments	No. of Tranches
Central Government Debt	**External Debt**			**372**	**455**
		Loans		**367**	**450**
			Active	120	290
			Hypothetical	200	120
			Cancelled	67	40
		Debt Securities		**5**	**5**
		Eurobonds	Active	5	5
	Domestic Debt			**91**	**95**
		Loans	**Active**	**10**	**14**
		Debt Securities		**81**	**81**
		Bills- discounted	Active	12	12
			Fully Paid	50	50
		Bonds - Fixed Coupon rate	Active	10	10
		Bonds – Variable Coupon rate	Active	5	5
			Fully Paid	4	4
Guaranteed Debt	**External Guaranteed Debt**	**Loans**	**Active**	**3**	**3**
Non- guaranteed debt	**Private External Debt**	**Loans**	Active	**16**	**16**
On lending		**Loans**		**196**	**196**
			Active	98	98
			Active	74	74
			Fully Paid	24	24
Grants		**Grants**	Active	6	

	No of records	Date of last record
Participants	350	21.06.2016
Exchange rates	1096	14.02.2019
Variable rates	153	15.12.2018

Annex 4: Debt-DQA Results Presentation

The tables below present the results the assessment methodology on core debt data. It includes classification by institutional sector and subsector and instruments types in addition to the debt coverage and assessment date.

Assessment coverage:

Institutional Sector	Institutional Sub-Sector	Instrument Type	Debt Source	Instrument Status	Number of Instruments	Number of Tranches
General Government	GL1 (Budgetary Central Government	Loans	External	Active	120	290

Date of assessment: 31/012/2018

Final results by Dimension:

Institutional Sector	Institutional Sub-sector	Instrument Type	Dimension	Quality Gap	Quality Level Assessment
General Government	GL1 (Budgetary Central Government	Loans (External Active)	Correctness	25%	Level 3
			Timeliness	50%	Level 3
			Coherence	46%	Level 3

Final results by Components and Dimension:

Institutional Sector	Institutional Sub-sector	Instrument Type	Dimension	Components	Quality Gap	Quality Level Assessment
General Government	GL1 (Budgetary Central Government	Loans (External Active)	Accuracy		25%	Level 3
				Agreements	3%	Level 3
				Drawings	11%	Level 3
				Debt Service	65%	Level 3
			Timeliness		50%	Level 3
				Agreements	33%	Level 3
				Drawings	42%	Level 3

Institutional Sector	Institutional Sub-sector	Instrument Type	Dimension	Components	Quality Gap	Quality Level Assessment
				Debt Service	74%	Level 3
			Coherence	Debt Service	46%	Level 3

Final results by Indicators, Dimension Components:

Dimension	Component	# of Indicator	Indicator	Indicator Quality Gap	Component Quality gap	Dimension Quality gap	Quality Level Assessment
Accuracy	Instrument Agreements	1	Active Instruments with error messages	4%			
					4%		Level 1
	Drawings	2	Active instruments with undisbursed balance and expired date drawing limit	11%			
					11%		Level 1
	Debt Service	3	Transactions of Interest that have passed the due date and have not been updated	87%			
		4	Total Interest payments (in domestic currency or USD) that have passed the due date and have not been updated	67%			
		5	Transactions of commission/fees/charges that have passed the due date and have not been updated	25%			
		6	Total amount of commissions/fees/charges payments (in domestic currency or USD) that have passed the due date and have not been updated	78%			
		7	Transactions of principal that have passed the due date and have not been updated	67%			
		8	Total amount of principal payments (in domestic currency or USD) that have passed the due date and have not been updated	69%			
					65%		Level 3
	Reports	9	Active instruments showing negative outstanding		0%		Level 1
						25%	Level 3
Timeliness	Instrument Agreements	10	Instruments with time lag between agreement signature date and date of recording in the system	33%			

Dimension	Component	# of Indicator	Indicator	Indicator Quality Gap	Component Quality gap	Dimension Quality gap	Quality Level Assessment
					33%		Level 3
	Drawings	11	Drawings with time lag between creditor's value date and date of recording in the system	42%			
					42%		Level 3
	Debt Service	12	Debt service transactions (Principal, Interest and Commissions) with time lag between payment value date and date of recording in the system	74%			
					74%		Level 3
						50%	Level 3
Coherence	Debt Service	13	Interest transactions with difference between scheduled amount and real amount	37%			
		14	Commission/fee/charges transactions with difference between scheduled amount and real amount	100%			
		15	Principal transactions with difference between scheduled amount and real amount	0%			
					46%		Level 3
						46%	Level 3

Reference Data

Dimension	Component	Quality Gap	Quality Level Assessment
Timeliness	Exchange Rates	78%	Level 3