Unlocking Public and Private Finance for the Poor

A MODEL FOR THE SYSTEMATIC CAPTURE, MANAGEMENT AND ANALYSIS OF REMITTANCE DATA BY CENTRAL BANKS

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ABBREVIATIONS

AML	anti-money laundering
API	application programming interface
ATM	automated teller machine
BOP	balance of payments
CFT	countering the financing of terrorism
IIP	international investment position
IMF	International Monetary Fund
ITRS	International Transaction Reporting System
LDC	least developed country
MTO	money transfer operator
POS	point of sale
SARB	South Africa Reserve Bank
UNCDF	United Nations Capital Development Fund

GLOSSARY

Application programming interface – A connection between computers or between computer programs. It is a type of software interface, offering a service to other pieces of software. In contrast to a user interface, which connects a computer to a person, an application programming interface connects computers or pieces of software to each other.[1]

Aggregated data – When volumes and values of transactions are aggregated by one or more attributes. For example, if the value of remittances is reported summarized by the country of origin or by the channel (i.e. bank or MTO). This would provide a central bank the ability to analyse the data either by country or by channel but not both.

Highly disaggregated data – Data that are aggregated using multiple, not singular attributes. For example, if remittance values and volumes are reported summarized by all of the following: country of origin, channel, currency, sex and location of residence of the sender or recipient. This would, for example, enable a central bank to see how many women, in a certain region, received what total value of remittances from the United States, through a transfer via a commercial bank.

Transaction level data – Every transfer having its own individual record or entry in a database, the equivalent of a single row in an Excel document.

Transaction data – Data that could be expected to be present within the transfer instruction. This include country of origin and destination, entity type (i.e. bank or MTO), currency of transfer and value of transfer.

Supplemental data –Any data required by a country to support analysis of remittances that could not reasonably be expected to be contained within the transfer instruction. This could include the sex of the recipient, the sender or recipient's location of residency, the location of the branch or service point used to send or receive money.

International Transaction Reporting System – A system that captures, aggregates, manages and facilitates analysis of transaction-level data generated by cross-border, foreign currency transactions (including but not limited to remittances).

Reporting institutions – Financial service providers required to report data on cross-border transactions to the central bank or another financial regulator.

[1] Wikipedia, Application programming interface (API), https://en.wikipedia.org/wiki/API.

EXECUTIVE SUMMARY

The way central banks think about remittances data is changing. As the world becomes more digital, there is an ever-growing need for detailed insights and automated and data-driven platforms from which central banks and regulators can extract information about the economy and remittance flows. Transaction-level data on remittance transfers are crucial for regulators to be able to understand remittance markets and foreign exchange markets, their challenges and opportunities. This understanding is vital to the development of policies, products and services that lower barriers and increase total values of incoming remittances as well as to drive remittance formalization and financial inclusion. This is particularly true of economies that rely heavily on received remittances. The availability of quality remittances data will provide the accurate landscape of the remittance market and players, which in turn will help central banks and other policymakers to develop data-driven policies that meet the needs of all stakeholders.

The objective of this paper aims to provide central banks who wish to gain a better understanding of the remittance flows to and from their country with a model for a system to collect, manage and analyse transaction-level data in a manner which supports the development of data-driven policy and can be used to inform private sector investment and product development.

In particular, this model looks into the following four key aspects for the systematic capture, management and analysis of remittances data by central banks:

- insight generation, data granularity and the role of the regulator
- transactional and supplemental data
- system-generated data
- insight generation and communication.

Insight generation, data granularity and the role of the regulator

Key message 1: The increasing speed and complexity of economic change has necessitated a fundamental transformation in the way that financial regulators collect, analyse and use data. Central banks are not only having to become more data driven themselves but are increasingly being relied on by policymakers more broadly to collect and process data to

support the formulation of macro and microeconomic policy. This has come at a time when more data are being generated than ever before, and the world is rushing to exploit this untapped value.

To fully exploit the value contained in these data, central banks and financial regulators will have to make a fundamental shift away from traditional aggregated data reporting to transaction-level data reporting. This shift will give regulators access to the raw transactional data, subject to redactions of personally identifiable information, which will allow them to generate the insights necessary to regulate these complex and fast-changing markets.

> *"By asking for aggregate data, which is pre-organized and aggregated by the reporting agents or by the national central banks, we miss lots of valuable information. After all, it is not only the average that matters, but also the underlying distribution. And in order to analyse the distribution we need the "basic" (granular) data".*
>
> – Sabine Lautenschläger[2]

This paper provides the model for a system that will allow transaction-level data on remittances to be collected and analysed, while also decreasing the compliance burden on reporting entities and increasing data quality.

Transactional and supplemental data

Key message 2: Understanding remittance markets requires more than understanding the volumes and values flowing into and out of the country. Remittances are conducted by individuals, and gathering customer or supplemental data add value to the policymaking.

The sending and receiving of money to support a household is inherently gendered and, without understanding the sex dynamics around access and usage to formal services, it would not for example be possible to develop regulations or insights for the private sector designed to increase the use of formal services. This means that the transaction data need to be supplemented by other information including the sex and location of users of remittance services. South Africa offers an interesting model for the capture of this information. The South Africa Reserve Bank (SARB) requires all recipients of cross-border remittances to complete a Reporting Mandate form. This form captures data on sex, location and reason for transfer, and these data are submitted along with the transaction data on the value, currency and channel used for the transfer.

This paper explores options for the capture and inclusion of this supplemental data in the development of a remittance reporting and analysis system.

[2] Speech by Sabine Lautenschläger, member of the Executive Board of the ECB and Vice-Chair of the Supervisory Board of the Single Supervisory Mechanism, at the Eighth ECB Statistics Conference, Frankfurt am Main, 5 July 2016, www.ecb.europa.eu/press/key/date/2016/html/sp160705_1.en.html.

System-generated data

Key message 3: Data collection technology, open standards and automation will play an increasingly important role, as a as an automated system will reduce the compliance burden for reporting entities, reduce the need for manual cleaning and quality control and ensure timely, complete and accurate reporting.

Both moving to transaction-level reporting and including supplemental data to reporting requirements will significantly increase the volume of data that have to be submitted. This would lead to a vastly increased compliance burden for reporting entities and may produce an unmanageable volume of data for central banks to store and analyse if the data are compiled and reported manually by staff.

To avoid this scenario, this paper maps out the requirements to shift from the manual compilation and reporting of data to an automated system-to-system model. This model involves data being prepared by a rules-based system within the reporting entity and submitted automatically to a system at the central bank, which will validate the data checking for compliance with standards, completeness and flag outliers and other problematic records. This automation will reduce the compliance burden for reporting entities, reduce the need for manual cleaning and quality control and ensure timely, complete and accurate reporting.

Insight generation and communication

Key message 4: A system can contain the most complete, highest quality, most timely data available but, if there is no way to generate insights from the data, then 99 percent of the value is lost.

This paper explores the importance and recommend features for data analysis or businesses intelligence modules or tools to visualize and support the exploration and analysis of transaction-level remittance data. While often overlooked, the ability to derive insights, generate a narrative and communicate them clearly is crucial to influence policy and make real change in the market.

INTRODUCTION AND BACKGROUND

The purpose of this paper is to provide central banks who wish to gain a better understanding of their remittances landscape with a model to be used in the design, development or adaptation of a system for the systematic capture, management and analysis of remittance data of transaction-level data. This guide is particularly focused on presenting options for financial regulators in least developed countries (LDCs).

Another paper in this series, Lessons Learned on building an International Transaction Reporting System to collect remittance data: Experiences across central banks, explores the current use of International Transaction Reporting Systems (ITRSs) to report and analyse remittance data by central banks. Its aim is to highlight the potential opportunities and limitations of these systems to contribute to a deeper understanding of remittances. Given the central role of these systems for many countries in their collection and analysis of cross-border transactions, the model presented below has been designed to apply both to the adaptation of existing ITRSs, to make them more appropriate for the collection of remittance data, and equally to countries without existing systems looking to design a system purely to capture and analyse remittance data. The model, as presented here, is intended to provide a broad framework for detailed design discussions and decisions.

DEFINING AN ITRS:

In this paper, an ITRS will refer to a system that:

- is primarily concerned with the compilation and dissemination of **balance of payments (BOP) statistics**
- **captures, aggregates, manages and facilitates analysis of transaction-level data generated by cross-border, foreign currency transactions** (including but not limited to remittances)
- allows the **categorization** of all **inbound and outbound payments** according to the guidelines set forth in the IMF *Balance of Payments and International Investment Position Manual*.

An ITRS is designed to collect, store, manage and analyse data generated by foreign currency transfers. The structure, technologies and implementations of these systems vary widely between countries, and the term ITRS can be thought of as an umbrella for a cross-border "*data collection system that obtains data from banks and enterprises at the level of individual*

transactions".[3] Historically, many ITRSs grew out of foreign exchange control systems. As countries lifted these restrictions, it was necessary to broaden their remit to support the compilation of balance of payments (BOP) and international investment position (IIP) statistics.

While these systems have the potential to capture and analyse data on formal international remittances, they rarely have remittance data as even a secondary focus. Many implement limits on the value of transfers captured, meaning that low-value remittance transfers are either not captured at all or are captured at such an aggregated level that they only provide the highest-level view of the remittance landscape.

The COVID-19 pandemic has highlighted the importance of lowering barriers to increase the value of total remittances into LDCs as well as highlighting the need to formalize remittances to allow these values to be captured in national accounts. A combination of new technologies, new approaches and new service providers offer the potential for low-income countries to adapt and possibly leapfrog existing systems and implement transaction-level reporting systems for cross-border transfers, which support data-driven policy around remittances and promote the development and deployment of appropriate and accessible formal remittance products.

[3] International Monetary Fund, *Balance of Payments and International Investment Position Manual*, Chapter 4, www.imf.org/external/pubs/ft/bop/2014/pdf/BPM6_04F.pdf

A MODULAR DESIGN

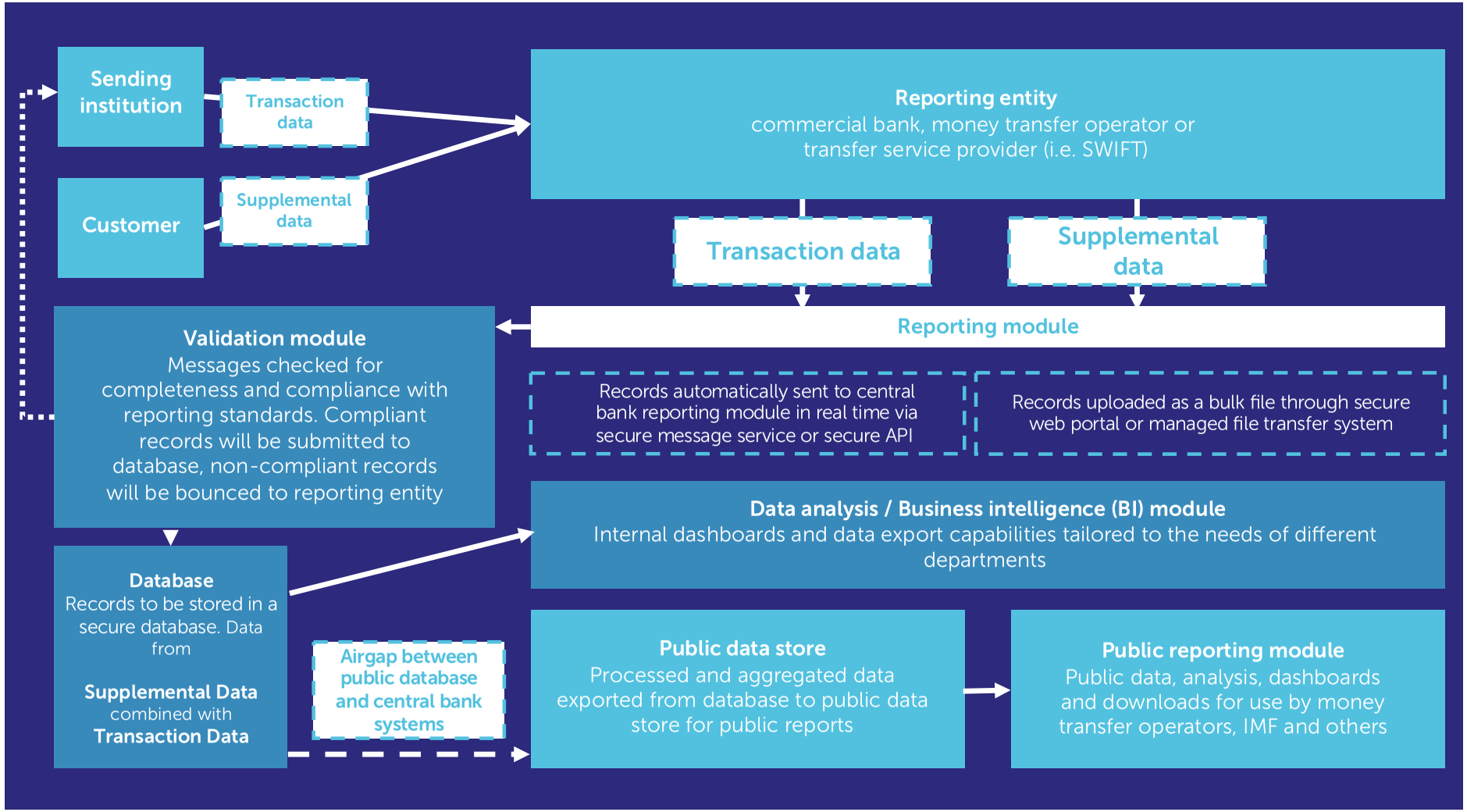
The model outlined below is for a complete ITRS but takes a deliberately modular approach to allow for cases where systems already exist but need to be modified to allow them to fully capture and exploit remittance data. This approach also allows regulators to explore new and emergent technology trends and how these might be exploited to increase the efficiency and effectiveness of existing systems.

The model can also be used to build a stand-alone remittance reporting system that only captures, manages and analyses data on remittances and does not capture the full range of BOP data usually present in an ITRS.

A new system designed by having in mind the weaknesses of the ITRS would contribute to overcoming challenges in collecting data on remittances by covering the data on remittances from non-financial institutions and offering a more reliable system for the capture, management and analysis of remittance data by central banks.

A uniform remittance data collection system will contribute to the harmonization of efforts in LDCs by capturing remittance data and increasing regional cooperation. This would support data-driven policy around remittances and promote the development of appropriate and accessible formal remittance products in the region.

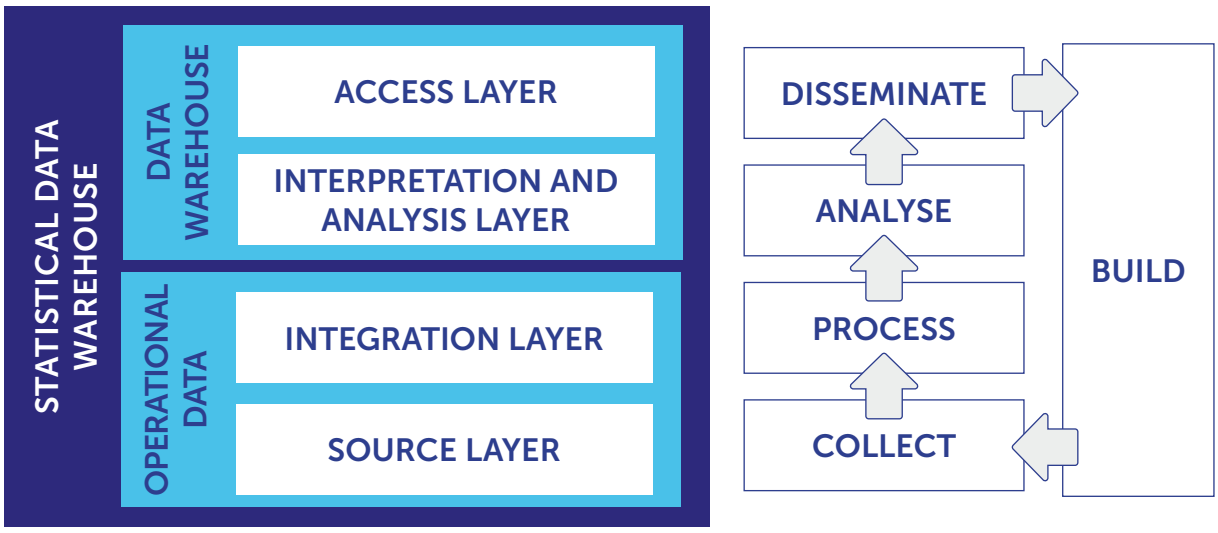
HIGH-LEVEL SYSTEM MODEL FOR THE SYSTEMATIC CAPTURE, MANAGEMENT AND ANALYSIS OF REMITTANCE DATA BY CENTRAL BANKS



THE BUSINESS ARCHITECTURE

A database holding statistical information and having many different types of users who each have different use cases and permission levels needs to be layered appropriately. The data model must sustain the ability of realizing data integration at macro and microdata granularity levels. The model, instead of focusing on a process-oriented design, should be on data interrelationships that are fundamental for different processes of different statistical domains. The Center of Excellence on Data Warehousing[4] identifies four functional layers in the Generic Statistical Business Process Model (GSBPM) that are defined as:

- **access layer** – for the access to the data: selected operational views, final presentation, dissemination and delivery of the information sought
- **interpretation and data analysis layer** – enables data analysis or data mining functional to support statistical design
- **integration layer** – is where all operational activities needed for any statistical production process are carried out, and data are transformed (e.g. aggregated on some level)
- **source layer** – where all the activities related to storing and managing data sources are located and where is realized the reconciliation (the mapping) of statistical definitions from external to internal data warehouse dictionary.



4 Center of Excellence on Data Warehousing, *Overall Handbook to Set Up a S-DWH* (2017), https://ec.europa.eu/eurostat/cros/system/files/dwh-hb-_overall_handbook_how_to_set_up_a_s-dwh_v3.pdf.

The layers can each have different granularity and levels of attributes and dimensions. They can also be tailored for specific user groups (e.g. integration layer for surveillance personnel who need to have all the detailed information, including names of persons). The interpretation and analysis layer could have a little less granularity but still be fit for BOP compilation. The access layer would hold data on some level of aggregation.

The layers are further grouped into two layers.

- **The operational data**, or the effective data warehouse, consist of the source layer and integration layer. This is where the data are acquired, stored, coded, checked, imputed, edited and validated.

- **The data warehouse** consists of the interpretation and analysis layer and the access layer. Here, raw data are uploaded from any base-phase elaboration output of a production process. Through the interpretation layer data, experts can access all data. The access layer is for data to be accessed by the public or reported to international organizations such as the International Monetary Fund (IMF) or the World Bank.

DATA REQUIREMENTS

The increasing speed and shift in the nature of changes in economies have necessitated a fundamental transformation in the way that financial regulators collect, analyse and use data. Central banks are not only having to become more data driven themselves but are increasingly being relied on by governments more broadly to collect and process data to support macroeconomic and microeconomic policy formulation. This has manifested in a move away from traditional aggregated data reporting to transaction-level data reporting.

For many developing economies, the COVID-19 pandemic has made the need for more granular data to understand remittances even more crucial as remittances represent a vital source of foreign currency and a potential lifeline in a situation where developed economies are likely to recover more quickly.

> *"Central banking statistics are currently undergoing a paradigm shift: the move from macro to micro statistics, or from aggregate to granular statistics."*
>
> *"That move is nothing short of a big bang for central bank statistics. In a sense, it resembles what happened in the 1930s, when the Great Depression moved the focus of economic analysis from equilibrium to fluctuations and downturns, eventually fostering the development of national income accounts."*
>
> – Sabine Lautenschläger[5]

This section examines the data required to implement a system that will provide insights to drive data-driven policy and investment in remittance services. This includes looking at the limitations of aggregated data reporting, the opportunities presented by transaction-level data, the potential of supplemental data to contextualize understanding and the importance of transaction limits, location data, sex-disaggregated data and the protection of personal data.

A more detailed discussion of these issues and the potential use cases for transaction-level data can be found in the series paper The case for disaggregated supply side data on remittances.

[5] Speech by Sabine Lautenschläger, member of the Executive Board of the ECB and Vice-Chair of the Supervisory Board of the Single Supervisory Mechanism, at the Eighth ECB Statistics Conference, Frankfurt am Main, 5 July 2016, www.ecb.europa.eu/press/key/date/2016/html/sp160705_1.en.html.

The current situation: Aggregated data reporting

Many central banks require data to be aggregated by the reporting institutions before they are transmitted. Aggregated reporting is where data are aggregated by one or more metrics, see the example below.

Month	Value of inbound cross-border transactions			
	Females	Males	SWIFT	MTOs
January 2021	1,800,000	2,100,000	7,500,000	2,400,000
February 2021	1,600,000	2,200,000	3,100,000	700,000

This process not only strips the data of many valuable insights, it also requires the processing of the data, which is often done manually. This processing of the data before submission is not only costly in terms of the human effort often required to prepare returns but it also introduces the potential for data entry, analysis or formatting errors to dramatically reduce the quality of the data.

> *"By asking for aggregate data, which is pre-organized and aggregated by the reporting agents or by the national central banks, we miss lots of valuable information. After all, it is not only the average that matters, but also the underlying distribution. And in order to analyse the distribution we need the "basic" (granular) data."*
>
> – Sabine Lautenschläger[6]

It is possible for central banks to require reporting institutions to report highly disaggregated data, which is aggregated using multiple, combined attributes instead of singular attributes (see Glossary for full explanation). The trade-off here is that while this approach can generate many more insights, it comes at the cost of a significant increase in the effort required for compliance and also significantly increases the chances of data errors.

[6] Speech by Sabine Lautenschläger, member of the Executive Board of the ECB and Vice-Chair of the Supervisory Board of the Single Supervisory Mechanism, at the Eighth ECB Statistics Conference, Frankfurt am Main, 5 July 2016, www.ecb.europa.eu/press/key/date/2016/html/sp160705_1.en.html.

Moving 'beyond the aggregates': Transaction-level data reporting

Transaction-level data can be thought of as a situation in which every transfer has its own individual record or entry in a database, the equivalent of a single row in an Excel document. This record contains all the relevant data concerning that transaction.

Date	Transaction value – sending currency	Transaction currency	Country of origin	Receiving institution type	Receiving institution name	BOP code	Sex of recipient
01/01/2021	10,000	USD	USA	Bank	Bank 23	xxxxxxx	Female
01/01/2021	980	EUR	FR	MTO	Bank 42	xxxxxxx	Male

Transaction-level data are crucial for regulators to be able to understand remittance and foreign exchange markets, their challenges and opportunities. This understanding is vital to the development of policies, products and services that lower barriers and increase total values of incoming remittances, as well as to drive remittance formalization and financial inclusion. This is particularly true of economies that rely heavily on received remittances.

A transaction-level reporting system entails capturing a much higher volume of data from reporting entities. However, if it is implemented collaboratively, this can reduce the long-term reporting burden for reporting entities as it removes the need for human intervention to analyse, classify, aggregate and submit the data. A detailed exploration of the value of transaction-level reporting to drive smart policy and product design can be found in the accompanying paper The case for disaggregated supply side data on remittances.

ADVANTAGES OF TRANSACTION-LEVEL DATA AND SYSTEM-TO-SYSTEM DATA TRANSFER

- Allows regulators to drill into data in a way that provides insights into the drivers of remittances
- Removes the potential for human error from data entry, transcription or analysis
- Removes the potential for manipulation by reporting entities
- Allows reclassification of categories (i.e. BOP categories) over time and allows historical records to be reclassified
- Provides regulator with access to almost real time, highly disaggregated data allowing a wealth of new insights to be generated
- Reduces aspects of the reporting burden from reporting institutions.

Transaction data

ITRSs often only capture transaction data, which can be defined as data expected to be present within the transfer instruction. For a bank receiving a cross-border transfer, this is most likely to be the SWIFT message that is received by the bank. Transaction data can be expected to include:

- transaction ID
- entity type (i.e. bank or money transfer operator [MTO])
- country of origin/destination
- currency of transfer
- value of transfer in foreign currency
- value of transfer in local currency
- time and date of transfer.

While there are often free text fields for *Purpose*, *Source* or *Reason* for transfer, there are no global standards or classifications for filling these out and, in some jurisdictions, they are not mandatory. This means that existing ITRSs must often rely on other methods to generate BOP codes, such as contacting the recipient of a cross-border transfer to obtain clarification on how that transfer should be categorized.

This process is often inefficient and requires a great deal of manual human input to classify transactions according to the IMF *Balance of Payments Manual* guidelines. While inefficient, it often produces an adequate level of insight in economies where the main goal of an ITRS is to generate high-level BOP statistics. However, it provides an extremely limited data set for the analysis of cross-border remittances, which are complex, highly gendered and where channels and formality vary greatly within countries, depending on location and access to formal financial services.

Transaction limits

Many countries with an ITRS set a value ceiling for transfers, below which data do not have to be reported at the transaction level but can be aggregated and reported as a single figure. This approach has distinct benefits in terms of reducing the volume of data to be stored and managed by the system and may make sense in economies where inbound or outbound remittances do not have a significant impact on the economy. However, in economies where remittances do play a vital economic role, this practice strips the data of nearly all of their value to inform policy or investment decisions.

Value ceilings aggregate low-value transfers and lump them together, making it impossible to know where they are coming from, where they are being received, who is receiving them and all the information vital to drive better policy and develop more suitable products. Even something as fundamental as understanding the distribution of values becomes impossible with aggregated values.

It is suggested that an ITRS, which aims to capture, manage and analyse data on remittances, should not set a lower ceiling on the value of transfers it captures as transaction-level data to ensure that low-value remittances can be analysed effectively. A more detailed discussion of the issue of transaction limits can be found in the accompanying paper The case for disaggregated supply side data on remittances.

Personal data and data protection

Capturing, storing and managing data that allow the direct or indirect identification of an individual through the reporting of names, ID numbers or other characteristics assigned to a person such as a phone number, address or credit card number are increasingly becoming the subject of regulations to protect individual's privacy. In jurisdictions where data protection legislation has been implemented, handling this kind of data often comes with increased restrictions and requirements for the storing and handling of the data as well as obligations to allow individuals to request access to data that refer to them. For these reasons, it is suggested that, in general, regulators avoid capturing and storing personal data as part of an ITRS.

One possible solution to this is to encrypt data that can directly or indirectly identify a person. This can be done by the sending institution before sending the data to the central bank. To make up for the loss of information, the reporting entities can be asked to process and classify the information as suitable for the central bank. For example, use the ID number to determine a person's residency or use the address to determine the region or postal code where the person lives. The ID or address would not be shared with the central bank, only information on the residency and region/postal code.

However, there may be situations and cases where identifying individuals responsible for cross-border transfers is desirable and legitimate such as identifying individuals who are suspected of breaking anti-money laundering (AML) or countering the financing of terrorism (CFT) regulations. In these cases, the relevant law enforcement authorities should have the right to request the personal details of individuals behind the transactions directly from reporting institutions, who should be required to keep full copies of cross-border transfer records for a mandatory period of time. The transaction codes can be used to link the transactions to the customer database of the reporting entity.

Central banks can and should reassure citizens of the full protection of their reported information, including organizational, physical and technological protection of data. This information should only be used for capturing and analysing data on remittances in country and published only in aggregate form, without identifying characteristics of individuals. Individual data collected will not be passed on to any other parties.

Supplemental data

Where transaction data alone is not adequate to generate the required insights to inform policymaking and investment decisions around remittances, the transaction data must be supplemented. We refer to this as supplemental data, which include any data attributes that are not contained within the transfer instruction. The supplemental data required will vary from country to country depending on the market, available products, diaspora profile, policy

priorities, heterogeneity of the country and economy and many other factors. Depending on a country's priorities, supplemental data could include:

- cash out/deposit location
- date and time of transfer, deposit or cash out
- sex of receiving individual
- date of birth of receiving individual
- address of receiving individual
- account type (if direct deposit)
- transaction type (e.g. automated teller machine (ATM) withdrawal, point of sale (POS) transaction, etc.)
- purpose of transfer – this classification would allow an expansion from the BOP classification and allow analysis of the use to which a remittance will be put.

An exploration of uses and use cases for these data can be found in the accompanying paper The case for disaggregated supply side data on remittances.

A full set of suggested transactional and supplemental data reporting requirements is detailed below in the section Suggested data reporting requirements and standards.

As supplemental data cannot be derived from the transfer or payment instructions, they must instead be sourced from the sending or receiving individual. Mechanisms for capturing these data could include paper-based forms, mobile or online applications and human staffed or automated phone lines. While allowing a multitude of options can help to support lower capacity users and service providers, standardized mobile and online apps offer significant advantages over the other options:

Firstly, dedicated applications can support increased **data quality**. This is done in several ways including allowing users to directly enter their own data digitally, thus removing the need for data to be transcribed by a third party. Transcription of data (that is, copying them from one place to another) should be avoided as much as possible due to the significant potential for the introduction of errors. Prompts can also be used to check and validate values that fall outside expected parameters. For example, if someone enters a value for an inbound remittance transaction of US$10,000,000, the application could prompt the user to check and confirm the value of the transaction before submission.

Secondly, digital entry of the data by the recipient allows fields to be made mandatory, meaning that the required fields must be filled before a transaction can be completed. This ensures **data completeness**.

Thirdly, digital data entry allows for **data standardization** and validation. For example, a digital application allows free text fields such as *Address* to be replaced with drop-down menus

populated with the first names of administrative areas and allows standard classification of the data across the country. Similarly, the free text field *Purpose of transfer* could be replaced with a list of standardized options and also allow for an *Other* field that would allow for a free text explanation. All free text data entry should be limited as far as possible as it complicates analysis and interpretation of the data. List selections should also minimize the use of the option *Other* as again this allows users to default to this option rather than properly classifying their data entry.

While both general and digital literacy could present a barrier to the use of an application to submit the required data, this process could be supported by service provider staff. The digital application could also help to alleviate some of these challenges by offering the data entry form in different languages while producing standardized data in the database.

Further discussion about the development of tools for capturing supplemental data can be found in the accompanying paper Design considerations for transaction level reporting systems in low capacity environments.

Location data

While the collection and analysis of subnational data are not a core feature of ITRSs, in countries where understanding remittance behaviours and increasing formal remittances are a priority, understanding the distribution of financial service points and their usage can add a huge amount of value. Combining location, transactional and supplemental data can help to drive informed, supportive policy and also provide insights to drive and direct private sector investment.

Two key location attributes should be considered for inclusion in any system analysing remittance data. The first is the location of the residence of the person sending or receiving a remittance payment. This data point can be key in determining how far customers have to travel to access formal services as well as providing an indication of market size for services in different areas of a country. This can be a key piece of information to drive and target increased investment in infrastructure required to increase usage of formal remittance services.

One key challenge when capturing these data is that they are usually captured as a free text *Address* field, which allows users to enter any value they please. Addresses provide very low-quality location data that are difficult to analyse. Many LDCs have inadequate and incomplete addressing systems and, even where they exist, a significant effort is required to update and maintain a national addressing database that allows addresses to be translated into usable data. To obtain higher quality data, predefined lists of administrative areas should be used to allow remittance users to select their residence location at the appropriate administrative level.

The second valuable location attribute to be considered is the location of the financial service points that allow money to be sent internationally as well as institutions that allow international transfers to be deposited or cashed out over the counter. Combining this location data with transaction data that record the branch outlet at which a transaction was performed allows a wealth of new insights to be generated. This will allow spatial analysis to be performed on the data to understand distribution of usage, identify patterns of usage

by geography as well as identifying areas suitable for private sector investment or that may require policy intervention to encourage increased service provision.

In markets where the use of prepaid international debit and credit cards is common, tracking the location of these transactions can also provide valuable insights. For the user of the remittances data, the information on the location can help to determine whether the transaction is a remittance (e.g. residential area) or other business services (e.g. institutions or businesses such as hospitals or education institutions).The feasibility of this data capture will however vary greatly between markets as these cards can be used at any physical or online retail location as well as to withdraw cash through the ATM network, and tracking the location of the purchaser may not be possible or may violate users' right to privacy.

When transactions are aggregated to a specific place and time, it allows the transaction data to be anchored in the real world. For example, the value of cross-border transactions at a single location could be influenced by the socioeconomic make-up of the population, the level of education and literacy in the area and the proximity to transport and financial infrastructure. Use cases for the reporting of the location of service points are explored further in the accompanying paper The case for disaggregated supply side data on remittances.

Addresses are an easy way to capture these data, but they produce very poor-quality data that do not allow the service points to be mapped or analysed. Locations of service points should be captured as pairs of latitude and longitude coordinates by using a standardized coordinate projection system such as WGS84.

Sex-disaggregated data

Remittances and behaviour around the sending and receiving of money internationally are highly gendered. As well as the different total values sent and received by males and females, there are often significant differences in the source of received funds, preferred channels and transfer methods, intended usage and frequency.

WOMEN AND PRICING

Research suggests that women tend to send a higher proportion of their income, even though they generally earn less than men. They also usually send money more regularly and for longer periods of time. By sending smaller sums more often, women tend to spend more on transfer fees. Therefore, reducing transfer fees and making different transfer options accessible would benefit these women and maximize the positive impact of remittances on their families and communities.

International Organization for Migration. *Gender, Migration and Remittances*, https://www.iom.int/sites/default/files/about-iom/Gender-migration-remittances-infosheet.pdf.

While surveys can be an important tool for capturing some of these insights, sex-disaggregated supply side data are far more comprehensive, cost-effective and sustainable. A case study examining the potential value of sex-disaggregated data can be found in the accompanying paper The case for disaggregated supply side data on remittances.

Supplemental data generation and capture

Because supplemental data are not generated automatically by the transfer instruction, they must be captured by the service provider at the point of sending or receiving a cross-border transfer. This process requires the financial service provider to capture the required data and adds in an additional step for users that may act as a barrier to the use of formal services. We must be cognizant of these challenges and design data capture mechanisms that lower the barriers for both users and providers as far as possible while still generating high quality data.

South Africa offers an interesting model for the capture of this information. The SARB requires all recipients of cross-border remittances to complete a Reporting Mandate form. This form captures data on sex, location and reason for transfer. Some institutions capture even more detailed data on tax and residency status, although these are for internal analysis rather than a reporting requirement of the SARB.

This form can be completed on paper, through a digital form online, through dedicated apps or can even be completed over the phone. This range of options allows users to select the method most appropriate for them and overcomes barriers such as illiteracy by allowing users to use the phone or fill in the form at an office or branch with the support of the staff of the service provider. The barriers for compliance are lowered further as a form is required for each institution where money will be received but this form is valid for one calendar year, unless the purpose of the transfers or other significant details changes between transfers. This prevents recipients from having to fill in a form for every transfer.

In countries with a centralized national ID database, the compliance burden could be reduced further by centralising the collection of data on the Reporting Mandate form. For example, in Iceland, the location of residence is obtained through the use of the customer's national ID number, which is used to look up additional data in the Persons Registry. A linkage with a national ID database would also allow users to submit one form to a central body every year, and then individuals would only have to pass their national ID number to the financial service provider in order for them to link the individual to all their relevant supplemental data.

DATA TRANSMISSION

How data move between reporting institutions and regulator's systems is likely to be significantly impacted by the move to transaction-level reporting. This section explores some of the issues and options available for data reporting.

Bulk file submission versus real-time data transmission

Central banks in low-capacity environments are mostly used to receiving aggregated data through some form of bulk file submission. Bulk file submission is the submission of multiple records in the same file. The mechanism by which this is done varies greatly from hand delivery of paper reports, emailing document or spreadsheet files, through to the automated upload of encrypted XML files using a managed file transfer (MFT) service. Bulk file submissions are often suitable for the periodic submission of aggregated data. The volume of data being transmitted is low, the data do not contain critically private information, and the reporting periods do not produce an undue burden on reporting entities.

However, with transaction-level data bulk file submission presents some significant challenges. Firstly, the volume of data being produced and transferred can be several orders of magnitude greater than would normally be found in aggregated reporting. This means that if transaction-level data are reported on a monthly basis, as is often the case for aggregate reporting, the file sizes become impractical and, in environments with inconsistent access to power and high-speed internet, this can result in a complete inability to submit data.

A solution to this is to implement near real-time data transmission. This involves system-generated data being sent between the reporting entity and regulator much more often, which effectively decreases the volume of data being transmitted at any one time. This increases the chances of a successful submission in low-capacity environments as it decreases the time required for a successful transfer. Depending on the systems and capacity of the reporting entities, this could involve real-time data transmission, where the completion of a record in the reporting entity system is automatically transmitted to the regulator, or it could involve transmitting the completed records for a single day in one transmission.

System-generated data

Increasing the volume and frequency of the data transmission would significantly increase the burden on reporting entities if data were compiled and transmitted by human intervention.

This is why transaction-level reporting must be combined, as far as possible, with the implementation of **system-generated data** and **system-to-system data transfer**.

System-generated data requires moving from submissions that are prepared by humans to submissions that are prepared automatically by a system. Much of the aggregated data reporting in lower income countries is based around a model where a staff member extracts data from the institution's database into a spreadsheet, manually reformats and edits the data into the required structure before submission. This model is costly in terms of person-hours and is highly prone to human-introduced errors.

On the other hand, system-generated transaction-level reporting requires that individual transaction records are formatted to conform to an agreed template, using agreed standard formats, coding structures and naming conventions by a rule-based system without the intervention of a human compiler. System-generated data require an initial investment in setting up the system to generate the required data but this cost can be offset against the cost of the person-hours that would be required to manually generate submissions. System-generated data also have the advantage of removing the potential for human-introduced errors and create a clear audit trail for the generation of every record.

In many countries, current systems for reporting data (such as ITRSs) are old and were established when the options for the transfer of data were limited, in some cases decades ago. With technological improvements and advancements, it has become necessary to introduce more effective and efficient methods for transferring data.

System-to-system data transfer

Automating the data generation process should ideally be combined with the automation of the data transfer process. Automation not only reduces the reporting burden in terms of person-hours required to submit data but can reduce the chances of a failed submission in low bandwidth environments. By reporting small files more often, the chances are reduced that the connection will be broken mid-transfer.

There are broadly three options for electronic system-to-system data transfer:

1. **Secure message service** – such as SWIFT or Ripple.
2. **Application programming interface (API)** –Secure APIs are

SWIFT SCOPE

While UNCDF does not endorse individual products or services, one unique service is worthy of highlighting. SWIFT Scope is a service available from the secure messaging service SWIFT, it is only available to central banks. This service allows central banks to have full copies of all cross-border transactions, which flow through the SWIFT network, sent directly to a server at a central bank. This removes the need for banks to transmit any transactional data to the central bank. To capture all the required data, this system would have to be supplemented to allow non-bank service providers to submit transaction data as well as provide a module to support the submission of supplemental data.

highly efficient and effective ways for systems to send data and communicate in near real time.

3. **Bulk file upload** – This involves the periodic upload of batch data files such as spreadsheets or XML files containing transaction or supplemental data using a web-based batch processing technology such as managed file transfer (MFP) or SSH file transfer protocol (SFTP).

In low-capacity environments, it is likely that a hybrid system will be most suitable in the short term. Implementing a bulk file upload system will allow time for lower capacity reporting entities to invest in the systems required for system-to-system data transfer through a secure API or through secure messaging services.

DATA VALIDATION

Data validation is a hugely important part of any data-driven system and consists of the application of a set of rules to a data set to ensure that they are complete, correctly formatted and consistent with expected inputs. It is important that data validation protocols mirror the data requirements developed for reporting institutions.

The data validation system should first check for **completeness**. Data reporting requirements should clearly delineate which data fields are *required* and which are *optional*. Records that are received with empty or null values in required fields should be rejected and returned to the reporting institution for completion.

Secondly, the system should check that the data are **properly formatted**. These checks involve checking that values are of the correct type, for example, that no text values are entered into a numeric field.

Lastly, a data validation module should **apply a set of rules to all records to ensure that they conform to expected limits**. There are broadly two types of rules that can be applied in data validation, these are static rules and dynamic rules.

Static rules represent hard limits. For example, if a country has an upper ceiling for the value of a single outgoing foreign currency transaction (i.e. US$100,000), a static rule should be applied that any record submitted with a value higher than this amount should be rejected and automatically returned to the reporting institution for investigation. Another example would be setting a rule that any incoming foreign currency transfer of under US$10 should be flagged and automatically returned to the reporting institution for investigation as, while this transaction is technically possible, it is also highly unlikely. This kind of rule can be useful in highlighting errors where a deflator has been applied (i.e. an institution is reporting in units of .000 rather than in whole numbers). It is important to have an understanding with the data provider that all static rules that fail the limit are to be corrected on a frequent and ongoing basis – preferably within one business day, but this can depend on the frequency with which the data are reported.

Dynamic rules are useful in flagging outlier transactions that may be caused by data errors but that may also indicate significant changes in behaviour, which may require further investigation or intervention to address. Dynamic rules allow data to be checked against themselves for consistency rather than a predefined set value. Warnings triggered by dynamic rules can also indicate a systemic error in the reporting mechanism of the reporting entity.

For example, data from certain branches could be missing entirely. This can also indicate that some of the systems (of banks or MTOs) that are used to handle foreign exchange transactions have lost connection with the reporting mechanism.

For example, a dynamic rule could be established to create an alert if the total value of remittances received increases or drops by more than 20 percent from the previous month or from the same month the previous year. These types of rules can be applied at different levels, to the total sum of all remittances received or within data submitted by individual providers.

Ensuring data quality is hugely important and is something that often consumes a disproportionate amount of time and energy in data collection processes without an automated validation module. The time saved by the proper implementation of an automated system can then be deployed in investigating and understanding genuine outliers in the data and their implications for policy and product design.

DATA STORAGE AND APPLICATION HOSTING

This section introduces the options for data storage and hosting. The three options for data storage and application hosting examined are on-site servers, cloud storage and hybrid models, which make use of both on-site and cloud infrastructures.

On-site server

The on-site server model is infrastructure-based and requires the purchase and management of physical primary server and backup stacks. These servers store both the applications and databases, which store the data collected. The primary servers are usually located within the regulator's premises with a secondary server stack installed at an off-site location for backup and recovery.

Most financial regulators are used to using this infrastructure model to manage and store aggregated data reported from market players. It requires a significant capital investment in hardware and infrastructure. Due to the increased data volumes that could be expected to be produced from a transaction-level reporting system, the volume of data storage required will also be much greater than that required to host and store aggregated data reporting systems.

Cloud storage and hosting

The cloud computing model is service-orientated and involves the delivery of services such as application hosting and data storage by a third party, over the internet. Instead of purchasing physical data storage devices, storage is provided as a service with data being stored on remote servers and is accessed via the internet. In this model, infrastructure management, system upgrades, security upgrades and uptime guarantees are usually included in the provider's service fees.

Adoption of cloud computing services to provide core services by financial regulators has been slow but is now increasing. In 2020, the Bank of England appointed a technology partner to design and construct a new cloud environment.[7] A 2019 survey of central banks

[7] Bank of England, *The Bank of England appoints Appvia as a partner to assist in design, construction and assurance of a new cloud environment* (2020), www.bankofengland.co.uk/news/2020/december/boe-appoints-appvia-as-partner-to-assist-design-construction-and-assurance-of-new-cloud-environment.

by CentralBanking.com[8] found that 42 percent of respondents use cloud computing in some aspect of their work, with 69 percent of respondents coming from emerging or developing countries.

Hybrid models

Many countries are now implementing regulations that govern how and where citizen's personal data can be stored. In many cases, this limits sensitive data to storage options within the geographic territory of the country. This can provide a significant barrier to the use of cloud computing services, unless the country in question has a local cloud-hosted within the country.

While these regulations do limit the use of cloud computing, it may still be possible to take advantage of the increased scalability, flexibility and cost-effectiveness of cloud computing while remaining compliant. Depending on the wording of the regulations, data that cannot be linked to an individual person may still be eligible for hosting outside the country. This opens up an option whereby the personally identifiable data associated with each record – name, ID number, location, etc. – is hosted on a local server within the regulator, and the bulk of the information – value, currency, service provider, etc. – are stored on the cloud. The two databases would be linked by a randomly generated transaction ID but ensure that even if the cloud data storage suffered a security breach, no citizen's data would be exposed.

[8] Daniel Hinge, *Central banks increasingly embracing the cloud* (2019), www.centralbanking.com/central-banks/economics/data/4526836/central-banks-increasingly-embracing-the-cloud.

	ON-SITE DATA HOSTING	CLOUD HOSTING
ADVANTAGES	**Legal compliance:** Some countries require certain types of data to be hosted locally, within the geographic bounds of the country **Limits third party access to data** (assuming sufficient in-house capacity to maintain system security) **No need for internet connection to access database**, although an internet connection would be required to access data remotely and would likely be needed to access a business intelligence product to visualize and analyse the data **Comfort and familiarity:** Many non-technical audiences are more comfortable with the idea of a locally hosted server that they can see and touch rather than the idea of cloud storage solution that is less tangible **Can be cost-effective** with small volumes of data	**Scalability and cost:** Storage on the cloud can be scaled up as needed without the cost of additional hardware. Given the volume of data, any transaction-level system is likely to have to digest and manage a cloud-based storage solution is likely to offer much greater scalability and be much more cost-effective **Security:** Cloud-based systems offer varying levels of encryption and security that are managed as part of the fee. This can help to ensure compliance with global best practice without the expense of updating a locally hosted system **Increased reliability and reduced system maintenance:** Cloud storage solutions come with service level agreements that guarantee uptime and, as the servers can be located in countries with favourable environmental conditions as well as reliable power and internet connections, they can be incredibly reliable **No need for physical backup server:** Cloud storage solutions can also provide cloud-hosted backup services, reducing the need for costly, locally hosted backup servers
CHALLENGES	**Expense:** Locally hosted solutions require not only one server stack, which has to be replaced or supplemented as it degrades or reaches its storage capacity, but also a second one as best practice involves another off-site, backup server to also be set up and maintained **Scalability:** Transaction-level reporting requires the retention of large amounts of data that will increase not only in a linear manner over time but also possibly exponentially if there is a dramatic increase in the number of cross-border transactions. In a locally hosted solution, each time the server capacity is reached, a new server and a backup one would have to be purchased and installed **Reliability and chances of environmental failure:** Managing large server stacks is challenging and costly in countries where power and internet connections are unreliable, and where dust and other environmental challenges can shorten the life of hardware Locally hosted solutions require both a main and backup server stack to be located in different locations. This dramatically increases the hardware and maintenance costs, especially in challenging infrastructure and environmental conditions	**Legal requirements to host locally:** Some countries have policies or laws that certain types of data must be stored within the geographic bounds of the country concerned **Requires a working internet connection:** Without internet access, data cannot be accessed **Fear and unfamiliarity:** Cloud hosting is often poorly understood and can be associated with increased fear of hacking or security breaches **Commitment to an ongoing cost:** Procurement of a multi-year service contract may be more challenging for procurement teams and procedures more used to asset purchases

DATA ANALYSIS

Comprehensive data analysis is often the most under-exploited function of data-driven systems within financial regulators and, in some cases, is missing altogether. Collectively, the function of the previous modules is to capture and manage high-quality, timely, complete data and, while these functions are critical, they should be thought of as the primary building blocks of value and not having an end value in themselves. To derive value from data, they need to be:

ACCESSIBLE

Reducing gatekeepers is crucial to maximising data value. Outside of ensuring data integrity and security, data should be accessible across departments and teams to support a more holistic view of the market and economy.

Lowering the technical requirements to access data (i.e. allowing data to be queried via filters or even artificial intelligence (AI)-supported free text search) makes data more accessible than systems that rely on structured query language (SQL) queries to generate data sets.

VISUAL

Numbers rarely make a difference without a narrative. The ability to build narratives from data is heavily dependent on the ability to visualize trends, spot outliers and understand context.

Value is dependent on the ability to 'see' and explore the data in a way that supports narrative storytelling. These could include dashboards charts, maps and other visual representations of key metrics.

INTERACTIVE

Data products should allow users to interact with the data in order to change the way the data are presented – presenting the data as a bar chart, map or trendline could support analysis of different aspects of the same data set.

Users should be able to control the level of the analysis. This could mean analysing data by month versus by quarter or changing from a national summary to a regional breakdown. Allowing users to control the dimension of the data analysed, such as changing from a monthly value to a cumulative value or to the change or percent change from a previous period, will all yield new insights.

FLEXIBLE

If data are being analysed effectively, then the analysis should generate new questions and highlight areas that require new tools to explore.

Systems should be flexible enough that advanced users or system administrators can create new dashboards, or other analysis tools, easily and flexibly in a way that minimizes the human capital required, both in terms of technical skill and bandwidth.

Reports versus business intelligence tools

To maximize the value of their data, institutions often need to supplement, or replace, existing reports with some form of business intelligence tool that allows interactive and visual analysis of the data. Dashboards not only fulfil the requirements laid out above, but they can also be instrumental in maximising human resources where human capacity, in terms of time, is limited. Reports are run periodically and take a lot of human capital to produce. Data tables must be extracted from systems, charts and graphics are often created from scratch for each report resulting in a lot of duplicated effort, text must be written, and a final document designed. This process consumes a lot of time and resources and produces a report that cannot be interrogated further, which means that any questions generated by the report will be referred back to the analysts who have to manually extract and analyse the data for each query. This often leads to the situation where analytic resources are so consumed with processing ad hoc data requests that there is no bandwidth left to proactively seek out and generate insight from the data produced.

On the other hand, once a dashboard or similar tool has been created, data can be automatically extracted from the database in real time to automatically populate the interactive charts, graphics, maps and commentary. This not only allows multiple users and levels of the organisation to interact with the data in near real time, to drill down and customize their analysis, but also frees analysts to spend their time interrogating the data, finding patterns and insights and adding real value to the organisation rather than running an endless series of queries to generate a narrow set of reports.

Selecting a business intelligence tool

There are many excellent business intelligence solutions on the market, and most can be placed on top of nearly any data source, which makes them one of the most flexible modules of any data-driven system. Many offer free trial periods or a free version of their products to allow users to explore and compare functions and features.

Finding the most appropriate solution for your institution will depend on a range of factors including:

- human capacity
- use cases and analysis needs
- primary and secondary audiences
- existing data infrastructure and licences
- cost of licence.

Understanding and exploring the potential of these tools are key to maximising the value of a data-driven system and one which, instead of being the final module to be defined, should be core to informing the design of the overall system.

CONCLUSIONS

The COVID-19 pandemic has highlighted the importance of improving existing systems and implementing transaction-level reporting systems for cross-border transfers, which support data-driven policy around remittances and promote the development and deployment of appropriate and accessible formal remittance products.

A modular design would allow regulators to explore new and emergent technology trends to increase the efficiency and effectiveness of existing systems. The model can also be used to build a stand-alone remittance reporting system that captures, manages and analyses data only on remittances and not the full range of BOP data usually present in an ITRS.

With the recent technological improvements and advancements, it has become possible to introduce more effective and efficient methods for transferring data. This would allow the transaction-level reporting to be combined, as far as possible, with the implementation of system-generated data and system-to-system data transfer.

By using data validation techniques and appropriate data storage options, central banks can reduce the burden of manually generating, validating, reformatting and editing data for both themselves and reporting entities. This enables the reporting of disaggregated data that are necessary for data analysis to produce actional insights for policymakers and to support the development of appropriate remittance products.

The availability of the detailed and disaggregated data on remittances would facilitate the estimation of the potentially missing data on remittances received/sent through informal channels. By better understanding the data through more detailed information (on sex, location, purpose of transaction, etc.), users and compilers of the data on remittances would be able to develop more targeted surveys and estimation techniques for compiling and analysing the data on remittances.

ANNEX

SUGGESTED DATA REPORTING REQUIREMENTS AND STANDARDS

Inbound transfers

FIELD	NOTES	SUGGESTED STATUS
Transaction ID	This should be a unique ID for each transaction	Required
Sending entity type	For example: • commercial bank • MTO • mobile money provider	Required
Receiving entity type	For example: • commercial bank – direct account transfer • commercial bank – on behalf of other MTO (for historical data) • MTO • mobile money provider	Required
Receiving entity name and code (where codes are required by the regulator)	The bank or MTO name and licence number	Required
Cash out/deposit point name/code (where codes are required by the regulator)	The bank or MTO branch name and sort code or agent identifier	Required
Country and country code of origin of transfer	Should employ a globally recognized standard such as ISO-3166-1[9]	Required
Country and country code of transfer intermediary	In cases where funds flow through an intermediary bank (should employ a globally recognized standard such as ISO-3166-1)	Required
Remitting currency	Should employ a globally recognized standard such as ISO-4217[10]	Required
Value in remitting currency		Required

[9] International Organization for Standardization, ISO 3166 Country Codes, www.iso.org/iso-3166-country-codes.html.

[10] International Organization for Standardization, ISO 4217 Currency Codes, www.iso.org/iso-4217-currency-codes.html.

FIELD	NOTES	SUGGESTED STATUS
Value in local currency	To be calculated using a standard exchange rate in line with local convention/regulations	Required
Date and time of transfer receipt		Required
BOP category and code	To be classified according to IMF *Balance of Payment Manual* 6th edition (BPM6)	Required
Date and time of deposit or cash out		Optional – recommended
Transfer mechanism	SWIFT, money order, proprietary transfer	Optional – recommended
Sex of receiving individual	This field is crucial for understanding the male and female dynamics of cross-border remittance transfers as well as informing both public policy and product design and infrastructure investment by MTOs	Optional – recommended
Date of birth of receiving individual	This data point would help to further understand the profile of beneficiaries of remittances	Optional – recommended
Cash out or deposit point location	The location of the branch where cross-border fund transfers are deposited or the location of the cash out point in the case of an over-the-counter (OCT) transaction (ideally, the GPS coordinates for each bank branch and OCT service point should be captured and stored in a separate database to allow easy look up based on the branch or OTC point code If this is not available, a suitable administrative level should be chosen for reporting and standardized codes used to report the location)	Optional – recommended
Address of receiving individual	Structured and standardized address fields should be used to capture the location of the normal residence of the receiving individual. These data will provide insights into the distances that people travel to access formal services and allow an understanding of the relationship between access to formal services and usage	Optional – recommended
Account type	Some jurisdictions have accounts (i.e. diaspora accounts) that have different rules for the retention and management of foreign currency	Optional – recommended

FIELD	NOTES	SUGGESTED STATUS
Transaction type	Transactions using credit or debit cards receipts include sum of payments/ withdrawals from individuals using foreign bank cards in the country. Transaction type can differentiate between ATM transactions and POS transactions	Optional – recommended
Purpose of transfer – Detail	The purpose of the transfer to provide further details about how incoming funds will used or the origin of the transfer, this would supplement the BOP codes which may not be sufficient for a full understanding of remittance behaviours	Optional

Outbound transfers

FIELD	NOTES	SUGGESTED STATUS
Transaction ID	This should be a unique ID for each transaction	Required
Sending entity type	For example: • commercial bank – direct account transfer • commercial bank – on behalf of other MTO (for historical data) • MTO • mobile money provider	Required
Sending entity name and code (where codes are required by the regulator)	The bank or MTO name and licence number	Required
Branch/agent name/code (where codes are required by the regulator)	The bank or MTO branch name and sort code or agent identifier	Required
Country and country code of destination of transfer	Should employ a globally recognized standard such as ISO-3166-1	Required
Remitting currency	Should employ a globally recognized standard such as ISO-4217	Required
Value in remitting currency		Required
Value in local currency	To be calculated using a standard exchange rate in line with local convention/regulations	Required
Date and time of transfer		Required
BOP category and code	To be classified according to IMF *Balance of Payment Manual* 6th edition (BPM6)	Required
Business identifier of sender	Business licence or tax identifier	Optional – recommended

FIELD	NOTES	SUGGESTED STATUS
Account type	Some jurisdictions have accounts (i.e. diaspora accounts) that have different rules for the retention and management of foreign currency	Optional – recommended
Transaction type	Payments include sum of payments/ withdrawals using country's bank cards abroad. Transaction type can differentiate between ATM transaction and POS transactions	Optional – recommended
Purpose of transfer - Detail	The purpose of the transfer provides further details about the purpose of outbound funds to supplement the BOP codes, which may not be sufficient for a full understanding of foreign cash outflows	Optional
Transfer mechanism	SWIFT, money order, proprietary transfer	Optional – recommended

Unlocking Public and Private Finance for the Poor

LEAVING NO ONE BEHIND IN THE DIGITAL ERA

The UNCDF Strategy 'Leaving no one behind in the digital era' is based on over a decade of experience in digital finance in Africa, Asia and the Pacific. UNCDF recognizes that reaching the full potential of digital financial inclusion in support of the Sustainable Development Goals (SDGs) aligns with the vision of promoting digital economies that leave no one behind. The vision of UNCDF is to empower millions of people by 2024 to use services daily that leverage innovation and technology and contribute to the SDGs. UNCDF will apply a market development approach and continuously seek to address underlying market dysfunctions

THE UNITED NATIONS CAPITAL DEVELOPMENT FUND

UNCDF makes public and private finance work for the poor in the world's 46 least developed countries (LDCs).

UNCDF offers 'last mile' finance models that unlock public and private resources, especially at the domestic level, to reduce poverty and support local economic development.

UNCDF's financing models work through three channels: (i) inclusive digital economies, which connect individuals, households and small businesses with financial eco-systems that catalyse participation in the local economy and provide tools to climb out of poverty and manage financial lives; (ii) local development finance, which capacitates localities through fiscal decentralization, innovative municipal finance and structured project finance to drive local economic expansion and sustainable development; and (iii) investment finance, which provides catalytic financial structuring, de-risking and capital deployment to drive SDG impact and domestic resource mobilization.

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