An Evaluation of the Usage and Operational Framework of the Real Time Gross Settlement System in the Zimbabwean Banking Sector

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Abstract
Payment systems have evolved over the years in tandem with the quantum leap in the volume and value of payment system transactions. Consequentially, the banking sector together with the financial regulatory institutions have developed safe, reliable and robust payment streams such as the Real Time Gross Settlement (RTGS) system. This research seeks to evaluate the usage and operational framework of the Real Time Gross Settlement system in the Zimbabwean banking sector. The cross-sectional survey research design was adopted for this research. The major findings from the research were that the RTGS system is widely available and optimally utilized. There are manual interventions between the RTGS system and core banking systems. It was concluded that there is capacity to synchronize the RTGS system with other payment streams, the RTGS system rules and procedures are not fully implemented by financial institutions and the framework governing the RTGS system is largely comparable to international best practice. Recommendations were that the RTGS system should be synchronized with other electronic payment streams, the adoption and implementation of the Straight-Through Processing should be expedited and that there should be an introduction of system availability barometers.

Keywords: real time gross systems (RTGS), payment systems, payment streams, operational framework, synchronize

INTRODUCTION
Over the last few decades, the issue of payment and settlement systems has been given prominence the world over. The payment system comprises institutions providing the payment services, the different forms of money, the means of transferring them and the contractual relationships linking the concerned parties. Payment systems can be divided into two broad categories namely small value and large value payment systems. Large value electronic payment systems are typically designed to process large value or urgent payments. In the case of Zimbabwe, the large value electronic payment system is known as the Real Time Gross Settlement system. The Real Time Gross Settlement system enables the public to receive as well as effect large value payments. Large Value Payment systems were adopted by many countries in the recent past as a tool for secure and efficient payment systems (Eisenbeis, 1995).

Many developing and developed economies have been redesigning large value payment systems through various fundamental reforms to support the increase in volume and value of payment system transactions, financial integration, technological advancement and financial participants’ demands. The main thrust of these developments encompass placing the large value payment systems at par with international standards, serving the requirements of domestic and international business and providing access to secure payment mechanisms to the banking public. As the large value payment systems develop, the obligation of the authorities and players in the financial services sector has been to ensure a sound and competitive financial system. To ensure that the transacting public receives a world class service with regards to large value payments, institutions in the financial services sector have been focusing on fostering the safety, efficiency and reliability of the payment system.

The rapid technological development and the deregulation of the financial sector in the last three decades have contributed to an inevitable surge in financial activity. These developments had the concomitant effect of increasing the volume and value of payment flows internationally. This trend is clearly illustrated by the significant increase in the volume and value of large value transfers handled by the major systems in the United States of America, China, Japan and the United Kingdom. According to Martin (2005), the large value payment system transactions in the United States of America
increased from 50 times of the GDP in 1989 to 62 times of the GDP in 2003. In terms of value, the transactions exceeded US$704 trillion in 2003.

In Zimbabwe, like many other countries, the Real Time Gross Settlement (RTGS) system plays a pivotal role with respect to large value payments. The RTGS system is one of the main settlement nucleus among other payment streams such as cheques, card based transactions, Point of Sale electronic settlements, internet payment system, telephone banking and smart cards. Total RTGS system values amounted to US$33 billion for the year 2011, an increase of 51% from US$21 billion recorded in the year 2010. The total volume of transactions for the same period were 2 million and 1.6 million respectively representing a 28% increase (Reserve Bank of Zimbabwe, 2012).

The increase in the quantum and value of transactions fundamentally alters the risk landscape of the operations of the Real Time Gross Settlement system. This arises from the fact that as the volume of payment traffic grows, there is a shift from manual to electronic payments. This result in a change in business processes. Apart from that, the RTGS system which is the nerve centre and pulse of the national payment system relies heavily on the country’s infrastructure such as telecommunication and electricity. The power outages which have been obtaining in Zimbabwe for the last five years coupled with an incapacitated telecommunications infrastructure collectively militate against an efficient and reliable electronic payment system. The unstable macroeconomic conditions have resulted in labour instability in the banking sector in Zimbabwe. This also has a negative bearing in terms of institutional memory and the smooth operation of critical systems such as the RTGS. In view of the maintained and sustained rise in both the volume and value of RTGS system transactions, the safety, security and reliability of large value payment is perceived to be paramount in that if compromised, this could have a devastating effect to the financial sector and the economy as a whole.

The deregulation of the financial sector in Zimbabwe in the 1990s led to an increase in the participants and payment instruments available in the national payment system. In addition, the rapid technological developments and the surge in financial activity also contributed to a significant increase in both the volume and value of payment flows in Zimbabwe. This unprecedented growth in volume and value of transactions processed through the Large Value Payment system has a propagation effect on systemic vulnerability among financial institutions. While the RTGS system brought positive results, the banking sector in Zimbabwe experienced the worst banking crisis ever witnessed between 2002 and 2005 due to deep rooted structural anomalies, inadequate risk management systems, poor corporate governance practices, diversion from core to speculative activities, liquidity and solvency challenges. In addition, the RTGS system became a conduit for speculative activities, in 2008, in the form of illegal parallel market foreign exchange transactions, a phenomenon which was widely known as “burning money”. The transacting public carried out the illicit deals outside the RTGS system and then used the system for the transfer of funds. Operational challenges continued to plague the banking sector, notwithstanding the adoption of the RTGS.

RESEARCH AIM
The study sought to evaluate the usage and operational framework of the Real Time Gross Settlement system in the Zambian banking sector.

LIMITATIONS OF THE STUDY
Statistical disclosures at the Reserve Bank of Zimbabwe were hampered by the fact that employees were obliged to adhere to the official code of secrecy. The researcher had to emphasize the academic nature of the study as well as the high level of confidentiality which data would be subjected to. The study being of a highly technical nature had to be informed by strategic players in the domain of the subject. The schedules of the key resource persons were continually busy hence the researcher had to adhere to strict appointments.

LITERATURE REVIEW
A payment system is a configuration of institutions supported by an infrastructure of technology driven processes and practises to facilitate commercial and financial transfers between buyers and sellers (www.investopedia.com). Similarly, the Bank of International Settlement (BIS) 
1 Committee of Payment and Settlement Systems (CPSS) 2 (2011) defines a payment system as consisting of a set of instruments, banking procedures and, typically, interbank funds transfer systems that ensure the circulation of money. In the same vein, The Swedish Financial Market (2009) indicates that the payment system derives from trade in goods and services which involve the exchange of money. Fundamentally therefore, a payment system is a transfer of an amount between two parties, the remitter and the beneficiary.

The Significance of Payment Systems
The fundamental aim of any national payment system is to facilitate the circulation of money in the economy. It is recognized worldwide that an efficient systems...
and secure payment system is an enabler of economic activity by providing the conduit essential for effecting payments and transmission of monetary policy, (Bank of India, 2005). Payment systems are a crucial part of the infrastructure of the country in that they enable the transfer of money and financial instruments. The efficient operation of payment systems allows transactions to be completely safe. This also enables financial transactions to be undertaken in a timely manner, thus contributing to overall economic development, (Central Bank of Malaysia, 2010).

Similarly, the Reserve Bank of Australia (2010) in tandem with the Reserve Bank of India (2005) and the Central Bank of Malaysia (2010) postulates that a safe and efficient payment system is essential to support the day to day business of the an economy. In addition, the payment system enables the settlement of transactions in the financial markets.

**Large Value Versus Small Value Payment Systems**

Payments between businesses and households differ from those made by banks and clearing houses. The later are usually referred to as large value transactions. According to the National Bank of Serbia (2010), a large value payment system is designed to process large value or urgent payments. This is supported by the European Central Bank (2002) which indicated that large value payment systems typically process high value time critical payments. Although, as a rule, there is no minimum value to be processed through such systems, the average value of payments is usually large.

Small value payment systems on the other hand are designed to process a large number of small-value payments in the form of cheques, credit transfers, direct debits and card payments. Cavarretta and de Silva (1995) goes further to point out that systems that support small value payment systems have to trade off between convenience of transactions and security or durability of transactions.

**Extent of Usage of The Real Time Gross Settlement System**

Real Time Gross Settlement systems are typically used by financial institutions for settlement of large value and/or time critical payments such as money market transactions, foreign exchange transactions and cash leg of security transactions. In the RTGS, each payment is settled individually and immediately, (Danmarks National Bank, 2005). The systems did not come into use until the end of the 1990s. However, in this millennium, virtually all industrialized countries and most developing countries have a Real Time Gross Settlement system used to manage risks in large value payment transactions, (Borio and Bergh, 1993; Leinonen H, 2009).

Usually, the transaction volume in the RTGS system is very high. Annual turnover of more than 50 times a country’s Gross Domestic Product (GDP) of RTGS transactions is not unusual, (Danmarks National Bank, 2005). This high turnover can be attributed especially to the use of RTGS system to settle large value payments in the financial markets.

**Administrative Framework Governing the Operation of the RTGS System**

Settlement of transactions in RTGS is made by simultaneously debiting the remitter’s account and crediting of the recipient’s account, after which payment is considered to be final. Payments in RTGS systems become final in the course of the day such that intraday exposures do not build up, (CPSS, 2005). Payment arrangements in RTGS systems are done in order to avert gridlocks and deadlocks.

Conversely, Bech and Saromaki (2002) indicate that banks may experience situations where they have insufficient funds to settle claims against them. These claims may arise due to payment instructions from clients or as a result of their proprietary operations in the currencies, securities and money markets. A gridlock arises when payments cannot be settled individually due to distribution of liquidity among the banks. Deadlocks on the other hand arise when payments cannot be settled due to insufficient liquidity in the system.

**Revolvability, Conditionality and Finality in Large Value Payment Systems**

Borio and Bergh (1993) are of the view that revocability is whereby a transaction revoke may be repealed or invalidated before its execution on the large value interbank transfer system. Conditionality on the other hand means the certain provisions must be fulfilled before payment can be effected, for example, a payment intermediary may agree to credit the beneficiary’s account only on condition that the funds are received. Participants in an interbank funds transfer system may retain the right to revoke individual transfers before a cut-off time and the rules may be such as to make all orders conditional on final settlement. This, according to Borio and Bergh (1993), gives rise to the notion of finality, often used to denote a payment or delivery which is irrevocable and unconditional. However, it is worthwhile to note that conditionality which is mainly aimed at protecting individual participants, may actually have negative implications in so far as systemic risk is concerned.

In corroboration, the Bank of International Settlements Committee on Payment and Settlement Systems (2005) clarifies the notion of conditionality
in large value payment systems. They indicate that a key feature of the design of large value payment systems is the set of conditions that has to be met for a payment to settle. In the most straightforward case, after the payment has been validated, the only condition for settlement is whether sufficient funds are available in the settlement account of the paying participant. If the payment is larger than the funds available, the payment may be rejected by the system or else it will be put in a queued while the system verifies the sender’s overdraft limit.

Additional conditions for settlement may be created by limits. These may be set either by a participant or by the RTGS system. While limits typically restrict credit exposure, a recent feature in some systems providing continuous intraday finality is the introduction of position or sender limits in order to control the outflow of settlement funds (BIS Committee on Payment and Settlement Systems, 2005).

RESEARCH METHODOLOGY

In this research, the cross-sectional survey research design was adopted. This research design was practical in that the extent of usage of the Real Time Gross Settlement system, administrative framework, the oversight role of the Reserve Bank of Zimbabwe and the risk management tools and techniques of financial institutions in the RTGS system were identified through the administration of questionnaires to the relevant departments of institutions under research. In addition, interviews were arranged to clarify some of the open ended answers which were not clear from the questionnaire responses.

The target population comprised the Reserve Bank of Zimbabwe, seventeen commercial banks, four merchant banks and four building societies in operation in Zimbabwe as at the 18th of December 2009. However, commercial banks were the prime target of the research as it expected them to provide first hand information on the efficacy of risk management in large value payment systems due to the perceived volumes of transactions which they process.

In order to choose the research subjects, the stratified random sampling technique was employed. The sample consisting of the major players in large value payment systems was divided into three strata, that is, commercial banks, merchant banks and building societies. This ensured that each class of financial institutions was represented in the sample. Judgemental sampling was also employed to choose the respondents.

Financial institutions were selected from each stratum by taking cognisance of the total number of institutions in each class. This was meant to ensure that the final sample would reflect an accurate representation of the actual population. The basis of selection of the commercial banks, finance houses and building societies was the size of the deposit base as at the 18th of December 2009. As such, financial institutions with the highest deposit base were selected into the sample. The researchers were of the opinion that a high deposit base would have a bearing on both the volume and values transacted on the payment system.

The proportional representation of each class of financial institutions in the total population was as follows:

Table 1: Percentage representation of financial institutions in the sample

<table>
<thead>
<tr>
<th>Type of financial institution</th>
<th>Total number of institutions</th>
<th>Number of institutions sampled</th>
<th>Percentage representation in the sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial Banks</td>
<td>17</td>
<td>9</td>
<td>52%</td>
</tr>
<tr>
<td>Merchant Banks</td>
<td>4</td>
<td>2</td>
<td>50%</td>
</tr>
<tr>
<td>Building Societies</td>
<td>4</td>
<td>2</td>
<td>50%</td>
</tr>
<tr>
<td>Total</td>
<td>25</td>
<td>13</td>
<td>52%</td>
</tr>
</tbody>
</table>

Source: Primary Data

From Table 1 above, the nine commercial banks sampled were Standard Chartered Bank, Barclays, BankABC, Stanbic, CBZ Bank, FBC Bank, MBCA Bank, Premier Banking Corporation and ZB Bank. Interfin and Tetrat Investment Bank were among the sampled merchant bank. The two building societies sampled were FBC Building Society and Central African Building Society. The Reserve Bank of Zimbabwe was also part of the sampled institutions, being the regulator of financial institutions.

Judgemental sampling was used to choose respondents to the questionnaires and interviews. Given that the literature review established that the central bank and financial institutions are players in large value payment systems, the researcher selected risk managers of financial institutions, treasury back office managers of financial institutions, operatives of the Real Time Gross Settlement System at Reserve Bank as well as senior managers in the National Payments System Division of the Reserve Bank as respondents to both the questionnaires and interviews. The inclusion of senior management in the National Payments System of the Reserve Bank was imperative in that literature review indicated that the oversight of the central bank to payment and
settlement systems is of paramount significance in ensuring the safety, efficiency and reliability of payment systems. In addition, senior management of the Reserve Bank of Zimbabwe have the capacity to shape the policies of the central bank with regard to risk management in the RTGS system.

Primary data was collected using questionnaires and face-to-face interviews. Telephone interviews were also used in a limited capacity in order to clarify sections of the questionnaire that were not completed to the satisfaction of the researcher. Forty-eight questionnaires with a total of thirty three questions were administered to respondents. The researcher identified four respondents from each of the thirteen participating commercial banks, merchant banks and building societies in the sample.

Identical questionnaires were given to all the respondents in the sample in order to reduce potential bias in opinions. The concomitant effect of questionnaire standardization was also to enhance the quality of the findings as well as to obtain balanced opinions through the representation of stakeholders who are technocrats with respect to the Real Time Gross Settlement system.

The questionnaire comprised both structured and open ended questions. This enabled collection of raw data that could be coded, presented and analyzed directly without much difficulty. Information gathered was on the overall effectiveness of the Real Time Gross Settlement system in the management of risks and the strategies employed to manage the risks.

The usability of the questionnaire was tested using four participants from two commercial banks namely Standard Chartered Bank and CBZ Bank. This enabled the researcher to weed out confusing questions, repetitive questions and mistakes that could have caused fundamental changes in meaning and interpretation of responses.

The administration of the questionnaires was undertaken over a period of three weeks. This period was inclusive of the initial contacts to the respondents, the actual distribution of the questionnaires, follow up of responses and the actual receipt of responses. Responses were then coded to facilitate analysis using the Statistical Package of Social Sciences (SPSS) software packages version 12.0.

Consultations were done on the pre-tested questionnaire with senior managers in the National Payments Division of the Reserve Bank of Zimbabwe to determine its validity. The experts in the Research and Policy Formulation as well as Oversight and Risk Management sections of the National Payments Division recommended that the research instrument could be administered on the basis that questions asked were relevant, applicable and conclusive with respect to the title of the research. A simple analysis of the results from the questionnaire pre-test also reinforced the legitimacy of the instrument used in that the data produced was relevant.

In addition, the questionnaire was a reliable research instrument due to the fact that a snap shot of the results as indicated by an analysis of the pre-tested questionnaire provided a mirror image of the final results obtained. Therefore, there was consistency of results which authenticated the reliability of the research instrument used.

FINDINGS AND DISCUSSION
An investigation into the extent of usage of the RTGS system in Zimbabwe revealed that the level of awareness about the system by the banking public is very high. In addition, the research also established through a majority of the respondents that the RTGS is the only large value payment system in Zimbabwe. In light of the foregoing, the majority of respondents indicated that the system is optimally utilized. However, an overwhelming majority of the respondents indicated that there is room for improvement in the extent of usage of the RTGS system in Zimbabwe.

The research established that the Real Time Gross Settlement system in Zimbabwe has a well founded basis as evidenced by the National Payment Systems Act (Chapter 24:09), the Bills of Exchange Act (Chapter 14:04) and the Reserve Bank of Zimbabwe Act (Chapter 22:15). The fact that the legal basis of the RTGS is in the form of legal instruments promulgated by parliament attests to the fact that the payment system legislation is legally enforceable by the Reserve Bank of Zimbabwe and the participants of the RTGS system.

Administratively, the Real Time Gross Settlement system in Zimbabwe has conditions which must be met before transactions can be processed, transactions processed are irrevocable and the system provides prompt and final settlement. However, while the RTGS system provides prompt and final settlement of transactions, there is a considerable time lag between the transfer of funds in the RTGS system and the receipt of value by account holders. This is due to the fact that there are manual interventions between the RTGS system and core banking systems.

Most of the respondents indicated that the Reserve Bank of Zimbabwe is effective in the discharge of its mandate of providing an oversight role in ensuring the safety, security and stability of the RTGS system. A majority of the respondents indicated that the Reserve Bank of Zimbabwe has rules and procedures
that enable the participants in the RTGS system to have a clear understanding of the system’s impact on risk in the banking sector. However, a majority of the respondents indicated that the system rules and procedures are not fully implemented by most of the system participants.

In addition, the RTGS system rules and procedures clearly specify the responsibilities of participating financial institutions. However, it also appears through a majority of the respondents that there is laxity by the RTGS system participants in the implementation of the existing and available system rules and procedures. This exposes the RTGS system participants to operational risk.

Results from the research pointed to the fact that the Real Time Gross Settlement system is configured in a manner that ensures that it is secure to a large extent. Cases of insecurity arise due to operational risk and weak internal controls with respect to manual authorizations which are inexorably uploaded onto the RTGS system. The research also established that the RTGS system is largely reliable. Nevertheless, the software of the RTGS operating system and infrastructure such as the fiber optic network lags behind in comparison to other countries in the region as indicated by some of the respondents.

**CONCLUSIONS**

In line with the findings from the research highlighted above, the conclusions that can be drawn from the study are as follows:

**Usage of the RTGS System in Zimbabwe**

The research concluded that the system is currently being optimally utilized. The optimal utilization of the system implies that the RTGS system is effective in the management of risks in the banking sector. This confirms Danmarks National Bank (2005) which indicated that apart from the fact that the transaction volume on the RTGS system is very high and as such the system is being effectively utilized to manage risks. However, notwithstanding the optimal utilization of the RTGS system, there is capacity to synchronize the system with other electronic payment streams such as internet banking, Point of Sale, telephone banking and the Zimbabwe Stock Exchange.

**Adequacy of Legislation Governing the RTGS System**

Concerning the legal foundation of the Real Time Gross Settlement system it was concluded that the system has a well founded legal basis backed by statutory instruments which are legally enforceable by both the Reserve Bank of Zimbabwe and the RTGS system participants. Given that the RTGS has a well founded legal basis, the system is to a large extent effective in the management of risks due to the fact that there is legal certainty. This corroborates the Bank of International Settlements (2001a) which alluded to the fact that the system should have a well founded legal basis under all relevant jurisdictions.

**The Framework Governing the Operation of the RTGS**

The research concluded that the framework governing the operation of the Real Time Gross Settlement system in Zimbabwe is largely comparable to international best practice. This implies that the RTGS system is effective in the management of risk in the banking sector given that it meets the international operational specifications. This is in line with the Bank of International Settlement Committee on Payment and Settlement Systems (2011) which clarified the notion of conditionality in large value payment systems. They indicate that a key feature of the design of large value payment systems is the set of conditions that has to be met for a payment to settle. In addition, Borio and Bergh (1993) confirms that irrevocability in the RTGS system ensures that a transaction cannot be revoked, repealed or invalidated once it is executed. However, transactions are not processed on a real time basis due to the time lag between transfers of funds on the RTGS system the receipt of value into beneficiary accounts.

**The Oversight Role of the RBZ on the RTGS System**

The Reserve Bank of Zimbabwe is effective in the discharge of its mandate of having oversight on the operations of the RTGS system in the banking sector. This has a bearing on the effectiveness of the system in the management of risk in the banking sector.

**RTGS Rules and Procedures**

It was also concluded from this research that although the Reserve Bank of Zimbabwe has rules and procedures for the management of risks, their operational implementation was inconclusive. This impedes upon the effectiveness of the RTGS system to manage risks in the banking sector.

**RECOMMENDATIONS**

The Real Time Gross Settlement system should be synchronized with other electronic payment streams such as internet banking, Point of Sale, telephone banking and the Zimbabwe Stock Exchange. In addition, the Reserve Bank of Zimbabwe should undertake on-going cost management of the transactions processed through the Real Time Gross Settlement system such that it is always cheaper than using other payment streams.

The adoption and implementation of Straight-Through Processing should be expedited. This involves the inter-linkage of the Real Time Gross Settlement system to banking systems of participating
A large value system failure could trigger a domino effect in the banking system hence this calls for more rigorous monitoring of the large value payment systems against the Bank of International Settlements’ core principles of systemically important payment systems. Therefore, rigorous and robust surveillance mechanisms should be implemented by the Reserve Bank in order to ensure that any loopholes in the operational implementation of the Real Time Gross Settlement system rules and procedures are plugged.

There must be efforts by the Reserve Bank of Zimbabwe’s Human Resources Division to retain critical staff responsible for the Real Time Gross Settlement System. This also includes technical personnel responsible for managing the information technology. This ensures continuity in the smooth operation of this critical payment stream.

System availability barometers must be re-introduced to ensure that there is a tracking mechanism for the efficient operation of the Real Time Gross Settlement system.

There should be delimitation of transactions that should be processed through the Real Time Gross Settlement system. This would ensure that the system is not unnecessarily clogged by numerous small value transactions which are currently being processed through the RTGS system.

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