

A Simple Funds Transfer Pricing Model for a Commercial Bank

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DECLARATION

I, Nataliya Pushkina, declare that the research work reported in this dissertation is my own, except where otherwise indicated and acknowledged. It is submitted for the degree of Masters of Management in Finance and Investment at the University of Witwatersrand, Johannesburg, South Africa. This thesis has not, either in whole or in part, been submitted for a degree or diploma to any other universities.

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ABSTRACT

This thesis addresses the core issue of Funds Transfer Pricing (FTP) that has been brought about by the dynamic nature in the changes in the financial industry. This research has drawn up elements from a systematic historical perspective of how a funds pricing policy has been carried out among the banks. The research has made use of the elements of classical economic theory to formulate a conceptual model that will assist in the understanding of the dynamics of the driving changes in Funds Transfer Prices.

In an effort to bridge the theoretical and empirical gap in classical economics and the value chain theory, a simple systematic model was constructed. This model was used to understand the dynamics of future changes in the Funds Transfer Pricing. This was done by first analysing the various components that have influenced the basic elements of the model. The basic elements are the liabilities, assets and the Treasury of banking institutions. The interaction of these elements forms the basis of the Funds Transfer Pricing model that was formulated. Using this model, banking institutions would be able to maximize profits and ensure customer satisfaction at the same time.

The simple model proposed handles the problems that are caused by the more complex methods used and offers a practical and simple approach to Funds Transfer Pricing in commercial banks.

Keywords: Funds Transfer Pricing, Transfer Price, Base Curve, Single Pool Approach, Multiple Pool Approach and Matched-Maturity Approach

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1 INTRODUCTION

A banking system is one of the key elements of the economic system of a country. Banks are designed to regulate the movement of cash flows, to promote the best use of the financial resources of the community and to manage the overflow of capital into those sectors of the economy where the return on investment is maximized.

Managing such a complex system like a bank, is impossible without analysis; the results of which are the basis for decision-making within an organization.

One of the most important elements to function effectively in commercial banks is associated with their Funds Transfer Pricing (FTP) policy. Through a clear account of their own costs of providing various types of banking products and services and formulation of reasonable prices, commercial banks are able to adequately respond to changing situations in financial markets. Today, the process of managing the internal pricing structures of banking products and services is of paramount importance to the on-going operations of commercial banks, and often a strategy for its continued existence.

The basic products of commercial banks are loan and deposit facilities, which are offered to the two existing types of clients: institutions and individuals. The money that clients deposit into banks is divided into cash to service the clients as their needs arise and into cash to invest so the bank itself can make a profit for the shareholders. Banks, being profit-making organizations, concentrate their energies on interest because it is their single most profitable income earner. Therefore, banks must seek a balance between marginal income on loans and the marginal cost on deposits in order to ensure that they are able to serve their clients profitably (Dermine, 2011).

1.1 Problem Statement

This thesis will attempt to analyse the common Funds Transfer Pricing strategies that are pursued by commercial banks, pointing out their features, strengths and weaknesses. Based on this

analysis, possible areas of enhancement by way of a simplified model based on empirical findings and industry experiences will be explored.

For many years, commercial banks have recognized the value of Funds Transfer Pricing as a profitability and risk management tool (Dermine, 2011; Woodward, 2007). FTP has been around for many years and financial institutions have applied it to understand the value of its product offerings (Dimitriu & Oaca, 2010; Levey, 2008). Modalities differ, however, it has been useful, to review as well as transfer, the “true” trade cost of financing, between profit centers.

Turner (2008) described Funds Transfer Pricing as a significant tool in running bank books of accounts composition, extensively used to assess and maximize trade line profitability as well as neutralize the trade line rate of interest risk.

Hanselman (2009) states that “FTP is an internal management information system and methodology designed to allocate the net interest margin between funds users, such as lenders and investment officers, and funds providers, including branch deposit gathers and the Treasury function” (p. 4).

The reason why FTP is so crucial to a commercial bank is that it enables the assessment of assets and liabilities for existing and expected cash flow items by attaching a market price in line with the particulars of the specific asset or liability (Levey, 2008). The FTP helps to ensure that the deposits do not generate additional overhead costs and hence limit the availability of loans (Kugiel & Jakobsen, 2009).

This research is important since it would enable banks to understand in a simple framework, how to run its book in a manner that would maximize trade line profitability while neutralizing a trade line rate of interest. This is due to the fact that a simple FTP serves the purpose of transfer of risks to the intermediary and hence ensures that the business lines function independently from the market movements beyond their control (Dimitriu & Oaca, 2010).

The business units of the financial institution routinely receive funds from their depositing customers and other parties (liability business unit). These funds are then invested in loans and investments to borrowing customers or third parties (asset business unit). During the process, liability and asset units are required to obtain a levelled balance sheet and a net interest spread per individual record is established. Any mismatched earning from the business units are then posted by the FTP into a special funding mismatch unit or intermediary. In commercial banks, this unit is traditionally the Treasury department. This particular funding mismatch unit does the function of a central clearing house for the funds, providing a benchmark used for all the transfer rates (TR) against a market derived yield curve adjusted appropriately by other pricing factors (Hanselman, 2009).

In a well-designed FTP system, the Treasury department will buy funds from the liability business unit at a charge and then sell those funds to the asset business unit at the Funds Transfer Price (Dimitriu & Oaca, 2010).

In the measurement of performance, the transaction's transfer rate would remain unchanged over its reprising life and this would insulate the transaction's margin contribution from market interest rate changes (Woodward, 2007). Through Funds Transfer Pricing the commercial bank would be in a better position to analyse its net interest margin since the FTP allows for the quantification of the variances that are caused by an imbalance in the funds used and the funds provided (Rice & Kocakulah, 2004). The process of Funds Transfer Pricing is depicted in Figure 1 below.

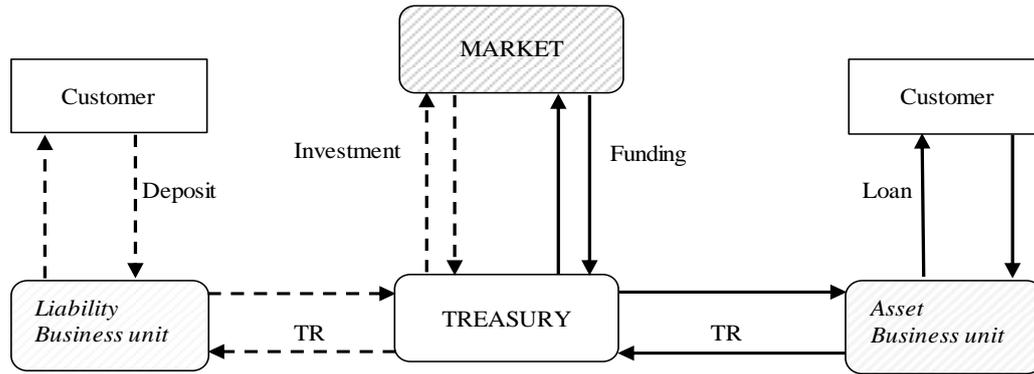


Figure 1: Funds Transfer Pricing Process

A proper FTP should reflect the cost of risk and avoid any kind of criticism i.e. to be rational and fair to avoid the possibility of arbitrage between the Treasury and business units (Adam, 2007). Though the basic concept behind FTP is fairly simple, the implementation, management and interpretation of the results can be cumbersome.

The global financial crisis highlighted some weaknesses that exist in the structures of some banks as they did not adequately protect themselves from market risks and hence the importance of the FTP (Turner, 2008). The crisis proved the assumption to be false that market-based funding would always be available to finance illiquid loans of banking institutions (Dermine, 2011). This particular research shall try to answer the question of the best approach to FTP that is practical in both implementation and management, using a simple conceptual model.

The secondary questions of the research will also evaluate the strengths and weaknesses of the current approaches and subsequently formulate a simple practical model that can be implemented in commercial banks. This research will enhance the body of knowledge into FTP modelling and policy implementation and also form a basis for further specialized study that would be built upon it.

1.2 Purpose of Study

The purpose of this study is to explore existing Funds Transfer Pricing methodologies in commercial banks, to identify areas for improvement and to propose a simple, easy to implement FTP model.

1.3 Question of Study

The thesis also aims to answer common questions about FTP:

- (i) Why is a Funds Transfer Pricing necessary in commercial banks?
- (ii) What are the existing Funds Transfer Pricing methodologies, their advantages and drawbacks?
- (iii) What are the basic components of the Funds Transfer Pricing System?
- (iv) Is there an easy and simple way to build a Funds Transfer Pricing framework?

1.4 Significance of Study

Recent studies have highlighted the importance of implementing an advanced FTP approaches to enhance performance in the banking sector. However, there is limited information on FTP policies, methodologies and models available to the public. In handbooks and other publications on banking, FTP discussions are brief and only basic explanations and implementation are available. Although much focus is given to the prevailing methodology of FTP, there is little guidance available to management on how to produce internal pricing policies, which define the purposes of the FTP system in an easy and simple way to achieve better results. This paper takes a step towards filling that gap.

In-depth analysis of the FTP system and the proposed approach to improve it can be the conceptual basis for further development of a scientific based pricing method in the banking sector. A theoretical conclusion from research can be applied in the process used to improve the program of training courses related to the study of FTP and the pricing policy of commercial

banks. The practical significance of this research is to develop recommendations for improving the FTP system in a commercial bank.

Eventually, the information from this thesis can be used by the management of commercial banks to enhance their decision-making and financial performance.

1.5 Methodology

To achieve research aims and to answer the research questions, a clear understanding of FTP theory in a commercial bank is needed. This thesis will examine the available literature to endeavour to come up with a simple proposal for an easy to use FTP model for commercial banks.

The first target of this study is to explore existing FTP approaches, their advantages and drawbacks. It will require a solid knowledge of FTP process flows and the primary components involved in determining the net interest margin. In addition, this thesis will refer to an economic approach to calculate the transfer rates and to show some empirical results in this study it will use simple examples of the bank's balance sheet and income statement. By understanding the drawbacks of existing methods, areas for improvements could be identified, and it would be the starting point for the proposed FTP model.

1.6 Outline of Study

This paper will be structured in the following way. Chapter 2 will cover the basics of Funds Transfer Pricing within commercial banks. Chapter 3 will give the literature review of foundation approaches used throughout the banking world, its advantages and disadvantages. The following chapter will introduce the reader to research methodology. Chapter 5 will present a proposal for a simple Funds Transfer Pricing model and Chapter 6 will draw conclusions about this study and present recommendations for future study.

2 OVERVIEW OF FUNDS TRANSFER PRICING

Funds Transfer Pricing is used to assess the performance of the bank units at different periods to determine how well they are functioning. It aids in analysing the economic positioning of the bank and is thus regarded as a very useful tool by the banks. The banks have various needs for the Funds Transfer Pricing system and the reasons why it is needed will be discussed further.

The FTP system consists of three components: asset contribution, treasury contribution and liability contribution. All these components, as will be discussed later, are very crucial in determining and sustaining the economic positioning of the bank.

2.1 Why Banks Need Funds Transfer Pricing

Banks need Funds Transfer Pricing to ensure that their financial statements reflect their true prevailing economic situation. The economic situation of banks is best shown by the numbers in its critical financial statements, which are its balance sheet and income statement.

“One of the biggest measures of a bank’s profitability is its net interest income (NII). Net interest income is by far the largest driver of product profitability, typically accounting for up to 80 percent of a bank’s revenue” (Coffey, 2001; Kocakulah & Egler, 2006; p.46). The income statement of any bank presents interest income and interest expense incurred for a period and does not give a further break down of these particular components.

Without an FTP system, it would appear as if all deposits only incur costs. To consider all deposits as a cost would be incorrect, given that issuing a loan to a customer entails funds that usually come from deposits collected from another customer. When calculating a price for each loan, a Funds Transfer Pricing system puts an internal price on each deposit within a bank which is deducted as a cost from the loan. Therefore, an FTP system gives a clear understanding of profitability of loans, deposits and other products. In addition, it enables the bank to measure profitability of different branches, business lines and customers (Kocakulah & Egler, 2006).

Burucs (2008) in her summary stated that FTP is a powerful tool that management in commercial banks could use to do a profitability analysis and compare products, business lines and branches of varying sizes. It therefore allows a bank's management to make well-versed decisions on product pricing. In addition, the FTP would help in forecasting individual business units' performance and lastly measure the effectiveness of the funding center's liability and asset management.

The risk management framework of FTP is routed predominantly into a mark-to-market based framework. This differs from what most financial institutions utilise which is based on the accrual income. Thus, the FTP could be proposed as a link through which a market based financial risk management system can be utilized for commercial banks (Wyle & Tsaig, 2011).

In line with managing risk, the FTP is advantageous to commercial banks because it enables business units to measure their profitability independently of interest rate risks. The various line managers are able to maintain discretion over the product pricing in which they most often lack the necessary expertise in managing exposure to interest risk. It can also be noted that decentralized interest rate risk can negatively affect the performance of a commercial bank (Grant, 2011). Thus, the use of FTP transfers all the hedgeable interest rate risk exposure from the different lines of business by locking them into a funds transfer spread. This practice helps the lines of business to focus more on profit maximization. The FTP also aims at centralizing management and measurement of interest rate risk. This process would enable various business units to remain indifferent from market rates and hence focus on managing their businesses (Dermine, 2011).

Leading commercial banks have been able to marshall Treasury and retail resources to build a clear picture of the financial situation of the business in a process that involves understanding customer deposit price elasticity. These insights into detailed, fresh observations of consumer

behaviour by product, term, and market and balance tier can be used to refine the liquidity and reprising calculations for the usage of FTP (Zenios, 2007).

With various advances in the FTP in recent years, the following can be possible in commercial banks:

- The ability to project deposit reprising behaviour
- Estimation of deposit balance retention in both stressed and normal scenarios
- The degree of optionality in a portfolio or the extension of accounts terminated, depending on rate movements, might be easily assessed
- The FTP could be able to measure any costs that would be associated with potential adverse optionality.

Funds Transfer Pricing systems are flexible, and this enables them to be consistent with the complexity of the organisation and to its strategic objectives (Hanselman, 2009; Levey, 2008; Wyle & Tsaig, 2011).

2.2 The Components of Funds Transfer Pricing

The main components of Funds Transfer Pricing are asset contribution, treasury contribution and liability contribution. Each of these components is important to the economic prosperity of a commercial bank as profit. The liability contribution is the lowest contributing factor to a commercial bank; treasury contributions attract higher interest rates while asset contributions attract the highest interest rates (Wyle & Tsaig, 2011). The assets of a commercial bank are mainly loans, the liabilities are mostly deposits and the Treasury contribution is the external source of liquid input received or issued by a bank. This is depicted in Figure 2 below.

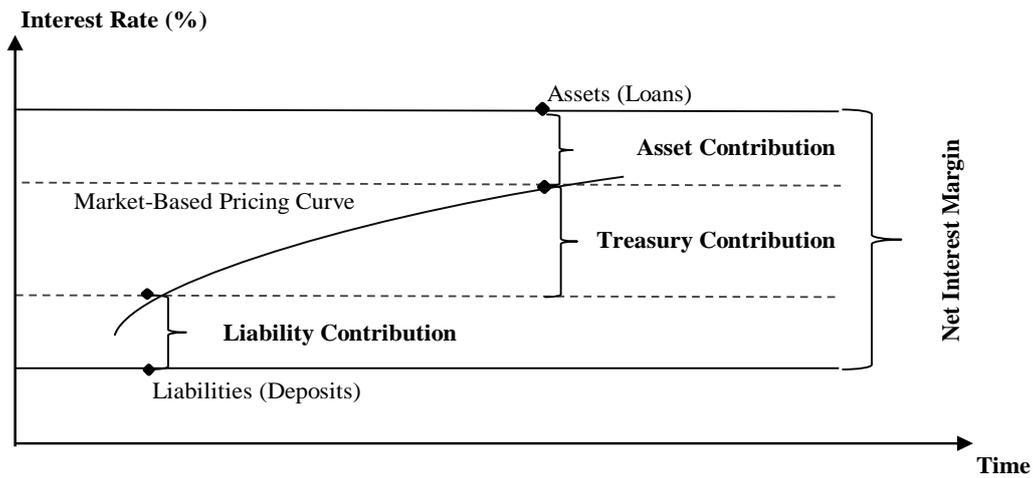


Figure 2: Primary Funds Transfer Pricing Components

The next illustration introduces the mechanism of income allocation and shows how such an allocation is made consistent with the bank’s overall net interest income.

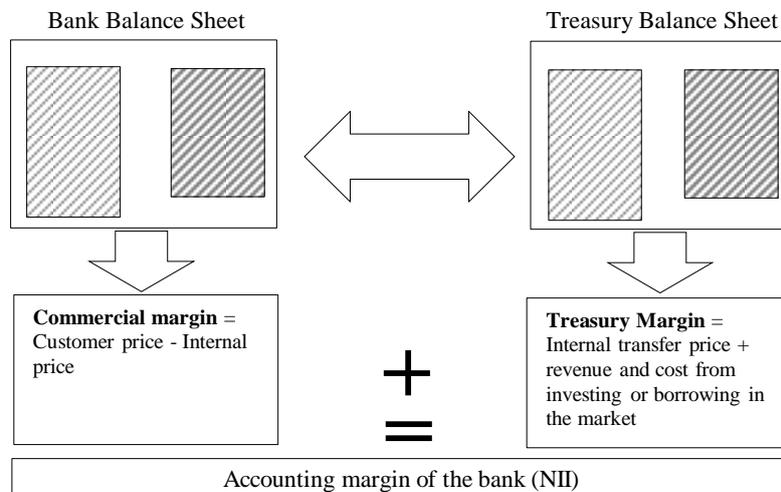


Figure 3: Components of Net Interest Income

The net interest margin (NIM) is a common measure of bank performance that is equal to gross interest income from assets minus gross interest expenses from liabilities (Casu, Girardone & Molyneux, 2006). The condition for achieving this goal is that all funds transit through the Treasury and that transfer prices serve to determine the income statements of both business units and the Treasury unit. Therefore, banks in their actual accounting calculate income received on

loans, based on interest rates, and internal expenses are calculated using transfer prices (Kugiel & Jakobsen, 2009; p.37).

To understand how each component depicted in the Figure 3 above contributes to the net interest income (NII) of the commercial bank, let us assume a hypothetical situation where a bank has two items on its balance sheet, namely a deposit and a mortgage. For the deposit, the bank pays an interest rate of 6.5% and the deposit has a duration of 3 years. For the mortgage on the other hand, the bank receives an interest rate of 10% and the mortgage has a duration of 8 years.

In this scenario, the net interest income is 3.5% derived from deducting the interest paid by the bank on the deposits from the interest received for the mortgage. Assuming that the bank has more assets, meaning that its volume of loans is higher than its volume of deposits. Therefore, the Treasury is able to borrow from the wholesale market at a rate of say 7% for 3 years and an interest rate (IR) of 8% for 8 years, then using FTP, the bank can split the 3.5% interest margin into a loan interest margin, a deposit interest margin and a risk mismatch interest margin (Treasury).

The bank's net interest margin is given by,

$$NII_{Bank} = IR_{Mortgage} - IR_{Deposit}$$

where,

$$\begin{aligned} NII_{Bank} &= 10\% - 6.5\% \\ &= 3.5\% \end{aligned}$$

The loan bank's net interest margin is given by,

$$NII_{Loan} = IR_{Mortgage} - MR$$

where MR is a current market rate, therefore,

$$\begin{aligned} NII_{Loan} &= 10\% - 8\% \\ &= 2\% \end{aligned}$$

The deposit bank's net interest margin is given by,

$$NII_{Deposit} = MR - IR_{Deposit}$$

where,

$$\begin{aligned}NII_{Deposit} &= 7\% - 6.5\% \\ &= 0.5\%\end{aligned}$$

Finally, the Treasury's net interest margin is given by,

$$NII_{Treasury} = MR_{n\ year} - MR_{m\ year}$$

where in our example m (3 years) and n (8 years) is equal to 7% and 8%, respectively, therefore,

$$\begin{aligned}NII_{Treasury} &= 8\% - 7\% \\ &= 1\%\end{aligned}$$

In many other examples, FTP is a bit more difficult to compute but always follows the objective of getting a smoothed margin for liability and asset profit centers (Adam, 2007).

A robust Funds Transfer Pricing System is made up of various components and practices. There is no such thing as a “one-size fits all” solution when it comes to FTP (Wyle & Tsaig, 2011).

2.3 Objectives of Funds Transfer Pricing System

The Figure 4 below can be used to illustrate the objectives and goals of FTP under the categories of product pricing, profitability management, balance sheet management and liquidity management.

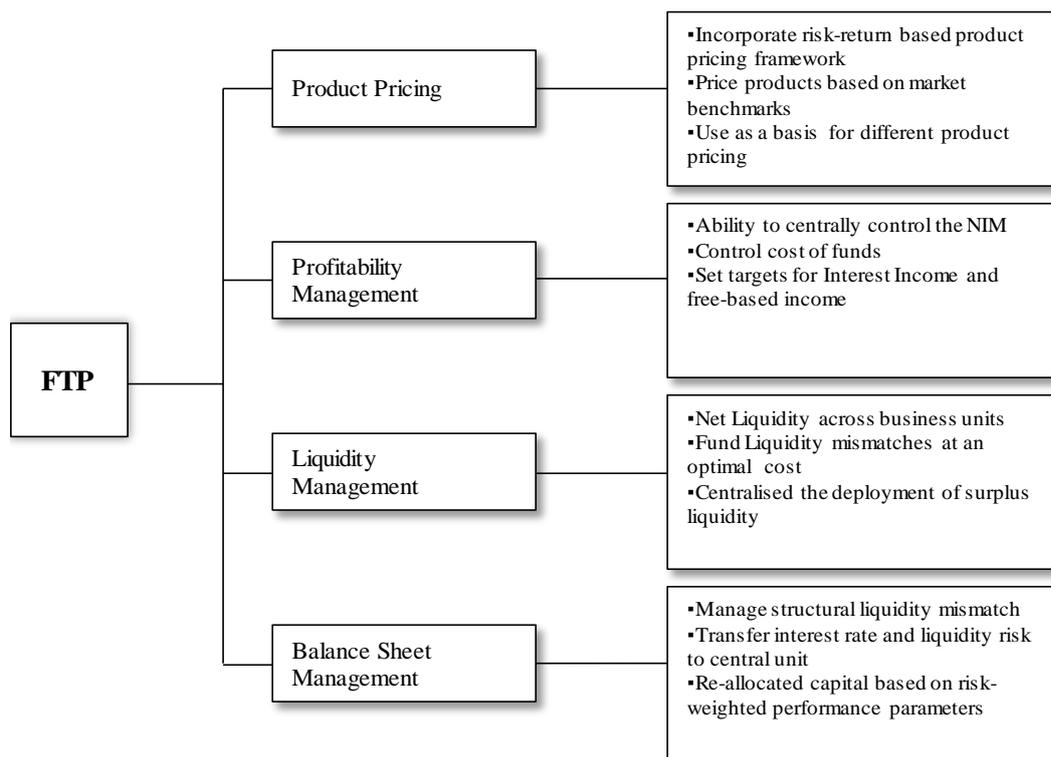


Figure 4: Funds Transfer Pricing Objectives

Source: Patel, 2010

2.3.1 Product Pricing

Commercial banks, like other profit making organizations that offer similar goods and services, rely on some level of product differentiation in order to attract customers. The product pricing framework that commercial banks apply should be based on the incorporation of a risk-return analysis that favours the bank. The pricing strategy that banks utilise should be based on benchmarks. The benchmarks that the banking institutions use to measure the price, that will be profitable to offer their products, are based on bank management’s ability to understand the market place (Patel, 2010). FTP would provide consistent product pricing guidelines for the various business lines of commercial banks. Consistency is important when dealing in a competitive market, and keeping and attracting more clients is central for commercial banks’ success. FTP would guide the bank management on the pricing strategies that would maximize profits and ensure that they are not exposed to any interest rate risks. Based on these functions,

the management would be able to set clearly defined profitability targets for the various lines of business involved in a commercial bank. This activity is usually done using a proforma of Funds Transfer Pricing performed as part of the overall annual budgeting process (Levey, 2008).

2.3.2 Profitability Management

For banks as institutions that depend on deposits to leverage the ability to serve customers, and at the same time investing (for example, by putting some of the money in property), profitability is measured mostly in terms of ratios. Rationalizing the measurements that are used for measuring the profitability of banking institutions is advantageous, because the changes in the prices of products and services will be accounted for in the percentages. Profitability is therefore actively managed by controlling the net interest margin, control of funds and setting targets for interest income and free-based income. By understanding the difference between the total interest income and total interest expenses, commercial banks are able to have control over the net interest that the enterprise enjoys within a given period of time (Rasiah, 2010).

The income of banks is categorized into two streams: interest income and non-interest income. Within this income portfolio, mix loans are among the highest yielding assets a bank can include in their balance sheet. Funds from unit trust services and standard fees are the non-income earning assets of a bank that banks have to account for when measuring their net interest margin (Rasiah, 2010). Setting targets for income based and free-based income enables commercial banks to have a measurable progress rate for their own performance.

2.3.3 Liquidity Management

As this term suggests, liquidity management is the activity that bank managers participate in, in order to maintain a healthy balance between invested cash and cash that is within a bank's vaults for customer service on a regular basis. Commercial banks have several units across which the net liquidity must be averaged. The optimal cost that a bank wishes to achieve must not be mismatched to fund liquidity if the banks are to be in a healthy financial state (Patel, 2010). There

must also be a centralized department for surplus liquidity. Business decisions need to consider the impact of the level of liquidity they support. Increased liquidity risk that is the result of investing more cash and holding on to less, triggers other financial risks that are referred to as consequential risks. The liquidity cost depends on prevailing market conditions, the balance sheet of the bank and the market position that the commercial bank takes (Ghosh, 2012).

2.3.4 Balance Sheet Management

The balance sheet of commercial banks should be managed so the structural liquidity maintained is healthy for the well-being of the institution as a whole. The current trend for commercial banks is to transfer their interest rate and liquidity risk to a central unit. The performance parameters are risk-weighted and capital based. FTP is useful for any organization that hopes to be successful in implementing whatever balance sheet strategy they have in place. It is necessary for banks to have a proactive approach towards the management of the balance sheets they are working with for a given period. Managing the balance sheet of a commercial bank requires management to apply the underlying principles of balance sheet planning, asset-liability management and liquidity management (Oracle Financial Services, 2011). “In the aftermath of the most recent market turbulence, asset/liability management’s role within the banking industry continues to evolve, and FTP is an important part of that evolution” (Wyle & Tsaig, 2011; p.5).

2.4 Challenges of Funds Transfer Pricing

Funds Transfer Pricing has become popular with banks; however, it is still faced with a number of challenges. These challenges may not paralyse the working of the system completely, but make it difficult to use in some areas. Resistance to change by banks that did not originally have a system in place is one of the challenges. The system is also prone to manipulation, which means that an individual can influence the results the system provides by changing the components. Like all systems, if not all the key components work together in sync then the results that will be offered will be faulty thus leading to faulty deductions. FTP may give the true positioning of a

bank in the economic front; however, it does not offer solutions to the problems that are encountered along the way.

2.4.1 Impact of Recent Financial Crisis

Funds Transfer Pricings is useful to bankers who seek to evaluate the profitability of engaging in deposits and loans. After there has been a banking crisis such as the recent one, some issues that had been previously ignored need the attention of the concerned parties within the global economy. The global financial crisis of 2007 proved the assumption false that market-based funding would always be available to finance the illiquid loans of banking institutions. During the 2007 financial market crash, many banking powerhouses that were in unsure FTP positions, such as Bear Stearns', were forced to restructure some of their investment vehicles. The fact that the global liquidity crisis caused a decrease in the amount of cash available to banks for lending and depositing forced the banks to turn to government banks and central banks to obtain liquidity to keep functioning. The result was commercial banks being subjected to the conditions that the central banks set and in some cases, there were closures where banks had to file for bankruptcy (Dermine, 2011).

2.4.2 Weaknesses of a Funds Transfer Pricing System

Funds Transfer Pricing as a method of attributing income to the various internal contributors that exist within it, is not a flawless system. The weaknesses in bank liquidity risk management methods that were in place before the liquidity crisis in the financial system clearly made stakeholders realize that the principles needed to be refined (Grant, 2011). The plotted graphs and curves that are used to show the relationship of various internal contributors of the bank's income may be inaccurate because of several deficiencies. During the global financial crisis the weaknesses of the Funds Transfer Pricing systems that some banks were using, revealed their weaknesses based on their inability to produce results. When a manager is about to issue a loan with potential weaknesses, FTP cannot measure this weakness conclusively (Kugiel & Jakobsen,

2009). FTP is therefore still dependent on the managers' ability to deliver on the job; they have to meet the goals and objectives of the commercial banks. FTP is useful in analysing and attributing different departments of the commercial banks with different levels of productivity, but it cannot be used to prevent loss by predicting the effect of a specific level of liquidity, lending and deposits (Grant, 2011).

2.4.3 Liquidity Risk

The main challenge that commercial banks may face in relation to FTP is liquidity risk. Liquidity risk is the potential risk of "failing to meet the expected and unexpected current and future cash flows and collateral need effectively" (Oracle Financial Services, 2011; p. 4). If the bank cannot meet the liquidity level that is required for it to perform, its duty towards clients and institutions, then it has failed in its whole duty. In the same breath, if a bank can serve the customers it is committed to, but suffers economic loss instead of profit, then the bank is failing in its profit making objective. The challenge of unstable liquidity levels is further enhanced by inflated interest rates, declining deposits and a highly likely real estate collapse. In a situation where all these problems are simultaneous and acute, it is likely the bank will close down because of an inability to perform the tasks that it has been established to achieve. The recovery of loans that have been given to the realty sector has also posed a great problem for banks and their clients. Banks feel that the clients that take loans to finance their projects and fail to repay these loans, must have their properties repossessed; while clients feel banks may be taking advantage of high interest rates to meet their profit objective at the expense of customers. Reducing associated costs may be a good way of reducing the interest on loans because borrowers do not approach banks when interests on loans are high (Shrestha, 2011).

2.4.4 Credit Crunch

In reaction to the recent credit crunch, all economic stakeholders have been more vigilant in the regulation of lending rates, interest rates and better risk management techniques. A credit crunch

is defined as an economic condition where there is excess demand for credit without resistance towards the prevailing interest rates. When there is excess demand for loans the bank cannot achieve the goal of having a balanced investment amount and liquidity for client servicing, without some conflict. The usual response for banks is to ration credit using mechanisms that are not directly related to the price of their product (Lindgren, 1999). During such times, commercial banks cannot resort to the central banks to find a quick solution because the central bank as the ‘overall commercial bank’ may not have the solution they seek. The central bank is responsible for regulating commercial banks in order to ensure that the economy stays afloat. The balance of deposits and loans issued is volatile during credit crunches. During the most recent credit crunch, banks stopped lending to each other, and it led to a complete halt in issuing loans by commercial banks to their clients (Saunders & Cornett, 2011). This shows that it is important for commercial banks to have a basis upon which they may compare their interest rates in order to ensure they can predict events and be up to date. Interbank interest rate imbalances are the cause of a lack of equilibrium in the market that can only be regained. “The impact of monetary policy on a banks’ amount of lending is stronger for banks with less liquid balance sheets and establishes the existence of imperfections in the interbank market” (Frexas & Jorget, 2007; p.3).

2.5 Conclusion

Funds Transfer Pricing is useful to balance deposits and loans a commercial bank accommodates. The objectives and goals of Funds Transfer Pricing are product pricing, profitability management, liquidity management and balance sheet management. FTP has its advantages as a management system, but it also has weaknesses that are made evident during hard financial times (financial crises) such as credit crunches. “Introducing a robust FTP mechanism should enable seamless product pricing and profitability management, while addressing the impact of liquidity and interest rate risk on the commercial banks’ balance sheet” (Patel, 2010; p.5).

3 FUNDS TRANSFER PRICING FRAMEWORK

This chapter discusses the foundation of a Funds Transfer Pricing (FTP) framework, used throughout the banking world. This framework relies on transfer prices (TP) for showing the exchange of products and services between various business units in the bank as well as to ascertain the frequency with which services of transfer between the business units occur. In addition to this, TP acts as an indicator of income and expense levels among various business units. The FTP methodology begins with a discussion about what is to be transfer priced and how to identify which business units it is to be allocated to. This is because, just like all commercial banks, the model of the bank discussed here has products on both sides of the balance sheet with differing interest rates as well as maturity dates and therefore, a funds transfer rate must be assigned for each product on the balance sheet and allocated to different business units.

The rest of the chapter is arranged as follows: In section 3.1, the term “Transfer Price” (TP) is defined and explained. The next section discusses what needs to be transfer priced and how the allocations to different business units are to be assigned. All asset and liability transactions as well as equity transactions need to be transferred and this section is highlight how this can be achieved. Section 3.3 discusses the base Transfer Pricing Curve (TPC) considering that a robust FTP system must ensure that business lines within an organization are not affected by external factors. A base TPC is basically a curve that establishes the yields and interest income margins based on factors such as yield and maturity (Rice & Kocakulah, 2004). This section discusses the Libor/swap curve and the need to adjust it in order to ensure it reflects organizational-specific details such that the FTP system finally deployed within the organization, achieves the intended purpose. Section 3.4 discusses the various components of the FTP system including the Libor/swap curve (reference rate), prepayment penalty, term liquidity, credit risk spread, bid/call spread and option pricing spread. Section 3.5 discusses the FTP approaches including the single pool approach, the multiple pool approach and the matched-maturity approach.

3.1 Defining Transfer Price

Setting a Transfer Price (TP) is arguably the most critical component for any bank intending to implement an FTP framework (Burucs, 2008).

TP basically refers to the internal price at which assets and services are sold or bought within the company, which is typically not the same price at which assets and services are sold to or bought from external suppliers or buyers. TP may also refer to the intra-company or inter-company price for buying or selling of assets or supplying of services.

Kugiel and Jakobsen (2009) defines TP as “an internal rate of interest used to calculate transfer income or cost due to an internal flow of funds in a financial institution” (p.37).

Transfer pricing eliminates the distortion of the cost of products and services by eliminating double counting. Thus, it is possible to more accurately determine the value of the bank's products and services, make better decisions based on information about a revision of variable and fixed costs, and determine profit margin (Kimball, 1997).

The following gives an understanding of importance of the transfer price (TP) in a Funds Transfer Pricing framework:

- (i) TP shows if business units will have an exchange of services in general.
- (ii) TP determines the amount and frequency of an exchange of services between business units.
- (iii) TP affects income and expenses (including the allocation of funds as owned and borrowed) between business units.
- (iv) TP allows the introduction of appropriate models to calculate the real income and expenses of each business unit.
- (v) When a bank uses methods, such as accounting or budgeting, TP is the basis for determining financial results of profit centers.
- (vi) TP is the core element for motivation of everyone involved in the FTP system.

There are two main issues that arise in relation to setting TP within a bank. The first issue is that setting an incorrect TP will inevitably lead to a distortion of performance within the bank in that some departments or business units will become more profitable at the expense of others and this may lead to incorrect managerial decisions. The second issue that arises is that there is a high likelihood of artificial pricing within the FTP model that leads to the creation of artificially profitable products (Carter, Di Rollo & Bond, 2012).

The fundamental difference between FTP and TP worth pointing out is that while TP includes a charge for capital, FTP as a process does not include the capital charge, but rather includes a mechanism for enabling the bank to measure the performance of individual business units (Carter et al., 2012).

There are many different methodologies that banks may opt for when it comes to assigning a transfer rate to a stream of cash flows. Just like the FTP methods themselves, methodologies of assigning transfer rates also differ in terms of complexity and sophistication, but the rule of thumb is to use an economic application when calculating transfer prices because it helps to reveal the potential risks of a given financial instrument. In addition to this, a calculation of transfer prices also involves the appropriation of a premium to every component of risk.

3.2 What must be Transfer Priced?

As a general guideline what should be established is exactly what needs to be transfer priced. Common sense dictates, that anything related to the transfer and exchange of goods and services and the compensation derived by one or both parties from that exchange is subject to transfer pricing.

Regardless of which FTP system a financial institution finally settles for, transfer pricing must be carried out in all products presented on the Balance Sheet (BS) of the financial institution (Adam, 2007).

Commercial banks in particular, have their products on both sides of the balance sheet and each bank product has different interest rate characteristics and maturity characteristics that are the basis of assigning transfer prices (Kugiel & Jakobsen, 2009; Saunders & Cornett, 2011). The Table 1 presents the basic products, which appear on the balance sheet of the bank and its characteristics.

Assets			Liabilities		
<i>Product</i>	<i>Maturity</i>	<i>Rate Repricing</i>	<i>Product</i>	<i>Maturity</i>	<i>Rate Repricing</i>
Consumer Loan	3mth - 2 yrs	fixed/libor/internal	Current Account	unknown	+/- zero
Commercial Loan	0.5 - 5 yrs	Libor	Savings Account	unknown	internal
Mortgage	10 - 30 yrs	fixed or Libor	Term Deposits	1 day - 2 yrs	fixed or Libor
Credit Card	unknown	internal			
Line of Credit	unknown	internal			

Table 1: Characteristics of Commercial Bank Products

In addition, the bank’s entire investment portfolio should be transfer priced, and so should all the trading activities. Additionally, even the non-earning assets, equity and non-costing liabilities must be transfer priced as well (Simoff & Morris, 2000; Wyle & Tsaig, 2011).

According to Wyle and Tsaig (2011), most financial institutions have a near-zero spread on their low risk assets and for this reason, most of them do not “transfer price” their investment portfolios. For such institutions, their investment portfolios often contain assets with agency Mortgage-Backed Securities (MBS) and which therefore are always available for sale. Consequently, such institutions never expect to hold the assets in their portfolios up to maturity and as such they do not transfer price them. One of the key benefits of having investments is that the institution has ready collateral that it can pledge when it needs to acquire stand-by liquidity, which is why it is important to transfer price all assets in an institution’s portfolio. As funding centers, these assets provide critical benefits to an institution thus it is important to credit them in order to get a clear picture of their contribution.

The transfer pricing for trading operations is the same as that of the investment portfolio. However, the two differ in that instead of using a matched-maturity transfer rate for trading operations, a short-term index is used because the assets in trading operations are held for a short time (Rice & Kocakulah, 2004; Wyle & Tsaig, 2011). Using a short-term index for trading operations as opposed to using a matched-maturity transfer rate makes more sense in this situation because these assets are primarily for short-term gains as opposed to interest income. Consequently, when banks use transfer pricing for its trading operations, they either use an overnight index or moving averages (Wyle & Tsaig, 2011). In some cases, organizations may use monthly rates for transfer pricing in trading operations (Adam, 2007).

Additionally, other assets including premises and equipment must be evaluated individually when considering a Funds Transfer Pricing system because such items differ from one institution to another. Similarly, some types of liabilities, for example accrued expenses must also be evaluated on a case-by-case approach because there are no two identical institutions when it comes to such expenses (Wyle & Tsaig, 2011). This is the primary reason why FTP models differ from one institution to another.

A majority of financial institutions set aside an immaterial source of funds to support non-earning assets but these items become more prominent as margins become narrower. For this reason, every institution must make an independent decision regarding how the allocation of non-margin sources and funds is to be done in order to have an accurate performance measurement model. There are two universal rules for attributing items in a balance sheet. The first rule is that whichever method an institution selects, it should send a positive signal to management level employees as well as encourage managerial behavior that is in line with the institution's goals and strategy. The second rule is that the selected method must be consistent with the selected methods of allocation in other areas, mainly capital assignment, revenue assignment and expense assignment (Wyle & Tsaig, 2011).

For every equity that is allocated to a given business unit based on the capital allocation formula that a bank uses, a funds transfer charge must be assigned. However, a review of literature has indicated that a majority of financial institutions often use the duration of equity as a means for benchmarking the matched-maturity transfer rate. Other institutions calculate the required rate of return on capital, using an assumed hurdle rate while other banks consider the special attributes of the funds and use this to adjust the capital charge (Adam, 2007; Wyle & Tsaig, 2011).

3.3 The Base Transfer Pricing Curve

One of the most critical aspects of FTP is the selection of the transfer pricing yield curve. The dilemma here is deciding between using the funding rate or the investment rate because selecting one or the other has a direct impact on the accuracy and reliability of the FTP framework.

In order for an FTP framework to serve its intended purpose, the bank must first assess its source of assets and consequently formulate a funding yield curve that best reflects their assets. When deciding the rate to use when making their funding yield curve, banks have the following choices:

- (i) Libor curve
- (ii) Treasury yield curve
- (iii) Interbank swap curve

Choosing any of the above-mentioned curves has an impact on the bank. For example, when a bank opts to use a credit-risk free market index such as Treasury yield curve, then the bank is likely to make loans that are not very profitable while foregoing deposits that could be profitable (Burucs, 2008).

Another tough call that the bank's management has to make when selecting the appropriate funding curve is whether to apply a single benchmark yield curve or a multiple benchmark one. At a first glance, multiple benchmark yield curves may appear to be more appealing than the

single benchmark ones but the actual implementation of a multiple benchmark yield curve may seriously impact on the FTP framework in the following ways:

- Resource misallocation within business units
- Inconsistency when it comes to comparison of margins among different products
- Inaccuracy in terms of measuring the institutional total interest rate risk
- Improperly including credit risk in the interest rate risk since there is no separation of risk (Shih, Crandon & Wofford, 2004)

There are four characteristics required of any curve if it is to be considered prudent and accurate. Those four different characteristics are; that it should represent the opportunity cost or benefit of the funds, it should embody the marginal wholesale rate, it should be derived from reliable and readily available data and it should be reliable as well as understood by, and acceptable to, FTP users such as lenders, loan officers, deposit collectors, etc., as being legitimate and accurate (Hanselman, 2009).

For banks that operate using different currencies, there is a more pressing need to apply a single benchmark yield curve so that it can allocate a yield curve for each currency. This is necessary because each currency represents an independent and distinct source of interest risk, thus assigning a multiple benchmark yield curve to different currencies would lead to considerable errors that would negatively impact the banks' bottom-line (Shih et al., 2004). Interest rates for various currencies may rise or reduce for completely unrelated reasons such that the Euro's interest rate may be rising at a given time, while the Rand's interest rate is reducing but for different reasons altogether. In such a scenario, it would be erroneous to apply the same yield curve to both currencies because the interest risks are not the same.

Part and parcel of doing all of this correctly is that applicable assigned transfer rates for each product must match with reality at the given point in time. Components used to figure out the point of the curve utilized, include overall cash flow as well as the maturity of each individual

instrument, which has to be applied to ascertain the point on the curve, which should be wielded to calculate the proper transfer rate (Hanselman, 2009). Whichever option a bank opts to use, determination of the base transfer-pricing curve plays a major role in the effectiveness of the Funds Transfer Pricing model that the institution eventually settles for.

3.4 Components of Transfer Price

Using an economic framework for Funds Transfer Pricing, bridges the gap between market value-based risk management systems/accrual accounting principles, and commercial product pricing. From a practical point of view, one may have variations for the Transfer Price, whereby economic criteria and commercial criteria are mixed together to form a unique model (Wyle and Tsaig, 2011).

The primary component of a Transfer Price for a commercial bank is the base funding curve, also referred to as cost of funds. The funding curve primarily shows the relationship between various indicators, but there are some factors that may have an impact on the financial instruments, which are beyond the yield curve benchmark. For this reason, it is important to make various adjustments to the base FTP yield curve in order to reflect not only the unique attributes of the financial instruments in question but also the unique attributes of the bank itself. In this regard, the bank's corporate culture as well as its fundamental principles must be taken into consideration when deciding the method to apply (Burucs, 2008).

The following are the types of adjustments made to the funding curve:

Prepayment Penalty – this may be incorporated into the funding curve and applied to the TP in one of two ways: The first way to factor in prepayment penalty is to take into account the transaction costs applicable to large transactions such as is the case when borrowers are charged an economic prepayment fee. In this situation, transfer rates for various instruments are assigned according to the contractual amortization whereby the transfer fund is sold back to Treasury when prepayment occurs. The loss or gain made in this transaction is passed to the responsible business

unit as a cost allocation. The second way to factor in prepayment penalty is to consider transactions used for loan products. Typically, these transactions are not charged a prepayment penalty, thus the transfer price is increased by the amount needed to compensate the Treasury for prepayments that will occur over the life of such loans (Burucs, 2008).

Term Liquidity – this is the impact when the repricing frequency of a given asset happens to be shorter than the expected maturity. To estimate the liquidity premium, the difference between the banks' wholesale funding curve and its swap curve is observed. To adjust term liquidity, a term liquidity premium is debited to the variable rate assets depending on their contractual term while a liquidity premium is credited to variable rate liabilities depending on their contractual term. Adjusting for term liquidity is especially important where given instruments have the same repricing period or duration, but each with its own unique liquidity characteristics implying that their value to the bank is not the same despite their repricing period being the same (Burucs, 2008; Grant, 2011).

Institution Credit Risk – in case of a bank that is not deposit rich, there is a need to adjust the base yield curve so as to reflect the bank's institutional credit risk (Burucs, 2008).

Funding Commission or Bid/Call Spread – the commission or fee paid for brokering services is factored into the yield curve since the typical products for this approach are managed by the Treasury department (Burucs, 2008).

Option Pricing – this adjustment is crucial because it reflects the cost of giving the customer a right to alter the contractual terms of the transactions should the customer want to do so at a future date (Burucs, 2008; Wyle & Tsaig, 2011).

Mandatory Reverse Deposit Requirement – covers the cost of interest the bank loses on deposits that do not have an interest or a lower interest that the bank needs to hold with the central bank in lieu of deposit (Burucs, 2008; Kugiel & Jakobsen, 2009).

Interest Payment – it is important for the bank to adjust its TP to an interest payment frequency. All the interest earning and interest bearing require debit and credit adjustments respectively. This is more important when interest payment frequency differs from the basic yield curve (Burucs, 2008).

Apart from the above-mentioned adjustments, there are other adjustments that a bank can make to reflect its situation although some of the adjustments are not as common as the ones highlighted above. These include tax advantages (especially for commercial leases) and stand by liquidity adjustments (Burucs, 2008).

3.5 Funds Transfer Pricing Approaches

For banks, there are basically three different Funds Transfer Pricing approaches. The first one is the single pool approach, which uses only one rate in crediting and charging liability and assets. Then there is the multiple pool approach where the assets and liabilities are classified into different pools using different criteria and better reflect market reality. Finally, within the matched-maturity approach, which is a more detailed extension of the multiple-pool approach, each transaction has its unique price. All these approaches have their own benefits and weaknesses and are thus preferred at different times, depending on the requirement and structure of the balance sheet of the bank.

3.5.1 Single Pool Approach

The single pool approach of funds allocation is arguably the simplest FTP method to implement. This method uses a uniform funds transfer rate for both asset and liabilities. Therefore, the single pool approach does not consider factors like maturity and level of risk (Burucs, 2008; Coffey, 2001; Wyle & Tsaig, 2011). When using this method the banks add together or pool, both providers of funds depositors and borrowers. The implication of this method is that some products, customers or business units will be unfairly advantaged while others will be unfairly disadvantaged.

Derivation of the assigned transfer rate is either done internally, based on the rates paid or earned or based on interest rates derived from the market.

Using the single pool approach, a bank can assign an average cost of funds to all transactions and in this way be able to get an idea of how profitable various products or even bank branches are. In practice to calculate a transfer price, the bank must first determine the average interest rates on the bank's products for both assets and liabilities. Then all interest received on loans and paid on deposits is weighted by their outstanding balance. The resulting rate is a weighted average rate of interest of all banks assets and liabilities.

For example, "if deposits were a bank's only source of funding the average rate would be based on the total interest expenses for all deposits divided by average total deposits, adjusted for floats and reserve requirements" (Grant, 2011; p. 14).

Given its characteristics, the single pool approach is best suited for small banks that have stable but undiversified sources of funds and whose primary financing for loans is from customer deposits. Given its simplicity, the single pool approach also suits banks that operate as a single unit without a big branch network and which do not have multiple business lines.

The following Table summarizes major advantages and disadvantages of a single pool approach according to Kawano (2005); Kimball (1997); Kugiel and Jakobsen (2009); Schulze (2009) and Webster (2012):

<i>Advantages</i>	<i>Disadvantages</i>
It is the simplest method to implement in terms of cost	There is no separation of interest rate risk from credit risk
It does not require the bank to invest in costly data system	There is only one transfer price thereby minimizing managerial incentives
Requires little IT expertise as compared to other FTP approaches	There is no differentiation of transfer results in line with a portfolio's term structure
Enables assigning of an average cost of funds to transactions	It does not take prevailing historical interest rates into account
Suited for small banks, especially those that operate as a single unit	The measurement of managerial results is not fair since prices are not assigned to each transaction

Table 2: Advantages and Disadvantages of Single Pool Approach

According to Webster (2012), the single pool approach is an old method, which has become inappropriate for the risks that are now apparent. These factors make this approach obsolete for large commercial banks because without measuring such factors, the desired internal control would not be achieved. For smaller commercial banks the single pool approach can be modified to achieve the desired goals such as calculation of net or gross balance (Kawano, 2005).

An example of the single pool approach

A simple balance sheet of a commercial bank can be constructed where funds generating business unit (liabilities) attracted customers who have deposited R20,000 and R10,000 into a current account and a term account respectively. These funds are posted by the bank into short-term consumer loans (R23,000) and medium-term loans to small business (R17,000). In this example, the bank's balance sheet generates a deficit (R10,000) funded by the Treasury on an external market. Consequently, the average customer price for borrowers is 11% for consumer loans and 13% for commercial loans and the average customer rate paid to depositors is 4% for current accounts and 5% for term deposits. The Treasury borrows from the market at the 6% current market rate. Operational costs are not considered in what follows, only interest revenues and costs are involved. Table 3 below presents the single pool approach example and all related calculations.

Assets						Liabilities						
CR (%)	AR (%)	TR (%)	Product	Maturity	Amount (R)	Product	Maturity	Amount (R)	TR (%)	AR (%)	CR (%)	
11	11.9	8.09	Consumer Loan	1 year	23 000.00	Current Account	unknown	20 000.00	8.09	4.33	4	
13			Commercial Loan	2 years	17 000.00	Term Deposits	2 years	10 000.00			5	
						Funding	unknown	10 000.00			6	
	11.9		Total Assets			40 000.00	Total Liabilities			40 000.00	4.33	

Average Pool Rate (APR) Deposits: $(20,000 \times 4\% + 10,000 \times 5\%) / 30,000 = 4.33\%$
Average Pool Rate (APR) Loans: $(23,000 \times 11\% + 17,000 \times 13\%) / 40,000 = 11.85\%$
Transfer Price (TP): $(11.85\% - 4.33\%) / 2 = 3.76\%$
Transfer Rate (TR) Liabilities: $3.76\% + 4.33\% = 8.09\%$
Transfer Rate (TR) Assets: $11.85\% - 3.76\% = 8.09\%$

Calculation of NII

Margin	Calculation	Value
<i>Direct Calculation of NII</i>		
Accounting Margin	$(23,000 \times 11\% + 17,000 \times 13\%) - (20,000 \times 4\% + 10,000 \times 5\% + 10,000 \times 6\%)$	R 2 840
Net Interest Margin (NIM)	$2,840 \div 40,000$	7.1%
<i>Commercial NII</i>		
Loans	$(11.85\% - 8.09\%) \times 40,000$	R 1 504
Deposits	$(8.09\% - 4.33\%) \times 30,000$	R 1 128
Total commercial NII		R 2 632
<i>Treasury NII</i>		
Treasury NII	$(8.09\% - 6\%) \times 10,000$	R 208
Bank Margin	Commercial margin + Treasury margin	R 2 840

Table 3: Single Pool Approach Example

In our example there are two types of deposit accounts; a current account that pays 4% interest rate and a term account that pays 5% interest on deposit. Therefore, the average pool rate (APR) of the deposits will be calculated as follows:

$$APR_{Deposits} = Total\ Costs_{Deposits} / Outstanding\ Balance$$

On the other side of our balance sheet we have two types of loan accounts; a consumer loan that pays 11% interest rate and a commercial loan that pays 13% interest on a loan. Here we will do a similar calculation to determine an average pool rate for all the loans.

$$APR_{Loans} = Total\ Income_{Loans} / Outstanding\ Balance$$

To get the Transfer Price (TP) we subtract the average pool rate of deposits from the average pool rate of loans and then divide the results by two, to get equal amounts for loans and deposits.

$$TP = (APR_{Loans} - APR_{Deposits}) / 2$$

The transfer price of 3.76% shows how each source of finance, both deposits and loans, add to the bank profitability. In the banking industry, banks depend on deposits that they receive. The bank then uses these funds to give loans or investments. The interest rate of this fund determines the overall profitability of the bank. Transfer pricing assists in calculating the net interest margin on the bank's source of finances. It is among the most essential tools used by the banks to measure the profitability of each profit center. After obtaining the transfer price (TP), we can calculate the transfer rate (TR) for both assets and liabilities as follows:

$$TR_{Assets} = AR_{Loans} - TP$$

and

$$TR_{Liabilities} = AR_{Deposits} + TP$$

Therefore, TR for assets and liabilities is the same, and in our example equals 8.09%

In a single pool approach the transfer price for both assets and liabilities are equal because the bank uses the same rate to value both assets and liabilities and, therefore, the following relationship holds,

$$TP_{Loans} = TP_{Deposits}$$

The transfer rate of both assets and liabilities are also the same. We obtain a transfer rate for the assets by subtracting the average pool rate from transfer price while for liabilities we add the average pool rate and transfer price.

$$TR_{Assets/Liabilities} = APR \pm TP$$

This equation can be reorganized as:

$$APR = TR \pm TP$$

After obtaining the transfer rate we can calculate the interest income and interest expense of each profit center and the net interest margin (NIM) of the bank. We add all revenues from lending and the cost of customer deposits. All interest income is added together and interest payable to customers is also added together. The cost of funds generated from the external market should be subtracted. From the example, the net interest margin is calculated as follows:

$$NIM = (Interest\ Income_{Loans} - Interest\ Expense_{Deposits}) / Outstanding\ balance_{Loans}$$

Therefore, NIM is equal to 7.1% and shows the percentage profit of bank loans. We can also obtain NIM in actual value which is in our example equals R2,840.

The bank's Net Interest Income (NII) for each business unit is calculated as follows:

$$NII_{Loans} = (APR_{Loans} - TR) \times V$$

and

$$NII_{Deposits} = (TR - APR_{Deposits}) \times V$$

where V is actual monetary value.

When we add the two results together we get the total commercial (NII), which is equal to R2,632.

Finally, to get the bank margin, both the commercial net interest income and the Treasury margin are added together. NII for the Treasury is calculated as follows:

$$NII_{Treasury} = (TR - MR) \times V$$

where MR is a current market rate.

Therefore, by adding the results of the total commercial NII and Treasury NII together, we will obtain the bank margin of R2,840.

The sum of the NIIs generated by business units and those generated by the Treasury balance sheet should be equal to the actual NII of the bank, since internal exchanges, between the commercial units and the central Treasury unit, cancel out.

By constructing this simple example we can see how FTP works in practice, how banks determine the transfer price/rate for a single pool approach and how banks allocate an interest margin to each business unit.

One limitation of the single approach method is that it uses the same transfer rate for both loans and deposits. Although this method is easy to use and implement it does not give an accurate account of profitability of the bank's customers and loans.

3.5.2 Multiple Pool Approach

Under the multiple pool approach of FTP, assets and liabilities are classified into different pools using different criteria. Such criteria may include factors such as maturity, the embedded optionality, credit, seasoning and so on. The unique pool criterion is what determines the transfer rate assigned to each pool whereby a long maturity pool for example, is assigned a long-term rate and vice versa (Wyle & Tsaig, 2011). The re-pricing term and original maturity are the major points of concern under the multiple pool approach, but other factors such as the type of product also come into play. Under this method, every individual pool covers only one part of the maturity spectrum while the number depends on the balance sheet structure of the bank (Kugiel & Jakobsen, 2009).

The multiple pool approach requires a set of rates and not just one or two transfer prices as is the case under the single pool approach and its derived forms. Each pool under the multiple pool approach is assigned one price although just like in the single pool approach, the rates for multiple approaches can also be derived internally by calculating the average interest rate of assets and liabilities assigned to a pool (Simoff & Morris, 2000). The major shortcoming of calculating the transfer rate internally for the different pools under the multiple pool approach is the lack of objectivity which leads to an equal lack of objectivity when the results are used to make key business decisions. The best method for calculating the transfer price rate under the

multiple pool approach is by basing the transfer price on the prevailing market rates (Grant, 2011; Shih et al., 2004).

Calculating transfer prices based on the prevailing market rates is especially suitable for commercial banks that are active in the interbank market because transfer prices derived in this manner represent either an income source or a cost alternative. Deriving the transfer rates using market rates reflects the impact of actual transactions, thus a bank may opt to borrow funds as opposed to taking customer deposits. Every client transaction is accompanied by an alternative interbank transaction. The prevailing market rate is therefore acceptable as the cost of funding for a large commercial bank and in addition to this, using the prevailing market rates ensures consistency in terms of results (Kugiel & Jakobsen, 2009). Using the market rate, banks are able to objectively verify their product pricing policies and to evaluate management performance.

The transfer prices for every pool should be a reflection of the prevailing market rates for various instruments. Such instruments include treasuries and interbank loan/interest rate derivatives. The bank must then come up with a transfer rates yield curve that is an accurate reflection of the market cost of funds (Kocakulah & Egler, 2006). Unlike the single pool approach and its derived form, the multiple pool approach uses two transfer price curves that are for assets and for liabilities.

The process of building pools under the multiple pool approach involves the following three characteristics; product type, rate and currency. A rate from the Libor/swap curve is assigned to each pool subjected to the currency. When calculating the transfer price, one should determine the length of price period, ex-post or ex-ante price and the weighted moving average. Additionally, this method allows prices to be adjusted for liabilities by constructing the deposit curve, adjusting the reserve ratio as well as ascertaining transfer prices for other assets and liabilities. The multiple pool approach also enables the spreading of components into an FTP portfolio and adjusting of corrective margins (Kugiel & Jakobsen, 2009).

According to Kawano (2005); Kimball (1997); Kugiel and Jakobsen (2009); Simoff and Morris (2000); Webster (2012); Wyle and Tsaig (2011), the following Table 4 presents the summary of advantages and disadvantages of multiple pool approach.

<i>Advantages</i>	<i>Disadvantages</i>
Does not require complex computing power	It is subject to changes in market interest rates since profitability of products is tied to the
Does not require detailed transaction information	It does not take into effect the historical interest
Can be deployed using internally developed software	It is suited for short-term fixed rate transactions and for long-term transactions
Enables accurate calculation of profitability for pools of float rate products	There is no separation of interest rate risk from credit risk
Incorporates time structure of assets and liabilities while allowing adjustments	There is considerable variance in regards to the accuracy of managerial results
Valuable to commercial banks with many branches and using interbank transactions	There is more disparity in relation to managerial and accounting interest
Facilitates objective performance evaluation and aids managerial decision-making in relation to product structure	When compared to the single pool approach, multiple pool requires more IT resources

Table 4: Advantages and Disadvantages of Multiple Pool Approach

Nevertheless, banking institutions may have to invest in professional software applications in order to make the multiple pool approach suitable for their purposes. Since the Libor/swap curve, necessary for the multiple pool approach, is developed using actual market data, this method ensures an accurate calculation of profitability for pools of products (Kugiel & Jakobsen, 2009).

An example of the multiple pool approach

The following example demonstrates how the multiple pool approach works. In this example, there are two types of deposits and loans, implying that two pools will be made based on the products' maturity. In addition the transfer rates as well as the transfer price for each pool will be calculated the same way it was done in the single pool approach example shown in the previous section. To compare how the multiple pool approach differs with the single pool approach; the customer rates used in the single pool approach are used in the multiple pool approach to demonstrate how the different approaches impact on the various business units' NII.

In this example there are two pools whereby the TP for pool one is 3.5% while the TP for pool two is 4%. Using the two TP rates, the Transfer Rates in each pool are calculated as shown in Table 5 below.

The results from the multiple pool approach example indicate that the NII for the bank is R2,840 and is still the same as the single pool approach. However, the commercial NII of the asset, liability and the Treasury are different from those obtained using the single pool approach. Since there are only two products on each side of the balance sheet, the commercial NII is not significantly different in terms of value when compared to the single pool approach, but when all the bank's products are considered and their differences are aggregated, then the difference could be significant.

Another issue worth noting is that in a multiple pool example, the Treasury's NII increased by R47. In the single pool approach example, the Treasury's NII was R208 but when the multiple pool approach is used, it increased to R255. This is a significant difference brought about by the fact that now the Treasury will separate the R10,000 borrowed externally and transfers this amount to the user of funds (assets) at a different transfer rate. The use of multiple pools results in a clear funds allocation between the two business units.

Assets					Liabilities					
AR (%)	TR (%)	Product	Maturity	Amount (R)	Product	Maturity	Amount (R)	TR (%)	AR (%)	
11	7.5	Consumer Loan	1 year	23 000.00	Current Account	unknown	20 000.00	7.5	4	
13	9	Commercial Loan	2 years	17 000.00	Term Deposits	2 years	10 000.00	9	5	
					Funding	unknown	10 000.00		6	
Total Assets				40 000.00	Total Liabilities			40 000.00		

Pool 1:

Transfer Price (TP): $(11\% - 4\%)/2 = 3.5\%$

Transfer Rate (TR) Liabilities: $3.5\% + 4\% = 7.5\%$

Transfer Rate (TR) Assets: $11\% - 3.5\% = 7.5\%$

Pool 2:

Transfer Price (TP): $(13\% - 5\%)/2 = 4\%$

Transfer Rate (TR) Liabilities: $4\% + 5\% = 9\%$

Transfer Rate (TR) Assets: $13\% - 4\% = 9\%$

Calculation of NII

Margin	Calculation	Value
<i>Direct Calculation of NII</i>		
Accounting margin	$(23,000 \times 11\% + 17,000 \times 13\%) - (20,000 \times 4\% + 10,000 \times 5\% + 10,000 \times 6\%)$	R 2 840
Net Interest Margin	$2,840 \div 40,000$	<i>7.1%</i>
<i>Commercial NII</i>		
Loans	$(11\% - 7.5\%) \times 23,000 + (13\% - 9\%) \times 17,000$	<i>R 1 485</i>
Deposits	$(7.5\% - 4\%) \times 20,000 + (9\% - 5\%) \times 10,000$	<i>R 1 100</i>
Total commercial NII		<i>R 2 585</i>
<i>Treasury NII</i>		
Treasury NII	$(7.5\% - 6\%) \times 3,000 + (9\% - 6\%) \times 7,000$	<i>R 255</i>
Bank Margin	Commercial margin + Treasury margin	R 2 840

Table 5: Multiple Pool Approach Example

In conclusion, therefore, it is clear that the multiple pool approach is more advanced than the single pool approach but still relatively blunts and fails to assess the true cost of liquidity.

3.5.3 Matched-Maturity Approach

The matched-maturity approach of a Funds Transfer Pricing framework is also referred to as “the co-terminus approach” which according to Wyle & Tsaig (2011) is “a more detailed extension of the multiple-pool, historical variation” (p. 8).

The matched-maturity FTP approach was developed by the Bank of America in the 1970s, a period that was characterized by rampant market volatility. During this era, it became clear that the existing accounting system was no longer sufficient to reliably allocate profitability to different business units hence the need to develop another approach (Deventer, 2002).

Kugiel and Jakobsen (2009) assert that the major difference between the matched-maturity approach and the multiple pool approach is that prices are allocated to individual transactions as opposed to first amalgamating transactions into pools. By allocating prices to individual transactions separately, the transfer rates accurately reflect the interest rate on those transactions meaning that the end result is more accurate than in the multiple pool approach. The matched-maturity approach takes into consideration the unique features of funds at the cash flow level and is therefore the most preferred FTP approach in the financial industry (Wyle & Tsaig, 2011).

The matched-maturity FTP approach is more complex in comparison to the pooled approaches. However, this method captures the contribution margin of every transaction within the bank this can help to improve managers' decision-making (Kawano, 2005).

The major differences between the multiple pool approach and the matched-maturity approach is that in the latter, there is a separation of interest rate risk from credit risk (Simoff & Morris, 2000). Another difference is that every sales unit accounts for its corresponding credit risk - meaning that there is no unfair advantage or disadvantage of certain products or business lines over others as does happen when they are pooled together.

Under the matched-maturity approach, each transaction/source is allocated a unique transfer rate which is maturity-specific. Additionally, funds usage takes into account the expected cash flow stream as well as the interest rates prevalent at the time of the funds origination. The matched-maturity approach also applies behavioral assumptions and the calculation of future cash flows is done at the transaction level based on the contractual features in the banks records. The

behavioral assumptions applied when calculating the transfer rate include prepayment options, amortization and other similar embedded features (Simoff & Morris, 2000; Wyle & Tsaig, 2011).

The difference between asset yield and the marginal cost of funds comprises the profitability of purchasing an investment or originating a loan (Kocakulah & Egler, 2006). Using the matched-maturity approach, the process of calculating the contribution margin of every transaction is pretty straightforward. This is because every transaction under this method is assigned a transfer rate reflecting its marginal cost of funds. In addition measuring the spread of Treasury is easily achieved. One of the features of FTP is that funds are bought from liability gatherers and then sold to asset gatherers. The matched-maturity approach makes it possible to use historical market data to lock in the net spread and by so doing; the interest rate risk is effectively transferred from the concerned business unit on to the funding center. Similarly, since the matched-maturity approach uses the historical market time series, it becomes easier to assess the effects of past pricing decisions (Wyle & Tsaig, 2011).

The matched-maturity FTP approach is implementable in phases and this is what makes it more attractive to financial institutions. This approach is immensely important in terms of assets and liabilities management and as already seen, among the three methods examined in this thesis, the matched-maturity approach is the only one capable of separating interest rate risk from credit risk and thus is able to transfer the same to responsible business units. In today's financial industry characterized by low variable market rates, implementing the matched-maturity approach becomes a prerequisite for banking institutions that wish to reach sound investment decisions informed by the prevailing market conditions. Institutions participating in the financial markets cannot afford to do without the matched-maturity FTP approach because by holding various financial instruments, they expose themselves to greater risk and therefore they require a tool that can assist them in making managerial decisions.

Since it is possible to achieve different variations of the matched-maturity approach, it is possible to overcome some of the disadvantages associated with this approach. For starters, while the matched-maturity FTP approach is the only one that allows transferring of interest rate risk, where foreign transactions are involved, the currency risk remains at the concerned branch. The matched-maturity FTP approach may be slightly altered such that a fixed exchange rate is set for every transaction in accordance with that transaction's date of origination. However, it is important to point out that this variation does not take into consideration the fluctuation of exchange rates. To mitigate this, a re-pricing exchange rate matching the re-pricing interest rate must be assigned to such transactions. None of the three FTP frameworks takes exchange rates into account due to the fact that it has minimal impact on risk management (Kugiel & Jakobsen, 2009).

The other method of modifying the matched-maturity FTP approach is through the use of fixed rate variation in all transactions. Using this modified approach, all deals including the ones based on internal rates are assigned matched-maturity rates. This modification is based on the assumption that the cost of financing has more to do with the term of a transaction than the rate re-pricing characteristic. The pooled FTP approaches use a corrective liquidity margin while the matched-maturity approach uses assigning of matched maturity rates (Randal, 1998).

The Table below presents a summary of benefits a matched-maturity FTP approach can offer to commercial banks, as well as the main drawbacks. These were identified in the works of Kawano (2005); Kimball (1997); Kugiel and Jakobsen (2009); Simoff and Morris (2000); Webster (2012); Wyle and Tsaig (2011).

<i>Advantages</i>	<i>Disadvantages</i>
Separates credit risk and interest rate risk	It is an expensive method to implement
All the business transactions are based on a fixed interest margin	Requires acquisition of expensive IT tools
Facilitates unbiased business decisions by enabling accurate evaluation and motivation	It is unsuitable for small banks that do not have the resources or expertise to operationalize
Enables centralization of interest risk and its subsequent transfer to the responsible business unit	

Table 6: Advantages and Disadvantages of Matched-Maturity Pool Approach

Consequently, only large commercial banks have the ability to implement the matched-maturity FTP approach because apart from their ability to perform the required IT upgrades, they usually already possess the capability of processing detailed transaction data. The matched-maturity FTP approach is best suited for large commercial banks that wish to make their interest risk management and evaluation of business performance capabilities more robust.

An example of the matched-maturity approach

Many commercial banks today prefer to use the matched-maturity approach of FTP because it overcomes the disadvantages of both the single pool and the multiple pool approach.

To demonstrate how the matched-maturity approach differs from the multiple pool approach, the following illustration assigns a different transfer rate to each item in the balance sheet. In addition to this, the bank uses the maturity of products to determine the suitable point on the transfer curve where the transfer rate can be found. To begin with, it is important to establish a funding curve that best reflects the use of funds on the wholesale market. It was mentioned earlier, some commercial banks build a funding curve using Libor/swap curve or use of an overnight government rate for short-term products, commercial paper for the intermediate term and the government advances for the long term. These curves are used to determine asset rates (AR) and liability rates (LR) to provide optimal customized loan and deposit pricing. Hence, these optimal prices are driven from the cost of funds used or value of funds provided plus a consideration of

the following elements, which are exclusive to each commercial bank: goals and strategies, costs of business operations, imbedded transaction risks. Table 7 below shows all the necessary values and calculations illustrating the differences between the matched-maturity approach and the single pool as well as the multiple pool approach.

Assets					Liabilities					
LR (%)	TR (%)	Product	Maturity	Amount (R)	Product	Maturity	Amount (R)	TR (%)	DR (%)	
11	7	Consumer Loan	1 year	23 000.00	Current Account	unknown	20 000.00	5	4	
13	8	Commercial Loan	2 years	17 000.00	Term Deposits	2 years	10 000.00	8	5	
					Funding	unknown	10 000.00		6	
Total Assets				40 000.00	Total Liabilities			40 000.00		

Funds Transfer Pricing rates

Maturity	1 day	1 year	2 year	3 year	4 year	5 year
Asset Rate (AR)	8%	11.00%	13.00%	13.80%	14.00%	14.80%
Libor/Swap Rate	5%	7.00%	8.00%	9.00%	9.50%	10.00%
Liabilities Rate (LR)	4%	4.50%	5.00%	6.00%	6.20%	7.00%

Calculation of NII

Margin	Calculation	Value
<i>Direct Calculation of NII</i>		
Accounting margin	$(23,000 \times 11\% + 17,000 \times 13\%) - (20,000 \times 4\% + 10,000 \times 5\% + 10,000 \times 6\%)$	R 2 840
Net Interest Margin (NIM)	$2,840 \div 40,000$	7.1%
<i>Commercial NII</i>		
Loans	$(11\% - 7\%) \times 23,000 + (13\% - 8\%) \times 17,000$	R 1 770
Deposits	$(5\% - 4\%) \times 20,000 + (8\% - 5\%) \times 10,000$	R 500
Total commercial NII		R 2 270
<i>Treasury NII</i>		
Treasury NII	$(7\% - 5\%) \times 20,000 + (8\% - 8\%) \times 10,000 + (7\% - 6\%) \times 3,000 + (8\% - 6\%) \times 7,000$	R 570
Bank Margin	Commercial margin + Treasury margin	R 2 840

Table 7: Matched-Maturity Pool Approach Example

To establish how TR is assigned to different products, assume the bank issues a loan with a maturity of one year. Additionally, assume that when this loan was originated the transfer rate

was established by locating the corresponding term point on the Libor/swap curve. Table 7 illustrates a loan of one year where the customer is charged an interest rate of 11%. The transfer expense rate of 7% shown in the Table 7 represents the market-based incremental cost of funding. Going by these figures, there is a 4% variance (11% - 7%) between the interest rate negotiated between the bank and the borrower. This difference in a transfer rate is referred to as the credit spread. The term credit spread basically refers to the money a lender earns for assuming credit risk. For it to be viable, the credit spread must be sufficient to compensate the lender for things such as credit losses, direct operating costs associated with lending operations, loan servicing as well as the general overheads allocated by the bank.

To determine the transfer price of a current account with unknown maturities on deposits, the applicable point on the Libor/swap curve is located. However, since this product does not have an exact maturity date and the customer could withdraw funds any day, the bank has to assign one day maturity on the selected curve which is then matched to an income rate of 5% leaving a 1% variance between the transfer income rate earned by the bank and the deposit rate paid to the customer. Once the appropriate transfer rates are assigned to each financial instrument, the NII for each business unit can be calculated using the following formulas:

$$NII_{Loans} = (CR_{Loans} - TR) \times V$$

and

$$NII_{Deposits} = (TR - CR_{Deposits}) \times V$$

where CR is a customer rate.

$$Total\ Commercial\ NII = NII_{Loans} + NII_{Deposits}$$

Referring to the matched-maturity approach example shown in Table 7, the following values were obtained,

$$NII_{Loans} = R1,770$$

and

$$NII_{Deposits} = R500$$

Comparing these results to the results obtained using the single pool approach and the multiple pool approach there is a significant difference. This difference is primarily due to the way the

transfer rate is determined under the matched-maturity approach as well as how the assigning of specific rates for each loan/deposit is done. The matched-maturity approach clearly gives a better understanding of cost and income of different business units.

Using the matched-maturity approach, the Treasury's NII increased to R570 as compared to the single pool approach and the multiple pool approach where the Treasury's NII was equal to R208 and R255, respectively. This implies that when the bank uses the matched-maturity approach, the Treasury receives more allocation of NII because of the responsibilities it takes in terms of managing risks and mismatched risk between the products. The end result is that the spread reported on assets and liabilities are steadier and mirrors the true economic conditions of these products. Additionally, the income variability resulting from changing interest rates is detached in the Treasury where it can be best managed on a consolidated basis.

These examples give a clear picture of how the single pool approach, the multiple pool approach and the matched-maturity approach work in practice. Most importantly, the examples demonstrate how NII allocations for the different business units differ.

3.6 Conclusion

In conclusion, this chapter has highlighted the different approaches of FTP, explained TP, TPC and the components of an FTP system. There are three main approaches to FTP namely; single pool approach, multiple pool approach and matched-maturity approach. According to a survey by PricewaterhouseCooper (PwC) carried out in 2009 among 43 leading financial institutions around the world the matched-maturity FTP method is the most common approach. The Basel Committee on Banking Supervision (2008), states that many banks use matched-maturity FTP. 95% of the respondents to a survey by PwC use an interbank money market and swap rates to determine their FTP rates. About half of the respondents update FTP rates on a daily basis and about 16% on an intra-day basis (PwC, 2009).

One of the reasons why the matched-maturity approach is more attractive to financial institutions as compared to multiple pool approach and the single pool approach is that it can be implemented in phases. Additionally, in this approach every individual transaction/source is allocated a unique maturity-specific transfer rate thus the method of calculating the transfer prices for all transactions is straightforward. As compared to the other two FTP approaches, the matched-maturity approach is the most costly but since it can be implemented in phases and it has more benefits, it is preferred over the multiple pool and the single pool approaches.

4 RESEARCH METHODOLOGY

Following the core issues surrounding Funds Transfer Pricing, the research methodology chapter is corroborated on the research questions that this study is trying to adopt. This chapter also helps the reader to get an idea of how research has proceeded and how it has been realized under the following sub-headings: research approach, research methods, research procedure and conclusion.

4.1 Research Approach

The research used a conceptual approach in its effort to identify the best suited model of Funds Transfer Pricing for commercial banks. However, the research recognizes the importance of arriving at a model that is empirically testable and hence has used a framework that realizes this objective. In effect, it adopts a mixed methodology approach that has enabled the research to have the opportunity of exploiting the benefits of both qualitative and quantitative methods as outlined by Kumar (2007). Since a Funds Transfer Pricing model's effectiveness depends on different economic conditions and cannot be universal, his research uses a variety of qualitative data to ensure that the most appropriate framework is employed.

4.2 Research Method

The research has relied largely on secondary sources from scholarly works to build a desirable and effective model. Qualitative research has therefore been used as the main method of conducting this research. This paper has identified a variety of scholarly and professional sources for the purposes of comparing the available Funds Transfer Pricing models. Their benefits, applicability, cost and implementation requirements have been taken into account as reported in the identified sources and thereafter a most appropriate model deduced from the listed models based on the above mentioned criteria.

Bledsoe (2008) indicates the concerns that some of the banking industry players have had regarding the effectiveness of Funds Transfer Pricing models and therefore the developed model

should be able to clear doubts that management may have on implementing one. The method of research utilized by this study therefore takes into account the various concerns by collecting all the information on the weaknesses of the major models and identifying the best model. In addition, the identified model is further improved by adopting the best practice methods that are derived from other models to ensure efficiency.

Overall, the goal of this method is to ensure that the most effective and efficient model is developed out of the existing model of a Funds Transfer Pricing.

4.2.1 Data Sources

For a conclusive paper, the research utilized a number of sources to be able to obtain the required information. One of the most important sources was the Witwatersrand library and in particular the scholarly and periodicals section that provided an up to date insight on the available approaches of Funds Transfer Pricing. The published book's section was also utilized so that the research could have a good historical as well as a conceptual overview of the available models and their main benefits or drawbacks.

Secondly, the research also recognized the importance of diversity and therefore employed the use of online and accessible libraries. In particular, the Wiley publishers' library and the proquest library were used. The latter provided a good collection of scholarly reviewed journals and research literature that formed a good foundation for the conceptual approach utilized by this research. However, the research was not only limited to the mentioned sources but also other secondary, but relevant literature so that the research would not rely on a limited data pool. Generally, the guiding principle was to ensure that the selected materials and sources were realizable, authoritative and up to date. Recently published materials were given priority over the past literature so that the resultant information was reflective of the prevailing economic conditions.

4.2.2 Research Procedure

The procedure involved included the identification of relevant material, retrieval of the most applicable data, and the compilation and analysis of the data. In the identification of materials, the secondary sources containing the relevant information on Funds Transfer Pricing were singled out from the varied sources available, most appropriate data obtained from them and empirically tested using a simple example on calculation of net interest margin for every business unit.

4.2.3 Methodology Analysis

Data analysis involved the comparison of the available models of FTP so that a simple model was to be arrived at. The different approaches of Funds Transfer Pricing were analyzed for their potential benefits, risk neutralizing potential and profitability enhancement potential. The likelihood of their implementation was also evaluated using projections on their costs and the benefits that will be derived by banks in the event that they integrate the models into their operations.

Consequently, the models identified in the secondary sources were eliminated on the basis of the criteria of reliability and effectiveness. The remaining model was therefore checked for potential weaknesses and thereafter modified to eliminate the identified drawbacks that may paralyze the system during implementation stages and for a permanent effectiveness.

4.2.4 Validity and Reliability

The research has ensured that the issues of reliability and validity are appropriately addressed. Firstly, the recognition that the research's use of a qualitative approach has made it rely on secondary sources and has been addressed by the identification of the most appropriate academic and professional sources. The sources have also been appropriately acknowledged and properly cited so that the research study is not a duplication of other research findings. At all times, the methods used by this study in obtaining information were bound by the guidelines that are used in standard research studies.

This research is therefore good for the adoption by the commercial bank industry policy makers because it has made sure that the most efficient means of Funds Transfer Pricing has been reflected in the proposed model. However, since economic changes are likely to influence the success of the proposed model, it is important that the model undergoes frequent reviews for its sustainability. The information presented in the final model has been empirically tested and therefore is applicable to the banking industry. It is also important that prospective banks implement change management initiatives so that the proposed model is well received and implemented. The importance of a Funds Transfer Pricing model cannot be overlooked by any institution with the ambition of gaining a competitive advantage in the highly globalised banking sector (King, 2009). It is therefore clear that models like the one proposed will remain valid and important for commercial banks.

4.3 Conclusion

The sections above include the research approach and the research method of this study. The next chapter will present a FTP model, which is simpler and easier to implement in commercial banks, particularly in the developing economies with limited IT infrastructure.

5 A SIMPLE FUNDS TRANSFER PRICING MODEL

The intense competition in the financial services industry has reduced the potential of traditional operations to finance loans through deposits. The current situation forces us to reconsider traditional approaches to improve the efficiency of banks: increase attention to the internal generation of bank capital, financial innovations, the search for new investment opportunities, reduce management cost, etc. The key overarching principles of the banking institution is long-term business sustainability, and this is one of the key reasons why Funds Transfer Pricing is so important to these institutions.

According to Hanselman (2009), “financial institutions recognize that FTP is a critical path to enlightened risk and return net interest margin analytics and key to optimizing the margin” (p.16). However, individual banks have their own unique business models despite being in the same business and competing with others. A bank’s business model mainly depends on its customers and targeted customers, but also reflects the size of the bank itself, the type of lending it undertakes, its funding and capital structure and so on. Due to these factors, each bank needs to develop an individual approach to FTP taking into account its individual attributes to develop an FTP framework that gives it a competitive advantage.

With a clear picture on the role played by FTP framework on the operations of commercial banks and for the attainment of the main purpose of this thesis, this chapter will therefore present a simplified FTP model. The general structure of this chapter will be constituted of the two main sections. First is section 5.1 which is a summary of the key concepts derived from the literature review. Next, section 5.2 will subsequently proceed to illustrate and establish a simplified FTP approach according to the objectives of this paper. In addition, the chapter will conclude by stating some of the major benefits of the proposed model to commercial banks.

5.1 Summary of Findings

After analysis of the available literature and other sources on the different approaches of FTP that included single pool approach, multiple pool approach and matched-maturity approach, the study intended to arrive at a single most effective and simple model.

Today, the most suitable FTP model that has been proposed after close examination and analysis of the available models is the matched-maturity approach. This approach goes beyond other models by assigning prices to each single transaction making it most beneficial to banks. However, this model is complex and has highly integrated functionality areas for the ascertainment of individual transactions, it is therefore obvious that it may require heavy investment and much skill to establish and maintain the desired system of application. Another limitation of matched-maturity approach is that it presents a great challenge to banks that operate in highly interconnected financial markets. Since there is a high risk exposure in such markets, implementation of the model may be quite challenging.

Continuously, a single pool approach is not suitable anymore for the most financial institution that operates internationally. Its simplicity might be an advantage but lack of taking risk and maturities of the product into consideration are definitely a drawback in today competitive environment.

As a result, the author settled on the multiple pool approach. The idea of creating a simple FTP was seen to align with the features of the multiple pool method that among other benefits has a potential of reflecting the actual market conditions as well as having a flexible rate. In addition to this, the gains of its use can be derived by either gross or net values. It is for this reason that Kawano (2005) recommends this approach especially for banks having a variety of users and providers as well as an unstable funding portfolio. Conversely, this method has its own weaknesses that may range from high requirements for fund utilization to a complex implementation process when compared to a single pool approach (Kawano, 2005). However,

this method still meets the requirements of the proposed FTP model because of its simplicity. To further streamline a multiple pool approach, the simple FTP model employs the use of an average rate instead of the usual marginal rate so that there is a fair spread of internal costs.

5.2 A Simple Model

During the initial overview of different FTP approaches, key concepts were studied to understand the framework of FTP in the commercial bank. These concepts were thereafter summarized to lead to the corroboration of ideas for a simple FTP model. Figure 5 depicts a simple Funds Transfer Pricing model. This model is designed on the basic principles of a multiple pool approach to meet the immediate requirements of commercial banks, but it is simplified to overcome some of the main drawbacks of the approach and at the same time provides a framework for future commercial bank's needs.

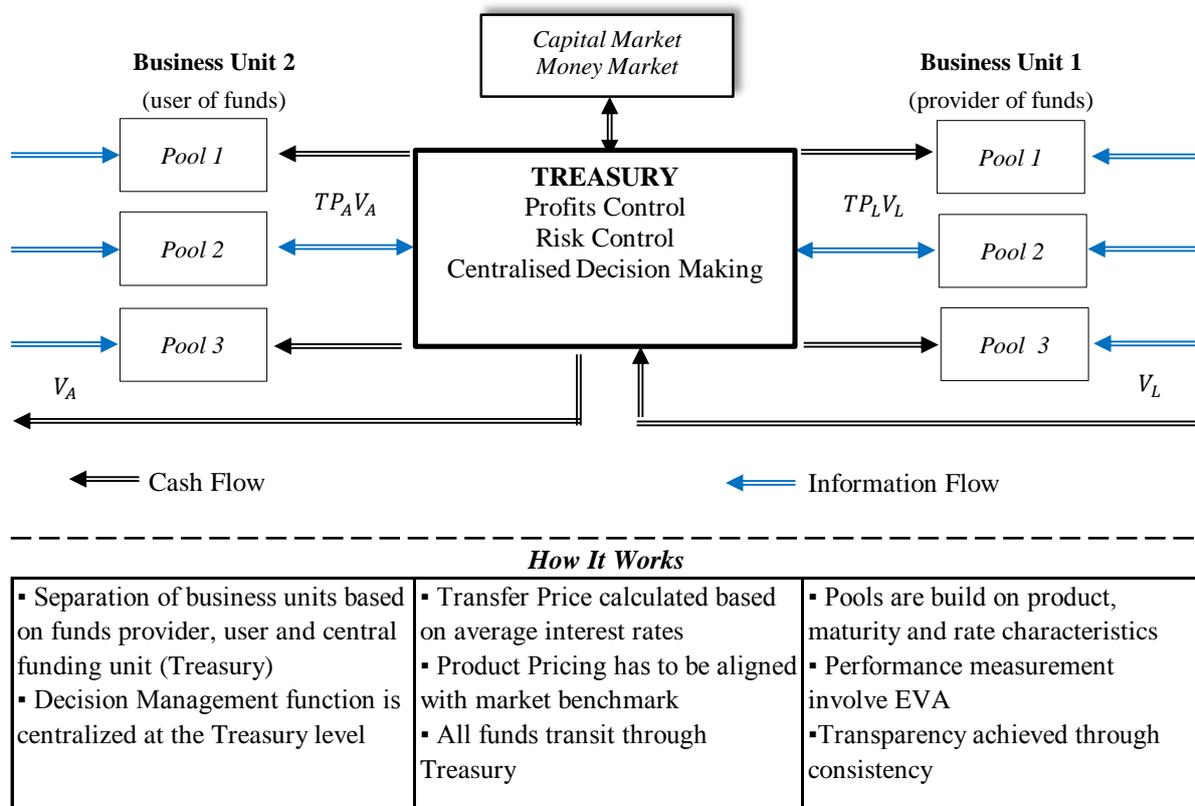


Figure 5: Simple Funds Transfer Pricing Model

5.2.1 Process

The model presented in the Figure 5 has three distinct business units of operation for an effective Funds Transfer Pricing system. The three business units include the Treasury, the funds generation unit and the funds issuing unit. Each unit is designed to work with the others to ensure that the success of the FTP is achieved. The funds generating unit is established for the purposes of attracting deposits into the system. Secondly, the funds issuing unit is involved in facilitation and issuance of loans. The Treasury is at the core of the model, as it is the main unit for the administration of the FTP system since it acts as the intermediary between the other two units.

The model proposes for the use of pools as it is in a multiple pool approach for both the generation and issuing units. However, the pools are not comparable to those of multiple pool models because they assort products according to closely related characteristics.

The Treasury framework of this model has also been restructured for a more effective FTP. The Treasury has been designed to act as a centralized funding center as proposed by several writers (Rajendra, 2003; Gox & Schondube, 2004; Grant, 2011). All the risk control functions are assigned to the Treasury including the credit risk as championed for by Kugiel and Jakobsen (2009). The Treasury also acts in a centralized model that serves the main functions of control and funding whereas other subsidiary tasks are decentralized for increased efficiency in the system. This model therefore eliminates the risk associated with leaving decision making concerning risk evaluation to the branches of the commercial bank. Generally, the Treasury will be a hub between the other two business units as presented in the proposed model. As mentioned earlier, the Treasury will be overly responsible for liquidity pricing, risk control, profits control, and mismatched gap among other control functions.

The calculations on profit, transfer prices and transfer rates shall be carried out as discussed in the sections that follow. The calculation of TP is based on the internal cost of funds. All the

calculations will be based on efficiency and applicability of the model so that they remain as simple and objective as possible.

Having looked at the general outlay and operations of the proposed model, it is important to further discuss its components. The following building blocks (principals) were identified and served as a guide for an FTP model presented in this thesis that can be empirically validated to improve the FTP framework of commercial banks or can be used as an additional benchmark for an existing FTP to redesign it.

5.2.2 Information and Cash Flow

Since the Treasury acts as a hub in the model, most information from the two other units are directed to it. Blue arrows in Figure 5 indicate information flow. This information depends on the nature of purchase and the respective unit in which it emanates from. The information from the different product pools will originate and be sent directly to the Treasury for decision making, control or necessary action. For instance, since the Treasury acts as the centralized funding center, the transactions that need funding will send information to the Treasury concerning the nature of financing and further action relayed from the Treasury to the individual pool. It is also important to note that information flow from the two units has a difference. Whereas the fund generating side sends unidirectional information to the Treasury, the funds issuing unit sends multidirectional information to the Treasury due to the feedback it must get from the hub concerning the issuance of loans and other instruments.

Black arrows in the diagram indicate the general flow of finances within the bank's system. The Treasury is at the central point of this flow since all funds must pass through it before being channelled to the other business units. For instance, when a business unit issues out loans or receives customer deposits, the amount is actually received or paid out by the Treasury. Subsequently, the Treasury transfers the equivalent earned to the respective business unit, where

the transfer price (TP) is multiplied by the actual monetary value (V). In effect, there is enhanced funds flow control in the implementing institution's system.

5.2.3 Building Pools of Transactions

The pools of the transaction will take the nature of a multiple pool model, but with adjustments as earlier stated. The Treasury will be the principle in the system and hence the pools may not have to freely operate as in the case of the multiple pool approach. The products can be allocated to three main pools, namely the long term fixed products, float products and blended term for indeterminate maturity products. In addition, these main pools can be divided into sub-pools to categorise characteristics of products as closely as possible. The number of pools will depend on the structure of the bank's balance sheet. Basically the transaction pools will be built on product type, interest rate and maturity characteristics. The model proposes that assets that are short term and have the same liquidity rate are to be pooled together so long as their margin of interest does not vary for the stated period of operation. The same will be done to the liability side products that will take into account the flexibility of interest rates, currency as well as the nature of products.

A Table 8 below presents and summarises the three pools described in the text.

<i>Pool:</i>	1	2	3
<i>Name:</i>	Long-Term Fixed Rate	Float Rate	Blended Term
<i>Characteristics:</i>	Products with long term (LT) and fixed rates	Products with long maturities, but with float rates and products with short term (ST), but fixed rates can be handled homogeneously	Products with very short or unknown maturities
<i>Products Examples:</i>	Fixed rate mortgages, Term Deposits	Monthly Deposits, Mortgages with float rate, Corporate loans	Current Deposits, Credit Cards

Table 8: Building Pools of Transactions

The pools will be subject to sanction and monitoring by the Treasury and each pool establishment will depend on the rates of reprising of the individual customer transactions according to the

nature of currency or instruments used. The Libor/swap curves will also be assigned to each pool for the establishment of the transfer prices and other evaluation purposes by the Treasury. The determined rates are thereby assigned to loans and deposits according to the pool they have been assigned.

Accuracy for the process of the pool building has been given a lot of emphasis because it plays an important role in the effective calculation of transfer prices and hence properly determining a performance of the system.

5.2.4 Establishing the Funding Curve

As mentioned in the section above, the transfer curve will take the form of Libor/swap according to the currency used. The deposits and loan curves will take different forms to produce a more effective funding framework. In line with the reviewed literature, the multiple pool has two curves namely; ask and bid curves for assets and deposits respectively. Libor rates are majorly used when lending from other financial institutions and therefore the need for their use is during the evaluation of loan pricing. The loan's curve will vary according to the long term or short-term nature of the products. The curves are to be constructed according to the product characteristics that have been established by the Treasury as opposed to the method used in multiple pool models.

On the other hand, the deposit curve is constructed differently due to concerns of efficiency and accuracy of transection pricing. The deposit's curve needs to be adjusted to meet the reserve requirements and other regulations. As a result, the Treasury is able to effectively eliminate risks.

5.2.5 Setting Transfer Price and Rates

The general guideline is to calculate the transfer prices according to the prevailing market rates. Since markets have a tendency of changing at different periods, the transfer price (TP) will, as well, need to be adjusted from time to time in accordance with the changes to reflect a true and

fair value of different products. The TP will be influenced by both short term and long term liquidity risks and therefore the need for constant adjustment by the Treasury. Here, a calculation of TP done based on the internal cost of funds. The customer rates of the particular pools will be taken into account by the system so that they are not affected by the adjustments which may influence the model's effectiveness. Kugiel and Jakobsen (2009), "highlighted that calculating average TPs for a pool should always be done with one goal in mind – the best approximation of customer interest rates in that pool" (p.47).

The transfer pricing for the pools will be calculated by getting the difference between the average rate on loans and deposits. On the other hand, the rate will be calculated on average to cater for three units. This implies that the rate will be derived by dividing the rates by three. This will ensure that there is an equitable allocation of the spread to the Treasury as well as the other two business units. The spread allocation for the Treasury will be for the purposes of covering risks. The following formula presents a calculation of the transfer price in a simple FTP model:

$$TP = (AR_{Loans} - AR_{Deposits})/3$$

Hence an easy determination of the transfer rates for deposits and loans as follows:

$$TR_{Deposits} = AR_{Deposits} + TP$$

and

$$TR_{Loans} = TR_{Deposits} + TP$$

As a result, the net interest income for individual business units will be derived by:

$$NII_{Loans} = (AR_{Loans} - TR_{Loans}) \times V_{Loans} - OE_{Loans}$$

and

$$NII_{Deposits} = (TR_{Deposits} - AR_{Deposits}) \times V_{Deposits} - OE_{Deposits}$$

and

$$NII_{Treasury} = (TR_{Loans} - TR_{Deposits}) \times V_{Treasury} - OE_{Treasury}$$

where AR is an average interest rate for a pool of funds provided/used, TR is the transfer rate, V is an amount of actual money and OE is operating expenses.

For the determination of individual business unit's net interest income, the calculation illustrated above should be used for each pool in consideration.

5.2.6 Risk Control

The risks like, credit risk, interest rate risk, liquidity risk and currency risk, shall be transferred to the Treasury as a general requirement for the proposed model. This is for the better management of risks rather than spreading them at different units or pools. The main benefit of a centralization of risks by the Treasury is that it enables the other units to focus their efforts in attracting new businesses. In the simple FTP model, this can be outlined as below:

$$Risk_{Bank} = Risk_{Business\ unit\ 1\ and\ 2} + Risk_{Treasury}$$

where risk of business unit one and two ($Risk_{Business\ unit\ 1\ and\ 2}$) is equals to zero and risk of the Treasury is comprised of all the risks defined above. This is because in an FTP model all risks such as interest rate and currency risks are transferred from business units to the Treasury.

5.2.7 Performance Management

Literature suggests that FTP can help to improve banks' net interest margin through a reward system. When using a matched-maturity approach, detailed reports are produced, which give information details on a spread between yield and TP, as well as the officer code of who issued a particular loan/deposit (Rice & Kocakulah, 2004). Therefore, it easy for a bank to link their incentive programs to their spread, and consequently to an FTP system. However, in a model with pools, there is no direct relation between the profits received by the business unit and everyone's role in this matter. The Economic Value Added (EVA) analysis should be introduced to the model to overcome this drawback and analyses the performance of different units.

The EVA method measures that economic value over a specified period of time. It is equivalent to the net operating profit after tax (NOPAT), modified for the cost of capital employed (the sum

of interest bearing liabilities and shareholders' equity). The cost of capital employed is the required yield (R) times capital employed (CE).

EVA is defined by:
$$EVA = NOPAT - (R \times CE)$$

Elliot and Elliot (2007), state that numerous organizations have employed the EVA method to determine the bonus rewarded to management. As a result, managers in the reward scheme crafted using the method have ended up showing good performance relative to other schemes.

However, to introduce such a system within the bank, managers have to have a good understanding of the concepts of EVA.

5.2.8 Reporting, Communication and Transparency

Business units are likely to accept the model provided there is transparency, rational decision making and consistent application of the models' framework in the organisation by management.

According to Atomei, Robu and Bigioi (2012), "transparency is meant to correctly judge the ethics of transactions and increase trustworthiness of market participants" (p.2).

The model will apply transparent ways of reporting and communicating so that the system remains trustworthy. The use of a technology based information system will be employed by the Treasury so that all stakeholders get involved for better management of the model.

5.3 An Example of a Simple FTP Model

This section will illustrate how margins for each business unit described in a simple FTP model could be determined in practice. To compare the results with an example depicted in the section 3.5.2 it would be convenient to use the same balance sheet and values as previously indicated.

As a result, income calculations employ a simplified balance sheet with only two products on either side. In addition, the average customer rates for a current account and term deposit is 4% and 5% respectively. On the side of assets, a customer loan and a commercial loan have average

customer rates equal to 11% and 13% respectively. The business balance sheet generates a deficit funded by the Treasury at 6% of the current market rate. Here we can build two pools, where in the pool one, the current account (R20,000) and the consumer loan (R23,000) will be brought together. Correspondingly, pool two will have a term deposit (R10,000) and a commercial loan (R17,000). In practice and in the model proposed in this thesis it will be done differently, but because we have only two products on each side this is an ideal combination which could be achieved.

Subsequently, after calculating the bank's accounting margin, that is R2,840 in this case and is the same in every example presented in this thesis, we proceed by distributing it across business units and the Treasury. To do such a calculation we have to determine a transfer price for pools using the formula below:

$$TP_{Pool\ x} = (AR_{Loans} - AR_{Deposits})/3$$

Here we obtain for pool one that the TP is equal to 2.33% and for pool two the TP is equal to 2.67%. These values mean that an equal TP will be assigned to each business unit involved in transferring funds through the bank. Furthermore, the TP for each pool is different and much lower than in the example from 3.5.2, where the TP for pool one is 3.5% and 4% respectively.

The transfer rate for each pool is therefore calculated using the formulae indicated below:

$$TR_{Liabilities} = AR_{Deposits} + TP_{Pool\ x}$$

and

$$TR_{Assets} = TR_{Liabilities} + TP_{Pool\ x}$$

Transfer Rates for each pool will vary according to loan and deposit amounts. In this example, each pool will require additional funding. Whereas in pool one, we will add R3,000 at the market rate of 6% and pool two will require an additional R7,000 at the same rate, here we will have to do an additional calculation to determine a separate transfer prices where only two business units are involved namely: the Treasury and user of funds. In this special case we will use the following formula to calculate the TP:

$$TP_{Treasury} = (AR_{Loans} - MR)/2$$

where MR is the current market rate.

Therefore, for a pool one TP between Treasury and user of funds business unit is equal to 2.5%. Since there are two units involved, it would therefore be more logical and correct to divide the difference between two units instead of three business units. The same would be done for pool two and the TP, in this case, is equal to 3.5%. All the calculations are depicted in Table 9 below.

Overall, all the data for the determination of profitability of each business unit i.e. the net interest income for each business unit is achieved by the use of the following calculations:

$$NII_{Loans} = (AR_{P1} - TP_{P1}) \times V_{P1} + (AR_{P2} - TP_{P2}) \times V_{P2} + TP_{Treasury,P1} \times V_{Treasury,P1} + TR_{Treasury,P2} \times V_{Treasury,P2}$$

and

$$NII_{Deposits} = (TR_{P1} - AR_{P1}) \times V_{P1} + (TR_{P2} - AR_{P2}) \times V_{P2}$$

and

$$NII_{Treasury} = (TR_{Loans,P1} - TR_{Deposits,P1}) \times V_{P1} + (TR_{Loans,P2} - TR_{Deposits,P2}) \times V_{P2} + TP_{Treasury,P1} \times V_{Treasury,P1} + TP_{Treasury,P2} \times V_{Treasury,P2}$$

Results from the example give us the NII for loans equal to R1,053 for deposits to R734 and Treasury amount is equal R1,053. These results reflect a disparity from the example on a multiple pool approach in section 3.5.2, where NII for loans and deposits are higher than the results using a simple FTP model. The reason being, some of the spread is taken from the two business units through TP, allocated to the Treasury and hence increasing its NII. Therefore, the Treasury NII increased by R798, from R255 to R1,053 in comparison to a multiple pool approach, it increased by R845 in comparison to the single pool approach and it increased by R483 in contrast to the matched-maturity approach. An increase in the interest margin of the Treasury is received due to the enhanced role played by this department in monitoring the interest rate risk, credit risk, liquidity risk and currency risk, compared to the other three methods introduced in section 3.5. Whereas in a single pool and a multiple pool approaches, the Treasury department is simply responsible for controlling the flow of funds and managing the surplus/deficit of funds in a bank.

Additionally, in a matched-maturity approach the Treasury department is responsible for managing the mismatch risk and monitoring changes in interest rates, excluding, for example, the management of credit risk, which is often controlled by user of funds business unit. The transfer amount has to be carefully managed by the Treasury department to be able to cover all the incurred risks.

From a simple FTP model, we achieve the following important objectives when making decisions on the most appropriate methodology to utilize in a commercial bank system. Firstly, funds are transferred through the Treasury, which improves control over the cash flow within a bank and can improve business decision making. Secondly, by transferring all the risks to the Treasury department, it gives the ability to other business units involved in the model to concentrate on issuing loans/deposits. Thirdly, it also “locks-in” the profits of the deposits and loans. Finally, the third objective is achieved, as the FTP system is still simple and can be easily understood by everyone involved in the process.

Assets					Liabilities					
AR (%)	TR (%)	Product	Maturity	Amount (R)	Product	Maturity	Amount (R)	TR (%)	AR (%)	
11	8.66	Consumer Loan	1 year	23 000.00	Current Account	unknown	20 000.00	6.33	4	
13	10.34	Commercial Loan	2 years	17 000.00	Term Deposits	2 years	10 000.00	7.67	5	
					Funding	unknown	10 000.00		6	
Total Assets				40 000.00	Total Liabilities			40 000.00		

Pool 1:

Transfer Price (TP): $(11\% - 4\%)/3 = 2.33\%$

Transfer Rate (TR) Liabilities: $2.33\% + 4\% = 6.33\%$

Transfer Rate (TR) Assets: $6.33\% + 2.33\% = 8.66\%$

Pool 2:

Transfer Price (TP): $(13\% - 5\%)/3 = 2.67\%$

Transfer Rate (TR) Liabilities: $2.67\% + 5\% = 7.67\%$

Transfer Rate (TR) Assets: $7.67\% + 2.67\% = 10.34\%$

TP between Treasury (T) and user of funds

Transfer Price (TP) pool 1: $(11\% - 6\%)/2 = 2.5\%$

Transfer Price (TP) pool 2: $(13\% - 6\%)/2 = 3.5\%$

Calculation of NII

Margin	Calculation	Value
<i>Direct Calculation of NII</i>		
Accounting margin	$(23,000 \times 11\% + 17,000 \times 13\%) - (20,000 \times 4\% + 10,000 \times 5\% + 10,000 \times 6\%)$	R 2 840
Net Interest Margin	$2,840 \div 40,000$	7.1%
<i>Commercial NII</i>		
Loans	$(11\% - 7.67\%) \times 20,000 + (13\% - 10.34\%) \times 10,000 + 2.5\% \times 3,000 + 3.5\% \times 7,000$	R 1 053
Deposits	$(6.33\% - 4\%) \times 20,000 + (7.67\% - 5\%) \times 10,000$	R 734
Total commercial NII		R 1 787
<i>Treasury NII</i>		
Treasury NII	$(7.67\% - 6.33\%) \times 20,000 + (10.34\% - 8.66\%) \times 10,000 + 2.5\% \times 3,000 + 3.5\% \times 7,000$	R 1 053
Bank Margin	Commercial margin + Treasury margin	R 2 840

Table 9: Simple FTP Model Example

5.4 Conclusion

The FTP model described in this part of the thesis tries to simplify the concepts of a multiple pool approach. This system is easier to establish while making transfer pricing effective. A simple FTP

model differs from an average rate multiple pool approach in terms of determining the transfer price, whereas in the multiple pool method, the resulting net interest margin between loans and deposits is divided by two, involving two business units only. Here we try to allocate a spread to the Treasury department, consequently dividing the difference between average loan rates and average deposit rates by three. It assists us in overcoming the next major difference introduced in a simple FTP model, which is transferring all the major risks to the Treasury. Accordingly, a spread allocated to the Treasury has to cover not only the operating expenses of the Treasury but all the risks it has accepted.

A great disadvantage created by the use of an average rate method is that it does not effectively show the exact costs of funds according to their market rates.

However, there are justifications for the adoption of this model by a majority of commercial banks. Firstly, the allocation of equal transaction prices to each business unit in the respective pools provides a more simplified criterion than charging individual transactions. Secondly, the straightforwardness of the average cost of a Funds Transfer Pricing approach makes it easier for business lines to comprehend the process and implement it faster hence compliance issues are eliminated. In addition, under a simple FTP approach, the process could be accomplished proficiently through using the basic Management Information System (MIS). Lastly, the average rate method is less vulnerable to changes in the actual market cost of funding, meaning that volatility in the net interest income could be diminished across business lines. This is beneficial because it limits the skewed decision-making of business unit managers and endows central management with more oversight of the banks' objectives as a whole.

It should be recognised that Funds Transfer Pricing and its components are an integral part of the overall information management and control system of a financial institution and that it interacts and relies greatly on budgeting, profit planning and asset/liability management.

6 CONCLUSION AND RECOMMENDATION

Having looked at the simple Funds Transfer Pricing model proposed by this paper, it is important to review some of the major issues that have been adopted in the research study. To begin with, it is vital to mention that the banking system forms an integral component of every nation's economy. The financial system that is operational in the banking industry is usually varied and complex in nature from one country to another. Consequently, this complexity has given rise to the desire of a well-planned, efficient and cost effective banking system for the purpose of prudent decision making as well as for monitoring and controlling mechanisms.

The Funds Transfer Policy is one such system in the banking sector that has remained instrumental towards the productivity of commercial banks (Turner, 2008). Besides, the choice of such a policy is critical in the attainment of adequate wealth and stakeholders' satisfaction. In any case, loans and deposits in the banking system act as the major sources of cash inflow and outflow. As such, there is need for them to be well coordinated for profit realization (Convery, 2003). This is the point where the issue of an appropriate pricing strategy comes into play and hence the need of a properly formulated and implemented Funds Transfer Pricing policy.

The proposed model of Funds Transfer Pricing is aimed at simplifying the main objective of enhancing profitability as well as properly managing risks influenced by prevailing financial market changes. There are three units in the proposed model that include Treasury at the core of the model and two other business units on the funds issuance and funds generation sides. In other words, the model is based on asset contribution, liability contribution and treasury control. The increasing pressure on the commercial banks and other banking institutions to have a system that reflects their true prevailing economic situation in a simple and easy to implement framework has necessitated the need for a Funds Transfer Pricing model.

A simplified multiple pool approach chosen in this paper is for the attainment of the objectives discussed in this section. As a result of the model, business units are able to accurately and

appropriately measure profitability of products in a given pool, regardless of interest rate risks. The model is built from a conceptual framework of data gathering rather than on an empirical basis. However, the final model is based on the summation of the findings and the formulation of an empirically tested model. The sources used are authoritative and academic for the subsequent attainment of a model that is easily implemented and can effectively eliminate the drawbacks of other models.

The transfer price of this model is attained by a simple formula:

$$TP = (AR_{Loans} - AR_{Deposits})/3$$

The formula takes into account the three units of the banking system and therefore assigns equal spread for each business unit through transfer pricing process. For better management of risks, the Treasury controls all the risks transferred by the particular unit in the Funds Transfer Pricing model. The economic value analysis (EVA) is discussed as the main performance evaluation criteria for the model. The model has been efficiently formulated to ensure that it has a good network for information flow within units for prompt decision-making.

6.1 Conclusion

The operations of commercial banks depend upon how deposits and loans, that form the basis of transactions, are effectively managed. The multiple pool approach ensures that all products with the same characteristics are, therefore, grouped and priced together for maximum profitability and effective elimination of all risks in all financial transactions for individual commercial banks' operations. The model has also considered the nature of the banking industry that has been found to be different in accordance with the country that they are being deployed in.

Due to the complexity of transactions, the issue of customer interests and the costs of implementing a Funds Transfer Pricing model like the one proposed by this paper, the simple FTP model, has been able to eliminate such challenges. The way this model takes into account other factors such as information flow, risk control and performance evaluation by the use of

proven and effective methods, ensure that this model is a practical approach the banking industry can adopt to ensure maximum shareholder wealth through risk control and profit maximization enhancement.

The average rate that has been used by this model is an improvement from the traditional marginal rate because it effectively ensures that risk spread is distributed equally to three business units. If appropriately implemented, the model proposed by this paper is able to substantially improve the efficiency and productivity of banking institutions. Since the Treasury has been charged with a central role of managing and controlling all operations of the other business units, this is an effective way of controlling risks associated with banking business.

6.2 Recommendation

Financial institution wishing to implement a simple FTP model should take into account several following factors. First, the change that may be brought by the introduction of this model may not be immediate and will depend on the tradition of individual institutions to effectively introduce and manage changes. It is therefore recommended that a good training and sensitization program precede the introduction of this model in any organisation, so that its implementation phase is well controlled.

It is equally important to note that the pooling of various products is effectively done so that the objectives of this approach are attained. Therefore, there are different conditions for implementation concerning the business jurisdictions. The respective banking institutions should research on their economic environments so that they are able to come up with the best way of ensuring that this model will be successfully integrated in their core functions.

Lastly, the author might not have foreseen certain conditions that may arise in the future as a result of financial market dynamism, and therefore recommends frequent review of various components like the pooling criteria to ensure that the model will be up to date with the prevailing economic conditions of the region of business operation. The simple Funds Transfer

Pricing model promises excellent business performance and therefore it is the most appropriate for banks that have not fully developed their Funds Transfer Pricing systems.

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