



# **Transfer pricing in International Bank sector and its influence on economic of Cyprus**

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# **Transfer pricing in International Bank sector and its influence on economic of Cyprus**

Dissertation

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## I. ABSTRACT

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**Purpose** – The thesis aims to investigate the preconditions of transfer pricing, its methodology, application and use in relation to international banking groups (IBGs), relating to transfer pricing manipulation and discuss on pricing strategies IBGs at various aspects of transfer pricing in Cyprus.

**Design/methodology/approach** – The thesis conducts literature reviews regarding a concerning the motives of transfer pricing application in banking, bank integration into the process, and then conducts expert interviews to select and summarize the methods of transfer pricing decision-making.

**Findings** – The thesis finds that decentralization and redistribution of profit centers by international regions with the greatest interest in funding, it becomes more and more in the spotlight in the field of transfer pricing strategy of IBG's presence in Cyprus, and their real concerns are winning maximum economic profits, enhancing the competitiveness of the enterprise, and effectively repatriating profits to parent companies in order to facilitate greater economic profits.

**Research limitations/implications** – It is found from the model that most of the transfer pricing methods are based on strategies of differentiation's attraction and placement margin, which circumvent the possible risks of low quotes. A possible reason is that current business operational patterns that have been limited to the market share of branches adopt the quantity-based pricing strategy of "narrow volume margin and large profit". However, the transfer pricing in IBGs branches has great influence on the financial structures of the banks. The banks, as a result, must understand and reinforce the working of pricing transfer in the business development of branches and representatives.

**Originality/value** – The thesis collects questionnaires and investigation results from experts and scholars and uses a survey of experts to build a complete model of strategic pricing decisions that may be taken under actual IBG different methods in order to provide a link to IBG in making transfer pricing strategy and its use in branches and representative offices.

# TABLE OF CONTENTS

|                                                            |           |
|------------------------------------------------------------|-----------|
| <b>Abstract.....</b>                                       | <b>4</b>  |
| Introduction .....                                         | 10        |
| <b>1 Literature review.....</b>                            | <b>12</b> |
| <b>2 Bank's General Framework.....</b>                     | <b>14</b> |
| 2.1 General framework for Banking and financial risk ..... | 14        |
| 2.2 Financial Intermediaries .....                         | 14        |
| Transaction costs .....                                    | 14        |
| Information asymmetry .....                                | 14        |
| 2.3 Definition of a bank.....                              | 15        |
| Access to payment system and financial liquidity .....     | 15        |
| Asset transformation.....                                  | 15        |
| 2.4 Types of banks.....                                    | 16        |
| Investment banks.....                                      | 16        |
| Universal banks .....                                      | 17        |
| Commercial banks .....                                     | 17        |
| Para-banks .....                                           | 17        |
| 2.5 Central Bank.....                                      | 18        |
| Monetary policy .....                                      | 18        |
| <b>3 Financial markets and risks .....</b>                 | <b>21</b> |
| 3.1 Financial markets.....                                 | 21        |
| Interbank deposit market.....                              | 21        |
| Government debt markets .....                              | 24        |
| 3.2 Managing risks .....                                   | 24        |
| Credit risk.....                                           | 25        |
| Liquidity risk.....                                        | 26        |
| Interest rate risk.....                                    | 27        |
| Currency risk.....                                         | 28        |
| <b>4 Multiple pool method.....</b>                         | <b>30</b> |
| 4.1 Market transfer prices .....                           | 30        |
| 4.2 Building pools of transactions .....                   | 30        |
| Long term fixed rate products .....                        | 31        |
| Float and internal rate products .....                     | 31        |
| Blended term for indeterminate maturity products .....     | 32        |
| 4.3 Calculating transfer rates .....                       | 33        |
| Price period length .....                                  | 33        |

|                                                         |           |
|---------------------------------------------------------|-----------|
| Ex post or ex ante prices.....                          | 33        |
| Weighted moving average methodology.....                | 34        |
| 4.4 Adjusting prices for liabilities .....              | 35        |
| Deposit curve.....                                      | 35        |
| Reserve ratio adjustment .....                          | 36        |
| 4.5 TPs for other assets and liabilities .....          | 36        |
| 4.6 Spread components in FTP portfolio.....             | 37        |
| 4.7 Corrective margins .....                            | 38        |
| 4.8 Pros and cons of multiple pools.....                | 39        |
| 4.9 Historical multiple pool variation.....             | 40        |
| <b>5 Matched rate method.....</b>                       | <b>41</b> |
| 5.1 Benefits of MRM.....                                | 41        |
| 5.2 Business unit results .....                         | 41        |
| Credit risk.....                                        | 42        |
| 5.3 Transfer price calculation .....                    | 42        |
| Float rate transactions.....                            | 43        |
| Internal rates .....                                    | 43        |
| Transactions of indeterminate maturity.....             | 44        |
| Fixed rate transactions.....                            | 44        |
| Prepayment option adjustment .....                      | 45        |
| 5.4 FTP portfolio management.....                       | 45        |
| 5.5 Variations of matched rate methodology.....         | 47        |
| <b>6 Introduction to Transfer Pricing .....</b>         | <b>48</b> |
| 6.1 What is Transfer Pricing? .....                     | 48        |
| 6.2 Transfer pricing in the EU context .....            | 50        |
| <b>7 Introduction in TP Bank's Sector.....</b>          | <b>52</b> |
| 7.1 Transfer Pricing Methods in the banking sector..... | 52        |
| 7.2 Market pricing methods.....                         | 52        |
| 7.3 The costs method.....                               | 53        |
| 7.4 Transfer pricing .....                              | 54        |
| <b>8 Basic transfer pricing theory.....</b>             | <b>57</b> |
| 8.1 Introduction to fund transfer pricing.....          | 57        |
| The need for fund transfer pricing.....                 | 57        |
| Definition and objectives of a FTP system.....          | 59        |
| Defining transfer prices .....                          | 59        |
| Bank products.....                                      | 60        |
| 8.2 Single pool method.....                             | 60        |
| Advantages and drawbacks of single pool .....           | 61        |

|                                                                                                                                                        |           |
|--------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| Calculating internal transfer price .....                                                                                                              | 62        |
| Net or gross balance .....                                                                                                                             | 62        |
| Double pool method .....                                                                                                                               | 62        |
| <b>9 Bankers TP Ethics.....</b>                                                                                                                        | <b>64</b> |
| 9.1 Introduction. ....                                                                                                                                 | 64        |
| 9.2 Transfer Pricing Methods against the ethics of their application for national economies. ....                                                      | 64        |
| 9.3 Is ethics is the driver we should have in mind? .....                                                                                              | 66        |
| <b>10 TP and Funding.....</b>                                                                                                                          | <b>68</b> |
| 10.1 Transfer pricing and Funding. ....                                                                                                                | 68        |
| 10.2 Transfer Pricing Methods .....                                                                                                                    | 68        |
| 10.3 Procedure for calculating the transfer price .....                                                                                                | 70        |
| 10.4 Funding - a method of internal (or transfer) pricing to the banking business.....                                                                 | 70        |
| 10.5 Internal functions (transfer) pricing (of Treasury):.....                                                                                         | 71        |
| 10.6 Stages of building a system of funding in the bank:.....                                                                                          | 72        |
| 10.7 Overview of banking sector in Cyprus .....                                                                                                        | 72        |
| International banking groups and their branches and offices in the territory of the Republic of Cyprus. ....                                           | 73        |
| 10.8 Use of transfer pricing schemes offices and branches of European international banking groups ..                                                  | 74        |
| 10.9 Use of transfer pricing schemes offices and branches of international banking groups located<br>outside the territory of the European Union ..... | 74        |
| 10.10 Effectiveness of the use of transfer pricing schemes by different banking groups .....                                                           | 76        |
| Specificity of transfer pricing in banks with extensive branch structure .....                                                                         | 76        |
| <b>11 Results .....</b>                                                                                                                                | <b>79</b> |
| <b>12 Discussion and conclusion .....</b>                                                                                                              | <b>83</b> |
| <b>13 Recommendations .....</b>                                                                                                                        | <b>86</b> |
| <b>14 Future Work .....</b>                                                                                                                            | <b>87</b> |
| The Ethic aspects of TP.....                                                                                                                           | 87        |
| <b>Bibliography .....</b>                                                                                                                              | <b>88</b> |

## II. List of figures

**Figure 1.** Assigning transfer prices to multiple pools

**Figure 2.** Residual sub pool estimation

**Figure 3.** Methods for calculating average monthly TP

**Figure 4.** Components of FTP portfolio

**Figure 5.** Business Units in a Bank

**Figure 6.** Transfer price in the single pool method

**Figure 7.** Transfer price in the double pool method

**Figure 8.** Scheme of interaction of wholesale bank

**Figure 9.** Scheme of interaction of financial responsibility centers in the distribution of resources

### III. List of tables

**Table 1:** Key ECB interest rates 1999 – 2014

**Table 2:** Interest rates – market from 11 of July, 2014

**Table 3:** Formulas for TPs on deposits

**Table 4:** Exemplary liquidity margin table

**Table 5:** Exemplary ALCO margin table

**Table 6:** BOC Consolidated Income Statement Year ended 31.12.2013

**Table 7:** Typical bank product's characteristics

**Table 8:** Number and size of foreign credit institutions

## IV. INTRODUCTION

Although globalization opens worldwide trade markets bringing business opportunities never before seen, this phenomenon also opens the door to numerous competitors of various industries (Lin and Kuo, 2007). In the globalized business operations of multinational enterprises (MNEs) and international bank groups (IBGs), foreign direct investment brings various benefits, including expansion of trade, job opportunities, technology transfer, and flow of international market information, industrial upgrading, technical R&D, economic growth, and increased taxes, which in turn upgrade the recipient country's overall economic power. There are still some strategies that MNEs and IBGs will use to maintain growing and promising organizational performance and economics efficiency, such as innovation management, differentiation and cost leadership (Prajogo, 2007), information systems and technology (Ojiako and Maguire, 2008), and revenue and costs (Heather, 2002; Allen, 2005; Bojnec and Latruffe, 2008). Meanwhile, many countries have applied measures, such as tax incentives, financial incentives, and administrative incentives, to attract more investment.

Past studies have identified many of the factors that influence outward investments of MNEs and the role of institutions of MNEs in international business (Dunning and Lundan, 2008). One important consideration is the tax environment of the investment locations (Ho, 2008; Dunning, 1993). Therefore, whether a country's tax environment is conducive to investment has become an important factor of consideration in the selection of investment locations of MNEs and IBGs. The differences between the tax system and the tax rate of the home country and host country may affect the overall business performance of MNEs (Klassen and Shackelford, 1998). In addition, tax incentives are no longer just a pre-tax benefit deduction item, applied after the generation of profits, but an important business cost. Even if an enterprise is not profitable, tax costs may still exist. Therefore, if relevant tax costs are not taken into consideration, the enterprise may result in false profits, which should be taken seriously by all IBGs.

This thesis presents the concept and research of Transfer pricing (TP), their use in the activities of international banking groups as well as the in International Bank sector in Cyprus, and its influence to Cyprus economic. This subject is insufficient attention also because the issue of transfer pricing in banks is the subject of highly confidential. This is due to the fact that transfer pricing in the bank adjusts the question of "*the value of money*" - the fundamental question of the banking operation. This, however, in no way affects the efficiency of our research, as are used in the work of official documents of the banks confirmed by the audit. Once we started the topic, it became clear that is necessary to disclose the issue of forming a transfer price and to elaborate further on its methodology (if can be called such). This issue is not so many years (the first work appeared in the early the 80s of XX century), but we have tried extremely elaborate on it.

IBGs' transfer pricing manipulation takes into account of tax laws and regulations of host countries for price manipulation; by transferring into the country with the lower tax burden (as a Cyprus) in low prices, and transferring out of the country to retain profits, minimize international taxes and maximize the profits of the group. When affiliated enterprises carry out international transfer pricing manipulation, it results in reallocation of income and tax among such affiliated enterprises, making tax money flow from the country with higher tax rate to the country with lower tax rate (Lin, 2006).

Thus, transfer pricing attracts global attention, becoming an issue of growing importance in the international business arena (Bouzas, 2007). With flexible strategies in transfer pricing, IBGs are able to enhance the efficiency of resource allocation and management and thus create internalization benefits.

In this thesis applied questionnaire 9 senior professionals and senior executives of banks that have branches and representative offices in Cyprus. Unfortunately, the number of interviews have failed to do even close to 30 questionnaires, due to the insignificant number of representative offices of banks in Cyprus (see. Table 8. Number and size of foreign credit institutions in Cyprus).

The judgments of all the decision makers must be unified; therefore, this work, with multiple communications, reaches the unified analysis deductively. After confirming the adoption of questionnaires to TP methodology's relationships, this study constructed the assessment model from factors relationships (Chapter 12, Discussion and Conclusion). In addition, this research makes answers (Chapter 12) to express the complex relationship of the factors on the basis of assessment model factors relationships in questions below. The findings include that point to assist the bank's branch office or representatives in obtaining the maximum economic profits and to strengthen competitiveness in the country receiving investment are the highest of interdependence among of all questionnaires.

The work also aims to answer common questions about transfer price in Cyprus banking:

- Is TP necessary, or can a bank cope without it? Why is it necessary? What are the dangers of not having a TP system?
- What are the advantages of using a main component of TP – a FTP system? Why are they important?
- How can it improve results? Can TP directly increase profits? What is the effect on bank's profitability and effectiveness?
- How to build a TP system, is there an easy way to do it? Are there any simple variations of TP methodology? What are the basic components of a transfer system?
- How to develop a perfect TP system? What are its requirements? What are the issues faced when implementing a complex TP system?

The research approach used to answer those questions comprises building on academic background on banking, financial markets and risks in order to introduce the theory of fund transfer pricing. First, the role of financial institutions in transformation of financial assets and liabilities is described. Altering maturities, amounts, and currency and interest rate characteristics of financial instruments entails various market risks for those institutions. Interest risk, increased by the ever-changing market rates, is the main challenge, followed by issues of liquidity and currency mismatch. Next, the need for TP is explained and advantages of various methodologies are listed. Attribution of transfer prices to divisions, products, customers and transactions is described. Dilemmas in the use of TP are answered, such as choosing the relevant FTP method, calculating and assigning transfer prices and liquidity margins and reconciling results through fund transfer division.

This thesis is organized as follows. Section 2 presents literature. Next, Section 3 – 6 describes the methods of TP and analysis. Finally, Section 7-10 discusses the results and presents conclusions. Moreover, the data section is in the 11 and 12.

# 1 LITERATURE REVIEW

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In order to achieve the maximum after-tax profits, IBGs often apply internal transfer price adjustments between parent companies and subsidiaries, or among the subsidiaries, in order to reduce their overall income tax payable. For example, when exporting Transfer pricing strategies products to subsidiaries in countries with high income tax, the transfer pricing manipulation is set at a higher level (Styron, 2007) in order to reduce the surplus of the local subsidiaries and the tax payable. On the contrary, when exporting products to countries with low income tax, the transfer price is set at a lower level, in order to transfer the profits to the local subsidiaries, thus increasing the overall after-tax profits.

Motives for transfer pricing manipulation (Lin and Cnahg, 2010) as seen, the main purpose of IBGs is to obtain maximum economic profits, enhance the competitiveness of enterprises, and repatriate profits to home country (parent company) to help the parent companies to create greater economic profits. The main purpose of transfer pricing is to maximize their economic profits and enhance the competitiveness. Therefore, the real concern of banks is how to effectively repatriate profits to home country (company headquarters) to create greater economic profits. The study advises that only by stabilizing the economic profits of the parent companies can IBGs survive the impact of the financial crisis in the current turbulent financial environment.

The vertical integration of a multinational bank through transfer pricing would gain higher profits than two conventional commercial banks of similar business operations (Istrate et al., 2009; Granfield, 1993). This indicated that the main purposes and functions of applying transfer pricing strategies by IBGs are as follows:

- (1) Enhanced market competitiveness. The fundamental method for IBGs to improve a new product's competitiveness in a foreign market is to set lower transfer prices of products / services purchased from within the banks, as well as affiliates, in order for the subsidiaries to be competitively in price in local markets.
- (2) Flexible transfer of internal funds. IBGs can transfer funds from a local subsidiary of a host country through high transfer in and low transfer-out prices to facilitate their global fund management. For example, when the currency of the host country may depreciate, or in order to avoid the over erosion of local assets by inflation, IBGs may take advantage of transfer pricing adjustment to reduce financial risks.
- (3) Alleviate tax burdens: Reduce tariff costs. IBGs may apply low-transfer pricing policies to reduce the tariff costs of the importing subsidiaries of the internal transactions. As the value-added proportion of products in the area is the calculation basis of tariffs, the tariff costs may be eliminated if the subsidiaries of IBGs, from outside the area, sell service products with lower transfer prices to subsidiaries in the area. Reduce income tax. To achieve the highest after-tax profits, IBGs often take advantage of the adjustments of parent-subsidiary, or subsidiary-subsidiary, transfer pricing strategies to reduce the overall income tax payable. For example, set a transfer price higher when exporting products or services from subsidiaries located in countries with high income tax, which reduces the profits and tax payable of the local subsidiaries, accordingly. On the contrary, set a transfer price lower when exporting service products to countries

with low income tax, which transfers profits to local subsidiaries with low local tax rates in order to further increase the overall after-tax total profit of the bank.

- (4) Government control (price restrictions and quantity limits). Break trade restrictions. When a host country adopts quotas, subsidies, or other non-tariff trade restrictions, IBGs are met with considerable obstacles when ensuring or expanding the local market objectives. Therefore, if the government of the host country places restrictions on quantities imported, without affecting the competitiveness of the products of the local market, then setting a higher transfer price will reduce taxes and thus make up for losses assumed from the inability to import large numbers of service products. Overcome dividend export restrictions. IBGs' profits in the host country are remitted in the form of dividends and are often restricted by the government of the host country. However, IBGs may take advantage of high transfer pricing manipulation strategies to effectively shift such profits, through raising prices of internal business transactions.

The ongoing worldwide financial market instability leads to intricate banking risk management. Volatile exchange rates and interest rates significantly increase banking risks including currency, interest and liquidity risk. Currently both regulatory entities and bank management pay much attention to commercial bank liquidity levels. Insufficient liquidity may result in insolvency, although excess liquidity results in understated income from the liquid assets surplus. Funds transfer pricing allows commercial banks to effectively control currency, interest and liquidity risks as well as resolving other management issues (European Committee for Bank Supervision, 2010).

A central components of the funds transfer pricing system in bank are components, that reflect the risks that carries this product, and most important of them is a liquidity risk transfer price (Bazel III, 2010). Moreover, Schierenbeck (2003) stated that from a controlling perspective, the funds transfer system is fair in the aspect of causality as well as performance, as business units can influence their contributions only through means of setting better rates than the market equivalent (i.e. transfer price). Based on the literature review, it is found that most literature refers to motives, purposes, or risks relating to transfer pricing manipulation, and there is no complete, objective, and efficient transfer price making decision model analysis. Therefore, this study aims to conduct further analysis and discussion on the transfer pricing strategies of IBGs and establish a strategic pricing decision-making model on different motives for IBGs.

## 2 BANK'S GENERAL FRAMEWORK

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### 2.1 GENERAL FRAMEWORK FOR BANKING AND FINANCIAL RISK

This chapter outlines basic concepts in banking to the extent necessary in this work. The following definitions and descriptions do not sum up to a complete theoretical introduction to banking. Only the areas necessary to constitute a general theoretical framework for Fund Transfer Pricing (FTP) are presented and further developed in subsequent chapters. Concepts discussed below comprise bank functions and types, including the European Central Bank. These concepts are relevant to the dissertation not only as a source of basic banking vocabulary. Understanding bank products and services shows the need to employ FTP system. For different types of banks, different models of FTP are suitable. Further on, the central bank, by setting official rates and financial security requirements, largely influences bank transfer prices.

### 2.2 FINANCIAL INTERMEDIARIES

Banks are specific financial intermediaries. In general, a financial intermediary is an institution specializing in simultaneously buying and selling financial contracts and securities. Their existence is justified by their intermediation skills, resulting in a number of unique services they can offer to investors.

#### **Transaction costs**

Access to financial markets is costly, and requires expertise. Carrying out financial transactions requires spending money and time. Transaction costs comprise monetary costs, search costs and monitoring costs. Financial intermediaries are able to reduce transaction costs due to:

- economies of scope – a company dealing in a wide range of financial instruments and transactions increases its efficiency;
- economies of scale – as the total size of the transactions of an intermediary increases, the costs per unit of transaction are reduced.

This is the case when fixed transaction fees are in use, or when indivisibilities (a minimum size of an operation) take place.

#### **Information asymmetry**

Another justification of necessity of financial institutions is the problem of information asymmetry. It is the case when one side of a transaction does not know enough about the other side to make accurate decisions. This unequal knowledge appears before and after the transaction is effected:

- Adverse selection materializes before the transaction occurs. It is defined as a tendency of the most risky borrowers (with possibility of large gains and large losses) to be also the ones most actively seeking a loan. This leads to an increasing percentage of loans being bad credit.
- Moral hazard appears after the transaction occurs. It is the risk of the borrower engaging in risky activities that diminish the probability of loan being repaid, inclined to do so by the fact, that he does not risk his money.

Financial institutions are more capable of dealing with information asymmetries than individuals, due to large number of transactions and increased expertise.

## **2.3 DEFINITION OF A BANK**

There are many definitions of a bank and compiling them would result in a statement similar to the following: Banks are financial intermediaries, whose current operations consist of transforming deposits received from the public into loans. This definition emphasizes the fact, that only banks lend and borrow money at the same time as their main source of income. Moreover, banks' main source of financing are the deposits of the public, as opposed to financing mostly by issuing debt or equity.

This basic banking function of transforming deposits into loans entails an important problem – how to set prices for those two products? How to decide whether, at a given price, it is still profitable for a bank to offer loans and deposits? These are the very basic questions that FTP aims to answer.

Banks fulfil several basic tasks. Not every bank does all of the following and other financial intermediaries can fulfil some of those functions, however only banks can provide all of them. Banks:

- Ensure access to payment system;
- Guarantee financial liquidity;
- Allow for asset transformation;
- Take, manage and resell financial risk;
- Offer information on risk levels.

### **Access to payment system and financial liquidity**

Historically, the initial banking activities were money changing, i.e. exchanging one currency into another, and safekeeping of coins. Money was initially kept in banks for security, not for profit, and was not invested into loans. Certificates (as Bills and Notes, incl. Promissory Notes) were issued by banks to confirm the amount of money stored in vaults. Storing money allowed for facilitation of payments between bank's customers. If two merchants had coins stored in one bank, it was easier to clear their positions through a bank than to actually move coins, especially at a distance or when large amounts were involved. Banks allow not only for execution of payments, but also for transfer of payments in time. Credit lines permit postponing cash outflow, while factoring services allow early recognition of cash inflow. Banks can be considered in this aspect as source of liquidity for customers, facilitating transactions, ensuring quick conversion of their savings into goods and allowing them to satisfy their consumption needs by transferring financial resources in time.

### **Asset transformation**

Banks play an important role as institutions capable of transforming financial resources with regard to time, amount and risk level:

#### **Maturity transformation**

Maturity transformation is necessary, because owners of financial resources typically want their money deposited for short term, whereas borrowers would like to receive funding for a longer term. Banks are able to transform short-term deposit into long-term credit. Maturity transformation creates a risk that a bank won't be able to repay a depositor since his money could be "locked up" in a long term loan. This is a source of liquidity risk.

#### **Amount transformation**

Amount transformation is the result of lack of size similarity between amount of money deposited by an individual and the sum required by the borrower. Banks can adjust the size of loans of deposits to the needs of their clients. Usually, depositors place small amounts, while borrowers require large sums of money. Also, banks serve as intermediaries between large-amount financial markets and individual retail customers.

### **Information transformation**

Information transformation is a result of information asymmetry – when a borrower has better information about the risk of the projects financed by loan than the lender does. Banks have better information on risk of borrowers not repaying a loan than depositors do. Intermediation of a bank increases the safety of funds lend to another party. Banks are able to reduce initial risk of adverse selection by evaluating borrowers and screening their investment projects. The ex-post risk of moral hazard can be controlled by closely monitoring the situation of borrowers, by preventing opportunistic behaviour and by auditing the borrower that fails to meet loan obligations.

### **Risk transformation**

Risk transformation comprises of diversifying risk due to a large number of borrowers. The process of risk sharing allows for creating assets with risk characteristics suitable for different customers. This way the exposure of customers to risk can be reduced, since risky credits are turned into safer assets. It is safer for a depositor to allow a bank to lend his money to third parties than to issue loans by himself. Internally, a bank diversifies risk by investing in a portfolio of loans which are less than perfectly correlated, resulting in diminishing the overall risk.

## **2.4 TYPES OF BANKS**

The definition given in chapter 4.2 & 4.3 describes a commercial bank. There are however different types of banks, with different scope of activities. Some banks focus only on one side – either loans or deposits. Certain banks don't deal in regular banking products at all, focusing more on financial markets. Others do the opposite – offering services to small customers only and not dealing in interbank markets. Some banks narrow their scope to a small number of products. Finally, there are international differences in bank types, resulting from local specifics. Each type of bank has a version of FTP best suited to its products and services. Banks that have access to wholesale financial markets as a source of borrowing set their transfer prices differently than those that can access the market.

### **Investment banks**

Investment banks are not really banks as defined here, that is, they don't transform deposits into loans. More precisely, investment banking activities are different from regular banking. They provide direct financing on financial markets through debt and capital. In detail, their functions include: private placement, dealing in derivatives, issue broking, underwriting, portfolio management, investment funds, corporate financial advisory, advice on mergers and acquisitions, global custody. Due to the riskiness of some investment banking activities (especially dealing in derivatives), authorities in most countries tend to separate those functions from regular banking (especially gathering deposits from the public). In USA, the 1933 Glass Steagall Act excluded investment banking activities from commercial banking. In legal

nomenclature, the disparity between commercial and investment banking is emphasized by using the term “investment firms” (in EU) or “broker dealer (in USA) instead.

### **Universal banks**

Universal banks combine commercial and investment banking. In many countries, such activities are restricted or discouraged by authorities. In USA, restricted universal banking is allowed by the Gramm Leach Bliley Financial Modernisation (GLB) Act passed in 1999, but only to the extent that US financial holding companies can own commercial banks and investment banks as subsidiaries. In contrast, in Germany banks can offer commercial and investment services under a single firm. In most European countries however, universal banking is discouraged by regulatory authorities. Financial holdings are the most common way for a bank to develop abroad. Usually, a bank deals in one country, and international expansion is attained by acquiring or starting up separate subsidiaries in other countries. These subsidiaries act as separate legal entities, whose shares are owned by the holding company.

### **Commercial banks**

Commercial bank is the most common type, dealing in loans and deposits, and having access to financial markets. They raise funds mostly through deposits (checkable, savings and time deposits) and use them to offer loans (mortgages, consumer and commercial loans) and invest in debt securities (usually government and municipal). The most common case of a commercial bank is a country-wide bank offering a full range of services, although sometimes small banks are regional. Their existence is supported by regulations, like in USA, where they are obliged by law to invest in the same region where their deposits were gathered. In many European countries, regional banks offer financing to local authorities, who are often their partial owners. Other banks tend to specialise in a selected choice of products, offering them on a national scale. Specialized banks usually focus mostly on one type of loan: mortgages, consumer loans, car loans etc. They can also focus on a customer type, taking deposits and offering loans to consumer or commercial clients.

### **Para-banks**

Para-banks are institutions restricted in some way from being a complete commercial bank. Often those institutions are excluded from some of the regulations that banks have to comply with, as a consequence being refused access to interbank market. There are two main types of those institutions.

#### **Savings and loan associations**

Historically, the most important feature of savings and loans associations was their ownership structure – every customer needed to buy a share in this institution. These associations focused mostly on consumer loans and residential mortgages and acted regionally. They didn't have access to financial markets and were exempt from some of banking sector regulations. Nowadays, savings and loans associations are very similar to commercial banks. Due to regulatory changes, cooperation of groups of associations and commercial banks' intermediation between them and financial markets, they are able to compete in the same markets as regular banks. Their characteristics vary between countries, but they are present in USA and most European countries (they originated in Germany).

#### **Credit Unions**

Credit unions are formed by a group of people, most often by employees of a company, union members etc. Among themselves, they gather deposits and make small consumer loans. Sometimes the company they work for can support them financially. These are very small financial institutions that don't offer any services outside a limited group of members. Historically, there were some similarities between credit unions and savings and loans associations, however the latter have significantly evolved, while the former remained the way they initially were.

## **2.5 CENTRAL BANK**

Central Bank is a special type of bank, unique for each country. To be more precise, there is one central bank in every single monetary area (e.g. the Euro zone). This implies its main function, which is control over a particular currency, including its amount in the market and its price. Another function of central bank is being a bank of banks for all commercial banks in one country, i.e. offering them loans and taking deposits, as they offer to the public. These functions are described below, to the extent necessary in this thesis. This chapter describes those elements of Central Bank policy that are strictly relevant to FTP. The construction of commercial banks' transfer prices is largely influenced by the reserve ratio, since the safety reserve required by authorities decreases the amount of funding available and increases funding costs to the bank. Central bank rates have also a general effect, as they influence market rates that are taken into account by transfer prices.

### **Monetary policy**

Monetary policy is the set of central bank's actions that concern the national currency, its supply, the exchange rate and interest rates. In most countries, central banks were originally regular commercial banks that were granted by government's exclusive rights to issue bank notes functioning as legal tender. Central banks became responsible for controlling the supply of national currency they issued, since excessive growth of money supply would result in inflation. The main goal of central bank's monetary policy is the control of inflation. In most developed countries the inflation goal is set at about 2,5% or less. In some countries, central banks have an additional goal of supporting economic growth. Inflation is a direct result of growth of money supply in economy. Since commercial banks increase amount of money in circulation by lending out deposits, central bank cannot control money supply directly, and it uses a set of methods to influence lending by commercial banks. These methods include: open market operations, reserve ratios and discount rates.

#### **Open market operations**

Central bank can influence lending by banks through trading government securities with commercial banks. If it wants lending (and monetary supply) reduced, it sells securities, thus "blocking" some bank deposits for lending. Buying treasury securities from banks has the opposite effect. The securities traded in these operations are short term treasury bills. Sometimes central bank would issue its own bills and sell them to banks to reduce monetary base. Apart from outright sale or purchase, central bank can enter into a repurchase agreement with a commercial bank. Central bank can buy T-bills from a bank, and then sell them back at a specified date (called repo) or do the opposite – sell and buy back (called reverse repo).

#### **Discount rates**

Each central bank controls a set of interest rates that are intended to guide rates in the interbank. Increasing rates makes loans more expensive, and reduces money circulation. Usually, a central bank would set three basic rates: reference rate, discount rate and deposit rate:

- Reference rate is a central bank's main rate, set as the target for short-term interbank rates. In USA, the target rate is the Federal Funds Rate. It is the overnight rate, at which banks lend to each other the funds they have deposited in the Federal Reserve in order to meet the required reserve ratio. In Europe, the main refinancing rate is used for reference. It is the minimum bid rate for refinancing bank loans at Central bank.
- Discount rate is the rate charged to banks when they borrow from central bank. In US, there's a primary and secondary discount rate, available to banks depending on their credit worthiness. It is set higher than the reference rate, since Central bank prefers that banks borrow from each other instead. By lending funds to commercial banks, central bank exerts its function of lender of last resort. In EU, this rate is called the marginal lending rate.
- Deposit rate (in Eurozone) is the lowest of the three. It's the rate that banks receive for deposits at the central bank.

Historical ECB and Fed rates are presented in the Table 1

Table 1. Key ECB interest rates

|             | Date    | Deposit | Refinancing |      | Marginal lending |
|-------------|---------|---------|-------------|------|------------------|
| <b>2014</b> | 11 Jun. | -0.10   | 0.15        | -    | 0.40             |
| <b>2013</b> | 13 Nov. | 0.00    | 0.25        | -    | 0.75             |
|             | 8 May.  | 0.00    | 0.50        | -    | 1.00             |
| <b>2012</b> | 11 Jul. | 0.00    | 0.75        | -    | 1.50             |
| <b>2011</b> | 14 Dec. | 0.25    | 1.00        | -    | 1.75             |
|             | 9 Nov.  | 0.50    | 1.25        | -    | 2.00             |
|             | 13 Jul. | 0.75    | 1.50        | -    | 2.25             |
|             | 13 Apr. | 0.50    | 1.25        | -    | 2.00             |
| <b>2009</b> | 13 May  | 0.25    | 1.00        | -    | 1.75             |
|             | 8 Apr.  | 0.25    | 1.25        | -    | 2.25             |
|             | 11 Mar. | 0.50    | 1.50        | -    | 2.50             |
|             | 21 Jan. | 1.00    | 2.00        | -    | 3.00             |
| <b>2008</b> | 10 Dec. | 2.00    | 2.50        | -    | 3.00             |
|             | 12 Nov. | 2.75    | 3.25        | -    | 3.75             |
|             | 15 Oct. | 3.25    | 3.75        | -    | 4.25             |
|             | 9 Oct.  | 3.25    | -           | -    | 4.25             |
|             | 8 Oct.  | 2.75    | -           | -    | 4.75             |
|             | 9 Jul.  | 3.25    | -           | 4.25 | 5.25             |
| <b>2007</b> | 13 Jun. | 3.00    | -           | 4.00 | 5.00             |
|             | 14 Mar. | 2.75    | -           | 3.75 | 4.75             |

|             | Date    | Deposit |      | Refinancing | Marginal lending |
|-------------|---------|---------|------|-------------|------------------|
| <b>2006</b> | 13 Dec. | 2.50    | -    | 3.50        | 4.50             |
|             | 11 Oct. | 2.25    | -    | 3.25        | 4.25             |
|             | 9 Aug.  | 2.00    | -    | 3.00        | 4.00             |
|             | 15 Jun. | 1.75    | -    | 2.75        | 3.75             |
|             | 8 Mar.  | 1.50    | -    | 2.50        | 3.50             |
| <b>2005</b> | 6 Dec.  | 1.25    | -    | 2.25        | 3.25             |
| <b>2003</b> | 6 Jun.  | 1.00    | -    | 2.00        | 3.00             |
|             | 7 Mar.  | 1.50    | -    | 2.50        | 3.50             |
| <b>2002</b> | 6 Dec.  | 1.75    | -    | 2.75        | 3.75             |
| <b>2001</b> | 9 Nov.  | 2.25    | -    | 3.25        | 4.25             |
|             | 18 Sep. | 2.75    | -    | 3.75        | 4.75             |
|             | 31 Aug. | 3.25    | -    | 4.25        | 5.25             |
|             | 11 May  | 3.50    | -    | 4.50        | 5.50             |
| <b>2000</b> | 6 Oct.  | 3.75    | -    | 4.75        | 5.75             |
|             | 1 Sep.  | 3.50    | -    | 4.50        | 5.50             |
|             | 28 Jun  | 3.25    | -    | 4.25        | 5.25             |
|             | 9 Jun.  | 3.25    | 4.25 | -           | 5.25             |
|             | 28 Apr. | 2.75    | 3.75 | -           | 4.75             |
|             | 17 Mar. | 2.50    | 3.50 | -           | 4.50             |
|             | 4 Feb.  | 2.25    | 3.25 | -           | 4.25             |
| <b>1999</b> | 5 Nov.  | 2.00    | 3.00 | -           | 4.00             |
|             | 9 Apr.  | 1.50    | 2.50 | -           | 3.50             |
|             | 22 Jan. | 2.00    | 3.00 | -           | 4.50             |
|             | 4 Jan.  | 2.75    | 3.00 | -           | 3.25             |
|             | 1 Jan.  | 2.00    | 3.00 | -           | 4.50             |

Source: European Central Bank, Data, [www.ecb.europa.eu](http://www.ecb.europa.eu)

Some central banks set more interest rates, used for various transactions with banks. The most typical transactions include lending funds to banks with various securities deposited by them as collateral or buying trade bills and other commercial securities from banks at some discount. Central bank rates usually concern commercial banks only indirectly, as a point of reference for interbank rates. However, in specific market conditions, e.g. when there is a lack of liquidity in money market, banks tend to deal directly with the Central bank, instead of trading among themselves. In these situations, discount rates illustrate real costs of funding and should be included in the calculation of transfer prices.

## 3 FINANCIAL MARKETS AND RISKS

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### 3.1 FINANCIAL MARKETS

In general, financial markets are places where various financial instruments are traded. There are many typologies of markets, but the most common classification is by the traded instrument type. Commercial banks are mostly active on markets in order to hedge financial risk they encounter. When financial institutions buy and sell financial instruments among themselves, they usually do it on markets, that are wholesale (minimum transaction volume is hundreds of thousand USD or EUR) and OTC (over- the-counter, where the majority of transactions are concluded directly, without a clearing house). The most important instruments traded are: interbank loans and deposits, government bills and bonds, foreign exchange, interest rate and currency derivatives. Most instruments can be traded either in the money market (for securities maturing in less than a year) or in the capital market (for instruments with a life longer than one year). The central bank participates in most of these markets, in order to attain monetary policy goals.

In this chapter the concepts of financial markets and risk management will be discussed. Prices on interbank deposits, treasuries and interest rate derivatives can all be expressed in the form of a rate. These rates show what is the cost or gain of lending and borrowing on wholesale markets as compared to dealing with individual customers. Market rates are used in the construction of transfer prices as a reference point for setting interest on bank products. The second part of the chapter deals with various types of financial risk, which is relevant to transfer prices in a number of ways. Basically, each risk involved in a customer transaction should be taken into account when pricing products. There are different ways of incorporating risks in FTP system according to its type.

#### **Interbank deposit market**

When a bank has excess short term cash it would usually seek a counterparty that needs short term funding (e.g. in order to meet reserve requirement) on the interbank deposit market. This is the main market for bank liquidity management. The lender of funds requires compensation in the form of interest on the capital lent. The interest rate on a particular transaction depends on a number of factors, including: transaction length, whether the bank is a lender or a depositor, partner's credit risk, etc. Banks that participate in the market constantly quote interest rates that they offer to depositors (BID) and lenders (ASK), for various maturities. A bank hopes to pay BID rate on funds that other banks deposit with it, receive a higher ASK rate on funds it loaned out, and profit from the BID-ASK spread. Interbank rates are largely dependent on Central Bank rates, which are meant to set boundaries for interbank trading. In general, interbank rates should vary somewhere in between central bank offer and bid rates. The idea is that depositing money with central bank and borrowing from it should be the least profitable option a commercial bank has on the market. Financial market rates constitute the basis of each transfer price formula, as they express the opportunity cost of transactions with customers. Market rates set boundaries for lowering rates on loans and increasing interest on deposits offered to the public. A bank should not pay more for customer deposits than it costs to raise funding from other banks. This relation is analogous to the one a bank has with its central bank – trading with central bank is less profitable than with other banks, and trading

with other banks is less profitable than dealing with customers. There are different interbank rates to choose from when building the transfer price equation. The choice should generally depend on actual transactions a bank can make – i.e. it is preferable to use rates from the markets that a bank most often uses for wholesale loan and deposit transactions.

### **Interbank interest rates**

Interest rates vary depending on the date on which the transaction is to be concluded. This time structure of interest rates can be represented on a time scale as a curve with either upward or downward slope, showing rates that rise or fall with increasing length of deposit. The difference between short-term and long-term part of the slope is most commonly explained by the expectations theory as the expected change of interest rates in future (e.g. a downward slope predicts falling rates). Another factor influencing the curve is the liquidity preference, meaning that with increasing loan term, the lender requires higher interest due to increased risk (the result would be an upward slope). The time scale of the curve consists of specific nodes, i.e. lengths of deposits that are most typical for the local interbank market. This set of time knots usually consists of the following lengths:

- O/N – overnight, a deposit starting today and ending tomorrow;
- T/N – tomorrow next, starting tomorrow and ending the day after;
- S/N – spot next, starting the day after tomorrow for one day;
- SW – spot week, starting the day after tomorrow for a week;
- 2W – two weeks, starting on spot date (as all the following do);
- 1M, 2M, 3M, 6M, 9M – one, two, three, six or nine months from spot;
- 1Y – one year is usually the longest term available.

One year is the maximum term on the interbank market, since it is a money market. Apart from the enumerated nodes, other lengths are available as parties choose so, since it is an OTC market. In such cases, rates for non-standard maturities are set based on linear interpolation of neighbouring rates. (See: <http://www.federalreserve.gov/releases/h15/data.htm>).

### **LIBOR rates**

Rates quoted by a particular bank depend on its liquidity situation – when in need for financing, it would offer higher rates, than when having surplus funds. A small bank, with liquidity issues and a low credit rating would have a lot higher rates than a big, stable bank. The interbank rates differ therefore among banks, usually within limits set by central bank's deposit and discount rates. In order to have a benchmark rate, independent of individual bank's conditions, an average rate is calculated. This rate, fixed once a day, is a mean of daily quotes of a few selected contributor banks, usually the largest and most reliable ones in a given market. Every day, the whole time curve of rates can be calculated. There are separate rates for interbank deposits in each currency, however reference rates on deposits in most important currencies are set in London and called LIBOR rates (London interbank offered rate). There's LIBOR GBP for pound sterling, but also LIBOR USD for US dollar, LIBOR CHF for Swiss franc, LIBOR JPY for Japanese yen. LIBORs are ASK (offer) quotes, and BID is usually calculated as 10 to 15 b.p. (basis points) less, basing on general market consensus, although in past this spread was significantly wider.

### **Alternatives to LIBOR**

The LIBOR rates are the most common reference rate for various interbank transactions, including derivatives. However, there are alternatives to LIBORs. Since LIBORs are set in

London, many countries with strong local financial markets quote their interbank rates domestically. For example, EURIBOR rates for deposits in Euro are set in Frankfurt. The importance of these local market rates depends usually on the amount of deposits traded in local markets. If these local markets are more active than markets for those currencies in London, the local rates become a point of reference for a currency. A specific situation exists in USA, since LIBOR USD is set abroad and concerns mostly international cross-currency transactions. Domestically, USA banks use overnight federal funds rate as a point of reference, as transactions with central bank are more popular in USA than actual interbank transactions. Another popular rate in the US is the prime rate, which is a consensus rate at which large US banks would lend money to their most favoured customers. Another type of a fixing rate is the SONIA (sterling overnight interbank average, there also EONIA for EUR). It is a mean of rates on actual transactions that took place on a single day. Sometimes it's a lot better approximation of market conditions than LIBOR, which is a theoretical rate, established under specific conditions, including high credit rating, a limited nominal of transaction, and a straightforward deal. Banks with low ratings, entering a large amount transaction, customized (e.g. a derivative) might find that LIBOR rates are irrelevant as a point of reference for their transaction.

### **Long term interbank rates**

LIBOR rates have a serious drawback – they are money market rates, ending at maturity of one year. Fortunately, there are active interbank markets for interest rate derivatives – FRAs and especially IRS. The latter are instruments that allow to exchange a series of LIBOR rate payments for a number of payments based on a fixed IRS rate, during a period from a year to ten and more years. Therefore, IRS rates can be added to the interbank rates curve for nodes above one year. These derivatives will be described in more detail in the chapter on interest rate risk. Table 2 presents different interest rates with a term structure for a number of currencies.

Table 2. Interest rates – market from 11 of July, 2014.

|                        | <i>Over<br/>night</i> | <i>Day</i> | <i>Change<br/>week</i> | <i>Month</i> | <i>One<br/>Month</i> | <i>Three<br/>Month</i> | <i>Six<br/>Month</i> | <i>One<br/>year</i> |
|------------------------|-----------------------|------------|------------------------|--------------|----------------------|------------------------|----------------------|---------------------|
| <i>US\$ Libor*</i>     | 0.09400               | 0.000      | -0.001                 | 0.005        | 0.15150              | 0.23360                | 0.32720              | 0.54920             |
| <i>Euro Libor*</i>     | -                     | -          | -                      | -0.054       | 0.08286              | 0.17143                | 0.26571              | 0.43357             |
| <i>£ Libor*</i>        | 0.47063               | 0.001      | -0.003                 | 0.003        | 0.49563              | 0.55625                | 0.71063              | 1.05338             |
| <i>Swiss Fr Libor*</i> | -0.0090               | -          | -                      | 0.001        | -0.0010              | 0.01400                | 0.07140              | 0.18940             |
| <i>Yen Libor*</i>      | 0.05000               | - 0.003    | -0.004                 | 0.09429      | 0.13286              | 0.13286                | 0.17857              | 0.33000             |
| <i>Canada Libor*</i>   | -                     | -          | -                      | -            | -                    | -                      | -                    | -                   |
| <i>Euro Euribor</i>    | -                     | -          | -                      | -            | 0.09                 | 0.20                   | 0.30                 | 0.49                |
| <i>Sterling CDs</i>    | -                     | -          | -                      | -            | 0.54                 | 0.60                   | 0.75                 | 1.10                |
| <i>US\$ CDs</i>        | -                     | -          | -                      | -            | 0.00                 | 0.11                   | 0.17                 | 0.42                |
| <i>Euro CDs</i>        | -                     | -          | -                      | -            | 0.00                 | 0.05                   | 0.06                 | 0.35                |

|                        |         |        |        |        |
|------------------------|---------|--------|--------|--------|
| <i>US o'night repo</i> | 0.10    | 0.010  | -0.020 | -0.020 |
| <i>Fed Funds eff</i>   | 0.09    | -      | -0.010 | -      |
| <i>US 3m Bills</i>     | 0.02    | -0.005 | 0.005  | -0.020 |
| <i>SDR int rate</i>    | 0.07    | -      | -0.010 | -0.010 |
| <i>EONIA</i>           | 0.033   | 0.006  | 0.010  | -0.020 |
| <i>EURONIA</i>         | -0.0052 | 0.000  | 0.009  | -0.046 |
| <i>RONIA</i>           | 0.5092  | 0.046  | 0.019  | 0.020  |
| <i>SONIA</i>           | 0.4277  | -0.004 | 0.005  | 0.002  |
| <i>LA 7 Day Notice</i> | 0.35%   | -0.30% |        |        |

\*Libor rates come from BBA (see [www.bba.org.uk](http://www.bba.org.uk)) and are fixed at 11am UK time. Other data sources: US \$, Euro & CDs: dealers; SDR int rate: IMF; EONIA: ECB; EURONIA, RONIA & SONIA: WMBA. LA 7 days' notice: Tradition (UK). Source: Financial Times, Markets, Market data, [www.ft.com](http://www.ft.com)

### Government debt markets

Apart from dealing in interbank deposit market, commercial banks are active traders of government securities. These papers are issued to finance budget deficit and are sold at auctions, usually at a discount to their nominal value. Later on, these securities are traded on the market, mostly over the counter. At the redemption date, they're redeemed in full nominal value. Governments issue the following securities:

- bills – with maturities from one to twelve months, paying no coupon, sold and traded at a discount to nominal;
- notes and bonds – with maturities from two to ten and more years, usually offering a coupon, sold at a price close to nominal, trading according to market prices. Coupons can be fixed or float and are usually paid every six months. Some bonds have no coupon (zero-coupon), similarly to bills.

Government securities prices can be also expressed as yields. Using the internal rate of return methodology, a yield to maturity (YTM) of a bond can be calculated. YTM is the rate of discount that equates all the bond's cash flows with its current price. A government securities yield curve can be calculated for maturities from 1 month to 10 years, and can be an alternative to the interbank rates curve. However, the instruments underlying those two curves have different purposes – while government securities are a mean of investment, interbank rates are a basis of a multitude of transactions, including derivatives. Securities are used by banks to lend money, not to borrow, although it is somewhat possible through the use of repo (repurchase) deals in the form of Sell-Buy-Back transactions. In general, LIBOR rates are a better point of reference for most bank transactions.

### 3.2 MANAGING RISKS

Asset transformation results in various types of financial risk being transferred from customers to the bank. The tree main types of bank risk are:

- Credit risk;

- Interest rate risk;
- Liquidity risk;
- Currency risk.

The latter three are altogether described as the components of market risk. All of the above-mentioned risks are related to FTP. Interest risk is the one that is estimated by the rate used in the transfer price formula. It is necessary to estimate interest risk profile for all bank products in order to choose the most suitable transfer price equation for each of them. The effects of interest, currency and liquidity risk on bank's balance sheet (BS) and profit and loss account (P&L) are singled out by FTP methodology in the management accounting approach, facilitating risk management. Interest and currency risk management includes derivatives. Their introduction in the thesis is necessary, as they are also priced by FTP as any other bank product. Liquidity risk, interpreted as the risk of funding costs being in excess of market rates, is directly included in transfer prices in the form of additional margin. Credit risk is generally relevant to FTP, as it needs to be incorporated in prices for products. It shows that, as a way of setting a minimum profitability level for products, transfer prices are not always enough and other factors – like credit risk – should be taken into consideration in the management accounting approach.

### **Credit risk**

Credit risk is a result of information transformation function. Incomplete information on borrowers requires appraisal and monitoring of risk of borrowers not repaying their loans. To reduce that risk, banks require collateral on loans. Apart from individual loan security, risk transformation includes risk diversification due to a large number of borrowers.

#### **Individual risk**

Individual credit risk is the possibility of a counterparty not being able to comply with his contractual obligations, e.g. a borrower not repaying a loan, or delaying principal or interest payments. Different customers generate various risk types: consumer, corporate or country risk, which can be subsequently divided to loan type:

- Individual consumer loan risk is evaluated through the use of credit scoring models. The outcome of such models shows personal risk levels, allowing the bank management to decide whether to give the loan or not, and how to price its risk in the level of interest required. Some consumer loans usually have collateral, e.g. mortgages are secured by property. Collateral is a supporting source of cash in the event of loan being not repaid.
- Corporate loans risk appraisal resides mostly on ex ante analysis and ex post monitoring. Prior to giving loans, thorough analysis of financial statements, financial ratios and business plans is conducted using advanced models. For large companies, credit ratings are issued by international agencies, facilitating the risk assessment process. Loan contracts often include covenants – restrictions put on borrowers' activities that could increase credit risk, e.g. excessive borrowing. Corporate risks also include the risk of other financial institutions as counterparties in different financial instruments.
- Country risk is the risk of a government not repurchasing debt securities at their maturity. However, country risk influences also risk of all companies from that country. It is measured by rating agencies.

#### **Portfolio risk**

Credit risk can be limited by ensuring that the loan portfolio adheres to exposure limitations. Limits include: concentration on a single customer or customer type, geographic limits, economic sector limits, loan category limits, etc. After the loan is given out, credit risk is managed on the portfolio level. The management comprises monitoring the portfolio characteristics and identification of nonperforming loans. In general, these are loans on which principal or interest payment is overdue for a specified period of time. Also, loans with potential weaknesses are sometimes taken into consideration. There are legal requirements for banks to set up provisions for underperforming loans. The level of these provisions varies according to legal regulations adopted in specific countries. Up till recently, all loans were divided into several categories based on payment delay and debtor's financial situation, and a specific level of provisions for each category was required:

- Standard loans with satisfying performance were assigned a 1-2% level of provisions (varying from country to country);
- Watched loans with very little delay or with slightly deteriorating financial situation of the borrower - 5-10% • Substandard loans – unsettled for less than 90 days with borrower's cash flows diminishing dangerously – 10-30%
- Doubtful – less than half a year past due, with questionable repayment – 50-75%
- Lost – overdue for more than half a year or considered uncollectible – 100%

Recently, with introduction of new International Accounting Standard in 2005 and with Basel Committee second recommendations, European banks are required to implement models in order to estimate losses from impaired loans (incurred and expected) in the form of discounted value of cash flows from those loans.<sup>36</sup> Despite those changes, the basis remains the same – provisions are recognized on a portfolio of loans according to their performance. The total level of provisions, compared to the total portfolio of loans, indicates the total credit risk accounted for by a bank. It can be expressed as a percentage ratio, quantifying the average risk of loans. Therefore, interest rates on various loans should be sufficient to cover probable losses.

### **Liquidity risk**

Liquidity risk is the result of maturity transformation. It emerges because loans, in principle, last longer than deposits. Depositors typically require direct access to their funds, meaning that they agree to lend money to the bank for short term, fearing they wouldn't be able to use their funds when needs arise. In contrary, borrowers need long term funding - for a few years in case of commercial loans, or for a few dozens of years with housing loans. The consequence is the liquidity risk - meaning the maturity mismatch between assets and liabilities. This entails a risk that the bank will not be able to fulfil its current obligations. The maturity mismatch effect on bank's P&L can be measured using FTP methodology. Liquidity risk measurement aims to estimate the actual cost of market funding, which can sometimes differ from market rates. This extra liquidity cost can be included in the transfer price formula, in order to reflect current market conditions faced by a bank.

### **Measurement of liquidity risk**

Several measures can be used in order to identify liquidity risk. The most basic measure (used by regulators) is the ratio of liquid assets compared to liquid liabilities, which should be greater than one. This static measure can be enhanced by analysing all assets and liabilities in terms of their time structure. An analysis of contractual payments of interest and principal on loans and

deposits, divided on a time scale according to their maturity, allows to determine whether at a given moment there is a lack of liquidity. This analysis can be improved by assuming different scenarios of liquidity needs.

### **Interest rate risk**

Interest rate risk is the main risk that a commercial bank is exposed to, since bank's activities as intermediaries between customers and financial markets result in creating assets and liabilities with incoherent interest rate characteristics. Various bank products and elements of balance sheet receive or pay interest based on different conditions. Rates can be fixed during the life of a transaction or flexible – where the rate is reset, either at periods of time specified ahead or at managements' discretion. Interest rate risk results from unequal elasticity of assets and liabilities rate adjustment to market rates. For example, if assets' elasticity is higher than that of liabilities, and market interest rates decrease, average rates on loans fall more than interest paid on deposits, resulting in diminishing net interest income. Estimating interest rate elasticity and resetting profile for all bank products is necessary to select relevant transfer price. Not all products have simple LIBOR + margin interest. Non-market interest products require an estimate of their repricing characteristics.

#### **Measuring interest rate risk**

The most basic method of measuring interest rate risk is the gap analysis. In this model, all the assets and liabilities are put on a time scale, which is divided into time periods (e.g. into months below one year, and into years above). A loan or deposit is allocated to a period based on the time, when its interest rate is repriced. After all the products are divided according to the time interval when their rates may change, the difference between assets and liabilities in each segment is calculated. If this result is positive, more loans than deposits reprice in the specific timeframe, resulting in positive correlation of rate increase and interest income. When the gap is close to zero, interest risk is minimized. Cumulative gap is the sum of all individual gaps for different time periods. To show impact on interest income, the gap can be multiplied by the rate change. The gap analysis should be enhanced by measuring the elasticity of various products within one time segment. The simple gap model assumes that when a product's interest rate is reset in a segment, it is reset by the amount that market rates change. However, product elasticity can be different than one. Different loans and deposits can have unequal level of reaction to market rate shifts. Even if the gap equals zero, elasticity differences entail interest rate risk (e.g. an equivalent amount of assets and liabilities reprices in a given time period; however assets have an elasticity of one while elasticity of deposits equals one half). The gap method doesn't account for a number of factors. First of all, it doesn't consider unparallel shifts in yield curve, where short term rates change differently than long term rates. Moreover, as a static measure, it doesn't account for basis risk – a risk that some rates reprice on a different yield curve than the others do (e.g. some loans can be linked to central bank rates, whereas most products are reset based on LIBOR rates). Finally, it is a static method, and doesn't include expected changes in balance sheet repricing structure. Other methods overcome those disadvantages. Sensitivity analysis applies different yield curve shift scenarios to the gap method. In more complex models, the entire balance sheet is simulated and bank's income sensitivity to various interest curve changes is examined.

#### **Managing interest rate risk**

Interest rate risk can be managed by influencing the product structure. Changing business strategies in order to limit sales of some products (e.g. fixed rate loans) and promote others can result in long-term reduction of risk. Selling fixed-rate assets (e.g. bonds) has similar effect. Limits can be set on exposures to interest risk, as a proportion of bank's income, capital or assets, further on divided by products or business units. Most often however, especially when debt securities are involved, yield curve risk is managed by the use of interest derivatives. As it was mentioned before, there are many different interest rate derivatives traded by banks: forward rate agreements (FRA), interest rate swaps (IRS), interest rate futures and options. FRAs and IRS are the most widespread for risk management purposes. These instruments will be briefly described below. A FRA is an agreement where one party (long) agrees to pay a specified above rate, in exchange for a floating market rate, which will be known in future. For example, in a 2x5 FRA a bank taking long position agrees to pay in two months a 3M LIBOR rate, receiving at the same time a rate fixed today, which is the 2x5 FRA rate. Both rates will be paid on an agreed nominal for a quarter of a year. There is only one cash flow – a net of both payments, made in two months from now, however the amount to be paid and the payer are unknown at the contract initiation. The most popular FRA agreements are: for 1 month (starting in 1 or months), for 3 months (starting in 1, 2, 3, 6 or 9 months) and for 6 months (starting in 1, 3 or 6 months).

An IRS is a series of FRAs. The most typical IRS changes a fixed rate into a 3M or 6M LIBOR. It can last from 1 to usually 10 years. A 1 year IRS based on 3M LIBOR is like entering today an into a series of FRA (3x6, 6x9 and 9x12) and a 3 month deposit. The first payment is known ahead, and equals the difference between the IRS rate and the current 3M LIBOR. An OIS (overnight interest swap) is an IRS based on O/N LIBOR, with everyday payments.

### **Currency risk**

Currency risk is another type of risk, faced by banks that operate in more than one (domestic) currency. Even conservative commercial banks have such products - a typical example is a loan denominated in a foreign currency which has low interest rates. Currency risk exists when assets in a given foreign currency don't equal liabilities, or, more precisely, when cash flows in a currency don't even out (e.g. interest paid doesn't equal interest received). This results in a currency gap, which influences bank profits. This effect can be shown using FTP methodology. Currency risk management requires using derivatives and pricing them with transfer prices is a complex issue.

### **Foreign exchange rates**

Currency risk is a result of significant exchange rates variability. The value of the most important currencies – US Dollar, Euro, UK Sterling, Japanese Yen, and Swiss Franc – is set on the market. Despite central banks' interventions in defence of national currencies, this can result in large fluctuations. Central bank announces official fixing rates daily, based on prevailing market rates. However banks often quote more than one rate for each currency. They announce different price for foreign deposits (BID) than for loans (ASK), and profit from the spread between them. Moreover, exchange rates they offer to individual customers are dissimilar (with a larger spread) from those applicable for wholesale customers.

### **Currency risk measurement**

Currency risk analysis and measurement is similar to interest rate and liquidity risk measurement conducted for each foreign currency on bank's balance sheet. A so called net long or short position in foreign currency is the most widespread measure. It is calculated as difference between assets and liabilities (and off-balance derivatives) that mature in near future (e.g. a week), which can be further on divided into maturity periods, similarly to gap analysis. Net position should be calculated in each currency, and summarized, either as total of positive and negative positions, or as a sum of absolute values, or as the greater of the aggregate short positions and aggregate long positions.

### **Currency risk management**

Currency risk can cause very large losses for banks, therefore most commercial banks seek to have zero currency risk exposure. As a basic tool of currency risk management, limits are established for aggregate currency position – usually 10% to 15% of bank's relevant capital. Limits are also set on individual currency positions, most often expressed as a maximum absolute value of mismatch during specific time periods – this day, next week, next month, next half year etc. The net position for the next day or a few is then closed on everyday basis on currency markets, with spot and forward currency transactions. These transactions consist of simple currency exchange, either immediately (spot) or on a future date, with an exchange rate set today (forward). Nevertheless, closing impending currency positions is not sufficient for liquidity disparity. Just like funding long term loans with short term deposits entails regular liquidity issues, funding loans in one currency with deposits in another one results in long term currency liquidity issues. This is a popular case in countries with high interest rates, where offering loans in currencies with low interest rates (JAP or CHF) is very popular with customers. This discrepancy can't be handled within everyday currency position management, since interest paid in one currency is based on different rates than the interest received in another currency. For example, funding LIBOR CHF loans with LIBOR GBP deposits results in currency and interest risk combined. It is more suitable to hedge such transactions against both types of risk at once with derivatives such as FX Swap and CIRS. FX Swap (foreign exchange swap) is an instrument similar to a FRA, except that instead of swapping fixed for floating payments, it exchanges payments based on rates in different currencies. Likewise, CIRS (currency interest rate swap) is a foreign exchange version of a regular IRS. Typical FX Swap and CIRS deals would swap float for float, although fixed for float rate swap is also possible. More often than not, these derivatives include initial and final exchange of nominal, necessary for hedging currency risk.

Using FX Swap and CIRS handles currency and interest rate risk, but not the liquidity risk. This can be handled with regular liquidity management methods, however finding long term funding for foreign currency loans might be impossible or very expensive, and currency swaps with long term maturities might be unavailable on global interbank market.

## 4 MULTIPLE POOL METHOD

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Under multiple pool approach, all products are divided into a number of pools, divided by different criteria. Most often the criterion is to aggregate products based on their original maturity or reprising term. Additional factors may include product type and other attributes. Each pool covers a single part of the maturity spectrum, and their number are span depends on individual bank's balance sheet term structure. The bank establishes a set of transfer rates, assigning to products in each term segment a different interest rate. Under this approach, the difference between term structure of assets and liabilities is added to the FTP portfolio.

### 4.1 MARKET TRANSFER PRICES

Instead of one or two transfer prices, a whole set of rates is needed under the multiple pool approach – one price for each pool. These can be derived internally, just as for single and double pool, by calculating average interest rate on assets and deposits in each pool. However, this approach lacks objectivity, and doesn't encourage correct business decisions. A much better method is to base transfer prices on market rates. This approach is specifically suitable for banks that actively trade in the interbank market. For them, transfer prices determined in this way represent a source of income or cost alternative to dealing with customers. This concept reflects actual transactions – instead of taking in deposits from customers, a bank can borrow funds on the market. For each client transaction there's an alternative in the form of interbank transactions. At any point of time, the rates prevailing in the market should be accepted as the cost of funds suitable for the bank.

Applying market-based transfer prices provides the most methodologically consistent results, based on objective external criteria. Market rates allow objective verification of product pricing policy, they are also a good mean for evaluating management performance. Transfer prices should reflect market rates on instruments such as treasuries, interbank loans or interest rate derivatives. The bank must establish a set of transfer rates in the form of a yield curve that most accurately reflects its market cost of funds. Most banks use the LIBOR/Swap curve, as it is built of instruments they most actively trade-in.

### 4.2 BUILDING POOLS OF TRANSACTIONS

The above-mentioned rate curve shows the relationship between maturity and interest rate, as it was described in the chapter on financial markets. In multiple pool method, instead of two TPs as in double pool, there are two transfer price curves used – one for assets and another for liabilities, depending on their interest rate reprising characteristic. Pools are created of transactions with similar customer interest rate characteristics. The typical pool-building process is conducted on three levels – product, rate characteristic and currency. To each pool a rate from a LIBOR/Swap curve for a given currency is appointed. These curves are presented in the Figure 1, along with the transfer price selection process.

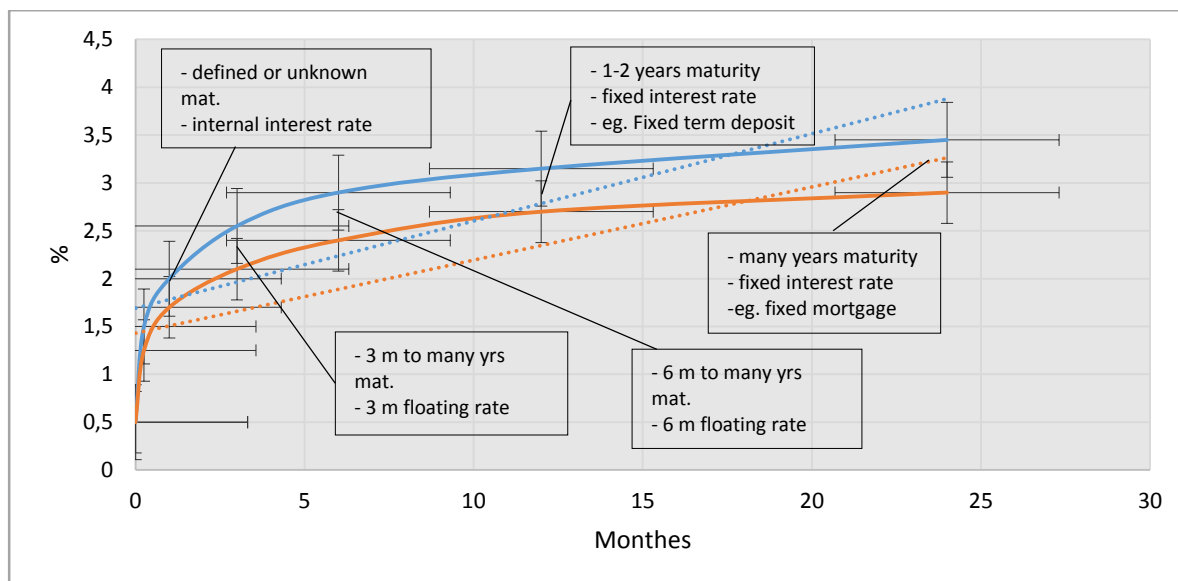


Figure 1. Assigning transfer prices to multiple pools

Source: OECD, *OECD Transfer Pricing Guidelines for Multinational Enterprises and Tax Administrations*, (2010), 2-nd edition, pp. 59-105.

The graph shows curves for the domestic currency, curves for any currencies that make up a significant part of portfolio need to be built. For the currencies with a small share of transactions, the main currency curves can be used. Rates from the curve are assigned to loans and deposits basing on the pool they are in. A loan that has a longer maturity would be assigned a higher transfer price under a normally shaped rate curve. As shown in the graph, pools are constructed for typical product categories, according to their interest rate type and maturity. Typical product pools are listed below.

#### Long term fixed rate products

Products with long term (LT) fixed rates – e.g. fixed rate mortgages - are difficult to model under multiple pool methodology, as their rate structure is very inhomogeneous. Products with a rate fixed for a year or two – e.g. long term deposits – are easier to replicate. A rate from swap curve is assigned, from a point that is close to average time to maturity of transactions in a portfolio. It can be assumed for a portfolio of transactions that have been sold in similar numbers for an amount of time, that the average maturity equals half of the original term. E.g. a pool of two year fixed rate products can have a LIBOR 12M rate assigned. For the two years deposit pool, the average time (assuming constant sales structure) to maturity would be one year, as the transactions in the pool can have current maturities ranging from a day to two years. There can be a number of fixed rate portfolios, each for transactions of different length for a given product.

#### Float and internal rate products

Short term (ST) products with fixed rate (e.g. monthly deposits) and products with long maturities but with float rates can be treated uniformly. E.g. mortgages with interest based on a 3M LIBOR will have the same reprising characteristics as a pool of 3M deposits. Pools with rates from 1M to 9M can be created, according to their term characteristics. Many bank

products have rates set by management. Products with such an internal rate need to have a proxy market rate assigned, basing on predicted bank rate alteration frequency. This rate is set at discretion of management, basing on business conditions – such as level of sales – and on external environment – i.e. market rates or, most often, official central bank rates. Decisions to keep or change rates are usually made in monthly cycle, so for products with internal rates and with maturities above a month, often a 1M rate is assigned. Basing on historical frequency of internal rates alteration, another period length can be assumed.

### **Blended term for indeterminate maturity products**

When the internal rate is combined with very short or unknown maturity – as for current accounts or credit cards – TP can be assigned as in the previous example, based on a single rate, usually 1M. Sometimes, a shorter rate is appointed, due to interpreting unknown maturity as being a very short one. However, the most popular approach is to divide each product with unknown maturity into two or more maturity layers each assigned a different average rate. The overall pool rate is then blended from all the rates on different pool layers. E.g. in current account pool, funds from many accounts are withdrawn on any given day, however, there's always some amount of funds left in the whole pool. In other words, the sum of money deposited in accounts varies, but it doesn't fall below a certain minimum level. This minimum level of funds, different for each product in each bank, can be calculated based on historical data. This residual amount is then treated as a sub pool with a maturity of a year or even longer, whereas the fluctuating part of the portfolio is priced with weekly or even daily rates. This residual sub pool is represented in Figure 2.

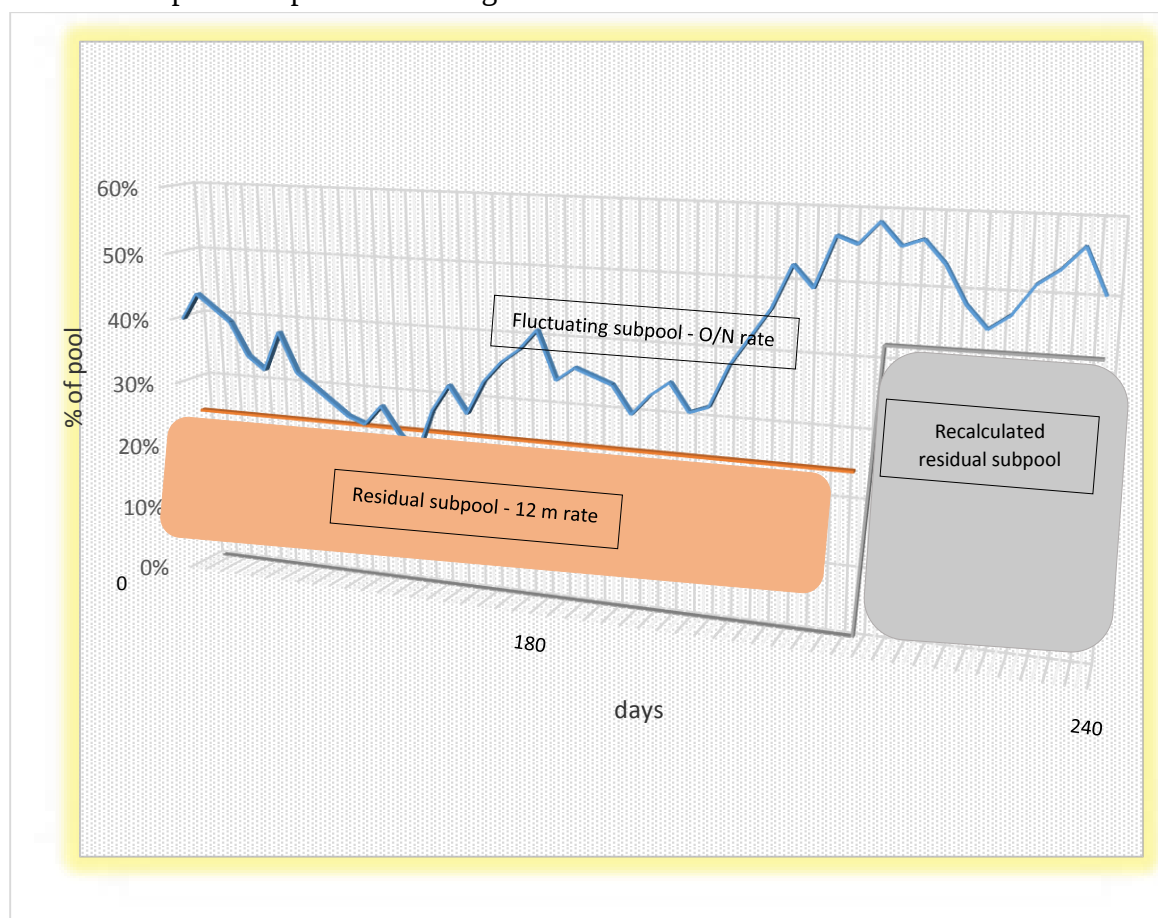


Figure 2: Residual sub pool estimation

Source: OECD, *OECD Transfer Pricing Guidelines for Multinational Enterprises and Tax Administrations*, (2010), 2-nd edition, pp. 59-105.

As the residual level of deposits changes, the size of the sub pool (expressed in percent of total portfolio) needs to be re-estimated. More than two sub pools can be employed, representing layers with different volatility characteristics in the pool. The average of rate terms of all sub pools, weighted by their size, is used as a proxy for the pool maturity.

#### **4.3 CALCULATING TRANSFER RATES**

The transfer price assigned to each pool is based on its maturity and on market rates prevailing for its term. For assets which bring interest income the TP is negative in order to calculate a cost of funds. For liabilities bearing interest costs the TP is positive, showing the internal income attributed to funds raised. However, since market rates vary constantly, transfer prices for the pools need to be changed from one period to another. First, the length of this period needs to be determined.

##### **Price period length**

There's actually very little diversity in the choice of transfer price alteration frequency period. Usually, monthly periods are used for market price calculation, since internal reporting on managerial results is commonly conducted on a monthly basis. External accounting reporting is most often conducted quarterly, but TPs are not involved in external reports. The price can be calculated based on average daily TPs in a month; however, shorter periods can also be employed. Instead of calculating average monthly price and multiplying it by average monthly pool balance, daily prices and daily pool balance can be used. This approach adds accuracy to the pool model and should be implemented if data allows it.

##### **Ex post or ex ante prices**

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. There are two ways to approach that subject:

- One is to assign ex ante rates to transactions – the ex-ante rates are set for a month ahead basing on current or historic rates. For business units, knowledge of the transfer price at the time of transaction is important, as the management can then make a correct business decision. They know how much interest they need to “charge” customer for a loan in order for the transaction to be profitable.

However, under pool methods, rates are recalculated each month, and the rate for the loan will be changed next month. So, under the ex-ante approach in multiple pool method, the rate on the loan will be known ahead for the first month only, then TP will be reset for the whole pool. Since most bank products last longer than one month, there's little gain from using ex ante prices to the quality of management decisions.

- Another method is to assign ex post prices. In this method, the prices are calculated after the end of a month. The TPs are therefore unknown at the time of sale, which is a drawback. However, there's a significant advantage, that the ex post price is a better approximation of actual market rates prevailing at the time of transaction. Since ex ante prices last only during

initial month, the ex post method is preferred under multiple pool. Business units don't know the TP on their loans when they sell them, however they can check current market rates, and, knowing the formula for determining the price, they know what average rates on loan pool are to be expected.

### **Weighted moving average methodology**

After deciding between ex-ante or ex-post prices, the method of weighting daily rates in the monthly TP calculation needs to be chosen. The methods can be used with both ex-ante and ex-post prices, however here it is assumed that the latter technique is employed, as it is more suitable for multiple pools. There are a number of methods of approximating the TP for a pool of transactions that have the same rate type:

- The simplest methodology uses average market rates during each month. E.g. loans paying LIBOR 3M are priced with average LIBOR3M on that month. Also, daily prices can be used with daily pool balances. This is always suitable for LIBOR 1M and shorter rates.
- However, for rates longer than 1M it is more accurate to extend the period of time used in calculating the mean price to the term of market rate itself in order to better reflect the transactions that build up pools. For example, in the LIBOR 3M pool on any given day, some transactions have rates that reprised almost 3 months ago, some have reprised a month or two ago, and some had their rates reset just yesterday. So, a moving average of past three months (including the month for which we calculate the average) reflects the actual transaction rates much better than one month average. For each rate term, a time span equalling the term is suitable, e.g. 5 past months and the current one for a LIBOR 6M.
- For TP to be the most correct approximation of customer rates structure in a pool, the day-by-day reprising composition of that pool needs to be taken into account. First, it is assumed that the transactions are evenly spread in time, i.e. that an equal piece of the transaction pool reprises each day. Then, for each piece of pool, a reset profile needs to be built. E.g. a LIBOR 3M loan that had the interest rate reset on the 1st day of the current month will bear that rate for the entire month. However, another loan can be reset in the middle of the month. It would have the LIBOR 3M from the 15th for half of the month, and a historical rate from 3 months before for the other half of that period. Doing that estimate for each day of the month results in obtaining a profile of weights for the average TP to be calculated.

The weighting profiles for all three moving average methods can be shown on a Figure 3.

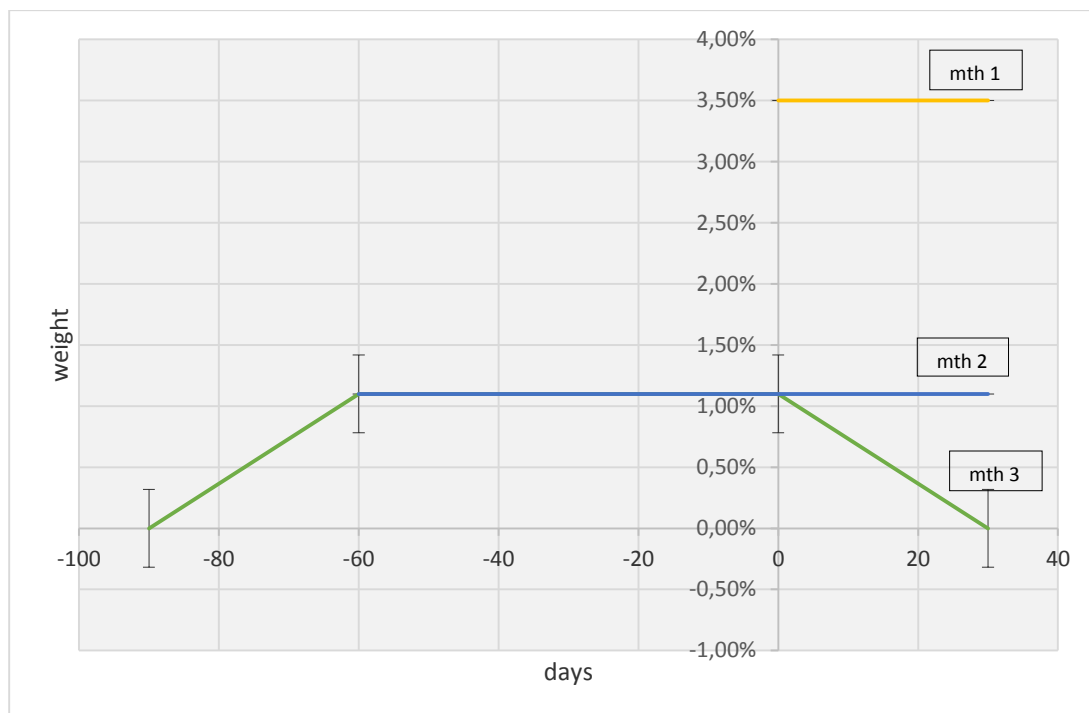


Figure 3. Methods for calculating average monthly TP

Source: OECD, *OECD Transfer Pricing Guidelines for Multinational Enterprises and Tax Administrations*, (2010), 2-nd edition, pp. 59-105.

The third method is preferred, as it gives the best estimate of interest reprising structure of a pool, with little extra effort necessary compared to other two methods.

#### 4.4 ADJUSTING PRICES FOR LIABILITIES

After building the product pools, assigning rate curves and calculating average rates, we have the basis for TP determination. For most loans, this is enough, and the price can equal the mean rate computed. For deposits however, additional amendments need to be done.

##### Deposit curve

As it was mentioned in the chapter on financial markets, LIBOR rates are the rates that banks ask for lending money to other market participants. Therefore, LIBOR rates are suitable TPs for loans. For deposits however, we need to know the market rate that banks pay to their depositors – the bid rate. As it is shown in the graph representing assigning prices to pools, two curves are necessary in the multiple pool method - the ask curve for assets and the bid curve for deposits. Some financial instruments are quoted on a bid/ask basis, and some interbank deposit markets also follow that rule – e.g. in Poland there's WIBOR (Warsaw Interbank Offer Rate) but there's also WIBID – the bid rate. So in Poland, both curves can be directly based on market quotes. LIBORs however are only quoted as ask curve, and the bid curve needs to be derived from it. As it was mentioned before, currently the spread to LIBID is most often estimated to be about 0,125 p.p. (percentage point). Thus, prices for deposits are calculated by subtracting 0,125 p.p. from LIBOR rates.

### Reserve ratio adjustment

As it was written in the chapter on central bank (CB), in most countries banks are required to keep a part of their deposits in reserve instead of using them to fund loans. This reserve requirement is rewarded with interest by some central banks. Since the funds in reserve cannot be used, the ratio of reserve is deducted from transfer price. The only gain on those funds is the rate paid by central bank. The overall deposit transfer price can be calculated using one of the formulas of Table 3.

Table 3. Formulas for TPs on deposits

$$TP_{\text{depo1}} = (\text{LIBOR}_t - 0,125) * (1 - 3,5\%) + 3,5\% * \text{CBrate}$$

$$TP_{\text{depo2}} = \text{LIBOR}_t - 0,125 - 3,5\% * \text{LIBID}_{1M} + 3,5\% * \text{CBrate}$$

The second formula uses an estimate of the interest lost due to reserve requirement, most often a 1M rate is used. The second formula is preferable, as it is also suitable for currency deposits, whereas the first one would result in overestimation of TP if rates for that currency are higher than domestic rates.

### 4.5 TPs FOR OTHER ASSETS AND LIABILITIES

The previous subchapter explained the treatment of deposits under FTP. These products are sold in business branches. However, there are more bank products than just loans and deposits. Specific products are dealt in by the central unit of bank, namely the treasury department. The specific instruments in treasury include:

- Treasuries and other securities in held to maturity or for long term - these instruments should have a long term transfer price assigned, e.g. 12M. The TP is multiplied by the original price paid for the instrument at the moment of transaction origination.
- Trade instruments (treasuries and interbank loans & deposits) are held for short time and for speculative purposes, therefore they are priced with short term rates, e.g. O/N. Thus, the same instruments can be priced differently depending on their purpose and designated time of holding in portfolio.
- Derivative instruments have to be priced differently. As they are valued on market and often don't pay interest, they are not valued by transfer prices. Instead, a cost of carry is calculated, relating short term rates to all the cash flows of the instrument.
- Equity is priced with cost of equity (COE). As a source of funding alternative to liabilities, cost of equity should be included in transfer pricing system. It can be done by pricing fixed assets with it. Another way is to price fixed assets with long term interest rates and include COE in all asset transfer prices. Adding the cost of equity margin requires allocating the risk weighted cost of capital to all the products and transactions. Introducing this margin to transfer prices relies on the concept that internal financing requires not only debt type financing priced with market rates, but in some part it also needs to employ bank's capital, whose cost differs from market prices.

#### 4.6 SPREAD COMPONENTS IN FTP PORTFOLIO

Apart from branches and treasury, the graph above shows also the FTP portfolio. Contrary to single pool method, where fund transfer pricing system didn't leave any parts of accounting interest income unassigned to products, multiple pools leave out a significant part of interest, forming the FTP portfolio. In double pool, this portfolio included only the spread between prices for assets and liabilities. Under the multiple pool method, the spread includes not only the bid/ask spread, but comprises also the differences in pool term and currency structure along with other components. The FTP portfolio is built up by the managerial transfer of funds from businesses, making it the source of funding for all transactions. Each negative TP paid by business for funding a loan is an income to FTP portfolio. When the sales unit gathers deposits, the internal transfer income is paid by the FTP unit. The total flow of funding of all transactions is the FTP income. To analyse this bundle of flows, it is necessary to extract the income due to different components of FTP system. Different transactions have more or less such components.

The graph below shows the FTP portfolio components basing on two transactions – a domestic loan (EUR is assumed to be the local currency) and a currency deposit (in USD):

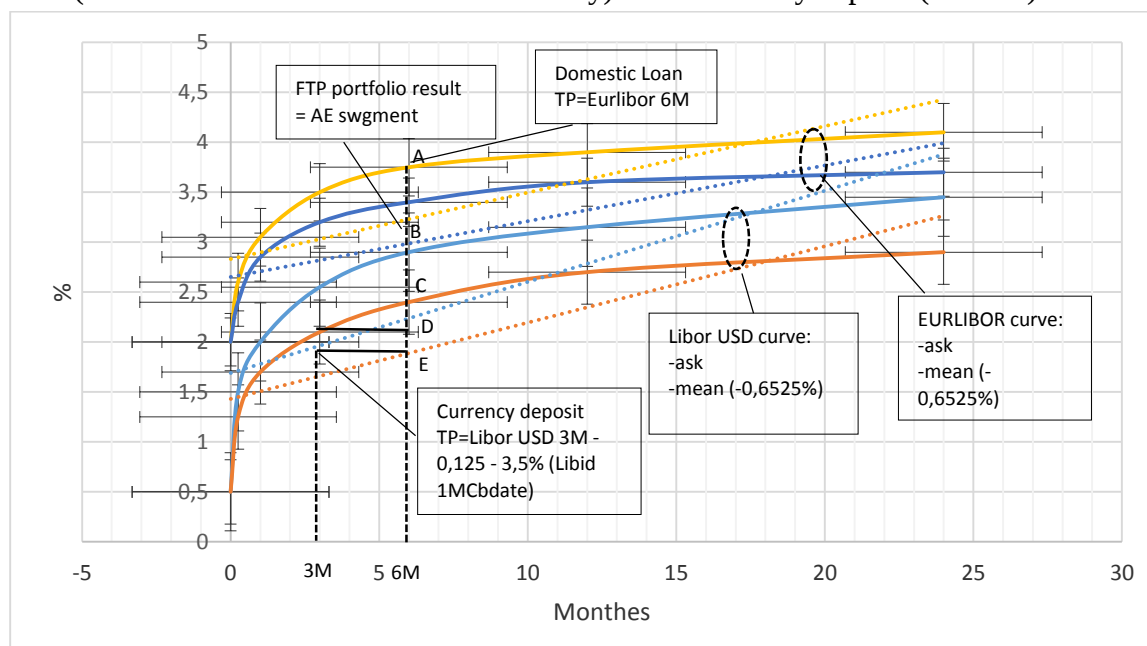


Figure 4. Components of FTP portfolio

Source: OECD, *OECD Transfer Pricing Guidelines for Multinational Enterprises and Tax Administrations*, (2010), 2-nd edition, pp. 59-105.

The difference between the price on domestic loan (point A) and the price on foreign deposit (point E) is the result of FTP portfolio. The AE segment can be divided into:

- AB segment – currency spread – is the difference between the foreign currency curve and the local curve. FTP portfolio receives transfer interest on a loan in domestic currency, which in this case has higher rates than a deposit in foreign currency. If the loan was in a currency with lower rates, e.g. in CHF, the currency spread would be negative.

- BC segment – bid/ask spread – the difference between a loan and deposit curve in one currency, which equals 0,125pp. for LIBOR and EURIBOR. This spread can be cut in half by a MEAN rate into the spread earned on a loan and on a deposit.
- CD segment – term spread – the difference between the term of loan and the term of deposit, calculated in one currency. In this case it is positive, as the loan term is longer than the maturity of deposit, however it can be the reverse. To calculate the term spread separately, terms of both transactions can be compared to a short, e.g. O/N rate. The 6M-O/N term spread is the received on a loan, and the 3M-O/N spread is paid for the deposit.
- DE segment – reserve ratio spread – is the result of price on deposit moving away from the curve due to the reserve requirement amendment to the TP formula. Most often the ratio lowers TP on deposit, adding to the result of FTP portfolio.
- An amendment not visible in the graph would appear if the amount in deposit would differ from the loan balance. This difference doesn't appear in rates, but in interest transferred, since the prices are then multiplied by different amounts. This is the assets & liabilities (A&L) imbalance spread, which develops when a bank has more liabilities than assets included in FTP system or vice versa.
- Other amendments, which are not shown in the graph, are corrective margins added to transfer prices. These margins are described in the following chapter.

#### 4.7 CORRECTIVE MARGINS

Corrective margins are another component of FTP portfolio. They are introduced to reflect external and internal business conditions. Positive margins added to TP for product pools increase both the transfer cost of loans and the transfer income on deposits. Management can set the following margins:

- Liquidity margin – should be added to prices when actual cost of financing that the bank faces in the market differs from official interbank rates. It can be the result of bank's credit risk as perceived by the market, when its financial condition requires a premium over market rate. Also, in times of market liquidity crisis, actual short term financing might be unavailable, and more costly long term financing must be raised from sources other than interbank loans. Corrective margins are added to TP to reflect the increased cost of funds. An exemplary table of liquidity margins is presented in Table 4.

Table 4: Exemplary liquidity margin table.

| Currency term | EUR assets | EUR liabilities | USD assets | USD liabilities | Other assets | Other liabilities |
|---------------|------------|-----------------|------------|-----------------|--------------|-------------------|
| O/N           | 0,00%      | 0,00%           | 0,00%      | 0,00%           | 0,00%        | 0,00%             |
| 1W            | 0,00%      | 0,00%           | 0,00%      | 0,00%           | 0,00%        | 0,00%             |
| 1M            | 0,25%      | 0,25%           | 0,00%      | 0,00%           | 0,00%        | 0,00%             |
| 3M            | 0,25%      | 0,25%           | 0,00%      | 0,00%           | 0,00%        | 0,00%             |
| 6M            | 0,25%      | 0,25%           | 0,00%      | 0,00%           | 0,00%        | 0,00%             |
| 12M           | 0,50%      | 0,50%           | 0,10%      | 0,00%           | 0,10%        | 0,00%             |
| 2Y            | 0,50%      | 0,50%           | 0,10%      | 0,00%           | 0,10%        | 0,00%             |
| 5Y            | 0,75%      | 0,75%           | 0,10%      | 0,00%           | 0,10%        | 0,00%             |
| 10Y           | 0,75%      | 0,75%           | 0,10%      | 0,00%           | 0,10%        | 0,00%             |
| 20Y           | 1,00%      | 1,00%           | 0,10%      | 0,00%           | 0,10%        | 0,00%             |

|            |       |       |       |       |       |       |
|------------|-------|-------|-------|-------|-------|-------|
| <b>30Y</b> | 1,00% | 1,00% | 0,10% | 0,00% | 0,10% | 0,00% |
|------------|-------|-------|-------|-------|-------|-------|

Source: Financial Times, Markets, Market data, [www.ft.com](http://www.ft.com)

Margins are appointed basing on currency and maturity of product pool, with balance sheet side (asset or liability) optionally taken into account. Using the table, management can foster gathering of deposits and/or limit sale of loans, when liquidity issues arise. Liquidity margins are typically positive, to reflect increased cost of funding. Negative liquidity margins are very uncommon. When management decides to change the table, new margins are reassigned to pools.

- ALCO margin – reflects the target A&L structure that management has in mind. In order to boost sales of some products and reduce the significance of other products, margins can be used to influence product profitability. ALCO margins are set for each product separately, notwithstanding its term or currency structure, but taking into account the balance of transactions. Most often ALCO uses its margins to improve internal profitability of significant large transactions. An exemplary ALCO margin is shown in Table 5.

Table 5. Exemplary ALCO margin table

| <b>Products</b>      | <b>&lt;100ths</b> | <b>&lt;500ths</b> | <b>&lt;1mln</b> | <b>&lt;5mln</b> | <b>&lt;10mln</b> | <b>above</b> |
|----------------------|-------------------|-------------------|-----------------|-----------------|------------------|--------------|
| <b>Loan 1</b>        | 0,10%             | 0,10%             | 0,10%           | 0,10%           | 0,10%            | 0,10%        |
| <b>Loan 2</b>        | 0,00%             | 0,00%             | 0,00%           | -0,10%          | -0,10%           | -0,10%       |
| <b>Deposit 1</b>     | 0,00%             | 0,05%             | 0,10%           | 0,15%           | 0,20%            | 0,20%        |
| <b>Transaction 1</b> | -                 | -                 | -               | -               | 0,25%            | -            |

Source: Financial Times, Markets, Market data, [www.ft.com](http://www.ft.com)

A positive margin limits profitability of a loan, whereas a negative one increases it (the opposite is true for deposits). Unique transactions require setting one margin only.

#### 4.8 PROS AND CONS OF MULTIPLE POOLS

The multiple pool methodology is complex and detailed in many areas. However, from an information technology point of view, it doesn't require much computing power or detailed transaction information. It is not as easy to implement as single pool, however it can work based on databases supported with internally developed software. For larger institutions, some sort of professional application might need to be bought. Multiple ensures a fairly good calculation of profitability for pools of float rate products, and approximates fixed rate pools' results basing on current market rates. It takes into account the time structure of assets and liabilities and allows for many adjustments. It can be recommended for any commercial bank, with many branches and businesses, various sources of funding and complex product portfolio. It is suitable for banks that actively use interbank transactions. The method allows for more objective performance evaluation and provides management with tools for governing product structure and profitability.

However, multiple pool methodology has a number of disadvantages as well:

- Profitability of products is influenced by changes in market interest rates.
- Historical interest rates prevailing at the time of the contract are not regarded.
- Method is not suitable for long term fixed rate transactions.

- Interest rate risk is not separated from credit risk.
- Managerial results are approximated with varying accurateness.
- Increased disparity between managerial and accounting interest in the FTP portfolio.
- More IT resources required in comparison with single pool method.

The drawbacks listed above are not crucial however, and the multiple pool methodology is successfully used in many large banks. The main reason for preferring it to more accurate methodologies is the quality of transaction data a bank has. If bank's data bases don't allow to determine parameters like reprising and original maturity on every single transaction, multiple methodology is the only choice. Moreover, multiple method is the historical choice – it was employed when available hardware and software didn't allow for successful implementation of more complex methods. Today, it still prevails in many banks, as switching to more advanced methodologies would require alterations in the majority of existing software, which may be costly, time consuming, and temporarily slow down data processing.

#### **4.9 HISTORICAL MULTIPLE POOL VARIATION**

To overcome some drawbacks of multiple pool methodology, adjustments can be implemented. Using average rates significantly distorts profitability of long term fixed rate transactions. Instead of current rates, historical rates from the initiation of transaction can be used. Using historical rates allows fair evaluation of product pricing decisions made at the time of transaction.

To resolve this issue, an adaptation of the multiple pool method divides the LT fixed rate pool into a series of historical pools. Each historical pool includes transactions that originated in a historical period of time, and assigns to them rates prevailing at that time. E.g. for a pool of fixed rate mortgages, twenty historical sub pools can be created for each year in the past, with an average rate calculated based on the rates prevailing in that year. This way, transactions are divided according to the time of their initiation with rates assigned accordingly.

## 5 MATCHED RATE METHOD

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Matched rate method (MRM) differs from multiple pool by one crucial aspect – instead of using transaction pools, prices are assigned to each transaction separately. This allows for TP to mimic perfectly the customer interest rate on transactions. Matched rate method can be interpreted as the result of employing the historical pool method with a vast number of historical pools, one for each transaction. In many aspects those two methods are similar – they use the same TP formulas and corrective margins, both methods entail a FTP portfolio.

### 5.1 BENEFITS OF MRM

The main differences between multiple and matched rate include:

- Separation of credit risk and interest rate risk;
- Sales unit held responsible for credit risk only;
- Business transactions based on a fixed interest margin;
- Unbiased business decisions evaluation and motivation;
- Interest risk centralized and transferred to a responsible unit.

MRM offers significant advantages, however it is costly to implement. It requires buying expert applications that can fulfil a number of functions – processing of detailed transaction data, incorporating various aspects of advanced FTP methodology and translating interest risk data to treasury IT systems.

It can be recommended for largest commercial banks, which have detailed transaction databases and sufficient funds to build costly IT systems. It is suitable for banks that wish to improve business performance evaluation and interest risk management. If not in full scale, MRM can be implemented for large fixed rate transactions first, where it brings the most significant improvements.

Nowadays, its popularity rises due to the functions it has in aiding the assets and liabilities management. As the only method capable of effective interest rate risk transfer and management, MRM becomes a must in the environment of low and variable market rates. This method is indispensable for institutions that are active on financial markets, as they are faced with increased risks stemming from various financial instruments in their holding.

To sum up, MRM is the choice of future, and large banks that still use multiple are currently implementing MRM, or at least are planning to do so.

### 5.2 BUSINESS UNIT RESULTS

The main effect of MRM on branches and business units is that margins on all their loans and deposits are constant throughout the transaction duration. At the time of transaction origination, the TP is assigned based on reprising characteristic, in order to “freeze” the interest margin. As a result, business unit knows what the profits on a transaction will be throughout its entire life at the moment of product sale. This entails significant changes in business results evaluation, compared to multiple methodology:

- With a fixed margin on transactions, business units' profits are due only to the factors that the unit can influence. In MRM, branch managers are rewarded for the quality of decisions made in a given market environment, not for the effect of changes in market conditions, as is the case in multiple method. In multiple, business results include undeserved losses and gains due to interest rate fluctuation.
- With interest rate risk removed from business, financial plans can be set and evaluated despite of changing market conditions. Forecasted business results are still valid, even if actual interest rates differ significantly from predictions.
- In matched rate methodology, branch management is rewarded fairly, which is important for motivating future business performance. Knowing they'll be rewarded for the results they can influence, managers make unbiased pricing decisions knowing total future results on a transaction. Their decisions are based only on actual cost of funds at the moment of transaction.
- Under multiple past transactions are affected by subsequent market rate fluctuations. Using current TPs distorts business decisions, as management tries to avoid fixed rate transactions. They make decisions basing not only on customer profit contribution. Each line managers tries to predict future rates and manage interest risk, which he is not responsible for.
- Knowing the net interest margins on transactions at their origination allows for detailed profit contribution analysis. Using MRM, this contribution can be measured of business line level, branch level and customer level without market rate variability bias.
- Under MRM, business managers are only responsible for credit risk on their transactions, and the interest risk is transferred to the FTP portfolio.

### **Credit risk**

With interest risk removed, business results are influenced by credit risk only. Sometimes, credit risk can also be removed from the branch. This is justified in case when bank's structure includes a centralized credit risk unit, which takes over the credit decision authority from branches.

In such cases, when the credit decision is centralized, then the credit risk should be removed from business transactions. This can be done by attributing an average credit spread, expressed in percent of balance, to the sales unit as cost of credit risk. Actual credit losses should be then attributed to credit risk unit, with average credit spread as income. The average spread can be calculated for different products or customer types separately, based on past and predicted credit quality of product portfolio.

### **5.3 TRANSFER PRICE CALCULATION**

The core characteristic of the MRM is the assignment of individual transfer prices. For this purpose, just like with multiple, market rates are used. Contrary to multiple pool, there is no ex post or ex ante price dilemma – all TPs are based on rates prevailing at the moment of transaction origination. In practice, daily interest rate fixing is used, although for large transactions, intraday rates from the exact moment of transaction can be used. Rates from a curve are assigned to loans and deposits basing on their reprising characteristic. This doesn't necessary mean a fixed TP, which is true only for fixed rate transactions. For float rate deals, TP mimics changes of customer interest rates on each loan and deposit. Other components of

TP formula, like corrective margins, are kept constant from the moment of transaction origination. Only then the total interest margin on the loan will be unchanged for the transaction life. Just like in multiple, prices on deposits are taken from the BID curve and adjusted by reserve ratio. The specific TP calculation method depends on the interest rate type on a transaction.

### **Float rate transactions**

Transactions with interest based on regularly reprised market rates obtain a TP based on the market rate that the customer coupon is referenced to. For example, a 1 year loan paying interest based on a 3M LIBOR will have a TP based on the same rate. Each quarter, on the day that customer's rate is reset to the current 3M LIBOR, the TP is reset as well. As a result, the interest margin on the loan is constant, despite of changes in both TP and customer coupon. Float rate instruments reprise on a given day with a frequency dependant on their reference rate. When a transaction reprises during a month, it is important to observe transaction balance before and after the reprise date. The balance can change on any day due to early withdrawal of deposit or due to prepayment of loan, therefore it is necessary to differentiate between the balance before and after reprising. As a practical consequence, with MRM, transaction balances need to be measured daily.

### **Internal rates**

Similarly to multiple, products with yields set internally by bank management get TPs based on market rates with term best approximating the actual and predicted changes in internal rates. For reasons previously explained, most often monthly rates are used, sometimes quarterly rates (if management changes rates rarely, or when market conditions are stable). This entails a so called basis risk – a risk that internal rate will change with different frequency or by different amount than its market proxy. Contrary to interest rate risk, basis risk isn't usually removed from business level. This is due to the fact that its business line management who is responsible for product pricing, and it's their authority to use internal rates or to change them to market based rates in order to get rid of basis risk.

Despite of the similarities between the multiple and matched rate methods, there is however one difference– in MRM, no average rates are allowed. Every transaction must be priced like a market transaction, with reprising schedule compatible with market standards. In order to best replicate internal rate change timetable, all products with internal rates have their TPs reset on the first day of each month (or quarter). This reflects the widely employed routine of introducing changes in bank rates from the begging of month, in order not to complicate monthly managerial accounting calculations. For example, a loan paying interest based on internal yield will have its LIBOR 1M TP (if such rate is assigned) reset on the 1st day of each month, independent of the actual transaction date. This is actually a drawback compared to the multiple pool approach to internal rate products pricing, since changes in rates on one day have a significant influence on the profitability on entire portfolio of products. Using average rates in multiple method smoothens any potentially large daily rates variations. For large individual transactions with unknown maturity, another method can be used. If the transaction required a direct interbank transaction to fund it (or to place funds gathered from it in case of a deposit), the rate on respective market transaction can be applied as a fixed transfer price (after necessary amendments).

### **Transactions of indeterminate maturity**

Transactions with unknown maturity are another products treated similarly under multiple and MRM. In matched rate methodology the multiple layer approach to product portfolio is also employed, dividing each product into layers with different actual maturity (historical or predicted), with respective market rates assigned. The average weighted maturity of products can also be calculated. There are however some differences. First of all, the sub pool approach is obligatory in MRM, whereas in multiple it was one of the options. Next, in MRM, there are usually more pools than the typical couple in multiple. Finally, there's no average rates employed, and each layer has a rate that reprises according to market rate schedule. For example, a current account portfolio would typically have the following layers:

- a 10 year layer, with amounts stable during many years and with a 10Y IRS price, changed every ten years;
- a 1 year layer, with a LIBOR 12M based price, reset each year on 1st of January;
- a monthly layer, with a 1M rate reset on the 1st day of each month;
- a daily layer, with O/N transfer price reset daily.

Similarly to MRM for internal rate transactions, instead of using average rates, yields from a specified day are used. This doesn't necessarily improve the quality of FTP system, however it is a consequence of interest risk transfer to Treasury department, and will be explained later on.

### **Fixed rate transactions**

Compared to the previously described transaction types, the treatment of long term fixed rate transactions is completely different under MRM than under multiple. Each fixed rate transaction is assigned a rate from the curve basing on its original maturity. Actually, the result is a slightly modified version of MRM - the maturity matching method (MMM). There is no reprising schedule, and the fixed rate on transaction can be only vaguely based on market rates. Therefore, a TP is assigned basing on the original maturity of transaction.

For example, a 5 year fixed rate commercial loan is assigned a 5 year swap rate prevailing in the market at the moment when the transaction was originated. This rate is then kept constant for the entire life of the transaction. As a result, each transaction has a fixed interest margin for its life. This is where MRM differs most significantly from multiple, where the interest margin would fluctuate as market rates change. For transactions with unusual length, prices are calculated based on the interpolation methodology. E.g. a four and a half year loan would be assigned a TP calculated as a mean of 5Y IRS and a 6Y IRS.

### **Amortizing loans**

Assigning TP to transactions basing on their original maturity can pose problems when dealing with amortizing loans, e.g. mortgages. Amortizing loans pay back principal evenly throughout their lives, instead of paying it in a lump sum at the end of transaction. As a result, their balance diminishes constantly. Therefore, funding for the transaction isn't raised in the whole amount for its entire life, as a fixed rate based on contractual maturity would suggest. In order to better reflect the time span that the funds are necessary for, actual maturity (shorter than contractual) is calculated and used to assign the constant TP. A number of methods can be used to fulfil that goal:

- Simple average – this method divides the loan into a series of all the principal repayments, and assigns to each one a TP from the moment in the futures when that principal cash flow will take place. Then, a simple average of all TP for consecutive payments is calculated.
- Balance weighted average – this a modification of simple average method, when all the TPs assigned to principal cash flows are weighted by the size of cash flow, i.e. by the portion of principal repaid. The principal repayment schedule set at origination is used, without taking into account any potential prepayments. This method is preferred to the previous one.
- Duration based – instead of using initial maturity, duration can be used to determine average length of transaction. Duration calculation was described in the chapter on risk management. In short, duration weighs all the cash flows by the time at which they occur.
- Median life – the simplest way to determine actual term of transaction is to use the time at which half of the principal will be repaid according to schedule. For evenly amortizing loans, this would equal half of the transaction life. This method is very popular.

These methods provide quite similar results, however for long term instruments in a variable interest rate environment, results may differ. The actual term determined by one of the methods is used not only to determine the transfer price, but also for other purposes, like assigning corrective margin. E.g. using the median life method, a liquidity margin is assigned to mortgages based on half of their contractual lives.

#### **Prepayment option adjustment**

Most products provide the customer with an ability to of early principal payment. Loans can be prepaid and deposits withdrawer ahead of schedule. This risk is essentially left together with interest rate risk in the FTP portfolio. Prepayment risk is mostly significant for long term fixed rate loans. At loan origination, funds are raised for the expected life of transaction, at market prices for that term. Prepayment results in a need for a reverse transaction for part of the initial amount, but at now prevailing rates. FTP centre isn't able to control that risk, therefore branches should be charged with the cost of such transactions. However, charging a marked based penalty for prepayment or withdrawal would result in significant costs for business lines in periods of interest rates decline, since prepayments are massive in such economic environment. A better method of including potential prepayments in FTP system is to calculate the value of prepayment option owned by customers on various products. This option value is then added to the transfer pricing rate (or subtracted for deposits), similarly to other corrective margins.

#### **5.4 FTP PORTFOLIO MANAGEMENT**

Fixing the interest margin on business transactions entails a transfer of interest rate and liquidity risk to the FTP portfolio. The portfolio is managed by ALCO (Assets and Liabilities Management Committee), however on a daily basis, the Treasury department administers the total pool of transactions.

The place of FTP portfolio in the overall bank structure is illustrated in the Figure 5.

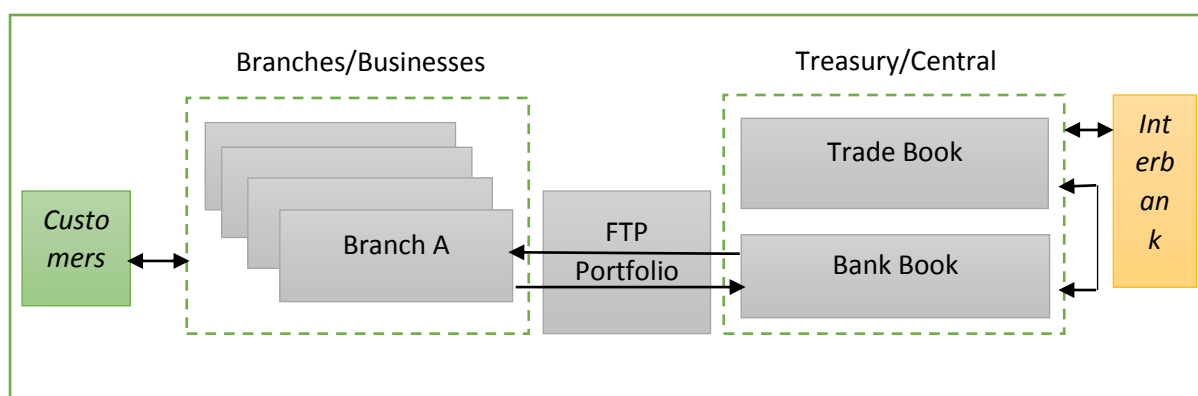


Figure 5. Business Units in a Bank

Treasury, under the guidance of ALCO, manages the risk of FTP portfolio. Treasury is divided into Trade book, which trades with the market both for profit and to close Bank book transactions and Bank book, whose task is to manage the surplus or lack of funding. Treasury is able to borrow and lend on the market, in order to ensure the necessary level of funding. Transferring all FTP transactions to treasury systems provides detailed information on interest rate and liquidity risk of the entire balance sheet. These risks are materialized in the overall FTP portfolio due to bank's funding mismatch, caused by sources and uses of funds having unmatched reprising terms, amounts, or origination dates. The mismatch is mainly composed of volume and term differences, the latter being more significant. The maturity mismatch component is a result of differences between the shorter and the longer tenor side of balance sheet. As is often the case, financing long term fixed rate loans with shorter term deposits conveys a risk that should interest rates rise, interest cost on deposit will increase while interest income on a loan will remain unchanged.

However, loans and deposits are valued in financial reports using accrual accounting – meaning that they're presented in their nominal value, adjusted only for credit risk. Their book value doesn't reflect the potential influence of market rate changes on future profits. On the other hand, most instruments in treasury department (derivatives and trade securities) are marked to market (MTM) – their price is recalculated constantly in order to reflect how current market rates influence their value. In marked-to-market valuation methodology, the value of an exemplary loan would be influenced by changes in interest rates to the extent of predicted changes in future profits. Therefore, during the transfer of FTP transactions to Treasury, the valuation method is changed. MTM valuation of loans and deposits allows to measure interest rate and liquidity risk on the entire bank's product portfolio. Translating all FTP transactions to MTM is possible provided there's complete information on reprising and maturity characteristic of all transactions. This is available only in Matched Rate Methodology of FTP.

To allow for interest and liquidity risk management, all the transactions in FTP portfolio need to be observable by the Treasury department. This can be done provided that the treasury IT system responsible for following market transactions is able to communicate with databases on FTP transactions. Treasury can then manage all deals and close them with market when necessary. It doesn't mean all transactions are paired off against one another or on the market. The goal of A&L management isn't to eliminate all funding mismatches but to control them, since they are a source of bank's profits. In order to fulfil this goal, ALM uses a number of

techniques of interest rate risk management that accompany market-value accounting, e.g.: duration analysis or cash-flow analysis. For liquidity management, analysis of cash flows is combined with gap analysis, scenario analysis can also be used.

## **5.5 VARIATIONS OF MATCHED RATE METHODOLOGY**

The MRM is the only method that allows proper transfer of interest rate risk from business, leaving there a fixed interest margin. However, for foreign transactions, currency risk remains in the branch. Some variations of MRM try to overcome this problem, by setting a fixed exchange rate to transactions based on their origination date.

This doesn't account for the fact that each CF from or to customer in foreign transactions is priced by a different exchange rate. Therefore, a reprising exchange rate, similar to reprising interest rate should be assigned to such a transaction. However, the exchange rate issue is rarely covered by FTP systems, since it isn't necessary for risk management. Banks typically keep a very low open currency position, not taking much risk in that area (while they're open to interest rate risk).

Another approach modifies the matched rate methodology by using its fixed rate variation for all transactions. The matched maturity rates are assigned to all deals, including those based on float or internal rates. This approach is derived from a concept, that it's the transaction term, not the rate reprising characteristic that indicates its cost of financing. This method of including cost of liquidity is alternative to the corrective liquidity margin, used in regular FTP methodologies.

## 6 INTRODUCTION TO TRANSFER PRICING

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### 6.1 WHAT IS TRANSFER PRICING?

This introductory chapter intends to give a brief outline of the subject of transfer pricing and addresses the practical issues and concerns surrounding it, especially issues faced by, and approaches taken by, developing countries. Many of the issues discussed in the introduction are dealt with in greater detail in later chapters.

Rapid advances in technology, transportation and communication have given rise to a large number of multinational enterprises (MNEs) which have the flexibility to place their enterprises and activities anywhere in the world.

The fact is that a significant volume of global trade nowadays consists of international transfers of goods and services, capital (such as money) and intangibles (such as intellectual property) within a MNE group; such transfers are called “intra-group” transactions. There is evidence that intra-group trade is growing steadily and arguably accounts for more than 30 per cent of all international transactions.

Furthermore transactions involving intangibles and multi-tiered services constitute a rapidly growing proportion of an MNE’s commercial transactions and have greatly increased the complexities involved in analysing and understanding such transactions.

The structure of transactions within an MNE group (the component parts of which, such as companies, are also called “associated enterprises” in the language of transfer pricing) is determined by a combination of the market and group driven forces which can differ from the open market conditions operating between independent entities. Thus, a large and growing number of international transactions are no longer governed entirely by market forces, but by forces which are driven by the common interests of the entities of a group.

In such a situation, it becomes important to establish the right price, called the “transfer price”, for intra-group, cross-border transfer of goods, intangibles and services. Transfer pricing is the general term for the pricing of cross-border, intra-firm transactions between related parties. “Transfer pricing” therefore refers to the setting of prices at which transactions occur involving the transfer of property or services between associated enterprises, forming part of an MNE group. These transactions are also referred to as “controlled” transactions, as distinct from “uncontrolled” transactions between companies that, for example, are not associated and can be assumed to operate independently (“on an arm’s length basis”) in reaching terms for such transactions.

It follows that, with the need to set such prices being a normal incident of how MNEs must operate, “transfer pricing” by itself does not necessarily involve tax avoidance. It is where the pricing does not accord with applicable norms internationally or at domestic law that we are entering into areas more properly called “mispricing”, “incorrect pricing”, “unjustified pricing” or similar, and where issues of tax avoidance and evasion may arise. A few examples illustrate these points:

- Consider a profitable computer group in country A that buys “flash-memory drives” from its own subsidiary in country B: how much the parent country A company pays its subsidiary country B company (the “transfer price”) will determine how

much profit the country B unit reports and how much local tax it pays. If the parent pays below normal market prices, the country B unit may appear to be in financial difficulty, even if the group as a whole shows a reasonable profit margin when the completed computer is sold.

- From the perspective of the tax authorities, country A's tax authorities might agree with the profit reported at their end by the computer group in country A, but their country B counterparts may not agree - they may not have the expected profit to tax on their side of the operation. If the computer company in country A bought its flash-memory drives from an independent company in country B it would pay the market price, and the supplier would pay taxes on its own profits in the normal way. This approach gives scope for the parent or subsidiary, whichever is in a low-tax jurisdiction, to be shown making a higher profit by fixing the transfer price appropriately and thereby minimising its tax incidence.
- So, when the various parts of the organisation are under some form of common control, it may mean that transfer prices are not subject to the full play of market forces and the correct arm's length price, or at least an "arm's length range" of prices (an issue discussed further below) needs to be arrived at.
- Consider next the example of a high-end watch manufacturer in country A that distributes its watches through a subsidiary in country B. Let us say the watch costs \$1400 to make and it costs the country B subsidiary \$100 to distribute it. The company sets a transfer price of \$1500 and the subsidiary unit in country B retails the watch at \$1600 in country B. Overall, the company has thus made \$100 in profit, on which it is expected to pay tax.
- However, when the company in country B is audited by country B's tax administration they notice that the distributor itself is not showing any profit: the \$1500 transfer price plus the country B unit's \$100 distribution costs are exactly equal to the \$1600 retail price. The country B's tax administration wants the transfer price to be shown as \$1400 so that the country B's unit shows the group's \$100 profit that would be liable for tax.
- However this poses a problem for the parent company, as it is already paying tax in country A on the \$100 profit per watch shown in its accounts. Since it is a group it is liable for tax in the countries where it operates and in dealing with two different tax authorities it is not possible to just cancel one out against the other. Nor should it be made to pay the tax twice. So, the MNE can end up suffering double taxation on the same profits where there are differences about what constitutes "proper" transfer pricing.

The economic reason for associated entities charging transfer prices for intra-group trade is to be able to measure the performance of the individual entities in a multinational group. The individual entities within a multinational company group are separate profit centres and transfer prices are required to determine the profitability of the entities. Rationally, an entity

having a view to its own interests as a distinct legal entity would only acquire products or services from an associated entity if the purchase price was equal to, or cheaper than, prices being charged by unrelated suppliers. This principle applies, conversely, in relation to an entity providing a product or service; it would rationally only sell products or services to an associated entity if the sale price was equal to, or higher than, prices paid by unrelated purchasers. Prices should on this basis gravitate towards the so-called “arm’s length price”, the price which two unrelated parties would agree to a transaction.

Though the above explanation of transfer pricing sounds logical and innocuous, arriving at a “proper” transfer price is a complex task because of the difficulty in identifying intangibles and services which were transferred or provided and the price at which they are to be valued. For example, intangibles could be of various different types such as: industrial assets like patents, trade types, trade names, designs or models, literary and artistic property rights, know-how or trade secrets. Sometimes such intangibles are reflected in the accounts and sometimes not. Thus, there are many complexities involved which have to be taken into account while dealing with transfer pricing in cross-border transactions between MNE entities.

Transfer pricing is an economics term so it should be useful to see how economists define it - in business economics a transfer price is considered as the amount that is charged by a part or segment of an organisation for a product or service that it supplies to another part or segment of the same organisation.

## 6.2 TRANSFER PRICING IN THE EU CONTEXT

In our view, the EU's approach to transfer pricing taxation accounting comes from the European and American taxation system therefore carries with it more loyal accounting system. Even to the extent that many European countries have different tax system, in particular, and tax rates. This can be seen by bringing its definition from the site of the EU (see below source from

[http://ec.europa.eu/taxation\\_customs/taxation/company\\_tax/transfer\\_pricing/index\\_en.htm](http://ec.europa.eu/taxation_customs/taxation/company_tax/transfer_pricing/index_en.htm)).

Transfer pricing refers to the terms and conditions surrounding transactions within a multi-national company. It concerns the prices charged between associated enterprises established in different countries for their inter-company transactions, i.e. transfer of goods and services. Since the prices are set by non-independent associates within the multi-national, it may be the prices do not reflect an independent market price. This is a major concern for tax authorities who worry that multi-national entities may set transfer prices on cross-border transactions to reduce taxable profits in their jurisdiction. This has led to the rise of transfer pricing regulations and enforcement, making transfer pricing a **major tax compliance issue**.

According to international standards individual group members of a multi-national enterprise must be taxed on the basis that they act at arm's length in their dealings with each other. This arm's length principle is found in article 9 of the OECD Model Tax Convention:

"[When] conditions are made or imposed between ... two [associated] enterprises in their commercial or financial relations which differ from those which would be made between independent enterprises, then any profits which would, but for those conditions, have accrued

to one of the enterprises, but, by reason of those conditions, have not so accrued, may be included in the profits of that enterprise and taxed accordingly."

In The Company Tax Study (See Appendix PPDF format file also on disc, pp.1-463; [SEC\(2001\) 1681](#)  (1.96 Mb)), the Commission identified the increasing importance of transfer pricing tax problems as an Internal Market issue: although all Member States apply and recognize the merits of the OECD "Transfer Pricing Guidelines for Multinational Enterprises and Tax Administrations", the different interpretations given to these Guidelines often give rise to cross border disputes which are detrimental to the smooth functioning of the Internal Market and which create additional costs both for business and national tax administrations.

More information on the tax problems involved and solutions proposed can be found on the following web pages.

- the [Transfer Pricing Forum](#), an expert group, created by the European Commission in 2002 in order to reduce the high compliance costs and to avoid (or facilitate the elimination of) double taxation that easily arises in the case of cross-border inter-group transactions;
- [Transfer Pricing and the Arbitration Convention](#), a specific EU instrument on the elimination of double taxation in connection with the adjustment of profits of associated enterprises.

## **7 INTRODUCTION IN TP BANK'S SECTOR**

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### **7.1 TRANSFER PRICING METHODS IN THE BANKING SECTOR**

In relation to the circuit of monetary resources in the bank financial resources are depersonalized character, since receiving the money funds to the credit organization from different sources monetary resources are redistributed between subdivisions in accordance with the current needs of the bank.

However, to attract financial resources have a different price for a commercial bank, because for evaluating the profitability of individual subdivisions and profitability of banking products or services necessary to determine the real prices at which the subdivision get resources. Application of transfer pricing for resources redistributed in the bank allows us to find the price of resources for the units the actual cost efficiency and profitability of the bank units.

Transfer cost of resources describing the direction movement of funds in the bank and contributes to good overflow of resources between units, becoming a means of liquidity management in the bank.

In parallel with the redistribution of resources between subdivisions of a credit institution is a redistribution of cash risks by dividing commercial and financial margin of the bank. In particular there are dividing a credit risks of stationing subdivision and fundamental risks (interest rate and liquidity risk) managed by the Treasury. Thus, transfer pricing is considered to be part of bank risk management system.

Transfer prices are taking over the functions of management accounting and allow to analyze the effectiveness of the separate subdivisions of the bank and banking trends.

In international practice the credit institution uses a number of groups of transfer pricing methods on the resources: expert evaluation methods, market methods and methods of costs determining. (In more detail, we consider these methods in Chapter 5.)

The meaning of Expert evaluation method is the administrative purpose of the transfer price or the main regulatory body the bank's management, responsible for the management of bank resources (usually a division of management for Asset and Liability).

Using this method is economically substantiated and implemented with the objectives of subdivisions contributing to maximizing the profitability of the bank as a whole.

It should be noted that it is inappropriate to use calculated using transfer pricing profit margin as the motivation of managers, due to the potential desire financial clerks to distort the transfer prices.

When making managerial decisions on matters of material stimulation is advisable based not only on the characteristics of margin, calculated using cost-reasoned transfer prices, but also take into account the characteristics that are describe the position of a credit institution in the market of the relevant goods, and other goals of development and the specificity of the bank. Briefly discuss the main TP methods.

### **7.2 MARKET PRICING METHODS**

Market pricing methods consist in the fact that as transfer pricing are perceived a quotations on the analogous resources in the foreign market.

The use of market methods can be when effective a financial markets and availability of free transactions implementation relevant units in the foreign market.

Despite the relative simplicity in use, foreign banks departed from the use of market-based methods for the following reasons.

**First**, in practice, the simultaneous execution of the above criteria is almost impossible, and units of banks may be administrative or scientific and technical limitations of the transactions on the foreign market.

Solutions which does not satisfy a conditions of optimality on matters for the volume of manufacture of the product, leading to a loss of benefits, even big banks, setting interest rates on deposits, on the basis of which may be attributed the transfer prices.

For smaller banks, which may not act on process of establishing the above mentioned rates, the use of market-based approach in determining transfer prices results in losses.

**Second**, when applying this method, we need to find the financial market sector, the characteristics of which accepted as transfer pricing resources.

Including if the given market is considered an effective and shows signs of competition, in it are likely frequent fluctuations in interest rates, which complicates the process of transfer pricing.

### 7.3 THE COSTS METHOD.

Depending on the costs applied to decide transfer price will recognize: the weighted average cost method liabilities, general fund method, the method of separation fund resources, cost recovery method, the method of weighted average maximum costs.

Using the weighted average cost of liabilities to determine the transfer price leads to the equalization in external sources of resource mobilization.

Notwithstanding the ease of use and the possibility of motivation of attracting subdivisions in attracting low-cost short-term liabilities, this method does not control a spread and assess impact of liabilities. Is recommended to apply it to analyze the bank's actually earned profits.

The principle of general fund implies the unity of transfer price for attracting and placing bank's subdivisions. The method is simple to use, but does not allow to analyze the effectiveness of the subdivisions that implement the different active bank transactions.

Excluding this, the acquisition or realization of resources for the same value for all subdivisions does not contribute to motivate managers of units.

At the same time alignment of disproportions in wages through the establishment of coefficients for bonus payment in subdivisions does not guarantee rational management because transfer pricing does not implement its own major functions - risk management and profitability evaluation of units.

The most effective method of transfer pricing, which is based on the principle of **division of fund of monetary resources**.

This approach involves the transfer price differentiation in the financing of different types of assets at the expense of different maturity liabilities. Implementation of this approach makes

bank closer to the golden rule of bank liquidity, when the highly mobile liabilities are invested in highly liquid assets and urgent assets are funded by urgent liabilities.

A method for dividing of fund of resources is more difficult to use, because it requires increasing the bank's analytical apparatus, but it allows us to control not only market risk, but also obligations, and still provide performance evaluation of units.

The method of cost is means a setting recovery transfer pricing of resources based on operating costs to raise of the resources plus minimum possible margin.

This formation method of transfer price stimulates any involvement of resources without considering the needs of the credit institution at a certain time.

The selection of type of transfer pricing is dependent on the following conditions: the level of independence of subdivisions, the values of market competition, the level of the ratio of goals and objectives of subdivisions to goals and objectives of the bank, the relationship between demand and supply of funds in close prospects and evaluation of bank's subdivisions tasks.

#### **7.4 TRANSFER PRICING**

Let us recall that international transfer pricing problem originated in the early 1960s, on a wave gaining independence a number of countries in Asia and Africa.

Then the direct methods of economic plunder of countries - ex colonies by companies from metropolitan countries are gone, and there was a need for more delicate methods of tax-free repatriation of the profits from the new independent states.

Transnational companies began to apply purposely understated prices for raw materials delivered from these countries to world markets.

Subsequently, the scheme was supplemented by the creation of intermediary firms in small, usually in the islands states, that have attracted foreign companies and banks for registration on its territory very tempting financial conditions (reduced rates or even complete abolition of taxes). As a result, the loss in tax revenues began to bear themselves developed countries.

The first country to adopt the special legislation for regulating detail transfer pricing issues, have become the U.S. (mid-1960s). However, the fact that in this country were carried out activities or multinational companies, as well as considering the fact that the relevant U.S. legislation significantly different from legislation in other interested countries, has prompted many governments to look acceptable for most countries the principles and methods of determining the order of the tax regulation transfer pricing.

This example was followed by other countries, especially companies of which were active in the markets of developing countries - in the beginning the UK and France, and then Canada, Japan, Australia, the Netherlands.

And already in the 1976 the issue of the transfer legislation has been settled at international level.

In particular, the primary international instrument are: Declaration of countries - participants of the OECD on International Investment and Multinational Enterprises on June 21, 1976, guiding explanations OECD 1979 - OECD Report "Transfer Pricing and Multinational Enterprises", which was emphasized the danger of applied by many multinationals manipulation "negotiated prices" in order to circumvent the tax laws of countries in of which they operate.

Formally proclaimed of the OECD the main objectives are:

1. Providing high economic growth and high employment in the Member States;
2. The economic and social welfare in the Member States through coordination of their policies;
3. Encourage and coordinate the efforts of the OECD members in support of developing countries.

In OECD attach exceptional importance cooperation with other international organizations.

In OECD activities involves representatives of the European Commission in accordance with the protocol between the two organizations. Organization for Economic Cooperation and Development maintains relations with the IMF, World Bank, EFTA, ILO, FAO, and other organizations to avoid duplication of their work.

A fundamental principle of the OECD Guidelines on transfer pricing is the principle of "arm's length» (**arm's length principle**). It consists of the following:

Interdependent companies operate "hand in hand" in their relations apply prices that are differs from the market. Independent companies are located from each other "at arm's length", using prices that are influenced by market factors.

A State, in its turn, corrects the non-market prices, as if the company were independent (were "arm's length").

Should be noted that in most countries the tax legislation contains norms that secure the principle of "arm's length" and its application procedure.

When analyzing the non-market prices are used methods for determining the price "at arm's length" (a method of "comparable uncontrolled price" and methods based on the evaluation of profits).

If there is sufficient and reliable information an optimal method is considered "comparable uncontrolled price method." This methodology transfer pricing was elaborated over the decades and in many cases has reached a high level of complexity.

We consider the pricing legislation in some countries.

Core legislative instruments in the United States are: Internal Revenue Code, Provisional instructions to the Code, the Tax Code of the United States «IRC».

Control of price formation is as follows:

- control of the competent authorities interdependent persons by separation, distribution of gross income, rebates, allowances, if the authority determines that such distribution involves tax evasion;
- verification of cost saving in the case of actions in terms of jurisdiction, characterized by low costs;
- verification of methods determination of prices, not with the principle of "arm's length» (arm's length principle);
- analysis of financial ratios of the taxpayer with statistics data (SOI);
- verification of methods for the determination of prices (comparable uncontrolled price method, the resale price method, the method of "cost plus" method of profit distribution, the method of comparing profits).

The authorized body shall be entitled to analyze the distribution of gross income if revenues exceed \$ 10 million per year.

In the UK, the basic law is the Law on Income Tax on individuals and corporations (Income and Corporation Taxes act).

Control of price formation is as follows:

- control of associated persons (person associated with a company that controls another company's entity, either directly or indirectly owns 30% of shares, borrowed capital);
- control of interested party transactions;
- verification of methods determination of prices, not conforming to a principle "arm's length» (arm's length principle).

In Germany, the main acts are the Regulations on tax control, the Law "On taxation for foreign relations."

Price formation control carried out through the following activities:

- Control methods for determining of conformity the prices (comparable market price method, the method of further realization, the cost method);
- verification of the amount of trade between related parties (less than 5 million euros and the total annual amount of other transactions does not exceed 500 thousand euros);
- evaluation circle of interdependent persons (directly or indirectly involved in 25% of another company, a person could have an impact on the terms of the agreement transactions made by another person, the presence personal interest in the transactions);
- comparison of controlled transactions between related parties with the same transactions between independent third parties, possibly carried out at more or less the same conditions;
- determination of the price "transfer package" is carried out on stage of hypothetical proportionality.

It should be emphasized that in the developed countries, the control of under transfer pricing for intra-trade is almost never used.

Of course, the abuse of such practice among taxpayers are quite common, but in most countries it is legalized (through the concept of consolidated taxpayer, taxpayer's household, etc.) or leveled by other means.

Among the last possible to allocate unitary taxation system applied at the level of regional authorities in several countries; taxation at the principal place activity of the company (regardless of the place of its registration); natural forms of taxation (such as the terms of production sharing agreements); order of taxation for each area activity of the company, etc.

## 8 BASIC TRANSFER PRICING THEORY

The previous chapters presented the basic concepts in banking, including functions and types of banks and the role of central bank. For each model of banking, different FTP system is relevant. Further on, financial markets were described with emphasis on the prevailing interest rates, which are most commonly the basis of transfer price formulas. Next, the need for risk management, including interest and liquidity risk, was brought into attention. The risks described are taken into account by the most sophisticated FTP models. This chapter introduces transfer prices and describes fund transfer pricing systems. First of all, the need for and objectives of FTP are explained and transfer prices are defined. Secondly, different FTP methodologies are presented, beginning with simple ones and moving to the ones with increased complexity. Along with explaining methodology, arising issues are outlined: the choice between one transfer prices or many, calculating TP internally or basing on market rates, using product pools or matching individual transactions.

### 8.1 INTRODUCTION TO FUND TRANSFER PRICING

To begin with, it is necessary to understand the need for FTP, its objectives and its definition, along with the definition of transfer price. This is the content of the following subchapters.

#### The need for fund transfer pricing

Fund transfer pricing system in general allows the decomposition of interest income. As shown in an exemplary bank's income statement, see Table 6, interest constitutes a large part of a bank's profit.

Table 6. BOC Consolidated Income Statement Year ended 31.12.2013

| BANK OF CYPRUS GROUP                |       | Annual Financial Report 2013 |                                               |
|-------------------------------------|-------|------------------------------|-----------------------------------------------|
| Consolidated Income Statement       |       |                              |                                               |
| for the year ended 31 December 2013 |       |                              |                                               |
|                                     | Notes | 2013<br>€000                 | 2012 (restated<br>and<br>represented)<br>€000 |
| <b>Continuing operations</b>        |       |                              |                                               |
| Turnover                            | 3.11  | <b><u>1.966.621</u></b>      | <u>1.859.797</u>                              |
| Interest income                     | 6     | <b>1.660.461</b>             | 1.415.611                                     |
| Interest expense                    | 7     | <b><u>(661.030)</u></b>      | <u>(713.835)</u>                              |
| Net interest income                 |       | <b>999.431</b>               | 701.776                                       |
| Fee and commission income           | 8     | <b>193.458</b>               | 191.566                                       |
| Fee and commission expense          | 8     | <b>(24.639)</b>              | (18.881)                                      |

|                                                                                      |    |                           |                           |
|--------------------------------------------------------------------------------------|----|---------------------------|---------------------------|
| Net foreign exchange (losses)/gains                                                  | 9  | <b>(5.148)</b>            | 24.948                    |
| Net gains/(losses) on financial instrument transactions and disposal of subsidiaries | 10 | <b>10.589</b>             | (27.899)                  |
| Insurance income net of claims and commissions                                       | 11 | <b>64.956</b>             | 62.972                    |
| Other income                                                                         | 12 | <b><u>(64.282)</u></b>    | <b><u>(15.099)</u></b>    |
|                                                                                      |    | <b>1.174.365</b>          | 919.383                   |
| Staff costs                                                                          | 13 | <b>(442.797)</b>          | (293.556)                 |
| Other operating expenses                                                             | 14 | <b><u>(277.196)</u></b>   | <b><u>(260.553)</u></b>   |
| Profit before impairment of loans and advances and goodwill and intangible assets    |    | <b>454.372</b>            | 365.274                   |
| Provisions for impairment of loans and advances                                      | 46 | <b>(1.067.345)</b>        | (1.339.269)               |
| Impairment of goodwill and intangible assets                                         | 15 | -                         | <b><u>(359.746)</u></b>   |
| <b>Loss before share of profit of associates</b>                                     |    | <b>(612.973)</b>          | (1.333.741)               |
| Share of profit of associates                                                        | 55 | <b><u>1.885</u></b>       | <b><u>222</u></b>         |
| <b>Loss before tax</b>                                                               |    | <b>(611.088)</b>          | (1.333.519)               |
| Tax                                                                                  | 17 | <b>5.184</b>              | 43.463                    |
| <b>Loss after tax</b>                                                                |    | <b>(605.904)</b>          | (1.290.056)               |
| <b>Discontinued operations</b>                                                       |    |                           |                           |
| Loss after tax from discontinued operations                                          |    | <b>(1.455.604)</b>        | (932.290)                 |
| <b>Loss for the year</b>                                                             |    | <b><u>(2.061.508)</u></b> | <b><u>(2.222.346)</u></b> |

Source: Bank of Cyprus, Financial information, Annual report 2013, [www.bankofcyprus.com.cy](http://www.bankofcyprus.com.cy)

Net interest income is the largest component of a typical commercial bank's income (followed by fees and commissions) and can constitute up to 80 percent of a bank's revenue. On the income statement, this component is decomposed into interest income and interest expense for the entire bank and no further analysis is available.

Decomposition of net accounting interest result into products shows that all loans and other assets generate interest income, while deposits and other liabilities carry interest expense. Judging product effectiveness using this measure would result in evaluating all loans as profitable and all loans as causing losses. This is simply wrong, since giving a loan to customer requires funds that usually come from deposits placed by another customer. Each deposit has a value to the bank as a source of loan activity, and each loan bears the cost of using funds from that source. FTP puts an internal price on deposits, deducted as cost from loans.

Not only does transfer pricing allow to calculate profitability of loans, deposits and other products. It also enables measurement of interest income by branches, business lines and

customers. Measuring profits on different levels allows the internal comparison of effectiveness, evaluation and appraisal.

Monitoring the participation of different sources in the creation of overall profits is one of the elements necessary to manage a bank. It allows to make rational decisions about resource allocation, cost control and level of profitability. Information on product and customer profitability creates the basis for pricing decisions, and indicates which products and customers are the most cost-effective for the bank. Making sound business decisions based on correctly calculated profitability becomes more important with increasing competition in financial services and in the environment of low but highly variable interest rates.

Faulty FTP systems can even cause bankruptcy, as was the case of Franklin National Bank and many other financial institutions in USA in the '70s.

### **Definition and objectives of a FTP system**

In short, a FTP system “measures the value of products furnished by a profit centre to other responsibility centres within a company. Internal exchanges that are measured by transfer prices result in (1) revenue for the responsibility centre furnishing (i.e. selling) the product and (2) costs for the responsibility centre receiving (i.e., buying) the product.”

Basing on the definition above and on the requirements enumerated in the previous subchapter, a list of objectives of an FTP system can be built. A good FTP system should enable the following:

- Allocating interest margins to assets and liabilities, in order to reflect cost of funding.
- Determining profitability of products and customers in order to boost changes in assets and liabilities structure that lead to increased total profits. Transfer prices set a minimum required level of profitability for products, indicating which of them bring more gains to the bank.
- Evaluating business decisions in organization basing on the contribution of branches and business lines to overall profits. To fulfil this goal, it is necessary that decision makers are held responsible for the results that they are able to control.
- Control of interest rate and liquidity risk by transferring it to the unit responsible for interest rate risk management. Overall market risks can only be effectively managed on the central level, by treasury department and by ALCO.

Some of these goals were mentioned above, other will be explained in more detail in latter parts of the thesis, as various FTP methods are presented.

### **Defining transfer prices**

Each fund transfer pricing system relies on transfer prices (TP). A transfer price is an internal rate of interest used to calculate transfer income or cost due to an internal flow of funds in a financial institution. It is very similar to actual rate of interest paid or received on a bank product, since it concerns the same transaction balance that the actual rate of interest does. As the actual accounting income received on a loan is calculated based on the interest rate, the internal transfer expense is calculated using the transfer price. For each loan, there's a transfer cost, whereas for each deposit, there's a transfer income.

The difference between interest rate and a transfer price is the interest margin, which allows to calculate the internal interest profit on a transaction. The actual method of assigning TP to a loan or deposit depends on the choice of FTP methodology.

### Bank products

There are a number of FTP methodologies available with different level of accurateness and complexity. These methods differ by their approach to transfer price calculation and by the level of assets and liabilities (A&L) decomposition that they allow.

Each bank product has different interest rate characteristic and maturity characteristics that are the basis of assigning transfer prices. The most popular products, building up most of an average commercial bank's balance sheet are: consumer loan, commercial loan, mortgage, credit card, line of credit, current account, savings account, term deposit. They differ by their maturity (average life), repayment schedule, interest rate type, etc. Table 7 presents the most typical characteristics of these products.

Table 7: Typical bank products' characteristics

| Product                | BS side   | Maturity  | Rate reprising       |
|------------------------|-----------|-----------|----------------------|
| <b>consumer loan</b>   | Asset     | 3mth-2yrs | fixed/Libor/Internal |
| <b>commercial loan</b> | Asset     | 0,5-5yrs  | Libor                |
| <b>mortgage</b>        | Asset     | 10-30yrs  | fixed or Libor       |
| <b>credit card</b>     | Asset     | 1-3yrs    | internal             |
| <b>line of credit</b>  | Asset     | Unknown   | internal             |
| <b>current account</b> | Liability | Unknown   | +/- zero             |
| <b>savings account</b> | Liability | Unknown   | internal             |
| <b>term deposit</b>    | Liability | 1day-2yrs | fixed or Libor       |

Source: Financial Times, Markets data

As the table shows, loans and deposits can have different maturities – varying from many years for a home mortgage loan, to even a day for an overnight term deposit. Some products don't have actual maturities, as their repayment doesn't follow a set schedule – e.g. funds on a current account are available to the owner at any point of time. Moreover, interest on products can be calculated by many methods. Term deposits can have a fixed rate, set at their origination and unchanged for their entire life. Many commercial loans receive interest based on a market reference rate, e.g. LIBOR 1M, which changes once every month for the whole life of the loan. Many products have rates set internally by bank authorities. Rate on a transaction is then changed whenever management decides to alter rates for the relevant product.

## 8.2 SINGLE POOL METHOD

Out of many FTP methods created to allocate interest margin to bank's assets and liabilities the most basic one is the single pool method. This method treats all transactions uniformly, putting them in one pool of funds. The providers of funds add to the pool, and the users take from it. Under this approach, the same one and only transfer price rate is assigned to all the loans and deposits. There's no difference in pricing products with various reprising and maturity characteristics. This is illustrated in Figure 6 using exemplary rates.

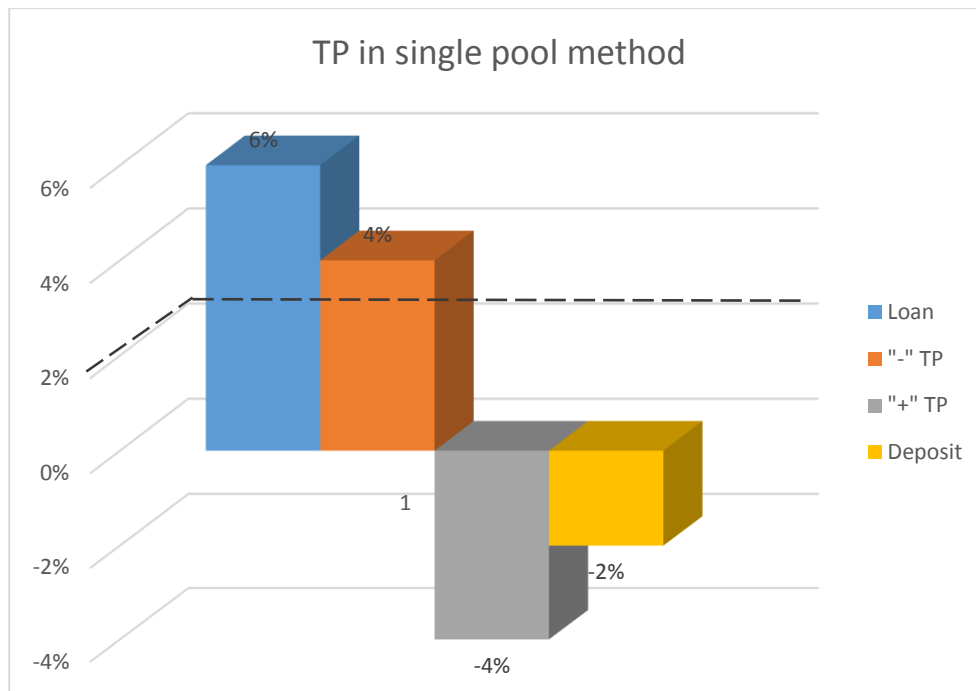


Figure 6. Transfer price in the single pool method

Source: OECD, *OECD Transfer Pricing Guidelines for Multinational Enterprises and Tax Administrations*, (2010), 2-nd edition, pp. 59-105.

#### **Advantages and drawbacks of single pool**

The single pool method is simple and easy to implement, without much investment in data systems. It doesn't require much know-how or buying expensive IT systems. In fact, FTP calculations for this method can be done by one person in a spreadsheet. Single pool allows for assigning average cost of funds to all transactions, giving a crude estimate of product or branch profitability.

It is good enough when a bank doesn't have detailed databases of transactions, and possesses product information only on balance sheet level. It is suitable for a small bank, with stable and undiversified sources of funds, financing its loans with deposits only. Also, the bank should be operating as a single unit, without many branches or business lines. Therefore it can be recommended for para-banks: savings and loan associations or credit unions. However, even for those institutions, single pool should only serve as an initial FTP system, consequently developed to a more detailed approach.

This method however has a number of drawbacks that make it obsolete for larger commercial banks with various products. These disadvantages include the following:

- Interest rate risk is not separated from credit risk and it cannot be transferred;
- Single TP makes it impossible to create managerial incentives to attract deposits without simultaneously providing disincentives to sell loans;
- A single rate values doesn't allow to differentiate transfer results according to the term structure of the portfolio;
- The method doesn't take into account the historical interest rates prevailing at the time of transaction origination;

- It doesn't allow fair measurement of managerial results.

### **Calculating internal transfer price**

In the single pool method, the transfer price is usually calculated internally – as an average interest rate on bank's products. At the moment of calculation, 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 A&L.

To calculate the transfer income or expense, the TP is multiplied by product balance. Different levels of product decomposition can be used for balance, either basing on BS or customer's account data. The balance can be calculated as a mean for a period of time. The actual length of the period should equal the frequency of TP calculation, which should be done repetitively, to account for interest rate variation.

Variations of average internal fund price calculation include computing it based only on interest expense on deposits or only on interest income on loans. However, choosing the mean deposit rate as the single TP favours loans (lower transfer expense) at the detriment of deposits, whereas choosing the average loan rate would have the opposite effect.

### **Net or gross balance**

Although the single pool method is very straight forward, it entails some issues and dilemmas that can be solved in different ways. First of all, the single pool method can be used on a net or gross basis for each branch or business line. It means that the transfer of funds can be employed either to all the deposits and loans in the unit (gross balance) or only to the net position of interest result.

In the net balance approach, a branch that uses more funds than it provides is charged only for the funds that it cannot rise by itself. This method relies on observation of the actual transfer of funds from and to the branch. If a branch lacks some funding, the central treasury department has to provide the financing, and invest the surplus in the contrary situation. Treasury does it usually by moving funds between branches, using the interbank market only as the last resort.

The gross balance method assumes that all the funds, not only the excess and lacking ones, are virtually moved through the treasury department. As a result, all the transactions are priced within the FTP system, contrary to only some in the net balance method. The gross methodology, although not reflecting real flow of funds, is preferable, since it allows better estimate of branch profitability and treats all transactions equally, disregarding the current net A&L position in the branch.

### **Double pool method**

As it was written above, the internal TP can be calculated basing on all products, or only on loans or deposits. Calculating the latter two rates allows a modification of the method by dividing the single pool into two separate pools. In the double pool method (also called split pools), loans are attributed the average loan rate, and the mean deposit rate is used as the TP for deposits. This approach allows better product profitability evaluation. Since all new deposits are valued in comparison to the current deposit portfolio, only the ones that increase overall profitability of deposits are attributed a positive interest margin. However this modification causes an imbalance between managerial and accounting results. The difference between TP for assets and deposits called the spread isn't attributed to any product, therefore it should be

classified to a distinct FTP portfolio. This is represented in the graph below, which is a slightly modified version of the previous one:

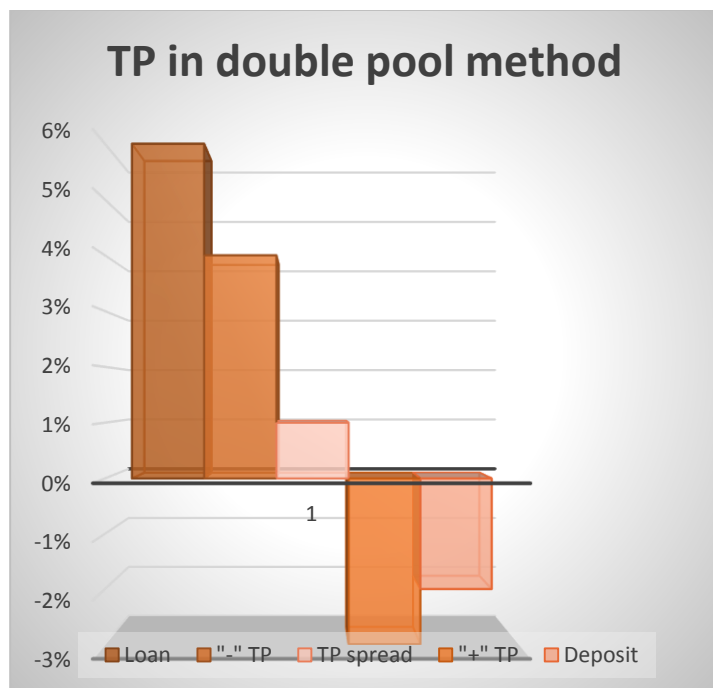


Figure 7. Transfer price in the double pool method

Source: OECD, *OECD Transfer Pricing Guidelines for Multinational Enterprises and Tax Administrations*, (2010), 2-nd edition, pp. 59-105.

Adding more prices that differ not only by BS side, but also by reprising characteristics and term structure of products, leads to a multiple pool methodology, which increases the size and complexity of FTP portfolio.

## 9 BANKERS TP ETHICS

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### 9.1 INTRODUCTION.

Banking profitability is ultimately induced by transfer pricing policy within each financial group. We deal with ethics of current prices to transfer the profitability between branches, the need for transparency in terms of information management systems, and delimitation from money laundering activities. Once a delimitation of ethics within these transactions is made, we identify the best method to face new challenges to better optimize the profitability of the bank, and the need for optimal taxation policy of economic environment. This chapter is using logics, financial behavior and introspection of banking market in Cyprus. The chapter emphasizes interest rate swaps as main instrument to handle day-to-day operations in completion of standard transfer pricing policy, in current days of interbank limits system deterioration. Once the ethics of transfer pricing being delimited, the used methods will generate trustworthiness of market participants for the benefit of interbank financing, and counterparties' awareness of banking behavior. Ultimately, the fiscal authorities all over the world will aware the importance of the measures within their capability of rising taxes, by imposing optimal taxation, comparable at international level.

### 9.2 TRANSFER PRICING METHODS AGAINST THE ETHICS OF THEIR APPLICATION FOR NATIONAL ECONOMIES.

From a corporate strategy perspective, a banking company wants to keep revenue in the local offices where revenue is being created; this will serve as an incentive to management who bear financial responsibility for local office operations. Organization for Economic Cooperation and Development (OECD) is revising and updating key elements and provisions of its transfer pricing guidance; under these circumstances there are new or proposed disclosure requirements; these will increase the transparency of intercompany transactions and their transfer pricing risks. We denote the role of financial authorities, the movement of funds related to willingness to keep funds where these have been created, and a need for transparency. Transparency is meant to proper judge the ethics of transactions and increase trustworthiness of market participants.

In chapter 3 and 4, we have already considered the transfer pricing methods. Let us consider the methods in terms of reviewing the business ethics of banking institutions.

Prior to selecting the best transfer pricing method, a summary of these methods is set forth as follows: Comparable Uncontrolled Price method (CUP); Resale Price method (RP); Cost Plus method (CP); Transactional Net Margin method (TNM); Profit Split method (PS). Comparing these methods, CUP is assuming taking into account a reference (benchmark), independent to company, since RP is going to use a current market price, which is a counterparty based price transaction. CP method is trying to cover the historical cost and could not be realistic in times of market price decreases. TNM method is an agreed price and could derive from incapacity to practice a CP method in times of market price decrease. It is based on fairness and term structure of yield curve. Profit split method is a matter of ethical and uniform market conditions. Each of these methods could be ethical, if proper invoked in market conditions. Interest rate swaps are subject to CUP and TNM, if proper applied and to RP method when

specific market conditions are invoked. The ethics of Resale Price method is motivated by extended desire to transfer the profitability to low tax fiscal authorities.

The methods of determining an appropriate price for sophisticated financing techniques (other than long term inter-company loans), such as discounted loans, and swaps could be fairly analysed. Interest rate swaps should consider the interest rate and specific risk involved in interest rate composition, since discounted loans should take into consideration proper yield curve and specific risk. These methods should be documented, whatever will be, transparently presented to be debated, and further improved. If not, there are reasons to believe that unfairly margins are applied to cover unjustified risks and take advantage of transfer pricing policy. These transactions should be in line with uniform transfer pricing policy system for other types of interbank accounts. For consolidation purposes, the interbank accounts are hedged considering a Profit Split method. The using of this method should be declared as part of transfer pricing policy before using, otherwise the differences should be proper emphasized to determine the effective transfer price.

One of the most controversial and often least understood operations of multinationals, transfer pricing, can be used by multinationals to maximise their profits by tax avoidance and by obtaining tax rebates; additional profits come from tax avoidance; in other words it is possible for a multinational company to minimise its liability for corporation tax by transfer pricing; this is legal until governments legislate to prevent this practice. Lacking the legal framework, we raise the issue of ethics, and having a proper framework, we raise the issue of proper implementation and documentation of operations to be fully transparent for the fairness in the market.

Having the methods in mind, and drivers, such ethics, transparency, and motivation, we raise the question of most appropriate method to be used, that is CUP or transactional Profit (net margin).

Some transfer pricing regulations have been enacted with a view to provide a statutory framework which can lead to computation of reasonable, fair and equitable profit and tax so that the profits chargeable to tax do not get diverted elsewhere by altering the prices charged and paid in intra-group transactions leading to erosion of national tax revenue. This issue is encompassing the core driver of behaviour and future ethics behind transfer pricing. In fact, and optimal taxation policy is not giving room to unethical behaviour. There is a tendency of multinational companies to over-report income in jurisdictions that impose heavy penalties. This is in correlation with highly disclosure needed according to OECD. Tax harmonization is categorically undesirable because taxpayers are unable to benefit from better tax policy in other nations. Consequently, the transfer pricing will always exist, and ethics behind it always be a subject under discussion.

While transfer prices may be set for purely internal reasons, there are often strong external motivations to engage in transfer price manipulation (over/under invoicing), the ethics of transfer pricing focusing on two different views: moral ethics and tax ethics. There are proposals to changes in accounting standards and global norms to reduce abusive transfer pricing, because governments do not believe that transnational companies set their transfer prices fairly, but rather engage in widespread transfer price manipulation. In other words, national governments are specifically concerned about situations where aggressive transfer

pricing manipulation focused on tax or regulatory minimization moves “over the line” into abusive transfer pricing, which is defined as illegal or fraudulent transfer pricing.

### **9.3 IS ETHICS IS THE DRIVER WE SHOULD HAVE IN MIND?**

National governments concerns denote the ethics in transfer pricing is a major issue of transnational companies, the banking companies having particular issues due to complexity of pricing the financial instruments and operations. A way to minimise the interpretations is using of expert system modules. In this respect there are raised issues for integration of transfer pricing policy into the Management Information Systems environment, and concerns for advantage of the expert system approach. Funds transfer pricing programs are analysis tools that can be used to help a bank measure its profitability in different ways, allowing management to compare the profitability of different product lines within the company. Banks had been obliged to find new ways to measure and evaluate the performance of different lines of business; the result of these innovations in management accounting was that banks succeeded in creating risk-based performance standards for lines of business, so as to avoid an uninspired allocation of resources to risky businesses that may appear superficially attractive. With all these efforts there is place for proper dissemination of technical approaches and practical implementation and transparency against auditors and public authorities. Ethics is the driver we should have in mind due to unwillingness to tax harmonization as above mentioned.

An overarching principle for defining economic transfer prices employs a market-based pricing approach that equates the market value of an instrument with the present value of the cash flows. High-value fund transfer pricing systems tend to reflect the following principles: all assets and liabilities must be transfer-priced (reporting units cannot simply transfer-price net positions); a consistent approach should be applied to interest rate risk measurement, risk-adjusted performance measurement, and customer product pricing; transfer rates should be based on cash market interest rates; funds transfer rates should be applied to individual transactions based on each maturity, re-pricing, and “vintage” assumption; funds transfer pricing assignments should last until final maturity; all instruments should receive a “locked-in” spread for each new transaction; the rate assigned should remove basis risk; when instruments have embedded options, an option cost over credit should be included in the assigned rate.

The difference between interest rate and a transfer price is the interest margin, which allows calculating the internal interest profit on a transaction. Fund transfer pricing is fundamental to evaluate the profitability of deposits and loans. Following the global banking crisis, there is needed rationing on the interbank market, creation of a Basel III contingency liquidity buffer, and necessity to adjust fund transfer pricing to the credit riskiness of specific assets of the bank; as well, there is needed to include a liquidity premium in the case of long-term funding, and finally a consistent methodology to incorporate the credit spread

The interest rate swaps are done between banking companies, and between parent company and local branches. The floating legs, fairly, should use the basis risks and specific risks of counterparties. Simply ignoring the specific risks could generate higher spreads between the paying amount (fixed or floating), and receiving amounts (floating). Resale Price method is considering new basis risks and specific risk from one day to another. An ethical approach could determine the splitting of transaction into initial forecasted terms and disclosure, and

future effective conditions, during intermediary valuation according to residual maturity forward price. The corollary consists of operations description, motivation (hedging, transfer pricing or speculative), criteria, standard pricing rules and principles, deviation criteria based on market new conditions, and disclosure activities. A proper determination is subject to relevant taxation of transferable funds. Under current blocking of interbank limits due to financial crisis, the interest rate swaps is a tool to surpass the inexistence of deposits limits on long term maturities, involving higher risk. The covering of longer maturities needs intensive dealing on overnight transactions to surpass this inconvenient. Under this framework, the parent company is establishing the transfer pricing policy for its own benefit, if taxation is higher on local markets. Authorities have two alternatives: to tax reasonable these kinds of transfers or modify the full income taxation policy to diminish the funds transferring activities. Internal auditors can help evaluate effectiveness of corporate policies regarding international transfer pricing. International transfer pricing is a major issue for multinational corporations, as transfer pricing is a key element in corporate taxation strategies. Transfer pricing done correctly, can improve the overall success and value of an international company. Transfer pricing is not an exact science but does require the exercise of judgment on the part of both the tax administration and the taxpayer. Auditors are the people with necessary expertise to judge the fairness and ethics of transfer pricing policy to proper expose the company in terms or corporate behaviour and communication.

Competition has forced banks to apply developed funds transfer pricing systems. Transfer pricing practices are responsive to opportunities for determining values in ways that are consequential for enhancing private gains, and thereby contributing to relative social impoverishment, by avoiding the payment of public taxes. Under the umbrella of opportunity, the ethics is a matter of correct identification and assuming of market arbitrage and unconventional structuring of transactions. Offshore finance centres facilitate the transfer with its attractions of taxation and foreign exchange exemptions, exploited by non-resident companies. In order to avoid money laundering, the adopted solution is known as “know your customer”. The best offshore banks in Cyprus, for example, are developing today products and services tailored for Europeans, Eastern European customers and customers from Middle East, including multi-currency accounts. Under the triangle of transparency–ethics–opportunity, knowing the customer needs and legal founding of operations let finalise an optimal transaction.

The conclusion derived from this work is emphasizing the need for ethical behaviour of banking companies against transfer pricing policy. The proper solving of ethical issues locally, and internationally, together with optimal implementation could be the key of prevention for market anomalies, and understanding of profit splitting at internationally level. It is a matter of identifying the best practices, and customize to national and regional taxation legislation. The presented study case is a method of day-to-day operations used by banking companies, through interest rate swaps, lacking a system of interbank limits, into a contracted interbank market. OECD requirements and Basel III requirement for liquidity buffers will further impose the dissemination of detailed information of transfer pricing policies and specific risks to be incorporated, this work contributing to better understand the banking transfer pricing behaviour and rationales.

## 10 TP AND FUNDING

### 10.1 TRANSFER PRICING AND FUNDING.

Funding - the financing process of active operations of the bank own and borrowed resources.  
Transfer price - the interest rate at which units of the bank placed resources attract resources from the branches of the bank that they are attracted to.

The transfer rate = (interest rate margin \*) + stake in liabilities

The transfer rate \* Funding = In terms of CFD (Transfer revenue or Transfer expenses).

Allocation of non-interest income and expenses: 3 stages of allocation based on an iterative cross-coefficient method of diversity. Transfer pricing process identifies four main components of pure (net) interest margin:

- spread earned on assets (credit spread);
- spread earned on liabilities (funding spread);
- spread earned or lost due to the exposure to interest rate risk (rate risk spread);
- spread earned or lost due to the cost of the option (option cost spread)

Scheme of interaction of wholesale bank and retail bank with the Treasury:

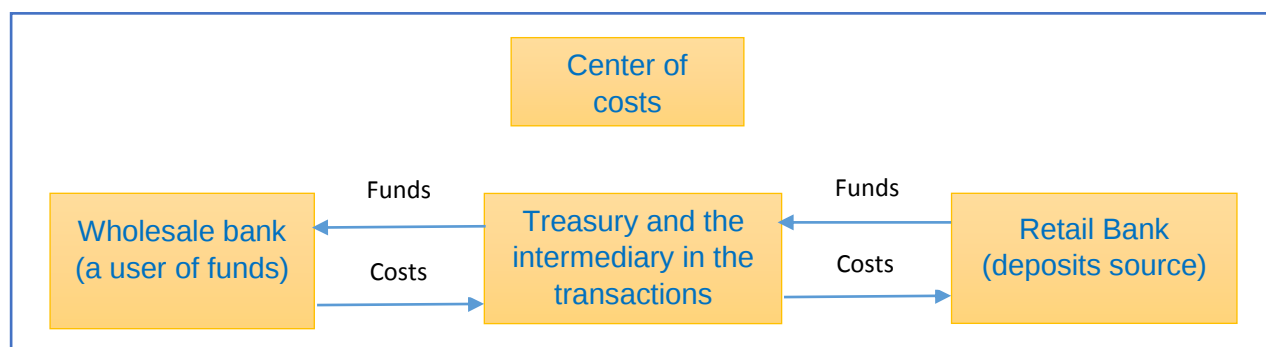


Figure 8. Scheme of interaction of wholesale bank

Source: Shimayev, I. (2011), *“Transferring prices in banks”*, SPB State University publishing, Saint-Petersburg, Vol. 87. pp. 49-56.

Transfer price for the funds: the price at which organizational units which were borrow funds, sell them to the organizational units of the bank, which were placed this funds.

Components of spread can be graphically highlight, noting the loan and deposit on the yield curve.

### 10.2 TRANSFER PRICING METHODS

IN A FIRST APPROXIMATION, ALL METHODS CAN BE DIVIDED INTO TWO GROUPS

1) CASH FLOW

2) NON-CASH FLOW

Methods of Cash Flow is calculated transfer rates based on the estimated cash flow of financial instruments:

- Cash Flow Weighted Term
- Cash Flow Zero Discount Factor
- Cash Flow Duration

Methods of Non-Cash Flow are often used for products with uncertain Cash Flow, for example, for current accounts:

- Moving Averages;
- Spread from Interest Rate Code;
- Straight Term;
- Spread from Note Rate;
- Redemption Curve (Repayment Curve);
- Unpriced Account.

These methodologies are used a yield curve of transfer pricing which defined by user, the individual characteristics of the financial instruments and customized expected prepayment. IRC - Interest Rate Code.

Financial elements for transfer pricing (Oracle Financial Services - Module Transfer Pricing):

- Beginning transfer rate;
- Ending transfer rate;
- WATR, Weighted Average Transfer Rate;
- Average Historical Option Cost;
- Charge / Credit for Funds - TR (Module Transfer Pricing) establishes fees for funds for each asset and the cost of providing funds for each liability.

Indicators of standard report TP module as an example of the profit and loss account:

- Assets

Transfer price - this is the price that is used in the calculations within the corporation between its separate subdivisions; selling price of inventories (TMZ) between interconnected subdivisions.

Transfer pricing is always based on the data of balance sheet. Other Terms: LIBOR, MMMFTP, bonds (coupon is paid). Treasury Result = purchase price - sale price + coupon during possession.

To "intra-systemic" rate (the transfer rate, the rate of funding) affect:

- Current cost of funding;
- Prediction of the interbank lending market;
- Yield securities;
- Bank liquidity;
- Change in the structure of liabilities.

Spread - the difference between the best purchase prices (bid) and sales (ask) at the same time on any asset (share, commodity, currency, futures, options).

Spread - the difference between the levels of return on various financial instruments.

### 10.3 PROCEDURE FOR CALCULATING THE TRANSFER PRICE:

1) CALCULATE THE MARGINAL COST OF THE PARENT BANK TO ATTRACT ITS OWN LIABILITIES:

$$MC_{PB} = (MIC + MOC) / (1 - SDF), \text{ WHERE}$$

MIC - marginal interest costs of the parent bank to attract their own liabilities;

MOC - marginal operating cost of servicing liabilities;

SDF - statutory deductions into funds required reserves.

2) Calculate the transfer price (TP) to attract resources from the Treasury of Central Branches those who are engaged in raising funds in the branch network, as the opportunity cost to attract similar resources at the parent bank

TP = MC<sub>pb</sub> (where MC<sub>pb</sub> is a Marginal Cost of the parents bank).

Profits of the branch: P<sub>fil</sub> (branch) = TP – MC<sub>fil</sub> (branch)

### 10.4 FUNDING - A METHOD OF INTERNAL (OR TRANSFER) PRICING TO THE BANKING BUSINESS

Keywords: transfer pricing, funding, recruitment and placement rates, treasury, asset and liability management, liquidity risk, the basic rate spread.

Pricing - formation of prices, the process of selecting of the final price depending on the value of products, competitors' prices, the ratio of supply, demand and other factors.  
Funding is the process of accounting of funds in the bank.

Rate of funding - transfer rates reallocating resources within the bank.

Department which is responsible for funding in the bank, is a Treasury playing.

Treasury is responsible for:

- traditional trading operations
- Asset and Liability Management

Treasury functions:

- Management of resource risks;
- Assessment of demand and proposals of financial resources throughout the system of the bank;
- Provides of transfer pricing;
- Efficient allocation of capital among business units of the bank;
- Verifying the use of funding rates and preparing proposals for their correction.

In normal practice, Treasury operations can be divided into two components:

- Internal activity (reallocation of resources between different subdivisions of the bank with the use of transfer pricing);
- External activities (work with assets of money market - IBC, FOREX, securities and Bonds).

Treasury functions are divided into two main groups:

1. Management of Resource risks (asset and liability);
2. Conducting operations on the monetary and foreign exchange markets, as well as the precious metals market for the purpose of efficient allocation of resources;
  - 2.1. Liquidity management and funding of the Bank's operations;
  - 2.2. Profit from arbitration;
  - 2.3. Hedging interest rate and currency risks.

#### **10.5 INTERNAL FUNCTIONS (TRANSFER) PRICING (OF TREASURY):**

1) Adjustment of prices and rates of raising funds placements (in terms of maturity and currencies);

2) Management of financial flows;

Internal earning divisions - Retail Banking, Corporate Banking and interbank business.

Funding rates to attract and place for different business units are slightly different.

3) Motivating;

4) Deliverance the business units of the bank against all risks: foreign exchange, interest rate, credit and liquidity risk.

Currency risk - the risk of loss due to unfavorable changes in foreign exchange rates and (or) precious metals (metals exchange).

Interest rate risk - the possibility of reducing the rate of profit when changing interest rate (discount rate).

Credit risk - the risk associated with delinquency and can be defined as the uncertainty of the lender that the borrower will be able to and will mean to fulfill its obligation to repay the loan and the payment of funds in accordance with the terms and conditions of the credit agreement.

Liquidity risk - the risk arising from the fact that the bank may not be enough or too is liquid is liquid. Insufficient liquidity risk - the risk that the bank will not be able to meet its obligations or it will require separate sale of bank assets on unfavorable terms. Excess liquidity risk - the risk that the bank's loss of income due to an excess of highly liquid assets, but little or no income and assets, as a result, unnecessary financing low-income assets from borrowed resources.

5) The maximum bid is attracting (bid) and the minimum rate of placement of funds (offer). Rate - the base and liquidity premium (spread).

Currency - LIBOR (U.S. Dollars) and EURIBOR (Euro).

Asset Liability Management — AML-unit

Liquidity premium (spread) determines the value of instruments used for liquidity management (working assets - correspondent account, cash, liquid reserves, mandatory reserve fund), i.e. costs AML-unit.

Graph Gap Liquidity - liquidity gap report, based on which the management of liquidity risk by establishing and monitoring limits on gaps.

## **10.6 STAGES OF BUILDING A SYSTEM OF FUNDING IN THE BANK:**

1. Determining funding principles assets. "Nostro" can make funds of "Loro" accounts, transactions and repo interbank placement being funded by interbank loans and repurchase agreements. The main principle - conformity maturity of assets and liabilities.
2. Determining the permissible value the imbalance structural liquidity as a percentage of net assets.
3. Construction of a matrix of funding in order to determine the actual sources of funding assets.
4. Determine economic benefit the used operating system of funding, including search imbalances of liabilities by urgency. The ALMC - Committee on Asset and Liability Management.

Pricing principles:

1. Principle of risk-neutral;
2. Principle singularity (increment);
3. Principle of prices;
4. Principle of marginality;
5. Principle of conservatism;
6. Principle normal course of business (or the replication approach model portfolio);
7. Principle market price.

Hedging - opening transactions in one market to compensate for the price risk exposure equal but opposite position in another market. Hedging is usually carried out with the purpose of insuring risks of price changes by entering into transactions in the futures markets.

Hedging is the result not only reduce the risks, but also reduce the possibility of profit.

Hedging distinguish by purchase (buyer hedge, long hedge) and selling Hedging (hedge seller, short hedge).

## **10.7 OVERVIEW OF BANKING SECTOR IN CYPRUS**

Primary regulator of financial institutions and banks is the Central Bank of Cyprus.

The Central Bank of Cyprus was established in 1963, shortly after Cyprus gained its independence, as an autonomous institution in accordance with the *Central Bank of Cyprus Law 1963* and the relevant articles of the Constitution. Today the Bank is governed by the *Central Bank of Cyprus Laws 2002-2007*, which ensure the Bank's independence as well as compatibility with the relevant provisions of the Treaty establishing the European Community and the Statute of the European System of Central Banks and of the European Central Bank.

The law's amendment in March 2007 paved the way for the legal integration of the Bank into the Euro system in January 2008.

The main functions of the Central Bank include:

- implementing the European Central Bank's monetary policy decisions;
- holding and managing the official international reserves;
- supervising banks;
- safeguarding the stability of the financial system;

- promoting, regulating and overseeing the smooth operation of payment and settlement systems;
- acting as banker for the government.

According to the central bank, as of 2012, the number of foreign banks in Cyprus in Table 8.

Table 8. Number and size of foreign credit institutions in Cyprus

|                             |                              | € '000 |
|-----------------------------|------------------------------|--------|
| <b>FROM EEA COUNTRIES</b>   | Number of branches           | 9      |
|                             | Total assets of branches     | 2,342  |
|                             | Number of subsidiaries       | 5      |
|                             | Total assets of subsidiaries | 13,026 |
| <b>FROM THIRD COUNTRIES</b> | Number of branches           | 16     |
|                             | Total assets of branches     | 7,230  |
|                             | Number of subsidiaries       | 3      |
|                             | Total assets of subsidiaries | 15,173 |

Source: Central Bank of Cyprus, [http://www.centralbank.gov.cy/nqcontent.cfm?a\\_id=8088](http://www.centralbank.gov.cy/nqcontent.cfm?a_id=8088)

As regards banking supervision, the objective of the Central Bank is to ensure the stability of the banking system, the minimization of systemic risk and the protection of depositors. The rules, policies and practices of the Bank are in line with the EU directives and the recommendations of the Basel Committee on Banking Supervision. The *Banking Law 1997* as amended, which establishes the legal framework within which banking business can be pursued, reflects the principles and rules of the EU directives on credit institutions. Furthermore, in accordance with the *Prevention and Suppression of Money Laundering Activities Laws 1996 - 2004*, the Central Bank is the supervisory authority for banks in this respect. In this connection, the Central Bank has issued a series of directives to banks concerning strict customer identification procedures, record keeping, recognition and reporting of suspicious transactions, the appointment and duties of money laundering compliance officers, and education and training of bank employees in anti-money laundering matters and in combating the finance of terrorism.

#### **International banking groups and their branches and offices in the territory of the Republic of Cyprus**

Under the Central Bank of Cyprus Law, 2002 -2007, and the Banking Law, 1997- 2009, the Central Bank of Cyprus is the competent authority for the supervision and licensing of banks. In exercising its supervisory role, the CBC is guided by the recommendations of the Basel Committee on Banking Supervision, the guidelines issued by the European Banking Authority (EBA), and the rules of the EU which promote the adoption of best practices and standards. In this connection, various directives, circulars and guidelines regarding prudential supervision are issued by the CBC to all banks operating in Cyprus. The supervision of banks incorporated in

Cyprus, including both their domestic and foreign subsidiaries and branches, is exercised by the CBC on a consolidated basis.

According the List of investment and ancillary services offered by each bank (LAST UPDATED: 7 February 2013), there are main foreign bank's group in Cyprus:

1. Saxobank AS Cyprus
2. Russian Commercial Bank (Cyprus) Ltd
3. Société Générale Cyprus Ltd
4. National Bank of Greece (Cyprus) Ltd
5. Hellenic Bank Public Company Ltd
6. BANQUE BEMO SAL
7. FBME Bank Ltd
8. Barclays Bank PLC
9. Eurobank EFG Cyprus Ltd

And 16 more branches, including: Promsvyazbank, VTB (Vneshtorgbank), Gazprombank, etc.

Next factors below affecting the opening of branches of foreign banking groups in Cyprus.

#### **10.8 USE OF TRANSFER PRICING SCHEMES OFFICES AND BRANCHES OF EUROPEAN INTERNATIONAL BANKING GROUPS**

Creation of bank branches - the potential for increasing a larger market share by promoting its banking products and programs in Cyprus. On the one hand, it is expressed in the inflow of additional funds, on the other, an increase in the volume of performed operations and the load on the system of budgeting bank.

Attracted resources have different costs for the bank, so to assess the performance of individual units and profitability of banking products is necessary to identify the funds and determine the actual prices at which the units obtain resources.

Introduction of transfer pricing for resources that has have reallocated within the bank, lead to determine the value of the resources for the departments of the bank, the cost-effectiveness and profitability of business units. In addition, the domestic price of resources taking into account with the volume of their redistribution and suggestions of banking product is the basis for external pricing of banking services.

Optimal allocation of capital between divisions of the bank for more effective management of liquidity and bank risk especially actual for large multi-branch bank with a complex organizational structure and hierarchy management and diversified business. Namely a mechanism of internal transfer pricing for financial resources is may act a key element of the management system management decision-making of the commercial bank.

#### **10.9 USE OF TRANSFER PRICING SCHEMES OFFICES AND BRANCHES OF INTERNATIONAL BANKING GROUPS LOCATED OUTSIDE THE TERRITORY OF THE EUROPEAN UNION**

Commercial banking includes units which exchange of the financial resources. In relation to system of financial flows we can allocate of placed and attracted unit banking structures. Attracting divisions enable the formation of the bank's liabilities, drawing funds from clients.

Placing units perform active operations and provide receipt of bank interest income. Structuring of the bank of placed and attracted unit determines the existence of an intra-cash flow, when financial resources are transferred from the centers of attraction to the centers accommodate internal transfer price.

Given the interest in our work to multi-branch banks operating in Cyprus, consider the system of transfer pricing is in such a structure.

Thus, the transfer price of the resource - is internal price of financial resources reallocated within the bank from one responsibility center to another. Manage profitability of the bank at the level of structural units of the bank's management called responsibility centers. Responsibility center is defined as a structural unit, which produces the homogeneous products and services, or as a control unit with specific goals, budget and reporting. The basis for the implementation of such a management system in the bank is exactly transfer pricing on domestic financial resources.

As centers of responsibility in banking groups, leading activities in Cyprus are the real division of the bank, such as governance, divisions, branches. This can be a strategic unit of the banking business or segments of the banking market in which the bank operates.

Considering the influence on the use of financial resources, as well as features of functioning structural units in the bank there are three basic responsibility center: retail bank operations, bank treasury operations and wholesale bank. Applied to multi-branch banks as a retail bank is considered the so-called Management Network of branches; as a wholesale bank - headquartered bank, implements major projects and transactions in the financial markets; and also the Treasury, make transfers between departments and raise funds on international financial markets.

Branches are profit centers to raise funds, the parent bank - a profit center by offering financial resources, treasury - a profit center for financial management of resources.

Subdivisions have the assets and liabilities attributed in accordance with the functional type of responsibility center and the specificity of its operations. Units are trading with the Treasury, which sets the transfer prices for resources depending on the specific characteristics of raising funds. Thus, the Treasury centralizes and redistributes resources by setting transfer prices and adjusting the internal cash flow of the bank. Treasury, thus acting as an owner, acquiring financial resources from centers of attracting - the branches, and carrying out the sale of resources to the bank's head office to allocate resources in the financial markets.

The branch network is engaged in service of the population and small institutional clients and is the center of attraction of financial resources and a net creditor of the Treasury.

In the process of activity, branches and other structural subdivisions are selling their net liabilities and buying net assets from the Treasury for carrying out asset operations at transfer prices. Treasury adjusts the financial flows within the Bank and to determine transfer prices for financial resources, realizing the function of the centralized resource management of the bank.

#### **10.10 EFFECTIVENESS OF THE USE OF TRANSFER PRICING SCHEMES BY DIFFERENT BANKING GROUPS**

One of the main tasks of top management for actively functioning of commercial banks is the development and implementation of business development projects. Trying to attract for such projects as much as possible resources for the implementation of their activities, they try to take a bigger share of the market by promoting its banking products and programs in Cyprus. This territorial expansion is to create a regional bank branches on the island. Definitely the inflow new money from attracting of new customers is a positive business development, gave a new impulse in the direction of increasing profitability as a whole. However, increases and the total volume of operations performed, and with it increases the load on the system of management of the bank and, in particular, on its foundation - the budgeting system. Funds attracted by banks are continuing their movement, redistributed between departments of the bank. Thus, the cost of attracted and redistributed resources for the bank is not the same. With this provision, the key to effective management of the bank is the optimal distribution between of all received resources. Such tool is the distribution mechanism of internal transfer pricing, which will identify the actual prices at which units receive financial resources, which is certainly important in the budgeting process at the stage of formation of budgets, and at a stage monitor and analyze their performance and measure the performance of each units.

The essence of the transfer price is the specifics of banking activities namely the presence of attracted and placed units. Management Accountant called such units the centers of financial responsibility.

If any center of financial responsibility operates only to attract (placement) of resources and does not carry out active (passive) operations, it initially can't make a profit, and its budget revenue and expenditure consists only of the expenditure (revenue) parts. Evaluate the effectiveness of such a center of financial responsibility is not possible. But one of the objectives of budgeting as a management tool is just the analysis and determination of the effectiveness of all departments. The introduction of transfer pricing is designed to solve the problem. Transfer price - the price of financial resources reallocated between the centers of financial responsibility. Precisely the introduction of such a pricing enables us to show their transfer income or expense, i.e. domestic revenues (expenses) of the center of financial responsibility of the bank from the sale (purchase) resources at intra-bank market.

#### **Specificity of transfer pricing in banks with extensive branch structure**

Due to the fact that the object of study in this paper is a bank with an extensive branch network, the use of different methods of cost-group has its own characteristics. One of the main objectives of opening branches in Cyprus, including distant, is to attract funds. That is, the branch network as a separate center of financial responsibility is for the bank side, attracting resources, and affiliates as separate business units or profit centers. Specifics of bank's head office is placing financial resources which was raised earlier. As a rule, a large proportion of resource allocation falls on the head bank, as his hands are the largest customers. Such placement is carried out, in particular, through the provision of loans to both legal and private individuals, and in the framework of inter-bank lending; investment activities, and so on. For transfer pricing purposes is allocate (as a center of responsibility) the third "intermediary" side - managing the allocation of resources, or, as it is called experts on budgeting, the Treasury. The Centre of financial responsibilities has implements the distribution function of its financial resources through their purchases from departments on attraction and further sale of units

engaged their placement (see. Fig.9). Buying and selling take place according to the established transfer prices.

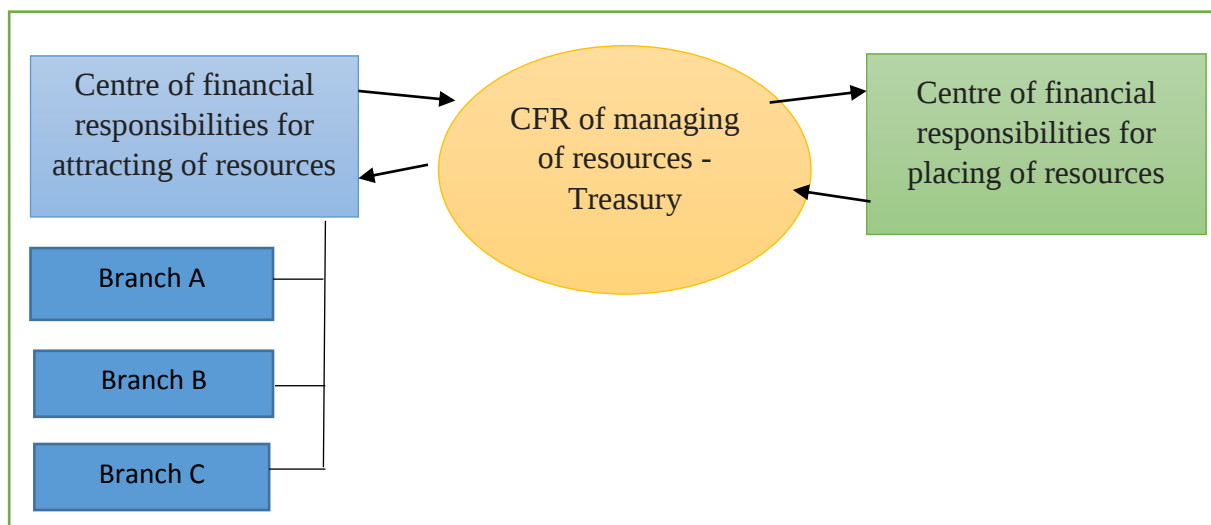


Figure 9. Scheme of interaction of financial responsibility centers in the distribution of resources

Source: Shimayev, I. (2011), *“Transferring prices in banks”*, SPB State University publishing, Saint-Petersburg, Vol. 87. pp. 49-56.

In order to create income of the bank as a whole, it is necessary that the price of placed resources will exceed the price of attracted resources. If, for example, the rate (price) of the raised funds in deposits is 4%, and the rate (price) for loans is 8.5%, so at the disposal of the bank will remain operating margin of 4.5% (8.5% - 4%).

But, first, are here we have in mind external prices, and, secondly, for the purposes of management of multidivisional bank is still necessary the financial results which reflect by two responsibility centers - place and attract. This is necessary in order to objectively evaluate the effectiveness of their activities and, in particular, the effectiveness of the branch network. Activities of the bank, as well as any economic entity is linked to the implementation of a number of expenses. Thus, the profit the centers of responsibilities will also depend on their size. In this case, the transfer price will include the amount of operating (direct) and non-operating (indirect) costs the center of responsibility. As a result, the role of administrative account and distribution of income and expenses between the centers of responsibilities and individual profit centers for economically justified determination of the transfer prices of resources reallocated between the divisions of the bank. Thus, the transfer price on domestic resources will be the one point on which to base will be the formation of external prices.

Each center of responsibility and business unit it is the center of accounting, as the function of accounting of earnings and expenses incurred. Moreover, if the direct operating expenses directly related to a particular center of responsibility, the indirect costs shall be apportioned. For example, the cost of advertising of new banking product, carried out by the head bank, it is advisable to distribute proportional to the volume of raise funds. Definitely there are general bank costs that are difficult to distribute, i.e. Impossible to find a basis for a proportional allocation of costs. Such kind of expense may be, for example, the costs for the services of the external audit. This expenditure has in all financial and credit institutions in view of the fact that, according to Cyprus Law of accounting (financial) statements are subject to mandatory

audit. In this case it is recommended these costs attributed to head bank. The above measures can more accurately determine the effectiveness of the branches of the bank.

Speaking about the costs that incurred by the Bank in the normal course of business, is also worth a mention another tool that allows for enhanced process of management. This tool is the introduction of rationing non-operating expenses separate profit centers. This is caused by the fact that with the expansion of the bank's activities, including at the opening of new branches, increasing the amount of such costs. Among the such costs can be identified - communication costs, office expenses, and so on. Such costs are easy to rationing, however in setting norms should take into account the functional responsibilities and the specifics of the particular unit. Further, normed costs accounted for in the budgeting process as planned quantities.

Responsibility centers in specific activity scale - general banking or in a specific branch - narrowed down to the individual departments of the branches. Definitely such a detailed analysis, which allows to have information on the activities of individual units of each branch, it is currently impossible to carry out without the introduction of an automated control system, which, of course, require additional tangible costs. Accounting system as a unified information base on bank activity is also complicated and requires revision, in particular, the analytical apparatus, in order to be able to receive any detailed data down to individual transactions.

## 11 RESULTS

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The crisis events of recent years in the global financial markets have given impetus to a new wave of reforms and changes in the various areas of the world economy and the banking sector in particular.

Stability and sustainability of the banking sector has a special place in the struggle with the consequences of the 2008 financial crisis, as well as to prevent new outbreaks of instability in the world economy.

Due to the high systemic risk of the banking sector, considerable attention is paid to the liquidity of credit institutions. Sources of changes aimed at improving the liquidity of commercial banks can be external and internal.

External sources are supervisory authorities of individual countries, implementing, including the recommendations of the Basel Committee on Banking Supervision. Among the provisions of the latter document (Basel III) is listed introduction of two new liquidity ratios: measure short-term liquidity LCR (Liquidity Coverage Ratio) and the index of the net stable funding NSFR (Net Stable Funding Ratio). Internal sources is a management of credit institutions, seeking to preserve the reliability and competitiveness of the bank, while applying all the available tools to do so.

The use of transfer pricing in liquidity management.

In the context of tightening liquidity requirements for banks, expected in connection with the implementation of Basel III, banks are seeking to optimize liquidity management process, as much as possible using the available tools to do so. One of those tools is the transfer pricing. Transfer pricing in a commercial bank is called the establishment of domestic prices of financial resources in order to reallocate funds between separate entities of a commercial bank. The intra-bank's intermediary in redistribution of financial resources is the Treasury: all department's attracted resources are located in the Treasury, all unit's placed resources are involved from the Treasury. The functions of the Treasury is also define and establish the transfer rates.

Relevant financial results of independent divisions are calculated by analytical departments of the bank in the process of management accounting. The main tasks to be solved by the use of transfer pricing in a commercial bank, can be divided into four groups:

- Centralized management of risks. The use of transfer pricing frees business units from the following risks by transferring them to the Treasury: liquidity risk, interest rate and currency risks.
- Evaluation of results of activity of individual business units of the bank. This assessment allows us to analyze the efficiency of units; configure the system of motivation of employees, as well as helps the management to make strategic decisions about the direction of the credit institution.
- The client product's pricing. Transfer prices are the benchmark for pricing interest-client products (such as loans and deposits).

- The process of budgetary planning. Planning interest income and expense in the context of business lines, as well as ensuring of control over the use of resources and financial discipline, cost-effectiveness and sustainability of structural units of the bank.

Liquidity risk can be divided into two types of risk: the risk of lack of liquidity and the risk of excess liquidity. In case of insufficient liquidity risk is the inability to perform its obligations by the bank, in case of excess liquidity risk is the lost profits due to funding too much highly liquid assets.

The most attention from the point of view supervisory authorities, of course, deserves the risk of insufficient liquidity. In order to prevent the implementation of liquidity risk, the Treasury uses a wide range of available tools: building a gap analysis; plans to incoming and outgoing cash flows (cash flow); builds models of probable outflows demand; if necessary, initiate transactions aimed at the adjustment of the balance sheet, etc.

Transfer pricing can also be attributed to the instruments of liquidity management. The most important functions of transfer pricing is a diffusing risk concentrations (interest rate, currency and liquidity risk) in the Treasury for the purpose of centralized management.

Redistribution of risk inside the bank between business-units and the Treasury as follows: transfer rates are determined by maturity and currency (there are also additional sections: business lines, products, etc..).

Attracting bank's unit puts funds into Treasury in the same amount, currency and for the same duration as the client's Attracting deal. Similarly, when granting a loan, placing bank's unit has attracts in the Treasury funding in the same amount, currency and for the same term as the credit transaction with the client.

Thus, the balance of each business unit is closed: any transaction with the client corresponds to the opposite transaction with the Treasury.

This approach is called the method of coincident terms, it solves two problems: firstly, when the balance of the closed business units simplifies the calculation of its financial results: net margin units equal to the difference of external client and internal transfer rate (taking into account the sign depending on the location or Attracting funds);

Second, in an analytical balance of business units the assets and liabilities, taking into account of transfer transactions with the Treasury always coincide in time and currencies.

The absence of an imbalance in the structure of the analytical balance business unit removes from business unit currency risk (regardless of exchange rate the assets and liabilities are revalued by the same amount), interest rate risk (regardless of changes in the level of interest rates net interest margin does not change until maturity of the transaction) and liquidity risk (active and passive transactions are completely balanced by age, dates the beginning and redemption).

Credit risk in this case is separated from the liquidity risk, interest rate and currency risks, and remains in the business unit. Centralized management of liquidity risk in the Treasury has significant advantages.

The Treasury has the most complete information about the planned changes in the structure of the balance.

If necessary, adjust the structure of the balance of short-term or close the liquidity gap, the Treasury has a large (compared to business units) set of market-based instruments, such as Treasury securities portfolio, a bond issue to raise funds of the Central Bank, participation in the Federal Treasury deposit auctions, etc.

Liquidity risk management has requires considerable experience and training, so the content in each independent business unit of costly management specialists liquidity risk is economically unfeasible.

Majority of credit institutions which use in their practice of transfer pricing, are used transfer prices as a starting point in pricing of customer loan and deposit products. Many methods of transfer pricing in banks envisage the powers of the Treasury on the adjustment of transfer rates to control bank liquidity. Short-term transfer rate is usually are set by the Treasury on a daily basis.

In case of increasing of bank's liquidity in the short-term period, the transfer rate for the corresponding period are reduced, which leads to lower customer rates on loans and deposits. Thus, starts limited attraction of funds and starts stimulated in placing of funds.

In the case of short-term liquidity gap, the transfer rates rise, which leads to stimulation of attraction and limit allocation of funds. Liquidity management on long terms is more difficult.

To establish the of transfer rates for more than 1 month is necessary to consider the forecast of incoming and outgoing payments; ability to attract of state funds; seasonality of supply and demand for financial resources; increase in interest rates in the days of tax payments in the last few days at the end of the quarter and year, etc.

Thus, in establishing of transfer rates for each maturity is necessary to analyze not only the current state of liquidity, but also forward-looking events of the closing date of the transaction. Spread liquidity as part of transfer rates.

Depending on the level of development of the system of transfer pricing in the bank, the structure of transfer rate may be different. In the simplest case, each term there corresponds a definite transfer rate, which used for active and passive operations. According to the principles of transfer pricing, each of active and passive transactions (that leads to the transfer of funds), corresponds two rates: the client and transfer. Customer rate is usually calculated from the transfer by adding a spread business units (positive for credits and negative for deposits). With the development of transfer pricing system the structure of transfer rates becomes more complicated, and their number is increasing: for various products are set different transfer rates. The structure of the transfer rates include various components that reflect the risks that carries the product, including - liquidity risks. Products (which create additional liquidity risk) include: deposits with the possibility of early termination (including all deposits of individuals), deposits with the possibility of replenishment, loans with an early redemption, the credit line with the obligations of the bank to issue funds at the request of the client and others. Liquidity risk for each product (who bears liquidity risk), should be evaluated and taken into account in the transfer rate as an additional spread, or in the form of commission charged at the same time at the opening of the transaction. European Committee for Banking Supervision in October 2010 in the Manual on the distribution of costs and benefits associated with the liquidity is considering the establishment of transfer prices, as "an important aspect, because the transfer price is defined as the deposits will be measured of unit's assistance into the net interest margin

of the bank." The text summarizes the approaches and makes recommendations concerning the structure of transfer rates.

Base rate to determine the transfer rate used market indicator: for short-term operations and floating rates used money market indicators Prime / Libor / Euribor (depending on the currency of the transaction) for longer-term operations used quoted market instruments (swap). Also may be used quotations of CDS tool and bond spreads, are in circulation.

European Committee for Banking Supervision proposes the following structure of transfer rates:

- Reference rate - the basis for the construction of the transfer rate is typically a market indicator.
- Institutions own credit spread - spread, reflecting the effect of the credit risk of the bank on the rising cost of raising funds by the bank.
- Bid / offer spread - spread, representing the difference of bets in investment and borrowing.
- Liquidity adjustments - spread, taking into account the different value of the instruments of the same maturity, but with different properties in terms of liquidity.
- Optional spread - spread, taking into account the value of the embedded options in the product (prepayment option, early withdrawal, possibility of replenishment, etc.). Also used in the case of products with irregular samples schedule and maturity.
- Other spreads can also be included in the calculation, such as the spread of country risk spread contributions to the NNE.

Reaction of supervisory authorities to the global financial crisis of 2008 was a further tightening of the requirements for the stability of banks. New regulations as contained in Basel III, pay considerable attention to the liquidity of credit institutions. According to this document will introduce new liquidity ratios of banks LCR and NSFR, entry into the full force and effect which is scheduled for January 1, 2019.

With the introduction of the new requirements of banks' liquidity management complicated because to optimize for management process and the of liquidity is necessary to more efficient use of available tools.

One such tool is the transfer pricing in the bank.

The use of transfer pricing allows to accumulate liquidity risk in one unit of the bank (the Treasury), followed by centralized management of this risk. Also transfer rates are the basis for the pricing of client product that allows you to more quickly implement changes in interest rates for all active and passive products of the bank, depending on the liquidity situation of the bank and the banking system as a whole.

## 12 DISCUSSION AND CONCLUSION

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Transfer pricing system is necessary for successful management of any major financial institution and literally all large banks have implemented one of FTP methodologies. In a highly competitive environment, with historically low interest rates and decreasing interest margins, banks need to improve their performance management abilities in order to achieve sustainable profits. TP is the best tool for analysing net interest income, which is the biggest component of bank's profits. FTP system is fundamental for financial institutions and no bank can be well-managed without possessing some sort of transfer pricing system.

### **What are the advantages of using an FTP system?**

Various FTP methodologies provide different sets of advantages. Overall, fund transfer pricing provides the following benefits:

- Allows to calculate a cost of funds and apply them as a price to all internal sources and uses of funds
- Allows to plan, motivate and evaluate management performance based on fair appraisal of results
- Permits removing interest rate risk from sales divisions by setting a fixed margin on transactions, leaving only customer's credit risk
- Allows transferring interest rate and liquidity risk to a central unit responsible for its management
- Facilitates management of market risk through assets and liabilities management
- Transfer price allows to minimize interest margin fluctuations due to market rate changes
- It prices marginal cost of funds in order to improve business decision making
- Facilitates deep analysis of interest income, by product, branch, business line, transaction, etc.
- Interest income decomposition improves product pricing and tailoring the product offer to various needs

### **How can it improve results?**

FTP system improves profitability by enhanced pricing. Applying a transfer price most reflective of actual funding cost to each transaction allows for perfected decision making. Prices for products are then set at a level that ensures an increase in bank's total profits. Customers can be evaluated based on their overall contribution to bank's results, and selective conditions can be awarded. The profit contribution of branches and business lines can be appropriately estimated, allowing to close down the units that don't contribute to profitability. The same methodology can be used to evaluate management and even individual employees, basing on their contribution to profits, compared to their financial targets. Statistical studies show that accurate fund transfer pricing can generate a measurable increase in a bank's interest margin. Another benefit of FTP is the quality of interest rate and liquidity management it entails. Transfer pricing system can effectively move those risks away from sales units into a centralized portfolio. The overall level of bank's risk can be then observed, divided into sources

of origin, and managed. Asset and liability management is more effective when it can be conducted towards all bank's loans and deposits and their funding mismatch directly by Treasury department. This is possible only with a sophisticated FTP system with a direct connection to Treasury IT systems.

### **How to build an FTP system, is there an easy way to do it?**

Building a basic FTP system is relatively simple. The easiest way to implement an initial FTP system is through the use of a single pool method. In this method, only one transfer price is established, calculated based on average interest rates on all products. It is enough to divide interest profits between assets and deposits and to calculate branch results. This system is cheap and easy to apply, with literally no investment in IT or know-how necessary. It can be gradually enhanced, e.g. by using two transfer rates, one for deposits and another for loans, allowing to control generation of deposits and loans independently. Further amendments can include accounting for reserve requirement, building more pools for different products, or using current market rates instead of internal cost of funds. Such a system would be easy to establish while making transfer pricing effective.

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### **How to develop a perfect FTP system?**

The choice of FTP methodology depends largely on resources available: manpower, know-how, quality of data bases, IT systems capacity and the budget for FTP. Financial institutions seeking to develop the perfect FTP methodology, should implement the matched rate method. It is a complex method, requiring significant investments and developments. However, only this method allows for proper transfer of interest risk to a central unit, leaving a fixed interest margin in the business. Using historical rates individually assigned to transactions ensures a proper calculation of profits on customer and transaction level. A fixed margin ensures fair evaluation of management decisions and business results. Business decisions and their assessment are unbiased by market rate fluctuations, which are uncontrollable by sales unit. Removing interest rate risk from business units allows for proper risk management in a central unit. Treasury can observe risk characteristics of each transaction by valuing them by marking to market. The matched rate method should be implemented by any large bank that has a significant amount of fixed rate transactions on balance sheet. It is also suitable for institutions that wish to better control their interest rate and liquidity risk.

Banks need to employ one of FTP methods in order to be able to analyse contributions to overall interest profit, to control and evaluate business results. Lack of a proper FTP system

negatively influences bank's overall profits and deteriorates the quality of risk control. FTP system is crucial for financial institutions and no bank can successfully expand without implementing one of its versions.

## 13 RECOMMENDATIONS

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The matter is that the resources contributed to a commercial bank, are impersonal and redistributed inside the bank, depending on the needs of a specific period. However, they all have different price and to understand at what price eventually received funding of a branch, it is difficult, which in turn gives rise to difficulties in determining the effectiveness of the various operations of the branches and the bank as a whole.

The absence of transfer pricing makes it difficult to calculate the internal profitability of bank branches, since branches attracting resources costly part does not correspond the revenue, and vice versa - units for allocation of funds have income, but do not bear the costs of resources used. Transfer pricing is particularly important for multi-branch bank, because simultaneously with the redistribution of resources between the branches is a redistribution of financial risks.

In this regard, we can formulate the following general goals and objectives of transfer pricing:

- measurement of results of activity;
- Risk management;
- business planning

Transfer pricing, in addition to the common goals must to solve the following specific objectives:

- serve as an instrument for liquidity management of the international banking group through the optimal internal redistribution of deficits and surpluses of funds between departments or lines of business;
- To provide management of the most important characteristics of banking activities - weighted average cost of capital and the interest margin;
- To share business risks generated by linear units or businesses (primarily credit risk), as well as fundamental financial risks of the bank (liquidity risk and interest rate risk) by separating commercial and financial margins.

Thus, transfer pricing allows us to solve two key problems of interest policy - measurement of results of activity by accounting for cost price of financing and the cost of services provided, as well as the elimination of interest rate risk.

The main advantage of transfer pricing system is that in the implementation process the unit of interest rate risk management has been separated from the unit of credit risk management.

Credit units of the head office can concentrate all their attention on the quality of credit portfolio as well as resource management department is determines the allowable maturities or durations of assets, on the one hand, and liabilities - on the other.

## 14 FUTURE WORK

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All units of the bank shall bear the costs and receive income from of economic activity and from the sale / purchase of resources in the domestic credit market resources at transfer prices, which defines the center of Financial Resources Management in the bank.

Attracting centers have profit, if the income of the provided resources, including from the sale of resources to treasury, exceed the costs of units to attract resources, maintenance of accounts and other actual expenses. For example, the income of the center of attracting is defined as the difference between the transfer price on deposits and interest expense on attraction and actual expenses of the center.

Placing the funds Centres have make a profit if the incomes from active operations might cover the costs of Centres, including interest expense to the treasury.

Profit of the Loan center is defined as income on loans plus transfer pricing on deposits, net of transfer prices on Financing for loans and of actual expenses of the Center.

Thus, the centers of attracting are interested in increasing the transfer price, but placement centers - in its decline.

The Treasury Department receives profit from the reallocation of resources in the event that the transfer prices on Financing for active operations of the bank exceeds the transfer price paid by the Treasury on deposits, and cover their own overheads.

Thus, in assessing and managing profitability of the bank at the departmental level, transfer prices play a key role for internal resources of the bank.

### THE ETHIC ASPECTS OF TP

One of the most controversial and often least understood operations of multinationals, transfer pricing, can be used by multinationals to maximize their profits by tax avoidance and by obtaining tax rebates; additional profits come from tax avoidance; in other words it is possible for a multinational company to minimize its liability for corporation tax by transfer pricing; this is legal until governments legislate to prevent this practice. Lacking the legal framework, we raise the issue of ethics, and having a proper framework, we raise the issue of proper implementation and documentation of operations to be fully transparent for the fairness in the market. Nevertheless, this issue has always rested against the cornerstone of "greed of bankers," which, as I recall, brought the world to the financial crisis in 2008.

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