

## IMPLEMENTATION OF STRAIGHT TERM, WEIGHTED AVERAGE, AND TERM WEIGHTED MATCHED-MATURITY FUND TRANSFER PRICING (FTP) ON INDONESIAN BANK

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### ABSTRACT

*Transfer pricing in the banking industry has a huge impact on maintaining risks and strategic decision-making for preserving competitive advantage in the market. As a best practice, the bank owns an Asset & Liabilities Management (ALM) function assigned to control internal pricing, named Fund Transfer Pricing (FTP), to regulate the inter-division fund pricing between the Funding Division and the Lending Division. While the FTP implementation provisions of a bank are not regulated due to management's appetite, the FTP calculation methods are definitively established based on several research studies. The most sophisticated method is named Match-Maturity, by reason of matching every banking product's tenor to the yield curve and calculating them by the repayment behavior. This paper aims to study the significance of the Match-Maturity FTP (MM-FTP) method on a bank in Indonesia which currently apply the Multiple-Pool FTP (MP-FTP) method. To achieve the set objective, the study performed the FTP calculation of identical banking products including samples and all population utilizing MP-FTP and MM-FTP. The result shows 10 out of 11 groups of product and segment experienced over-charged or over-credited employing MP-FTP, which lead to inaccurate evaluation of balance sheet management and performance measurement.*

**KEYWORDS** *fund transfer pricing; asset & liabilities management; multiple pool; matched maturity*



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## INTRODUCTION

The bigger a bank, the bigger the organization that can distinguish the focus and achievements of each division. A division can manage only deposit products, only loan products, or both. Because savings are input while credit is output for banks, these two products are directly related and influence each other's pricing. In general, the higher the pricing for deposits given to customers, the higher the pricing for loans given to customers, and vice versa.

The bank has a work unit or asset and liability management (ALM) function that aims to manage the bank's overall balance sheet and off-balance sheet, which must achieve the expected profitability, manage assets and liabilities efficiently to anticipate mismatches, and finally control bank risk management (Nargiza, 2023; Pisarenko, 2013). In practice, the treasury or asset and liability management division, as a non-business division, has the responsibility to regulate the amount of transfer pricing by considering liquidity risk and market risk (Lindblom & Elliot, 2017).

Transfer pricing in banking can be divided into fund transfer prices (FTP) and service transfer prices (STP). FTP is an internal price related to fundraising and lending products. FTP is an important concept in how financial institutions, in this case banks, determine the value of internal prices when allocating funds to different divisions (de Castroa et al., 2019). While STP is an internal price related to business activities related to banking services.

FTP has a very strategic role in determining the tendency of banks to be aggressive or conventional in extending credit (Wyle & Tsaig, 2011). The main objective of the FTP calculation process is a calculation performed on an individual transaction basis to obtain net interest income (Weiner, 1997). Net interest income for asset spreads is the difference between interest income received from customers and fees charged for providing these funds. As for the liability spread, it is the difference between the income provided for raising a number of funds and the interest costs paid to customers. The Organization for Economic Co-operation and Development (OECD) recommends that each financial institution have its own FTP provisions and policies based on funds transferred through different divisions and intermediary divisions (OECD, 2010).

The implementation of FTP calculations is very important for banks because it has an impact on the profitability of each division in managing its asset and/or liability portfolio. FTP calculates the contribution of each funding source to overall profitability in financial institutions (Dermine, 2013). FTP calculations do not only depend on whether the product is classified as an asset or liability; each product must be evaluated based on its maturity date and characteristics, such as cash flow ownership, to determine the appropriate calculation model.

In light of the aforementioned context and the banking industry's lack of FTP matched maturity implementation, the researcher is interested in gathering a final work on the application of the straight-term, weighted average, and match maturity methods for FTP calculations to assist stakeholders in evaluating performance management. An Indonesian bank (The Bank) is used as a study object because The Bank intends to employ these three approaches to replace the current method, which is thought to fall short of representing the required precision and validity in calculating the FTP of savings and loan products.

This paper comprises five sections. The second section briefly discusses literature review of FTP, whereas the third and fourth section discusses the MP-FTP and MM-FTP methods and characteristic. Data and methodology of the calculation and analysis are discussed in the fifth section. The sixth section elaborates the sample that used to perform

the exercise, while section seventh points out the MM-FTP yield curve construction. The results and discussion of the findings are studied in the eighth and ninth. The section tenth will conclude the topics discussed in the paper.

#### Theoretical Literature on Fund Transfer Pricing

Transfer pricing is the value of a product (goods/ services) produced by another work unit within a company (Anthony et al., 2007). Thus, transfer pricing is a method for measuring the value generated by a work unit for a product or service.

There are three reasons underlying the importance of implementing transfer pricing (Benke & Edwards, 1980). First, inaccurate transfer pricing will hinder the company's goal of obtaining optimal profit. This is because each work unit has the intention of achieving its own interests, which are more important than the larger company goals. For example, Unit Alpha produces Product A, which is required for Unit Beta. If the transfer pricing value of product A is lower than the market price, Alpha Unit will tend to sell it to the market to increase revenue. Thus, the Alpha Unit was able to exceed its target, but the Beta Unit had to obtain product A from the market at a higher cost.

Second, transfer pricing is important for evaluating work units. Transfer pricing inaccuracies can cause companies to make mistakes in developing their organization. For example, the Alpha Unit produces product A and the Beta Unit produces product B. If the transfer pricing of product A is lower than that of product B, while the market value is the opposite, the company tends to prioritize the development of the Alpha Unit over the Beta Unit.

Third, the complexity of the relationship between work units within the organization can be simplified by using transfer pricing. The larger the company organization, the more complex it tends to be in determining performance evaluation policies. If the evaluation parameters are different for each work unit, for example, if one work unit is based on income and another is based on speed, it becomes difficult to see the relationship between work units. Meanwhile, by using the right transfer pricing model, all work units can be assessed using the same parameters, namely the value generated by each work unit for the larger company goals.

FTP is a mechanism for determining whether a bank actually generates profits from activities or, in fact, the opposite (Anthonio & Randell, 2022). In accordance with its use, FTP is part of management accounting, primarily to assess contribution or profitability. FTP also separates profits from commercial activities that deal directly with customers and activities related to risk management (Early, 2005). FTP specifically is a transfer price expressed in the form of interest rates to manage the assets and liabilities owned by the bank.

Transfer pricing in the banking industry has specific characteristics because, according to banking risk theory, in carrying out its business of collecting deposits and extending loans, there is liquidity risk and market risk. So that the difference in the implementation of the FTP method can determine the location of risk ownership. For example, ALM, as the party that determines FTP in mandated transactions and considers maturity and repricing in determining the FTP method, is directly responsible for the liquidity risk and market risk (Apostolik et al., 2009).

#### FTP Method and its Characteristics – Pool Methods

Generally, there are two methods used to determine FTP, namely the pool method and matched-maturity transfer pricing (Early, 2005). To simplify the management and presentation of FTP, loan and deposit products can be presented in the form of groups (pools) based on a certain maturity. The three types of pool methods commonly used by

banks are as follows:

*Single-Pool Method*

This method is the simplest and easiest to implement because it uses a single rate for transfer pricing that applies to both assets and liabilities. As an illustration, the FTP rate is set at 5%, while the deposit interest rate is 2.5% and the loan interest rate is 8%. Thus, according to management accounting rules, the contribution margin of a savings unit is 2.5% and a loan unit is 3%.

In this method, maturity and repricing have not been taken into account, so that liquidity risk and market risk are still part of the work unit's contribution.

*Dual-Pool Method*

Is a method of developing single-pool accounts by separating the FTP rate for the asset and liability sides. The value of the FTP rate of assets is the average between the total cost of funds and total assets. The FTP rate of liabilities is the average between total yield and total liabilities. As an illustration, the FTP rate base (liabilities) and assets are set at 5% and 6%, respectively. Meanwhile, the deposit interest rate is 2.5% for a 1-year tenor, and the loan interest rate is 8% for a 2-year tenor. Thus, according to management accounting rules, the contribution margin for a savings unit is 2.5% and a loan unit is 2%. ALM in this method has a contribution of 1% of the difference in FTP rate assets and FTP rate base/liabilities.

In this method, liquidity risk and market risk are still included in the work unit. The purpose of separating rates for assets and liabilities is a business strategy that is represented by a gap rate with a base for business divisions to expand or shrink in the market.

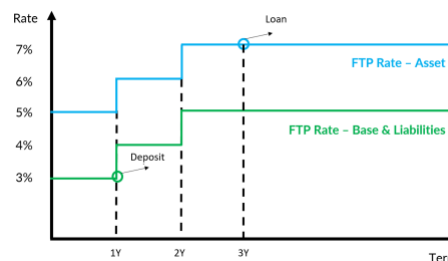
*Multiple-Pool Method*

In this method, maturity and repricing are taken into account, so that ALM is required to manage liquidity risk and market risk. ALM will divide asset and liability groups into maturity groups, for example, short-term, medium-term, and long-term. The Treasury rate is the most commonly used reference for transfer pricing value; for the short term, it is the three-month rate; for the medium term, it is the one-year rate; and for the long term, it is the five-year rate.

As an illustration, a bank determines a pool group based on the maturity range of assets and liabilities as attached in Figure 1. With a deposit interest rate of 2.5% for one year and a loan interest rate of 10% for five years. Thus, according to management accounting rules, the contribution margin for a savings unit is 0.5% and a loan unit is 3%. ALM in this method contributes 4% of the difference between FTP-rated assets and FTP-rated base/liabilities.

**Table 1. Pool/Bucket of the FTP Rate for Liabilities and Asset**

Period	FTP	Rate	FTP Rate
	Liabilities	Asset	
0 Day - 365 Days	3%		5%
366 Days – 730 Dyas	4%		6%
> 731 Days	5%		7%

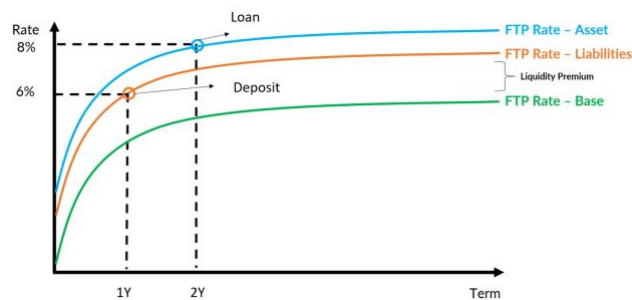


**Figure 1. FTP Curve and rate for Saving and Loan – Multiple Pool**

### FTP Method and its Characteristics – Matched-Maturity Methods

This method takes into account each account, both savings and loans, individually based on their maturity characteristics (Hanselman, 2009). This calculation is accomplished by assigning each account a transfer rate from a transfer curve or yield curve. The transfer rate used reflects the value based on cash flow, repricing, and the attributes of the designated account as much as possible. In addition, the transfer rate is also attached to the account until the account reaches maturity or revaluation. On a per-account basis, the total net interest margin of the organization is a combination, or aggregate, of each business unit, product, and customer level.

A simple example of this approach is used to demonstrate the role of ALM in controlling mismatches that occur when there is just one asset product, such as a loan, and one liability product, such as deposits with various maturities (Pushkina, 2013; Wyle & Tsaig, 2011). ALM, as an intermediary and determiner of the transfer rate, determines the FTP curve for assets and liabilities from a predetermined FTP curve base for deposits with a 1-year maturity and a 2.5% interest expense to customers and loans with a 2-year maturity and a 10% interest income.



**Figure 2. FTP Curve and rate for Saving and Loan – Matched Maturity**

Based on the liquidity premium—the liquidity risk that financial institutions bear (Lindblom & Elliot, 2017), such as the Primary and Secondary Statutory Reserves (GWM) applicable in Indonesia—the liability curve is determined. ALM contribution of 2% is received for market risk and mismatch. This plan allows business divisions, particularly the Credit Division, to be exempt from market risk and liquidity risk, leaving them with only credit risk to consider when conducting their operations (Kawano, 2000). It is not necessary for ALM to receive the maximum contribution in order to fulfill its obligation to manage the risks that can be brought about by the size of the FTP; rather, this decision must be grounded in historical data, present circumstances, and corporate strategy.

The current market rate or historical market rate may serve as the foundation for the FTP rate that is shaped into a curve. The ability for management to assess prior performance and price choices on completed transactions is facilitated by the usage of historical market rates (Tumasyan, 2012; Wyle & Tsaig, 2011).

More specifically, matched maturity employs a yield curve that represents each asset and liability maturity at the most detailed level, namely accounts. This approach is a part of the evolution of the multiple-pool method, which has divided the FTP rate based on the maturity pool (de Castroa et al., 2019; Hanselman, 2009; Ritchie, 2016). Because of the complexity of the calculation construction and the need for a powerful calculation engine, this strategy is the one that is closest to being optimal (Anthonio & Randell, 2022).

According to prior research, there is no set procedure for using the FTP model; rather, it must be customized to the needs of the bank (Sudarso et al., 2020). The suggested FTP model is a straightforward and uncomplicated approach that also matches the

objectives of the bank.

Calculation Techniques of Matched-Maturity FTP Based on Product Characteristics and Repayment Behavior

*Straight Term*

This technique calculates FTP by determining the rate using the last repricing date or maturity of an account that has no cash flow or installments (*Oracle Transfer Pricing User Guide*, n.d.). This applies to product liabilities, namely deposits and assets, namely revolving loans, each of which has a maturity date and during the active period of the account there is no change in cash flow.

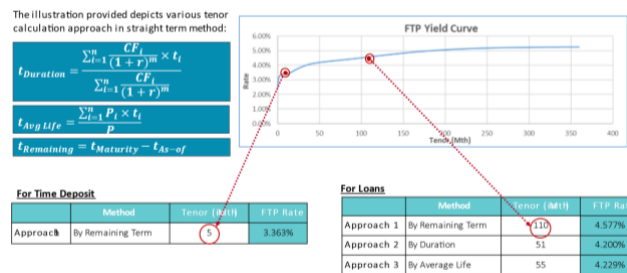


Figure 3. Illustration of Straight Term FTP Calculation

*Weighted Average*

The technique used to calculate the FTP rate of current account and deposit products which are products in banking without maturity. Thus a behavioral analysis must be carried out to categorize the tenor representative of the product (Anthonio & Randell, 2022). To be able to estimate a suitable profile, banks must look at historical data to determine patterns or use statistical models. But the most important thing is the agreement with the related business division to assess product behavior.

Non-core is the fluctuating portion while the core is the historical behavior portion of the product within a predetermined timeframe. This activity is unique in each company and there are no standard rules governing it.

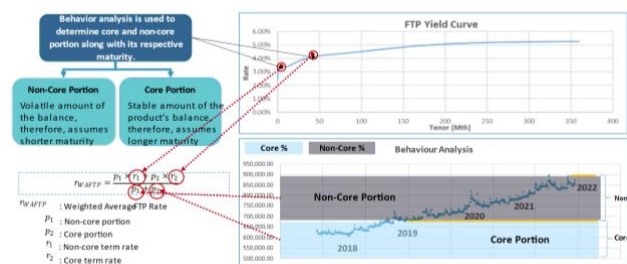
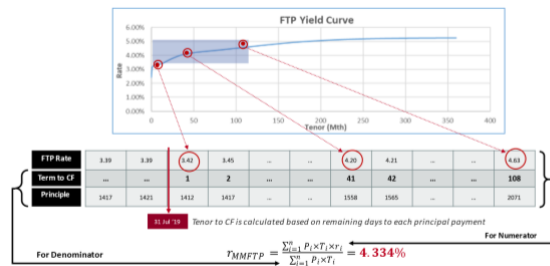


Figure 4. Illustration of Weighted Average FTP Calculation

*Term Weighted*

The technique which is also commonly referred to as Term Weighted is a technique that is built on the concept theory of the duration of products that have a maturity and cash flow for each certain period. As in the concept, duration calculates the weighted average term by weighting each period with the present value of each discounted cashflow using the rate at each tenor position throughout the period. Products calculated using this technique are non-revolving credit or have cashflow.





**Figure 5. Illustration of Term Weighted FTP Calculation**

Based on background of study, this study aims to study the significance of the Match-Maturity FTP (MM-FTP) method on a bank in Indonesia which currently apply the Multiple-Pool FTP (MP-FTP) method.

## RESEARCH METHOD

The data used in this study is primary data which consists of several objects, the first is the Bank's FTP Rate charged for loan and deposit products at the position of 30 June 2022 as contained in an internal letter issued by the Bank's ALM Division.

The current FTP Rate Bank employs the multiple-pool approach, which is divided into four maturity pools: 0 to 30 days, above 30 days to 90 days, above 90 days to 365 days, and above 365 days. These pools are based on Non-Wholesale and Wholesale, Rupiah and Foreign Currency, Savings and Loans, and Savings and Loans. The Bank manages a more developed portfolio of assets and liabilities as seen by the various bucket division, particularly the distribution of rates between assets and liabilities that account for both the company's obligations to handle other banking risks as well as the liquidity risk.

The second primary data used in the study is the unit of analysis for bank savings and loan products consisting of product type, sub-product, currency, segment, maturity, and repayment (for certain products). Because the data will be analyzed in relation to customer data, then each sample used will be masked so as to maintain the privacy of customer data. The actual sample variations could be more, but because one of the research objectives is to compare how much the differences in the FTP method affect company profitability, the samples are able to represent real conditions in the Bank.

The third primary source of information considered is the outcome of interviews with Bank sources and consultants with relevant experience in best practice FTP development. Separate interviews with each informant were performed using a framework of linked questions, but with each source's focus being different. The interview results will be distilled into arguments that are supported by the calculations made in this research and used as evidence in data processing.

Secondary data is used in this study to be able to compare Bank's existing FTP calculation method, namely the Multiple-pool, with the method proposed in the plan for implementing straight term, weighted average, and term weighted matched-maturity fund transfer pricing. The data used is in the form of a reference rate for the position of 14<sup>th</sup> June 2022 which will be used as a Base Curve from several sources to be processed. The sources of FTP IDR reference rates are Inter-Bank Borrowing (Bank A, Bank B, Bank C, and Bank D), IndoNIA, JIBOR, and Government Bonds. One of the reference differences between the existing method and the proposed method is the range of data that aims to get the most accurate accuracy according to market conditions.

After those data are collected, the last step is to calculate the FTP income or expense

for every product using MP-FTP and MM-FTP.

### Sampled Banking Product and All Population Based nn Group

FTP income and FTP expense calculations use the final FTP yield curve at position 30 June 2022. In this section, FTP rates will be calculated using two methods, namely MP-FTP and MM-FTP for the same account. To carry out the analysis, 5 samples were used which represent the calculation of the FTP matched maturity method.

To aims the study objectives, this study also calculates all of the Bank's product with the similar method but grouped as product and segment to achieve the appropriate way of comparing FTP method's impact on the same product and position.

This paper refers to the Bank's FTP internal report as a result of the ALCO decision on 14<sup>th</sup> June 2022 which applied to calculate MP-FTP on position 30<sup>th</sup> June 2022. More over, since the Bank does not have existing MM-FTP yield curve, the next section will elaborate how the Bank construct it based on the judgement of management's appetite and best practice in the market.

**Table 2. Bank's Samples Product**

No	Product	Sub Product	Currency	Segment	Maturity	Repayment
1	Saving	Current Account	IDR	Corporate	-	-
2	Saving	Time Deposit	IDR	Consumer	695 Days	-
3	Loan	Revolving	IDR	SME	1 Years	Balloon Payment
4	Loan	Non-Revolving	IDR	Micro	8 Years	1 Month
5	Loan	Mortgage	IDR	Consumer	20 Years	1 Month

**Table 3. Bank's Group of Products and Segment**

No	Product	Sub Product	Segment	Currency
1	Loan	-	Micro	IDR
2	Loan	-	SME	IDR
3	Loan	-	Consumer	IDR
4	Loan	-	Medium	IDR
5	Loan	-	Corporate	IDR
6	Saving	Time Deposit	Micro	IDR
7	Saving	Time Deposit	SME & Consumer	IDR
8	Saving	Time Deposit	Corporate	IDR
9	Saving	Current Account/Saving Account	Micro	IDR
10	Saving	Current Account/Saving Account	SME & Consumer	IDR
11	Saving	Current Account/Saving Account	Corporate	IDR

**Table 4. MP-FTP Rate for Corporate Segment**

Saving	IDR	Non-IDR	Loan	IDR	Non-IDR
Current Account	5.85%	1.25%	< to 1 Month	3.30%	0.20%
Time Deposit < to 1 Month	3.90%	0.75%	>1 to 3 Months	3.55%	0.30%
Time Deposit > 1 Month to 3 Months	4.75%	1.15%	>3 to 6 Months	4.70%	0.40%
Time Deposit > 3 Months to 1 Year	5.55%	1.20%	>6 Months to 1 Year	5.60%	1.25%
Time Deposit > 1 Year	5.90%	1.35%	>1 Year to 5 Years	6.65%	2.30%
			>5 Years	8.00%	3.05%



**Table 5. MP-FTP Rate for Non Corporate Segment**

<b>Saving</b>	<b>IDR</b>	<b>Non-IDR</b>	<b>Loan</b>	<b>IDR</b>	<b>Non-IDR</b>
Giro	5.85%	1.25%	< to 1 Month	3.30%	0.20%
Time Deposit < to 1 Month	3.90%	0.75%	>1 to 3 Months	3.55%	0.30%
Time Deposit > 1 Month to 3 Months	4.75%	1.15%	>3 to 6 Months	4.70%	0.40%
Time Deposit > 3 Months to 1 Year	5.55%	1.20%	>6 Months to 1 Year	5.60%	1.25%
Time Deposit > 1 Year	5.90%	1.35%	>1 Year to 5 Years	6.65%	2.30%
			>5 Years	8.00%	3.05%

**FTP Final Yield Curve Construction**

In this study, banks use several reference rates to form a base yield curve as shown in the table 6 (in percentage). From these references, banks cannot use just one reference to form a base yield curve because there is no single reference rate source capable of representing rates from 1D (1 day) to 30Y (30 years). So, the bank decided to use two references with an additional spread by considering aspects of consistency and suitability for the nature of the bank.

**Table 6. Reference Rate of Indonesian Bank**

<b>Tenor</b>	<b>IndoNI A</b>	<b>JIBO R</b>	<b>Indonesia Compoundin g</b>	<b>Indonesia Gov. Bond</b>	<b>Counterpart</b>					
					<b>BN I</b>	<b>BC A</b>	<b>Mandiri</b>	<b>Panin</b>	<b>CIM B</b>	<b>Danamon</b>
1D	2.7830		2.7830							
1W		3.44	3.44		3.50	3.50	3.50	3.50	3.50	3.50
1M		3.44	3.44		3.55	3.52	3.55	3.55	3.55	3.55
3M		3.65	3.65		3.75	3.76	3.75	3.75	3.75	3.75
6M		3.81	3.81		3.90	3.99	3.90	3.90	4.05	4.05
1Y		3.97	3.97	4.0670	4.05	4.10	4.05	4.00	4.15	4.15
2Y				5.2330						
3Y				5.9010						
4Y				6.4990						
5Y				6.7350						
6Y				7.0210						
7Y				7.2960						
8Y				7.6310						
9Y				7.5820						
10Y				7.5010						
11Y				7.5120						
12Y				7.705						
13Y				7.5840						
15Y				7.5170						
16Y				7.5860						
18Y				7.6740						
20Y				7.4420						
30Y				7.3720						

**Table 7. The Bank's Base Yield Curve Formula**

<b>Tenor</b>	<b>Formula</b>
1D	=Interbank Mid rate
1W	=Interbank Mid rate
1M	=Interbank Mid rate
3M	=Interbank Mid rate
6M	=Interbank Mid rate
1Y	=Interbank Mid rate
2Y	=Gov Bond yield + Spread
3Y	=Gov Bond yield + Spread
4Y	=Gov Bond yield + Spread
5Y	=Gov Bond yield + Spread
6Y	=Gov Bond yield + Spread
7Y	=Gov Bond yield + Spread
8Y	=Gov Bond yield + Spread

Tenor	Formula
9Y	=Gov Bond yield + Spread
10Y	=Gov Bond yield + Spread
11Y	=Gov Bond yield + Spread
12Y	=Gov Bond yield + Spread
13Y	=Gov Bond yield + Spread
15Y	=Gov Bond yield + Spread
16Y	=Gov Bond yield + Spread
18Y	=Gov Bond yield + Spread
20Y	=Gov Bond yield + Spread
30Y	=Gov Bond yield + Spread

After obtaining the base yield curve, it is necessary to adjust the curve by considering the liquidity premium, which is the opportunity cost owned by a bank for providing liquidity in the form of primary GWM, High Quality Liquidity Assets (HQLA), and Loan to Deposit Ratio (LDR).

Primary GWM is determined at 5% of the average position of third party funds for two months placed at Bank Indonesia. This amount of funds will get a yield of GWM Return, which is 1.5%, while if it is allocated at the 1D base rate, it will get a yield of 3,970%. This difference is referred to as the GWM cost (cost of GWM) which is then proportional to the total assets (% cost of GWM).

HQLA is determined at 5% of the average position of third party funds for two months, consisting of placements in Cash, Placements with Bank Indonesia, and Government Securities. Because the placements vary, based on the amount of funds allocated and the yield of each instrument, it will be found that the weighted average return value of the HQLA instrument is 2,566%. Meanwhile, if it is placed in a similar instrument, there is a potential return of 6,107%. This difference is referred to as the HQLA cost (cost of HQLA) which will then be proportional to the total assets (% cost of HQLA).

The last adjustment is the costs incurred for managing LDR which are lower than the minimum or higher than the maximum. LDR lower limit and upper limit respectively determined by 78% and 92%. By setting a Capital Adequacy Ratio (CAR) of 24.82% in accordance with the Bank for International Settlement (BIS) standard reference of 8% and the Indonesian Financial Services Authority (OJK) of 11% -14% for banks with a risk profile rating of 4 or 5.

Because the add on component is only applied to the base curve, banks must add the add on rate to differentiate the asset curve and the liability curve using the ask spread and bid spread. So that the bank has an add on curve construction for each tenor as follows.

**Table 8. Add-on Rate on the Tenor Base Yield Curve**

Tenor	% Cost of GWM Rate	% Cost of min HQLA Rate	% Adjustment of LDR Rate	% Bid Spread Rate	% Ask Spread Rate
1D	0.0909%	0.1303%	0.000%	0.000%	0.000%
1W	0.0909%	0.1303%	0.000%	-0.050%	0.050%
1M	0.0909%	0.1303%	0.000%	-0.100%	0.100%
3M	0.0909%	0.1303%	0.000%	-0.106%	0.106%
6M	0.0909%	0.1303%	0.000%	-0.100%	0.100%
1Y	0.0909%	0.1303%	0.000%	-0.081%	0.081%
2Y	0.0000%	0.1303%	0.000%	-0.081%	0.081%
3Y	0.0000%	0.1303%	0.000%	-0.081%	0.081%
4Y	0.0000%	0.1303%	0.000%	-0.081%	0.081%
5Y	0.0000%	0.1303%	0.000%	-0.081%	0.081%
6Y	0.0000%	0.1303%	0.000%	-0.081%	0.081%
7Y	0.0000%	0.1303%	0.000%	-0.081%	0.081%
8Y	0.0000%	0.1303%	0.000%	-0.081%	0.081%

Tenor	% Cost of GWM Rate	% Cost of min HQLA Rate	% Adjustment of LDR Rate	% Bid Spread Rate	% Ask Spread Rate
9Y	0.0000%	0.1303%	0.000%	-0.081%	0.081%
10Y	0.0000%	0.1303%	0.000%	-0.081%	0.081%
11Y	0.0000%	0.1303%	0.000%	-0.081%	0.081%
12Y	0.0000%	0.1303%	0.000%	-0.081%	0.081%
13Y	0.0000%	0.1303%	0.000%	-0.081%	0.081%
15Y	0.0000%	0.1303%	0.000%	-0.081%	0.081%
16Y	0.0000%	0.1303%	0.000%	-0.081%	0.081%
18Y	0.0000%	0.1303%	0.000%	-0.081%	0.081%
20Y	0.0000%	0.1303%	0.000%	-0.081%	0.081%
30Y	0.0000%	0.1303%	0.000%	-0.081%	0.081%

By combining the base yield curve with the add on rate, two FTP final yield curves will be obtained, namely assets (ask) and liabilities (bid). These two curves are needed for companies to carry out expansive and conservative business strategies by having spreads for ALM which are used as mismatch mitigation.

In practice, it has never been found that the bid curve is higher than the ask curve, and vice versa. Thus, the ALM spread will most likely always be positive over the difference between the ask curve and the bid curve. However, under certain conditions, if the total volume of liabilities is too far from the volume of assets, a negative ALM spread may occur.

## RESULT AND DISCUSSION

### FTP Implementation Journey in The Bank

The implementation of FTP in banks does not have standard references or regulations, this is based on the fact that these tools are part of management accounting which does not have a direct impact on the company's income statement because FTP expenses and income are not recorded on a balance sheet. So that the methods and results of FTP calculations can only be compared within one organization and cannot be compared between organizations.

Ownership of the FTP method is the ALM function, the ALM function at the bank is managed by the ALM Division. Meanwhile, the determination of the FTP rate at banks is carried out periodically through a committee called the Asset and Liabilities Committee (ALCO). ALCO was attended by the CEO and C-level to avoid interference from the Business Division to the ALM Division in determining FTP pricing, because the ALM Division is structurally parallel to other Business Divisions. Because apart from having a balance sheet management function, FTP is also a tool for performance measurement management which has been targeted to each Business Division through Key Performance Indicators (KPI) in the Work Plan and Budget (RKA).

The Bank uses the Single FTP method which is set for all financial instruments, both assets and liabilities. This method was used for approximately 35 years until 2018. Based on several considerations and problems that occurred in the financial industry, the bank decided in 2018 to continue the journey of implementing the most advanced FTP to date, namely matched maturity. However, along the way, banks need to carry out several stages of developing methodologies that are useful for increasing the insight of all stakeholders on the use of FTP and avoiding strategic risks because FTP implementation is not easy and requires a lot of money.

In 2019, the bank's FTP method developed into Dual FTP which differentiates the FTP pool and rate on assets and liabilities. During this period, a large outreach was also carried out to all stakeholders, especially members of business units, both the Head Office

and Operational Work Units. The goal is for each party to have awareness that financial performance is not only based on transactions that occur between banks and customers, but in more detail related to the existence of centralized pool rules in the ALM Division to determine expansive and conservative decisions in marketing banking products.

Furthermore, in 2020 until now, banks use the FTP multiple pool method which differentiates FTP bucket prices based on several buckets, namely assets and liabilities, currency, segmentation and tenor. The FTP price charged for each bucket is based on the distribution of the highest weighted average of each account within the tenor of the bucket. Then, based on the tenor, the FTP rate value is seen on the FTP Yield Curve owned by the bank, so that each account in the tenor bucket will have the same FTP rate.

### FTP Calculation Results – MP-FTP

#### Sample 1 – Saving, Current Account

The account is a type of deposit, namely current account with corporate segmentation, rupiah currency, and no tenor. The tenor for demand deposits and savings products literally cannot be determined because the two products in the agreement with the customer do not specify a tenor or time limit for use. Customers can withdraw or deposit funds to current and saving accounts without being limited by the amount and time by the bank. Thus, to obtain the FTP base rate for these two products, different calculation methods are used for each bank based on judgment management using behavioral analysis.

**Table 9. Sample 1 MP-FTP Calculation Result**

<b>Multiple FTP - CASA</b>				
Segment	Currency	Product	Tenor	FTP Base Rate
Corporate	IDR	Giro	-	<b>5.85%</b>
<b>FTP Pool rate Multiple FTP - CASA</b>				
Product	Tenor	Corporate	SME & Consumer	Micro
Current Account	-	5.85%	5.85%	5.85%
Saving Account	-	<b>5.85%</b>	5.85%	5.85%

#### Sample 2 – Saving, Time Deposit

The account is a type of deposit, namely a time deposit with consumer segmentation, rupiah currency, and a tenor of 695 days. Thus, the FTP rate that applies to this account is a bucket over 1 year, namely 6.15%.

**Table 10. Sample 2 MP-FTP Calculation Result**

<b>Multiple FTP – Time Deposit</b>							
Segment	Currency	Product	Start Date	Validity Date	Payment Due Date	Remaining Tenor	FTP Base Rate
Cosnumer	IDR	Deposit	25-05-22	30-06-22	25-05-24	695	<b>6.15%</b>
<b>FTP Pool rate Multiple FTP - Deposit</b>							
Pool Rate	< to 1 Month	>1 to 3 Months	>3 Months to 1 Year		>1 Year		
Rate	4.15%	5.00%	5.80%		<b>6.15%</b>		

### Sample 3 – Loan, Working Capital Loan

The account is a type of loan, namely working capital credit (KMK) with SME segmentation, rupiah currency, and a 360-day tenor. This type of product does not have cash flow because the payment of the loan principal is made in a balloon payment at the end of the credit term, and the period can be extended when it reaches maturity.

**Table 11. Sample 3 MP-FTP Calculation Result**

Multiple FTP - Loan							
Segment	Currency	Product	Start Date	Validity Date	Payment Due Date	Remaining Tenor	FTP Base Rate
SME	IDR	KMK	30-06-22	30-06-22	30-06-23	360	<b>5.10%</b>
FTP Pool rate Multiple FTP - Loan							
Pool Rate	< to 1 Month	>1 to 3 Months	>3 to 6 Months	>6 Months to 1 Year	>1 Year to 5 Years	>5 Years	
Rate	4.25%	4.25%	4.25%	<b>5.10%</b>	5.80%	8.05%	

### Sample 4 – Loan, Micro Loan

The account is a type of loan, namely Kredit Usaha Rakyat (KUR) with micro segmentation, rupiah currency, and a tenor of 181 days. This account has cashflow or principal repayment every month.

**Table 12. Sample 4 MP-FTP Calculation Result**

Multiple FTP - Loan							
Segment	Currency	Product	Start Date	Validity Date	Payment Due Date	Remaining Tenor	FTP Base Rate
Micro	IDR	KUR	28-10-21	30-06-22	28-12-22	181	<b>4.25%</b>
FTP Pool rate Multiple FTP - Loan							
Pool Rate	< to 1 Month	>1 to 3 Months	>3 to 6 Months	>6 Months to 1 Year	>1 Year to 5 Years	>5 Years	
Rate	4.25%	4.25%	<b>4.25%</b>	5.10%	5.80%	8.05%	

### Sample 5 – Loan, Mortgage

The account is a type of loan, namely housing loans (mortgage) with consumer segmentation, rupiah currency, and a tenor of 3,042 days. This account has cashflow or principal repayment every month.

**Table 13. Sample 5 MP-FTP Calculation Result**

Multiple FTP - Loan							
Segment	Currency	Product	Start Date	Validity Date	Payment Due Date	Remaining Tenor	FTP Base Rate
Consumer	IDR	Mortgage	28-10-21	30-06-22	28-10-30	3042	<b>8.05%</b>
FTP Pool rate Multiple FTP - Loan							
Pool Rate	< to 1 Month	>1 to 3 Months	>3 to 6 Months	>6 Months to 1 Year	>1 Year to 5 Years	>5 Years	
Rate	4.25%	4.25%	4.25%	5.10%	5.80%	<b>8.05%</b>	

### FTP Calculation Results – MM-FTP Weighted Average

This method is used for sample 1 because the sample has the characteristics of not having a maturity date and no cash flow. So to analyze it requires Behavior Analysis before determining the size of the core and non-core. The Bank applies a core, namely a historical minimum balance per product for 3 years, while non-core is a balance of 1 day back. Thus the value of the FTP base rate is the weighted average of each rate and amount of core and non-core.

**Table 14. Sample 1 MM-FTP Calculation Result**  
Match Maturity FTP - CASA

Segment	Currency	Product	Balance	FTP Base Rate
Corporate	IDR	Current Account	145,878,048,133,580	<b>4.78%</b>

#### FTP Curve Match Maturity FTP - CASA

Min Bal Tenor	Core	Non-Core	Amount	Portion
FTP Curve Tenor	3 Year	1 Day	Core 87,882,311,320,481	60.24%
FTP Rate	<b>5.950%</b>	<b>3.004%</b>	Non-Core 57,995,736,813,099	39.76%

### Straight Term

This method is used for sample 2 because it has a maturity date but no cash flow. This method is appropriate for time deposit products because deposits have remaining days until maturity, but do not have regular cash flow, but only make one payment at the end of the tenor period. Based on the distribution of the FTP rate in the yield curve, the determination of the rate is distributed on a daily basis so that the rate on the 695th day can be determined.

**Table 15. Sample 2 MM-FTP Calculation Result**  
Match Maturity FTP – Time Deposit

Segment	Currency	Product	Start Date	Key Date	Payment Date	Remaining Date	FTP Base Rate
Consumer	IDR	Deposit	25-05-22	30-06-22	25-05-24	695	<b>5.170%</b>

FTP Curve Match Maturity FTP							
Tenor	693	694	695	696	697	698	
FTP rate Asset	5.326%	5.329%		5.332%	5.335%	5.339%	5.342%
FTP rate Liabilities	5.163%	5.166%	<b>5.170%</b>		5.173%	5.176%	5.179%

Sample 3 is also calculated using this method because it has similarities to sample 2, it's just that this sample is an asset product, namely working capital loans, checking accounts. So the rate refers to the FTP rate of assets on the tenor owned by the account, which is 365 days.

**Table 16. Sample 3 MM-FTP Calculation Result**  
Multiple FTP – Loan

Segment	Currency	Product	Start Date	Validity Date	Payment Due Date	Remaining Tenor	FTP Base Rate
SME	IDR	KMK	30-06-22	30-06-22	30-06-23	365	<b>4.272%</b>

Implementation of Straight Term, Weighted Average, and Term Weighted Matched-Maturity Fund Transfer Pricing (FTP) on Indonesian Bank



**FTP Curve Match Maturity FTP**

Tenor	363	364	365	366	367	368
FTP rate Asset	4.270%	4.271%	4.272%	4.275%	4.278%	4.282%
FTP rate Liabilities	4.108%	4.109%	4.109%	4.113%	4.116%	4.119%

**Term Weighted**

This method is used for sample 4 because it has a maturity date and there is a monthly loan principal repayment. In this method, each repayment amount will be matched with the rate value on the yield curve based on the tenor on a weighted basis so that the FTP base rate is found. (table 17)

This method is also used for sample 5, however, to shorten the analysis in this chapter, a summary of the repayment for the tenor will be carried out, but the FTP base rate will still consider the overall value. (table 16)

**Table 17. Sample 4 MM-FTP Calculation Result**

Match Maturity FTP - Loan

Segment	Currency	Product	Start Date	Validity Date	Payment Due Date	Tenor	Principle Balance	FTP Curve	Numerator	Denominator	FTP Base Rate
Micro	IDR	KUR	28-10-21	30-06-22	28-07-22	28	818,515	3.76%	871,363	22,918,420	0.17%
Micro	IDR	KUR	28-10-21	30-06-22	28-08-22	59	822,609	3.87%	1,921,613	48,533,931	0.37%
Micro	IDR	KUR	28-10-21	30-06-22	28-09-22	90	826,722	3.98%	2,990,818	74,404,980	0.57%
Micro	IDR	KUR	28-10-21	30-06-22	28-10-22	120	830,855	4.03%	4,080,559	99,702,600	0.78%
Micro	IDR	KUR	28-10-21	30-06-22	28-11-22	151	835,010	4.08%	5,221,127	126,086,510	1.00%
Micro	IDR	KUR	28-10-21	30-06-22	28-12-22	181	839,185	3.76%	6,341,008	151,892,485	1.21%
Total							4,972,896		21,426,487	523,538,926	4.09%

**Table 18. Sample 5 MM-FTP Calculation Result**

Match Maturity FTP - Loan

Segment	Currency	Product	Start Date	Validity Date	Payment Due Date	Tenor	Principle Balance	FTP Curve	Numerator	Denominator	FTP Base Rate
Consumer	IDR	KPR	28-10-21	30-06-22	28-07-22	28	524,099	3.76%	551,307	14,674,780	0.00%
Consumer	IDR	KPR	28-10-21	30-06-22	28-08-22	59	529,995	3.87%	1,208,794	31,269,728	0.00%
Consumer	IDR	KPR	28-10-21	30-06-22	28-09-22	90	535,958	3.98%	1,918,562	48,236,205	0.00%
Consumer	IDR	KPR	28-10-21	30-06-22	28-10-22	120	541,987	4.03%	2,620,193	65,038,483	0.00%
Consumer	IDR	KPR	28-10-21	30-06-22	28-11-22	151	548,085	4.08%	3,377,997	82,760,792	0.00%
...	...	...	...	...	...	...	...	...	...	...	...
Consumer	IDR	KPR	28-10-21	30-06-22	28-06-30	2920	1,516,961	7.84%	347,387,221	4,429,525,378	0.20%
Consumer	IDR	KPR	28-10-21	30-06-22	28-07-30	2950	1,534,027	7.84%	354,722,270	4,525,378,335	0.20%
Consumer	IDR	KPR	28-10-21	30-06-22	28-08-30	2981	1,551,284	7.83%	362,289,971	4,624,378,657	0.21%
Consumer	IDR	KPR	28-10-21	30-06-22	28-09-30	3012	1,568,736	7.83%	369,979,003	4,725,033,742	0.21%

Consumer	IDR	KPR	28-10-21	30-06-22	28-10-30	3042	1,586,385	7.83%	377,673,420	4,825,781,909	0.22%
Total							4,972,896		12,519,872,790	174,111,561,617	7.19%

### Analysis on FTP Calculation Results for Different Methodology

Based on the calculations that have been carried out in the previous section, for the same five samples, calculations were carried out using different methods. It is found that there is a difference in the value of the FTP rate which will be further analyzed regarding its impact and materiality on the bank. Differences that may occur are excess differences, namely over-charged & over-credited, and under-charged differences, namely under-charged & under-credited. Over-charged is a condition where the FTP calculation results of the multiple pool method give a higher rate for asset products than the matched maturity method, while under-charged is the opposite condition. Over-credited is a condition where the FTP calculation results of the multiple pool method give a higher rate for product liabilities than the matched maturity method, while under-credited is the opposite condition.

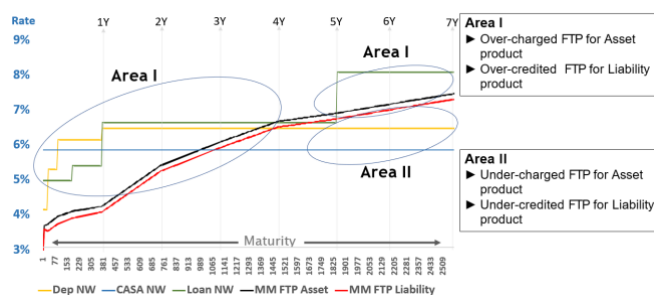


Figure 6. Illustration of gap area are occurred

Table 19. Comparison of FTP calculation results using the Multiple Pool and Matched Maturity methods

Sample	Product	FTP Rate Result		Deviation	Notes
		Multiple Pool	Matched Maturity		
Sample 1	Saving	5.85%	4.78%	-1.07%	Over-credited
Sample 2	Saving	6.15%	5.17%	-0.98%	Over-credited
Sample 3	Loan	5.10%	4.27%	-0.83%	Over-charged
Sample 4	Loan	4.25%	4.09%	-0.16%	Over-charged
Sample 5	Loan	8.05%	7.19%	-0.86%	Over-charged

Based on an analysis conducted on all accounts at banks grouped into business segments, the majority were found to be over-charged in multiple pool calculations when compared to matched maturity. The difference that occurs can be used as a reference for management to make decisions, based on the level of materiality and the readiness of the bank in the challenges of managing data, engines, and governance from the FTP matched maturity method.

### Discussion

#### FTP Improve Balance Sheet Management

The main objective of the ALM division as the owner of the ALM function in a bank is to ensure a healthy bank balance sheet in line with sustainably growing profitability. There are two factors that must be monitored on an ongoing basis, namely internal factors which include the composition of assets and liabilities, and external factors which include

foreign and domestic market conditions and risk levels based on provisions agreed upon by the industry. Through FTP, the ALM division is able to become the orchestrator of expansionary and conservative bank portfolio strategies according to the ratios of concern.

Aspects considered to achieve an efficient balance sheet are not limited to volume, but in more detail the tenor of each instrument owned. This is a concern of the ALM division through the FTP pool which reflects how large the mismatch gap between bank assets and liabilities is. Some examples of simple scenarios that show the benefits of FTP to banks are as follows:

**Table 20. The role of FTP in the Banking Industry Phenomenon**

Party Affected	Phenomenon	Role of FTP
Working Unit	High Loan to Deposit Ratio (LDR)	Increasing the add on rate for the liability and asset curves, so that the savings business unit expands while the lending business unit does conservatively
Treasury Division	Short term savings portfolio increased, long term loan portfolio increased	FTP is able to provide an analysis of an increasing mismatch between assets and liabilities, so that banks are able to issue bonds as long-term deposit instruments to reduce the mismatch gap

***FTP Evaluate Performance Management***

The Bank evaluates the performance of business units through various dimensions, for example divisions and products managed. The targets assigned to each division are determined in the company's budget performance plan (RKAP) every year and are revised in the middle of the year based on company and industry conditions. Based on the type of transfer pricing, FTP is only used for business divisions that have banking products, while divisions that only get contributions from banking services are excluded.

For business divisions, the profitability target that is determined does not only come from income and interest expenses. Rather it takes into account the spread from FTP which is determined by the ALM division as the owner of the FTP Pool. Thus, the assumption that the division that manages loans will always have a positive contribution if it continues to increase its credit volume becomes irrelevant. This is due to the possibility that the marketed product will have a negative spread against FTP that must be borne.

Therefore, each division that manages banking products is required to evaluate and forecast business expansion plans in line with the FTP rate from the ALM division, pricing rates for customers and KPI targets. So that every contribution received from a customer not only has a positive impact on the company but also reflects the division's performance as it should. The estuary of the results of the division's performance is appreciation to the stakeholders who are in it, this is what then causes the role of FTP to be able to act as a double-edged sword that provides benefits for one party but at the same time provides losses for the other party. So it becomes natural for the dynamics of the business division to determine KPI targets and FTP pricing.

**Table 21. Management of banking products based on segments in the business division**

Division	Saving	Loan	Segment	Spread
Micro Business	V	V	Micro	Asset & Liabilities
Small and Medium Business		V	SME	Asset
			Medium	Asset
Agribusiness		V	Corporate	Asset

Division	Saving	Loan	Segment	Spread
Corporate Business		V	Corporate	Asset
State-owned Enterprises		V	Corporate	Asset
Institution Relation	V		Corporate	Liabilities
Fund and Services	V		SME	Liabilities
			Consumer	

## CONCLUSION

FTP calculation method is a decision of management to be chosen by considering the Bank's portfolio size, data complexity, compliance to risk, and balance sheet strategic. The Bank has been implementing the FTP calculation method journey from the simplest to the most advance specifically Matched Maturity. The bigger the Bank, should emphasize the granularity of FTP calculation due to various product and account structure which led to data complexity and accuracy. To consider the market and liquidity risk, the Bank owns reference on determining the FTP method that could not be uniformed for all banks.

The Bank constructed the FTP Yield Curve by modifying Add On Rate to the FTP Base Curve. The Add On used by the Bank were Primary Reserve, High Quality Liquidity Asset, Cost of Loan to Deposit Ratio, and Bid-Ask Spread.

Based on the calculation result between Multiple Pool and Matched Maturity for the identical sample, shown that the current FTP method implemented by Bank were over-charged and over-credited compared with the proposed method. This could give an insight to management to rebalancing Bank portfolio, developing products, and setting business strategy.

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