

**Creating transparency of the BPR-industry
through industry-wide measurable
indicators for competitiveness and outreach**

Dr. Birgit Galemann

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0 Table of Contents

0	<i>Table of Contents</i>	2
1	<i>Summary</i>	3
2	<i>Key concepts</i>	6
2.1	Standardized Loan Product Classes	6
2.2	<i>Derivation of Transformation Formula for Flat Interest Rates</i>	7
2.3	<i>Derivation of Indicator Levels per Region</i>	8
3	<i>Demonstration of Indicators and Analysis of First Real Data</i>	11
4	<i>Manifold Usage of the derived Indicators</i>	13
4.1	Suggested adjustment to BI official format of BPR's Business Plans.....	14
5	<i>Formulas for Indicators and Measurement of Competitiveness</i>	14
5.1	Average Non-Flat Interest Rate per Standardized Product Class.....	15
5.1.1	Mapping each loan to a loan product class	15
5.1.2	Transforming <i>flat</i> interest rates into <i>non-flat</i> ones.....	16
5.1.3	Average non-flat rate per product class	17
5.2	Distribution of Interest Income on Business and Salary loans.....	18
5.3	Number of Salary Loans in Percent of Total Number of Loans	19
5.4	Distribution of Active Clients by Loan Size Ranges.....	19
5.5	Deposits in Percentage of Gross Loan Portfolio	21
5.6	Average Funding Rate per Funding Class	21
5.6.1	Savings.....	21
5.6.2	Term Deposits.....	21
5.6.3	Interbank Liabilities	21
5.6.4	Long term debt.....	22
5.7	Average Total Funding Rate excluding Dividends and assuming x% Dividend.....	22
5.8	Operational Cost Rate with respect to active loan portfolio	23
5.9	Rough Net Margin on Loan Business	24
5.10	Deriving Quartiles of the Indicator sets	24
5.11	Projecting <u>Future Competitiveness</u> using the Indicator's Time Series	25
5.11.1	A measure for <i>ranking</i> BPRs according to their degree of competitiveness	28
	<i>References</i>	30

1 Summary

In order to **measure current** and **stimulate future competitiveness** and **outreach** for each BPR and per region it had been recommended in 2008 (see [Gal]) to get more *transparency of the whole BPR-industry* in the following way:

- 1) Enhance the BI report on the breakdown of a BPR's loan portfolio by allowing to distinguish
 - a) five *standardized* product types combined with four *standardized loan size ranges* resulting into maximal twenty **risk & cost based standardized loan product classes**, see chapter 2 for details.
 - b) additional loan specifics to enable **transforming interest rates** quoted on non-decreasing balance ("**flat**") into rates quoted on **decreasing balance**. These are
 - *payment frequency* ("all at once" or daily, weekly, monthly, quarterly, etc.)
 - *date of first instalment* for loans with grace periods
- 2) Develop an efficiency, outreach and loan pricing tool for the BPRs that is based on these standardized product classes.

The *second* recommendation had already been realized in form of the Excel based quantitative management tool "SIAP-Simulasi BPR". Since October 2009, trainers in the BPR industry themselves provide courses on SIAP's concepts and applications. However, the user-friendliness of the tool was a bit hampered by the fact that the standardized loan product classes were not contained in the official loan report delivered on a monthly basis to BI. Fortunately, in **October 2010** a **new accounting standard** for the BPRs went live which contains many additional loan characteristics. This allows now realizing also the *first* recommendation by *deriving* the standardized product types and loan size ranges from these characteristics.

The newly obtained valuable data can be made use of for all parties involved:

- Support *management* capacities in the *BPR industry* by
 - a. adjusting **SIAP-Simulasi BPR** to the new accounting standard. This is now realized in **version 2.0** of the tool.
 - b. accepting business plans simulated per *quarter* using the *twenty product classes*
- Support *supervisors, the BPR industry, their potential investors and Apex organisations* as well as their *clients* by deriving from the enhanced reports the further below listed **indicators** for **competitiveness** and **outreach per BPR** and **per region**.

The **indicators** once derived, stored over time and published *per BPR* (for their supervisors and the BPR itself) and *per region* (for all parties) will

- **provide transparency over the current**
 - i. **BPR-market** regarding competitiveness
 - average interest rates per loan product class
 - *average funding rates per funding class and total*
 - *net margin on loan business*
 - *main sources of loan income*
 - ii. **BPR outreach**
 - *mobilized savings & term deposits in percentage of loan portfolio*
 - *stimulation of economic development via business loans*
 - *inclusion of micro and small borrowers*
- allow **simulating future competitiveness** of the **BPR-industry** based on (see **Ch. 5.9**)

- iii. **shifts of the current market interest and funding rates per class** using
 - **trends and relative changes in their respective monthly time series**
 - including the hardening demand for dividends
 - **instantaneous shocks** for all rates depending directly on the **BI rate**

The precise **indicators** are defined as follows:

- A. Average *non-flat* interest rate *per standardized loan product class*
- B. Distribution of interest income on Business loans by standardized loan size ranges and income on Salary loans, in (%) of total income
- C. *Number of salary loans* in percentage of the total number of loans
- D. *Distribution of active clients by loan size ranges*
- E. Savings and Term Deposits in percentage of outstanding gross loan portfolio
- F. *Average funding rate per funding class*: savings, term deposits, interbank liabilities, long term debt
- G. *Average total funding rate* excluding dividends and assuming x% dividend
- H. *Operational cost rate* with respect to *active* gross loan portfolio
- I. *Rough current and future Net Loan Margin via A, G and H*, see below
- J. *Active NPL-Ratio* (already calculated in the new EWS, see [Heldt])

The above indicators will shed light onto the following questions:

- A) What is the current *average interest rate per standardized product class* charged in the BPR-market? Is there a (downward) trend in these rates over time? Is it moving fast?
 - A meaningful quotation of the level of *current* interest rates can only be given when first separating loans into classes that are associated with similar risks and costs.
 - With respect to the chosen standardization of loan product classes by type and loan size range, one would expect e.g. that interest rates for
 - Salary loans are lower than those for Business loans
 - larger loans are lower than those for smaller ones
 - In some more efficient BPRs this could already be observed, see chapter 3.
- B) Which of the loan product classes are the major contributors to the BPR's interest income? Is the far largest part generated through small to medium sized business loans? Or is the BPR mainly profitable due to a high percentage of salary loans which carry much less risk and costs and which could much more easily be lost to a competitor?
- C) Does the BPR make an effort to *stimulate micro entrepreneurship* by disbursing mainly business (and not salary) loans? Does it invest into the economic progress in the community and with this into long term business relationships with its clients?
- D) Are at least 80% of the BPR's *active* clients falling into the *micro* and *small loan size range* or does the BPR serve instead the medium to large customers of the community?
- E) Does the BPR *mobilize savings* and term deposits in the community or is it heavily refinanced via interbank liabilities causing higher costs and large *exposure to increasing interest rates*?

- F) What are the current *average funding rates*, in particular regarding *savings and interbank liabilities* (IBL) in the various regions?
- G) What is the level of the *average total funding rate* once excluding dividends and once assuming x% dividend in the BPR market?
- H) What is the level of the *Operational Cost Rate* regarding the *active* loan portfolio (OS)?
- $\text{activeOpCostRate} = (\text{Personal} + \text{Admin. costs}) / (\text{Outstanding non-loss loans})$
- I) Is there leeway to decrease interest rates when facing strong competition with other micro financiers or through commercial banks entering this market as well?

The **rough current** and **future Net Loan Margin** (NLM) is derived as:

$$\begin{aligned} & \text{Sum over all ProductClasses of } [(InterestRate_{scen} * \text{activeOS per class}) / \text{Total activeOS}] \\ & - \text{Sum over all FundingClasses of } [(FundingRate_{scen} * \text{Liabilities per class}) / \text{Total OS}] \\ & - \text{activeOpCostRate} \end{aligned}$$

where “scen” indicates the respective *current* or *simulated* interest and funding rates

The margin is called “rough” since it does not include fee income and on the other hand it neither deducts costs for expected losses due to defaults nor the interest potentially not paid on loans already in arrears but not yet classified as loss or quality 4 loans.

- J) The *active* NPL-Ratio is defined as:

$$\text{Number of (loans in arrears – loss loans) / Number of (all loans – loss loans)}$$

A loan is accounted for as “in arrears” if any of the outstanding payments is more than seven days in arrears. The NPL-rate is called *active* because the non active or *loss loans* are excluded.

Working with the BPR managers using SIAP revealed their strong interest in comparing the levels of the above indicators for their own BPR with those of their fellow competitors.

Based on this observation and the above outlined reasoning we recommend to

- **derive** the above **indicators** for **competitiveness** and **outreach per BPR** and regularly **publish** the respective **median, 25% and 75% quartiles per geographical region**.

This will assist,

- **supervisors** in easily grasping the *current* and *future competitiveness* of a BPR
- **investors** in making a *long term financially* and *socially* oriented investment decision
- **clients** of some regions in profiting over time from interest rates coming down for some of the product classes

The reminder of this paper is organized as follows: The precise definition of the *standardized loan product classes*, the derivation of a *non-flat interest rate* from a flat one as well as the *statistical measures* for *aggregating individual BPR indicator levels* are provided in chapter 2. In chapter 3 (and 2.3) we demonstrate first remarkable results regarding regional differences in the indicators described above. The benefits of publishing the indicators on a *regional* basis for supervisors, BPRs, investors and clients as well as of sharing the *individual* indices with those BPRs that can’t yet determine them using SIAP are outlined in chapter 4. All formulas for deriving from the reports delivered by the BPRs to BI each of the **current indicator levels** as well as **simulated future values** based on their **time series** are specified in chapter 5. The simulated market scenarios result in a **ranking** of the BPRs **according to their future NLM** (5.11).

2 Key concepts

2.1 Standardized Loan Product Classes

In order to construct *standardized product classes* reflecting underlying *risk* and *costs* as well as the way the client is *creating cash flows for payment*, we distinguish

➤ **five loan product types**

Loan product type	Code
Business	Bus
Salary	Sal
Non business Non salary	NbNs
Group	Grp
Soft	Soft

The first three loan types reflect the way the client is creating cash flows for payment:

For a **business loan** payments are *generated* via the client's business *and* the loan is *used for* this business.

For a **salary loan** payments are covered by the client's regular salary cash flows.

For a **Non-business Non-salary loan** the client has *no regular salary* nor *direct business* usage to *produce* payments. It might e.g. be used for school fees or medical emergencies.

A **group loan** is one loan that is extended to a *group* of people

A **soft loan** is subsidized by the government or development organizations *and* the BPR is requested by its funding party to provide capital to the customers with *soft conditions* on the *interest rates*, i.e. the respective interest rates are much lower than what the BPR would charge their clients otherwise.

Note

Even if the funding party reimburses the BPR for the interest rate difference, the loan has to be classified as of type = Soft. This is since we wish to separate these loans so that

- the average interest rate per class does not get diluted
- the effects of subsidized loans per region can be analysed

Any other loan not falling into one of these five types is mapped to the type **Non-business / Non-salary**. For example a "back to back" loan falls under this category.

For each product type we distinguish

➤ **four loan size ranges**

Loan size Range	Code	Name
<= 5m Rp	1	Micro (mikro)
> 5m – 25m Rp	2	Small (kecil)
> 25m – 100m Rp	3	Medium (menenga)
> 100m Rp	4	Large (besar)

Combining the *five* product *types* with the *four* loan *size ranges*, we obtain

➤ **twenty different loan product classes**

e.g. Bus4, Sal2, Grp3, NbNs1

Important Note:

We are aware that there are official BI loan size ranges also referred to as micro and small but with much higher boundaries, namely less or equal to 50m Rp for micro business and between 50m Rp and 500m Rp for small-scale business.

However, we **highly recommended** to work in this context with the **above specified loan size ranges**. These had been defined based on

- the need to take higher interest rates for loans below 5 million Rupia in order make them profitable or otherwise to be able to quantify the loss in case these loans are considered as an *investment* into the future business relationship with the client
- a questionnaire for a wide spectrum of more than 60 BPRs as well as communication with more than additional 50 BPRs from different regions participating so far in the workshops on the management tool SIAP.

The specified ranges distinguish the different loan products and their respectively chosen prices well – provided that prices are already set by management in dependence of the loan size. See also the example data in chapter 3: In the example BPRs in Yogyakarta prices do already depend on the loan size whereas in NTB the prices are almost independent loan size.

In the case though that Indonesia experiences an extreme inflation or a revaluation of its currency one could shift the boundaries¹ of these ranges without influencing the whole idea of the loan product classification since there would still be a classification into micro, small, medium and large loans. Therefore even the time series on the collected indicator levels could be continued to be used after such a break.

2.2 Derivation of Transformation Formula for Flat Interest Rates

In this section we provide the derivation, i.e. the reasoning, for the formula specified in chapter 5.1.2 for transforming an interest rate quoted on a non-decreasing balance (“flat”) into one quoted on a decreasing balance, here referred to as “non-flat”.

A loan with a flat rate means interest is charged on a non-decreasing balance even though the debtor does reduce the outstanding balance in *equal sized* and *equal spaced* instalments.

The **corresponding non-flat rate** is understood as a rate that

- a) is paid on the respective outstanding of this instalment loan
- b) pays the same total amount of interest

This non-flat interest rate depends on: i) the flat rate itself, ii) the number of instalments and iii) the timing of these regular instalments

Neglecting the effect of discounting future cash flows to its present value, the dependence reduces to i) the flat rate itself and ii) the number of instalments

Because of this and conditions a) and b) above the following equation must hold between the non-flat rate, $r_{NonFlat}$, and the flat rate, r_{Flat} :

$$r_{Flat} \cdot n \cdot InitialPrincipal = \sum_{i=1}^n r_{NonFlat} \cdot OutstandingPrincipal_i \quad (1)$$

¹ The boundaries of the loan size ranges need to be programmed as variables, see chapter 5.1.1.

where

n	=	$number\ of\ instalments$
$Inst = Instalment$	=	$InitialPrincipal/n$
$OutstandingPrincipal_i$	=	$InitialPrincipal - i \cdot Inst = (n - i) \cdot Inst$

Equation (1) above is equivalent to

$$r_{nonFlat} = r_{Flat} \cdot \frac{n \cdot InitialPrincipal}{\sum_{i=1}^n OutstandingPrincipal_i} \quad (2)$$

And the quotient on the right hand side in (2) can be simplified to

$$\frac{n \cdot (n \cdot Inst)}{\sum_{i=0}^{n-1} (n - i) \cdot Inst} = \frac{n \cdot n}{n \cdot (n + 1)/2} = 2 \cdot \frac{n}{n + 1}$$

Hence the **flat quoted rate** for a loan with n regular instalments is **transformed into a non-flat rate by multiplying the flat rate with a factor of $2 \cdot n/(n + 1)$** .

This transformation formula reveals in particular that regardless of how many instalments exist until the due date of the loan, the *non-flat interest rate is never larger than twice the flat rate*.

An instalment loan with a **grace period** is one that starts paying down the principal amount in equal sized and equal spaced instalments *after* holding on to the initial principal for the entire length of the grace period. The interest paid during the grace period is thus the same amount regardless of a rate quoted on non-decreasing or decreasing balance. Therefore, the above transformation formula also holds for instalment loans with grace periods as long as the number of instalments is counted from the end of the grace period until the maturity of the loan instead of from the start date of the loan.

Estimation of error in transformation formula due to neglect of discounting effect:

The majority of the loans are currently priced between 12% - 24% flat p.a. with monthly payments for three months to three years. Discounting at a risk free non-flat rate of 8.5%, the non-flat rate is overestimated by 0.5% – 1.9% p.a. For flat rates between 12% – 33% p.a. the error increase to 2.6% p.a.

2.3 Derivation of Indicator Levels per Region

Once all of the indicators described in chapter 1 are derived for each of the BPRs, this information has to be aggregated in a meaningful way.

Based on findings during field studies in 2008 in Yogyakarta, West-Sumatra and NTB as well as workshops with BPRs from these regions, we believe that meaningful aggregates of the **competitiveness** and **outreach indicators** per BPRs will be obtained when **clustering by geographical regions**.

We therefore suggest deriving regional **aggregates of the indicators on BPR level** in two steps

- First aggregate across each of the regional official BI divisions (table of “wilaya” below).

- Thereby it might be possible to combine those wilaya with less than four member BPRs with a neighbouring wilaya.
- Then try combining those areas where numbers are coming out similar.
 - This might become more and more possible over time when the levels of the respective regional aggregates are starting to converge due to the published information.
- An aggregate on country level will only become meaningful in the long term future

Wilaya	# BPRs	Wilaya	# BPRs	Wilaya	# BPRs	Wilaya	# BPRs
DPBPR	250	MATARAM	65	PEKANBARU	18	PALU	6
SEMARANG	220	DIY	54	BANDA ACE	15	JAYAPURA	5
BANDUNG	149	JEMBER	53	PONTIANAK	15	KUPANG	5
DENPASAR	142	TASIKMALA	46	PALEMBANG	14	BENGKULU	3
SURABAYA	123	MEDAN	45	BATAM	12	AMBON	2
PADANG	103	BANDAR LA	27	SAMARINDA	11	BALIKPAPA	1
MALANG	86	BANJARMAS	24	SIBOLGA	8	LHOKSEUMA	1
SOLO	86	MAKASSAR	23	JAMBI	7	PALANGKAR	1
KEDIRI	78	MANADO	20	KENDARI	6	TERNATE	1
CIREBON	67	PURWOKERT	20				

Tab.1: Official BI supervising divisions as of December 2007

Aggregates of a specific indicator for a chosen set of individual BPRs (e.g. a wilaya) are suggested to be derived from the respective indicator levels of all BPRs belonging to this set and being *different from zero*² by taking the

- (1) **median** over these numbers as well as the
- (2) **25% and 75% quartile**

The median divides the set of the indicator levels in an equal number sitting above and below this “average” level. Twenty five percent of the data sit below the 25% quartile and another 25% sit above the 75% quartile.

In order to fulfil the goals of being competitive and to reach out to clients stirring economic entrepreneurship, a BPR should aim that its respective indicator levels are moving into the right **direction (Dir)**, i.e. are as low or as high as possible. Even if a concrete **benchmark** is being thought off, the BPR wants to be lower (<) respectively higher (>) or equal to this benchmark. For each of the competitiveness and outreach indicators the desirable directions are as follows:

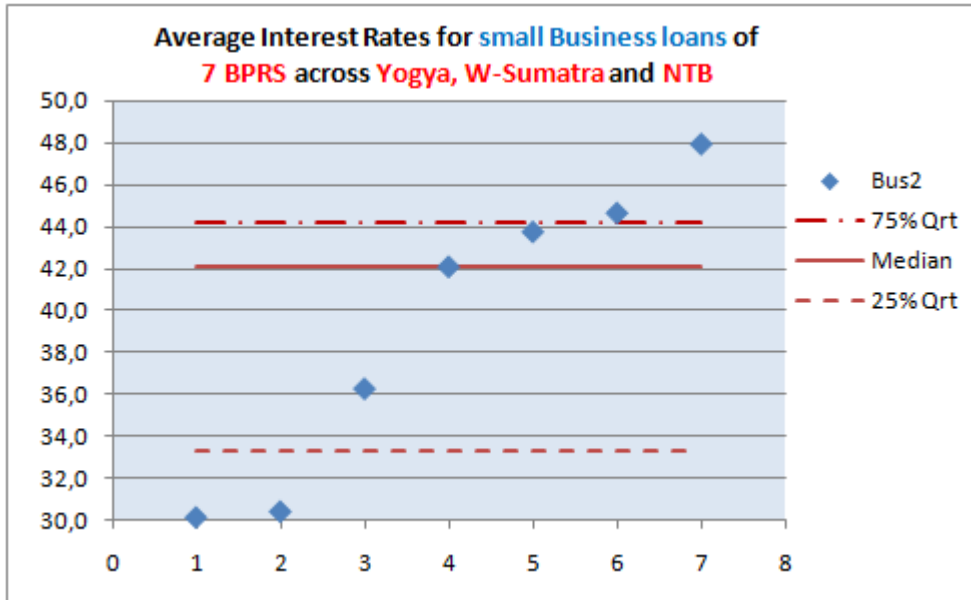
Indicator	Dir	Indicator	Dir
A : Interest Rates	<	E: Deposits / OS portfolio	>
B1: Income on Bus Loans in prctg of total	>	F: Funding Rates (deposits, IBL,...)	<
B2: Income on Sal Loans in prctg of total	<	G: Average Total Funding Rate	<
C : % Number of Sal Loans in portfolio	<	H:Operational Costs Rate	<
D1: % Number of Clients Loans of Size 1+2	>	I: Net Loan Margin, current & future	>
D2: % Number of Clients Loans of Size 3+4	<		

² E.g. a BPR not having large business loans (Bus4) need to be excluded from the set when deriving the average or the minimum interest rate for Bus4 loans.

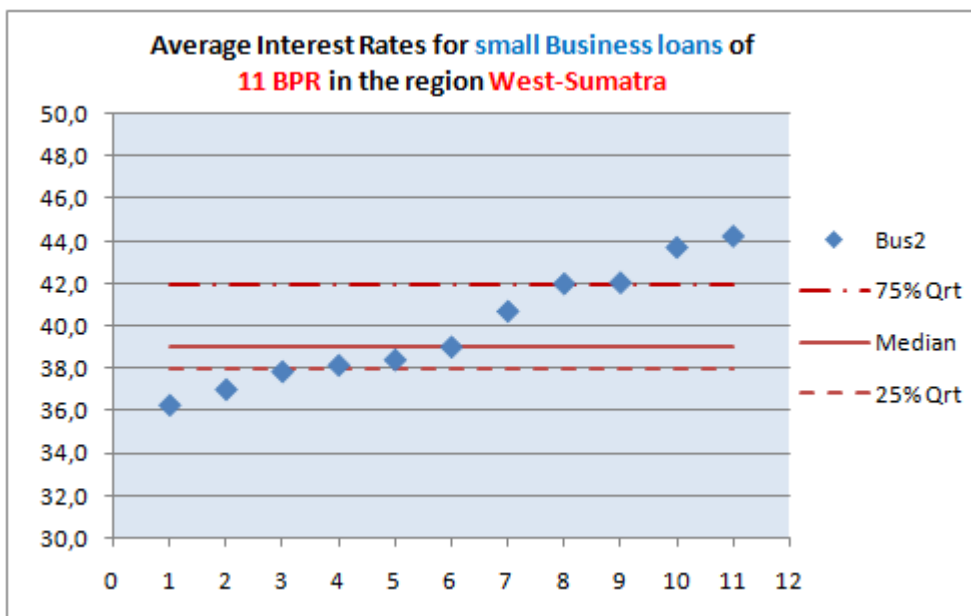
Using the Median, 25% and 75% quartiles to aggregate data per indicator allows analysing for each specific BPR how a respective indicator level compares against those of its competitors. For each indicator *targeting the downside direction* one reads off if the BPR's level

- i. falls into the 50% percent of the other levels surrounding the median or
- ii. sits *above* the 75% quartile, i.e. is amongst the *worst 75%* of all competitor's levels
- iii. sits *below* the 25% quartile, i.e. is amongst the *best 25%* of all competitor's levels

Analogously for indicators *targeting the upside direction* a level sitting below the 25% quartile needs improvement and one sitting above the 75% belongs to the "trend" leaders.



Indicator for interest rates for small business loans. Taking averages across regions that are in different stages of economic development will result in a **large distance between the lower and upper quartile.** Therefore it is suggested separating these regions when producing the aggregate information.



In the above set the respective indicator levels of two BPRs from West Sumatra are contained. This set is constituted in those two levels plus the levels of nine other BPRs from West Sumatra. The **distance between the lower and upper quartile is considerably smaller in this chosen set of indicators.**

Chapter 5.10 provides more explanations on the above measures and the way of driving them.

3 Demonstration of Indicators and Analysis of First Real Data

The below table displays the individual levels of all indicators listed in chapter 1 for seven BPRs from three different regions, namely Yogyakarta, West-Sumatra and NTB. It furthermore displays the respective regional medians of these indicators. Due to lack of space, the 25% and 75% quartiles aren't explicitly displayed as extra columns per region.

Some extreme indicator levels of individual BPRs are highlighted in green (for desired) and red (for undesired). Trends recognized in the regions (desired *or* not desired) are highlighted in blue

Analysing these data the following **remarkable results** are discovered:

- Around Yoga Interest rates are assigned according to the size of the loan, i.e. lower rates for larger loans, as well as according to the involved risks and costs, i.e. lower rates for Salary loans compared to business loans. This does *not* hold for NTB!
- Many BPRs generate the major part of their interest income through salary loans. This happens in particular in NTB. On the other hand the data of the first BPR show that it is possible to concentrate on business loans and still be profitable and with this not to risk losing this business in the future to the commercial banks.
- Micro entrepreneurship could be better stimulated in NTB by disbursing more business loans
- Small and in particular Micro customers, i.e. with loan sizes $\leq 5m$ Rp are well reached in all areas but in particular in NTB. Here even *medium* sized loans ($> 25m$ Rp) hardly exist. The average loan size is only 5.8m Rp!
- Mobilization of savings and term deposits seems not to be area specific. Some BPRs do very well others are heavily refinanced by interbank liabilities or have enough core capital.
- The level of saving rates seems to be depended on the state of regional economic development. Rates are low in Yoga, medium high in West Sumatra and high in NTB. The spreads on the BI-rate for interbank liabilities vary to a great extend between the different BPRs.
- Deriving the average funding rate once excluding dividends and once assuming a certain percentage reveals which of the BPRs does not leverage its capital at all, example NTB.
- Operational cost rates vary a lot – between 5.4% only! and 23.1% - but are lowest in Yoga and highest in NTB. This indicates again a certain degree of inefficiency of the BPRs in NTB, especially when considering that these BPRs should have fewer costs due to the high percentage of salary loan.
- The rough net loan margin is lowest in Yoga and highest in NTB indicating that competition is already much higher in Yoga than in West–Sumatra than in NTB. This supports the theory that market rates in Yoga are already much lower than in NTB due to the hardening of the competition in this economically further developed region.

Indicators / Ratios		Yogyakarta			West -Sumatra		NTB		Yogya	W-Smtr	NTB
Number of BPRs		1	1	1	1	1	1	1	3	2	2
Average non-flat Interest Rates per standardized product class, (% p.a.)											
Bus1		35.6	37.8	31.8	41.9	43.0	44.4	45.4	35.6	42.4	44.9
Bus2		30.4	36.2	30.1	42.0	43.7	44.6	47.9	30.4	42.9	46.2
Bus3		25.0	31.6	28.7	38.9	42.6	37.9	48.1	28.7	40.8	43.0
Bus4		24.2	28.4	27.7	31.9	35.4	0	0	27.7	33.6	0
Sal1		28.4	25.9	24.7	22.1	38.2	44.0	44.1	25.9	30.2	44.1
Sal2		25.2	24.3	24.4	27.3	41.8	42.4	44.6	24.4	34.5	43.5
Sal3		15.1	23.7	26.6	26.7	46.0	29.6	35.6	23.7	36.3	32.6
Sal4		0	22.4	0	9.0	0	17.7	0	22.4	9.0	17.7
Group		0	28.1	0	21.0	44.3	44.3	0	28.1	32.7	44.3
Soft		13.3	17.5	0	0	0.0	0	0	17.3	0	0
NbNs		0	0	28.4	0	46.1	0	0	29.1	46.1	0
Distribution of interest income on Bus loans by loan size ranges and income on Sal loans, (%) of total income											
Bus1	Target:	14	1	1	7	3	13	10	1	5	12
Bus2	>= 70%	29	9	4	18	19	9	15	9	18	12
Bus3		34	10	24	26	35	7	4	23	30	5
Bus4		20	15	44	6	14	0	0	19	10	0
Sal	< 30%	5	61	7	44	26	71	71	7	35	71
Does BPR stir economic entrepreneurship? -> Number of Salary loans/Number of all loans											
Target: < 30%		8	54	26	33	22	57	62	26	27	60
Are small customers reached? -> Distribution of active clients by loan size ranges, (%)											
Micro	Target:	50	37	20	34	44	60	66	37	39	63
Small	>= 80%	38	46	49	39	28	39	33	46	34	36
Medium		< 20%	11	17	22	26	26	2	2	17	26
Large	1		1	10	1	2	0,1	0	1	1	0.03
Av Principal loan size		14,719	21,875	38,833	21,344	21,400	5,797	5,845	21,875	21,372	5,821
Are savings and term deposits mobilized? -> (Savings + Term Deposits) / Outstanding gross loans											
Depo/Loan; Target >75%		83	34	120	72	58	37	60	83	65	48
Average Funding Rates, (% p.a.)											
Savings		4.5	5.5	4.5	6.0	6.0	8.0	9.0	4.5	6.0	8.5
Term Deposits		11.6	10.4	12.6	11.8	11.6	10.9	11.7	11.6	11.7	11.3
Interbank Liabilities		14.3	17.0	12.0	10.5	13.0	11.0	9.0	14.3	11.7	10.0
Average Funding Rate p.a. with x% p.a. dividend and without dividend (x = 0)											
X_divid. =	0.0	10.3	12.4	14.2	9.5	6.3	3.2	6.2	12.4	7.9	4.7
X_divid. =	20.0	13.2	15.4	16.9	11.9	10.8	19.3	16.2	15.4	11.4	17.8
Operational Cost Rate: (Personal + Admin. costs) / (Outstanding non-loss loans)											
Operational Costs, (%)		14.5	5.4	9.4	9.4	22.9	23.1	14.8	9.4	16.2	19.0
Rough Net Loan Margin = Yield of active loans - Avg. Funding Rate(excl. divid.) - activeOpCostRate											
Rough Net Loan Margin		2.4	8.2	4.3	13.5	13.2	14.9	23.4	4.3	13.3	19.1

4 Manifold Usage of the derived Indicators

Once the suggested indicators are derived by BI *per BPR* and *on regional level*, we suggest **storing** them **on a monthly basis** so that **trends in the BPR-market** regarding competitiveness (*interest and funding rates, current and future net margin on loan business, main sources of loan income*) as well as trends regarding **outreach** (*mobilisation of savings, stimulation of economic development, inclusion of micro and small borrowers*) can be read off from the resulting **time series**. This will produce **industry-wide benchmarks and trends for market rates and social performance** with respect to outreach. Please see chapters 5.10 and 5.11 for specifics on how to derive these benchmarks and trends from the collected aggregated indicators and their respective time series.

In order to **stimulate competition, regional aggregates of the indicator levels**, i.e. average, minimum, maximum and a lower and upper quantile **should be published** in the national magazine “Media BPR” and in the magazines of the regional PERBARINDO associations.

Benefit for BPR clients

If the regionally aggregated *interest rates per standardized product class* and *deposit rates* are quoted in the local newspapers, BPR clients having access to more than one BPR could make an informed choice of their respective financiers.

Benefit for supervisors

If **indicator levels of the individual BPRs** are **provided to** the regional **supervisors**, they can easily assess the *current* competitiveness and *future stability* of a BPR in the light of the hardening competition in particular with respect to interest and deposit rates.

The new Early Warning System (EWS) contains a measure of the *overall* profitability of a BPR, see *profitability ratio* in section 3.2 of the EWS user manual, ([Heldt]). The **competitiveness** and **outreach indicators** suggested in this paper **supplement** the **analysis proposed in the EWS manual**, compare [Heldt] section 4.1.2: “Questionnaire Profitability Analysis” and section 4.2.: “Addressing the Root Cause of Insufficient EWS Ratios”. The EWS furthermore suggests competitiveness ratios to be used as a medium to long term prospect for future stability of a BPR. The calculation and storage of the average non-flat interest rates per standardized product class and the average funding rates (average total and per funding product) recommended in this paper are an important **prerequisite for deriving early warning market benchmarks** for loan and deposit rates.

Benefit for BPR management

Once supervisors share the *individual* indicator levels with the respective **BPRs**, the **individual strengths and weaknesses** regarding a BPR’s competitiveness and social performance can be measured and compared by the BPR’s management with average levels in the BPR-market. This would allow them **following up over time** on their efforts made to either over-come any of these weaknesses or to maintain areas of strength.

It should be noted that all of those BPRs already using the loan pricing and portfolio planning tool **SIAP** would be able to directly compare these indicator levels also resulting from SIAP with the published aggregates on regional level. The representatives of those BPRs that already participated in the course on concepts and applications of SIAP were very eager to compare their performance with the one of their competitors by means of these indicators.

Benefit for BPR investors

Local governments might decide no longer subsidizing funds for **soft micro loans** but instead investing this capital into those BPRs that have a track record for being competitive and serving their communities well as regularly measured by the respective indicators.

Other types of investors might be encouraged investing in a certain BPR having now the means to measure its historic, current and future stability.

4.1 Suggested adjustment to BI official format of BPR's Business Plans

Currently BI supervisors request a more detailed business plan than the one derived in the quantitative management tool SIAP. The current format of a business plan needs to display:

- balance sheet and P&L on a *monthly* instead of a quarterly basis
- future outstanding per month for each of the BPR's *individual* loan product types

It would be an advantage to supervisors and BPRs if supervisors could accept from now on

- projections of **balance sheet** and **P&L statement** on a **quarterly** basis
- projections of the outstanding loan portfolio **per quarter according to the standardized risk and cost based product classes**

This level of detail in the reports is considered by BPR management to be sufficient.

Benefits

- **Business plans** will become **comparable across Indonesia**.
- The currently requested manual cumbersome calculations of each current as well as projected new and renewed loan over the future twelve months would no longer be needed.
 - Once the users of SIAP have decided on certain parameters, the projected outstanding portfolio *per standardized product class* is derived *automatically* in SIAP for the next four quarters.
- In case the business plan could not be realized in the next quarter(s) as originally projected, it **can be easily adjusted** to the new situation **using SIAP**.

5 Formulas for Indicators and Measurement of Competitiveness

For each variable in each formula the precise reference to the respective BI report is given.

In order to make these quotations more intuitive, the following mapping between the long names of the monthly reports and a short name is used:

Official Report Name	Short name	Description
Form 01 - Laporan Bulanan Neraca	Neraca	Balance sheet
Form 03 - Laporan Bulanan Rincian Kredit	Kredit	Loan Breakdown
Form 07 - Laporan Bulanan Tabungan	Tabungan	Savings Breakdown
Form 08 - Laporan Bulanan Deposito Berjangka	Deposito	Deposit Breakdown

Form 09 - LaporanBulananAntarBankPasiva	ABA	Interbank Liabilities
Form 10 - LaporanBulananRincianPinjamanDeterima	Pinjaman	BPR's loans
Form 12 - LaporanBulananLabaRugi	LabaRugi	Profit & Loss

A variable is then referred to using this short name and the respective column (and number of row) in the report.

Background and definition of *active* loans:

In the computation of the indicators described in the following sub sections, we will in general take out those loans that are classified in the monthly reports as “loss” (“macet”), i.e. “quality 4” (“kualitas 4”). We refer to the remaining loans as *active* loans. The loss loans are those that have already been transferred to State Claim Agency (BUPN) and/or filed for claim payment to insurance company. They are at least 2 months beyond maturity and at least 12 instalments have been missed in case of a monthly payment frequency which is agreed for the far majority of all loans.

The write off behaviour differs a lot amongst the various BPRs. Some BPRs write off these loss loans on a bi-annual basis whereas other BPRs (almost) never write off any loans so that these ones could accumulate easily to 40% of the number all outstanding loans!

Therefore a comparison between the indicators for the BPRs only becomes meaningful, when excluding the loss loans.

5.1 Average Non-Flat Interest Rate per Standardized Product Class

5.1.1 Mapping each loan to a loan product class

For each loan the associated **product type**, *ProdTyp*, is determined as

$$ProdType = \begin{cases} Grp & \text{if } GolonganDebitur = 872 \text{ else} \\ ProdType = \begin{cases} Sal & \text{if } SumberDanaPelunasan = 10 \\ Bus & \text{if } SumberDanaPelunasan = 22 \\ Soft & \text{if } SumberDanaPelunasan = 21 \text{ or } = 31 \\ NbNs & \text{else} \end{cases} \end{cases}$$

For each loan - possibly reported in a loan aggregate - the associated **product size range**, *ProdSizeRange*, is determined as

$$ProdSizeRange = \begin{cases} 1 & \text{if } PlafonAkad/JumlahRek \leq Batas1 \\ 2 & \text{if } PlafonAkad/JumlahRek > Batas1 \text{ and } \leq Batas2 \\ 3 & \text{if } PlafonAkad/JumlahRek > Batas2 \text{ and } \leq Batas3 \\ 4 & \text{if } PlafonAkad/JumlahRek > Batas3 \end{cases}$$

with

Variable Name, Bahasa	English	Report	Column	Row
<i>GolonganDebitur</i>	Debtor category	Kredit	11	all
<i>SumberDanaPelunasan</i>	Source of Financing	Kredit	5	all
<i>PlafonAkad</i>	Initial Principal	Kredit	18.1	all
<i>JumlahRek(ening)</i>	Number of loans in aggregate	Kredit	1	all

The three variables for the range boundaries have to be set to the following **initial values**:

Name of boundary	Initial value	Explanation	Name of boundary
<i>Batas1</i>	Boundary1	5 juta Rp	These initial settings need only to be changed should Indonesia experience extremely high inflation or a revaluation of its currency.
<i>Batas2</i>	Boundary2	25 juta Rp	
<i>Batas3</i>	Boundary3	100 juta Rp	

Explanations on codes:

Batas1, 2, 3 = Boundary1, 2, 3

1 juta Rp = one million Rupiah

If ... else = Jika ... (yang) lain

Golongan Debitur = 872 = Kelompok (Group)

Sumber Dana Pelunasan

= 10 = Gaji / Honor (Salary)

= 21 = Usaha, subsidi (Business, subsidized)

= 22 = Usaha, non subsidi (Business, non subsidized)

= 31 = Lainnya subsidi (other subsidized)

For each loan its associated **product class**, *ProdClass*, is determined as

$$ProdClass = ProdType \cup ProdSizeRange$$

Thus there are **twenty possible product classes**, e.g. Grp2, Grp3, Bus1, Bus4, Sal3, etc.

5.1.2 Transforming *flat* interest rates into *non-flat* ones

For each loan the *non-flat interest rate*, $SB_{nonFlat}$, is determined as

$$SB_{nonFlat} = \begin{cases} SukuBunga & \text{if CaraPerhitungan} = 10 \text{ or } = 20 \\ & \text{and PeriodePembayaran} = 7 \\ SukuBunga \cdot 2 \cdot \frac{n}{n+1} & \text{if CaraPerhitungan} = 10 \text{ or } = 20 \\ & \text{and PeriodePembayaran} \neq 7 \\ SukuBunga & \text{else} \end{cases}$$

where

$n = \text{NumberOfPrincipalPayments}$ (jumlah pembayaran plafon)

is derived as

$$n = 1 + \begin{cases} \text{JatuTempo} - \text{AngsuranPokokPertama} & \text{if PeriodePembayaran} = 1 \\ \text{Integer} \left[(\text{JatuTempo} - \text{AngsuranPokokPertama}) / \left(\frac{365}{52} \right) \right] & \text{if PeriodePembayaran} = 2 \\ \text{Integer} \left[(\text{JatuTempo} - \text{AngsuranPokokPertama}) / \left(\frac{365}{12} \right) \right] & \text{if PeriodePembayaran} = 3 \\ \text{Integer} \left[(\text{JatuTempo} - \text{AngsuranPokokPertama}) / \left(\frac{365}{4} \right) \right] & \text{if PeriodePembayaran} = 4 \\ \text{Integer} \left[(\text{JatuTempo} - \text{AngsuranPokokPertama}) / \left(\frac{365}{2} \right) \right] & \text{if PeriodePembayaran} = 5 \\ \text{Integer} [(\text{JatuTempo} - \text{AngsuranPokokPertama}) / 365] & \text{if PeriodePembayaran} = 6 \\ 0 & \text{if PeriodePembayaran} = 7 \\ \text{Integer} \left[(\text{JatuTempo} - \text{AngsuranPokokPertama}) / \left(\frac{365}{12} \right) \right] & \text{if PeriodePembayaran} = 8 \end{cases}$$

and

$\text{Integer}[x] = x$ rounded to the next integer number

with

Variable Name, Bahasa	English	Report	Column	Row
<i>SukuBunga</i>	Interest Rate	Kredit	15.1	all
<i>CaraPerhitungan</i>	Calculation method	Kredit	15.2	all
<i>PeriodePembayaran</i>	Payment Frequency	Kredit	6	all
<i>AngsuranPokokPertama</i>	First Principal Instalment	Kredit	7A.1-3	all
<i>JatTempo</i>	Maturity	Kredit	7B.1-3	all

Explanations on codes:

PeriodePembayaran

- = 1 = Harian (daily)
- = 2 = Mingguan (weekly)
- = 3 = Bulanan (monthly)
- = 4 = Triwulanan (quarterly)
- = 5 = Semesteran (semi-annually)
- = 6 = Tahunan (yearly)
- = 7 = Sekaligus (all at once, i.e. bullet payment)
- = 8 = Setiap saat (anytime)

CaraPerhitungan Bunga

- = 10 = Bunga Flat dan Tetap (flat interest and fixed)
- = 20 = Bunga Flat dan Mengambang (flat interest and variable)
- = 30 = Bunga tidak Flat dan Tetap (non-flat interest and fixed)
- = 40 = Bunga tidak Flat dan Mengambang (non-flat interest and variable)

5.1.3 Average non-flat rate per product class

For each product class k the annual *average* non-flat interest rate, $\text{rata2_SB}_{nonFlat}^k$, is determined as a weighted sum over the non-flat interest rates, $\text{SB}_{nonFlat,i}$ of all active (= non

loss) loans i (see section 5.1.2) in product class k whereby the weight is the loan's current outstanding (OS).³

This can be easiest achieved by setting the outstanding of a loss loan (quality = 4) to zero, see definition of $OS_{nonMacet_i}$ below, and then summing over ALL loans belonging to product class k :

$$rata2_{SB_{nonFlat}^k} = \frac{\sum_{loan\ i \in ProdClass\ k} SB_{nonFlat,i} \cdot OS_{nonMacet_i}}{\sum_{loan\ i \in ProdClass\ k} OS_{nonMacet_i}}$$

where

for each loan i

$$OS_{nonMacet_i} = \begin{cases} BakiDebet_i & \text{if } Kualitas_i \neq 4 \\ 0 & \text{else} \end{cases}$$

with

Variable Name, Bahasa	English	Report	Column	Row
<i>Kualitas</i>	Quality	Kredit	9	all
<i>BakiDebet</i>	Outstanding	Kredit	19	all

Explanations on codes:

Kualitas (Quality)

- = 1 = Lancar (standard)
- = 2 = Kurang lancer (sub-standard)
- = 3 = Diragukan (doubtful)
- = 4 = Macet (loss)

Possible Simplification:

Since there are not many loans with

$$ProdType = Grp\ or\ Soft\ or\ NbNs,$$

for simplicity reasons it is suggested deriving the average interest rate for these product types across all four loan size ranges.

5.2 Distribution of Interest Income on Business and Salary loans

The distribution of the interest income on active business loans *per loan size range* and the interest income on all active salary loans *in percentage of the total interest income* of all active loans is derived in the following steps:

With the definitions in 5.1.3 calculate first the *Interest Income per loan product class k* for class $k = Bus1, Bus2, Bus3, Bus4, Sal1, Sal2, Sal3$ and $Sal4$:

$$InterestIncome_k = rata2_{SB_{nonFlat}^k} \cdot OS_{nonMacet_k}$$

Then derive the total interest income of all active loans as

³ We exclude loss loans since these could distort the average interest rate – and with this the estimated income - in case many of these loans had not been written off since years. In this case these loans could have much higher interest rates. The author discovered examples of non-flat annual rates of up to 80%.

$$TotalInterestIncome = \sum_{k=1}^{20} rata2_SB_{nonFlat}^k \cdot OS_nonMacet_k$$

where with the definitions in chapter 5.1.3:

$OS_nonMacet_k$ is the BPR's current outstanding amount of all active loans in class k , i.e.

$$OS_nonMacet_k = \sum_{loan\ i \in ProdClass\ k} OS_nonMacet_i$$

Then the interest income for **Busk** active loans in percentage of the total interest income is given by

$$IntIncome_{Busk}\ inPercentOfTotal = \frac{InterestIncome_k}{\sum_{k=1}^{20} rata2_SB_{nonFlat}^k \cdot OS_nonMacet_k}$$

and the interest income for *all* active salary loans in percentage of the total interest income is given by

$$IntIncome_{Sal}\ inPercentOfTotal = \frac{\sum_{k=1}^4 InterestIncome_{Salk}}{\sum_{k=1}^{20} rata2_SB_{nonFlat}^k \cdot OS_nonMacet_k}$$

5.3 Number of Salary Loans in Percent of Total Number of Loans

With the definitions in section 5.1.3 regarding the loan quality, the number of *active* salary loans, $Nmbr_{Sal\ Active}$, is defined as

$$Nmbr_{Sal\ Active} = \text{Number of loans with } \begin{cases} ProdType = Sal \text{ and} \\ Kualitas \neq 4 \end{cases}$$

and the number of *all active* loans, $Nmbr_{Loans}$, is defined as

$$Nmbr_{LoansActive} = \text{Number of loans with } Kualitas \neq 4$$

The *percentage* of active salary loans amongst all active loans, $SalaryLoanQuota$, is then determined as

$$SalaryLoanQuota = \frac{Nmbr_{Sal\ Active}}{Nmbr_{LoansActive}}$$

5.4 Distribution of Active Clients by Loan Size Ranges

With the definitions in section 5.1.1 and 5.1.3 regarding the loan size ranges and loan quality, for each of the four loan size ranges, k , the *number of active loans per product size range* k , $Nmbr_{LoansActive}^k$ is defined as

$$Nmbr_{LoansActive}^k = \text{Number of loans with } \begin{cases} ProdSizeRange = k \text{ and} \\ Kualitas \neq 4 \end{cases}$$

Assuming that each client has only one loan with the respective BPR, the number of loans equals the number of clients unless the BPR has disbursed group loans.

Since we are interested in the **distribution of clients** by loan size range that are served by the BPR - and not the distribution of loans -, we need to adjust $Nmbr_{LoansActive}^k$ if the BPR has group loans. Since the average number of **members per group** is not reported by the BPR, we need to make an assumption on it.

Based on a survey made in 2008, we think that there are only a few BPRs that have group loans and most of these have only a few group loans. The existing groups have between 5 to 10 members. Therefore we suggest setting the average number of members per group, $AvrgGroupSize_{BPR}$, in general as follows:

$$AvrgGroupSize_{BPR} = \begin{cases} 8 & \text{if } Nmbr_{GrpActive} \neq 0 \\ 0 & \text{else} \end{cases}$$

where

$$Nmbr_{GrpActive} := \text{Number of active loans with } ProdType = Grp$$

In the system the parameter $AvrgGroupSize_{BPR}$ should be set up as *variable on BPR level* so that it could be set individually and possibly different from eight in cases where it really matters.

The *number* of clients in the k -th loan size range, $Nmbr_{clients}^k$, is then determined as

$$Nmbr_{clients}^k = \begin{cases} Nmbr_{Loans}^1 + AvrgGrpSize_{BPR} \cdot Nmbr_{GrpActive}^2 & \text{if } k = 1 \\ Nmbr_{Loans}^2 - Nmbr_{GrpActive}^2 + AvrgGrpSize_{BPR} \cdot Nmbr_{GrpActive}^3 & \text{if } k = 2 \\ Nmbr_{Loans}^3 - Nmbr_{GrpActive}^3 + AvrgGrpSize_{BPR} \cdot Nmbr_{GrpActive}^4 & \text{if } k = 3 \\ Nmbr_{Loans}^4 - Nmbr_{GrpActive}^4 & \text{if } k = 4 \end{cases} \quad (*)$$

where

$$Nmbr_{GrpActive}^k = \text{Number of active loans with } \begin{cases} ProdType = Grp \text{ and} \\ ProdSizeRange = k \end{cases}$$

And the *percentage* of active clients in the k -th loan size range, $LoanSizeQuota^k$ is determined as

$$LoanSizeQuota^k = \frac{Nmbr_{clients}^k}{\sum_{k=1}^4 Nmbr_{clients}^k}$$

As explained above, in the fast majority of the BPR, $Nmbr_{GrpActive}^k = 0$ for all k so that the expression in (*) simplifies to

$$Nmbr_{clients}^k = Nmbr_{LoansActive}^k \quad \text{for all } k.$$

Note:

The logic behind the inclusion of the summand in the above equations is as follows:

- ONE Group loan of category SMALL ($k=2$) serves about $AvrgGroupSize_{BPR}$ clients with a loan size of category MICRO.
- ONE Group loan of category MEDIUM ($k=3$) serves about $AvrgGroupSize_{BPR}$ clients with a loan size of category SMALL.
- ONE Group loan of category LARGE ($k=4$) serves about $AvrgGroupSize_{BPR}$ clients with a loan size of category MEDIUM.

5.5 Deposits in Percentage of Gross Loan Portfolio

The indicator Deposits in Percentage of the Gross Loan Portfolio, *DTL*, is defined as follows

$$DTL = \frac{Tabungan + Deposito berjangka}{Kredit yang diberikan}$$

with

Variable Name, Bahasa	English	Report	Sandi / Code
<i>Tabungan</i>	Savings	Neraca	Pasiva - 210
<i>Deposito berjangka</i>	Term Deposits	Neraca	Pasiva - 220
<i>Kredit yang diberikan</i>	Gross Loans	Neraca	Aktiva - 130

5.6 Average Funding Rate per Funding Class

5.6.1 Savings

The annual average Savings Rate (Suku Bunga Tabungan), SB_{Tab} , is determined as a weighted sum over the saving rates for each account i , $SukuBunga_i$ (respectively the i -th aggregated position in the report), whereby the weight is the savings' account current outstanding, $Jumlah_i$:

$$SB_{Tab} = \frac{\sum_i SukuBunga_i \cdot Jumlah_i}{\sum_i Jumlah_i}$$

with

Variable Name, Bahasa	English	Report	Column	Row
$SukuBunga_i$	Interest Rate	Tabungan	6	i -th row
$Jumlah_i$	Total / Amount	Tabungan	7	i -th row

5.6.2 Term Deposits

The annual average rate on Term Deposits, SB_{Depo} , is determined as a weighted sum over the term deposit rates for each account i , $SukuBunga_i$ (respectively the i -th aggregated position in the report), whereby the weight is the deposit account's current outstanding, $Jumlah_i$:

$$SB_{Depo} = \frac{\sum_i SukuBunga_i \cdot Jumlah_i}{\sum_i Jumlah_i}$$

with

Variable Name, Bahasa	English	Report	Column	Row
$SukuBunga_i$	Interest Rate	Deposito	7	i -th row
$Jumlah_i$	Total / Amount	Deposito	8	i -th row

5.6.3 Interbank Liabilities

The annual average rate on Interbank Liabilities (Antar Bank Pasiva, ABP), SB_{ABP} , is determined as a weighted sum over the rates on interbank liabilities for each position i , $SukuBunga_i$, whereby the weight is the position's current outstanding, $Jumlah_i$:

$$SB_{ABP} = \frac{\sum_i SukuBunga_i \cdot Jumlah_i}{\sum_i Jumlah_i}$$

with

Variable Name, Bahasa	English	Report	Column	Row
<i>SukuBunga_i</i>	Interest Rate	ABP	7	<i>i</i> -th row
<i>Jumlah_i</i>	Total / Amount	ABP	8	<i>i</i> -th row

5.6.4 Long term debt

The annual average rate on the BPR's loans (*Pinjaman*), $SB_{Pinjaman}$, is determined as a weighted sum over the rates on each of these loans i , $SB_{nonFlat,i}$, whereby the weight is the loan's current balance, $Saldo_i$

$$SB_{Pinjaman} = \frac{\sum_i SB_{nonFlat,i} \cdot Saldo_i}{\sum_i Saldo_i}$$

where

$SB_{nonFlat,i}$ is determined from $SukuBunga_i$, $CaraPerhitungan_i$, $PeriodePembayaran_i$, $Mulai/Akad_i$, $JatuhTempo_i$ as described in section 5.1.2.

with

Variable Name, Bahasa	English	Report	Column	Row
<i>Saldo_i</i>	Balance	Pinjaman	9	<i>i</i> -th row
<i>SukuBunga_i</i>	Interest Rate	Pinjaman	7.1	<i>i</i> -th row
<i>CaraPerhitungan_i</i> ,	Calculation method	Pinjaman	7.2	<i>i</i> -th row
<i>PeriodePembayaran_i</i> ,	Payment Frequency	Pinjaman	5	<i>i</i> -th row
<i>Mulai/Akad_i</i> ,	Start Date	Pinjaman	6A.1-3	<i>i</i> -th row
<i>JatuhTempo_i</i>	Maturity	Pinjaman	6B.1-3	<i>i</i> -th row

Note

In general the rates quoted on loans provided to the BPR (*Pinjaman*) will already be quoted as non-flat interest rates.

5.7 Average Total Funding Rate excluding Dividends and assuming x% Dividend

With the definitions in chapter 5.6 we can determine the *Average Total Funding Rate*, *BungaDana Rata2*, as follows

$BungaDanaRata2 =$

$$\frac{SB_{Tab} \cdot Tab + SB_{Depo} \cdot Depo + SB_{ABP} \cdot ABP + SB_{Pinj} \cdot Pinj + x \cdot Ekuitas}{Kredit\ yang\ diberikan}$$

where

x = assumed dividend yield as percentage number, e.g. 0,20 for 20% or 0 for 0%

Ekuitas

$$= \text{Modal dasar} - \text{Modal yg belum disetor} + \text{Dana setoran Modal}$$

and

Variable Name, Bahasa	English	Report	Sandi / Code
<i>Tab(ungan)</i>	Savings	Neraca	Pasiva - 210
<i>Depo(sitoBerjangka)</i>	Term Deposits	Neraca	Pasiva - 220
ABP (Antarbank Pasiva)	Interbank Liabilities	Neraca	Pasiva - 240
<i>Pinj(aman yg diterima)</i>	Loans to BPR	Neraca	Pasiva - 250
<i>Kredit yang diberikan</i>	Gross Loans	Neraca	Aktiva - 130
<i>Modal dasar</i>	Statutory Capital	Neraca	Pasiva - 281
<i>Modal yg belum disetor</i>	Capital not yet paid in	Neraca	Pasiva - 282
<i>Dana setoran Modal</i>	Capital injection fund	Neraca	Pasiva - 288

5.8 Operational Cost Rate with respect to active loan portfolio

The *annual* active Operational Cost rate, *activeOpCostRate*, is defined as

$$\text{activeOpCostRate} = \frac{(\text{Biaya Personalia YtD} + \text{Administrasi YtD}) / (\text{Nmbr of Mths in YtD}) * 12}{\sum_{k=1}^{20} OS_{nonMacet_k}}$$

where

$OS_{nonMacet_k}$ is the BPR's current outstanding amount of all active loans in class k ,
(see chapter 5.2)

Nmbr of Mths in Year to Date =

1, if the reporting months = January, 2 if it is February, 3, if it is March, etc.

Biaya Personalia YtD =

Gaji dan upah + Honorarium + Lainnya

Biaya Administrasi YtD =

Koreksi atas pendapatan bunga + Transaksi PVA + PremiAsuransi

+Biaya pendidikan + Biaya penelitian dan pengemban. +Biaya promosi dan edukasi

+Sewa + Pajak2 + Permeliharaan dan perbaikan

+Penhapusan Aktiva tetap dan investaris + Penhapusan Beban yg ditangguhkan

+Barang dan jasa + Lainnya

with

Variable Name, Bahasa	English	Report	Sandi
<i>Gaji dan upah</i>	Salaries and wages	LabaRugi	201
<i>Honorarium</i>	Honorarium	LabaRugi	202
<i>Lainnya</i>	Other	LabaRugi	209
<i>Koreksi atas pendapatan bunga</i>	Correction operational interest	LabaRugi	181
<i>Transaksi PVA</i>	Money Transfer costs	LabaRugi	182

<i>PremiAsuransi</i>	Insurance Premium	LabaRugi	190
<i>Biaya pendidikan</i>	Training costs	LabaRugi	206
<i>Biaya penelitian dan pengembangan</i>	Cost for research & development	LabaRugi	207
<i>Biaya promosi dan edukasi</i>	Costs for marketing & education	LabaRugi	208
<i>Sewa</i>	Rent	LabaRugi	210
<i>Pajak2</i>	Taxes	LabaRugi	220
<i>Permeliharaan dan perbaikan</i>	Maintenance & Repair	LabaRugi	230
<i>Penhapusan Aktiva tetap dan invest.</i>	Depreciat. fixed assets & inventory	LabaRugi	243
<i>Penhapusan Beban yg ditangguhkan</i>	Depreciation deferred costs	LabaRugi	245
<i>Barang dan jasa</i>	Goods and services	LabaRugi	250
<i>Lainnya</i>	Other	LabaRugi	269

5.9 Rough Net Margin on Loan Business

Using the definitions in chapter 1 for indicator I) and the formulas and definitions in chapter 5, the **rough current** and **future Net Loan Margin (NLM) based on Scenario X** is derived as:

$NetLoanMargin_{Scen X} =$

$$\frac{\sum_{k=1}^{20} rata2_SukuBunga_{nonFlat}^{k,ScenX} \cdot OS_{nonMacet_k}}{\sum_{k=1}^{20} OS_{nonMacet_k}} - \frac{SB_{Tab}^{ScenX} \cdot Tab + SB_{Depo}^{ScenX} \cdot Depo + SB_{ABP}^{ScenX} \cdot ABP + SB_{Pinj}^{ScenX} \cdot Pinj + x \cdot Ekuitas}{Kredit\ yang\ diberikan} - ActiveOpCostRate$$

where

$ScenX$ stands for a scenario of assumed interest rates paid or received.

Each interest rate indexed with $ScenX$ is chosen from this set of assumed rates.

Choosing for $ScenX$ the set of the *current* rates yields the *current* Net Loan Margin.

k runs over all 20 loan product classes

$rata2_SB_{nonFlat}^k$ is the BPR's *average interest rate for product class k*, defined in 5.1.3

$OS_{nonMacet_k}$ is the outstanding of the active loans in class k defined in 5.2.

SB_{Tab} , SB_{Depo} , SB_{ABP} , SB_{Pinj} , $Ekuitas$, x , and $Kredit\ yang\ diberikan$ are as in 5.7

$ActiveOpCostRate$ is the *active operational cost rate* defined in 5.8.

5.10 Deriving Quartiles of the Indicator sets

We have chosen taking the median instead of the average over the indicator levels since i) some of the regions have only a few data points, ii) the distribution of the data might not be symmetric and iii) there might be outliers in some of the sets.

If there are n BPRs in a chosen region, the **regional median** or **50% Quartile** of an indicator, $IndRegQrt50$, over the n respective BPR indicator levels $IndBPR_i$, $i = 1, \dots, n$, is derived in the following three steps:

- 1) Exclude those indicator levels which are zero
- 2) Sort the remaining N , $N \leq n$, BPR indicator levels in decreasing order
- 3) Determine

$$IndRegQrt50 = \begin{cases} IndBPR_{\frac{N+1}{2}} & \text{if } N \text{ is an odd number} \\ \frac{1}{2} \cdot (IndBPR_{\frac{N}{2}} + IndBPR_{\frac{N}{2}+1}) & \text{if } N \text{ is an even number} \end{cases}$$

The **regional first Quartile** or **25% Quartile** is then determined as

$$IndRegQrt25 = IndBPR_x \quad \text{with} \quad x = \text{round}(0.25 \cdot (N + 1))$$

The **regional third Quartile** or **75% Quartile** is then determined as

$$IndRegQrt75 = IndBPR_x \quad \text{with} \quad x = \text{round}(0.75 \cdot (N + 1))$$

Note

We exclude indicators exhibiting a level of zero since in this case the respective BPR has no position in the underlying assets or liabilities. For example, if a BPR does not disburse group loans, its indicator level "Average Interest Rate of Group Loans" will be zero.

5.11 Projecting Future Competitiveness using the Indicator's Time Series

Once **regional indicator levels** are derived and stored for each *month* j , the resulting time series, $IndRegQrtq^j$ with $q = 25, 50, 75$ and $j = 1, 2, 3, \dots$ allow estimating the following **types of changes** over moving time windows of m -months:

- i. **Trends** (T)
- ii. **Relative** changes (R)

With respect to indicators measuring **outreach (Out)** we wish to **analyse** and **measure** a potential *trend* for reaching more (or less) borrowers and savers thereby stirring economic entrepreneurship over time. Regarding the indicators for **competitiveness (Com)** which are not directly depending on market parameters we intend doing the same in order to understand at any point in time the level of a BPR's percental income generated through salary loans and the level of the operational costs rate as well as if there are downward trends in the level of these indicators over time.

Regarding indicators for competitiveness (Com) that are **depending on market parameters**, i.e. the interest and funding rates as well as the rough Net Loan Margin, we expect seeing downward trends over the short and medium term future. In the long term however, instead of a clear trend, **up down fluctuations** should be experienced as this is already naturally the case with the funding rates paid by the BPRs on all rates depending on the BI rate, in particular interbank liabilities and term deposit rates. Therefore for these indicators both types of changes, i.e. trends and relative changes need to be analysed and **applied** when **projecting business plans** and in particular **the future net income**.

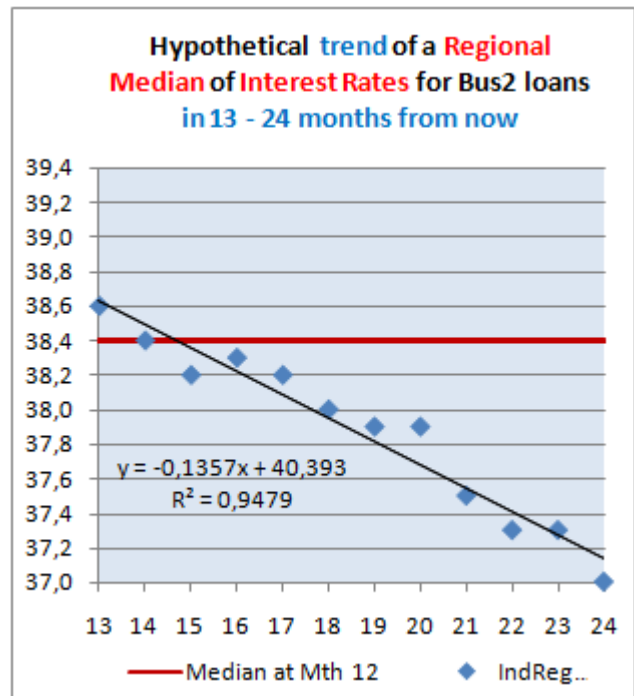
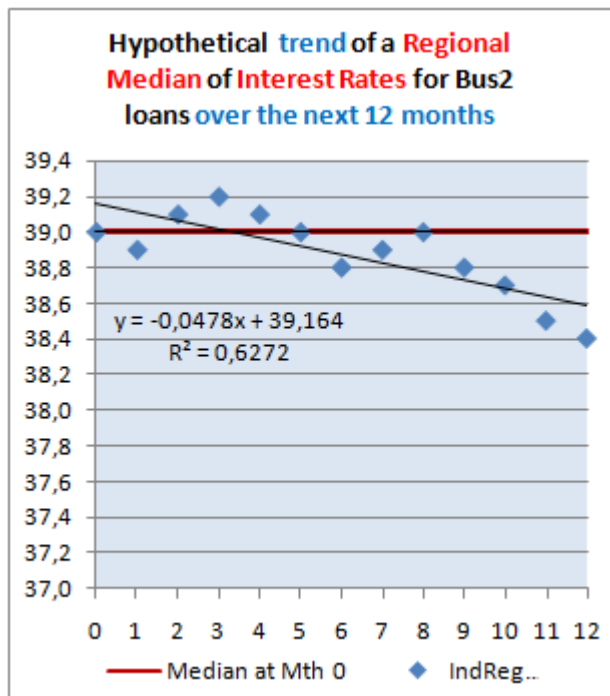
Indicator	Types		Indicator	Types	
A : Interest Rates	Com	T+R	E: Deposits / OS portfolio	Out	T
B1: Income on Bus Loans in prctg of total	Com	T	F: Funding Rates (deposits, IBL,...)	Com	T+R
B2: Income on Sal Loans in prctg of total	Com	T	G: Average Total Funding Rate	Com	T+R
C : % Nmbr of Sal Loans in portfolio	Out	T	H:Operational Costs Rate	Com	T
D1: % Nmbr of Clients Loans of Size 1+2	Out	T	I: Net Loan Margin, current & future	Com	T+R
D2: % Nmbr of Clients Loans of Size 3+4	Out	T			

Tab.2: Indicators for competitiveness and outreach plus type of level changes to be derived

Formula to measure trends:

For moving time windows of 6 - 12 months **perform a linear regression⁴** of the **last 6 - 12 data points** of a regional indicator's quartiles (25%, 50%, 75%) onto the number of the respective 6 - 12 consecutive months. The **sign** and absolute **slope** of the **regression line** reveals if there is a negative or positive trend as well as its magnitude.

Example: In the below hypothetical example data we imagine looking back over the last two years of publishing the regional median of interest rates for small business loans: In the first year a slight downwards trend of the interest rates of magnitude 0.05 *per month* can be seen in this region. Then in the next year this downward trend increases to a magnitude of 0.14 *per month*.⁵



A conscious BPR manager whose BPR does not yet offer interest rates as low as those of the 25% lowest quoted rates in the region can **use the information on trends** of the median and 25% quartile to **anticipate** changes in the **future markets rates**. In order that the BPR stays or becomes competitive the **projected income should be based on interest rates** that are

⁴ Use e.g. the method of minimizing the sum over the squared vertical deviances between the empirical y-data and the estimated straight line.

⁵ Please note that in the German notation in the above graphics digital numbers are indicated with a comma. In the English language the above non-flat rates are notated as 39.4, etc. and the magnitude of changes as 0.05 and 0.14.

reduced by a least the published trends for the median or 25% quartile in the respective region.

Formula to measure relative changes over *m*-months :

The series of relative changes over moving windows of 6-months, $\Delta IndRegQrtq^j$, $j = 6, 7, 8, \dots$ associated with the time series of an indicator's regional quartile, $IndRegQrtq^j$, $j = 0, 1, 2, 3, \dots$ is derived as

$$\Delta_{6m}IndRegQrtq^j = \frac{IndRegQrtq^j}{IndRegQrtq^{j-6}} - 1$$

If relative changes over other time periods are desired one could approximate them using the 6-months relative changes in order to ease calculations. For example, to obtain relative changes over 3 and 12 months periods one would respectively divide and multiply the 6-months relative changes by 2.

Example: The numbers in the next table provide the above hypothetical data for a regional median of interest rates for small business loans over the next 24 months plus the respective relative shifts over moving windows of 6 months:

Mth	Ind	Shift6	Mth	Ind	Shift6	Mth	Ind	Shift6	Mth	Ind	Shift6	Mth	Ind	Shift6
0	39,0	-	5	39,0	-	10	38,7	-1,0%	15	38,2	-1,6%	20	37,9	-1,3%
1	38,9	-	6	38,8	-0,5%	11	38,5	-1,3%	16	38,3	-1,0%	21	37,5	-1,8%
2	39,1	-	7	38,9	0,0%	12	38,4	-1,0%	17	38,2	-0,8%	22	37,3	-2,6%
3	39,2	-	8	39,0	-0,3%	13	38,6	-0,8%	18	38,0	-1,0%	23	37,3	-2,4%
4	39,1	-	9	38,8	-1,0%	14	38,4	-1,5%	19	37,9	-1,8%	24	37,0	-2,7%

Tab.3: Example of 6-months relative shifts in regional hypothetical interest rates for Bus2

Creation of market parameter scenario in case a strong trend exists

In order to **project** any **income** or **costs position** that directly depend on market parameters, i.e. interest and funding rates, one can **use trends** or **relative shifts** of these parameters that occurred over previous time periods. In fact as long as there is a strong trend in a time series of the data, the two methods should come out similar.

For example, in the above example the trend of monthly changes in the regional interest rates observed over the last 13 – 24 months is -0.14 per month. This means on average there is a change of $6*(-0.14) = -0.84$ over a 6-month period. Multiplying the regional rate for month 23 in table 3 with the associated 6-month relative shift yields a change of $37.3*(-2.4\%) = 0.89$ over a 6-month period. Doing the analogue for month 24 yields a change of $37.0*(-2.7\%) = 0.98$.

Creation of market parameter scenario in case *no* strong trend exists

If there isn't a strong trend in the market parameters but instead parameters are **continuously fluctuating up and down**, one can **use historical relative shifts of these parameters** for projecting future values of positions depending on these parameters.

Thereby the **choice of the size of the shifts** depends on the **severity of the scenario** one wishes to simulate. We suggest choosing the 95% / 5% largest / smallest historical shift for the general or "**business as usual**" case when simulating a one-factor scenario, i.e. when changing only one of the underlying market parameters. This means, assuming historical events are a

good predictor of future ones, that one can be 95% sure that the future realized income / costs position depending on this parameter will not be lower / higher than simulated.

Stress scenarios are best simulated with “manually” created shifts. Otherwise, i.e. automatic derivation of the 1-factor stress scenarios could be derived as follows:

- i) Assume that changes in the indicator levels for interest and funding rates are normally distributed (i.e. the levels itself are log normally distributed)
- ii) For each indicator derive the standard deviation of moving windows of at least 12 months, i.e. 12 data points of changes in the indicator levels
- iii) The size of the stress scenario shift applied to the current indicator level is chosen as plus / minus three to four standard deviations.

5.11.1 A measure for *ranking* BPRs according to their degree of competitiveness

We determine the current and future competitiveness of a BPR in the following steps:

- 1) Derive a one- or multi-factor market parameter scenario (“business as usual“ or stress)
- 2) Derive the *current* rough Net Loan Margin for a BPR using
its *current* average interest and funding rates but a dividend of 0%
- 3) Simulate the *future* rough Net Loan Margin for the BPR using
 - A. the *current regional 25% Quartile* of the interest rates in the respective location of the BPR and its own funding rates but a dividend of 20%
 - B. the interest and funding rates of the *chosen / simulated* one-or multi-factor scenario including any level of dividend
- 4) **Rank** all BPRs of a region for each of the two scenarios **according to** their **future NLM**

The BPR with the largest *future* NLM is the most competitive BPR since its major income and costs positions that are driven by market parameters will best resist any pressure from decreasing interest rates and in certain periods increasing funding rates.

Example of projecting future net loan margins

The following example is based on two of the BPRs in the Yogyakarta region for which we studied the respective current indicator levels already in chapter 3.

The chosen future scenarios demonstrate that a BPR with a *current* relative small Net Loan Margin could be performing as one of the best BPRs in the future, i.e. when interest rates have come down and funding rates might have increased in certain periods.

The precise scenarios are derived as defined above, i.e.

Current Market with

- the respective rates of the BPR and a dividend of 0

Scenario A with

- the interest rates equalling to the 25% quantile of the respective regional indicators - taken over the three BPRs for which data was already available
- a dividend rate of 20%

Scenario B with:

- the 25% quantile of the respective regional indicators except for interest rates of Sal3 and Sal4 loans

- Sal3 and Sal4 rates have been stressed down to 14 and 13% respectively. The idea being that these types of loans could sooner or later be easily being offered by any commercial bank in the area.
- a dividend rate of 20%
- Interbank Liabilities stressed up by 1.25%. This shift corresponds to the current BI-rate times the 95%-quantile of *relative 6 months shifts* of these rates fluctuating between Sep05 and Dec10 between 10% and 6.5% (see data on BI web page)

Market Parameter	active OS		Current, 0% Divid.		Scenario A		Scenario B	
	BPR1	BPR2	BPR1	BPR2	BPR1	BPR2	BPR1	BPR2
Bus1, active	2.519.473	1.064.767	35,6	37,8	33,7	33,7	33,7	33,7
Bus2, active	6.271.752	7.234.111	30,4	36,2	30,2	30,2	30,2	30,2
Bus3, active	8.978.942	9.093.546	25,0	31,6	26,9	26,9	26,9	26,9
Bus4, active	5.204.173	15.832.105	24,2	28,4	26,0	26,0	26,0	26,0
Sal1, active	99.443	964.495	28,4	25,9	25,3	25,3	25,3	25,3
Sal2, active	970.580	33.130.669	25,2	24,3	24,4	24,4	24,4	24,4
Sal3, active	246.568	41.852.859	15,1	23,7	19,4	19,4	14,0	14,0
Sal4, active	0	439.234	0,0	22,4	22,4	22,4	13,0	13,0
Group, active	0	2.849.685	0,0	28,1	28,2	28,2	28,2	28,2
Soft, active	103.520	2.316.356	13,3	17,4	14,0	14,0	14,0	14,0
NbNs, active	0	0	0,0	0,0	32,0	32,0	32,0	32,0
Total <i>gross</i> OS	24.434.386	119.756.697						
Savings	9.539.316	24.756.397	4,5	5,5	4,5	5,5	4,5	5,5
TermDeposits	10.832.450	16.286.890	11,6	10,4	11,6	10,4	11,6	10,4
Loans	0	2.947.781	0,0	6,0	0,0	6,0	0,0	6,0
Interbank Liabilities	5.791.570	68.301.923	14,3	17,0	14,3	17,0	15,5	18,3
Current Liabilities	78.756	296.751	0,0	0,0	0,0	0,0	0,0	0,0
Other Liabilities	75.146	136.652	0,0	0,0	0,0	0,0	0,0	0,0
Core Capital + P&L last yr	3.491.636	17.809.384	0,0	0,0	20,0	20,0	20,0	20,0
Profit /Loss YtD after Taxes	93.591	61.001	0,0	0,0	20,0	20,0	20,0	20,0
Total Liabilities	29.902.465	130.596.779						
Avg. Interest Income Rate			27,2	26,1	28,0	23,3	27,9	21,3
Avg. Funding Rate			10,3	12,4	13,2	15,4	13,5	16,1
(Pers +Admin costs YtD)/ (Nمبر of mths in YtD)*12	3.547.308	6.223.008						
Active Op Costs Rate p.a.			14,5	5,4	14,5	5,4	14,5	5,4
Current & future NLM			2,3	8,2	0,2	2,5	-0,1	-0,2

Tab.4: Ranking BPRs according to future competitiveness under changed market conditions

In scenario B BPR1 outperforms BPR2 even though BPR1's *current* Net Loan Margin is way below that of BPR2.

References

- [Gal1] Galemann, Birgit: *Operational Efficiency, Outreach and Loan Pricing of Bank Perkreditan Rakyat (BPR) - 1*, GTZ-ProFI, WPS WP 02/2008, June 2008
- [Gal2] Galemann, Birgit: *Operational Efficiency, Outreach and Loan Pricing of Bank Perkreditan Rakyat (BPR) - 2*, GTZ-ProFI, Working Paper Series WP 05/2008, December 2008
- [Heldt] Heldt-Sorgenfrei, Philipp: *EWS for BPR User Manual, Draft 05, June 2010*