Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ)
Promotion of Small Financial Institutions (ProFI)

Operational Efficiency, Outreach and Loan Pricing of Bank Perkreditan Rakyat (BPR) - 2

by

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1 Introduction

This paper is a follow up on the recommendations made in June 2008.[1] The aim is to develop and then test a *model / tool* for BPR's senior management allowing them to analyse by themselves their *current* weaknesses regarding operational efficiency and outreach as well as to *project* a precise (aggressive) business plan using the model's parameters.

During the on-site visits in June we found that a few banks - outside of NTB - do already quite well in terms of efficiency and productivity but that that there is still a lot of room for further improvement and a large potential for outreach, i.e. expansion. In order to be able to analyse and measure current and future efficiency and outreach indicators in each BPR and to get transparency over the whole BPR industry the following suggestions were made:

1. Enhance the current BI loan report distinguishing *standardized* product *types* combined with four *standardized loan size ranges* (micro, small, medium, large).
2. Develop an efficiency, outreach and pricing tool for the BPRs that is based on these standardized product classes.

Using the designed efficiency and outreach indicators together with *benchmark targets* - estimated in a first step based on data of 60 BPRs - the model assists senior managers analysing the *current* degree of being "a *perfectly efficient* BPR *serving also its rural community"*. This reveals which *actions* they have to undertake to reduce *risk* and *costs*, increase *outreach* and better *price* their loans. After the respective actions have been simulated with the model the managers can read off the projected levels of all efficiency and outreach indicators measuring the anticipated improvements including in particular the new - in general much higher - profits.

A first version of the tool was tested in three BPRs of different sizes and regions. Feedback regarding the usefulness of the tool was extremely positive. Once senior managers had understood how the model works and then analysed with the tool the large potential for more efficiency / profits prevailing in their respective BPR, they made an aggressive but realistic business plan. They also started to analyse how much leeway they have in the various product classes to *decrease* interest rates. On the other hand they noticed that all of their soft loans and some of their *individual* micro loans had negative net profit margins.

The *enhanced loan report* serves on one hand side as the *key input to the model* to derive amongst others average (effective) interest rates, average loan size amounts and total number of clients for each of the product classes. On the other hand – once rolled out to all BPRs as the official new BI loan report - it enables supervisors to have complete transparency over the BPR market and to develop *risk based supervision*.

[1] Galemann, Birgit: Operational Efficiency, Outreach and Loan Pricing of Bank Perkreditan Rakyat (BPR), ProFI Working Paper Series, WP 02/2008, June 2008.

2 Standardized loan product classes

In June 2008 we recommended that BPRs should report their loans by *standardized* product *classes* reflecting underlying *risk* & *costs* and the *way* the client is *creating cash flows* for payment.

We distinguish five **loan product *types*** :

1. Salary loan (Sal)
2. Business loan (Bus)
3. Group loan (Grp)
4. Soft loan (Soft)
5. Other (Other)

A **soft loan** is subsidized by the government or development organizations *and* there are soft conditions on the interest rates, i.e. they are much lower than what the BPR would charge their clients otherwise.

In the **salary loan** instalments are covered by the client's regular salary cash flows.

In a **business loan** the instalments are covered by the cash flows originating from the client's business. Furthermore, the loan is used for the business and not for other purposes such as school fees etc. If the loan officer knows that the capital is needed outside of the client's business, he/she should classify this loan under "other".

A **group loan** is extended to a group of people.

Any loan not falling into one of the first four types is classified as "**Other**". For example a "back to back" loan or a consumptive loan *not* covered by the customer's salary cash flows as described in the example above falls under this category.

For each product type we distinguish the following **loan *size ranges*** :

Micro (1):	<= 5 m Rp
Small (2):	> 5 – 25 m Rp
Medium (3): >	25 – 100 m Rp
Large (4):	> 100 m Rp

Combining the five product *types* with the four loan *size ranges*, we obtain twenty different ***loan product classes***, e.g. Bus1, Sal3, Grp2.

This classification allows on one had side analysing and projecting the loan portfolio, interest income and costs per product class and on the other hand side it sets the foundation for risk based supervision.

3 The efficiency, outreach and pricing model

Classifying the loan portfolio of the BPR into standardized product types and loan size buckets allows determining a ***parameterization*** *per* product class of quantities such as outstanding amount, interest and fee income, net profit per product class, etc. For example the outstanding amount (OS) of the small business loans (Bus2) can be expressed in dependence of the two parameters: *number of small business loans* and *average size of small business loans* as the following product:

$$OS_{Bus2} = NumberOfLoans_{Bus2} * AverageLoanSize_{Bus2} \quad (1)$$

The interest income per product class per month can be expressed as the *average flat interest rate per month in this product class* adjusted by the percentage of loans in this class no longer paying interest *(denoted as: NPL_{23})* times *the original amount of all loans in this product class*. The total interest per month is then derived by summing this expression over all of the twenty existing product classes. In formulas this looks as follows:

$$\sum_{i=1}^{20} IR^{i}{}_{flat} * (1 - NPL_{23}^{i}) * OrigPrinciple^{i} \quad (2)$$

Using parameters such as

- average loan size per class and savings per account
- average term per class
- average effective and average flat interest rate and fees per class
- maximal number of loans per loan officer per class
- maximal number of savings accounts per funding officer
- relative time spent by each loan officer per class per month
- number of loan officers and accountants
- average salary per loan officer and accountant
- administrative costs per motorcycle per month
- amount of term deposits from non-bank third parties, loans from other banks
- spread between BI-rate and the rates BPRs are paying on 3rd party savings & deposits, bank loans and other liabilities (cost of funds)
- expected loss- and recovery rate per product class

we can parameterize, i.e. express the *net profit per product class* and with this the total net profit of the BPR in similar ways. Furthermore it allows us to design efficiency and outreach indicators that are built from these variables.

The model works now as follows:
First we express the *current* performance, i.e. quantities in the BPR's latest profit & loss statement and the balance sheet, through these kinds of parameterizations by setting appropriate values for the above variables. This is done automatically by the model as soon as the new loan input report, the latest profit and loss statement and balance sheet are read in and values for a few additional variables regarding cost of funding rates and number of personnel have been input.

Then we read off the resulting levels of the efficiency and outreach indicators which analyse the *current* operational weaknesses. The indicators also reveal how these inefficiencies can be overcome since they are constructed from the above listed *parameters* for which other than the current values, i.e. projected ones, can be used as well. Hence by changing the values of these influencing parameters, the indicators describing the future performance will change accordingly.

This enables us to make *projections* of improvements in the level of the designed indicators by changing the values of the *current* parameters to levels that senior management thinks could be reached over the next (e.g. 12) months.

3.1 Comparing *current* efficiency levels against indicator targets

Weaknesses in the *current* operational efficiency of a BPR can be analysed by comparing target levels of indicators for effectiveness & outreach set up in the model against the respective values that are currently realized by the BPR. The tool highlights in red all those currently (*saat ini*) achieved indicator levels which aren't reaching the suggested target level.

For example:

- The *distribution of active clients by loan size range* (micro, small, medium, large) measures how well the BPR reaches micro and small customers.
- The number of existing loans & savings in percentage of the *maximal potential number of clients*[2] measures the current outreach of the BPR in the areas it is serving.
- The number of *group loans* in percentage of the total number of loans reveals if the BPR reaches "micro-micro" customers in an efficient way.
- The number of *salary loans* in percentage of the total number of loans reveals if the BPR makes an effort to stimulate micro entrepreneurship.
- The levels of *effective interest rates per product class* show to what extent the BPR is profitable only due to charging high interest rates.
- The *number of loan/funding officers in percentage of the total number of banking-staff* measures how well overhead costs are minimized.
- The *caseload per loan/funding officer per product class* is an indication for productivity and the potential for reduction of costs.
- The *outstanding loan amount in percentage of the capital* measures the capital leverage. This must be less than 12.5 (=1/8%) but should be larger than 10. This assumes that almost all risky assets consist of the loan portfolio.

The below two graphics are a copy of the sheet <Indikator> in the tool. The first one displays those indicators that measure the degree of *being a perfectly efficient BPR serving also its rural community*. The second one holds indicators revealing areas for improvement to *become* "perfect".

[2] This is defined as the sum over all served areas of the number of households per are divided by the number of all banks per area.

	Degree of being a perfectly efficient BPR serving also ist rural community Degree of being a "sebuah BPR yang efisien melayani komunitas sekitarnya"											
Inggris	Op. costs/income	No. grp or linkage loans in % of total or absolut			a) av. effective interest rate levels p.a. or				b) IR spread levels over BI-rate p.a.			
Bahasa	BOPO, YtD	Jumlah kelompok atau linkage dlm % dr total			a) rata-rata tingkat suku bunga efektif p.a. atau				b) selisih suku bunga dengan BI-rate p.a.			
Bahasa		Group	Linkage	Soft	Bus1	Bus2	Bus3	Bus4	Sal1	Sal2	Sal3	Sal4
a) Arah Tujuan	<	>=	>=	<=	<=	<=	<=	<=	<=	<=	<=	<=
Target	**100%**	**5,0%**	**2,0%**	**2,0%**	**50,0**	**40,0**	**30,0**	**30,0**	**45,0**	**35,0**	**22,0**	**22,0**
***atau* b) Arah**		>=	>=	<=	<=	<=	<=	<=	<=	<=	<=	<=
Target		100	50	50	**46,5**	**31,5**	**16,5**	**16,5**	**41,5**	**26,5**	**11,5**	**11,5**
Saat ini:												
Cek target a)	87,1%	0,0%	0,0%	0,0%	40,0	40,2	39,6	38,2	34,8	26,6	25,5	0,0
Cek target b)		0	0	0	30,5	30,7	30,1	28,7	25,3	17,1	16,0	-9,5
Proyeksi:												
Cek target a)	82,8%	0,0%	0,0%	0,0%	40,0	40,2	39,6	38,2	34,8	26,6	25,5	0,0
Cek target b)		0	0	0	30,5	30,7	30,1	28,7	25,3	17,1	16,0	-9,5

	Distribution of active clients by loan size				av. loan size across portfolio		Sal loans	Coverage loans & savings	
	Distribusi nasabah aktif menurut besar kredit				rata2 bsr kredit dlm portfolio		kredit gaji	Cakupan ...	
	Micro <= 5jt Rp	Small (5; 25] jt Rp	Medium (25;100] jt Rp	Large > 100jt Rp	Average os loan size, jt Rp	Av. orig loan size, jt Rp	Sal/tot. act loans	Exist. loans / max. potential	Exist. sav acc. / max. potential
	Mikro <= 5jt Rp	kecil (5; 25] jt Rp	Menengah (25;100] jt Rp	Besar > 100jt Rp	Rata2 O/S kredit, jt Rp	Rata2 bsr krdt orisinil, jt Rp	Kredit Gaji /tot. rek kredit	kredit saat ini / max. potensi	tabungan saat ini / max. potensi
a) Arah Tujuan	>=	>=	<=	<=	<=	<=	<=	>=	>=
Target	**60,0%**	**30,0%**	**8,0%**	**2,0%**	**8.000**	**10.000**	**30,0%**	**50,0%**	**80,0%**
***atau* b)Arah**	(mikro + kecil) >=		(menengah + besar) <=						
Target	**90,0%**		**10,0%**						
Saat ini:									
Cek target a)	37,4%	37,8%	24,5%	0,2%	14.938	19.261	30,8%	6%	88%
Cek target b)	75,3%		24,7%						
Proyeksi:									
Cek target a)	33,0%	35,7%	30,7%	0,6%	16.413		33,7%	10%	101%
Cek target b)	68,6%		31,4%						

	Indicators revealing areas for improvement to become "perfect" Indikator-indikator melihat wilayah perbaikan untuk "penyempurnaan"								
	av. NPL-Rate = (sub-st. + doubt) /(all - loss)	av. Exp. Default Freq._6m annualised	Realized IR / estim. IR Yld last mth	Realized/estimated dis bursements	Pers+ Adm costs p.a. /OS active Loans	OS Loans, net / total Assets	OS Loans / Capital (Leverage)	(LO + FO) / tot. banking staff	Blended Funding Rate - BI-Rate, p.a.
	Rt2 NPL = (KL. + Dirgkan) /(Total - macet)	av. Exp. Default Freq._6m annualised	Realisasi/ estimasi suku bunga bln lalu	Realisasi/estimasi penyaluran	Personalia+ Adm costs p.a. /OS kredit	OS kredit, net / total Assets	OS kredit / Capital (Leverage)	(AO + FO) / tot. banking staff	Funding digabung - BI-Rate, p.a.
Arah	<=	<=	>=	>=	<=	>=	>=	>=	<=
Target	**5,0%**	**5,0%**	**90%**	**90%**	**15%**	**80%**	**10**	**50%**	**2,00**
Saat ini:									
Cek target	**4,7%**	**3,7%**	**101,6%**	**0%**	**12,0%**	**86,0%**	**9,4**	**65,8%**	-0,67
Proyeksi:									
Cek target					**7,5%**	**90,1%**	**10,8**	**65,8%**	**-0,29**

	caseload per LO, Bus1	caseload per LO, Bus2	caseload per LO, Bus3	caseload per LO, Bus4	caseload per LO, Grp	caseload per LO, Other	caseload per LO, Sal	caseload per FO, Savings
	Beban kerja per AO, Bus1	Beban kerja per AO, Bus2	Beban kerja per AO, Bus3	Beban kerja per AO, Bus4	Beban kerja per AO, Grup	Beban kerja per AO, Lain	Beban kerja per AO, Sal	Beban kerja per FO, Tabungan
Arah	btw.	antara	btw.	antara	btw.	btw.	btw.	btw.
Target	80%	80%	80%	80%	80%	80%	80%	80%
	120%	120%	120%	120%	120%	120%	120%	120%
max dimungkinkan	**500**	**400**	**450**	**200**	**5**	**150**	**800**	**1.500**
Saat ini:								
Cek target	**28%**	**31%**	**15%**	**20%**	**0%**	**100%**	**31%**	**62%**
Rata2 jumlah rek per LO	**142**	**123**	**68**	**40**	**0**	**150**	**248**	**926**
Proyeksi:								
Cek target	**41%**	**51%**	**29%**	**55%**	**0%**	**93%**	**56%**	**71%**
Rata2 jumlah rek per LO	**206**	**205**	**132**	**110**	**0**	**140**	**451**	**1.067**

3.2 Projecting a precise business plan using the model's parameters

As explained further above, senior managers can use the model to establish a business plan since the outstanding portfolio and the major income & costs items are parameterized. This allows projecting the loan portfolio, income, costs, liabilities, staff, etc. over the next (e.g. 12) months by assuming future values for the influencing parameters, i.e. changing their *current* values.

For example:

- The *numbers of loans per product class* are used to boost the portfolio or change its loan size distribution.
- The *number of saving accounts* and *average outstanding per saving account* are used to reduce costs of funds.
- The current *average number of loans per product class per loan officer* is determined based on the estimated time spent per product class. Once senior managers have then agreed on the *maximal potential per product class per loan officer*, the model derives the *minimum number of loan officers needed* to build up and then serve the boosted portfolio.
- The *expected loss*- and *recovery rate per product class* are used to substitute PPAP, i.e. current provisions, with *Expected Loss*. This allows estimating the expected loss for the projected portfolio. Please see chapter 4.5 regarding the concept of expected loss.
- The *Inter-bank liabilities* are used to balance the total projected assets with the total projected liabilities.

3.3 Calculating future funding needs

Once the business plan for the next (e.g. 12) months has been made in terms of anticipated number of loans per product class, number of saving accounts & term deposits and their respective average outstanding, number of loan/funding officers needed, interest rates per product class, etc., the model derives the new profit. For simplification the calculations are based on the assumption that all anticipated changes in the portfolio are realized as soon as possible, i.e. over the next few months.

The estimated income is then derived on the total portfolio (i.e. current plus changes) that is estimated to be outstanding *after one year*. By that time the projected outstanding portfolio will again be about stable if as usual each month any matured loan is renewed or a similar loan is given to another customer instead and the terms of the additional loans are not much longer than one year. If their terms are far longer and the amount of the additional loans is significant compared to the current outstanding portfolio, stability will be reached later.[3]

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[3] As a rule of thumb, the total outstanding amount in percentage of the original principal amount of a portfolio of 2 - 3 year term loans with monthly, equal instalments that are continuously disbursed on a monthly basis is about 75% - 85% one year after disbursement of the first loans. For comparison: if respectively 2 and 3 year term loans with monthly, equal instalments are disbursed in one specific month (i.e. not on a continued basis), their respective outstanding after one year is of course about a half and two thirds or more precisely 54% and 69% of the principle.

The calculations incorporate i) the expected loss of the current and the projected loans that will accumulate over that year and ii) the reduced interest income due to non-performing but not yet defaulted loans. The new income and expense items are quoted *per month* in the **projected profit & loss statement** see second column from right in the graphic below.

Profit & Loss Statement	Laporan Laba Rugi	30. Sep 08	reported	estimated	+ 1 year	+ 1 year
		P&L YtD	P&L this mth	P&L this mth	P&L p.m.	Change p.m.
			bulan ini	bulan ini	per bulan	
IR from non-bank 3rd parties	Bunga dri pihak ke-3 bukan bank	2.247.315	**259.708**	**255.568**	**498.196**	335.161
Fess from credit	Fee dari kredit	233.039	19.513	9.540	25.113	5.600
Interest from other banks	Bunga dari bank lain	102.566	2.661	n.a.	2.661	n.a.
Other oper. Income	Pendapatan operasional lainnya	107.149	13.102	n.a.	13.102	n.a.
Operating Income_YtD	Pendapatan operasional Ytd	2.690.069	294.984		539.072	340.761
IR to non-bank 3rd parties	bunga utk phk ke-3 bukan bank	681.693	75.543	63.952	83.648	12.292
Interest to other banks	Bunga dibyr pd Bank Lain	298.566	59.776	55.138	142.191	0
Total IR costs	Total biaya bunga	980.259	**135.319**	**119.090**	**225.839**	12.292
Personnel costs	Biaya personalia	832.845	92.536	n.a.	111.286	18.750
PPAP product. assets / Exp Loss	PPAP aktiva produktif (atau **Exp Loss**)	91.729	12.974	n.a.	**46.012**	**21.964**
Admin costs	Biaya administrasi	438.084	63.394	n.a	63.394	0
Operating Costs_YtD	Biaya operasional Ytd	2.342.917	304.223		446.531	53.005
Op. Income_YtD - Costs_YtD	Pendapatan ops_ytd-Biaya2_Ytd	347.152	-9.239		92.541	287.756
P&L after Tax (30%)	Laba rugi setelah pajak (30%)	243.006	0		64.779	230.205

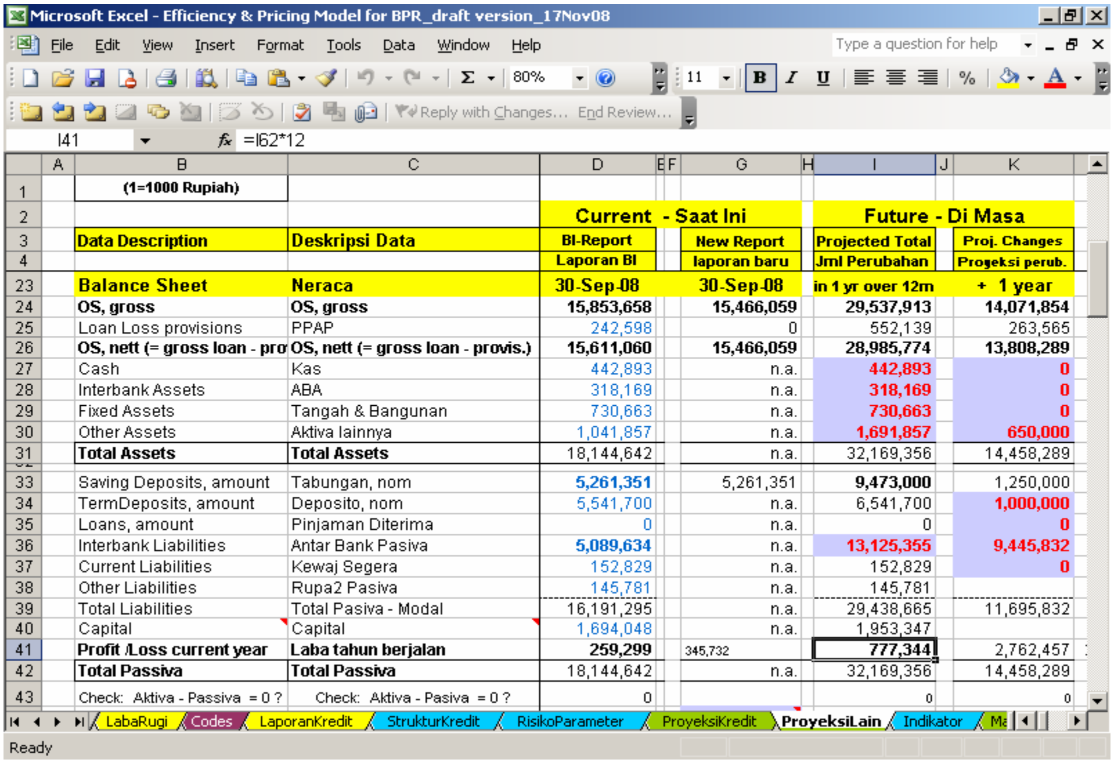
After multiplying the estimated monthly profit and loss after tax with twelve the model inserts this amount as "Profit/Loss current year" into the **projected balance sheet** which is set up for a period over twelve months with respect to this item, see graphic below.

The *projected assets* are composed out of the *projected net portfolio* as well as the *currently reported* cash, interbank assets, fixed assets and other assets. In case that senior managers plan to increase/decrease any of the latter four types of assets, they can do so by inserting the respective amount in the "balance sheet for the projected changes only". See cells with blue background in the first column from the right in the graphic below.

The *projected liabilities* (= total pasiva – modal) are composed out of the *projected savings & term deposits* and the *projected interbank liabilities & loans* as well as the *currently reported* other liabilities. Since the sum of these items plus the *current* capital & reserves has to be equal to the total projected assets, either the **interbank liabilities or** the **loans** or both of these items have to be **used to adjust for any imbalance**.

If the projected total net portfolio exceeds the total projected savings and term deposits, the BPR needs to increase its interbank liabilities and/or loans. This has again an influence on the profit & loss statement since interest has to be paid on this amount. Therefore solving for the appropriate amount of interbank liabilities to be projected is an iterative process.[4]

[4] In the current version of the model the solution is found by pasting in closer and closer approximated values for a few times. In an improved version of the model this task will be performed by a macro.



	B	C	D	G	I	K
1	(1=1000 Rupiah)					
2			Current - Saat Ini		Future - Di Masa	
3	Data Description	Deskripsi Data	BI-Report	New Report	Projected Total	Proj. Changes
4			Laporan BI	laporan baru	Jml Perubahan	Progeksi perub.
23	**Balance Sheet**	**Neraca**	30-Sep-08	30-Sep-08	in 1 yr over 12m	+ 1 year
24	**OS, gross**	**OS, gross**	**15,853,658**	**15,466,059**	**29,537,913**	**14,071,854**
25	Loan Loss provisions	PPAP	242,598	0	552,139	263,565
26	**OS, nett (= gross loan - pro**	**OS, nett (= gross loan - provis.)**	**15,611,060**	**15,466,059**	**28,985,774**	**13,808,289**
27	Cash	Kas	442,893	n.a.	442,893	0
28	Interbank Assets	ABA	318,169	n.a.	318,169	0
29	Fixed Assets	Tangah & Bangunan	730,663	n.a.	730,663	0
30	Other Assets	Aktiva lainnya	1,041,857	n.a.	1,691,857	650,000
31	**Total Assets**	**Total Assets**	18,144,642	n.a.	32,169,356	14,458,289
33	Saving Deposits, amount	Tabungan, nom	5,261,351	5,261,351	9,473,000	1,250,000
34	TermDeposits, amount	Deposito, nom	5,541,700	n.a.	6,541,700	1,000,000
35	Loans, amount	Pinjaman Diterima	0	n.a.	0	0
36	Interbank Liabilities	Antar Bank Pasiva	5,089,634	n.a.	13,125,355	9,445,832
37	Current Liabilities	Kewaj Segera	152,829	n.a.	152,829	0
38	Other Liabilities	Rupa2 Pasiva	145,781	n.a.	145,781	
39	Total Liabilities	Total Pasiva - Modal	16,191,295	n.a.	29,438,665	11,695,832
40	Capital	Capital	1,694,048	n.a.	1,953,347	
41	**Profit /Loss current year**	**Laba tahun berjalan**	**259,299**	345,732	777,344	2,762,457
42	**Total Passiva**	**Total Passiva**	18,144,642	n.a.	32,169,356	14,458,289
43	Check: Aktiva - Passiva = 0 ?	Check: Aktiva - Pasiva = 0 ?	0		0	0

In the example demonstrated in the above graphic, the projected portfolio is almost twice as large as the current portfolio. Since in this example senior managers believe that they can almost double the amount of savings as well but that they can't double the term deposits, a part of the additional loan amount has to be funded by increasing the current percentage of interbank liabilities in the total liabilities. In the below graphic we can see that in this case the proportional size of the interbank liabilities in the total liabilities have increased from 31.4% to 44.6%.

Cost of funds , effective rates				estimat. curr.	projected	
BI-rate	SBI	n.a		9,50	9,50	
Spread: Savings - Bi-Rate	Spread: Tabungan - SBI	n.a	3,00	-6,50	-6,50	3,00
Spread: TermDeposits - Bi-Rate	Spread: Deposito - SBI	n.a	11,00	1,50	1,50	11,00
Spread: Loans - Bi-Rate	Spread: Pinjaman-SBI	n.a	13,00	3,50	3,50	13,00
Spread: Interbank - Bi-Rate	Spread: ABPasiva -SBI	n.a	13,00	3,50	3,50	13,00
Spread: Current Liabilities - Bi-Rate			0,00	-9,50	-9,50	0,00
Spread: Other Liabilities - Bi-Rate	Spread: Kewajiban lain - SBI	n.a	0,00	-9,50	-9,50	0,00
Savings ./. Liabilities, %	Tabungan ./. (total Passiva -Modal), %	n.a		32,5%	**32,2%**	
TermDeposits ./. Liabilities, %	Deposito ./. (total Passiva -Modal), %	n.a		34,2%	22,2%	
Loans ./. Liabilities, %	Kredit ./. (total Passiva -Modal), %	n.a		0,0%	0,0%	
Interbank ./. Liabilities, %	ABP ./. (total Passiva -Modal), %	n.a		**31,4%**	**44,6%**	
Current ./. Liabilities, %	Kewajiban saat ini ./. (total Passiva -Modal), %	n.a		0,9%	0,5%	
Other Liabilities ./. Liabilities, %	Kwj lainnya ./. (total Passiva -Modal), %	n.a		0,9%	0,5%	
BlendedFundingRate	**Sk bunga Pendanaan campuran**	n.a		**8,83**	**9,21**	

This has of course an effect on the costs of funds as can be measured via the ***blended cost of funding rate***. The latter one is the sum over the funding rates of all *k* funding sources used (e.g. k = 6) weighted by their proportional fund sizes in the total outstanding funding amount.

$$\sum_{j=1}^{k} FundingRate^{k} * ProportionalFundSize^{k} \tag{3}$$

In the above example the costs of funds increase from 8.83% to 9.21% per annum.

3.4 Checking *projected* efficiency levels against indicator targets

After *all* projections have been performed we can read off the *projected* levels of the efficiency and outreach indicators and compare them against both their *current* levels and the indicator *targets*. Please see in the two graphics in chapter 3.1 the rows entitled "target", "proyeksi, cek target" as well as "saat ini, cek target".

The graphics show for example that:

- *BOPO* has further decreased by 4.3% from an anyway good value to now 82.8%
- *Average effective interest rates p.a.* have not yet been changed so that the projected rates for medium and large loans are still breaching the suggested targets whereas those for small and micro loans are still well meeting the targets.
- The *distribution of loan sizes* did get worse in the sense that the percentage of medium and large sized loans is further increased – far above the suggested target of maximal 10%.
- The *outreach to potential loan and saving customers* has improved a lot.
- The *productivity of the loan /funding officers* has almost doubled in each of the loan products. However there is still room for further increases in productivity levels as can be seen when comparing the projected levels to the targets set by senior managers. They believe e.g. that the maximal capacity of a loan officer concentrating on small business loans (Bus2) could be 400. This means that such a person would maintain, i.e. monitor and renew on a continuous basis, a portfolio of 400 small business loans.

3.5 Using a loan price calculator per product class

The loan price calculator which is incorporated in the model/tool determines first the net profit/loss margin per product class for the *current* and the *projected* situation. It can then be used to *analyze* which of the influencing parameters have to be changed in order to make a profit in *each* product class[5]:

a) Increase the average effective interest rate
b) Increase the average loan size
c) Decrease the expected loss rate
d) Decrease the funding costs
e) Decrease the "fix admin" and/or "fix personnel" costs *per* loan
f) Decrease the "variable admin" and/or "variable personnel" costs *per* loan

[5] Please see Galemann, *Operational Efficiency, Outreach and Loan Pricing of the BPRs in Indonesia*, GTZ-PROFI, June 2008 for the precise pricing formula. In the model this formula has been further improved by substituting the "average provisions over a quarter" by an estimation of the "expected loss per quarter". Compare also formula (5) further below. All formulas in the realization of the model in form of an Excel based tool are *fully disclosed*.

Fix admin and ***fix personnel costs*** are defined as those costs that occur independently of the portfolio size. More precisely, the fix admin costs are all admin costs minus the ***variable admin costs*** and the latter ones are the costs of operating & depreciating one motorcycle for each of the loan/funding officers. The fix personnel costs are all personnel costs minus the ***variable personnel costs*** and the latter ones are the personnel costs of all loan/funding officers.

Options a) and b) are obvious but should only be used for the *micro* loans in case their current interest rates are really low or their average loan size is really tiny.

Option c) implies that the appraisal and monitoring process for the respective loan product has to be improved.

Option d) could be realized for example by increasing the percentage of savings in the total liabilities, compare formula (3) and the graphic above.

Option e) can be realized by boosting the portfolio which means that the overhead costs will be distributed across more loans. This will reduce the fixed admin and personnel costs *per* loan.

Option f) can be realized by increasing the productivity per loan/funding officer. This is demonstrated in the example below:

Current break down of variable costs per loan by product class

...

Inggeris	Time spent all LO/FOs	No. active accounts / tot. savings	average no. accounts / tot. sav. per LO/FO	"Var" Adm. Costs per loan / per 1000 Rp sav., p.m.	"Var" Pers. Costs per accnt / per 1000 Rp sav. p.m.
Bahasa	Wkt digunakan AO/FOs	Jml rek aktif	Rata2 jml rek / jml tab per AO/FO	Biaya "Variabel" Adm. per rek / per 1000 Rp tabungan, p.bl.	Biaya "Variabel" Pers. per accnt / per 1000 Rp, tabungan p.bl.
Savings	1776%	5.261.351	296.247	0,14%	0,79%
Sal	127%	315	248	1,6	9,4
Bus1	265%	375	142	2,8	16,4
Bus2	195%	239	123	3,3	19,0
Bus3	130%	89	68	5,9	34,0
Bus4	5%	2	40	10,0	58,2
Grp	0%	0	0	0,0	0,0
other	2%	3	150	2,7	15,5
Total:	2500%	5.262.374			
All loans:	724%	1.023			

Projected break down of variable costs per loan by product class

...

	Time spent all LO/FOs	No. active accounts	average no. accounts / tot. sav. per LO/FO	"Var" Adm. Costs per loan / per 1000 Rp sav., p.m.	"Var" Pers. Costs per accnt / per 1000 Rp sav. p.m.
	Waktu digunakan sel AO/FOs	Jml Rek aktif	average no. accounts per LO/FO	Biaya "Variabel" Adm. per rek / per 1000 Rp tabungan, p.bl.	Biaya "Variabel" Pers. per accnt / per 1000 Rp, tabungan p.bl.
Savings	1776%	9.473.000	533.390	0,08%	0,58%
Sal	127%	573	451	0,9	6,8
Bus1	265%	547	206	1,9	14,9
Bus2	195%	400	205	2,0	15,0
Bus3	122%	161	132	3,0	23,3
Bus4	10%	11	110	3,6	28,0
Grp	0%	0	0	0,0	0,0
other	5%	7	140	2,9	22,0
Total:	2500%	9.474.699			
All loans:	724%	1.699			

Note: When applying the tool to the first three pilot BPRs we found that in fact two of them are currently making a loss on their micro business and micro salary loans due to the tiny loan size amounts combined with interest rates as low as those for their small (and medium) sized loans.
Furthermore all three BPRs make currently a loss on their soft loans

4 Recommendations

Whereas recommendations 4.1 and 4.4 are a contribution to the continuously ongoing initiative of capacity building for the BPRs / rural banks, recommendations 4.2, 4.3 and 4.5 will assist in the development of *risk based* supervisory systems and methods.

4.1 Test the efficiency, outreach and pricing model on a larger pilot group

We suggest testing the efficiency, outreach and pricing model now on a larger pilot group of BPRs. This could be accomplished via the following next steps:

1. Further develop the draft version of the model
2. Make the model's realization as excel based tool a bit more user-friendly
3. Document the tool throughout, i.e. it's intention, how to use it, all concepts behind as well as all inputs and outputs
4. Develop training material for a workshop on the application of the tool and the concepts behind
5. Train managers in a 3 - 4 days workshop explaining the concepts and make use of the imparted knowledge by applying the tool onto their respective, enhanced loan data.
   Some of the key concepts to be covered are:
   - Derivation of effective interest - & blended cost of fund rates
   - Derivation of Expected Default Frequencies (EDFs) per product class
   - Estimation of recovery rates
   - Expected Loss versus PPAP
   - Determination of maximal caseload per loan/funding officer
   - Derivation of costs per loan per product class

4.2 Enhance the current BI loan report

We recommend enhancing the official BI loan report for all BPRs with the following additional data:

i) *risk* & *costs* based *standardized* product classes (see chapter 2)

ii) further loan specifics:
   (1) *original principle of the loan*, i.e. "Plafond Awal" (Pawal)
   (2) *date of first instalment* for loans with grace periods
   (3) *payment frequency* (1payment *or* daily, weekly, monthly, quarterly, s.a., p.a.,other)

iii) specifics on personnel:
   (1) number of loan and funding officers
   (2) number of non-banking staff (i.e. drivers, security, service & cleaning staff)
   (3) number of total employees

iv) Information on all areas served by the BPR:
   (1) number of households *per area* that is served by the BPR
   (2) number of competing banks (commercial or other BPRs) per area served
   (a bank with several branches in the same area counts as 1)

From the above suggestions i) and ii) are the most important ones since they set the basis for *risk based supervision*, see also chapter 4.3. Furthermore it makes the performance, outreach and loan pricing of the whole BPR industry comparable. Request ii) allows transforming flat quoted interest rates into effective ones so that for each BPR the average effective interest rate *per product class* can be determined.

The *productivity* per loan/funding officer can be derived if the specifics on personnel as described in iii) are known. Finally the information requested in iv) allows deriving indicators measuring the BPR's current *outreach*. The requested additional information allows in particular calculating *on a monthly basis* for each BPR the *efficiency and outreach indicators* graphically displayed and partially listed in chapter 3.1.

Once the above information is collected and processed, i.e. indicator levels are derived, we suggest furthermore to store the respective *time series* and to produce ***statistics*** that are **re-distributed to the BPRs**. This will assist BPRs recognizing their weaknesses with respect to efficiency, outreach and loan pricing. It also allows **following up over time** on their efforts made to either overcome any of these weaknesses or to keep up areas of strength. This is equally important for supervisors as well as for potential investors (government or private). Moreover, it is a strong desire of the **BPRs having means of comparing themselves to their competitors**.

4.3 Set up an Early Warning System

As BI has started working on developing an early warning system for the BPRs, we recommend incorporating an element that is based on *stress testing the BPR's net profit.*

In order to do so we first need to express the total net profit through parameters whose current values can be changed by applying an instantaneous shock (stress).

We can achieve this by first applying the loan pricing formula not just to a single loan but instead to a whole *standardized product class*. This results in a *parameterization* of the *net profit per product class*. Summing then over each of these expressions yields a parameterization of the *total net profit* of the BPR. The following formula derives the total net profit *over a period of 6 months*:

$$TotalNetProfit = \sum_{i=1}^{20} NetProfitPerProductClass^i \tag{4}$$

$$\begin{aligned} &NetProfitPerProductClass^i \\ &= [avIR^i_{flat} * (1 - NplR^i_{23}) + FeeR^i] * Pr^i_{awal} \\ &\qquad - [FundR - PersCoR - AdmCoR - EDF^i_{6m} * LGD^i] * OS^i_{123} \end{aligned} \tag{5}$$

and

OS^i_{123}	=	Outstanding loans in product class of quality 1, 2 and 3 (= non loss or *active* loans) The sum over all product classes of these amounts equals the total outstanding active loans.
OS^i_{23}	=	Outstanding loans in product class of quality 1 and 2
$avIR^i_{flat}$	=	Annual flat interest rate divided by 2 and averaged over all interest rates in product class
$NplR^i_{23}$	=	OS^i_{23} / OS^i_{123} This is the non-performing loan rate for the product class cleaned from accumulated loans of quality 4 (= loss loans)
$FeeR^i$	=	One-off fee rate for the product class divided by the number of months in the average term for the class multiplied by 6
Pr^i_{awal}	=	Total original principle of all loans currently outstanding in product class
$FundR$	=	Annual blended cost of funding rate divided by 2 as described in formula (3) above
$PersCoR$	=	Total semi-annual personnel costs per 1 rupiah of total active outstanding loans = total annual personnel costs divided by *total* outstanding loans of quality 1,2 and 3 divided by 2
$AdmCoR$	=	Total semi-annual administrative costs per 1 rupiah of total active outstanding loans = total annual administrative costs divided by *total* outstanding loans of quality 1,2 and 3 divided by 2 The administrative costs are all costs minus the costs for personnel and funding.
EDF^i_{6m}		6-months Expected Default Frequency for product class, see chapter 4.5
LGD^i		Loss Given Default for product class, estimated as (1 – recovery) for product class, see chapter 4.5

As a second step we **design stress scenarios for the above risk parameters**.

All of the following movements in their respective values would decrease the BPRs net profit according to formulas (4) and (5) above:

- A *decrease in BPR's interest rates per product class* due to increased competition
- An *increase in blended costs of funds* due to raising inter-bank rates
- An *increase in personnel costs* due to need for salary increases
- An *increase in Expected Default Frequencies* due to economic crisis
- A *decrease in recovery rates* due to reduction of collateral values
- A *decrease of the outstanding active portfolio* due to less funding availability (via savings and/or inter-bank)

The size of the respective shocks can be adjusted according the expected economic conditions.

The **early warning system** could then work as follows:

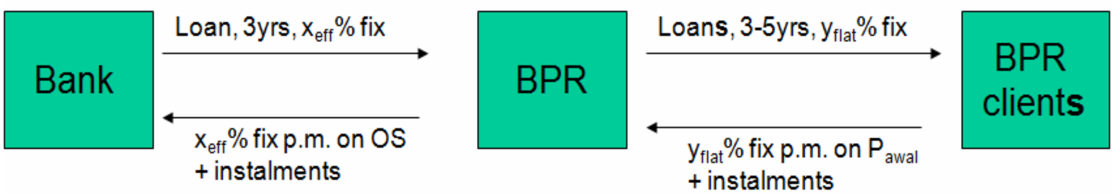
1) A BPR is flagged "yellow" if the expression in formula (4), i.e. the total net profit becomes negative under any combination of the above stress scenarios.
2) The BPR is flagged "red" if it has been flagged yellow on a continuous basis over several months. Alternatively, it could be flagged red if already a slight change in the risk parameters, i.e. the application of a very moderate stress scenario, results in a negative total net profit.

4.4 Reduce interest rate risk for BPRs

In order to increase outreach and profitability by boosting the loan portfolio BPRs have to increase their inter-bank liabilities, i.e. get a loan, in case that they can't collect enough savings and term deposits.

However up to now, these external funds are only provided on a *floating rate* basis. Since BPRs always *receive fix rates* from their clients, increasing their interbank-liabilities raises their *interest rate risk* to increasing rates and could thus push them into bankruptcy.

We therefore recommend that banks supporting the BPR industry should develop and then provide a ***medium term fix rate loan facility*** for the BPRs:



For example:

$$x_{eff} = 13\%,\ y_{flat} = 14\%\ .\ \text{Thus}\ y_{eff} \sim 1.95 * y_{flat} = 27.3\%\ \text{ and }\ y_{eff} - x_{eff} = 14.3\%$$

In this way BPRs could **lock in a profit** of ($\sim 1.95 * y_{flat}$ - x) percent effective interest rate payments on the respective loan amount per annum. Expressed in absolute amounts the total locked in profit for a loan term of *n* years is about *n* times ($\sim 1.95 * y_{flat}$ - x) percent of the average outstanding which is between 51 - 54% of the original principle. In these calculations it is assumed that the new loan facility from the bank has *regular* monthly instalments so that cash flows from the BPR's clients can *flow through* as indicated in the graphic above.

In the example the locked in profit would be 14.3% effective per annum. Unless a BPR is still highly inefficient in terms of its personnel & admin costs relative to its portfolio size, this would allow the BPR to securely cover these remaining costs (financial costs are already covered) and to build up capital from the potential residual profits.

The profit of ($\sim 1.95*y_{flat}$ - x) percent effective per annum (e.g. 14.3%) is locked in since regardless of market rates decreasing or increasing the BPR has to pay the bank x% effective (e.g. 13%) for 3 years but continues receiving ~1.95*y% (e.g. 27.3%) effective for at least 3 years (may be even for 5 years) from its clients.

Just to emphasize the need for this kind of funding facility:

BPRs can't hedge their risk to raising interest rates unless they charge their clients a floating interest rate which is not desired. However, commercial banks can achieve this since they have many cash flows in their total portfolio where they do both, pay or receive floating and pay or receive fix. Besides this they might buy interest rate swaps to hedge any remaining imbalances between their fix and floating rate based cash flows.

4.5 Apply IAS for rural banks using Expected Loss

The new International Accounting Standard could soon be able applicable also to rural banks. The current way of determining provisions (PPAP) maybe replaced with an estimate of their *Expected Loss*:

Expected Loss = *Expected Default Frequency * Loss Given Default * Exposure at Default*

=

*EDF * (100% - Recovery Rate) * Outstanding at Default*

Since BPRs do not have the capacity to estimate expected default and recovery rates on their own, one needs to develop a simplified method to estimate these risk parameters:

Recommendation:

1) Estimate expected default frequencies based on loan *classes* instead of via a rating *per client*.
2) Use
    a. the BI-report enhanced with *standardized loan classes,*
    b. the monthly reported number of loans per quality category (i.e. 1,2,3,4) *to estimate expected loss rates per standardized loan class* (see chapter 4.5.1),
    c. the collateral rates determined per product class plus judgment *to estimate loss given default* or (1 - recovery)-*rates per standardized loan class* (see chapter 4.5.2)

Applying a consistent method in all BPRs has the additional advantage that the resulting EDFs can be compared across the entire BPR industry.

4.5.1 Methodology to derive 1-year Expected Default Frequencies

As requested in the regulations outlined in “Basle 2” the first step in estimating expected default frequencies consist in setting up a **definition of “*default*”.**

> *We consider a loan as being defaulted if more than six instalments are in arrears and/or the loan is more than1 to 2 months overdue.*

The loans fulfilling this condition are

- all monthly paying loans of quality 3 (their instalments are late for more than 6 and up to 12 months)
- *minus* those loans that will improve instead of moving on to quality 4.

The number of loans of quality three is reported each month. However, we do not know how many of those loans will improve to quality 2 or 1. Therefore we need to estimate the percentage, x, of quality 3 loans that move on to loss using long time series on monthly numbers of quality 3 & 4 loans. One could start doing this for a sample of BPRs and if numbers are similar an average could be taken. As long as this work has not yet been done, we suggest to start by setting x = 80%.

We recall that the ***probability of default over a period*** (i.e. the frequency of these events over the total number of events in the sample) is the number of loans not defaulted at the beginning of the period but defaulting *during* this period divided by the total number of loans in the sample.

According to the above default definition we know many examples for “number of loans not defaulted at the beginning of a 6-month period but defaulting *during* this 6-month period”, namely

> *any monthly reported number of quality 3 loans minus the number of loans that improve to quality 2 or 1.*

Illustration:

The "March 08 quality 3 loans“ defaulted in the period from October 07 to March 08 but had not yet been defaulted in September 07 (i.e. they had less than 6 instalments in arrears in September 07) since otherwise in March 08 they had already been classified as quality 4.

Assuming that only 20% of these loans will improve, 80% times the March 08 quality 3 loans defaulted over the 6-month period from October 07 to March 08.

With the above argumentation we can estimate for each BPR 6-months expected default frequencies per product class *i* **using monthly reported numbers of quality 1 – 4 loans** as follows:

$$EDF_{6m}^{i} = x * \frac{Quality_3^i}{Quality_1^i + Quality_2^i + Quality_3^i} \qquad (6)$$

where

x	=	Estimated percentage of quality 3 loans that move on to loss, see further above.
$Quality_k^i$	=	Number of loans of quality k (k =1,2,3,) in product class i reported in a respective month

Performing the above calculations each month will result in time series of these 6-month EDFs per product class. In case some serious default events have happened they could fluctuate quite a lot. Taking averages over these monthly derived numbers (best if done over non overlapping 6-months periods) will result in more stable EDFs.

The so derived 6-months EDFs are *accumulated* default frequencies over 6-month periods. Annualising these ones we derive the desired **1-year expected default frequencies** as[6]:

$$EDF_{1yr}^{i} = 2 * EDF_{6m}^{i} - (EDF_{6m}^{i})^{2} \qquad (7)$$

Note:

As long as the BI loan report is not yet enhanced with the standardized product classes as recommended in chapter 4.2 the estimation of expected default frequencies can only be performed across all loan facilities.

Once loans are reported by product class one still has to recombine a few of them before estimating the EDFs in case there aren't many loans reported in the respective classes. This will ensure that estimations are based on good statistics. However, one should always perform a separate estimation for *salary* and *business* loans. We expect that in general the EDFs for salary loans are much lower than those for business loans.

4.5.2 Recovery rates for rural banks

The realized loss of a defaulted loan depends not just on the outstanding amount at the time of default but also on the percentage of the amount that can be recovered.

In the "micro finance world" we can in general assume that any amount that is not collateralised will have a recovery rate of zero percent. Thus it remains to estimate the recovery rate of the **collateralized part** of the loan.

According to BI policy the collateral values used in the BI loan reports have already been reduced by a substantial amount (e.g. by 20% for certified land and buildings, by 50% for vehicles) which is supposed to cover price fluctuations and to a certain extend the loss of value due to depreciation The latter one is already partly or fully covered through the regular repaid instalments of the loan amount.

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6 This is achieved by composing the accumulated annual probability p_{12m} out of two 6-month *marginal* probabilities, $p_{1\text{-}6m}$ and $p_{7\text{-}12m}$: $p_{12} = p_{1\text{-}6} + (1-p_{1\text{-}6}) * p_{7\text{-}12} = p_{1\text{-}6} + (1-p_{1\text{-}6}) * p_{1\text{-}6} = 2*p_{1\text{-}6} - (p_{1\text{-}6})^2$.

Therefore it is suggested to use the reported values less a further small amount that depends on the *type* of the collateral as well as on *judgement* based on collected experiences of practitioners of the BPR industry.

In the case of already *existing* loans the recovery rate could then be estimated as:

$$\mathrm{Re}\,cocveryRate_a = \min(100\%, \frac{CollateralValueReportedForloan}{OutstandingLoanAmount}) * \alpha_{collType} \qquad (8a)$$

where

$\alpha_{collType}$	=	100% minus anticipated loss in collateral value due to events such as: legal issues, removal of vehicle, etc. For example, $\alpha_{land} = 95\%$, $\alpha_{vehicle} = 90\%$

For *projected* loans the recovery rate could be estimated as:

$$\mathrm{Re}\,cocveryRate_b = \min(100\%, BPRsAverageCollateralValueForLoanType) * \alpha_{collType}$$

In an attempt to refine these first estimates one could make $\alpha_{collType}$ further dependent on the time evolved since the start of the loan.