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SK Direktur Jenderal Pendidikan Tinggi Departemen Pendidikan Nasional Republik Indonesia
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Pusat Penelitian dan Pengabdian Kepada Masyarakat
Program Magister Manajemen
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Dari Redaksi

Edisi kali ini, kami memilih dari berbagai tulisan yang masuk dan cukup menarik dimana pembaca akan menikmati keragaman tulisan tersebut. Pada edisi ini kami mempersembahkan tulisan dari keuangan, ekonomi, pajak dan pemasaran bank. Metodologi yang dipergunakan pada tulisan yang ditampilkan edisi ini juga sangat sedikit lebih baru dipakai para peneliti dan sedikit diatas biasanya. Walaupun demikian, tulisan yang ditampilkan masih bisa dapat dicerna bagi mereka yang kurang kuat analisis kuantitatifnya. Kami tetap konsisten menampilkan sebanyak tujuh tulisan pada edisi ini sehingga pembaca tetap tidak dirugikan karena tidak ada alasan kami untuk mengurangi tulisan tersebut, bahkan kami sedang meningkatkan jumlah tulisan tersebut.

Pada edisi ini, tulisan pertama dimulai dengan Judul "Deteksi Dini Periode *Bearish* Return Saham Sektor Properti: Pendekatan Signal – Nonparametric". Paper tersebut ditulis oleh Sdr. R. Nurhidayat dari Kementerian Keuangan Republik Indonesia. Penulis paper mempunyai tujuan untuk menulis paper tersebut yaitu menyelidiki atau mendeteksi periode bearish return saham dari saham-saham sektor properti dengan berbagai kondisi ekonomi. Periode penelitian yang dipergunakan pada Januari 1996 sampai Juni 2011 dengan data bulanan. Metodologi yang dipergunakannya untuk mendeteksi periode bearish tersebut yaitu pendekatan signal secara non-parametrik dimana dipergunakan 18 leading indikator. Adapun hasil penelitian tersebut memberikan kesimpulan bahwa periode bearish dapat dideteksi oleh satu indikator yang terutama pada tahun 2008. Tetapi, penulis juga menemukan bahwa deteksi periode bearish tersebut dapat juga

terdeteksi oleh indikator lain.

Sdri Prima Naomi dari Universitas Paramadina menulis paper yang berjudul "Risiko Idiosinkratik dan Imbal Hasil Saham pada Bursa Saham Indonesia" menjadi tulisan kedua pada edisi kali ini. Tulisan ini mempunyai tujuan untuk melihat pengaruh risiko dari volatilitas idiosinkratik dan beta terhadap imbal hasil saham dan juga size perusahaan. Periode penelitian dari tulisan tersebut dimulai 1 Januari 2008 sampai dengan 15 Maret 2011 dengan data bulanan. Metodologi yang dipergunakan dalam paper tersebut yaitu model tiga factor Fama-French. Adapun hasil penelitian dari paper tersebut yaitu volatilitas idiosinkratik yang diberikan simbol IVOL pada data obeservasi menunjukkan pola yang random walk. Baik risiko pasar (BETA) maupun risiko indiosinkratik (IVOL) berpengaruh positif terhadap rata-rata imbal hasil. Risiko idiosinkratik memiliki pengaruh yang lebih kuat dibanding risiko pasar. Variabel *size* BE/ME merupakan variabel yang signifikan berpengaruh terhadap imbal hasil.

Tulisan ketiga kami tampilkan yang berjudul "Volatilitas Inflasi di Indonesia: Fiskal atau Moneter?". Tulisan ini ditulis Sdr Aloysius Deno Hervino dari Universitas Katolik Indonesia Atma Jaya, Jakarta. Tulisan tersebut mempunyai tujuan menganalisis volatilitas inflasi dari sisi fiskal atau moneter dan juga pengaruh subprime Mortgage pada tahun 2007. Periode penelitian dari paper tersebut yaitu periode 2000 hingga 2010. Sehingga pada periode tersebut didapati adanya periode krisis dan pasca krisis 2007. Model yang dibangun pada penelitian adalah ECM *Engle Granger* (ECM-EG) bila data yang dipergunakan memiliki derajat integrasi satu dan dua serta

terkointegrasi. Tetapi, jika memiliki derajat integrasi yang beragam, maka model yang akan dibangun adalah *Autoregressive Distributed Lag Error Correction Model* (ARDL-ECM). Hasil yang diperoleh penelitian ini yaitu dalam jangka pendek peningkatan utang luar negeri dan jumlah uang beredar justru akan menurunkan tingkat inflasi di Indonesia. Dalam jangka panjang, volatilitas tingkat inflasi di Indonesia dipengaruhi oleh dua sisi, yaitu sisi fiskal dan moneter.

Teman-teman peneliti dari Program Studi Statistika, Universitas Brawijaya Malang yaitu Sdri HeniKusdarwati; Eni Sumarminingsih dan Evi Mashita Arifin menuliskan paper berjudul "Pemodelan *Threshold Vector Autoregressive* (TVAR): Studi Kasus Data Kurs Jual dan Kurs Beli EURO" menjadi paper keempat pada edisi ini. Penelitian ini mempunyai tujuan menyelidiki penggunaan *Threshold Vector Autoregressive* (TVAR) untuk tingkah laku hubungan non-linier pada data deret waktu. Adapun variable yang dipergunakan nilai tukar EURO (kurs Jual dan Beli) untuk periode 1 Februari 2002 sampai dengan 30 November 2009. Hasil yang diperoleh yaitu Model TVAR yang dibentuk oleh kurs jual dan Beli EURO yaitu TVAR (1) dengan $\gamma_1 = 13430.3$ dan $\gamma_2 = 13980.7$.

Tulisan kelima pada edisi ini berjudul "Significance of Loyalty on Consumer Credit Risk Profitability" dimana penulisnya empat penulis yaitu Sdr Aditya Galih Prihartono; Ujang Sumarwan; Noer Azam Achsani; dan Kirbrandoko dari Institut Pertanian Bogor. Adapun tulisan ini mempunyai tujuan menganalisis dan menguji efek loyalitas terhadap probabilitas kredit konsumen. Penelitian ini menggunakan periode data Oktober 2010 sampai dengan Maret 2011 dimana analisis ANOVA dipergunakan untuk menguji efek loyalitas. Hasil yang diperoleh yaitu "The *loyalty significantly influences profitability where ANOVA result to the 3*

loyalty clusters shows a significant value even when customers were under pressured due to capacity to pay issue. It was proven that customer in a different clusters, has lower average profitability."

Tulisan Sdr Suska dari Kementerian Keuangan Republik Indonesia, ditampilkan menjadi tulisan keenam pada edisi ini dengan judul "Fungsi Pajak Penghasilan sebagai *Automatic Stabilizer*." Tulisan ini mempunyai tujuan menganalisis fungsi pajak penghasilan sebagai stabilator otomatis. Periode penelitian yang dipergunakan yaitu periode 1970 sampai 2010 dimana metodologi yang dipergunakan regresi biasa dan mengaitkannya dengan peraturan pajak yang diterbitkan. Adapun hasil penelitian yang diperoleh yaitu pergerakan PPh sejalan dengan PDB atau dapat dikatakan telah menunjukkan fungsi *automatic stabilizer*. Pengaruh perubahan Undang-undang PPh selama beberapa kali dari tahun 1984 berdasarkan hasil analisa tidak menunjukkan pengaruh yang signifikan terhadap PDB.

Tulisan terakhir pada edisi ini ditulis Sdri Tettet Fitrijanti dari Universitas Padjajaran dengan judul "Keputusan Pendanaan: Pilihan Keputusan Hutang dan Ekuitas." Tulisan ini merupakan satu bagian dari penelitian penulis di Disertasinya. Adapun tujuan penelitiannya ingin mempelajari kebijakan pendanaan dengan meneliti apakah *lag leverage*-estimasi dan *lag leverage*, sebagai sub-variabel *target-leverage*, mempengaruhi probabilitas terjadinya suatu keputusan pendanaan relatif terhadap suatu keputusan pendanaan lainnya. Periode penelitian yang dipergunakan dalam penelitian ini berdasarkan nilai buku total aset yang terdapat pada laporan keuangan akhir tahun 2008 atau periode paling akhir yang tersedia. Perusahaan yang menjadi sampel adalah yang memiliki nilai buku total aset minimal Rp. 750 miliar dengan alasan bahwa kelompok

perusahaan yang relatif lebih besar dibandingkan dengan perusahaan-perusahaan dalam industri yang sama biasanya menjadi representasi perilaku industri, dan dengan laporan keuangan yang tersedia di media publikasi relatif lengkap. Multinomial Logit analisis dipergunakan dalam menganalisis tujuan penelitian tersebut. Adapun hasil penelitian ini memperoleh sebagai berikut: terjadi penerbitan hutang pada kas yang

tinggi dan kas yang rendah menerbitkan saham; dan Perusahaan yang memiliki rasio *market to book* yang tinggi cenderung menerbitkan saham dan memiliki *leverage* yang rendah.

Dengan memperhatikan tulisan tersebut maka sangat banyak variasi yang terjadi dan pada edisi mendatang kami akan menghadirkan berbagai tulisan untuk menambah wawasan para peneliti dan dosen-dosen.

Prof. Dr. Adler Haymans Manurung, M.Com., ME.

Editor in Chief

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THE SIGNIFICANCE OF LOYALTY ON CONSUMER CREDIT RISK PROFITABILITY

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The purpose of this research is to analyze and to test the effect of loyalty on consumer credit profitability. Loyalty Score was developed to determine the level of customer's loyalty level through 4 main variables; Longevity, Depth, Breadth and Referrals. Cluster development by K means algorithm was then developed to segment the sample into its similar characteristics. The effect of Loyalty to profitability was further tested by ANOVA analysis to see the significance of loyalty on profitability. The result showed that loyalty significantly influences profitability where ANOVA result to the 3 loyalty clusters shows a significant value even when the customers were under pressured due to capacity to pay issue. It was proven that customer in a different clusters has lower average profitability. The conclusion could be made by using data from personal loan customers in one of the biggest multinational bank in Indonesia during October 2010 until March 2011.

Keywords: Loyalty, Consumer Credit, Credit Risk, Credit Loss, Profitability

INTRODUCTION

Different view of specific dimensions on customer relationship construct has been acknowledged in the past years until now. However, there is general confirmation can be taken; its link with organization performance is almost the same universally (Sheth and Sisoda, 1999). Sin and Tse (2000) confirm this link further in service industry where intangibility may puzzle the relationship. Before that, Chang and Chen (1998) explain how service quality and customer relationship management influence financial performance significantly.

Many researches in customer relationship focused on increasing the marketing result of a campaign in product offering whether it is highly tangible or intangible. In those researches, the framework was mainly associated with customer loyalty as the bridge of customer relationship concept into another big concept such as financials, sales and expense. In financial institution, customer relationship was commonly developed to further understand the specific segment that can be offered for additional credit line which will be suitable for its customer needs and in return will produce rev-

enue for the company.

The increasing importance of relationship marketing in recent years, particularly in the service industries, has made additional emphasis on customer loyalty. Several authors such as Reicheld and Sasser (1990), Reicheld (1993), Sheth and Parvatiyar (1995) emphasize the positive relationship existing between customer loyalty and business performance.

In other research, Consumer loyalty is also considered as an important key to organizational success and profit (Oliver, 1997). Selin et al. (1987) state that, "those customers that demonstrate the greatest levels of loyalty toward the product, or service activity, tend to repurchase more often, and spend more money". As a result, many of research attention have focused on the identification of effective methods of actively enhancing loyalty, including loyalty programs such as point reward schemes (Lach, 2000).

Loyalty programs "create a reluctance to defect" by rewarding the customer for repurchasing from the organization (Duffy, 1998). Loyal customers not only increase the value of the business, but also maintain lower cost than those associated with attracting new customers (Barsky 1994, Barroso and Martin, 1999). Thus, no wonder if loyalty rather than satisfaction is becoming the number one strategic goal in competitive business environment (Oliver, 1999).

The concept of customer loyalty has been discussed and explored with many assumptions underlying it. This fact is, obviously, gives much additional knowledge in confirming some specific factors which influence customer loyalty. Concepts which were mostly associated with this are customer trust or commitment and customer satisfaction (Ehigie 2006). It is then, not too difficult to understand the strong association among these concepts and connect

that as overall process of marketing strategy to improve financial performance of a company

In credit industry, consumer credit has been one of the main contributors in overall credit growth. The span of products from mortgage, credit card, personal loans, car loan, had made this portfolio grow significantly with the growth of consumer spending and economic improvement post crisis in 1997 until another crisis in 2008 (see Table 1). However, still after 2008 this portfolio leads the growth until now compared to the other portfolio. This fact is actually not so surprising given some supporting factors at macro and micro level such as market relax on credit policy, the salary growth of low level job, better interest rate compared to past years and other factors which finally evolve the business into as it is right now.

This growth however has its impact at individual customer level which will need further attention. As many banks and other financial credit institutions start to lend the products to their potential clients, it is the fact that many of those institutions attempts to approach the same market. The potential customers mainly live in city with an easy access to banks and high education level (at least High School level). Interestingly, other banks also lend multiple products to the same customer with its product variations either through co-branding in credit card, personal loan with car loan and other mix products that made the customer highly leveraged.

Looking at how bank in consumer credit line attract and retain its customers, it is not only about loyalty but also related to customer capacity to pay (Finlay 2008). There were some customers who the banks may decide to leave as a matter of cost and benefit decision. In other words, It is more costly to retain the customer than just to let them go and move forward to attract another customer with better future relation-

ship. Customer capacity to pay can change along with customer financial situation and therefore it will also can change customer payment behavior towards consumer credit products regardless other factors.

As stated by Jacoby and Chestnut (1978), loyalty can be measured through the behavioral approach, attitudinal approach and composite approach. *The behavioral approach* is based on consumers' actual or reported purchasing behavior and has often been operationally characterized as sequence of purchase, proportion of purchase, and probability of purchase. However, this approach has been criticized by Dick and Basu (1994) as lacking a conceptual standpoint, and producing only the static outcome of a dynamic process. In addition, Pritchard and Howard (1997) also state that focusing on behavior alone cannot capture the reasons behind the purchases: repeat purchase may occur simply for arbitrary reasons such as price, time convenience and lack of choice, other than from any sense of loyalty or allegiance.

In *the attitudinal approach*, based on consumer brand preferences over time or purchase intentions, loyalty reflects consumers' psychological commitment to a brand, and is studied via its dimensions such as repurchasing intentions, word of mouth referrals, complaining behavior (Jones and Sasser, 1995; de Ruyter and Bloemer, 1998). The attitudinal measure explains an additional portion of unexplained variance that behavioral approaches do not address (Backman and Crompton, 1991). However, study attitude alone cannot determine competitive effects, familiarity, and situational factors (Baloglu, 2002).

In practical research, comparing between behavioural and attitudinal approach, behavioral measures are a common approach to operationalize loyalty, due to the difficulties in measuring attitudinal loyalty. As suggested by Opperman (2000) behav-

ioral measures will be much better than attitude measures because measuring attitudes over a longer time period is in most cases impractical.

Parasuraman, Zeithmal and Berry (1994) developed a loyalty scale including dimensions such as loyalty to company, propensity to switch, willingness to pay more, external and internal response to problem. Some researchers (Taylor, 1998; Yoon and Uysal, 2003) measured consumer loyalty with three indicators: 1) likelihood to recommend a product or service to other; 2) likelihood to purchase a product or service again; and 3) overall satisfaction/feeling. Hepworth and Mateus (1994) adopted similar indices to assess loyalty, including intention to buy same product, intention to buy more product, and willingness to recommend the product to other consumers. As can be understood from the loyalty development principle in these researches, loyalty has been measured in the mixed way from both behavior approach and attitude approach, or in simple term called *the composite approach*.

More recently, it has been argued that customer loyalty is a multidimensional concept including both behavioral element (repeat purchases) and attitudinal element (commitment) and the use of composite measure increases the predictive power of the construct, as each variable cross-validates the nature of truly loyal relationship (Dick and Basu, 1994). However, this approach has limitations because not all the weighting or quantified scores may apply to both the behavioral and attitudinal components, which may have different measurements.

Backman & Crompton (1991) explained four loyalty types based on the cross classification of consumers' behavioral consistency (behavior) and psychological attachment (attitude): low loyalty, spurious loyalty, latent loyalty, and high loyalty. While

empirical support for the typology has been noted in wider marketing literature (Dick and Basu, 1994), and leisure services (Selin et al. 1988, Backman and Crompton 1991), hospitality researchers have further confirmed the application of four distinct types of loyalty in a multitude of settings (Baloglu, 2001; Pritchard and Howard, 1997).

In another research by Griffin (1995) defines a loyal customer as someone who makes regular purchases, purchases across product and service lines, refers others, and demonstrates an immunity to the pull of the competition. Griffin (1995) explains further that loyalty can be broken down into four categories based on the customer attachment or affinity to the products and services (or to the organization that provides them) and their purchase pattern (i.e., whether they take a repeat loan²). Both Backman & Crompton (2001) and Griffin (1995) show almost similar loyalty typology, it has 4 different type of loyalty whereby each has one extreme high and extreme low with almost the same explanation.

In consumer credit scenario, loyalty strategy has been developed by money lenders or banks. Eakuru & Mat (2008) found that to increase loyalty, trust and image is two among many other things to be considered. This is to ensure the existence of long term relationship between money lender and its customer. The common strategy in current practice are as follow, point reward to be traded in with direct prize, point reward to be converted with lucky dip, direct discount for credit card purchase, sales offering with special discount, cash Back

special card discount, buy 1 get 2. In an indirect way, some loyalty strategy also can be listed as follow: cross sell with non loan products such as insurance, savings account, cross sell with other credit cards brand within the same bank provider, cross sell with unsecured personal installment

loan, simplification strategy, 1 bill under 1 credit card, and balance transfer.

As if customer take the products as listed above within one bank, it is expected that customer will keep loyal to that bank and in the end will produce long term relationship. Customer will think twice before reducing or terminating its financial relationship with the bank because of that dependency. However, since this is a consumer credit products with some credit risk involved, there are some critical factors to be considered such as customer capacity to pay and character. Customer character might be easier to check from past historical credit performance (for those who already have credit performance) however the story might be different for capacity to pay. Capacity to pay will be depend on customer current condition which may very different from the beginning.

In long term situation many scenario may happen which will influence the level of customer capacity to pay. As stated earlier, a more loyal customer will produce better profitability to the bank. However, Baumann et al (2007) conclude that customers are loyal as a result of their current life situations (e.g. age and income) rather than resulting from a positive attitude towards their bank. This means, no matter how loyal the customer is, when there is income (or capacity to pay) issue in customer financial cycle, profitability will be at risk. in the end, there will be priority to be chosen by the customer which one to be taken care in the first place, which products above the other. In operational concept, this is also means that there movement of loyalty level for the customer when they are in a normal condition along the way until they are in a financial difficulty (delinquent).

Under risk management to simplify the operational and strategy used, the delinquent customers will be grouped into its

bucket. Bucket will be determined by its days past due, how many days the customers missed their payment (Lawver 1993).

Service level is also correlated inline with the days past due numbers. Obviously, the highest service level can be seen when the customer stay current, always pay their installment or minimum payment and along with higher days past due, lower service level will be felt by the customer. This is for a simple reason, the money lender will focus on getting the payment to save their asset in the first place rather than serving the customer needs. The trust level for both parties (customer and money lender) will be at risk because both parties has different interest and priority. Hence, there is a point along the days past due line where customer payment is the only thing matter. This is where Risk mitigation play a big part, to give more alternative options for the customer in making their payment, most of it in terms of payment discount or delayed payment with schedule.

METHODOLOGY AND DATA

Sampling and Conceptual Framework

This research was done in one of multi-national banks in Indonesia from October 2010 – March 2011. Location of research covers Jakarta, Bandung, and Surabaya. Research was conducted by using descriptive analytical methods to describe processes and phenomena that occur through a quantitative approach based on past historical records for each customer in the sample.

Data for this research come from 2 types, primary and secondary. Primary data was taken from internal database, past historical records. Secondary data was collected from internal company and other related sources such as previous research, newspaper, Bank of Indonesia.

Sampling for this research was done by *stratified simple random sampling from list*

of customers in Bank A. Sampling technique details can be seen as follow:

- Sampling Element: Bank's Customer
- Population: All Personal Loan customer at Bank X (around 100,000)
- Sampling Unit: Customer who is still registered as Personal Loan customer in Bank X with minimum Months on Book (MOB) of 1 year (12 months).
- Sampling Frame: Non Delinquent Customer and Delinquent Customer (>30 DPD)
- Sampling Size: 31700
- Sampling procedures: Sampling will be done by classifying the population into 4 groups (Non Delinquent – Normal Capacity to pay, and Delinquent – Non Normal Capacity to pay: Early delinquent, Late delinquent and Restructuring accounts). Sample will be taken randomly from all groups to be further processed to the next step.

The main conceptual framework in this research is Loyalty and Profitability. Loyalty will be clustered by 4 indicators: Longevity, Breadth, Depth and Referrals where all of this indicators will be blended and converted into 3 different clusters.

Profitability measurement will be done through payment tracking which was made by the customers within a particular period. The payment will show whether or not it can save the accounts from further flowing to the next bucket (balance saved) and at the same time, whether or not the payment can cover the interest and late charge fees (revenue collected).

Buckets will play a critical role because the effect of loyalty will be tested in all buckets. This is to test whether capacity to pay influence loyalty, seeing the effect of loyalty when customer is in normal financial condition until under financial stress.

Hypothesis

H1 : There is significant different profit-

ability level for different loyalty clusters in non delinquent bucket

H2 : There is significant different profitability level for different loyalty clusters in early delinquent bucket

H3 : There is no significant profitability level in different loyalty clusters in late delinquent bucket

H4 : There is significant different profitability level in different loyalty clusters in restructuring segment

The hypothesis was developed inline with earlier literature review where loyalty will have impact into profitability and within that relationship, there is gradation from the highest loyalty level into the lowest one as explained under loyalty typology.

To simplify the research operationalization and ensure the sample availability, buckets will be grouped into: non delinquent (no days past due), early delinquent (1 – 29 days past due), late delinquent (30+ days past due) and restructuring segment(customer under restructuring program).

Analysis Tools

To prove the effect of loyalty on profitability, there are 3 analysis tools to be used: K means clustering development, ANOVA and Regression analysis. Cluster development was done by using k-means algorithm.

The decision to use k-means method is because of its practicability, relatively efficient with direct result. K-means also often terminates at local optimum, hence it can show the result with shorter time. On the other side, k-means is also not without weaknesses such as dealing with categorical data and its method to determine number of k or cluster in advance.

This weaknesses, however, will not be an issue in this research because the data is not categorical and also, it is planned in advance to have 3 different cluster as part of hypothesis testing among all 3 clusters based on its Loyalty indicators. Hence, the decision to choose k-means is considered as the right approach for this research at this moment.

After all sample were scored, the sample will be clustered or classified into 3 different loyalty categories: Class A, Class B and Class C. The cluster will be developed by using k-means algorithm . Based on earlier explanation under literature review (in Chapter 2) in this research, the process of using K-means. The next analysis will be done by using ANOVA to see the significance impact of loyalty on profitability based on credit risk segments or capacity to pay. In simple way, the table 1 is the main comparison to be done in this research:

Table 1. Loyalty and Credit Risk

X		Capacity To Pay			
		Non Delinquent	Early Delinquent	Late Delinquent	Restructuring
Loyalty	Class 1	1	4	7	10
	Class 2	2	5	8	11
	Class 3	3	6	9	12

By using ANOVA, Loyalty significance on Profitability will be tested and proved on each bucket segment:

- Group 1 vs. Group 2 vs. Group 3

- Group 4 vs. Group 5 vs. Group 6
- Group 7 vs. Group 8 vs. Group 9
- Group 10 vs. Group 11 vs. Group 12

By then, it will be clearer whether loyalty

ality has a significance effect on profitability for each group in each segment.

The last analysis will be done by using regression analysis. This is to see the dependency of profitability with loyalty. To come up with more comprehensive conclusion, there is a needs to see the dependency of loyalty to profitability when the ANOVA result shows a significant numbers. Hence, ANOVA will confirm the different level of profitability in among clusters while Regression will confirm the associations between loyalty and profitability in each buckets. To come up with regression analysis, loyalty score from each indicators will be added to get a single loyalty score. This score is then regressed with average profit-

ability numbers which was came from revenue collected minus credit loss numbers from October 2010 until March 2011. The definition can be modeled as follow:

- Loyalty score = longevity + depth + breadth + referrals
- Profitability = revenue collected - credit loss

RESULT AND DISCUSSIONS

Longevity

Longevity in credit management terminology is defined as Month On Book (MOB). MOB starts when banks disburse the credit to the customer's account. Table 2 shows the Longevity distribution across all samples.

Table 2 Longevity Distribution

Longevity	Total	%	Cummulative	Cummulative %
12	48	0.15%	48	0.15%
13	2,229	7.03%	2,277	7.18%
14	1,797	5.67%	4,074	12.85%
15	2,531	7.98%	6,605	20.84%
16	2,332	7.36%	8,937	28.19%
17	2,356	7.43%	11,293	35.62%
18	2,263	7.14%	13,556	42.76%
19	2,140	6.75%	15,696	49.51%
20	2,042	6.44%	17,738	55.96%
21	1,995	6.29%	19,733	62.25%
22	2,039	6.43%	21,772	68.68%
23	1,511	4.77%	23,283	73.45%
24	1,642	5.18%	24,925	78.63%
25	1,479	4.67%	26,404	83.29%
26	1,164	3.67%	27,568	86.97%
27	1,554	4.90%	29,122	91.87%
28	1,212	3.82%	30,334	95.69%
29	1,347	4.25%	31,681	99.94%
30	9	0.03%	31,690	99.97%
31	10	0.03%	31,700	100.00%
Grand Total	31,700			
Max	31			
Min	12			
Mean	20			
Median	20			
Mode	15			

As shown on table 2, accounts sample were distributed with MOB 12 (the lowest) and MOB 31 (the highest). The average MOB were 20 with the same Median numbers which means that the accounts sample is quite focus at the center value, and at the same time with Mode value were 15, lower

than Mean and Median value. This value will be used as the basis to determine the cut off score for Longevity criteria from the lowest till the highest. Below is the summary of the score distribution after considering Max, Min, Mean, Median and Mode value in Longevity variable:

Table 3 Longevity Score Distribution

Score	Longevity	Total	%	Cummulative	Cummulative %
10	<14	2,277	7.18%	2,277	7.18%
20	<15	1,797	5.67%	4,074	12.85%
30	<20	11,622	36.66%	15,696	49.51%
40	<30	15,985	50.43%	31,681	99.94%
50	>=30	19	0.06%	31,700	100.00%
Total		31,700			

The Mean and Median which has the same value at 20 MOB, will get 30 points while Max and Min number will get 10 points and 50 points respectively for MOB < 14 and >=30. Easily we can determine the score of 20 and 40 is somewhere in between those criterium above. By looking at data distribution, it is proposed to give 20 points for MOB <15 and 40 points for MOB <30. By using the above criterium, half of the sample were distributed at 40 points followed by 30, 10, 20 and 50 points.

Depth

Depth is the second variable in Loyalty Score development. Depth itself can be defined as total monetary amount or frequency payment has been made by the customer to the bank as compared to the total monetary amount or tenure that they need to pay till the last installment. Depth numbers will be converted into a percentage number which shows the level of loan completion from beginning till the end. A customer who has paid the loan installment for 18 months in a 36 months total tenure will have 50% of depth value (18/36 = 50%). The detail distribution can be seen as follow:

Table 4. Depth Distribution

Depth	Total	%	Cummulative	Cummulative %
<26%	577	1.82%	577	1.82%
<41%	6,735	21.25%	7,312	23.07%
<56%	10,010	31.58%	17,322	54.64%
<71%	7,617	24.03%	24,939	78.67%
<86	4,709	14.85%	29,648	93.53%
>=86%	2,052	6.47%	31,700	100.00%
Grand Total	31,700			
Max	105.0%			
Min	14.6%			

Mean	55.9%
Median	54.2%
Mode	50.0%

Table 4 shows data distribution in Depth category. Using the same approach with Longevity category, 30 points will be given to the middle value 56% (with Mean 55.9% and Median 54.2%), while 10 points and 50 points will be given to those value at the range of Min and Max numbers (14.6% and 105%) respectively. The cut off for 20 points will be given to the range of 36% - 56%. The criteria cut off at 36% is used as the

mid point between the lowest depth % (14.6%) and the mean dept % (56%). On the other side, cut off at 91% is used due to more as judgemental approach to differentiate those who will finish the loan versus those who still below 90%. Based on that, 40 points will be given to the range of 56% - <91% and 50 points will be given to those customer with Depth value equal or more than 91%.

Based on the above arrangement, Depth score distribution can be seen on Table 8. as follow:

Table 5. Depth Score Distribution

Score	Longevity	Total	%	Cummulative	Cummulative %
10	<36%	4,073	12.85%	4,073	12.85%
20	<46%	6,841	21.58%	10,914	34.4%
30	<56%	6,408	20.21%	17,322	54.64%
40	<91%	13,020	41.07%	30,342	95.72%
50	>=91%	1,358	4.2%	31,700	100.00%
Total		31,700			

By looking at Depth Score distribution, 41.07% of sample distribution were under 56% - <91% which means the customer had paid their installment more than a half from total tenure. The next portions were those customers with score 20 and 30 which means ranging from 36% - 56%. The last one will be those <36% with 12.85% and >=91% with 4.28%.

Breadth

Breadth is the total products which was enjoyed or bought by the customer. Based on data collections, we are able to identify 3 other products which the customer may

have besides personal loan product that they keep at the moment. The other 3 products were Credit Card, Credit Guard Insurance and Life Protector Insurance. Credit Card is a credit revolving product, a very common consumer credit products. Credit Guard Insurance is an insurance product to cover customer's personal loan product in case they cannot pay the loan due to illness and death. Life Protector Insurance is an insurance product to cover customer's life, a very common life insurance product as we know. Sample distribution based on breadth category is as follow:

Table 6. Breadth Distribution

Depth	Total	%	Cummulative	Cummulative %
1	16,805	53.01%	16,805	53.01%
2	12,779	40.31%	29,584	93.32%
3	2,116	6.68%	31,700	100.00%
Grand Total	31,700			
Max	3.0			
Min	1.0			
Mean	1.5			
Median	1.0			
Mode	1.0			

Accounts distribution under breadth category were 53% customer hold 1 product, 40.31% enjoy 2 products and 6.68% has 3 products in hand. Using slightly modified approach, score cut off were determined based on its Max, Min and Mean value. Due to max number of products in hand stop at 3 products, we can conclude that 10 points

will be given to those customer with 1 product, 30 points for those who hold 2 products and 50 points to those who have 3 products in hand. This approach are inline with the first 2 category, Longevity and Depth.

After scoring all sample, Table 7 shows the Breadth Score Distribution with its cummulative value.

Table 7. Breadth Score Distribution

Score	Breadth	Total	%	Cummulative	Cummulative %
10	1 Product	16,805	53.01%	16805	53.01%
20	NA	-	-	-	
30	2 Product	12,779	40.31%	29584	93.32%
40	NA	-	-	-	
50	>=3	2,116	6.68%	31700	100.00%
Grand Total		31,700			

The score distribution is inline with Breadth raw data distribution with 53% sample get 10 points, 40.31% sample get 30 points and 6.68% sample get the maximum 50 points.

Referral

The last category in Loyalty Score development is called Referral. Referral is the total accounts which was referred by the existing customer to also enjoy the products that they enjoy. This is one of the so

called active Loyalty concept where the customer reccomend the product to other people. In consumer credit term, this is called Member Get Member program (MGM) and most of the time, customer who did this is the best customer in the portfolio. They are the one who speak positively about the products and help the company to get free advertisement from them. Referral data distribution can be seen as follow on table 8.

Table 8. Referral Distribution

Referral	Total	%	Cummulative	Cummulative %
0	22,669	71.51%	22,669	71.51%
1	9,020	28.45%	31,689	99.97%
2	9	0.03%	31,698	99.99%
3	1	0.00%	31,699	100.00%
9	1	0.00%	31,700	100.00%
Grand Total	31,700			
Max	9.00			
Min	0.00			
Mean	0.29			
Median	0.00			
Mode	0.00			

From total samples, it was found that 28.45% referred this personal loan product to another 1 customer. Less than 0.5% referred more than 1 while the other 71.51% had never referred the accounts to the other potential customer. This can be, referral was in place but the applications was rejected by the bank due to many reasons.

Scoring approach for this category was done by direct simple approach i.e. 0 points for no referral, 10 points for 1 refer-

ral, 20 points for 2 referrals, 30 points for 3 referrals, 40 points for 4 referrals and 50 points for 5 referrals and more. This approach is choosed becasue there is no difference in median and minimum value on referrals while maximum value reach 9 referrals. Hence, the scoring cirterium was made based on simplicity practical used only.

The scoring result by using the above criterium under Referrals category are as follow:

Table 9. Referral Scoring Distribution

Score	Referrals	Total	%	Cummulative	Cummulative %
0	0	22,670	71.51%	22,670	71.515
10	1	9,019	28.45%	31,689	99.97%
20	2	9	0.03%	31,698	99.99%
30	3	1	0.00%	31,699	99.997%
40	4	-	0.00%	31,699	99.997%
50	>=5	1	0.00%	31,700	100.00%
Grand Total		31,700			

The scoring distribution under Referral category is dominated by 0 referral and it is followed by 1 referral. The main difference in scoring approach for Referral category as compared to the other 3 is 0 (zero) score point for those who never refer the products to the other customer up till the

acount is booked. There was also no 40 points given as a result of no total referral that equal to 4 accounts.

Overall Scaling

The last four section describes about loyalty development, distribution and its

scaling. To summarize and ease of overall understanding, Table 13. shows the sum-

mary of Score level and scaling per loyalty indicators.

Table 10. Summary of Loyalty Scaling

Score	Longevity	Referrals	Depth	Breadth
0	NA	0	NA	NA
10	<14	1	<36%	1 Product
20	<15	2	<46%	NA
30	<20	3	<56%	2 Product
40	<30	4	<91%	NA
50	>=30	>=5	>=91%	>= 3Product

As summarize on Table 10, the same approach had been used by Cheng and Chen (2009). Scaling for each indicator was done by specific criteria, considering central tendency value for each indicator. Score 0 (zero) was applied only for Referrals, while Breadth did not have Score 20 and 40. The rest of score level had been applied to all scaling.

Combination of score from each indicator shows the total Loyalty level of each

account in the sample. It is one from so many ways to predict customer's loyalty level and therefore, it can be used to further check its impact to profitability on all or specific segment.

Clustering Result

The result of k-means clustering after running for 4 iterations can be seen on Table 11 as follow:

Table 11. K-Means clustering result

Cluster Center	Cluster 1	Cluster 2	Cluster 3
Longevity	18.40	32.13	37.48
Depth	13.43	29.05	35.56
Breadth	12.95	16.78	29.53
Referral	0.42	1.80	5.27
The distance to zero point	51.87	81.29	168.70
Loyalty Score Average	57.29	82.19	105.04
Number of Sample	3,940.00	16,972.00	10,788.00

The formula for Distance to zero point is as follow:

$$D = \sqrt{(C_{i1} - 0)^2 + (C_{i2} - 0)^2 + (C_{i3} - 0)^2 + (C_{i4} - 0)^2}$$

Where:

- Ci = Cluster at i.....Cluster 1, Cluster 2, Cluster 3
- X1= Average Score at Cluster i for the first indicator

- X2= Average Score at Cluster i for the second indicator
- X3= Average Score at Cluster i for the third indicator
- X4= Average Score at Cluster i for the fourth indicator

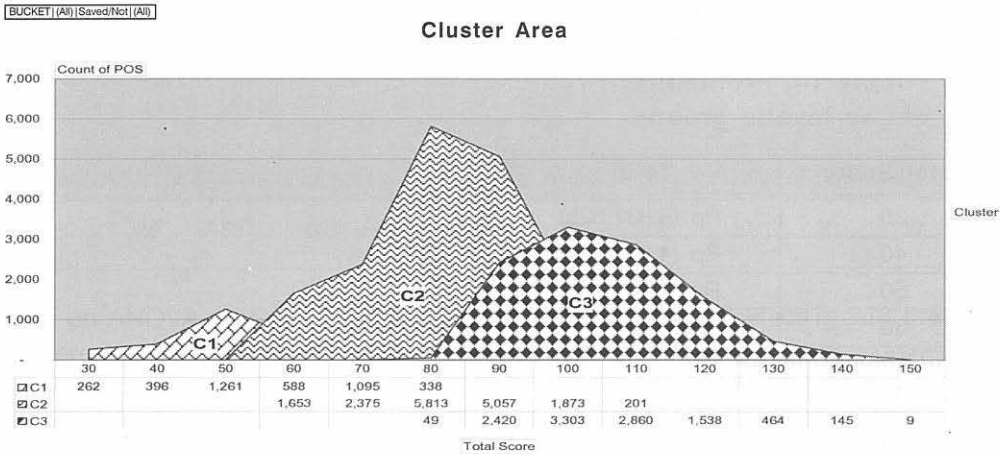
Distance to zero point and Loyalty Score average on each cluster determines the Loyalty level of each customer in the cluster. By this segmentation, we can conclude

that Cluster 1 has the least loyalty level, Cluster 2 has medium loyalty level and finally Cluster 3 has the best loyalty level.

Clustering development has been done with strong flag among itself. By using the cluster, we will be able to notice 3 different

set of customer and therefore, it can be used to further analyze cross tabulation with demography data. It is expected that a different level of profitability can be seen and proved by comparing this 3 cluster during hypothesis testing in the next section.

Graph 1. Cluster Distribution



Correlations Analysis

Correlations analysis was done to check the correlation value between each loyalty indicators and total score. Besides, Corre-

lation analysis was also done to know the value of correlations between each loyalty indicators with the total score.

Table 12. Correlations Analysis

Correlations	Longevity	Depth	Breadth	MGM	Total Score
Longevity	1.000				
Depth	0.195	1.000			
Breadth	-0.013	-0.223	1.000		
MGM	0.212	-0.057	0.111	1.000	
Total Score	0.605	0.522	0.525	0.365	1.000

From Table 12, among indicators the highest values were -0.223 (Breadth & Depth). The rest of correlation values were below that combination and therefore we can conclude that there is no multicollinearity problem among loyalty indicators. On the other side, on correlation value between loyalty indicators and total score, Longevity has the highest correlations value at 0.605 followed by Depth and Breadth with

0.522 and 0.525 respectively with MGM or Referral at the last rank with 0.365. According to Judge (1982) multicollinearity becomes a serious problem when the correlation coefficient are found to be greater than 0.80. Based on the above table, it is clear; there is no multicollinearity problem between Loyalty indicators and the total score.

Hypothesis Testing

Table 13. Average Profitability by Cluster & Bucket

Cluster	ND	ED	LD	R	Grand Total
C1	Rp 1,813,791	Rp (6,066,902)	Rp (23,032,336)	Rp 1,215,188	Rp (2,549,381)
C2	Rp 1,853,284	Rp (1,362,475)	Rp (9,705,173)	Rp 178,301	Rp 533,338
C3	Rp 2,453,048	Rp (910,681)	Rp (10,198,213)	Rp (22,047)	Rp 1,752,649
Grand Total	Rp 2,074,755	Rp (2,074,911)	Rp (12,827,707)	Rp 350,582	Rp 565,137

Table 14. Profitability by loyalty group

Total Score	Total
30	Rp (6,937,825)
40	Rp (4,279,061)
50	Rp (4,462,644)
60	Rp (992,939)
70	Rp 18,942
80	Rp 471,471
90	Rp 957,952
100	Rp 1,645,519
110	Rp 1,822,847
120	Rp 2,385,812
130	Rp 2,117,772
140	Rp 2,578,436
Grand Total	Rp 565,129

Hypothesis 1 state that there is significant different of profitability for different loy-

alty level in non delinquent (ND) segment. ANOVA and regression result are as follow:

Table 15. ANOVA between Cluster for Avg. Profitability in ND Bucket

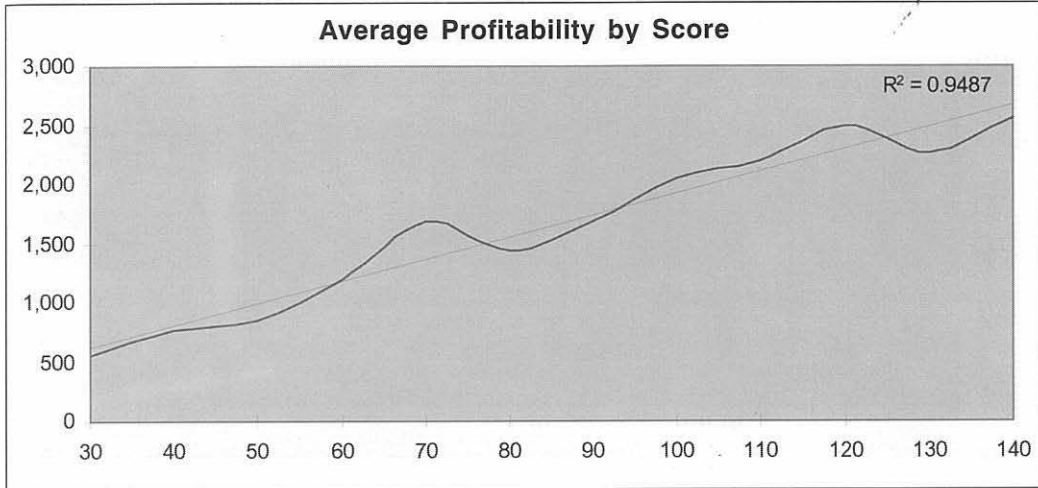
Anova: Single Factor

Groups	Count	Sum	Average	Variance
C1	2,873	5211020535	1813790.649	12,786,449,082,893
C2	13,477	24976713271	1853284.356	15,738,444,234,000
C3	9,872	24216487400	2453047.751	24,245,894,415,996

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	2,269,431,425,302,340	2	1,134,715,712,651,170	60.95	0.00	3.00
Within Groups	488,145,180,043,762,000	26,219	18,617,993,822,943			
Total	490,424,611,469,054,000	26,221				

Graph 2. Regression Avg. Profitability by LOYALTYgroup in ND bucket



Based on ANOVA on table 15, it is clear that there is significance different of profitability within 3 different clusters. By general comparison, C1 with average profit Rp 1,810,262 and C2 with average profit Rp 1,846,209 seems to have the same value. However, the value is quite far below average profit in C3 with Rp 2,436,670. This information is valid with $p < 0.01$, $F > F$ crit. This information then concludes that Hypothesis 3a is supported, H_0 is rejected.

In addition, graph 3 shows R square

value were 0.9487 which means that there is strong correlation between loyalty and profitability in non delinquent bucket. This is a significant value with $P < 0.001$ and thus it gives evidence that loyalty does matter for those customers in non delinquent bucket.

Hypothesis 2 state that there is significant different of profitability for different loyalty level in early delinquent (ED) segment. ANOVA and regression result are as follow:

Table 16. ANOVA between Cluster for Avg. Profitability in ED Bucket

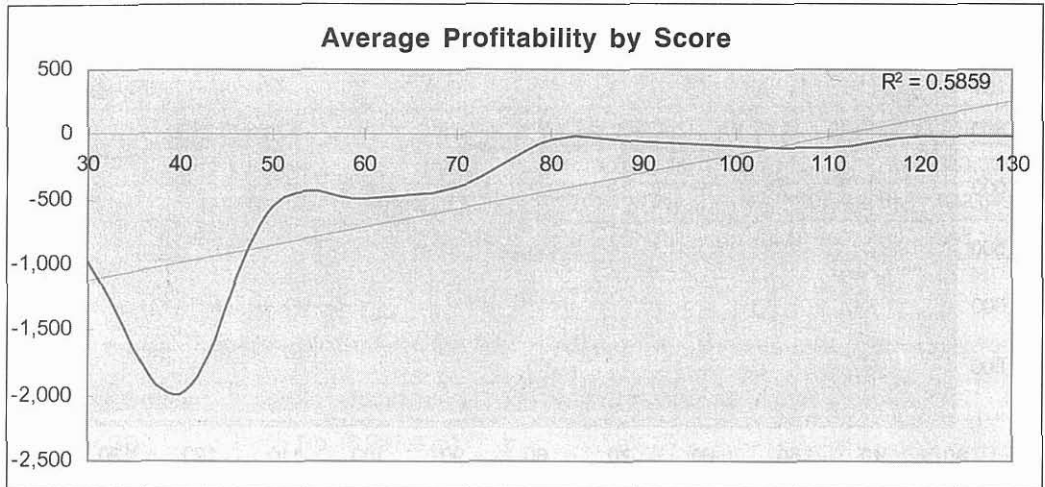
Anova: Single Factor

Groups	Count	Sum	Average	Variance
C1	415	-2517764216	-6066901.726	514,758,656,079,963
C2	1,657	-2257621164	-1362475.054	134,180,946,632,034
C3	409	-372468532.1	-910681.0075	116,312,528,015,381

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	8,008,842,472,604,030	2	4,004,421,236,302,020	20.55	0.00	3.00
Within Groups	482,769,242,670,029,000	2,478	194,822,131,828,099			
Total	490,778,085,142,633,000	2,480				

Graph 3. Regression Avg. Profitability by LOYALTY group in ED Bucket



Based on ANOVA on table 16, it is clear that there is significance different of profitability within 3 different clusters. By general comparison, C2 with average profit Rp (1,577,297) and C3 with average profit Rp (1,215,642) seem to have slightly different value. However, the value is quite far above average profit in C1 with Rp (6,249,005). This information is valid with $p < 0.01$, $F > F$ crit. This information then concludes that Hypothesis 3b is supported, H_0 is rejected.

In addition, Graph 3 shows R square value were 0.5859 which means that there is correlation between loyalty and profitability in non delinquent bucket. This is a significant value with $P < 0.001$ and thus it gives evidence that loyalty influence customers in early delinquent bucket.

Hypothesis 3 state that there is no significant different of profitability for different loyalty level in late delinquent (LD) segment. ANOVA result is as follow:

Table 17. ANOVA between Cluster for Avg. Profitability in LD Bucket

Anova: Single Factor

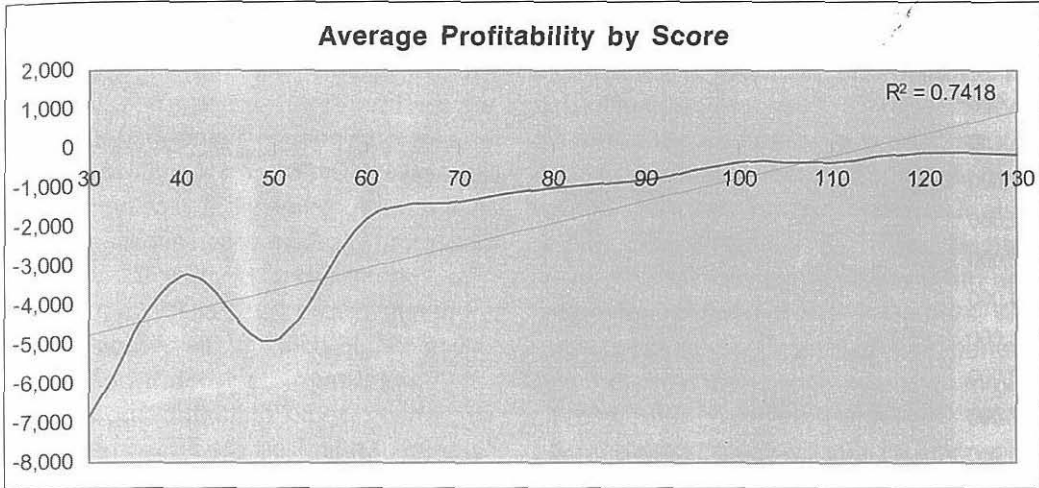
SUMMARY

Groups	Count	Sum	Average	Variance
C1	558	-12852043290	-23032335.64	682,089,828,145,365
C2	1,416	-13742524447	-9705172.632	233,473,955,738,580
C3	484	-4935934964	-10198212.74	293,119,992,176,262

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	75,259,825,704,123,600	2	37,629,912,852,061,800	108.45	0.00	3.00
Within Groups	851,866,637,868,191,000	2,455	346,992,520,516,575			
Total	927,126,463,572,315,000	2,457				

Graph 4. Regression Avg. Profitability by LOYALTYgroup in LD Bucket



Based on ANOVA on table 17, it is clear that there is significance different of profitability within 3 different clusters. By general comparison, C2 with average profit Rp (10,464,864) and C3 with average profit Rp (11,034,021) seem to have slightly different value. However, the value is quite far above average profit in C1 with Rp (23,616,404). This information is valid with $p < 0.01$, $F > F$ crit. This information then concludes that Hypothesis 3c is not supported, H_0 is accepted.

Graph 4 shows the R square value were 0.7418 ($P < 0.001$). This information confirm

ANOVA analysis earlier which state that Cluster 1, 2, and 3 has different value in average profitability. It has a different conclusion with hypothesis 3c because in the first place, it was suspected, loyalty will not have any effect when customer's capacity is getting lower. This new fact is very interesting to be known because it shows the importance of loyalty even more, especially from profitability point of view.

Hypothesis 4 state that there is no significant different of profitability for different loyalty level in Restructuring (R) segment. ANOVA result is as follow:

Table 18. ANOVA between Cluster for Avg. Profitability in R Bucket

Anova: Single Factor

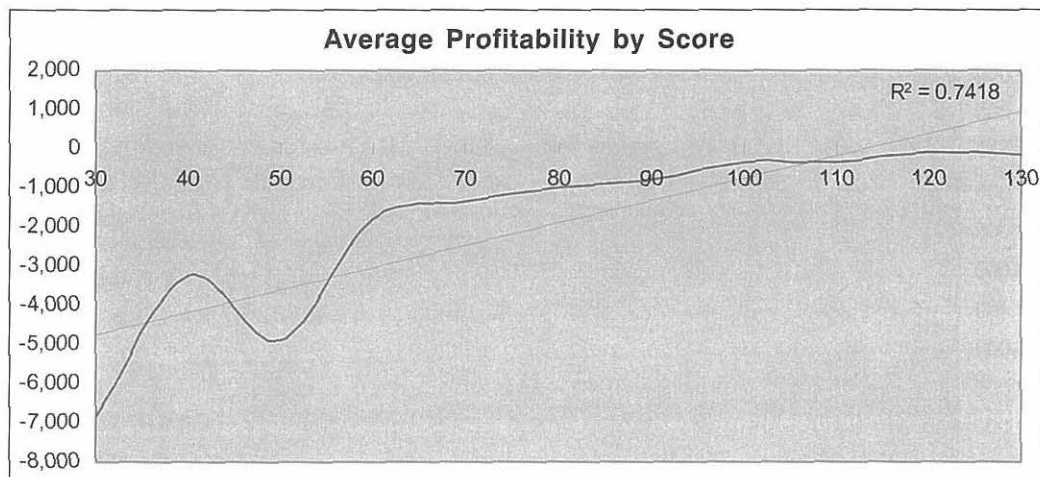
SUMMARY

Groups	Count	Sum	Average	Variance
C1	94	114227637	1215187.628	4,332,916,213,798
C2	422	75243163	178301.3341	1,096,180,398,244
C3	23	-507089	-22047.34783	4,031,175,423,070

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	85,987,867,245,934	2	42,993,933,622,967	24,18	0.00	3.01
Within Groups	953,139,014,851,591	536	1,778,244,430,693			
Total	1,039,126,882,097,520	538				

Graph 5. Regression Avg.Profitability by LOYALTYgroup in R bucket



Based on ANOVA on table 18, it is clear that there is significance different of profitability within 3 different clusters. By general comparison, all average profit in C1, C2 and C3 were different significantly with average profit at Rp 1,215,188, Rp 172,870 and Rp (22,047). This information is valid with $p < 0.01$, $F > F$ crit. This information then concludes that Hypothesis 3d is supported, H_0 is rejected. It was shown that the average profit in C1 is higher than C2 and C2 is higher than C3. It has a different pattern with those segments under normal active accounts in non delinquent, early delinquent and late delinquent.

On the other side, Graph 5 shows R square value were 0.0437 ($p = 0.30$). It means that there was weak or no correlation at all between loyalty and profitability in restructuring bucket. In conclusion, there is difference in profitability for restructuring bucket; however, there is no dependency on each segment as can be seen from ANOVA and R square value.

CONCLUSIONS

There were interesting findings can be concluded in this research. Through hypothesis testing, the findings are as follow: The main factors that can sustain the rela-

tionship between customer and bank in consumer credit portfolio are loyalty. Loyalty is the basic foundation for business relationship and therefore it needs to be improved and focused continuously. As explained earlier, in this research, there were 4 loyalty indicators; Longevity, Depth, Breadth and Referrals. Those four items need to be focused and broken down into concrete implementation. The principle things to be done are to keep the customer stay as long as they can, based on their needs and at the same time, expand the products to be offered to the customers for a more comprehensive experience with the bank and hence, with a strong service level, customer's will become product ambassadors which will be beneficial for the bank.

It was confirmed that loyalty in 3 different clusters differs significantly in term of average profitability for customers in non delinquent, early delinquent and late delinquent bucket. This was done by doing ANOVA to the 3 different clusters which shows significant statistic result. In addition, regression analysis was also done to further check any possibility of dependency which turns out to be true and statistically proven.

Using the same approach, it was also confirmed that loyalty in 3 different clusters

differs significantly in term of average profitability for customers in restructuring bucket. ANOVA was done and it showed significant statistic result. However, in a further regression analysis, it turns out that there was no dependency between clusters and average profitability for restructuring segment. Regression result shows no significant correlations between loyalty group and average profitability in this segment.

The Loyalty Score had proved that more loyal customer will produce higher profitability then those less loyal customers. Hence, from marketing point of view, we need to know where our most loyal customers are and how to enlarge this customer base. Some marketing strategy can be done such as:

Give more incentive to the customer who stays with the bank for some period of time such as 12 months, 24 months, and 36 months. Incentive can be given in many ways such as: point rewards, discount on installment payment, small token and others. The main thing is to make customer happy and aware that we know that they have been with us for quite sometimes and we would like to thank them for using our products.

The same approach can also be done for the customers who were able to achieve a specific period of tenure such as 50%, 80%, etceteras, and a point where actually the bank had received back its principle loan which was disbursed to the customers. Congratulate them for such achievements while keep on motivating them to finish the loan with the bank.

Cross sell is another way to bind the customer with the bank. Let the customer feel the overall service from the bank, not only from consumer credit products but also other products such as insurance, deposits and investment. One roof solution will make the customer happy and beneficial for the bank.

As research findings in restructuring bucket shows that Cluster 1 has higher profitability then Cluster 2 and 3, it gives a clue that actually to avoid further profitability issue, faster decision has to be made before customer records become worsen and in the end will make them unhappy not only with this one particular product, but also with the other products. Therefore, it is better to offer a settlement program with appropriate discounts to the customers. We might loose the opportunity to gain benefit from personal loan products but we might have another chance through other products and this strategy will avoid relationship termination.

Active loyalty is above everything. Bank will receive direct and indirect benefit from those customers who recommend its products to his friends, family and relatives. This behavior needs to get extra attention because this is the true value of loyalty, customer feel happy and therefore they offer the same product to the other. Bank did not have to pay for their salary, did not have to pay advertisement, did not have to provide working space for the customers, but yet, application comes in because its customer help them to do it. This customer has to be maintained and awarded equal to their contribution to the bank

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