The Study of Risk-Weighted Assets on the Affecting of Loan Exposure Valuation toward Credit Default

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Abstract
The objective of this research is to build a theoretical and an empirical model of Risk-weighted assets in banking industry. This study is very important for the banks because in uncertainty of environment, the banks must prudently when lend the money to the counterparty, so the default risk could be minimized. This study also wanted to investigate and test empirically direct and indirect effects of; first, Exposure Valuation to Credit Default, second, Loan Exposure Valuation to the Risk-weighted assets, third, the Risk-weighted assets to Credit Default at the local bank that listed on Indonesia Stock Exchange period 2008 – 2012.The Structural Equation Modeling by Amos Software 21.00 used to analysis data which result have a high goodness of fit, and the test of simultaneous and individual test proved significant with coefficient < 0.05 and the variation of the dependent variable could be explained or estimated by the independent variables with coefficient adjusted R Square > 0.60. The result of analysis shows that; first, Loan Exposure valuation not significantly positive influence to Credit Default, second, Loan Exposure valuation significantly positive influence to Risk-weighted assets, third, the Risk-weighted assets significantly positive influence to Credit Default, So the mediating effect of Risk - weighted assets on the affecting of Loan Exposure valuation toward Credit Default more strength than direct effect of Exposure Valuation to Credit Default.This study recommends about the importance of Valuation Exposure of Loan precisely such as; realized of credit, investment, placement, and to manage or control Risk-weighted assets to obtain a low risk that a low credit default also.
Keywords: Loan, Exposure, Valuation, Risk, Default

1. INTRODUCTION
1.1. Background of study
Bank is a business organization that is in an environment of uncertainty. Various environmental factors such as customer, intermediaries, competitors, government and other environmental factors will provide both positive and negative influence to the bank, which means if positive it will provide an opportunity or encouragement, while the negative effects, which means providing barriers or threats to the bank. Furthermore, when a positive or negative effect on the bank's case, then all the determinant factors must be considered, analyzed and diagnosed to predict the likelihood that a risk will occur.

According to the reality that faced by the banking industry, where there is always uncertainty, then for every person who involved in the management of the bank should seek to address the risks that occur or are likely to occur, and seeks to eliminate or at least minimize losses when the risks and uncertainties that loss occurred through a good risk management.

Good Risk Management will be able to minimize the losses faced by banks (Indonesia Central Bank No. 5/8/PBI/2003). So that the bank can maintain its viability could even develop into a larger bank and success in business. While banks do not have good risk management, meaning that the bank allowing all the same possibilities that could result in losses for banks, this requires serious attention of bank management.

With serious attention, through proper analysis and diagnosis, the management of the bank is expected to predict the risk imposed on the right bank, so that management will be able to minimize losses from such risks as something that is not expected to happen has been predicted earlier and the bank's management has prepared anticipated steps in accordance with the principle of prudent.

One of the most fundamental aspects in the implementation of the precautionary principle is capital adequacy. It is a major focus of the entire banking supervisory authorities around the world. Capital owned by the bank, basically should be enough to cover all the business risks faced by the bank. The main risks are the focus of attention is the bank's Credit Risk, Market Risk, Operational Risk and Liquidity Risk. Measurement of risk is very important, in this case to provide sufficient financial analysis with respect to the management of substantial funds from the public.

As an intermediary institution, the Bank is highly dependent on the extent of the trust placed by the public. One of the important aspects in the analysis of financial risks in the banking industry is risk-weighted assets, while there are many variations in calculating the risk-weighted assets (RWA) in the banking sector. RWA differences in various countries has led to reduced confidence and reliability on RWA and capital ratios, and if left untreated, can affect the credibility of the banking industry in general. (Vanessa Le Leslé and Sofiya Avramova, 2012).

1.2   Strengthen

This research tried to develop the relationship of The Loan Exposure valuation with variance amount realized of credit, investment and placement to the third parties toward Credit Default. This research different with Jeff Aziz and Narat Charupat (1998) that stated Calculating Credit Exposure throughout Monte Carlo Sumulation (BIS, 1998), has signicant effect to set capital reserves, meanwihle this study tried to increment a variable in the relationship of the loan exposure with credit default in bank. The variabel namely is Risk - Weighted Assets (RWA) is Every balance sheet assets and off-balance sheet given the appropriate weight levels of credit risk inherent in every post.

1.3. Problem Formulation

According the background, the phenomenon in the banking business and the research gap that has been described above, and according to the regulation of the Indonesia Central Bank No. 5/8/PBI/2003 dated May, 19, 2003 about Implementation of Management Risk for decrease default risk, So the author proposed the research problem is "***How to decrease the credit default".***

1.4. Research questions;

According with this problem formulation, so that this study tries to answer some questions are;
1) Does The Loan Exposure valuation influences to Credit Default
2) Does The Loan Exposure valuation influences to Risk weighted assets
3) Does The Risk-weighted assets influences to Credit Default

1.5. Research Objectives

Based on the background of problems and research questions, the research aims are;
1) To analyze and know that the effect of The Loan Exposure valuation to Credit Default
2) To analyze and know that the effect of Loan Exposure valuation to Risk-weighted assets
3) To analyze and know that the effect of Risk-weighted assets to Credit Default

1.6 Research Output

Through this research, may contribute for academics and organizational practitioners in the form of recommendations and the development of theoretical model and empirical model about concepts of Risk-weighted assets.
  a.   Academic implications ;
  It has implications for academic research by providing support for the development of transactional theory, achievement theory and the theory of risk that look from a wider perspective on the influence factors of Credit Default ;
  1) To suggest how the Credit Default could be decreased by decreasing the Risk-weighted assets
  2) To suggest how the Risk-weighted assets could be decreased by increasing Loan Exposure Valuation.
  b.   Practical Organizational implications;
  Provide a guidance in valuating Loan Exposure in order the credit default can be decreasing, therefore the practitioners should be calculating precisely the Risk-weighted assets when give the credit, invest to the securities or to place the money to the third parties.

1.7. Research Outcomes

This research provide a propose new model to Indonesian Government as regulator and Indonesian Central Bank as executor in order more prudent and aware in calculating of credit exposure and in setting risk-weighted assets.

2.   LITERATURE REVIEW
2.1 Contingency Theory

The purpose of establishment of a company is a going concern through the creation of revenue and profitability and improves social welfare. This purpose was prepared in the planning and control of the company, whether short, medium and long term, so that the company must on the track for achieve their objectives.

Accounting behavioral research was originally designed by some researchers to approach universalistic approach, such as the result of research of Argyris (1952), Hopwood (1972) and Otley (1978). Universalistic approach that expressed a control system can be applied to all characteristics of firm and environmental conditions anywhere. Universalistic approach is based on the scientific management theory.

Contingency theory can be used to analyze the design and management control systems, to provide information that can be used by companies for various purposes and to face competition (Otley, 1978), while the Merchant (1982) argued that there is no universal control system is always appropriate to be applied the entire

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organization in each state. Control systems will vary in every organization based on organizational and situational factors.

2.2. Control Theory

Anthony and Govindarajan (2005) said management control activities include: Plan, Coordinate, Communicate, Evaluate, Decide, Influence, and control system elements are: Detector, assessor, effector, communication networks.

Huezynski and Buchanan (1991) said that management control is as a process through which the implemented plans and goals - goals achieved through the establishment of standards, measurement databases must address satisfying, comparing actual performance with the standards, and determining corrective action and feedback needed. Furthermore Huezynski and Buchanan (1991) said the controls for the organization have the meaning as an activity is needed because if the control activities in an organization is not running the operating activities will be impaired and will excess to waste (in efficiency).

While, Snell (1992) define the controls are any process that helps align the actions of the individual with the interests of the organization who hired him. Furthermore, Snell (1992) said that the control has 3 (three) typology, namely the control systems of behavior, control systems results, and input control system.

2.3. Concept of Banking and Credit

According to the Circular Letter of Bank Indonesia (SE BI) No.26/4/BPPP dated May 29, 1994, earning assets (loans) are all assets in dollars and foreign currencies held by the bank in order to earn revenue according to function. The types of earning assets are; Amount of credit, letter of credit, Placement with banks and non-banks, Investments.

The loan terms under the Basic Banking Act 10 of 1998: "Credit is the provision of money or bills that can be similar with that, based on an agreement between banks with other parties that requires the borrower to repay the debt after a certain period of time with interest ". So credit is the transfer of funds from the lender to the borrower.

Assessment of the principles in the provision of credit or determine the collectability of loans earning assets in the form of credits specified in 5 (five) categories according to Bank Indonesia Regulation No.8/19/PBI/2006 dated October 5, 2006, namely: Fluent, Special mention, Doubtful and Loss.

2.4. Concept of Management Risk

Smith (1990) stated that Management of risk is a process identification, measurement and control of a risk that threat an asset and revenue of company or a project that impact to a damaged of asset or company losses.

Noshworthy, (2000: 600) stated that Management of risk is an implementation of measures aimed at reducing the likelihood of those threats occurring and minimizing any damage if they do; Risk analysis and risk control form the basis of risk management where risk control is the application of suitable controls to gain a balance between security, usability and cost.

Stoneburner et al. (2002) said that Management of risk controlling and mitigating information system related risks; encompasses risk asessment; cost-benefit analysis; implementation, test and security evaluation of safeguards.

2.5. Credit Risk and Loan Exposure

According to Bank Indonesia Regulation Number 14/18/PBI/2012, credit risk is a risk due to the failure of the debtor and/or other party in fulfilling obligation to the Bank. Banks are exposed to credit risk that given by the nature of their lending based business. The bank business have debt to capital ratio is highly leveraged. The source of credit risk can come from any bank‟s functional activity such as; lending of loan, placement and investment. Credit risk still dominating the activity of banks in Indonesia, this happens because margin received by banks are relatively small besides the potential loss which occurred for large credit exposure.

Joel Bessis, (1998) defined that Credit risk is the loss that caused by the default of the debtor or due to a decline in the credit quality of borrowers. Aat the time of the decline in credit quality, although not the default, it reflects the increase in credit risk. This reflects the growing opportunities the event of default downs due to credit quality. While, Kountur (2006, p 3) defines "risk" is the possibility of adverse events. Risk would be great if more many / complex the activity is done, the greater the risks faced.

While Loan Exposure is the cost of replacing or hedgingthe contract at the time of default. This is the maximum value that will be loss if the counterparty to that contract default (Jeff Aziz and Narat Charupat (1998).

Tomasz and Marek (2002) defined that Default Risk is a possibility that a couterparty in a financial contract will not fulfill a contractual commitmentto meet his/her obligations stated in contract.

From the various explanation and literature review that has been described above re garding the decreasing credit default, so through this paper, the author proposed the proposition as follow.

Proposition : Risk-weighted assets is the risk of all bank assets are placed with third parties in the form of loans, investment, placement and other forms of credit. If the risk calculated precisely, It is potentially decrease the credit default.

3.   RESEARCH METHODS
3.1 Population and Research Sample
The population in this study are financial report of all bank that listed in Indonesia Stock Exchange from 2008 – 2012.

The sample method is the purposive sample method (Ferdinand Augusty, 2006). As reasoning for choosing purposive sampling method is to consider all information related to the research problem. Therefore, samples in this study are financial report of the midle and top fifteen Local Indonesian banks which listed on the Stock Exchange from 2008 until 2012.

3.2. Operational of Variables
Basically the necessary data in this study can be grouped into 3 (three) groups of variables, namely: Independent Variable, Dependent Variable, Variable Intervening, are;
1) The first variable (EXP) is the Loan Exposure Valuation. This variable is independent variable with indicated by amount credit realized, placement and investment.
2) The second variable is Risk-weighted assets (ATMR). This variable is intervening variable with indicated amount Risk-weighted assets
3) The third variable (NPL) is the Credit Default, this variabel as dependent variable with proxy Non Performing Loan,
     So that this model can be made mathematically as follows:

$$NPL = f(EXP) \quad + \qquad e \qquad\qquad\qquad (1)$$
$$NPL = f(EXP) \quad + \ f(ATMR) \qquad + \qquad e \qquad\qquad (2)$$
$$ATMR = f(EXP) + \qquad e \qquad\qquad\qquad (3)$$

3.3. Data Collection Techniques
The data required in this study consisted of primary data and secondary data. Primary data required in this study was collected by conducting field research that is, directly to the banks which listed on the Stock Exchange. Secondary data was collected through library research.

3.4 Method of Analysis
In this study, author used a technique of analysis by the method of Structural Equation Modeling (SEM). SEM is a method of analysis in addition to providing information about the simultaneous causal relationship between the variables. It provides information about the load factors and measurement of errors. SEM is able to analyze the relationship between latent variables with indicator variables, the relationship between latent variables with another, as well as knowing the size of the measurement error. (Ghozali, 2008). To support Structural Equation Modeling, in this study the author used the software of Amos 21:00.

4.   DISCUSSION
4.1.TESTING THE FEASIBILITY OF RESEARCH MODEL
1. Normality and Linearity
Normality test is done by using the skewness test that showed almost all normal variables at the 0.01 level (1%). This is reflected in the value of skewness CR under ± 2.58 (Arbuckle, 1997:78). Multivariate value in testing multivariate normality is kurtosis coefficient, if the results are still below the limit of ± 2.58; this means that there is data used multivariate normal distribution.
2. Extreme numbers (Outliers)
Outliers are observations that appear extreme values both univariate and multivariate namely that arise due to the combination of its unique characteristics and look very much different from the other observations. In this testing model proved that no outlier.
3. Multicollinearity
Multicolinearity can be detected from the determinant of the covariance matrix (Cooper and Emory, 1996:324).. Covariance matrix determinant value is very small gives an indication of multicolinearity problem. In Table visible correlation between the independent variable value is less than 1 (r <1), meaning the independent variable no symptoms of multicolinearity.

Furthermore, the following assumptions are met then conducted a feasibility SEM models. To test the feasibility of the developed model in this structural equation model, it will be used some eligibility index models. According to Arbuckle (1997), AMOS, is also used to identify the proposed model meets the criteria of a good

structural equation models. The criteria are:

1) Degrees of freedom (Degree of Freedom) must be positive

Output results, degree of freedom equal 4, which mean that the model is being developed to meet the criteria as a good model.

2) X2 (chi square statistic) and probability

Fundamental test equipment to measure the overall fit is the likelihood ratio chi-square statistic. Significant level of acceptance is recommended if p ≥ 0.05 (Hair et al., 1998:389), which means the actual input matrix with the predicted input matrices were not statistically different. R degree of freedom. Amos output results showed that the ratio of chi square of 3,3328 or less than 3 x 197 = 591 (Wheaton, 1977).

Besides ratio chi-square, according to Hair et al. (1998:340) recommended value of conformity to accept a model is the value of CMIN / DF is less than or equal to 2.0 or 3.0. While the value of CMIN / DF = 0.8307 < 2.0, meaning this model well and can be used.

3) Goodness of fit index (GFI)

This index reflects the overall suitability of the model is calculated from the residual quadratic model that predicted compared with the actual data. Goodness of Fit Index value is 0,9826 or usually from 0 to 1. The larger the sample size the study the greater the value of GFI. Better value close to 1 indicates that the tested models have good agreement (Hair et al., 1998:387) is said to be good value GFI ≥ 0.90.

4) Adjusted GFI (AGFI)

AGFI states is an analogue of R2 (R square) in a multiple regression. Fit Index can adjust the degree of freedom available to test whether the model is accepted estimated. 16:00 Amos output results show AGFI has coefficient of 0.9347 or 93,47%. Acceptance rate is recommended if a value equal to or greater than 0.9.

5) Tucker-Lewis Index (TLI)

TLI is an alternative incremental fit index that compares a model was tested against a baseline models. The Amos output results show TLI has coefficient of 1.00 or 100%. Acceptance rate is recommended if a value equal to or greater than 0.9. Recommended as a reference value for the receipt of a model is greater than or equal to 0.9 and a value close to 1 indicates a very good fit. TLI is a fit index is less affected by sample size.

6) CFI (Comparative Fit Index)

CFI is also known as the Bentler Comparative Index. CFI is an incremental suitability indices are also compared with the null model tested and estimated models. Amos output results show the CFI coefficient of 1.00 or 100%. It was said to be a good index to measure the suitability of a model because it is not affected by sample size (Hair et al., 1998:289). Index indicating suitability models tested had a good is if the CFI ≥ 0.90.

7) RMSEA (Root Mean Square Error of Approximation)

RMSEA values indicate the goodness of fit is expected when the model is estimated in the population. Amos output results show RMSEA index of 0.00 or 0 %. RMSEA value is less than or equal to 0.08 (8%) is an index to the acceptability of the model showed a close fit of the model was based on degree of freedom. RMSEA is an index of measurement that is not influenced by the size of the sample so that the index is usually used to measure the fit model on large sample numbers.

The indices are used to test the feasibility of a model can be summarized in the table below.

Table.1 : Goodness of Fit Full Model Loan Exposure, Risk Weighted Asset, Credit Default.

Goodness of Fit Index	Cut off Value	Result	Evaluation Model
χ2 Chi square	< 591	3,328	Good
Hoelter (0.05)	> 120	212	Good
Significance Probability	≥ 0,05	0,5053	Good
GFI	≥ 0,90	0,9826	Good
AGFI	≥ 0,90	0,9347	Good
CMIN/DF	≤ 2,00	0,8307	Good
TLI	≥ 0,90	1,000	Good
CFI	≥ 0,90	1,000	Good
RMSEA	≤ 0,08	0,000	Good

Source: Results Output Full Amos 18:00

4.2. HYPHOTESES TESTING

FIT MODEL TESTED :
$\chi 2$ Chi square = 3,328
Significance Probability = 0,5053
GFI = 0,9826
AGFI = 0,9347
CMIN/DF = 0,8307
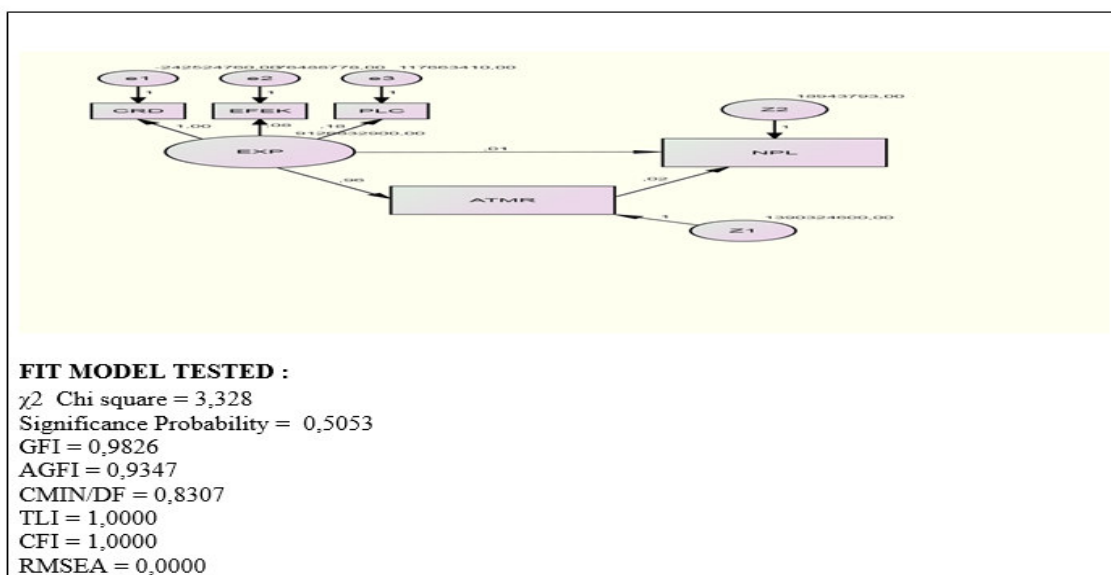TLI = 1,0000
CFI = 1,0000
RMSEA = 0,0000
Source : Amos ver. 21.00

Figure – 1 : Pichtograph Loan Exposure, Risk Weighted Asset, Credit Default

Table. 2 : The Affecting of Loan Exposure to Credit Default.

			Estimate	S.E.	C.R.	P	Label
ATMR	<---	EXP	,9562	,0468	20,4234	***	
CRD	<---	EXP	1,0000				
EFEK	<---	EXP	,0803	,0106	7,5742	***	
PLC	<---	EXP	,1757	,0134	13,1096	***	
NPL	<---	EXP	,0094	,0126	,7480	,4545	
NPL	<---	ATMR	,0209	,0124	1,6818	,0092	

Source : Amos ver. 21.00
Notes:
ATMR = Risk Weighted Asset
EXP = Loan Exposure
CRD = Credit Realized
EFEK = Investment
PLC = Placement
NPL = Non Perforfing Loan

Hypothesis 1: **Loan Exposure** *has positive effect to* **Credit Default**
Statistical tests of this hypothesis (Table 2), showed variable Loan Exposure has coefficient postive 0.0094 on influencing the Credit Default but not significant, where the value of P = 0.4545 > 0.05, meaning hypothesis "1" is not acceptable, or Loan Exposure valuation directly has not significant effect on Credit Default.

This study support to Jeff Aziz and Narat Charupat (1998) that stated Calculating Credit Exposure troughout Monte Carlo Sumulation, has signicant effect to set capital reserves.

This study differ to Duffie and Singleton (1999) who classify the models for Valuation risky assets (bonds) into two categories. The first branch have been called "Structural models" require firm specific inputs to model the default process. Typically, the cause of default bond is a decline in the value of a firm's assets below a fixed threshold. The second branch called "Reduced form models" estimate the risk neutral probability of default over a given interval from actual credit spreads without necessity to know the cause of default.

Hypothesis 2: **Loan Exposure** *has positive effect to Risk* **Weighted Asset**
Statistical tests of this hypothesis (Table 2), showed variable Loan Exposure has coefficient positif 0.9562 on influencing the Weighted average asset based risk and significant, where the value of P = 0.00 < 0.05, meaning hypothesis "2" is acceptable, or Loan Exposure directly has significant effect on Risk Weighted Asset.

This study support to Andersen et.al (2012) that stated higher risk weights can to a certain extent mitigate systemic risk, as banks might both set aside more capital and reduce lending and investment that generate systemic risk.

Hypothesis 3: Risk **Weighted Asset** *has positive to* **Credit Default**
Statistical tests of this hypothesis (Table 2), showed variable Risk Weighted Asset has coefficient positive 0.0209 on influencing the Credit Default and significant, where the value of P = 0.009 < 0.05, meaning hypothesis "3" is acceptable, Weighted average asset based risk directly has significant effect on Credit Defaut. This result prove that mediating effect of Weighted average asset based risk is 0,1998 or greater than the direct effect of Loan Exposure toward Credit Default with cofficient 0,0094.

This study support to Sonali Das and Amadou N.R. Sy (2012) who focused to How Risky Are Banks' Risk Weighted Assets, Evidence from the Financial Crisis. They argued that The Bank with lower RWA will perform better during the crisis, meaning that if banks obtain better return, so Credit Default or NPL must be low.

This study also agree with Bradley et al (1991) who found that RWA for banks, respectively, are positively related to the bank probability of failure.

5. CONCLUSION AND IMPLICATION
5.1. Conclusion
1) Loan Exposure has coefficient positive 0.0094 on influencing the Credit Default but not significant, where the value of P = 0.4545 > 0.05, meaning hypothesis "1" is not acceptable, or Loan Exposure directly has not significant effect on Credit Default.
2) Loan Exposure has coefficient positive 0.9562 on influencing the Risk Weighted Asset and significant, where the value of P = 0.00 < 0.05, meaning hypothesis "2" is acceptable, or Loan Exposure directly has significant effect on Risk Weighted Asset.
3) Risk Weighted Assets has coefficient positive 0.0209 on influencing the Credit Default and significant, where the value of P = 0.009 < 0.05, meaning hypothesis "3" is acceptable, Risk Weighted Asset directly has significant effect on Credit Defaut. This result prove that coefficient mediating effect of Risk Weighted Asset is 0,1998 or greater than the direct effect of Loan Exposure toward Credit Default with cofficient 0,0094.

5.2. Implication
1) Academic Recommendation
This study proved and contributes to the academics in the form of recommendation and the new theoretical model Loan Exposure valuation in influencing the Credit Default. This study has implications for academic research by providing support for the developing theory contingency and the theory of organizations that look from a wider perspective, namely; 1). Suggests Loan Exposure Valuation directly has not significant effect to Credit Default or directly Loan Exposure Valuation can not increasing Credit Default, so this variable must be mediated by other variable in order affected and more strengthen to decrease Credit Default, 2). Proposes that by using an indirect effect of Loan Exposure valuation to Credit Default mediated by Risk Weighted Asset that calculated precisely, it could be strength caused by it has positive and more strength coefficient than direct effect.

2) Practical Recommendations
Policy implications of these results for practitioners bank provide a guidance in improving the Loan Exposure when processing a credit application. Loan Exposure must be built by Organization as well as adequate, beside the practitioner must implementing organizational learning to build and developed a credit system and control. This study has implications for practitioner and suggesting that Creditor use RWA as an indicator of Credit risk, and the practitioners should be calculating precisely the RWA when give the credit, invest to the securities or to place the money to the third parties. Actually, banks with higher risk-weighted assets implement a bad credit management.

3). Future Research Recommendation
For future research, it is suggested that the object of research is not limited to the middle top banks only, but also developed to all banks that listed on the Indonesia Stock Exchange, Jakarta, so that the sample relatively more distributed and widely.

REFERENCES
Andersen Henrik et.al, (2012), "Effects of Changing Banks' risk Weights", Norges Bank
Anthony dan Govindarajan, (2005), "Management Control System", Penerbit. Salemba Empat, Jakarta.
Argyris, C., (1952), "The Impact of Budget on People, Ithaca, NY: The Controllership Foundation", Inc. Cornell University.
Arbuckle, (1997), JL. AMOS, Computer software. Chicago: Small Waters.
Augusty Ferdinand, (2006), "Metode Penelitian Manajemen: Pedoman Penelitian IlmuManajemen", Semarang: BP Universitas Diponegoro.

Bessis, Joel. (1998), Risk Management in Banking, John Wiley & Sons, New York.

Bank for International Settlement (BIS, 1998), International Convergence of Capital Measurement and Capital Standard, Basle Commitee on Banking Supervision

Bradley, M.G., C.A. Wambeke, and D.A. Whidbee, (1991), "Risk weights, risk-based capital and deposit insurance," Journal of Banking and Finance, 15 (August): 875-893

Ghozali, Imam, (2008), Model Persamaan Struktural Konsep dan Aplikasi dengan Program Amos 16.0, Badan Penerbit UNDIP, Semarang

Hair, J. F. Jr., Anderson, R., Tatham, R., & W. C.,(1998), "Multivariate Data Analysis (5th ed.). Upper Saddle River", NJ: Prentice Hall.

Hopwood, A.G., (1972). "An Empirical Study of The Role of Accounting Data in Performance Evaluation". Journal of Accounting Research 10 (Supplement) 156-182.

Huczynski, A.A. & Buchanan, D.A.,(1991), "Organizational behavior": An Introductory Text. (2nded). New York: Prentice Hall.

Jeff Aziz and Narat Charupat,(1998), "*Calculating Credit Exposure and Credit Loss*, Algo Research Quarterly", Vol. 1 N o.1

Kountur, Ronny, (2006), "Manajemen Resiko", Abdi Tandur, Jakarta.

Nosworthy, J.D., (2000), A Practical Risk Analysis Approach : Managing BCM Risk, Computers & Security Vol. 19 no.4

Otley, D.T., (1978)."Budget Use and Managerial Performance". Journal of Accounting Research 16 (1): 122-149.

P.J. Smith (1990), Redefining Decision: Implications for *Managing Risk* and Uncertainty. Volume 14, Issue 3, pages 230–240, Journal Disaster

Retnadi, Djoko, (2006), "Memilih Bank Yang Sehat", Elex Media Komputindo, Jakarta

Saunders, Anthony, (1999), "Credit Risk Measurement" : New Approaches to Value at Risk and Other Paradigmas, John Wiley & Sons Inc., Canada.

Sugiarto, Ferry, (2006), "Manajemen Resiko Perbankan Dalam Konteks Kesepakatan Basel dan Peratuan Bank Indonesia", Graha Ilmu, Yogyakarta.

Snell, Scott A (1992), "Control Theory in Strategic Human Resources Management: The Mediating Effect of Administrative Information", Academy of Management Journal 35 (2):292-327

Sonali Das and Amadou N.R. Sy., (2012), "*How Risky Are Banks' Risk Weighted Assets? Evidence" from the Financial Crisis*, IMF Working Paper, Monetary and Capital Markets Department

Stoneburner, Gary, Goguen, Alice, Feringa, Alexis. (2002). Risk Management Guide for IT

System. Gaithersburg: National Institute of Standards and Technology

Tomasz R. Bielecki and Marek Rutkowski (2002), Credit Risk: Modeling, Valuation and Hedging, Springer Berlin-Newyork.

Vanessa Le Leslé and Sofiya Avramova, (2012), "Revisiting Risk-Weighted Assets", IMF Working Paper, Monetary and Capital Markets Department

Regulation.

Republik Indonesia, (1998), Undang-Undang Nomor 10 Tahun 1998 tentang Perubahan

Undang-Undang No. 7 Tahun 1992 tentang Perbankan. Jakarta

Bank Indonesia (2012), Peraturan Bank Indonesia Tentang Kewajiban Penyediaan Modal Minimum Bank Umum No. 14/ 18 /PBI/2012, Jakarta

Bank Indonesia (2006), Peraturan Bank Indonesia Tentang Kualitas Aktiva Produktif Dan Pembentukan Penyisihan Penghapusan Aktiva Produktif Bank Perkreditan Rakyat. Nomor: 8/19/PBI/2006, Jakarta

Bank Indonesia. (2003), "Penerapan Manajemen Risiko Bagi Bank Umum" Peraturan Bank Indonesia Nomor 5/8/PBI/2003 Tanggal 19 Mei 2003, Jakarta.

Bank Indonesia (1994) Tentang Penyempurnaan Pembentukan Penyisihan Penghapusan Aktiva Produktif, SE BI No.26/4/BPPP 29 Mei 1994, Jakarta