Using Earnings-at-Risk to Assess the Risk of Indonesian Banks

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ABSTRACT

The implication of Asian Crises in 1997-1998 has been detrimental to many financial institutions in the Asia-Pacific region. Most severely, followed by political reformation throughout 1998 to 2000, almost all of approximately 250 banks registered in the Indonesian Central Bank (Bank Indonesia) database had to undergo major financial reformations, merged with other banks, or simply had to be liquidated. The CAR Methodology, which has been used as the main tool by Bank Indonesia to investigate and estimate the riskiness of Indonesian banks, was not able to accurately estimate the risk of these banks. In this paper, we provide a theoretical framework and empirical analysis on the potential use of Earnings-at-Risk (EaR) to complement the current risk assessment methods used for the Indonesian banks.

INTRODUCTION

Asian Crises in 1998 have brought down many financial institutions in the South East Asian Nations to their lowest point of loss from their highest peak of glory during the Asian Tigers Economic period in the 1990s. More specifically in Indonesia, within 2 years (1998 – 1999), the government had to merge 4 state-owned banks (there were only 7 state-owned banks registered in the Indonesian Central Bank -herewith will be referred to as Bank Indonesia- since 1990), close 48 commercial banks, recapitalize 7 others, and merge another 9 into 1 bank (Raj and Rinastiti, 2001).

According to many recent studies[1], the main quantitative reasons to blame for this massive recapitalization and avalanche of closures are the undercapitalization and heavy dependence on foreign exchange loans of the Indonesian banks. The main qualitative reason for it, is the weak risk management enforcement by the country's central bank (Enoch, 2000). The method adopted by Bank Indonesia to assess the financial viability of Indonesian banks since 1992 has been the Capital Adequacy Ratio (CAR)[2]. Whilst proven to be useful, CAR has several potential drawbacks, mainly because (a) it cannot be easily updated to provide the most recent picture of the bank's financial condition, and thus may not be used as a *continuous pre-emptive* method to assess the risk of the banks; and (b) it does not assess the importance of the *earnings volatility* of the banks over a desired period of analysis.

Earnings-at-Risk (EaR) methodology provides an estimate of the worst value of earnings that a bank may have to survive with during a certain financial period. It certainly has the potential to overcome the drawbacks of CAR, namely (a) it can be easily updated; (b) it assesses the earnings volatility of the bank; and (c) it incorporates many other factors that may influence the banks' capability to generate 'real' earnings through usage of different assumptions. Having been used by many corporations in developing countries, EaR uses in Asia have been very limited (Delhaise, 1998). This paper provides a theoretical framework and preliminary empirical evidence that EaR is a viable and useful technique to estimate the risk of a bank in Indonesia.

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[1] See for example Claessens and Glaessner (1997), Claessens, Djankov, and Klingebiel (1999), Mishkin (1999), Tornell (1999), Laeven (1999), Enoch (2000), and Pangestu and Habir (2002).

[2] See Claessens and Glaessner (1997), Mishkin (1999), Tornell (1999), Laeven (1999), and Enoch (2000).

LITERATURE REVIEW

Indonesian Banking System during the Pre-Crises Period

Since Indonesia's independence in August 1945 until the financial system reformation in October 1988, the banking scene in Indonesia was dominated by a string of state-owned banks. Each of the banks had a specific mission to promote certain sectors of the economy. They submitted their financial reports to Bank Indonesia, and therefore indirectly to the Ministry of Finance, which would then dictate everything from interest rates to the list of the beneficiaries of the bank loans. Over the years, a few private sector banks were established by the government, and by 1988, they were together handling about 15% of all banking services, with a number of directive and restrictions imposed on them. To enrich themselves, however, some banks' owners also invested their assets outside Indonesia, and became important clients of foreign banks. Corruption was rampant. They were invited on luxury cruises and idyllic retreats. Many foreign banks ended up paying dearly for their naïveté, but this was seen as part of the price for partaking in the business, finance, and economic development in the upcoming Indonesian economy.

In 1988, Indonesia decided to liberalize its banking sector in a way that no other Asian country had ever seen or was to duplicate thereafter. The Indonesian authorities issued a regulation, which was so lenient that it practically allowed anyone with some spare cash to come forward and apply for a license to open and manage a bank, without proper due diligence as to whether or not they had the professional ability and qualification to become a banker. For about seven to eight years afterward, banks were alarmingly mushrooming in Indonesia. Moral hazard was eminent, especially in the credit management area of the banks who gave loans to their own business groups without imposing any proper scrutiny in the loan applications process.

The main attraction for the banks' owners was also toppled by the profitable expectation of opening a bank in Indonesia because of the very large net interest margins (NIM) and interest spread[3] in the country. The NIM should normally dictate the level of net profit, but the relationship was affected by two other factors: non-interest income and administrative expenses. Particularly in Indonesia, administrative expenses have always been amongst the highest in Asia due to the country's huge geographical spread. More specifically, the high communications and transportation costs are

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[3] A measure of the difference between the average interest paid on deposits and the average interest received on loans.

prominent in banks to maintain relatively viable commercial banking operations in many small distant communities.

Another attraction for banks' owners was the calculation method of CAR. Although in 1991 Bank Indonesia required banks to comply with the 8% minimum requirement of CAR (in compliance with the Bank for International Settlement regulation), in May 1993, Bank Indonesia released another policies, which allowed banks to calculate their CAR, based on capital, which incorporated all profits that these banks earned last year. As a result, the CAR of many banks, which were realistically inadequate, became seemingly satisfactory to meet the 8% minimum requirement.

Indonesian Banking System during the Crisis and Post-Crisis Periods

During 1997/1998, the Indonesian banking industry experienced a formidable crisis as a result of the uncontrollable volatility and declining public confidence of Rupiah (the Indonesian currency). As for any countries in the world, the crisis of the local currency posed a severe liquidity problem in the country's banking industry. Particularly in Indonesia, aggravating the external pressure to a more severe financial damage was the banks' internal weaknesses such as corrupted management, excessive credit concentration, moral hazard, inadequate and non-transparent information on the financial condition of the banks, and ineffective supervision by Bank Indonesia.

To restore confidence in the banking system, at the end of January 1998, the government decided to guarantee the payments of banks' liabilities to depositors and domestic and international creditors; and encouraged inter-bank mergers to form a more financially-sound institution. Additionally, to restore the soundness of problem banks, Indonesian Bank Restructuring Agency (IBRA) was established. There were four ingredients, which highlighted the implementation of the banking reform agenda. The first objective was to improve the enforcement of prudential rules to strengthen internal conditions and resilience against external disturbances. Several agenda to achieve this first objective included raising the minimum requirement for a bank capital; improving regulation on productive asset quality and provision of allowance for productive asset amortization; and enhancing transparency and access of information on the banks' financial reports to the public. Secondly, IBRA was also formed to strengthen the supervision function of the financial industry by enforcing rules and enhancing skills and expertise of the financial market participants. Thirdly,

IBRA was also responsible for improving rules and legal infrastructure that entailed a review of Banking Law Draft, Bankruptcy Law Draft, and established a Deposit Insurance Institution. All in all, the main goal of IBRA remained improving the soundness of the banking industry in Indonesia[4].

The formation of IBRA weakened the intermediary function of Bank Indonesia. A number of banks faced a shortage of liquidity as a consequence of deeper segmentation in the money market. Interest rates remained high and a number of banks violated the condition of the statutory reserve requirement during the reporting period of 1998/1999. During the period, banks' profitability dropped drastically and showed a negative figure. The faltering profitability was mainly attributed to operating losses suffered by banks as a result of enlarging non-performing loans, which are highly related to troubled assets and negative interest rates spread. During 2000, the policy of Bank Indonesia remained firmly focused on accelerating the completion of bank-restructuring. The result was improving performance of many banks and other financial institutions in the country, even though some of them are still facing difficulties over compliance with the Capital Adequacy Requirement (CAR) and non-performing loans.

Value-at-Risk in General

Value-at-Risk is technically a statistical method, which is used to measure the amount of money an investment portfolio can lose from an unlikely, adverse, event during a certain period with a certain level of confidence[5]. Sir Dennis Weatherstone of JP Morgan popularized the concept of VaR indirectly by demanding a one-page report of the company's exposure position and potential losses of the day resulting from movements of financial instruments in the markets (Reed, 1997). The report was the renowned '4.15 Report'[6] and the methodology employed has been known as the Value-at-Risk (VaR) technique. Considering that this technique may improve the efficiency of risk management for banking supervision, in April 1995, the Basle Committee (Basle Proposal, 1995) encouraged banks to calculate their capital requirements using their own VaR models (with 99%

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[4] IBRA was replaced by Asset Management Corporation (in Indonesian, P.T. Perusahaan Pengelola Aset) as of February 27, 2004.

[5] Schachter (1997) describes VaR as: (1) A forecast of a given percentile, usually in the lower tail, of the distribution of returns on a portfolio over some period; (2) An estimate of the level of loss on a portfolio, which is expected to be equalled or exceeded with a given, small probability.

[6] The 4.15 Report provides a brief summary of the risks and potential losses across the entire trading portfolio run by JP Morgan. Therefore, the report had to aggregate diverse market positions on the basis of a single consistent risk measure.

level of confidence for a maximum of 10 working days investment horizon). Following their European counterpart, in June 1995, the US Federal Reserve started to require US banks to develop their own VaR models, calculate, and publish their market risk capital requirement. If during a certain financial period, the loss experienced by a bank exceeded its reserve capital, the bank would be fined, and its privilege to use their internal VaR model would be taken away. Additionally, starting from January 1996, The European Union's Capital Adequacy Directive Committee accepted VaR as a valid method to calculate the capital adequacy requirements for foreign exchange transactions undertaken by financial institutions.

Theoretically, Hoffman and Johnson (1997) and Kaplanski and Kroll (2002) suggest that although VaR may not be a perfect measure within the expected utility framework, it is at least as good as other traditional risk measures of the risk of an investment[7]. Nonetheless, it can be argued that the limited use of VaR as a risk assessment tool is mainly caused by the following reasons ((Reed (1997), Hoppe (1999) and Simons (2000)). Firstly, there is still no 'standard' agreement in respect of the VaR methodology. Secondly, VaR seems to be designed to assess the risk of investment trading of short-term liquid assets in a 'natural' market condition. Thirdly, a few studies[8] also show that different methodologies to calculate VaR may yield different VaR estimates despite the fact that the same data and time period are used. As a result, studies (KPMG Risk Publications (1997), Schachter (1997) and Jones, Oncu, and Sheikh (2000)) suggest that although VaR can provide an efficient (single figure) measure of investment risk, other types of risk measures[9] should also be used in conjunction with VaR in order to engender more reliable risk management practice[10]. Reed (1997) specifically points to the fact that although the concept of VaR has already had a profound

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[7] Kaplanski and Kroll (2002) list the traditional risk measures as: (a) Dispersion Measures: (a.1) the standard deviation risk measure; (a.2) the coefficient of variation risk measure; (a.3) the expected absolute deviations risk measure; (a.4) the Gini mean difference risk measure; (b) Below-a-reference Point Risk Measures; (b.1) Fishburn's $\alpha - t$ risk measure; (b.2) Baumol's risk measure. Readers interested in the details of these 'traditional' risk measures are encouraged to read the paper by Kaplanski and Kroll (2002).

[8] See Beder (1995), Simons (1997), Hopper (1997), Hendricks (1997), Pritsker (1997).

[9] Such as using standard deviations, tracking error, stress testing, or scenario analysis methods.

[10] Miyamoto (1997) describes that understanding and using VaR are analogous to understanding and using a personal computer (PC). In other words, we know a PC when we see one, just as we know a risk when we see one. However, the variety of PC models and their uses are varied, likewise the method to derive VaR varies depending on the needs of the users. Different users will derive a VaR based on different assumptions, thus may result in a different figure of VaR for the same type of data. Additionally, Jones, Oncu and Sheikh (2000) describe that to manage risk, one has to uncover the sources of the risk, reduce the exposure to the sources of risk which are least compensated (in terms of expected returns), and increase the exposure to the sources of risk which are most compensated. Only by doing this, one will be able to increase the overall expected return of the investment while reducing or maintaining the desirable level of risk.

effect on the risk management community and global financial regulators, the standardization of its usage as a financial risk measure is challenging.

Earnings-at-Risk

The potential of using VaR to assess the uncertainty surrounding the future earnings or cash flows has been explored by several studies[11]. For example, Shimko (1995, 1997a and b) suggests that in the corporate framework, VaR may be used to determine the amount of capital that a company would require in order to survive the occurrence of higher-than-expected costs or lower-than-expected earnings. It is expected that by knowing the VaR of its earnings or cash flows, a company will be able to *control* the *volatility* of these figures[12], leading to better-developed risk management strategies (Hamilton and Pettersen, 1997).

The calculation process of a company's VaR, herewith will be referred to as the Earnings-at-Risk (EaR), may be undertaken using a bottom-up or top-down technique. The bottom-up technique relates to the variance-covariance or monte carlo simulation approach whereby EaR is estimated based on the inter-relationships between constituents of the company's earnings or cash flows. The top-down technique is associated with the historical approach in that the EaR is estimated on the basis of the distributions of the historical earnings. Baliman (1997), Darrough and Russell (1998), and Stein et al (2000) suggest that the top-down approach is especially suitable for companies whose cash flows and earnings highly depend on a lot of risk factors, which are complicated to quantify. For example, the cash flows and earnings of a clothing company depend on the trendy style of the season more than on the change of interest or exchange rate. Therefore, it will be a futile attempt to estimate the VaR of a clothing company based on changes of interest or exchange rate. In the case of assessing the EaR of Indonesian banks, several studies (see Delhaise (1998), Santoso (2001) and Pangestu and Habir (2002)) acknowledge that several non-operating-cost-related transactions and policies such as lending to the banks' affiliates, telecommunication and other

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[11] See Hayt and Song (1997), Turner (1997), Priest (1997a and b), Paul-Choudhury (1997), Baliman (1997), Hamilton and Smith (1997), Godfrey and Espinosa (1998), JP Morgan CorporateMetrics™ (1999), Stein et al (2000), LaGattuta et al (2000), Dorris and Dunn (2001), Blanco (2001), and Barnwell (2001).

[12] The 1995 Wharton/CIBC Wood Gundy Survey of Derivatives End-Users finds that 91% of non-financial firms report that reducing the volatility of the firms' cash flows or earnings is the primary objective of their risk management practice (Hayt and Song, 1997).

administrative (unrelated to the banks' operational / core activities) costs influence the earnings and financial performance of these banks more than interest or exchange rates.

Value-at-Risk in Asia

Having been used and approved by many companies and regulators in Europe and North America, the application of VaR in Asia has been limited to multinational corporations in order to comply with the requirements of their foreign (non-Asian) headquarters (Fry, 2000). There are a few reasons for this skepticism. Firstly, VaR needs suitable and comparable inputs in its model to assess the risk of a particular entity (a portfolio, an asset, liability, or even an institution). In Asia, valuations on most assets and liabilities are based on the floating interest rates policies, and thus do not have readily available market prices for valuation purposes and VaR model development (Ross and Basu, 2004). Secondly, although increasingly more sophisticated technologies have managed to make it relatively easier to build and operate a VaR model, without appropriate assumptions, none of these models will function properly. This is particularly true in Asia, whereby even the simple and basic risk method in use, the CAR (Capital Adequacy Requirement), is being manipulated by bank managers using overoptimistic and unrealistic assumptions (Delhaise, 1998, p.54). A recent survey at the Executives' Meeting of East Asia-Pacific Central Banks and Monetary Authority (EMEAP) in 2001 also reveals that banks in the East Asian Pacific region in general, and in Indonesia, in particular, have been concentrated on measuring their foreign exchange settlement exposures rather than on anything else (EMEAP, 2001). This is because most institutions in the region seem to have a common belief that the only risk that matters in their area is the foreign exchange rate volatilities.

Nonetheless, the number of proponents of VaR usage in Asia is growing. Pownall and Koedijk (1999) suggest that a modified model of VaR from JP Morgan's RiskMetrics™ may be used to capture the downside risk of a portfolio during the periods of financial turmoil (crises). They term their model the Conditional VaR-x methodology, which is able to capture the time variation of non-normality by allowing for additional tail fatness in the distribution of the expected returns. Similarly, Ho, Burridge, Cadle, and Theobald (2000) employ the Extreme Value approach by emphasizing upon the tails of the probability distribution of the returns of a portfolio to estimate the risk of a portfolio during the Asian financial crises period. They find that this approach is relatively

satisfactory in providing a reasonably accurate prediction of the risk of the Asian financial markets. More importantly, Vinod (2003) suggests that by using VaR, the scope of corruption in many Asian countries may be reduced to the minimum level, so that it may encourage more foreign direct investments in the particular country.

In Indonesia, VaR has not been used in any way by any local financial institutions (Bank Indonesia Annual Reports). Several foreign banks such as JPMorganChase, Citigroup, HSBC, Standard Chartered, or American Express, may have probably used VaR internally, to comply with the requirements of the headquarters. One of the main issues concerning the use of VaR in Indonesia is the highly volatile foreign exchange and interest rates in the country. On top of that, one may say that Indonesia's political situation and macroeconomic condition may not be considered solid enough to provide assurance for any risk models to function properly. Nonetheless, a risk measurement for Indonesian banks, which may provide a reasonable 'safety net' for investors and other interested parties, is needed. CAR allows one to assess the capital adequacy of the banks. However, it seems that it was not enough to utilize this method alone. Other measures, which may provide an idea of the worst situation that a bank may handle, are needed. It is the aim of this paper to introduce the use of VaR methodology on the earnings of the banks, namely the Earnings-at-Risk (EaR), to provide a more solid pre-emptive method to assess the risk of these institutions.

Contributions of this paper

The contributions of this paper are in fourfold. Firstly, this paper provides a theoretical framework on the use of Earnings-at-Risk (EaR) to estimate the risk of a bank from the perspective of its ability to produce earnings. Secondly, this paper investigates the specific application of EaR in Indonesia, which has been considered as one of the countries suffered the worst from the Asian crises. Thirdly, this paper may be used as a basis by regulators or risk managers to incorporate EaR in the risk assessment process of Indonesian banks in the future. Fourthly, this paper is probably one of the first studies that assess and compare the risk of financial institutions in Indonesia prior and subsequent to the worst point of the Asian crises.

DATA AND METHODOLOGY

Data

We handpicked the sample of our paper from three sources, which complement each other in providing the financial data of the banks (a) Bank Indonesia Annual Reports; (b) P.T. Ekofin Konsulindo and (c) Infobank Magazine. We include banks, which are in full operation, before and after the Indonesian worst crises period of 1997–1998 (see *Table 1* and *2*). We define 1997–1998 as the worst crises years because in year 1997, Indonesia started its economic crises resulting from the exchange rate collapse of the Indonesian currency, Rupiah. This currency collapse then led to further difficulties of Indonesian corporations to pay their debts to the bank, increasing the liabilities of the banks in the form of non-performing loans. Additionally, many Indonesian banks suffered from low liquidity having had to pay their debts and interests in foreign currencies. Subsequently, in 1998, with the recommendation and approval from the International Monetary Federation (IMF), Indonesian government formed a supervisory agent, the Indonesian Bank Restructuring Agency (IBRA), to restructure the banking sector in Indonesia. The agent launched its recapitalization program in September 1998 aiming to share the burden of restructuring between the government and the private sector (see Pangestu and Habir, 2002). The recovery period began in 1999 when, amongst imposing other monetary and banking policies, IBRA was able to identify that all 7 state banks had CAR less than -25%, therefore merged 4 of them into 1, capitalized 12 regional development banks, and closed 48 private national banks.

We classify our sample banks based on their ownership structure: state-owned, private, joint venture, and foreign banks. Considering that we use all state-owned, foreign, and almost all of the joint venture banks, our sample may be deemed as relatively representative to depict the general state of the Indonesian banking industry. It is unfortunate that due to the unavailability, inconsistency, and lack of transparency of the financial data of the Indonesian banks, we were only able to employ 8 out of 43 private banks, which are listed in Bank Indonesia and still active in operation after the Asian crisis period. Additionally, because there was no regulatory mandate for Indonesian banks to publicize their financial statements, we were unable to obtain the complete financial data of the 26 regional development banks[13] and those of non-foreign-exchange-traded[14].

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[13] In Indonesian, Bank Pembangunan Daerah (BPD).

[14] In Indonesian, Bank Komersial Non-Devisa.

Table 1

List of Sample Banks

(The rank begins from banks with the largest Total Assets at the end of 1997*)

	Total Asset	Name of Banks	Type	EAT	ROA
1	Rp57,174,552,000.00	BNI 46	**State-owned**	Rp317,209,000.00	0.55%
2	Rp53,357,439,000.00	BCA	**Private**	Rp171,132,000.00	0.32%
3	Rp40,964,155,000.00	BRI	**State-owned**	Rp55,927,000.00	0.14%
4	Rp28,292,446,000.00	Danamon	**Private**	-Rp5,021.00	0.00%
5	Rp24,697,680,000.00	BII	**Private**	Rp244,406,000.00	0.99%
6	Rp15,363,251,000.00	BTN	**State-owned**	Rp97,500,000.00	0.63%
7	Rp12,960,508,000.00	Lippo	**Private**	Rp118,106,000.00	0.91%
8	Rp10,965,187,000.00	Niaga	**Private**	Rp35,989,000.00	0.33%
9	Rp9,466,727,000.00	Citibank	**Foreign**	Rp142,732,000.00	1.51%
10	Rp7,890,122,000.00	Panin	**Private**	Rp101,546,000.00	1.29%
11	Rp6,036,857,000.00	HSBC	**Foreign**	Rp128,040,000.00	2.12%
12	Rp4,293,882,000.00	Standard Chartered	**Foreign**	Rp43,023,000.00	1.00%
13	Rp4,203,869,000.00	Bank of Tokyo	**Foreign**	Rp109,636,000.00	2.61%
14	Rp4,064,990,000.00	ABN Amro	**Foreign**	Rp10,269,000.00	0.25%
15	Rp3,479,852,000.00	Deutsche Bank	**Foreign**	Rp1,849,000.00	0.05%
16	Rp2,430,300,000.00	Multicor	**Joint Venture**	Rp28,855,000.00	1.19%
17	Rp2,064,352,000.00	Sumitomo Niaga	**Joint Venture**	Rp200,000.00	0.01%
18	Rp1,788,912,000.00	Chase Manhattan	**Foreign**	Rp12,119,000.00	0.68%
19	Rp1,703,668,000.00	NISP	**Private**	Rp24,182,000.00	1.42%
20	Rp1,609,976,000.00	American Express	**Foreign**	Rp9,911,000.00	0.62%
21	Rp1,377,070,000.00	Bank of America	**Foreign**	Rp57,403,000.00	4.17%
22	Rp1,237,535,000.00	ANZ Panin	**Joint Venture**	Rp23,818,000.00	1.92%
23	Rp1,180,612,000.00	Finconesia	**Joint Venture**	Rp8,487,000.00	0.72%
24	Rp1,124,470,000.00	Inter Pacific	**Joint Venture**	Rp10,426,000.00	0.93%
25	Rp1,072,831,000.00	ING Indonesia	**Joint Venture**	Rp7,331,000.00	0.68%
26	Rp1,057,023,000.00	Korea Exchange	**Joint Venture**	Rp79,195,000.00	7.49%
27	Rp696,668,000.00	DBS Buana	**Joint Venture**	Rp6,583,000.00	0.94%
28	Rp602,044,000.00	Bangkok Bank	**Foreign**	Rp12,501,000.00	2.08%
29	Rp586,702,000.00	Muamalat	**Private**	Rp7,410,000.00	1.26%

* We choose to report the total assets of our sample at the end of 1997 to show the performance of our sample banks on the last year prior to the worst crises period.

Table 2

List of Sample Banks

(The rank begins from banks with the largest Total Assets at the end of 2000**)

	Total Asset	Name of Banks	Type	EAT	ROA
1	Rp117,880,337,000.00	BNI 46	**State-owned**	Rp313,312,000.00	0.27%
2	Rp96,188,207,000.00	BCA	**Private**	Rp1,802,233,000.00	1.87%
3	Rp65,187,919,000.00	BRI	**State-owned**	Rp335,795,000.00	0.52%
4	Rp62,168,058,000.00	Danamon	**Private**	Rp340,053,000.00	0.55%
5	Rp37,210,267,000.00	BII	**Private**	Rp267,487,000.00	0.72%
6	Rp24,073,486,000.00	Citibank	**Foreign**	Rp546,126,000.00	2.27%
7	Rp23,949,063,000.00	BTN	**State-owned**	-Rp1,457,558,000.00	-6.09%
8	Rp22,627,375,000.00	Lippo	**Private**	Rp246,418,000.00	1.09%
9	Rp18,698,548,000.00	Niaga	**Private**	Rp66,718,000.00	0.36%
10	Rp16,600,700,000.00	Panin	**Private**	Rp28,857,000.00	0.17%
11	Rp12,057,797,000.00	Standard Chartered	**Foreign**	Rp200,291,000.00	1.66%
12	Rp11,453,064,000.00	HSBC	**Foreign**	Rp599,522,000.00	5.23%
13	Rp10,954,756,000.00	ABN Amro	**Foreign**	-Rp10,038,000.00	-0.09%
14	Rp8,954,555,000.00	Deutsche Bank	**Foreign**	Rp415,000.00	0.00%
15	Rp6,949,657,000.00	Bank of Tokyo	**Foreign**	Rp205,189,000.00	2.95%
16	Rp5,260,660,000.00	NISP	**Private**	Rp60,289,000.00	1.15%
17	Rp4,398,575,000.00	Multicor	**Joint Venture**	Rp246,927,000.00	5.61%
18	Rp2,965,259,000.00	Sumitomo Niaga	**Joint Venture**	Rp380,057,000.00	12.82%
19	Rp2,624,368,000.00	American Express	**Foreign**	-Rp234,997,000.00	-8.95%
20	Rp1,714,887,000.00	ANZ Panin	**Joint Venture**	Rp53,100,000.00	3.10%
21	Rp1,391,812,000.00	Bangkok Bank	**Foreign**	Rp674,000.00	0.05%
22	Rp1,334,175,000.00	Finconesia	**Joint Venture**	Rp54,966,000.00	4.12%
23	Rp1,238,233,000.00	Chase Manhattan	**Foreign**	Rp23,159,000.00	1.87%
24	Rp1,207,861,000.00	DBS Buana	**Joint Venture**	Rp26,114,000.00	2.16%
25	Rp1,126,988,000.00	Muamalat	**Private**	Rp7,127,000.00	0.63%
26	Rp1,057,527,000.00	Bank of America	**Foreign**	Rp30,004,000.00	2.84%
27	Rp996,978,000.00	ING Indonesia	**Joint Venture**	Rp47,581,000.00	4.77%
28	Rp720,573,000.00	Inter Pacific	**Joint Venture**	Rp1,255,000.00	0.17%
29	Rp540,227,000.00	Korea Exchange	**Joint Venture**	Rp11,190,000.00	2.07%

** We choose to report the total assets of our sample at the end of 2000 to show the performance of our sample banks on the first year after the beginning of the recovery year of 1999.

Calculating EaR

Following Bank Indonesia's criteria to assess the performance of Indonesian banks, we also use the Earnings After Tax (EAT) in our EaR calculation (see Bank Indonesia Annual Reports). However, instead of taking the earnings themselves as the main figures to determine the banks' financial risk, we estimate the worst value of EAT that a bank may have to survive with during a certain financial period, conditioned with the macroeconomics and other foreseeable external influences. We are using the modified Historical Simulation methodology of Stein et al (2000) to calculate the EaR of our sample banks. The method is described as follows.

In the *first* step, we categorize the EAT of each bank based on their annual figures from 1991 to 1996 as the pre crisis period, and those from 1999 to 2003 as the post crisis period. We then calculate the changes of EAT for each year from 1991 to 1996 and from 1999 to 2003. In the *second* step, we calculate the mean and standard deviation of the changes of EAT from these two periods for each bank. In the *third* step, we use the mean and standard deviation of the changes, which we have calculated from step two, to estimate randomly generated numbers for possible EAT of each bank using 500 times simulation:

Simulated EAT = Base EAT (1 + Randomly Generated Numbers) **(Equation 1)**

Finally, we estimate the EaR of each bank based on the histogram chart of the frequency distribution of the 500 possible EAT figures, which we have computed from step three, using the 5% cut-off point of the distribution of these simulated earnings.

We then calculate the ***ratio of the EaR to the actual EAT*** of the banks to enable us analyze the risk performance of each bank during a particular period, and compare it with that of other banks or industry. We use the EAT figures of the banking industry from Bank Indonesia, which include other types of banks existed in the country such as the regional development and non-foreign-exchange-trade private banks. In year 2000, these types of banks represent almost 46% of the Indonesian banking industry (see Bank Indonesia Annual Report, 2000, pp.31). We are using the Mann-Whitney and Kruskall-Wallis Tests to analyze the EaR of our sample banks within their ownership groups and over the pre and post Asian crises periods.

RESULTS

A. Analyzing the Ratio of EaR to EAT

I. Pre-crisis Period

We find that the EaR of the banking industry during the period of 1991-1996 was very high, approximately 92% of their average EAT (See *Table A in the Appendix*). This means that based on the conditions of the Indonesian banking industry during that period, the amount of earnings that can be considered 'at-risk' for the average banks in Indonesia are 92% of their EAT. We find that the main contributors to this poor situation are ANZ and Indosuez banks, joint venture institutions (see *Table G in the Appendix*). All other banks, apart from Citibank (6%), Finconesia (25%), and NISP (43%), had their EaR figures exceeded 50% of their actual EAT. In retrospect, Indonesian banking industry should not have existed until today. However, considering the following banking conditions during the pre-crisis period, we find our findings to be reasonably accurate[15] considering the following situations:

1. There was an implicit guarantee from Bank Indonesia, which aimed to protect a bank from experiencing a systematic failure. Therefore, bank owners seem to neglect their responsibilities to maintain the profitability of the banks' operations.

2. The ineffective monitoring system by Bank Indonesia because it was unable to keep up with the numbers of banks, which was growing very rapidly since Pakto 88[16]. More specifically, the inefficiency takes form as the poor law enforcement system to banks which did not meet the prudential banking requirements of the BIS.

3. As banks were more inclined to disregard proper bank loan procedures, many of them suffered from a huge amount of non-performing loans, which were originated from those lent to their business-related groups.

4. Poor management and internal information system also reduced the quality of productive assets and increased nonperforming loans.

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[15] It is also supported by Delhaise (1998), "…but the sad truth is that, before the crisis hit, all of state-owned banks were either to bankruptcy or already beyond repair. Moreover, before the crisis, the real level of NPLs was understated, as banks were routinely restructuring most delinquent loans."

[16] Pakto 88 is the name of a package of banking restructuring policies, which was introduced in October 1988, aiming to revive the banking industry in Indonesia and encourage further economic development in sectors other than that of oil and gas.

5. Finally, lack of information transparency, which stemmed from no requirements for banks to publish their financial information (actions) publicly, has led to lower valuation of public towards the banks' credibility.

II. Post-crisis Period

The EaR of the banking industry after 1999 was found to be much better, leveling at around 3% of the average of all banks' EAT (See ***Table A in the Appendix***). More specifically, however, we find that the EaRs of all state-owned banks were still more than 50%, which may be explained by the existence of moral hazard within these banks. We also find that the EaRs of most of our sample banks are still relatively high (above 30%).

One possible explanation is the actual lower earnings that most banks are experiencing after the crises. As Bank Indonesia reports, many Indonesian banks still have substantial excess liquidity that could have been channeled into lending, which would have resulted in higher earnings. The 31.1% level of lending rate of banks at the end of year 2000 was far below that of the pre-crisis position of over 70%. As ineffective as it may seem, this is actually a good sign because this means that the banking sector has become more cautious and therefore did not rush into loan commitments in this (yet, still) volatile business climate. Instead, many of them have chosen low-risk short-term placement alternatives, such as the Bank Indonesia Certificate of Deposit (SBI) or other types of Interbank deposits. Additionally, many banks are still struggling to meet the ongoing internal consolidation of their minimum capital requirements, and credit and corporate restructuring. Therefore, less attention may be given to the effort to recover their earnings productivity. Nonetheless, improvements over the years from 1999-2003 were eminent (see ***Table 3***)[17]. This was reflected in the ongoing process of recovering the intermediation function of banks through increases in new credit extension, Loan-to-Deposit-Ratio (LDR), credit to earnings asset ratio, and ratio of income on credit interest to total income on interest.

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[17] An important factor explaining these improvements was improving macroeconomic indicators, such as interest rates, inflation and the exchange rate, supported by policies in bank restructuring and in sustained improvements of the resilience in the banking system. However, despite improved indicators of intermediation, intermediary activities of banks remained sub-optimal. This was reflected in large amounts of un-disbursed credits (25%) and low LDR (43.74%). From the external side, the major cause was similar to the factors causing the credit slowdown, namely, restructuring of the real sector and development of alternative financing sources (bonds). On the internal side, banks perception of high risks and a wide spread between credit and deposits rates also hampered the recovery of intermediation (Economic Report on Indonesia 2003, 121-126).

Table 3

Commercial Bank Performance Indicators
(in trillions of Rupiah unless otherwise stated)

Indicators	1999	2000	2001	2002	2003
Total Asset	1,006.7	1,030.5	1,099.7	1,112.2	1,142.2
Amount of Approved Credit	277.3	320.4	358.6	410.3	475.7
Loan to Deposit Ratio (%)	26.2	33.2	33	38.2	43.74
Non-Performing Loans (%)	32.8	18.8	12.1	8.1	8.1
Capital Adequacy Ratio (CAR)*	(8.1)	12.5	20.5	22.5	20.7
Earnings Before Tax	(75.4)	10.5	13.1	22	23.7

* The CAR of the sample banks are obtained from the Bank Indonesia Annual Report; therefore, its definition[18] and methodology follows that of Bank Indonesia.

B. Analyzing the EaR of the Banks Pre- and Post-Crises Periods

We also provide an analysis on the performance of our sample banks (individually and amongst groups) during pre and post crisis periods using the Mann-Whitney and Kruskall-Wallis tests (see *Table J to U in the Appendix*).

I. Pre vs. Post-Crisis Period

We find that the EaRs of our sample banks during the pre-crisis period are significantly smaller than those after the crisis. This may support our earlier argument that our banks have become more stringent in their loan giving, therefore obtained less earnings.

II. Comparison among Groups of Banks: Pre-Crisis Period

Utilizing the Kruskal-Wallis test, we find that with 95% confidence level, conditioned with the 1991-1996 economic condition, the EaRs of our group banks are significantly different from one another. More specifically, by utilizing the Mann-Whitney test to each bank group, we find that the state-owned banks had the smallest EaR prior to the crisis period. Their performance was followed by the joint venture, private, then foreign banks. This finding shows that although the average EaR of the state-owned banks exceeded 50% of their EATs during the pre-crisis period, they were still the least risky in our sample banks.

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[18] CAR = The obligation of banks to provide the minimum requirement for capital (in Indonesian = Kewajiban Penyediaan Modal Minimum, KPMM); which is calculated as the Total Equities to Total Assets.

III. Comparison among Groups of Banks: Post-Crisis Period

Similar to the result of the pre-crisis period, we also find that the EaRs of our sample banks are significantly different from one another. However, slightly different from the results of the pre-crisis period, we find that joint venture banks have the highest EaR amongst the four bank groups. More specifically, we find that state-owned banks have the smallest EaR, followed by the private, foreign and joint venture banks.

C. Comparing the EaR and CAR of the Banks Pre- and Post-Crises Periods

We are comparing the rank of our sample banks using their CAR, as reported in the Bank Indonesia Annual Statements, and their EaR, as we calculated (see **Table 4**).

Table 4

Comparing the Rank of the Banks based on their CAR and EaR Pre Crisis

Name of Banks	Type	Pre Crisis		Post Crisis	
		CAR Rank	CAR Rank	EaR Rank	EaR Rank
ABN Amro	**Foreign**	17	5	27	22
American Express	**Foreign**	29	10	20	15
ANZ Panin	**Joint Venture**	5	27	25	5
Bangkok Bank	**Foreign**	13	13	5	23
Bank of America	**Foreign**	14	12	20	10
Bank of Tokyo	**Foreign**	8	16	17	1
BCA	**Private**	23	2	8	6
BII	**Private**	18	15	24	24
BNI 46	**State-owned**	27	26	6	17
BRI	**State-owned**	26	28	10	11
BTN	**State-owned**	7	17	13	8
Chase Manhattan	**Foreign**	24	11	26	21
Citibank	**Foreign**	20	14	1	2
Danamon	**Private**	19	8	16	9
DBS Buana	**Joint Venture**	2	22	14	12
Deutsche Bank	**Foreign**	22	29	28	28
Finconesia	**Joint Venture**	9	23	2	26
HSBC	**Foreign**	16	21	7	18
Korea Exchange	**Joint Venture**	12	6	11	4
ING Indonesia	**Joint Venture**	3	25	9	16
Inter Pacific	**Joint Venture**	6	9	12	25
Lippo	**Private**	21	1	23	14

Muamalat	**Private**	1	18	19	13
Niaga	**Private**	25	20	22	20
NISP	**Private**	15	4	3	3
Panin	**Private**	11	3	15	27
Multicor	**Joint Venture**	4	7	21	29
Standard Chartered	**Foreign**	28	24	29	7
Sumitomo Niaga	**Joint Venture**	10	19	4	19
Correlation		**-0.0202**		**0.1752**	

We expect that EaR will aid CAR in providing a more accurate risk assessment of the Indonesian banks. Therefore, we expect that the correlation between the ranks of the banks based on their EaR (EaR Rank) for the pre and post crisis period will be high. Our finding indicates that the EaR ranks are relatively more consistent (the correlation of the rank pre and post crisis is 17.52%) than the CAR ranks (the correlation of the rank pre and post crisis is -2.02%). Moreover, we find it interesting that the CAR ranks were, on average, inversely correlated between those during pre and post crisis periods.

We would need to conduct further investigations to suggest solid explanations for this finding.

PRELIMINARY CONCLUSIONS

We find that the EaRs of the banking industry and all our sample banks (aside from Citibank, Finconesia, and NISP) during the period of 1991-1996 were very high, approximately more than 50 % of their EAT. This means, that based on the conditions of the Indonesian banking industry during that period, the amount of earnings that can be considered 'at-risk' for the average banks in Indonesia are more than 50 % of their EAT. In other words, the Indonesia banks' condition before crisis was very vulnerable. Our finding supports the potential explanations of the banking collapse after the Asian crises such as the existence of implicit guarantee from Bank Indonesia, its ineffective monitoring system, unreliable business law enforcement, moral hazard, poor bank management, and lack of information transparency.

The condition of average bank Industry during the period of 1999 – 2003, however, was much better, i.e. the EaR was approximately 3 %. Nevertheless, the intermediary activities of banks remained sub-optimal. This was reflected in large amounts of un-disbursed credits (25%) and low

LDR (43.74%) (see Economic Report on Indonesia, 2003). From the external side, the major cause was similar to the factors causing the credit slowdown, namely, the restructuring of the real sector and development of alternative financing sources (bonds). On the internal side, banks perception of high risks and a widen spread between credit and deposits rates hampered the recovery of intermediation. Thus, the important factor explaining the bank industry improvement was improving macroeconomic indicators, such as interest rates, inflation and the exchange rate, supported by policies in bank restructuring and sustained improvements in resilience of the banking system.

We have to conduct further investigations, however, to arrive at a solid conclusion or suggestion that EaR is indeed a valid method, which can be used in addition to the CAR, to assess the financial risk of financial institutions in Indonesia.

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