The Impact of Hedging in Reducing Loss of Exchange Rate

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Abstract: Today, not a single country could act as a sole provider towards its own needs for food, energy, finance, communication and information. It requires other countries which then creates interdependent relationships. What started as merely barter then gradually increased into a form of currency which function as one of a nation’s identities. However not every country can use its own currency when engaging in export import activities, only developed countries are capable of doing so, whereas developing countries are required to have huge amount of reserve and capital in order to minimize the risk. Financial risk will always exists but there three ways to control them, through insurance, asset or liability management, and hedging. This article aimed to know how far the depreciation of Rupiah could result in exchange loss. Second, is to identify the hedging impact in order to avoid or minimize exchange loss. The author choose 15 companies listed in Jakarta Stock Exchange which possess an asset over 5 trillion Rupiah. The Solving method narrowed them down into 9 companies. The data used in this article is secondary, originated from end of year financial report starting from 1997 until 2001. The methodology is descriptive and correlational research.

Keywords: hedging, exchange loss, foreign currency, liability, risk management, reserve

INTRODUCTION

In fulfilling basic needs of life such as food, clothing, housing, transportation and communications, information, fund etc no such nation in the world able to fulfill their own needs. Each state own excess and insufficiency in providing resources needed by their people. As effect of interdependence in fulfilling the needs, hence interaction within nation is taken place so long for centuries and remains up to date.

In line with the human civilization, interaction to fulfill the needs of live started by direct exchange of goods (barter), but later on since the interaction became complex where barter cannot fulfill the needs anymore then it expand inter-states commerce, which recognized by import transaction (conducive to / buying goods or services into the country) and export transaction (sending / selling goods or services out of the country).

As an exchange tools to get goods or services needed and to replace the delivered goods or services, currency begin to become popular which later as identity of each state. To execute the import/export transaction, only a few the states are capable to use their currency directly to get goods or services needed from other state. Those are states with global influence in trade & economic such as USA, Japan and Western Europe, as producer of Industrial goods and services that is needed by many states. But most of States cannot use their currency directly in executing transaction of import / export. Therefore to execute the transaction they have to use other state currency which internationally accepted. In general, State that not yet able is a Consumers State with under-developed or developing economics level. Among those developing countries is our country: Indonesia.

In order to get those strong currencies such as US Dollar, English Pound Sterling, Japan Yen and Euro, each state compete to conduct export activities by selling goods / services produced by them to others, directly to those states who own the strong currencies or else. Among those strong currencies above, US Dollar became the most acceptable currency in the world. Therefore US Dollar became the most wanted by every state to strengthen their foreign exchange reserve.

More and more foreign exchange obtained, hence the state will progressively own ability to provide goods / services required by their people who not yet can be produced or more efficient if imported from other countries. To gain foreign exchange needed, not only obtained from export activities but also obtained from financing activity, in the form of “loan”
or "equity" gathered through money market or capital market.

Further to strengthen foreign exchange reserve, each and every State also competing to invite the investor to invest his capital in many forms of business activities or recognized as Foreign Direct Investment (FDI). Through FDI, besides getting foreign exchange it also can create job opportunities which badly needs by the people. Reserve of foreign exchange besides needed to finance international commercial activities of a State; it is also utilized to stabilize the exchange rate of pertinent State to other foreign currency.

The increasing of international activities in commerce and financing, besides yielding foreign exchange needed also generate problem that is "exchange rate risk" of its currency in dealing with other currency, especially with stronger one and mostly used in international commerce. The risk arise due to international trade not always entangle one currency, but frequently entangle some currencies, at least two currencies. The strong one utilized in international trade of import/export activities and local currency for domestic transaction. The fluctuation of local exchange rate compared to other currency can generate profit or loss, in state level, company or individual level.

Depreciation of an exchange rate will generate loss for those who having liabilities or obligation in other (foreign) currency and will bring advantage to those who own monetary assets in foreign currency, vice versa. Company with high risk level of exchange rate is company with raw material come from import while product sale locally, in other word importing use foreign currency while selling in local currency. The same goes to exporter company will also face risk of exchange rate if his input mostly local content, especially in the event of appreciation of local currency.

The risk of exchange rate of a company get higher if to finance its operations using loan in foreign currency, especially the strong ones. This risk is not only threatening a company but also economic activities of the country. In most cases, loss generated by fluctuation of exchange rate generate bigger loss for a company, even caused bankruptcy, while to a State it can generate convulsion of economics causing the increasing of unemployment and degrade level of prosperity of the people. This condition is being faced by Indonesian in general and by most of local companies in Indonesia since the middle of the 1997. The impact of exchange rate risk is very awful for continuity of a company or even economic growth of a State. Many big companies are facing financial difficulties, even threatening of the bankruptcy. Hence to avoid or to minimize affect of exchange rate risk, exchange rate management existence needed, in macro state level and micro company level, especially for those companies with commercial activities and/or international financing entangling foreign currency.

As an illustration below table describing the growth of exchange rate (Rupiah to US Dollar pursuant to mid rate Bank of Indonesia) from mid of 1997 up to year-end 2001. (Table1)

Above table describe that Rupiah value by the end of year 2001 have depreciated 324% compared to its position at end of June 1997 that is before monetary crisis. As consequences, Income per capita of Indonesia in US Dollar decreasing 76.5% (assumption: other factor constant - ceteris paribus) thereby prosperity level also decreased. For company with liability obligation in US Dollar, have generated loss of 324%, which is every 1 (one) US Dollar generate loss equal to Rp 7,950, so that if a company with obligation one million US Dollar will be suffered of exchange rate loss equal to Rp 7,950 billion. It will be very difficult to cover the loss by profit from normal activities and surely when the obligation getting bigger.

Basically the main factor of change in exchange rate is caused of influence in supply and demand on the other currency. Other economic factors are inflation and interest rate. But the fluctuation of exchange rate often deteriorate by non economic factor such as speculation by market players especially due to political instability, security and Government policy which have negative impact to the market. Nowadays the globalization of world commerce, money market and capital market also have significant effect on the exchange rate of a state currency. Therefore, in order to stabilize the exchange rate, besides balancing supply and demand, and also tight control of economic and monetary activities, other factors like security and political influencing have to be overcome. But often such action not sufficient enough because of regional and global influencing, which is out of government control, frequently more dominant.

Big fluctuation of exchange rate in a very short period was hitting the company, not only generating loss nor existence of certainty in business so it was difficult to specify plan and take decision. Loss of exchange rate mainly caused by currency imbalance of assets-obligation and also between income-expenditure. This situation was faced by a lot of big companies in Indonesia, because of using a lot of loan in foreign currency to finance the business but produce
non export-oriented products/services but only for the domestic market. Considering the impact generated by loss in exchange rate due to big fluctuation (depreciation or appreciation) is very significant to the profit level, even could threatening the continuity of a company, hence every company has to conduct effort to protect themselves from such risk, especially after implementation of free floating exchange rate system since the middle of 1997.

Based on above identification hence the research problem can be formulated in these questions:

How big Rupiah depreciation impacted the exchange rate loss of a company with liability obligation in foreign currency?.

How big the hedging on such obligation could avoid or minimize the loss so that finance condition and profitable level of a company can be safely guarded?

What kind of hedging instruments can be optimally used to avoid such loss in Indonesia?

**METHODS**

**Definition of Exchange Rate.** According to Maurice D Levi in International Finance The Market and Financial Management of Multinational Business (1996, 103), Exchange Rate is “as the price of one country’s money in terms of another country’s money” and refer to Marshall, Bansal in Financial Engineering (1992: 204), Exchange Rate is “the number of units of one currency that can be purchased (exchanged) for one unit of another currency”. While according to Michael Melvin in International Money and Finance (1985:126), Exchange Rate is “the relative price of a special kind of financial assets - money”. Based on that definition, in principle Exchange Rate is a price of a currency compared to other currency.

**Influencing Factors of an Exchange Rate.** According to Maurice D Levi (1996 : 103-292) main factor that influencing an Exchange Rate is inflation level (purchasing power parity = PPP), interest rate parity (IRP), demand and supply of money especially that connected to the balance of payment (Balance of Payment approach and growth of GDP (the monetary approach). Each factor will be described further as follows:

**Inflation Level (Purchasing Power Parity= PPP).** According to Maurice D. Levi (1996: 239), PPP was familiarized by Gustav Cassell in 1920s. Basically PPP describe the correlation between exchange rate and price of products/services in each currency of different states. The principle was based on “one price theory” that the price of a product will be equal anywhere in the world. So when inflation or different price among state occurred, hence the exchange rate will be corrected by itself where if inflation rate in a country is higher than others hence its currency will be depreciated, vice versa.

**Interest Rate (Interest Rate Parity= IRP).** According to Maurice D. Levi (1996 : 264-268) the influence of interest rate on exchange rate arise from action to get better return due to the difference in loan interest rate and also investment from different currency and at the same time cover the risk of loss in exchange rate or referred as “covered interest arbitrage”. When interest rate of investment higher than other currency, hence exchange spot rate of the currency will become stronger because of increasing in its demand, vice versa. But this will be on hold because at the same time demand on forward, to avoid the risk of exchange rate loss by closing the rate back to its original rate on time due, will increase simultaneously. The difference in interest rate between those two currencies will be reflected by the difference spot exchange rate and forward exchange rate recognized as premium forward or discounted forward. When the difference of interest rate and the level of premium forward occurred, it will always return to line that covered interest of parity or equilibrium line, due to market pressure especially the existence of covered interest arbitrage.

**Demand and Supply of Money Based on the Balance of Payment Account Approach.** Maurice D. Levi (1996, 105-116) explained that like a price of ordinary products or services, the value of a currency compared to others basically determined by supply and demand of the currency, especially on free market mechanism. Any factor that increasing the demand of a currency, ceteris paribus (other factors assumed constant), the value of that currency will increase accordingly or appreciation occurred, vice versa. Supply and demand of a currency influenced by many factors, reflected by the balance of payment account of a state. Although the balance of payment is not made to analyze those factors, but by evaluating the elements in the balance of payment we can conclude the factors that influencing demand and supply of a currency. Those factors are export and import of goods/services, unilateral transfer, foreign and domestic assets.

**Exchange Rate Based on The Monetary Approach.** According to Maurice D. Levi (1996:154-157) other theory related to determine the exchange rate is based on monetary approach. This theory was based on correlation between price level and money supply, and between price level and exchange rate. Hence there are two main components:
Correlation between Price Level and Supply of Money. Based on this approach, demand of total money is in line with GNP. This occurred due to the real GNP will be equal to total products and services produced and consumed by the society. Increase in GNP means more products and services produced, so money needed to consume those products and services. In other words, it will increase the demand of its currency while pushing down prices and interest rate. On the contrary, when GNP decreasing, demand of currency will also decrease until the circulated money exceed the requirement, then it will increase prices and interest rate.

Correlation between Price Level and Exchange Rate. Price disparity in two different states will influence exchange rates among those (Purchasing Power Parity Principle). As elaborated above, price level highly influenced by the amount of circulated money, which closely related to Gross National Product (GNP). When GNP of a state higher than another state, it will automatically push its currency (appreciation) to be higher than other currency. This is because higher increasing of a state GNP will push down goods and services price and the interest rate to be lower than price and interest rate in another state. On the contrary, when GNP of a state decreasing or increasing but in lesser rate compared to other state GNP, hence the currency of such state will be depreciated, because of demand on local currency also decreased and circulated money will be exceeded people needs, in comparison with other state. This condition will push inflation, increase in price level and higher interest rate, in comparison with inflation and interest rate in the other country.

Financial Risk Management. Under uncertainty situation, all of business entity/companies vulnerable of financial risks. General risks faced by companies is risk of fluctuating exchange rate, interest rate prices, government policies (tax, import duties etc), labor strikes, fire, force majeur etc. According to Marshall, Bansal (1992:151), there are three different techniques to control financial risk: insurance, assets-liability management and hedging. Each of them will be further explained as follows:

Insurance. Company or individual often facing financial risks, among others a specific risk such as loosing, fire, damage, dead, accident etc which can only be covered by insurance. General Insurance covered, for a year, except life insurance which for longer term, such risks could be minimized even dismissal through insurance premium payment. The amount of this premium in general is smaller than the value of assets insured.

Assets / Liability Management. According to John F Marshall and Vipul K Bansal in Financial Engineering, assets / liability Management is: “an effort to minimize exposure to price risk by holding the appropriate combination of assets and liabilities so as to meet the firm’s objectives (such as achieving a stated earning target) and simultaneously minimize the firm risk. The key to this of risk management is holding the right combination of on balance sheet assets on balance sheet liabilities” (1992:155).

Based on above definition, the key of risk management in Assets/Liability Management pattern is to maintain the composition/combination of assets and liability in the company balance sheet precisely.

This kind of risk management mostly develops to manage interest rate risk. According to Marshall, Bansal (1992:156) there are two techniques: cash flow matching strategy or also called dedicated portfolio and portfolio immunization. Cash flow matching strategy is to synchronize time and amount between cash inflow of assets and cash outflow of liabilities. In practice, it is almost impossible to implement this strategy, or very costly when it could. While portfolio immunization is classification of assets to minimize the level of sensitivity due to difference between assets and liabilities. With portfolio immunization, assets and liabilities composition will be more immune against interest rate fluctuation. Besides to manage interest rate risk, this pattern could and often used to manage the risk of exchange rate, fluctuating of price of commodities and stock price risk, by synchronizing the amount and value of money in assets with the amount and value of money in liabilities.

Hedging. The definition and benefit of Hedging. According to John F Marshall & Vipul K Bansal in Financial Engineering, Complete Guide to Financial Innovation, the term of hedging is define as follows:

“a position that is taken as a temporary substitute for a later position in another assets (liability) or to protect the value of an existing position in an assets (liability) until the position can be liquidated” (1992:165). In (1992:544) hedging also describe as “the art of managing price risk by taking offsetting position in derivative instruments”.

Refer to Pocket Finance, The Economist Books, hedge is “something that reduces the risk of loss from future price movement” (1994:109). While Jake Bernstein in How the Futures Markets Work, hedging is “using the futures market to protect against adverse price movements” (2000;125). Further Bernstein (2000;125), describe that “hedg-
Hedging involves taking a position in the futures market that is opposite to the position held in the cash or spot market.

From above definition, basically hedging is to minimize risk or loss of assets/liabilities which might occur in the future as a result of fluctuation or unfavorable price changed and unpredictable or price risk. According to Marshall, Bansal (1992:176), price risk is the potential for future price to deviate from its expected value, while refer to Bernstein (2000:27) price risk occurs as a result of time intervention in a transaction. During that intervening time lag, the price of the commodity is vulnerable change.

Among financial risks which often faced by companies, hedging is related to risks that uncovered by insurance, such as changing in exchange rate, interest rate and price of goods that traded in future market, which generally a systematic risk.

Distinguish with assets/liabilities management pattern, most of hedging is conduct off balance sheet instruments. Hedging instruments often been used are future, forward, option and swap. Each and every instrument will be described separately.

Jack Clark Francis in Investment Analysis and Management (1991:765), stated that there are three basic kind of hedging: Perfect Hedge: hedge applied by combining buying position (long) and selling position (short) once in the same assets. Any price fluctuation will not influence market value in perfect hedge condition, but in practice it is rarely chosen; Buying Hedge: hedge applied by buying future to cover from possibility of price increase; Selling Hedge: hedge applied by selling future to cover from price decrease.

In choosing hedging instruments option, John F Marshall and Vipul K Bansal (1992 : 515) there are some factors to be considered:

The Size of a Hedge. According to Marshall, Bansal (1992:176) Risk Profile is a graphic depiction of relationship between the change in a firm’s value (which we will henceforth call profit) and the changing price that give rise to this profit.

So risk profile is a graphic that draws the relationship between profit/loss which experienced by a company due to changing price that reflecting the said profit/loss. Risk profile of an exchange value means the relationship between profit / loss due to changing of exchange rate. Risk Profile will determine how many hedging instruments unit needed to hedge or hedge ratio. According to Marshall, Bansal (1992:172) hedge ratio is the number of units of the hedging instruments necessary to fully hedge one unit of the cash position.

Further an optimal hedge ratio will distinguish on each hedging instruments. For instance, to cover risk on a liabilities position in foreign currency need two (2) unit of a certain hedging instruments so the hedge ratio is 2 : 1. But if using other hedging instruments one unit is enough, so the hedge ratio is 1 : 1.

The Cost of Hedging. Basically the cost of hedging relatively cheap but not free. According to Marshall, Bansal (1992:173) there are two reasons why it is not free. First, the risk that covered by hedging agent have to be bearied by a counterpart in hedging contract. If the counterpart also wants to hedge to protect risk in reverse, hence both parties will enjoy the benefit of the hedging. Frequently the counterpart is a speculator who looking for benefit of his speculation. So if there is a cost encumbering speculator, they will bear it to the hedging agent. Second, there will always be a burden in every transaction called commission fee or the value difference between supply / demand or both, the same goes for hedging.

Not every hedging transaction will have the same cost, due to market inefficiency. Most of all a hedging cheaper than the other and cost today will different with tomorrow. So the hedging agent must compare cost alternatives among hedging strategy before decided to sign a hedging contract. According to Marshall, Bansal (1992 : 175) hedging cost is simply the difference between estimated profit with and without hedging.

The Effectiveness of a Hedge. According to Marshall Bansal (1992:173) level of effectiveness of hedging instruments often measured by “coefficient of determination”, squared value of correlation coefficient. Further Marshall, Bansal (1992:173) explained that menjelaskan bahwa Coefficient of determination is an exact measure of the percentage of the original risk that is removed by the hedge.

From above definition, higher coefficient of determination more effective the hedging instruments due to more price risk could be covered. But there is no hedging instruments could eliminate price risk entirely, there will always be uncovered risk called basic risk. Francis (1991:766), stated four kind of basic risk namely: Quantity Risk: unit measurement used in future contract which not fully fit with the amount of hedging commodities because of standardize future contract, not tailor-made, so some amount not covered by hedging to be risk. Quality risk: risk because of the quality of commodities stated in the future contract not fit with needs or not even wanted, so add extra cost for future buyer due to incompat-
This case a company is obliged to fulfill the sales contract available by coincidence only provide commodity residing in place which is not as required, so an additional transportation charge needed; Expiration date risk: risk where future contract only offer delivery of commodities which not in a proper time so an additional storage cost needed.

**Type of Exchange Risk.** Michel Melvin in International Money and Finance (1985:46), explained that there is three type of exchange risk, as follows:

- Translation Exposure. This exposure also known as accounting exposure that is sensitivity on changing of exchange rate in bookkeeping / financial statement caused by the difference between amount of assets and obligation in denomination foreign currency.
- Transaction Exposure. This exposure rose due to uncertainty of local exchange rate in order to close the transaction in the future.
- Economic Exposure. This exposure related to company value due to changing in exchange rate. When a company was measured by its present value from future cash flow after tax, so economic exposure related to the sensitivity of real value of long term cash flow against changing on exchange rate, in local currency. It is important for a company to focus on long term cash flow ability because it will determine the real value of a company. That is the reason why economic exposure is the most important to a company.

Obligation in foreign currency (FOREX). According to International Accounting Standards 1999 (1999:57) obligation is “a duty or responsibility to act or perform in a certain way”.

According to Financial Accounting Standard (SAK), Obligation in foreign currency is obligation in different currency with currency used in formal bookkeeping of the company. (2002: PSAK-10.2). Although a company by legal is located in Indonesia but if its bookkeeping is in foreign currency (i.e. in US Dollar), hence its obligation in other currency besides US Dollar (including Rupiah) is categorized obligation in foreign currency. It is obvious that when it’s bookkeeping in Rupiah, all other obligation besides in Rupiah categorized as obligation in foreign currency. For the sake of this thesis, obligation of foreign currency is all obligations besides Rupiah currency; therefore the bookkeeping is conducted in Rupiah currency.

**Hypothesis.** To conduct this research of pursuant to evaluation of book and above framework of opinion and in order to obtain an answer to problems of research, we hence formulated the following hypothesis:

**First Hypothesis:**

H1 : (b1 + b2 + 0) the impact of Rupiah depreciation due to exchange rate to the loss currency company with obligation in foreign currency is significant.

**Second Hypothesis:**

H2 : (b1 ≠ b2 ≠ 0) the impact of hedging on obligation in foreign currency to avoid or to minimize the loss of currency due to Rupiah depreciation is significant.

**Design / Research Method.** In accordance to the title proposed for this thesis, the analysis unit is the exchange rate of Rupiah compared to US Dollar and other currencies, the amount of obligation in foreign currency, hedging instruments and exchange rate loss.

This research is a descriptive and co relational research. Said to be descriptive because the objective in this research is to identify problems and to look for actual and detail information to elaborate the raising issues of the impact of Rupiah depreciation on company with obligation in foreign currencies. Besides it tries to collect information on hedging instruments which can be used to avoid or lessen loss of exchange rate effect due to Rupiah depreciation.

It is also said to be a co relational research be-
cause the objective to detect how a variable factor could influence another or more variables based on correlation coefficient. In this case we will elaborate the correlation between Rupiah depreciation and the loss of exchange rate and also the correlation between hedging of obligation in foreign currency and reducing of exchange rate loss.

**Variable and Its measurement.** In line with the research objective to know the impact of Rupiah depreciation and the amount of obligation in foreign currency on the loss of exchange rate and impact of hedging in reducing of exchange rate loss, we conduct testing on dependent and independent variables.

To know the impact of Rupiah depreciation and the amount of obligation in foreign currency on the loss of exchange rate such independent variable is the sum up of total value of depreciation of Rupiah during one book year to US Dollar (other foreign currency are equivalent to US Dollar) and sum up of obligation in foreign currency equivalent to US Dollar by the end of book year, while dependent variable is amount of loss of exchange rate during one year period.

Further to elaborate the impact of hedging in reducing of exchange rate loss, the independent variable are hedging unit which premium/forward discount Rupiah per US Dollar and sum up of obligation in foreign currency equivalent to US Dollar by the end of book year, while dependent variable is reducing of exchange rate loss to obligation in foreign currency exist at year-end. Variables, indicator and measurement as seen on table below: (Table 2)

**Definition of Operational Variable.** Definition of operational variable is a concept changed to a form that can be measured empirical. Definition that used in this research are:

- **Depreciation of Rupiah Exchange Rate on US Dollar.** Is the amount of Rupiah depreciated on US Dollar in a calendar year, i.e at the beginning US$ 1 = Rp 2,363 at the end of 1996 changed to US$ 1 = Rp 5,700 at the end of 1997, so Rupiah was depreciated during 1997 equal to Rp 3,337 per 1 US $ Dollar.

- **Discount (Premium) Forward.** Is the difference of exchange rate (ask) forward for 12 months with exchange rate (ask) spot at the due date of delivery forward. For example contract of forward bounded date of 31 December 1996 for duration of 12 months with premium of Rp 170 per US Dollar and spot rate at that date is Rp. 2,363, hence the exchange rate sell forward is Rp 2,533 (Rp170+Rp 2,363) per US Dollar for delivery on 31 December 1997. If at 31 December 1997 exchange spot rate is Rp 5,700, there is a discount of forward equal to Rp 3,167 (Rp 5,700-Rp 2,533) per US Dollar.

- **Exchange Rate Loss.** Is the loss in exchange rate in a book year beared to a company profit/loss calculation, for example company own obligation of foreign currency for the price of US$ 10 million, hence from above example loss of exchange rate due to obligation of foreign currency US $ 10 million is Rp 33.37 billion (US$ 10 million X Rp 3,337).

- **Reduction of Exchange Rate Loss by Hedging Forward.** Is reducing of loss due to company signed a forward contract to hedging its obligation position in foreign currency by the year end. For the sake of research, only 20% of this obligation are covered by forward contract considering obligation of the foreign currency is too many and duration is long enough and will due in phases. For example if by the end of year 1997 company still own total obligation of foreign currency equal to US$ 100 million, from that amount 20% covered by forward contract bound at date of 31 December 1996 or US$ 20 million, so the company will lessen loss of rate equal to Rp 63.34 billion ($ 20 Million X Rp 3,167), because on the date of forward delivery 31 December 1997 a discount occurred equal to Rp 3,167 per US$ that is exchange spot rate higher than forward rate.

- **Obligation of Foreign Currency.** Is the total obligation of Foreign Currency at the end of book year. Obligation besides US Dollar is equivalent on US Dollar with Bank Indonesia Middle Exchange Rate at the end of pertinent year.

- **Sampling Procedure.** Sampling in this research was conduct by determining the population which are big manufacturing companies listed in BEJ (Jakarta Stock Exchange) and own assets more than Rp. 5 trillion at the end of year 2001 comprises of 15 companies. Further based on Slovin Method with 20% level of error from the population as many as 9 companies are taken directly (unrestricted) as samples: PT. Astra International Tbk, PT. Indofood Sukses Makmur Tbk, PT. Indocement Tunggal Perkasa Tbk, PT. Barito Pacific Timber Tbk, PT. Gudang Garam Tbk, PT. Semen Cibinong Tbk, PT. United Tractor Tbk, PT. Polysindo Eka Perkasa Tbk and PT. Hanjaya Mandala Sampoerna Tbk. Data taken for represent samples are secondary data of Year-End Financial Statement each which have been made an audit of to 5 year of book that is for year of book 1997 up to year of book 2001.

**RESULTS AND DISCUSSION**

Rupiah Depreciation causing Loss of Exchange Rate to Companies with Liabilities Obligation in Foreign Currency (Forex). There are
some factors forced a company to own obligation in foreign currency. First to get cheaper financing source, because generally loan in foreign currency such as US Dollar, Yen or Singapore Dollar impose much lower rate of interest compared to a Rupiah. For example rate of interest in October 2002, for US Dollar using LIBOR (London Inter Bank Offer Rate) 3 month (1.7775% per year) if we added spread between 2.5% up to 4.5% the commercial interest rate of loan in US Dollar is about 4.2775% up to 6.2775% per year. While rate of interest rate in Rupiah is 14% per year according to JIBOR (Jakarta Inter Bank Offer Rate) 3 months, if added by spread of 2.5% up to 4.5%, the commercial loan in Rupiah will be about 16.5% - 18.5% (In fact, the loan interest rate were higher between 18% up to 20% per year). From above example, the loan interest rate different between US Dollar and Rupiah was significant, equal to 12,2225 % per year.

Second reason is the company has to import assets, raw materials or substance which has to be done by using foreign currency, because mostly of all industrial processing activities, still depend on importation. These import activities generate obligation to foreign supplier as accounts payable and also to banking party in the form of working capital loan or L/C facilities.

Loan in foreign currency not monopolize by private sector but also conducted by governmental sector generally to finance development budget because of scarcity of local fund and most development needs come from importation.

**Fluctuation of Rupiah Exchange Rate during 1997 - 2001.** Fluctuation (depreciation and appreciation) of Rupiah on US Dollar are very fluctuate during 1997 up to 2001. especially after control was entirely given on market mechanism (freely floating exchange rate) by abstracting of intervention of Bank Indonesia on 14 August 1997. Rupiah exchange rate moved freely depend on reaction and market perception on various information, economical and non-economical, considered will affected value of Rupiah.

Depreciation of a currency can be happen to infinite point, but appreciation maximum of 100%. By free floating exchange system, the possibility fluctuations of Rupiah currency of Rupiah can be happened extremely depend on it influencing factors, especially level of political economy efficiency.

Ultimate point of Rupiah depreciation occurred in year 1998 follow the collapse of new order regime marked by Soeharto step down as President and succeeded by Vice President BJ Habibie. Exchange rate of a state reflects the condition of political and economy efficiency. A Progressively stabilize exchange rate with strong tendency showed that political economy efficiency and condition better of. But on the contrary when exchange rate very fluctuate and incisively depreciated showed that political economy efficiency and condition deteriorate.

Fluctuate exchange rate faced by Indonesia reflects a very bad management of condition and efficiency among other the existence sum up of foreign debt which is so big more or less US$ 107.8 billion (year-end position 1995) both conducted by private sector and Governmental (Kwik Kian Gie, 1998 : 406) with inefficient and non optimal utilization and brittle banking systems have encumbered APBN more or less Rp 600 trillion on recovery.

Growth Exchange Rate of Rupiah to US Dollar during 1997 up to 2001 reflected on the following tables: (Table 3)

**The Impact of Rupiah Exchange Rate Depreciation to Indonesian Companies.** As result of Rupiah depreciation causing serious financial problems to most companies even up to bankruptcy, especially those who have big obligation in foreign currency. One of the impacts is loss in exchange rate that cause big loss to a company and failed to pay because the Rupiah amount needed to payback is incisively increased.

To avoid bankruptcy, almost all companies ask for debt restructuring, directly to their creditors or facilitated by Prakarsa Jakarta.

Almost all big and famous companies in Indonesia such as PT. Astra International, PT. Indofood Sukses Makmur, PT. Indocement, PT. Semen Cibinong, PT. Barito Pacific Timber Tbk, PT.Polysindo Eka Perkasa Tbk etc experiencing a big loss due to having an obligation in foreign currency, while most of its income in Rupiah. On the contrary for companies with export oriented and having assets in foreign currency was fortunate by Rupiah depreciation. The profile of companies as samples in Monetary Crisis period provided below: (Table 4-12)

**The Impact of Hedging on Obligation in Foreign Currency because of : Rupiah Depreciation and Loss of Exchange Rate.** Big loss experienced by most of big companies in Indonesia due to great Rupiah depreciation especially because no hedging was conducted on obligation in foreign currency, through hedging instruments or in nature by having income or assets similar with its obligation. Besides slow down in business due to continuous economic crisis.

On the contrary an export oriented company or income in foreign exchange (Forex), existence Rupiah depreciation oppositely brought big advantage
because earnings in strong world currency, generally US Dollar, so when converted into Rupiah will obtain big amount. Though the company also have obligation in foreign currency, but it is naturally protected by its earnings in foreign currency obtained from export activities. Therefore the company suffering big loss due to Rupiah depreciation generally having income and monetary assets mostly in Rupiah, but having big obligation in foreign currency without protection (hedging).

We describe about hedging instruments used, cost of hedging and its impact in reducing loss of exchange rate as follows:

**Hedging Instruments used.** Compared to developed countries as USA, Japan and Western Europe, hedging instruments available in Indonesia is very limited. Not like in developed countries which already have Future Market for future or option trading that is very liquid and advance, but in Indonesia financial future trading are not widely traded yet. Hedging instrument available just forward, but not traded inside the market but over the counter, generally through banks or other financial institution. Based on data obtain from Reuters which internationally received as reference, forward exchange rate compared to spot exchange rate (both using exchange rate selling-ask) in the following table 13.

As described on above table forward exchange rate is of spot exchange rate selling and premium forward selling on the date contract forward, in this case premium forward for delivery in next 12 months. For example in date contract forward 31 December 1996, delivery date is 31 December 1997. With premium forward equal to Rp 170 / US$ or 7.2%, so on the date of delivery forward buyer (hedging agent) oblige to pay Rupiah as per above table is Rp 2,533 per one US Dollar ( Rp 2,363 + Rp 170) and forward seller oblige to provide US Dollar to be sold to buyer with rate of Rp 2,533 per US Dollar.

With this contract, no matter how much spot exchange rate will be on the date of delivery (31 December 1997), forward buyer will get US Dollar with fixed rate Rp 2,533 per US Dollar. So forward buyer will get a certain rate and avoid the impact of fluctuate exchange rate. Further is forward buyer will get premium or discount on the delivery date, showed on below table 14.

As shown on above table, forward premium occurred when forward exchange rate is higher than spot exchange rate on the date of delivery, while forward discount is the opposite. For forward buyer, when at date of delivery forward discount occurred it will give profit because the needs of US Dollar obtained in lower rate in the forward market compared to the rate in the spot market. Forward premium is inversed.

On the date of forward delivery 31 December 1997, forward exchange rate sell at Rp 2,533 per US Dollar which lower than spot exchange rate spot Rp 5,700, so it gave a discount of Rp 3,167 per US Dollar. It means forward buyer gain profit of exchange rate equal to the said discount compared to if have to buy in spot market. On the contrary at date of delivery 31 December 1999, exchange rate forward selling at Rp 10,200 which way higher compared to spot exchange rate selling at Rp 7,000, so premium forward occurred equal to Rp 3,200. It means forward buyer suffered a loss of exchange rate equal to the said premium compared to if bought spot market.

The weakness of forward hedging that it is obliged to exercise, whether it gives profit or not to the buyer (hedging agent). To cover this weakness, an option could be an alternative where forward contract only executed when there is a discount for buyer, but not necessary when forward premium occurred. As consequence, buyer will lose the premium payment, because to a buyer, execution of the contract is not obligation but rights.

But forward market with option not like forward market without option, which more liquid and as big as spot market, so to get contract forward with option more difficult than to get contract forward without option. For the sake of analysis, hedging instruments used in this research is forward without option as buying hedging (bought US$ with Rupiah) and with outright forward transaction not a swap forward transaction. Other consideration why choosing hedging without option is: First, Forward is hedging instruments traded over the counter in a wider market, its availability, easy to get especially from banks, and more flexible conditions where easily adjusted to the needs, in total or time period (tailor-made). Second, Future only traded in the future market (Bursa Berjangka Jakarta) which in Indonesia not been traded yet, besides time period future and contract condition have been standardize by the authority, so not fit the needs. Third, like contract future, contract with option have not been traded in Indonesia (Bursa Berjangka Jakarta) yet, if any, contract with option must be traded over the counter which is very rare.

**Cost of Hedging.** Basically hedging instruments in forward form, there is no special cost have to be paid by buyer, except spread between buying price (bid) and selling price (ask) and the risk of difference between forward (exchange) rate and spot (exchange) rate at the date of delivery, if not appears as
expected. Forward Premium as timely updated by Reuter is a reference to determine forward rate, not a cost to be paid at forward contract. For forward buyer that wants to protect their Forex obligation, risk will rise only when forward exchange rate has been tied higher than spot exchange rate, so they lose the opportunity to get lower exchange rate. On the contrary, for forward seller that wants to protect their Forex assets, risk occurred when forward exchange rate has been tied lower than spot exchange rate, so they lose the opportunity to get higher exchange rate.

As shown on table No 14, cost of hedging occurred for delivery at 31 December 1999 and 2001, where forward rate higher than spot exchange rate which were Rp 3,200 /US$ and Rp 205 / US$ respectively. In this case, they lose the opportunity to get lower spot rate due to forward contract. But in forward contract with option, dealing with situation such as on date delivery 31 December 1999 was not necessary because it will be to buy US$ from spot market than from forward market. But for the situation such as on 31 December 2001, although forward exchange rate higher than spot exchange rate, better stay on the forward contract because forward premium still lower than premium paid at the contract forward signed on 31 December 2000 (assumed that premium option equal to forward premium or equal to Rp 930 or 9.5% of spot exchange rate) while forward premium on the date of delivery (31 December 2001) was only Rp 205 /US$.

Other thing to consider when choosing loan between US$ or Rupiah is to compare cost of loan in Forex (incl. cost of hedging) with cost of loan in Rupiah. For instance, cost of loan in US $ is LIBOR rate (October 2002 1.7775 %) + spread 4.5% = 6.2775% and cost of hedging 9.5% (forward 12 months for delivery at 31 December 2001 with assumption premium forward equal to cost of hedging), so the total cost of loan in US Dollar is 15.7775 % per year. If the cost of loan in Rupiah equal to 18% per year, it is better to get loan in US$ with hedging because will save 2.2225% per year (18% - 15.7775%).

Effectivity of Forward Hedging in reducing Loss of Exchange rate. From obligation position in Forex of 9 companies sample it was assumed that only 20 % of forex obligation balance at the end of year was hedged, considering that middle up to long term loan period (between 3 up to 7 years), so it is not real and will influence the cash flow if 100% hedged. Also because by using forward hedging instruments, on the date of delivery it is oblige to exercise, means have to provide fund in Rupiah to close the forward contract which in a huge amount besides at the time the needs of Forex not equal to the total yet, because obligation in Forex payment could be conducted by installment during a certain period of time. Further it is need to minimize the risk of more loss if forward rate is higher than spot rate at the date of delivery. So with forward rate as shown on table no 13 and 14, by using forward hedging instruments without option, loss of exchange rate for each company during time period 1997 up to 2001 could be reduced as of Table No 15.

Above table showed that loss of exchange rate with forward hedging equal to 20% of Forex obligation position at each end of year have been reduced between 17% up to 36.5%. Though total Forex obligation for each hedging company is 20%, but the impact of reduction not similar, this might be caused by: First, for company with reducing loss of exchange rate more than 20% (hedging impact more than 100%) caused by loan redemption at on-going year at higher rate of Rupiah compared to rate at the end of pertinent year and the company have monetary assets in Forex (cash and receivables) which have opposite impact on Rupiah depreciation. Second, for company with reducing exchange rate less than 20% (hedging impact less than 100%), caused by loan redemption at on-going year at lower rate of Rupiah compared to rate at the end of pertinent year and the company did not have just a few monetary assets in Forex. Hedging level of effectivity calculated with statistic analysis named "coefficient of determination" with result 0.601.

By considering background, problem and objectives of research, and framework, this research was conducted to gather data and information for analysis and discussion about the solution of problem. The problem to analyze and discuss is about "the influence of depreciation of Rupiah to loss of exchange rate at company with Forex obligation" and "The impact of Hedging on Forex Obligation in reducing Loss of Exchange Rate due to Rupiah Depreciation". The problem arose because the amount of loss of exchange rate as effect of Rupiah depreciation is incisively and faced by a lot of companies in Indonesia, that threatening the continuity of company business and how far the influence of hedging on Forex obligation could avoid or lessen the loss. For the sake of this research hedging instruments used is "forward without option", with consideration forward market is relatively bigger and liquid compared other instruments and traded over the counter and the contract more flexible can be adjusted to the needs of both parties. Beside futures market in Indonesia still
underdeveloped, especially for financial products such as hedging.

Based on analysis statistic by using SPSS 11 (Statistical Product for Services Solution), result as shown on table No 16.

The Impact of Rupiah Depreciation and Forex Obligation on Loss of Exchange rate. From statistic calculation as shown on Table No 16 it is explained that the impact of Rupiah depreciation and Forex obligation on Loss of exchange rate as follows:

\[ R = \text{Coefficient of correlation} = 0.644. \]

It showed close relationship between independent variable, which is Rupiah depreciation and Forex obligation in US, to dependent variable loss of exchange rate in moderate position (close enough). This close relation only in moderate position, because Rupiah depreciation used as independent variable is depreciation during one year, while loss of exchange rate charged on company profit/loss is accumulated loss of exchange rate during one year, where some include the effect of Rupiah depreciation occurred at certain months, which might be higher or lower than during a pertinent year depreciation and coincidence at the same time with the redemption of Forex obligation. There is also another independent variable which not input into the model of this research, among other the accountancy treatment to loss of exchange rate which not charged on the on-going year and Forex assets that have inverse impact to Rupiah depreciation compared to Forex obligation.

\[ RI = \text{Coefficient of determination} = 0.415. \]

This result showed that variation of dependent variable (loss of exchange rate) that could be explained by variation of independent variables (Rupiah depreciation and Forex obligation) is equal to 41.5% and the balance of 58.5% influenced by other independent variables which is not include in this model. As explained above, that Rupiah depreciation used in this model is Rupiah depreciation during one year, while loss of exchange rate charged on company profit/loss is accumulated loss of exchange rate during one year, where some include the effect of Rupiah depreciation occurred at certain months, which might be higher or lower than during a pertinent year depreciation and coincidence at the same time with the redemption of Forex obligation. There are also other variables which not input into the model, such as the accountancy treatment to loss of exchange rate which can be capitalized into assets which not charged on company profit/loss on the on-going year. Forex assets could reduce the loss because it has inverse impact to Rupiah depreciation compared to Forex obligation.

Simultaneous Test F ( ANOVA). Based on calculation of F test (ANOVA) statistic value of F is 14.873 with error significant level of total regression is 0.000. With level of significant equal to 0.05 and degree of freedom at (2, 42, a), F table value is 3.23. So it is concluded that we reject Ho and accept Ha because F value 14.873 > F table 3.23 and error level of significant of total regression 0.000 < 0.05, which mean there is a simultaneous significant impact of independent variables (depreciation of Rupiah and Forex obligation) on dependent variable (loss of exchange rate).

Individual test t. Based on calculation result of individual test, value statistic of t for independent variable (depreciation Rupiah) is 4.829 while for Forex obligation is -2.165. With level of significance 0.05 and df (n-k-42), t-table value is 1.684. Hence concluded that for independent variable (depreciation Rupiah) Ho rejected and Ha accepted, because t-stat 4.829 > t-table 1.684 and significance of error from slope is 0.000 < 0.05, so Rupiah depreciation has significant impact on loss of exchange rate. While for independent variable (Forex obligation) concluded Ho accepted and Ha rejected, because t-stat -2.165 < t-table 1.684 although significance of error from slope 0.036 < 0.05, means that Forex obligation as individual has no impact on loss of exchange rate and loss of exchange rate happened only due to Rupiah depreciation occurred.

Impact of Forward Hedging (Premium/Discount) and Forex obligation In reducing Loss of Exchange rate. Result of statistic calculation as shown on Table No 16 could explain the impact of premium J discount forward as follows:

\[ R = \text{Coefficient of correlation} = 0.775. \]

This showed the relation level between independent variables (premium/discount forward and Forex obligation) on dependent variable (reducing loss of exchange rate) is significant enough. As shown on table No 16, during year 1997 up to 2001, if forward hedging applied could give a significant discount that could reduce the loss of exchange rate significantly.

\[ RI = \text{Coefficient of determination} = 0.601. \]

It showed that variation of dependent variable (reducing loss of exchange rate) that could be explained by variation of independent variables (discount premium forward and Forex obligation) is 60.1% and remaining balance of 39.9% impacted by other independent variables which not include into the model.

Other variables which need further research is other instruments of hedging to cover the weakness of forward hedging when spot exchange rate occurred at the forward delivery is not in line with buyers expectation as occurred on 31 December 1999
and 2001. Other instruments such as forward with option and hedging forward which close related to the due date of forex obligation. As previously explained that forward discount (premium) used as independent variable in this research model is for 12 months period and forex obligation used is forex obligation at the end of book year.

Simultaneous Test F (ANOVA). Based on calculation of F test (ANOVA) statistic value of F is 31.627 with error significant level of total regression is 0.000. With level of significance equal to 0.05 and degree of freedom at (2, 42, a ). F table value is 3.23. So it is concluded that we reject Ho and accept Ha because F value 31.627 > F table 3.23 and error level of significant of total regression 0.000 < 0.05, which mean there is a simultaneous significant impact of independent variables (hedging forward and forex obligation) on dependent variable (loss of exchange rate).

Individual test t. Based on calculation result of individual test, value statistic of t for independent variables (premium/discount forward or forward hedging and Rupiah depreciation) is 7.900 while for forex obligation is -1.010. With level of significance 0.05 and df ( n-k= 42), t-table value is 1.684. Hence concluded that for independent variables (premium/discount forward or forward hedging and Rupiah depreciation) Ho rejected and Ha accepted, because t-stat 7.900 > t-table 1.684 and significance of error from slope is 0.000 < 0.05, so premium/discount forward or forward hedging has significant impact on loss of exchange rate. While for independent variable (forex obligation) concluded Ho accepted and Ha rejected, because t-stat -1.010 < t-table 1.684 although significance of error from slope 0.318 > 0.05, means that forex obligation as individual has no impact on loss of exchange rate and loss of exchange rate happened only when hedging conducted.

CONCLUSION

Based on research and statistical test conducted, it is concluded that: (1). Incisively Depreciation of Rupiah has a significant impact on loss of exchange rate suffered by most of companies with forex obligation. (2). Hedging with Forward instruments implemented during year 1997 up to 2001 period could minimize the loss of exchange rate significantly. Though this forward hedging has weakness but it is the most liquid instruments, has a bigger market and more flexible because contract forward can be adjusted with the needs in amount and time (3). To cover the weakness, could overcome through forward with option, though relatively more difficult because of very limited market.

Managerial Implication. When loan or financing in forex is unavoidable, in order to avoid or at least to minimize loss of exchange rate due to fluctuation of exchange rate and to give certainty in planning and doing business, it is strongly suggested to conduct hedging on forex obligation.

Forward is one of hedging instruments that could be considered, because it has a bigger market, more liquid and more flexible in implication, but has to conduct carefully by monitoring Forex market condition from time to time.

There are certain things to be considered in using forward hedging, among others: (1). Forward is better with option condition (forward contract is buyer’s rights not obligation) which only conducted if at the date of contract delivery, forward rate is lower than spot rate (forward discount occurred), as on year 1997, 1998 and year 2000; (2). Cost of hedging (premium option forward) higher than forward premium (at the date of delivery forward rate higher than spot rate), as on year 2001 with assumption premium option equal to forward premium; (3). Duration and total amount of forward are synchronized to duration and total amount of forex that is on oblige. Because the realization of loss/profit in exchange rate transaction happened when real cash transaction occurred, while loss of exchange rate calculated in P/L statement, including profit/loss in exchange rate, not capitalized yet because cash transaction is not yet occurred, but arise because of formulation of value convert for the sake of presentation of Financial Statement.

For company with most of income in Rupiah, using loan or financing in Forex must be conducted very limited and selectively. Only for unavoidable things and has to be the best alternative there is, because of lower cost (including cost of hedging) and needed badly to pay the obligation in Forex. For instance, interest rate in US Dollar is 6.5% per year and cost of hedging is 9.5% / year, so total hedge loan cost in US$ is 16% per year. If the interest rate of loan in Rupiah is 18% per year, it still feasible to get loan in US$ which will save cost of interest 2% per year and already include cost of hedging (secured from loss of exchange rate risk).

For companies with most income in Forex and has monetary assets in Forex (export oriented companies), hedging instruments needed to protect obligation in Rupiah when Rupiah appreciation occurred. This is an inverse condition of companies with most income in Rupiah but have obligation in Forex. For those who has assets in Forex with total amount and type of Forex similar with total amount and type of
its obligation, no need to use hedging instruments to cover the forex obligation, because assets and obligation position has naturally cover (hedge) each other.

Monetary stability / macro economics and other factor that influencing Rupiah exchange rate has to be well maintained in order to give a conducive situation for business and businessman. Government policies need are encouraging export, encouraging the use of domestic products and tight money policy to monitor all loan in forex, both by private and government sector, in efforts to guard the state reserve of forex at secure level which will badly needed to stabilize the monetary especially the value of Rupiah exchange rate.

The government have to keep on trying and encouraging the development of futures market, especially for financial products, because current market (Bursa Berjangka Jakarta) only conduct future commodities trading. By doing that, it will add various availability of hedging instruments and to ease in choosing alternative in accordance with buyer needs.

With all limitation in this research, it is expected further researcher could add another factors that influence loss of exchange rate, among others monetary assets of forex, monthly or quarterly Rupiah Depreciation, forex obligation position (monthly or quarterly) and accounting treatment on loss of Forex.

It is required to conduct further research with dissimilar method beside hedging to control the financial risk due to fluctuation value of exchange rate, among others "assets / liability management" method, and how for it could be applicable to companies in Indonesia.

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### Table 5. Profile of PT. Indofood Sukses Makmur Tbk

| Date       | Total Assets (Billion Rp) | Total Sales (Rp Billion) | L (R) Net (Billion Rp) | L (R) Net (Billion Rp) | Forex obligation (eqv US$ Million) |
|------------|---------------------------|--------------------------|------------------------|------------------------|-----------------------------------|
| 31-12-1997 | 7,889                     | 4,989                    | (1,198)                | (353)                  | 819                               |
| 31-12-1998 | 10,683                    | 8,834                    | 458                    | (1,176)                | 738                               |
| 31-12-1999 | 10,638                    | 11,549                   | 1,395                  | 209                    | 736                               |
| 31-12-2000 | 12,555                    | 12,702                   | 646                    | (889)                  | 543                               |
| 31-12-2001 | 12,979                    | 14,645                   | 746                    | (370)                  | 438                               |

Source: Financial Statement as of 31 December each year. Main Business: Industry food processing

### Table 6. Profile of PT. Indocement Tunggal Perkasa Tbk

| Date       | Total Assets (Billion Rp) | Total Sales (Rp Billion) | L (R) Net (Billion Rp) | L (R) Exchange rate (Billion Rp) | Forex obligation (eqv US$ Million) |
|------------|---------------------------|--------------------------|------------------------|----------------------------------|-----------------------------------|
| 31-12-1997 | 6,670                     | 1,572                    | (378)                  | (99)                             | 837                               |
| 31-12-1998 | 9,108                     | 1,590                    | (1,053)                | (1,102)                          | 500                               |
| 31-12-1999 | 9,860                     | 1,759                    | 521                    | 527                              | 457                               |
| 31-12-2000 | 11,649                    | 2,448                    | (874)                  | (1,145)                          | 1,042                             |
| 31-12-2001 | 11,930                    | 3,453                    | (63)                   | (320)                            | 833                               |

Source: Financial Statement as of 31 December each year. Main Business: Industry produces cement

### Table 7. Profile of PT. Barito Pasific Timber Tbk

| Date       | Total Assets (Billion Rp) | Total Sales (Rp Billion) | L (R) Net (Billion Rp) | L (R) Exchange rate (Billion Rp) | Forex obligation (eqv US$ Million) |
|------------|---------------------------|--------------------------|------------------------|----------------------------------|-----------------------------------|
| 31-12-1997 | 5,397                     | 1,085                    | (39)                   | (135)                            | 534                               |
| 31-12-1998 | 6,120                     | 1,929                    | (575)                  | (1,312)                          | 544                               |
| 31-12-1999 | 5,797                     | 1,595                    | (103)                  | 95                               | 511                               |
| 31-12-2000 | 6,680                     | 1,411                    | (1,024)                | (343)                            | 568                               |
| 31-12-2001 | 6,520                     | 1,601                    | (1,509)                | (169)                            | 660                               |

Source: Financial Statement as of 31 December each year. Main Business: Industry produces timber

### Table 8. Profile of PT. Gudang Garam Tbk

| Date       | Total Assets (Billion Rp) | Total Sales (Rp Billion) | L (R) Net (Billion Rp) | L (R) Exchange rate (Billion Rp) | Forex obligation (Eqv US$ Million) |
|------------|---------------------------|--------------------------|------------------------|----------------------------------|-----------------------------------|
| 31-12-1997 | 5,300                     | 7,517                    | 907                    | (31)                             | 130                               |
| 31-12-1998 | 6,532                     | 9,973                    | 1,111                  | (287)                            | 85                                |
| 31-12-1999 | 8,077                     | 12,695                   | 2,277                  | 39                               | 55                                |
| 31-12-2000 | 10,843                    | 14,965                   | 2,243                  | (95)                             | 75                                |
| 31-12-2001 | 13,448                    | 17,970                   | 2,087                  | (41)                             | 35                                |

Source: Financial Statement as of 31 December each year. Main Business: Industry produces cigarettes

### Table 9. Profile of PT. Semen Cibinong Tbk

| Date       | Total Assets (Billion Rp) | Total Sales (Rp Billion) | L (R) Net (Billion Rp) | L (R) Exchange rate (Billion Rp) | Forex obligation (Eqv US$ Million) |
|------------|---------------------------|--------------------------|------------------------|----------------------------------|-----------------------------------|
| 31-12-1997 | 6,088                     | 837                      | (269)                  | (388)                            | 2,060                             |
| 31-12-1998 | 9,145                     | 880                      | (2,329)                | (1,265)                          | 2,040                             |
| 31-12-1999 | 8,974                     | 1,189                    | 25                     | 896                              | 2,044                             |
| 31-12-2000 | 6,796                     | 1,492                    | (6,916)                | (2,759)                          | 1,447                             |
| 31-12-2001 | 5,972                     | 1,805                    | 1,163                  | (1,406)                          | 508                               |

Source: Financial Statement as of 31 December each year. Main Business: Industry produces cement
### ATTACHMENT

#### Table 1. Growth of Rupiah Mid Exchange Rate Bank Indonesia

| Month / Year | USD / Rp  | % Change of JUNE 1997 POSITION | % Change of PREVIOUS END OF SEMESTER |
|--------------|-----------|-------------------------------|-----------------------------------|
| JUNE - 1997  | 2,450     | -                             | -                                 |
| DECEMBER - 1997 | 4,650     | -90                           | -90                               |
| JUNE - 1998  | 14,900    | -500                          | -120                              |
| DECEMBER - 1998 | 8,025     | -228                          | +46                               |
| JUNE 1999    | 6,726     | -175                          | +16                               |
| DECEMBER - 1999 | 7,100     | -190                          | -6                                |
| JUNE - 2000  | 8,735     | -257                          | -23                               |
| DECEMBER 2000 | 9,595     | -292                          | -10                               |
| JUNE - 2001  | 11,440    | -367                          | -19                               |
| DECEMBER - 2001 | 10,400    | -324                          | +10                               |

Source: www.bi.go.id

#### Table 2. Variables, Indicator and Measurement

| Variable | Indicator | Measurement |
|----------|-----------|-------------|
| I. Equation First : | | |
| 1. Variable Free : | | |
| - Depreciation Rupiah per US Dollar During One Year | X1 | Ratio |
| - Total Forex obligation (Equivalent US Dollar) | X2 | Ratio |
| 2. Variable Not Free : | | |
| Loss of Exchange rate During One Year | Y1 | Ratio |
| II. Equation Second : | | |
| 1. Variable Free : | | |
| - Discount (Premium) Forward Rp per US Dollar. | X1 | Ratio |
| - Total forex obligation (Equivalent US Dollar) | X2 | Ratio |
| 2. Variable Not Free : | | |
| Reducing Loss of Exchange rate On Forex obligation End of Year | Y2 | Ratio |

#### Table 3. Appreciation (Depreciation) of Rupiah Exchange Rate on US Dollar Based on Middle Rate Bank of Indonesia

| Date         | Exchange rate Rp. / US Dollar | (Depreciation) / Appreciation Per Year (Rp./US$) | Accumulated (Depr) Appreciation (Rp./US$) | % (Depr) Appreciation Accumulated |
|--------------|-------------------------------|-----------------------------------------------|-----------------------------------------|---------------------------------|
| 31-12-1996   | 2,383                         | -                                             | -                                       | -                              |
| 31-12-1997   | 4,650                         | (2,267)                                       | (2,267)                                 | (95)                           |
| 31-12-1998   | 8,025                         | (3,735)                                       | (5,642)                                 | (236.8)                        |
| 31-12-1999   | 7,100                         | 925                                           | (4,717)                                 | (197.9)                        |
| 31-12-2000   | 9,595                         | (2,495)                                       | (7,212)                                 | (302.6)                        |
| 31-12-2001   | 10,400                        | (805)                                         | (8,017)                                 | (336.4)                        |

Source: Bank Indonesia

#### Table 4. Profile of PT. Astra International Tbk

| Date         | Total Assets (Billion Rp) | Total Sales (Bp Billion) | L (R) Net (Billion Rp) | L (R) Exchange rate (Billon Rp) | Forex obligation (equv US$ Million) |
|--------------|----------------------------|--------------------------|------------------------|------------------------------|------------------------------------|
| 31-12-1997   | 29,168                     | 14,249                   | (279)                  | (514)                        | 2.871                              |
| 31-12-1998   | 22,319                     | 10,208                   | (2,334)                | (2,586)                      | 2.167                              |
| 31-12-1999   | 22,204                     | 14,853                   | 1,487                  | 732                          | 1.864                              |
| 31-12-2000   | 26,863                     | 28,404                   | (239)                  | (2,520)                      | 1,644                              |
| 31-12-2001   | 26,574                     | 30,123                   | 845                    | (985)                        | 1,350                              |

Source: Financial Statement as of 31 December each year, Main Business: Industry automotive.
### Table 10. Profile of PT. United Tractor Tbk

| Date        | Total Assets (Billion Rp) | Total Sales (Rp Billion) | L (R) Net (Billion Rp) | L (R) Exchange rate (Billion Rp) | Forex obligation (Eqv US$ Million) |
|-------------|--------------------------|--------------------------|------------------------|----------------------------------|----------------------------------|
| 31-12-1997  | 4,146                    | 2,519                    | (254.9)                | (490.3)                          | 699                              |
| 31-12-1998  | 3,840                    | 3,683                    | (1,013)                | (1,673)                          | 504                              |
| 31-12-1999  | 4,430                    | 3,828                    | 670                    | 203.6                            | 444                              |
| 31-12-2000  | 5,150                    | 5,194                    | 2.8                    | (627)                            | 467                              |
| 31-12-2001  | 6,464                    | 7,058                    | 359                    | (275)                            | 410                              |

Source: Financial Statement as of 31 December each year. Main Business: Industry produces heavy equipment.

### Table 11. Profile of PT. Polysindo Eka Perkasa Tbk

| Date        | Total Assets (Billion Rp) | Total Sales (Rp Billion) | L (R) Net (Billion Rp) | L (R) Exchange rate (Billion Rp) | Forex obligation (Eqv US$ Million) |
|-------------|--------------------------|--------------------------|------------------------|----------------------------------|----------------------------------|
| 31-12-1997  | 9,121                    | 2,212                    | (32)                   | (403)                            | 1,249                            |
| 31-12-1998  | 11,094                   | 3,682                    | (1,749)                | (684)                            | 1,413                            |
| 31-12-1999  | 10,420                   | 2,353                    | (2,124)                | 331                              | 1,490                            |
| 31-12-2000  | 10,044                   | 3,301                    | (5,374)                | (3,681)                          | 1,574                            |
| 31-12-2001  | 9,559                    | 4,012                    | (2,323)                | (1,060)                          | 1,374                            |

Source: Financial Statement as of 31 December each year. Main Business: Industry produces textile and product textile.

### Table 12. Profile of PT. Hanjaya Mandala Sampoerna Tbk

| Date        | Total Assets (Billion Rp) | Total Sales (Rp Billion) | L (R) Net (Billion Rp) | L (R) Exchange rate (Billion Rp) | Forex obligation (Eqv US$ Million) |
|-------------|--------------------------|--------------------------|------------------------|----------------------------------|----------------------------------|
| 31-12-1997  | 3,873                    | 3,111                    | 20                     | (426)                            | 428                              |
| 31-12-1998  | 5,224                    | 4,649                    | (95)                   | (902)                            | 375                              |
| 31-12-1999  | 6,493                    | 7,412                    | 1.413                  | 121                              | 266                              |
| 31-12-2000  | 8,525                    | 10,029                   | 1.014                  | (472)                            | 107                              |
| 31-12-2001  | 9,470                    | 14,067                   | 955                    | (22)                             | 81                               |

Source: Financial Statement as of 31 December each year. Main Business: Industry Cigarettes.

### Table 13. Exchange rate forward Selling Based on Data Reuter

| Date Contract Forward | Exchange rate Spot Selling Rp/US$ | Premium Forward Selling (Rp/US$)(%) | Exchange rate Forward Selling Rp/US$ | (Premium) / Discount on Date of Forward Delivery |
|-----------------------|-----------------------------------|-------------------------------------|-------------------------------------|-----------------------------------------------|
| (1)                   | (2)                               | (3)                                 | (4=2+3)                            | (5)                                           |
| 31-12-1996            | 2,363                             | 170 (7.2%)                          | 2,533                               | 31-12-1997                                   |
| 31-12-1997            | 5,700                             | 700 (12.3%)                         | 6,400                               | 31-12-1998                                   |
| 31-12-1998            | 8,200                             | 2,000 (24.4%)                       | 10,200                              | 31-12-1999                                   |
| 31-12-1999            | 7,000                             | 325 (4.6%)                          | 7,325                               | 31-12-2000                                   |
| 31-12-2000            | 9,725                             | 930 (9.5%)                          | 10,655                              | 31-12-2001                                   |

Note: premium forward percentage is premium forward divided with spot exchange rate.

### Table 14. (Premium) Discount on Date of Forward Delivery

| Date Delivery Forward | Exchange rate Spot Selling Rp. /US$ | Exchange rate Forward Selling Rp / US$ | (Premium) / Discount Forward (Rp / US$) |
|-----------------------|-------------------------------------|---------------------------------------|---------------------------------------|
| (1)                   | (2)                                 | (3)                                   | (4=2+3)                               |
| 31-12-1997            | 5,700                               | 2,533                                 | 3,167                                 |
| 31-12-1998            | 8,200                               | 6,400                                 | 1,800                                 |
| 31-12-1999            | 7,000                               | 10,200                                | (3,200)                               |
| 31-12-2000            | 9,725                               | 7,325                                 | 2,400                                 |
| 31-12-2001            | 10,450                              | 10,655                                | (205)                                 |
### Table 15. Reducing Loss of Exchange rate with Forward Hedging Compared to Total Loss of Exchange rate During Period 1997 - 2001

| Company               | Total Loss of Exchange rate (Rp. Billion) | Total Reduction Loss of Exchange rate (Rp Billion) | % Decreasing in Loss of Exchange rate |
|-----------------------|-------------------------------------------|---------------------------------------------------|--------------------------------------|
| Astra International  | 5.874                                     | 2.140                                             | 36.5                                 |
| Indofood              | 2.579                                     | 556                                               | 22                                   |
| Indocement            | 2.419                                     | 884                                               | 36.5                                 |
| Barito                | 1.865                                     | 453                                               | 24                                   |
| Gudang Garam          | 415                                       | 112                                               | 27                                   |
| Semen Cibinong        | 4.923                                     | 1.405                                             | 28.5                                 |
| United Tractor        | 2.862                                     | 548                                               | 19                                   |
| Polysindo             | 5.497                                     | 1.047                                             | 19                                   |
| HM. Sampoerna         | 1.702                                     | 284                                               | 17                                   |

### Table 16. Statistic Result of the Impact of Rupiah Depreciation And Hedging Forward on Loss of Exchange rate

| Rupiah Depreciation Impact | Hedging Forward Impact |
|-----------------------------|------------------------|

I. Analysis Regression:

| R  | 0.644 | 0.775 |
|---|-------|-------|
| R2| 0.415 | 0.601 |
| F Statistic | 14.873 | 31.627 |
| Significance (F) | 0.000 | 0.000 |
| F (2.42, α) table | 3.23 | 3.23 |
| Level of significance | 0.05 | 0.05 |

Equation Regression:

\[ (? 1 = 230.377 + 0.344 X1 - 0.343 X2) \]
\[ (? 2 = 112.306 + 0.185 X1 - 0.263 X2) \]

| t-statistic |
|-------------|
| X1 | 4.829 | 7.900 |
| X2 | -2.165 | -1.010 |

| t-table (2.42, α) |
|-------------------|
| 1.684 | 1.684 |

II. Test Assumption Classic:

| VIP | 1.006 | 1.008 |
| --- | --- | --- |
| Probability | 0.074463 | 0.000003 |
| DW - stat | 1.924252 | 2.477828 |

III. Conclusion:

- Test Simultaneous (F):
  - Ho rejected, Ha accepted
  - F, sta 14.873 > F, table 3.23
  - Ho rejected, Ha accepted
  - F, sta 31.627 > F, table 3.23

- Test Individual (t) :
  - X1
    - Ho rejected, Ha accepted t, stat 4.829 > t, table 1.684
    - Ho rejected, Ha accepted t, stat 7.900 > t, table 1.684
  - X2
    - Ho rejected, Ha accepted t, stat 4.829 > t, table 1.684
    - Ho accepted, Ha rejected t, stat -2.165 < t, table 1.684
    - Ho accepted, Ha rejected t, stat -1.010 < t, table 1.684

- Test Multikolinieritas: No Multikolinieritas
- Test Heteroskedasitas: No Heteroskedasitas
- Test Autocorrelation: No autocorrelation