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ANALYSIS OF ECONOMIC EXPOSURE TO THE STOCK RETURN

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Abstract: *Changes in exchange rates have important implications for financial decision-making and firms' profitability. This paper empirically examines the effect of exchange rate exposure, particularly economic exposure, on firm's value, considering the firm size and holding period factor. This study employs regression which has developed from Fama & French Three Factor Model by adding a lagged variable exposure. However, this study could not find statistically significant relationship between economic exposure and stock return. In addition, this study found weak evidence in relationship of firm size and holding period in accordance to exposure level.*

Keywords: *economic exposure, exchange rate exposure, firm size, holding period.*

1. INTRODUCTION

The exchange rate is a source of uncertainty for firms, which either directly or indirectly may affect the value of the company. Dominguez and Tesar (2006) states that the exchange rate has important implications for financial decision making and the firms' profitability. How big the risk of the exchange rate is affects the value of the company called the exchange rate exposure (Adler & Dumas, 1984). Adler and Dumas (1984) also defines economic exposure as the sensitivity of stock returns to changes in the exchange rate. Jorion (1990) examine the economic exposure in multinational companies in the United States, but only found 15 of the 287 total samples with significant exposure to the index level MERM[2]. Jorion found that companies with international sales have a higher level of exposure than companies that only have domestic sales.

Research by Bartov and Bodnar (1994) then led to the hypothesis delayed market reactions because of any factor mispricing. The mispricing occurs due to lack of information received by investors and the stock price adjustment to the exchange rate change takes time (time lag). As a result, exposure measurement becomes inaccurate when investors estimated the impact of exposure to a company's value. In addition to factors caused by mispricing, delayed reactions can also be caused by a strategic investor to earn abnormal returns. Bartov and Bodnar adding lagged effects variables

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(contemporaneous exposure and lagged exposure) in their regression models to examine the correlation between exchange rate movements and abnormal return.

A number of other studies found to be more significant economic exposure to share price in line with the extension of the holding period (Dominguez and Tesar, 2006; Hsin *et al.*, 2007). One argument explaining that the noise decreases when the holding period is extended. Another argument is that the investment risk with long-term holding period is more difficult to be diversified through hedging rather than short-term investments. On the other hand, Lo and MacKinlay (1990) and McQueen *et al.* (1996) found empirical evidence that large stocks tend to react more efficiently to information than small stocks. Similarly, the research by Hsin *et al.* (2007) showed that the size of the market capitalization of companies also affect the amount of exposure of the economy in which small firms have greater degree of exposure than large firms. Their findings are consistent with research by Dominguez and Tesar (2006) which argue that large companies with their financial clout to have greater access to information and be able to do more hedging strategy to mitigate the impact of the economic exposure.

On the basis of the previous empirical research, the objective of this study is to test the significance of economic exposure influenced by firm size and the holding period of the stock return of multinational companies on the Indonesia Stock Exchange. Issues to be addressed in this study are:

1. How is the relationship of economic exposure to the stock return of multinational companies listed on the Stock Exchange in the period 2007-2011?
2. How does firm size on the level of economic exposure of multinational companies listed on the Stock Exchange in the period 2007-2011?
3. How does the holding period of the level of economic exposure of multinational companies listed on the Stock Exchange during the period 2007-2011?

2. LITERATURE REVIEW

According to Adler and Dumas (1984), the exchange rate risk is not the same as the exchange rate exposure. Exchange rate risk is the potential gains or losses arising from exchange rate fluctuations, can be identified through statistical data, as well as the predictable the potential effect to the company. On the other hand, exposure to the exchange rate is the rate at which companies are affected by changes in exchange rates. Exposure to foreign exchange rates is the sensitivity of changes in the real value of assets, liabilities, and operating income to changes in exchange rates are not expected (Madura, 2000). The size of the exposure is determined from regression slope coefficient that is running a systematic relationship between changes in the exchange rate with the value of the company. Although it has a different term, many researchers like Hsin *et al.* (2007) incorporating the terms of exposure and risk for both equally an

element of uncertainty in financial management. Economic exposure is the levels where the value of the company will be affected by the changes that are not anticipated in the exchange rate. Economic exposure measure the extent of the present value of the future cash flows of a company affected by exchange rate fluctuations.

The level of economic exposure to exchange rate fluctuations faced by multinational companies will be greater than purely domestic firms. The impact of exchange rate movements on multinational companies can differ according to the currency that is used for each currency exchange rate changes with different levels. Therefore, it can be concluded that exchange rate movements can affect the performance of multinational companies, the impact of fluctuations in the exchange rate could be beneficial and could be harmful, as well as the magnitude of the impact depends on the level of exposure to the currency of the multinational companies concerned.

He and Ng (1998) analyze the effect of exchange rate exposure to the Japanese multinational company and found 25% of 171 companies have positive for exposure to the exchange rate. This finding is larger than Jorion research results (1990) which is only found 15 of the 287 US multinationals showed significant exchange rate exposure. Moreover, He and Ng did not find strong evidence that lagged exchange rate changes affect the stock return. Nyadhl (2000) test the hypothesis Bartov and Bodnar (1994) that the exchange rate affects the stock price slowly and indirectly because of mispricing. Bartov and Bodnar considering that the investor may not be able to look at the complex relationship between changes in exchange rates and the value of the company directly. These difficulties lead to systematic errors pricing for some times while investors are already assessing stocks that are affected by changes in exchange rates. Nyadhl find only three of the 47 companies that are significantly affected by changes in exchange rates that the market reacts slowly. Thus, the test results do not support the hypothesis mispricing Nyadhl Bartov and Bodnar (1994).

Allayannis & Ofek (2001) found that the exchange rate exposure of companies is positively correlated with the ratio of overseas sales to total sales, and negatively correlated with the ratio of foreign currency derivatives to total assets. In addition, exposure through foreign sales and foreign trade also proved to be an important factor for companies to hedge. Most companies found using foreign currency debt and derivatives in hedging program to reduce the value exchange rate exposure. Koutmos & Martin (2003) provide evidence that the appreciation and depreciation may affect stock returns. More asymmetric response caused by the behavior of companies in asymmetric pricing-to-market and hysteresis. Asymmetrical relationship is more common in the financial sector, which may be caused by high hedging activities undertaken by financial corporations compared to non-financial companies.

Dominguez and Tesar (2005) examine the relationship between the movement of the exchange rate with the value of the company using research sample in eight non-US countries (Germany, Japan, Britain, the Netherlands, Italy, France, Chile, Thailand). They report that the exchange rate fluctuations have a significant effect on most of the

companies, although the direction of exposure of each company is different depending on the exchange rate of a particular currency, Faff & Marshall (2005) documented the majority of the company positively has a magnitude of exposure because of the high exchange rate are involved in international activities. In addition, also found that company managers tend to look at the impact of exchange rate exposure from changes in short-term cash flows and not the value of the company. Hsin, Shia-Hou, & Chang (2007) found no significant correlation between the exchange rate exposures on stock returns even after considering the effects lagged market reactions. In addition, there is no sufficient evidence that the hedging activity can lower levels of exposure. However, Hsin *et al.* supports the hypothesis of asymmetric behavior hedging that shown to affect the relationship between the characteristics of the company to the level of its currency exposure.

3. METHODOLOGY

The population in this study is all companies listed on the Indonesia Stock Exchange. While the selection of the sample in this study conducted by the mechanism of judgment sampling with sample criteria as follows:

1. Have sales abroad (foreign sales) were positive.
2. The non-financial company, because financial companies (banks and insurance companies) use foreign currency as a commodity and not as a means of payment.
3. The Company's non-property and real estate investment is not included because companies in these fields do not export or foreign sales.
4. It has been registered before January 1, 2007, and did not experience any delisting from the Indonesia Stock Exchange until December 31, 2011.

Based on the criteria of the samples, the results obtained 32 companies are used as samples.

The author employs a research model Hsin *et al.* (2007) that has developed the Fama and French Three-Factor Asset Pricing Model (1995) by adding a lagged variable exposure of the theory Bartov and Bodnar (1994) to grasp the potential delay in the reaction of the market. Three-factor model of Fama and French is used because it can capture the sensitivity of stock returns to variable market equity (ME) and the ratio of book equity to market equity (BE / ME) as a proxy. The model tesebut proved to be more efficient in light of the risk and return than the CAPM (Capital Asset Pricing Model) (Indraseno, 2006). Thus the regression models are as follows:

$$R_{it,t+T} - R_{ft,t+T} = \beta^{0}_{i,j,T} + \beta^{f}_{i,j,T} FX^{0}_{t,t+T} + \beta^{flag}_{i,j,T} FX_{t,t-T} + \beta^{m}_{i,j,T}(R_{m,t,t+T} - R_{f,t,t,+t}) + \beta^{S}_{i,j,T} SMB_{i,t+T} + \beta^{H}_{i,j,T} HML_{t,t+T} + \varepsilon_{i,j,T} \quad (1)$$

Where:

$R_{it,t+T}$ = Return on the company's common stock i from time t to t + T

$R_{ft,t+T}$ = Interest rate of Bank Indonesia or BI rate

$FX^{o}_{t,t+T}$ = Exchange rate movements from time t to t + T

T = holding period (1 month, 2 months and 3 months)

$R_{m,t,t+T}$ = Return of a market index (JCI)

$SMB_{i,t+T}$ = Small firm factor

$HML_{t,t+T}$ = Value factor

$\varepsilon_{i,j,T}$ = Error term

Value $\beta^{f}_{i,j,T}$ is the coefficient of direct exposure to the holding period during which time T. $\beta^{flag}_{i,j,T}$ is a lagged coefficient exposure, $\beta^{m}_{i,j,T}$, $\beta^{S}_{i,j,T}$, $\beta^{H}_{i,j,T}$ acts as a three-factor loadings, and $\beta^{0}_{i,j,T}$ as intercept. To measure the reaction between large stocks and small stocks to changes in exchange rates, the researchers compared the levels of direct exposure and exposure lag (versus) at large companies and small companies. Criteria for large company is a company with the highest market capitalization of 33% of the total sample, while small company is located in the lowest 33% of market capitalization (Hsin *et al.*, 2007).

In carrying out the regression model (1), the author uses a sample window 3 annual overlapping, so that there are 3 sample window from 2007 to 2011. Thus, there is a regression 288 to be executed, obtained from the total sample multiplied by the number of holding period and multiplied by the sample window. Then the results of the regression model (1) will be divided into two panels, the Panel A (stocks with a total positive exposure) and Panel B (stocks with a total negative exposure). Stocks with positive exposure show any depreciation of the local currency have an impact on the increase in value of company stock. Vice versa on stocks with negative exposure show any depreciation of the local currency resulted in a decrease in the value of company stock. Observations within each panel are divided according to the holding period, the exposure of 1 month, 2 months exposure, and the exposure three months. Furthermore, to see how big the market response delay, delay magnitude exchange rate exposure will be divided into three scenarios, namely under-reaction, over-reaction, and reversion. Under-reaction is described when $\beta^{f}_{i,j,T}$ having the same sign with $\beta^{f\,lag}_{i,j,T}$. Over-reaction occurs when $\beta^{f}_{i,j,T}$, the opposite sign with $\beta^{flag}_{i,j,T}$, while the reversion occurs when $\beta^{flag}_{i,j,T}$ greater than. $\beta^{f}_{i,j,T}$ All three scenarios were compared to see the market reaction to the pattern of exchange rate movements on the stock with positive exposure and positive exposure.

The dependent variable in this study is the stock return, while the independent variables consisted of 6 kinds of variables; risk-free rate, market risk, contemporaneous exposure, and lagged exposure are entirely calculated by using the natural logarithm. The last two other variables independent are the variable small-minus-big (SMB) and high-minus-low (HML).

4. RESULTS AND DISCUSSION

Table 1 shows the descriptive statistics of the sample during period of 2007 to 2011. Sample firms have an average return of 0.61% with a standard deviation of 12.61%, with the highest return of 4.11% and the lowest return of (3.29%). As for the BI rate movements during the period ranged between 6.5% and 9.75%, IHSG (Indonesia Composite Index) ranged between 1026.19 to 2726.76, and the movement of the exchange rate ranged between Rp 8842.39 to Rp 11852.75. The average market equity company of the sample is Rp 6,218,561,113 with a standard deviation of Rp 10,056,546,453. The average book equity amounting to Rp 2,587,683,541 with a standard deviation of Rp 4,718,848,895

Tabel 1
Descriptive Statisticscs

	Return	*BI Rate*	*IHSG*	*FX Rate*	*ME*	*BE*
Mean	0.0061	9.23	1753.53	9621.55	6,218,561,113	2,587,683,541
St. Dev.	0.1261	1.90	548.44	734.97	10,056,546,453	4,718,848,895
Min	(0.0329)	6.50	1026.19	8842.39	17,136,800	(7,984,822,632)
Max	0.0411	9.75	2726.76	11852.75	44,771,677,536	19,422,323,703

4.1. Relationship Analysis Foreign Exchange Exposure to Stock Return

The regression results from exposure to direct exposure and lag exposure of the sample firms can be seen in Table 2 where Panel A consisting of shares with a total exposure (sum-betas) positive and Panel B for stocks with a total negative exposure obtained from the regression model (1). N_obs is a significant number of observations in the F test and N * is the significant number of observations in t-test at 90% confidence level. The mean value (Mean), median (Med), and the standard deviation (S.D.) were calculated for each direct exposure and lag exposure on any holding period. At the bottom of the table is the result of Runs test the null hypothesis that large firms had a total exposure is equal to small firms based on the mean, median, and the significance level (p-value).

Based on Table 3 the effect of exchange rate exposure can be seen from a significant number of observations (N *). For 1 month exposures, it is found just 16 observations direct exposures in Panel A significant to stock returns, whereas in panel B only 10 have a significant observation. Similarly, for the lag exposure, in Panel A found only 10 observations is significant while in Panel B only 18 significant observations. When compared to the total observation (N_obs) on any holding period, the percentage of N * is very small:

Tabel 2
Contemporaneous & Lagged Exposure To Stock Return

	Panel A: Stocks with POSITIF total exposure						Panel B: Stocks with NEGATIVE total exposur					
	1 Month Exposure (N_obs = 108)						1 Month Exposure (N_obs = 74)					
Exposure	Min	Mean	Median	Max	S.D.	N*	Min	Mean	Median	Max	S.D.	N*
$\beta^{f}_{i,j,T}$	0.275	1.104	1.197	1.805	0.442	16	-3.213	-3.047	-0.225	1.629	0.975	10
$\beta^{flag}_{i,j,T}$	-1.141	0.311	0.597	1.299	0.925	10	-4.639	-1.024	-0.841	1.363	1.167	18
$\lvert\beta^{flag}_{i,j,T}/\beta^{f}_{i,j,T}\rvert$	0.015	1.788	0.539	11.267	2.935		0.058	1.921	1.543	10.185	1.838	
$\lvert\beta^{f}_{i,j,T}+\beta^{flag}_{i,j,T}\rvert$												
ALL	0.023	0.657	0.652	1.681	0.475	15	0.013	1.250	1.151	3.010	0.879	18
LARGE	0.056	0.649	0.662	1.265	0.382		0.880	1.363	1.386	3.010	0.780	
SMALL	0.023	0.663	0.441	1.681	0.541		0.013	0.997	0.440	2.923	1.084	
S-L		0.014	-0.221					-0.366	-0.946			
p-value		0.001	0.001					0.064	0.056			
	2 Month Exposure (N_obs = 110)						2 Month Exposure (N_obs = 78)					
Exposure	Min	Mean	Median	Max	S.D.	N*	Min	Mean	Median	Max	S.D.	N*
$\beta^{f}_{i,j,T}$	-0.760	0.870	0.766	2.416	0.754	17	-3.640	-0.152	-0.256	2.516	1.711	11
$\beta^{flag}_{i,j,T}$	-1.873	-0.178	0.000	1.497	0.617	9	-4.757	-1.150	-0.936	2.274	1.676	20
$\lvert\beta^{flag}_{i,j,T}/\beta^{f}_{i,j,T}\rvert$	0.000	0.767	0.493	5.791	1.055		0.035	2.598	1.283	18.121	3.630	
$\lvert\beta^{f}_{i,j,T}+\beta^{flag}_{i,j,T}\rvert$												
ALL	0.021	0.780	0.703	2.079	0.504	3	0.022	1.408	1.295	3.672	1.008	5
LARGE	0.072	0.592	0.638	1.016	0.352		0.022	1.590	1.380	3.672	1.013	
SMALL	0.021	0.874	0.772	2.079	0.548		0.057	0.930	0.940	2.676	0.877	

Tabel I.2 (*Continued*)

S-L		0.283	0.134					-0.660	-0.440				
p-value		0.007	0.006					0.056	0.056				
	3 Month Exposure (N_obs = 102)						3 Month Exposure 3 bulan (N_obs = 90)						
Exposure	Min	Mean	Med	Max	S.D.	N*		Min	Mean	Med	Max	S.D.	N*
$\beta^{f}_{i,j,T}$	-0.666	0.912	0.844	2.788	0.743	17		-2.298	0.048	-0.182	3.623	1.434	14
$\beta^{flag}_{i,j,T}$	-1.227	0.057	0.023	1.246	0.585	7		-5.009	-1.321	-1.165	1.706	1.519	23
$\lvert\beta^{flag}_{i,j,T} / \beta^{f}_{i,j,T}\rvert$	-1.871	0.058	0.045	3.046	0.954			-11.121	0.417	0.906	39.696	6.655	
$\lvert\beta^{f}_{i,j,T} + \beta^{flag}_{i,j,T}\rvert$													
ALL	0.039	0.859	0.729	2.574	0.628	4		0.052	1.406	1.008	3.927	1.047	8
LARGE	0.039	0.738	0.699	1.420	0.535			0.210	1.573	1.384	3.927	1.045	
SMALL	0.067	0.930	0.748	2.574	0.678			0.052	1.102	0.792	3.352	1.029	
S-L		0.192	0.049						-0.471	-0.592			
p-value		0.021	0.021						0.018	0.210			

Tabel 3
Percentage of N* against N_obs

	Panel A		*Panel B*	
		Eksposur 1 bulan		
N_obs	108		74	
$\beta^{f}_{i,j,T}$	16	15%	10	14%
$\beta^{flag}_{i,j,T}$	10	9%	18	24%
		Eksposur 2 bulan		
N_obs	110		78	
$\beta^{f}_{i,j,T}$	17	15%	11	14%
$\beta^{flag}_{i,j,T}$	9	8%	20	26%
		Eksposur 3 bulan		
N_obs	102		90	
$\beta^{f}_{i,j,T}$	17	17%	14	16%
$\beta^{flag}_{i,j,T}$	7	7%	23	26%

The low number of significant observations indicate that there is not enough evidence in the relationship between exchange rate exposures to the stock return. These findings are consistent with the research of Hsin *et al.*, 2007 which found only 18% significant direct exposure and significant lag exposures in Panel A (one-month exposure). Moreover, given the number N* of $\beta^{flag}_{i,j,T}$ which is smaller than $\beta^{f}_{i,j,T}$ verify that the use of lag exposure variable in the measurement model does not affect the significance of the stock return with a total positive exposure (Panel A), than if it is only use a direct exposure variable. However, in Panel B, lag exposure variable has an influence on the significance of stock returns, judging from the number N* of $\beta^{flag}_{i,j,T}$ greater than $\beta^{f}_{i,j,T}$. This was reinforced by the median value at a ratio of $|\beta^{flag}_{i,j,T} / \beta^{f}_{i,j,T}|$ less than 1 indicates that the lag exposure variable had no effect greater than direct exposure. In Table I.2, only exposure 1 and 2 months in Panel B which has a median value of a ratio $|\beta^{flag}_{i,j,T} / \beta^{f}_{i,j,T}|$ more than 1.

Thus the study found contradictory results between Panel A and Panel B and the holding period of 1 month, 2 months and 3 months. A possible explanation is that the company has used foreign exchange derivatives or other hedging instruments to minimize the exchange rate exposure. As a result, the measurement results become insignificant exposure to corporate value. Allayannis and Ofek (2001) argued that the

company's exposure to the exchange rate is negatively correlated with the ratio of foreign currency derivatives to total assets. The greater the use of foreign exchange derivatives, the level of exposure of the company becomes smaller. With the hedges, the exchange rate exposure is becoming increasingly insignificant affect stock returns.

4.2. Relationship of Firm size Against Foreign Exchange Exposure

The previous studies (Lo & MacKinlay, 1990, and McQueen *et al.*, 1996) have shown that large stocks tend to react more efficiently to information than small stocks. Similarly, the Hsin *et al.* (2007) provide evidence that exposure to the exchange rate tends to be higher in small firms than large firms. However in this study, only small firms in Panel A, which has a higher exposure than large firms (see Table I.2). Panel A is a composite total return stock with positive exposure of $\left(\beta^{f}_{i,j,T} + \beta^{flag}_{i,j,T}\right)$, which means that any depreciation of the local currency have an impact on the increase in value of company stock. Likewise in Panel B (joint return stock with a total negative exposure) showed any depreciation of the local currency resulted in a decrease in the value of company stock.

On the other hand, the reaction pattern stock returns against exchange rate lag exposure based on company size (large and small firms) is presented in Table 4 (Table 4 shows only one month of exposure, while exposure 2 months and 3 months is not shown because it has results that are not much different from the exposure of one month).

Table 4 reports stock returns reaction to exchange rate changes. It shows that stock return tend to over-reaction to changes in exchange rates. For example, in Table I.4 Panel A, 44% of the entire company's stock returns over-reaction, 39% under-reaction, and 17% reversion. While in Panel B, there are no stock returns that under-reaction, over reacting as much as 88% and 12% reacted reverse. In practice, under-reaction is a condition in which investors ignore information changes in exchange rate so that the return of shares to be less sensitive to changes in exchange rates; over-reaction occurs when investors responded excessive to changes in exchange rates and the share price corrected in a subsequent period, whereas reversion is a condition when the investor responding to changes in exchange rates and stock prices slowly adjust for these changes in the next period. The result presented in Table 4 (the large number of over-reaction and reversion) suggests that investors have vigilance against foreign exchange risk and overreact to changes in exchange rates.

On the other hand, with regard to size and stock return, the size of the companies did not significantly influence the reaction pattern returns, as evidenced by the results of testing the null hypothesis that there is no difference between small firms lagged exposure to large firms. Runs test results based on the mean and median where the p-value is very high exceeding the level of $\alpha = 0.10$ show small firms do not differ significantly from the large firms in every state holding period so it is not supported

Tabel 4
Stock Return Reaction to Exchange Rate Changes (1 Month Exposure)

Scenario		Panel A: stocks with POSITIVE sum-exposure			Panel B: stocks with NEGATIVE sum-exposure		
		Mean	Median	N (%)	Mean	Median	N (%)
All Firms							
Under-reaction	$\beta^{f}_{i,j,\tau} > 0$; $\beta^{flag}_{i,j,\tau} > 0$	0.226	0.163	39%	n/a	n/a	n/a
Over-reaction	$\beta^{f}_{i,j,\tau} > 0$; $\beta^{flag}_{i,j,\tau} < 0$	0.332	0.189	44%	1.275	1.016	88%
Reversion	$\beta^{f}_{i,j,\tau} < 0$; $\beta^{flag}_{i,j,\tau} > 0$	1.008	0.888	17%	0.527	0.171	12%
Total *N*_obs				36			26
Large Firms							
Under-reaction	$\beta^{f}_{i,j,\tau} > 0$; $\beta^{flag}_{i,j,\tau} > 0$	0.115	0.075	40%	n/a	n/a	n/a
Over-reaction	$\beta^{f}_{i,j,\tau} > 0$; $\beta^{flag}_{i,j,\tau} < 0$	0.433	0.238	53%	1.318	1.129	83%
Reversion	$\beta^{f}_{i,j,\tau} < 0$; $\beta^{flag}_{i,j,\tau} > 0$	0.274	0.274	7%	0.527	0.171	17%
Total *N*_obs				15			18
Small Firms							
Under-reaction	$\beta^{f}_{i,j,\tau} > 0$; $\beta^{flag}_{i,j,\tau} > 0$	0.310	0.246	38%	n/a	n/a	n/a
Over-reaction	$\beta^{f}_{i,j,\tau} > 0$; $\beta^{flag}_{i,j,\tau} < 0$	0.230	0.116	38%	1.194	0.796	100%
Reversion	$\beta^{f}_{i,j,\tau} < 0$; $\beta^{flag}_{i,j,\tau} > 0$	1.155	1.299	24%	n/a	n/a	n/a
Total *N*_obs				21			8
Test H_0: $\lvert\beta^{flag}_{i,j,\tau}\rvert$ of small firms = $\lvert\beta^{flag}_{i,j,\tau}\rvert$ of large firms							
Under-reaction	Small-Large (*p*-value)	0.226 (0.839)	0.163 (0.781)		n/a	n/a	
Over-reaction	Small-Large (*p*-value)	0.332 (0.819)	0.189 (0.438)		1.275 (0.903)	1.016 (1.000)	
Reversion	Small-Large (*p*-value)	1.008 (0.648)	0.888 (0.648)		0.527 (1.000)	0.171 (0.724)	

that small firms have greater exposure than large firms. This finding is not consistent with prior research (Hsin *et al.*, 2007) in which small firms are exposed to greater exchange rate exposure due to the limitations of small firms in accessing market information (information inefficiency).

4.3. Relationship of Holding period Against Foreign Exchange Exposure

Holding period is assumed to affect the level of exchange rate exposure, whereas the longer the holding period then the shares would become increasingly vulnerable to the risk of exchange rate fluctuations. The influence of the holding period of the exposure can be seen in the value of the regression coefficient beta of variable exchange rate on stock returns. In this study, the authors used direct exposure and lag exposure variables and observe the changes on any holding period (1 month, 2 months and 3 months). The beta value of these two variables have been presented in Table I.2 and summarized in Table I.3 and Table I.4 where the authors compare the mean values of the direct exposure (FX_CON), exposure lag (FX_LAG), and the ratio of lag exposure to direct exposure (FX_LAG / FX_CON). Figue 1,1 and 1,2 displays the changes in mean values of direct exposure, lag exposure and the ratio of lag exposure and direct exposure:

Figures 1 and 2 demonstrates that only variable direct exposure increased with the increasing holding period, while in the variable lag exposure and the ratio of lag exposure to direct exposure tend to fluctuate. These findings are not consistent with the results of previous studies (Chow *et al.,* 1997; Griffin & Stulz, 2001; Bodnar & Wong, 2003; and Dominguez and Tesar, 2006) who found that exposure to the exchange rate becomes more significant to the stock price by more increasing holding period. Thus, the hypothesis holding period only applies to direct exposure, whereas the lag exposure is not proven that the holding period significant effect on lag exposure.

The implications of these findings reflect that investors tend to ignore Stock Exchange lag exposure. As Bartov and Bodnar (1994) states that investors may not understand the complex relationship between exchange rate changes on firm value (stock price) directly. These difficulties lead to systematic errors pricing for some times while investors are already assessing stocks that are affected by changes in exchange rates. These research findings that the holding period does not significantly influence the lag exposure suggests that investors may not realize that the sahres they had bought actually been reduced in value due to changes in exchange rates. Similar findings were found in the study Nyadhl (2000) which found that only 3 of the 47 companies that return of their shares are significantly affected by lag exposure. In addition, investor behavior that ignores the lag exposure also resulted in the stock returns become less sensitive to fluctuations in the exchange rate, no matter the length of the holding period, so that the measurement of exposure to the stock return relationship becomes insignificant.

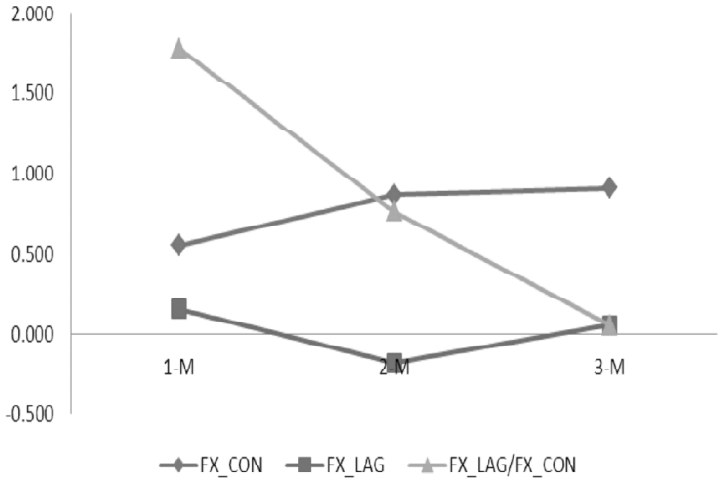

Figure 1: Panel A (Mean)

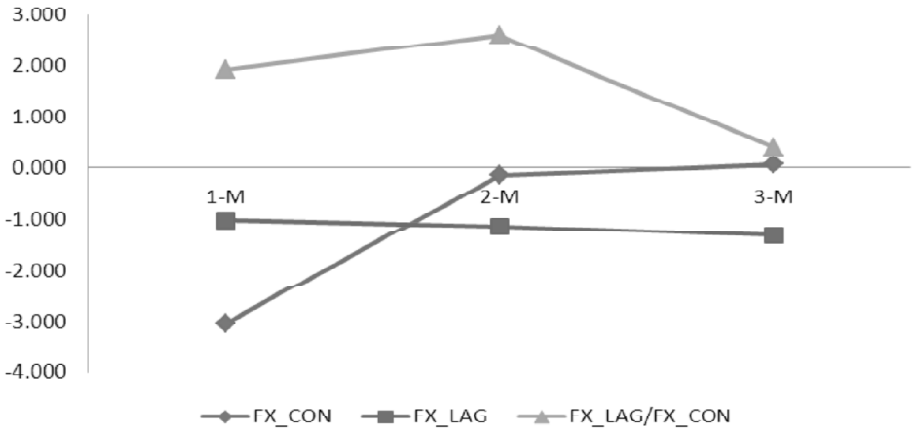

Figure 1: Panel B (Mean)

5. CONCLUSIONS

The results of the analysis of the relationship exchange rate exposure to the stock return shows that there is no significant relationship between the exchange rate exposures on stock returns, as evidenced by low yields significant observation by t test. From a total of 108 observations in Panel A with a holding period of 1 month, found only 15% and 9% significant direct exposure and lag exposure to stock return respectively. While a total of 74 observations in Panel B, only 14% and 24% significant direct exposure and lag exposure.

The results of the analysis of firm size relationship to the exchange rate exposure showed small firms do not shown to have greater exposure than large firms. Furthermore, stock returns reaction to changes in the exchange rate in terms of under-reaction, over-reaction, or reversion, in small firms is not significantly different than large firms. The implications of these findings suggest that large firms do not use the maximum capacity of their capital to hedge that is likely caused by a misunderstanding of the company's managers to the impact of exchange rate exposure, so they often ignore the effects of exchange rate fluctuations on the value of the company.

The results of the analysis of the relationship holding period against exchange rate exposure shows that holding period affects only to the direct exposure variable, while the variable of lag exposure and ratios of lag exposure to direct exposure does not support evidence the existence of a significant relationship. The implications of these findings reflect that investors tend to ignore the lag exposure and did not realize the effect of exchange rate exposure to the value of assets owned by the investor. Another possible expalanation is that investors are experiencing a lack of accessible information so it is difficult to estimate the level of exposure to the value of its assets (information inefficiency).

In order to strengthen the results of the study, this study suggests the areas for future research. First, this study ignores the factor of hedging, which hedging could reduce exchange rate exposure (Allayannis & Ofek, 2001). Expected future research could examine whether hedging strategies, such as foreign currency derivatives and foreign debt has a correlation with exchange rate exposure, as well as examine what factors are decisive in deciding the company's hedging policy.

Second, further research with a longer period is expected since the exchange rate affects the company's cash flow in the long term (Chow et al., 1997).

Third, this study only observed exchange rate exposure at the first moment (first-moment exposure). Yet according Koutmos & Martin (2003b), there are two moments of exposure (second-moment exposure) are often not identified in previous studies. First-moment exposure is a direct impact of exchange rate changes on profit companies involved in transactions denominated in foreign currencies, while the second-moment exposure is the volatility of exchange rate changes itself which affects the profit of the company. Expected further research can observe the moment of exposure both in multinational companies, as well as examine the comparison between large firms to small firms.

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