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**HEDGE FUNDS, EXCHANGE RATES AND CAUSALITY:
EVIDENCE FROM THAILAND AND MALAYSIA**

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Abstract

This article contributes to the debate on hedge funds and exchange rates in Thailand and Malaysia. It examines causal relations using a new Granger non-causality procedure proposed by Toda and Yamamoto (*Journal of Econometrics*, 66, 225-50, 1995). Monthly observations are utilized over a sample period from January, 1994 to April, 2002. The results show that the funds lead Thai baht for the crisis period. The results also reveal that the funds lead Malaysian ringgit for the pre-crisis period.

JEL Classification: G2, C5, F3

Keywords: Hedge Funds, Exchange Rates, Granger Non-Causality.

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HEDGE FUNDS, EXCHANGE RATES AND CAUSALITY: EVIDENCE FROM THAILAND AND MALAYSIA

I. INTRODUCTION

There is increasing interest in the activity of hedge funds. In recent years, there were several events associated with hedge funds activities. The attack on the sterling in 1992, the global bond rally in 1993, the Asian currency crisis of 1997 and the Long Term Capital Management crisis were few examples. Compared to other investment institutions, hedge funds have no restriction on the use of leverage, short-selling and derivatives than the more regulated investment institutions. This allows them to follow investment strategies that are significantly different from that of traditional investment institutions.

Despite a series of earlier events linked to hedge funds, it was not until the Asian currency crisis that regulators took active interest in their activities. The crisis which witnessed massive and abrupt falls of Asian currencies had led Mahathir Mohamad (i.e. former Prime Minister of Malaysia) to voice out his displeasure on hedge funds activities for selling short the currencies and brought significant pressure on them (Mohamad, 1997). The funds are also criticized for dealing in thin markets with substantial volume, herding, colluding and manipulating. Although recent studies fail to find evidence that hedge funds were responsible for the crisis, an interview with Stanley Drucker Miller (i.e. former head of the Quantum Fund) revealed that there were short positions in the baht and ringgit.¹

¹ The Quantum's year-to-date returns climbed from 3.2% at the end of the first quarter to 22% as of Sept. 3, 1997 (Wall Street Journal, Sept. 5, 1997, p. C1).

A few studies have assessed the link between hedge funds and exchange rates. Most of the studies focused on estimating individual funds exposure by inferring their position from return data. For example, using monthly data on 27 funds, [Fung and Hsieh \(2000\)](#) observe that most of them had a sizeable gain in July 1997 when the Thai baht was devalued. However, they conclude that the gain was attributed to long positions in the US equity market. ² [Brown et al. \(1998\)](#) examine whether the funds prompted the crisis by taking short positions in Asian currencies. Using the Sharpe-style analysis and a sample of ten global funds, they find that the aggregate exposure of the funds to the ringgit varied considerably. However, there was no relationship between the estimated changes in funds exposure and the changes in the value of the currency. [Eichengreen et al. \(1998\)](#) argue that there is little evidence to believe that funds are more likely to overwhelm a market than other large traders such as commercial banks, investment banks, insurance companies, and corporations. The funds are not able to manipulate a market than any of these entities and there is no evidence that funds used positive feedback trading strategies during the crisis in 1997. [Brealy and Kaplanis \(2001\)](#), however, argue that fund's exposures which are inferred from fund's return should be interpreted cautiously. As the funds are commonly thought to make frequent changes in their exposures, the estimated coefficient should be interpreted as fund's average exposures over the estimation period.

This article contributes to the literature on the relationship between hedge funds and exchange rates in two aspects. First, this study extends the literature by examining the causal relationship between hedge funds and exchange rates. Existing studies focus mainly on estimating the individual fund's exposure on currencies. Nevertheless, the interest of researchers is not only to assess their

² They also found that the funds exposure were significant during the ERM crisis in 1992, the global bond rally in 1993/1994. However, the funds exposures were insignificant during the stock market crash of 1987 and the Mexican peso crisis in 1994.

exposure, but they are more likely to know the causal patterns between these two variables. For instance, do hedge funds activities lead currencies depreciation? However, this question remains unanswered and therefore, this study fills the gap. Secondly, this study utilizes a new methodology which allows causal inferences to be conducted in a system including time series processes that may be integrated as well as cointegrated. [Toda and Yamamoto \(1995\)](#) provide a simplistic approach for assessing causal relations regardless of order of integration and/or the cointegration rank in a VAR system. This methodological approach is useful because it bypasses the need for potentially biased pre-tests for unit roots and cointegration, common to other formulations. The rest of the paper is structured as follows. Section II discusses the data and empirical methodological issues while Section III presents the empirical results. Section IV concludes.

II. DATA AND EMPIRICAL METHODOLOGY

Monthly observations for a sample from January 1994 to April 2002 are utilized.³ The pre-1994 data are avoided due to the measurement biases.⁴ The macro/global funds returns are used to proxy hedge funds activities. This study utilizes five different sources of data which are commonly used in the literature namely, *Investor Force Securities Inc. (IFS)*, *Hedge Fund Research Inc. (HFR)*, *Hennesse Group LLC. (HEN)*, *Credit Suisse First Boston/Tremont Index LLC. (TRE)* and *Zurich Capital Market Inc. (ZUR)*. End of month spot bilateral exchange rates vis-à-vis U.S. dollar are from *International Financial Statistic* and expressed as domestic currency per unit of U.S. dollar. The sample period is divided into two sub-samples. The pre-crisis period covers from January 1994 to June 1997 during which the currencies were relatively stable. The crisis period continues from July

³ In the case of Malaysia, the post- August 1998 period is avoided due to the imposition of capital control which almost completely closed the financial market to foreigners.

⁴ For a complete description of these biases, refer to [Fung and Shieh \(2002\)](#).

1997 through April 2002. This period was characterized by massive currencies depreciation.

It is well known that in the context of integrated series, the conventional application of the F -test (i.e. in a standard VAR model) is invalid⁵. Moreover, the F -test is not valid unless the variables are cointegrated in levels. Recently, an alternative approach which utilizes the modified wald (MWALD) test for testing linear restriction on the parameters was proposed by [Toda and Yamamoto \(1995\)](#) - hereafter, TY. The test has an asymptotic χ^2 distribution when a VAR ($k + d_{\max}$) is estimated where d_{\max} is the maximum degree of integration suspected to occur in the system. [Toda and Yamamoto](#) point out that, for $d=1$, the lag selection procedure is always valid since $k \geq 1=d$. If $d=2$, then the procedure is valid unless $k=1$. Moreover, the MWALD statistic is valid regardless whether a series is $I(0)$, $I(1)$ or $I(2)$, non-cointegrated or cointegrated of an arbitrary order. In addition, the MWALD test has a comparable performance in size and power to the likelihood ratio (LR) and Wald tests ([Zapata and Rambaldi, 1997](#))

[Rambaldi and Doran \(1996\)](#) demonstrated that this testing procedure can be easily constructed using a seemingly unrelated regression (SUR) framework. Following TY non-causality test, these variables can be causally linked in a system as follows:⁶

$$\begin{bmatrix} HF_t \\ EX_t \end{bmatrix} = \alpha_0 + \alpha_1 \begin{bmatrix} HF_{t-1} \\ EX_{t-1} \end{bmatrix} + \alpha_2 \begin{bmatrix} HF_{t-2} \\ EX_{t-2} \end{bmatrix} + \alpha_3 \begin{bmatrix} HF_{t-3} \\ EX_{t-3} \end{bmatrix} + \alpha_4 \begin{bmatrix} \varepsilon_{HF} \\ \varepsilon_{EX} \end{bmatrix} \quad (1)$$

where α_0 is an identity matrix and $E(\varepsilon_t) = [\varepsilon_{HF}, \varepsilon_{EX}]' = 0$ and $E(\varepsilon_t \varepsilon_t') = \Sigma$. For example, if $k=2$ and $d_{\max}=1$, a causality from EX to HF can be established through

⁵ Spurious regression due to non-standard distribution of the test statistics, see [Toda and Phillips \(1993\)](#).

⁶ Assuming 3-order VAR, where HF=hedge funds; EX=exchange rates.

rejecting the null hypothesis of EX_{t-1} and EX_{t-2} are jointly equal to zero in the first equation of the above system. A similar procedure can be used to test the causality from HF to EX by establishing a significance of the MWALD statistic for a group of lagged HF variables in the second equation of the system.

III. EMPIRICAL RESULTS

Applying the TY procedure outlined in the previous section, the nature of causal linkages between the hedge funds and exchange rates is examined. Since the appropriate lag length is important to identify the true dynamic of the model, the Akaike Information Criterion (AIC) and Schwarz Bayesian criterion (SBC) lag selection criteria are used to determine the optimal lag structure of the VAR system. In most cases, the lags suggested by AIC and SBC are the same. Due to the importance of serially uncorrelated residuals, higher lag is chosen whenever AIC and SBC suggest different lags.

The implementation of the TY procedure involves estimating system Equation (1) in the level form. The results are reported in Tables 1 and 2 for the baht and ringgit, respectively.

<INSERT TABLE 1>

Panels A and B report results for the pre-crisis period and crisis period, respectively. Using a 10 percent significant level as a testing criterion, we fail to establish the causal relationship from the hedge funds to the baht for the pre-crisis period. In all cases, the MWALD statistics are too small to reject the null. However, there are mixed evidence for the crisis period. In four cases, the null of non-causality are rejected. Generally, the findings are suggestive that hedge funds *Granger*-cause baht.

<INSERT TABLE 2>

Results in table 2 suggest that there is a strong evidence of causality running from hedge funds to ringgit for the pre-crisis period. In four cases, the null hypothesis of non-causality can be rejected at the 10 percent level. Thus, we can safely conclude that the funds performance contains leading information for the ringgit. One of the implications of this finding is that, the funds activities contain useful predictive information on the ringgit movements. However, the results of the crisis period show that no causal direction from hedge funds to ringgit can be established. The MWALD statistic is too small in order to reject the null.

IV. CONCLUSION

This study contributes to the debate on hedge funds and exchange rates in Thailand and Malaysia. Monthly observations are utilized for a sample period from 1994 to 2001. In order to better understand the issue, two sub-sample periods are created. The pre-crisis period covers from January 1994 to June 1997 and the crisis period spans from July 1997 to April 2002. A new Granger non-causality procedure by Toda and Yamamoto (1995) is utilized. Among the findings of interest is that the hedge funds *Granger-cause* baht during the crisis. However, there is no evidence that the funds lead ringgit during the same period which suggests that hedge funds activities did not exert significant influence on the ringgit. However, the findings for the pre-crisis period suggest that the funds contain useful predictive information only on the ringgit.

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Table 1: The results of Granger non-causality test for the Thai *baht*.

	Null Hypothesis				
	<i>HEN</i> \nrightarrow <i>THB</i>	<i>IFS</i> \nrightarrow <i>THB</i>	<i>HFR</i> \nrightarrow <i>THB</i>	<i>TRE</i> \nrightarrow <i>THB</i>	<i>ZUR</i> \nrightarrow <i>THB</i>
<i>A: Pre-crisis period (January 1994 to June 1997)</i>					
MWALD	0.3254	0.9569	2.1255	0.9141	0.4121
p-value	0.5683	0.3279	0.1448	0.3390	0.5208
Lag	1	1	1	1	1
<i>B: Crisis Period (July 1997 to April 2002)</i>					
MWALD	9.0693*	5.3672*	3.5207*	2.6882	5.0534*
p-value	0.0107	0.0683	0.0606	0.1010	0.0245
Lag	2	2	1	1	1

Notes:

* indicate rejection of null hypothesis at the 10% significant level.

The (\nrightarrow) and (\rightarrow) indicate does not *Granger*-cause and *Granger*-cause, respectively.

THB = Thai baht

Table 2: The results of Granger non-causality test for the Malaysian *ringgit*.

	Null Hypothesis				
	<i>HEN</i> \nrightarrow <i>MYR</i>	<i>IFS</i> \nrightarrow <i>MYR</i>	<i>HFR</i> \nrightarrow <i>MYR</i>	<i>TRE</i> \nrightarrow <i>MYR</i>	<i>ZUR</i> \nrightarrow <i>MYR</i>
<i>A: Pre-crisis period (January 1994 to June 1997)</i>					
MWALD	12.8937*	9.0464*	11.5756*	2.49104	24.7525*
p-value	0.0003	0.0026	0.0006	0.1145	0.0000
Lag	1	1	1	1	1
<i>B: Crisis Period (July 1997 to August 1998)</i>					
MWALD	1.8081	0.4663	1.3927	1.5880	1.4931
p-value	0.1787	0.4946	0.2379	0.20761	0.2217
Lag	1	1	1	1	1

Notes:

* indicate rejection of null hypothesis at the 10% significant level.

The (\nrightarrow) and (\rightarrow) indicate does not *Granger*-cause and *Granger*-cause, respectively.

MYR = Malaysian ringgit