ความเสี่ยงจากอัตราแลกเปลี่ยนสกุลเงินต่างประเทศ และ ตลาดหุ้นประเทศไทย

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FOREIGN EXCHANGE RATE RISK AND THAI STOCK MARKET

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วิทยานิพนธ์ฉบับนี้ศึกษาบทบาทของผลตอบแทนจากอัตราแลกเปลี่ยนต่อผลตอบแทนกลุ่มอุตสาหกรรมในประเทศไทย หลังจากที่ประเทศไทยมีการเปลี่ยนแปลงระบบอัตราแลกเปลี่ยนจากแบบคงที่มาเป็นแบบลอยตัวที่มีการจัดการเมื่อวันที่ 2 กรกฎาคม พ.ศ.2540 อันทำให้เกิดวิกฤติการเงินในภูมิภาคเอเชีย แบบจำลองที่ใช้ในการศึกษา คือ Unconditional two-factor model ที่ประมาณโดยวิธี Generalized Methods of Moments (GMM) เพื่อทำการทดสอบกับสกุลเงินหลัก 3 สกุลเงิน คือ ดอลลาร์สหรัฐ (US) เยน (JP) และยูโร (EU) ตั้งแต่ปี พ.ศ. 2535-2547 นอกจากนี้ ยังทำการศึกษาเพิ่มเติมโดยขยายจาก two-factor model ทางแรกคือ เพิ่มตัวแปรส่วนต่างระหว่างอัตราดอกเบี้ยในประเทศและต่างประเทศ ทางที่สองเพิ่มตัวแปรอีก 2 ตัวแปรในการทดสอบ ได้แก่ อัตราดอกเบี้ยในประเทศ และอัตราดอกเบี้ยต่างประเทศ

ผลการศึกษาแสดงให้เห็นว่าก่อนวิกฤติทางการเงินปี พ.ศ. 2537 ค่าสัมประสิทธิ์ของตัวแปรอัตราแลกเปลี่ยนในทุกสกุลเงินไม่มีนัยสำคัญ หลังวิกฤติค่าสัมประสิทธิ์ของตัวแปรดังกล่าวมีนัยสำคัญในบางกลุ่มอุตสาหกรรม มีทั้งอุตสาหกรรมที่ได้รับผลกระทบทางบวกและทางลบต่อจากการอ่อนตัวของค่าเงินบาท แต่ค่าขอบเขตความเสี่ยงกลับไม่มีนัยสำคัญทางสถิติ ซึ่งอาจหมายความว่าความเสี่ยงจากอัตราแลกเปลี่ยนมีการกระจายความเสี่ยงระหว่างกลุ่มอุตสาหกรรม และ/หรือ มีการกระจายความเสี่ยงในระหว่างช่วงเวลาที่ศึกษา และเมื่อเพิ่มปัจจัยระหว่างประเทศอื่นๆ ในแบบจำลองเพื่อเพิ่มความสามารถในการอธิบายตัวแปร ผลการศึกษาสนับสนุนกับแบบจำลอง Unconditional two-factor model

ภาควิชา การธนาคารและการเงิน
สาขาวิชา การเงิน
ปีการศึกษา 2548

ลายมือชื่อนิสิต.....
ลายมือชื่ออาจารย์ที่ปรึกษา.....

##4582199326 : MAJOR FINANCE

KEY WORD: EXCHANGE RATE RISK / RISK PREMIUM / STOCK RETURN / MANAGED EXCHANGE RATE REGIME

CHATCHAYA LERTPIYATAS: FOREIGN EXCHANGE RATE RISK AND THAI STOCK MARKET. THESIS ADVISOR : ANANT CHEARAWONGSWE ,Ph.D. 92 pp. ISBN: 974-14-2465-5

This study investigates how exchange rate returns effect return on investment in industries from the switching of exchange rate regime in June 2, 1997 that cause Asian economic crisis. The methodology is an unconditional two-factor model, estimated by Generalized Methods of Moments (GMM) to test the impact of bilateral exchange rate with three main traders (US, JP and EU) from 1992 to 2004. Moreover, this paper will explore another specification by extending the two-factor model. The first alternative is augmented with an interest rate spread factor. The second alternative specification is augment with two additional factors intending to capture the effect of domestic interest rate and foreign interest rate.

The results of the study show that there is no significant exchange rate coefficient in any currencies before the crisis in 1997. After the crisis, there are some sectors that are affected from domestic depreciation, some sectors benefit and some sectors suffer. The exchange rate risk is not significant in any currencies. A possible explanation is that the exchange rate risk is diversified across industries and/or across time. Extending two-factor model, additional explanatory variables are included to increase explanatory power. The results support robustness of using unconditional two-factor model.

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Academic year 2005

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Finally, I would like to express my deepest gratitude to my family for their understanding and encouragement at all times.

Any error in this study deems my own.

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CHAPTER I

INTRODUCTION

1.1 Introduction

Exchange rate is one of the macroeconomic variables and plays an important role in the economic condition both at the microeconomic and macroeconomic level. At the macroeconomic level, the change will affect trade sector, such as export- import goods and service and financial sector. For example, currency depreciation will increase the competitiveness of an export industry of the country by reducing the cost of export while appreciation of currency will benefit import industry by reducing the cost of import. In financial sector, it will affect capital flow. At the microeconomic level, we can see one of the impacts on performance in the value of firm.

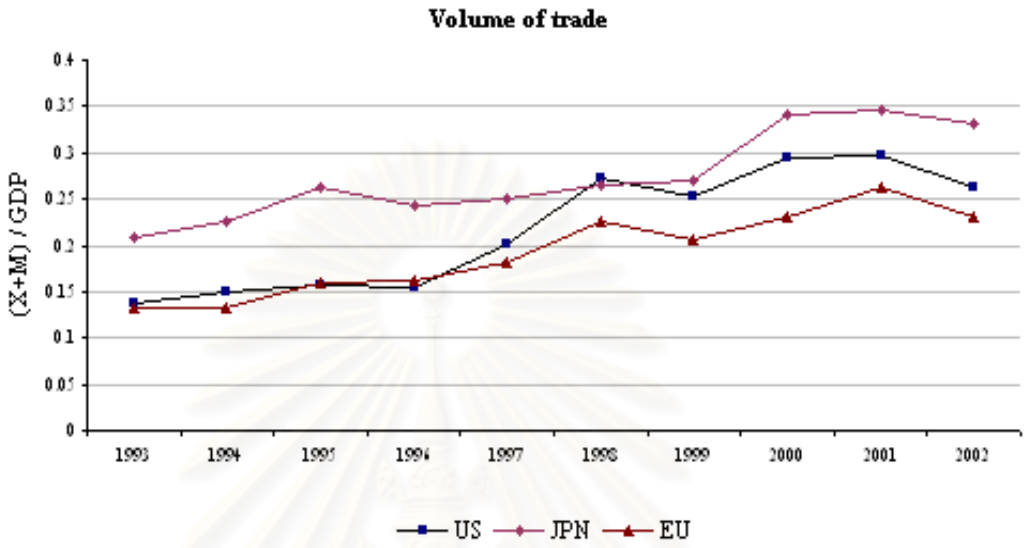
Because of the Asian economic crisis as 1997, Thailand exchange rate system had been changed from fixed (to a basket of currency) exchange rate to manage floating exchange rate on July 2, 1997. Although flexible exchange rate is advantage in that adjustments are automatically market driven rather than administered by government (thus nominal exchange rate is not far from real effective exchange rate), the disadvantageous of this system is that is generates uncertainty about future rates. For these reasons and the openness of the economy, the foreign exchange risk may become a prominent problem through both direct and indirect effect. For direct effect, exchange rate exposure troubles equity investors. The exposure disturbs the financial decision process of the firms because it will affect cash flows of firms, and hence the value of firms through both transactions

and operations[1]. Finally, it will affect cost of capital and will change value of the firms only if measure the terms of foreign currency. Indirect effect increases exposure for any investors through the currency risk.

The volume of trade (in Thai baht, see figure 1) trends up slightly increase over time resulting in increasing openness of the economy and increasing exposure as well. Net trade is shown in figure 2. It shows that Thai market position with the main traders. It can be seen that Thailand is a net importer to Japan while a net exporter to USA and EU. Thailand is a net importer before the crisis and a net exporter after the crisis. In the year 1998 after the crisis, there is an overshoot of export volume due to depreciation of home currency (figure 1). Net flow of foreign equity investment in million of baht as shown in figure 3 are rather stable except the overshoot in the year 1998. Net flow of Thai equity investment abroad million of baht in figure 4 is high before the crisis, however it slowdown during the year 1996-1998. After the crisis, the volume has decreased. The two lowest points after the crisis are in the year 1998 and 2000.

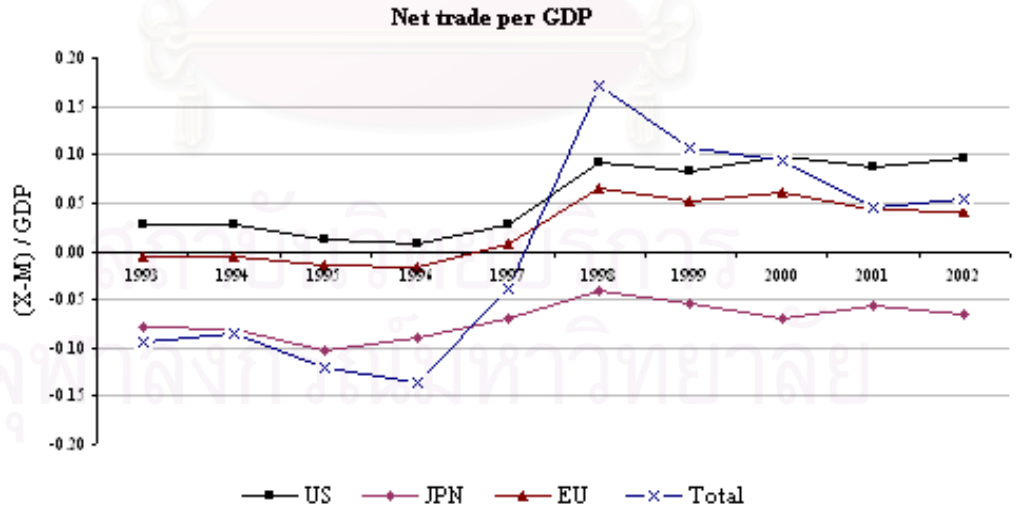
1 Dahlquist and Robertson (2001) define transaction exposure as the exposure that a firm is subject to when it has entered a contract denominated in a foreign currency but which is to be settled at a future date. This is an unambiguous measure, and does not necessarily reflect the total exposure of the firm. However, it is typically this type of exposure that most firms hedge. For operating exposure, this is related to the effect that exchange rate changes have on the value of a firm's existing financial contracts. Additionally, translation exposure (or accounting exposure) arises as a result of translating the financial statements of a foreign subsidiary into the reporting currency of the parent company to prepare consolidated financial statements. This is not a real exposure in the sense that it does not affect the current or future cash flows of the firm under the assumption that investors price stocks according to expected future cash flow.

Figure 1 Volume of trade



Source: BOT

Figure 2 Net trade per GDP



Source: BOT

Figure 3 Net flow of foreign equity investment

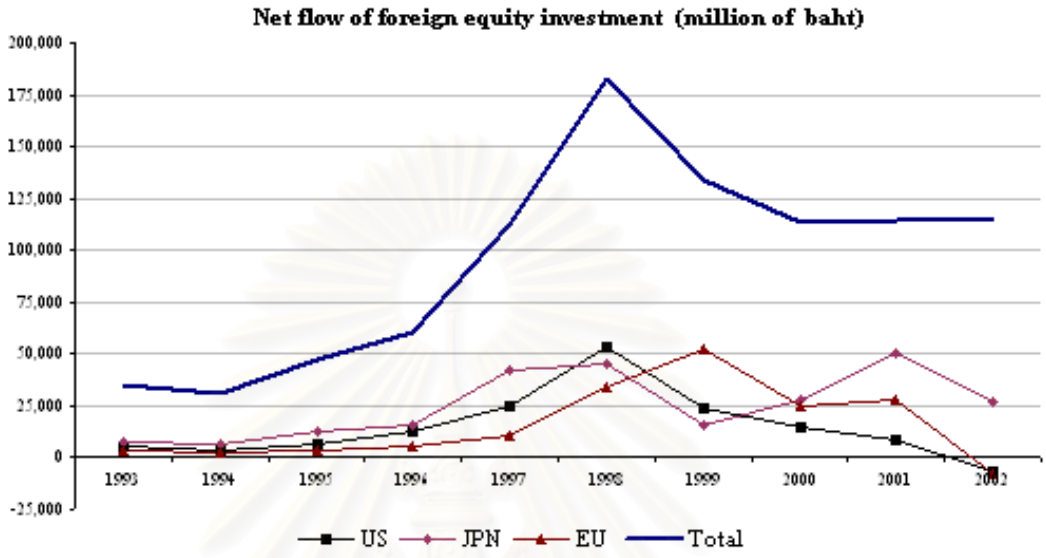


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Figure 4 Net flow of Thai equity investment abroad

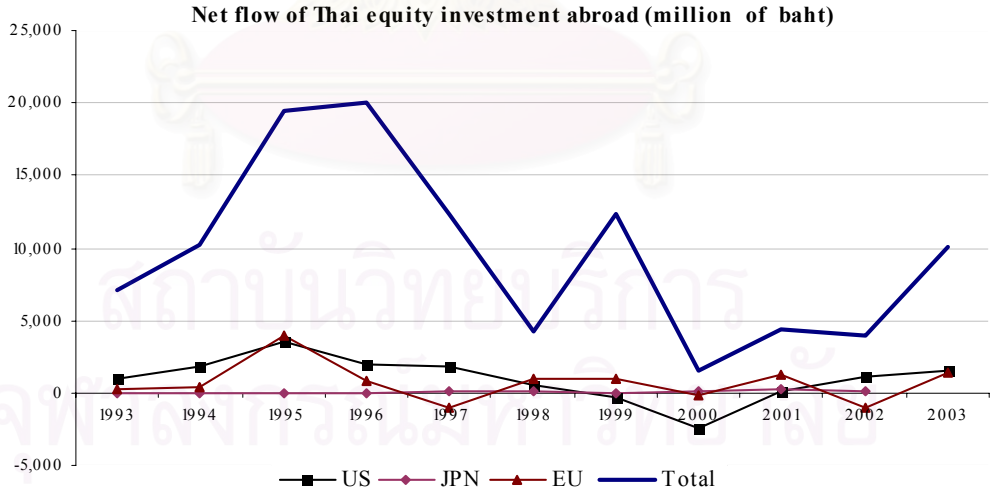

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Figure 5 Daily 1-month interbank rate

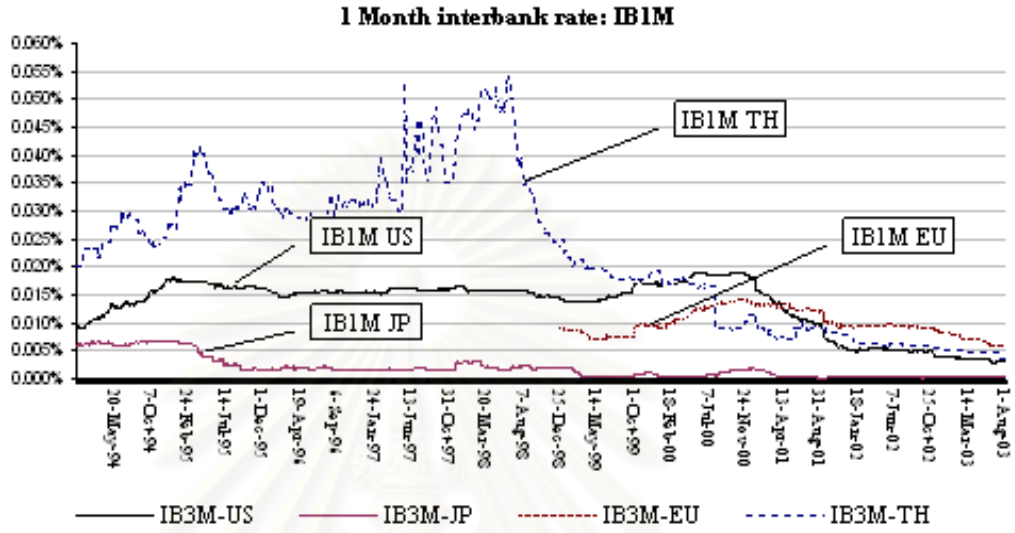

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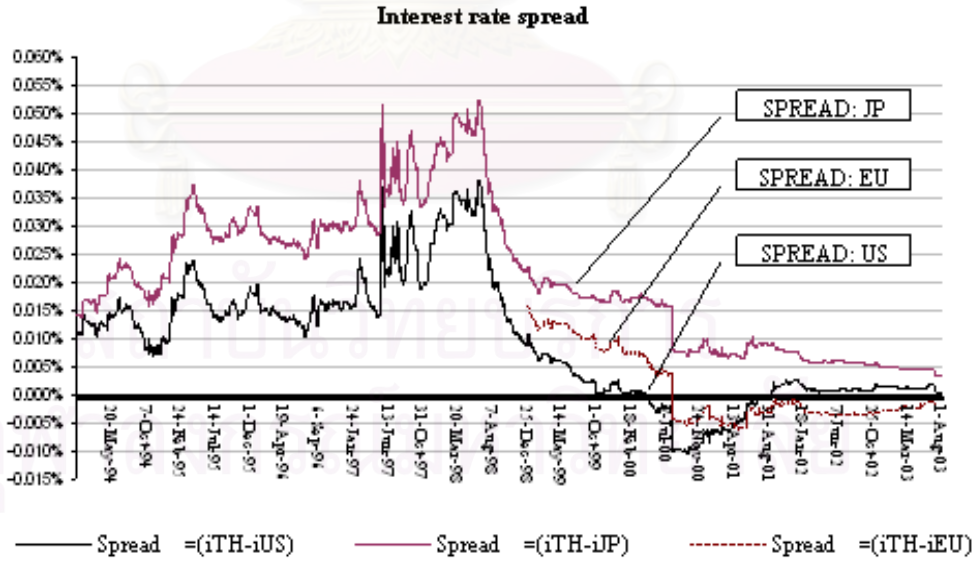
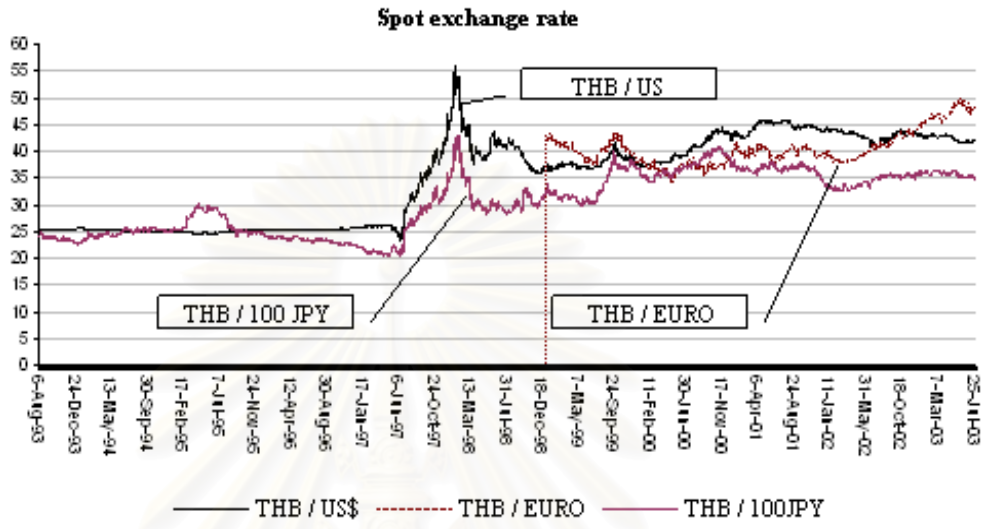
Figure 6 Daily interest rate spread



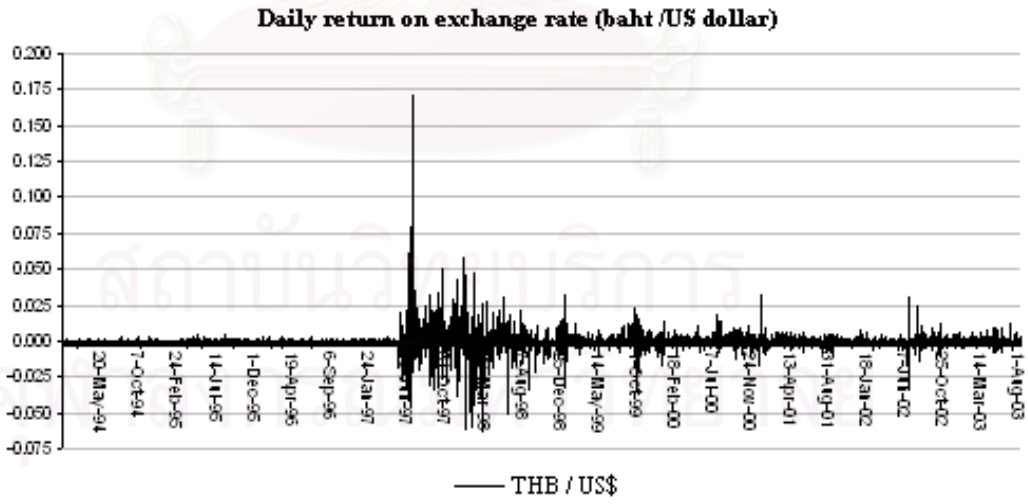
Source: DataStream

Figure 7 Daily spot exchange rate



Source: DataStream

Figure 8 Daily return on exchange rate (Baht /US dollar)



Source: DataStream

Figure 9 Daily return on exchange rate (Baht / Japanese yen)

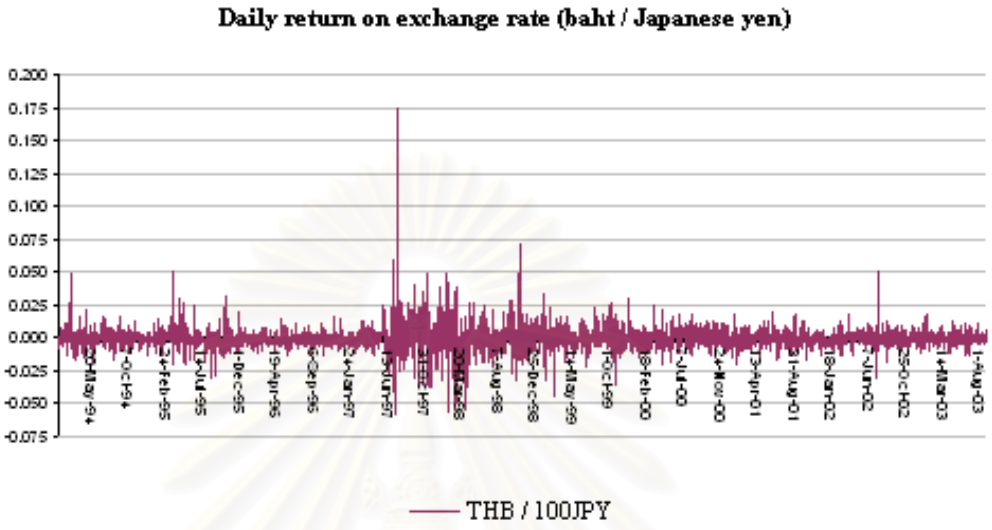


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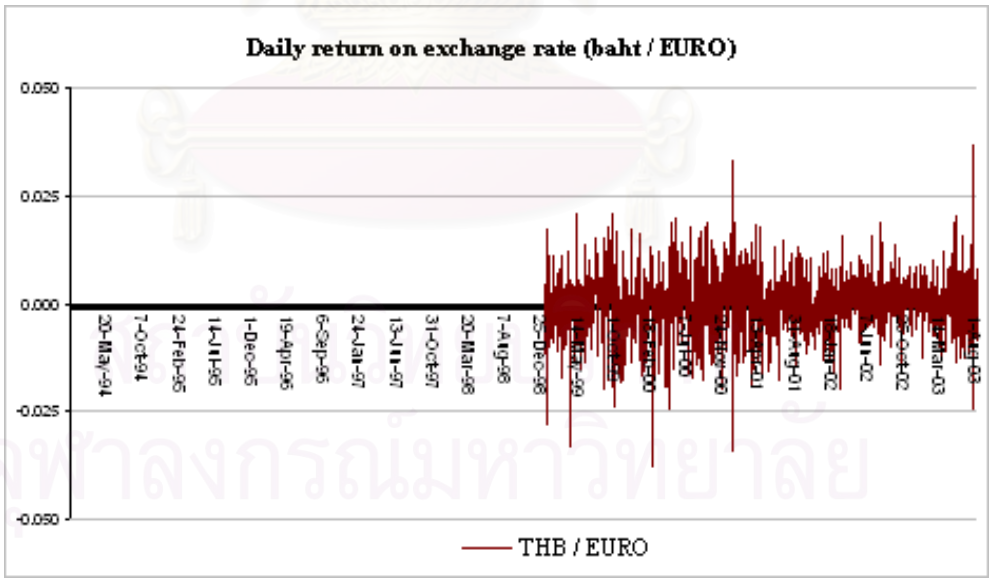
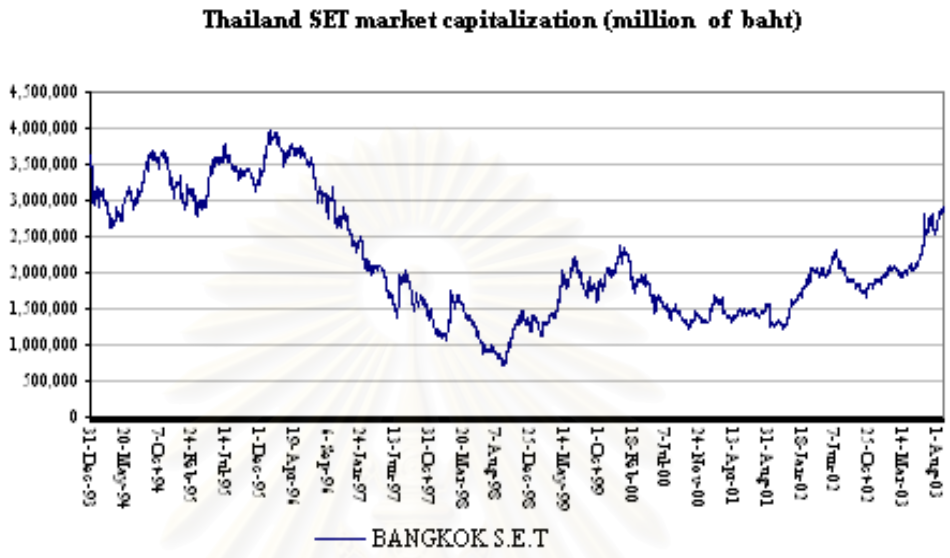
Figure 10 Daily return on exchange rate (Baht / EURO)



Source: DataStream

Figure 11 Thailand SET market capitalization



Source: DataStream

The movement of macro variables such as interest rate and exchange rate can significantly change market condition. The domestic 1-month interbank rate and interest rate spread (figure 5 and 6) show increasing volatility beginning in 1996. Domestic interest rate is high and more volatile than those of main trading partners; US JP and EU. After the crisis, domestic interest rate decreases and keeps moving in small band. All spot exchange rates (from figure 7 to figure 10) also display higher volatility after switching to flexible exchange. Finally, Thailand SET market capitalization decreases from the end 1995 to early 1997 which is the period before the crisis (figure 11).

1.2 Motivation

Many crucial issues in this area depend on whether or not currency risk is diversifiable. Ross (1976) suggests that if the economy is described by a small number of pervasive factors, then these factors may well be priced in the sense that investors must be paid premium in order to assume this risk. For this reason, hedging policy can affect the cost of capital if the exchange rate is one of those factors. However, modern portfolio theory emphasizes that investor are not willing to pay a premium for firms with active hedging policies if foreign exchange risk can be diversified away.

In this paper, I examine whether exchange rate risk is priced in financial market in Thailand by using multi-factor model. The main factors are a market factor and exchange rate factor. In addition, the model will incorporate the following factors, which may be priced: they are the first difference of interest rate spread and interest rates.

1.3 Objective

1. To investigate exchange rate exposure and the effect of exchange rate regime change on the exposure as well as difference exposure among industries.

2. To investigate the following explanatory variables that may influence stock return: error of interest rate spread, domestic interest rate and foreign interest rate.

3. To estimate risk premium that is compensated in any sub-periods.

1.4 Benefit of the Study

This study will explicitly measure the exposure of exchange rate risk and exchange rate compensation. For equity investment, both domestic and foreign investors will know how to group portfolio which diversify away exchange rate risk, to use other financial instruments together for hedging the exposure and to know the amount of compensation for the exposure. For private or commercial loaners, they will take this risk to their cost when they give credit to the business of borrower that face foreign transaction.

1.5 Organization of the study

The study is organized as follows. Chapter 2 reviews related theories such as Purchasing Power Parity (PPP) and International Fisher Effect (IFE) and related empirical studies. Chapter 3 outlines the methodology and data used in the analysis. Chapter 4 reports empirical results. Finally, conclusion and additional suggestion are contained in chapter 5.

CHAPTER II

THEORETICAL BACKGROUND AND REVIEW OF RELATED STUDIES

This chapter reviews related theories such as Asset Pricing Model (APM), Purchasing Power Parity (PPP) and International Fisher Effect (IFE) to support the model and empirical studies. The extension of exchange rate exposure is described in appendix.

2.1 Theoretical Background

This chapter starts with the definition of exchange rate exposure. The most widely used definition of the exposure is as follow: if the value of a firm share is influenced by changes in currency values, it exhibits exchange rate exposure (Adler and Dumas (1984)). In general, the impact of a given exchange rate is determined by the position in foreign currency of the firm, either long or short. The firm with net long position in foreign currency will benefit (suffer) from depreciation (appreciation) of the home currency, while the firm with net short position in foreign currency will suffer (benefit) from depreciation (appreciation) of the home currency. It is regarded as exposure because it influences cash flow, revenue or expense stream of the firm. The direction of exposure depends on activities of the firm such as import, export, or its foreign investment.

To explain the return, we need asset pricing models. The earliest and probably most famous asset pricing model is CAPM. CAPM determines equilibrium expected return on risky assets as follow:

$$R_i = R_f + \beta_i (R_m - R_f), \qquad \beta_i = \frac{\sigma_{i,m}}{\sigma_m^2}$$

While, R_i is expected return on asset, R_m is expected return on market, R_f is risk free rate. However, a drawback of this model is that it has low explanatory power. Therefore, some later financial theories extend the set of explanatory variables from one factor, which is the market factor, to multi-factor by adding some factors that are probable sources of systematic risk. Theories that may identify these factors in the international context are below.

2.1.1. Purchasing Power Parity (PPP)

There are two versions of Purchasing Power Parity (PPP). Absolute PPP states that - given any two countries - the exchange rate between two countries should equal to the ratio of the two countries' relative price levels. This refers to the equalization of real price levels across countries. Another version is relative PPP that is the percentage change in exchange rates, over any period, equals the difference in the percentage price changes of different countries. It refers to the equalization of real price changes across countries. The deviation from PPP identifies exchange rate exposure as a possible factor. The adding of exchange rate factor should increase the explanatory power

2.1.2 International Fisher Effect (IFE)

International Fisher Effect (IFE) or Uncovered Interest Parity (UIP) links exchange rate, interest rate and inflation rate. It is the combination between the generalization of the Fisher Effect[1] and the relative version of the Purchasing Power

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[1] This theory state that the nominal interest rate in a country is determined by the real interest and expected inflation rate over the term of interest rate as below

(1 + nominal interest rate) = (1 + real interest rate)(1 + expected inflation rate)

It means that the real interest rates across countries will be equal due to the possibility of arbitrage.

Parity. It states that the future spot exchange rate can be determined from the nominal interest rate differential. In continuous form (Hoontrakoon 1999), it can be written as

$$(i_d - i_f)_t = \alpha + \beta \ln[FX_{t+1}/FX_t] + s_t$$

While, i_d is domestic interest rate, i_f is foreign interest rate and FX is direct quote exchange rate. If coefficient (β) is not significant, or not approximately one, and constant term (α_i) is not roughly zero then IFE is violated.

An implication of this theory is that the rate of return from investment in domestic security should equal to the rate of return from investment in security abroad plus the expected rate of depreciation in domestic currency.

2.2 Review of Related Studies

Many previous researches examine the relationship between macroeconomic factors and return on stock market, such as interest rate and exchange rate. The latter factor is believed to be one of the major sources of uncertainty to the value of firms. This topic has been studied in many countries such as USA, Australia, Japan, Korea Malaysia Thailand, etc. Often, the methodology employed is multi-factor model, both conditional and unconditional model. The two-factor model is obtained by extending CAPM model with an exchange rate factor. There are various estimated levels of exposure such as compare between countries, consider in domestic country (both firm-level and industry-level). The period of study includes important event such as the breakdown of Britton Woods in 1973, the Asian crisis in 1997 and the inauguration of Euro currency in 1999.

For the unconditional model, one of the early studies is by Jorion (1991). He examined the pricing of exchange rate risk in the US stock market in the period started from 1971 (the year that exchange rate become managed float) to 1987. The paper uses

two-factor (market, exchange rate) and multi-factor model (adding industrial production, expected inflation, unexpected inflation risk premium and term structure to augment the two-factor model). Concerning that the augment factors may correlate with the market factor, he also investigates orthogonalized model. The results show US industries have significant cross-sectional differences in their exposure to movements in exchange rate. However, the results do not suggest that exchange risk is priced in the US stock market during that period. Thus, it appears that the US exchange rate risk can be diversified and US investors do not require compensation for bearing its risk.

Another study is by Loudon (1993). He estimated currency risk in Australian equity market from the year 1980 to 1991. This period includes the switching of exchange regime from a managed float to free float in 1983. By using two-factor model with OLS estimation, equity returns of Australian industries display significant exchange rate exposure. Exchange rate risk is not priced in Australian equity returns. The conclusion is the same as Jorion in that investment in Australian equity market is diversifiable.

Difference results are obtained by Choi , Hiraki and Takezawa (1998), who applied both conditional and unconditional multi-factor model, augmented with interest rate factors. They consider the main industries in Japan during the period from 1974 to 1995. This period includes all economic conditions in Japan. In unconditional model, by using Seemingly Unrelated Regression (SUR), using bilateral exchange rate, currency risk is priced in both weak and strong yen periods. However the result is mixed when use trade-weight exchange rate. With conditional model, by Generalized Methods of Moments (GMM), it is priced and is an important component in the form of time-varying expected return on asset in Japan. These results still the same when exclude interest rate (regress as two-factor model) and replace national market with world market in the

model. This result is in contrast to the research of Jorion (1991) in USA, Loudon (1993) in Australia.

Like Loudon (1993) and Jorion (1991), who analyze currency exposure in cross-section. By using two-factor model, Mun and Daniel (2002) attempt to identify the determinants of cross-sectional differences in the association between the value of Korean firms (1985-1996) and the exchange rate by extracting information from available firm- level data (the ratio of foreign to total sales, foreign translation gains and losses, foreign transaction gains and losses) to measure sensitivity. This finding shows the degree of foreign involvement is positively associated with the exchange exposure. The ratio of foreign to total sales is an important determinant of its exchange exposure. This is because exchange rate fluctuations directly impact the revenues of the firms.

Gordon (1993) also examines industry-level exchange exposure for Canada, Japan and USA from 1979 to 1988 (39 industries in US, 19 industries in Canada and 20 industries in Japan). This study tests the relationship by using excess return in the two-factor model. The result shows that not greater than 35 percent of industries in all three countries have statistically significant to the exchange rate exposure. The impact of exchange rate movements on industry in Canada and Japan returns is larger than the USA. Additionally, this paper specify a function of industry characteristics on a linear-relationship with an interacted non-trade goods, an export ratio, an import penetration ratio, a measure of the reliance on internationally-priced input and the ratio of foreign asset to total asset. The non-trade goods coefficient is negative only in USA. This suggests that non-trade goods industry gain from depreciation from home currency. Industries in all three countries have negative and positive coefficients in export ratio and import ratio respectively. Internationally-priced input coefficient is positive in Japan and

Canada but negative in USA. And the ratio of foreign asset to total asset coefficient is negative in USA and Japan.

Some studies also consider a specific industry at the firm-level. Khoo (1994) employs two-factor model to estimate foreign exposure from 1980 to1987 in the listed-mining companies. This industry is the highest export per GDP ratio in Australia industry. For the exchange rate factor, he chooses some of bilateral exchange rates that specifically related to company transaction to regress. The result shows the proportion of stock return explained by exchange rate movements are found to be small in both sign.

The event study emphasizes on the impact on a specific economic condition to the exchange rate exposure. Ramasamy (2000) considered the degree of foreign exchange rate exposure after the Asian financial crisis among Malaysian multinational firms and also study factors that may affect exchange rate sensitivity. The approach uses two factor-model and the results show that approximately 40 percent has currency exposure. In this amount, roughly 90 percent has negative significant exposure (mean that depreciation in domestic exchange rate has no benefit to the value of firm). The study also tests the possible factors that may affect the exposure such as foreign asset, foreign sale and foreign profit by regress as explanatory variable of currency coefficient. This includes the separation of the firm size by market value. He concludes that a larger firm is more exposed to the foreign rate volatility. Proportion of foreign sale and proportion of foreign profit shows significant correlation. The larger of foreign involvement, the smaller magnitude of exposure. The reason behind this result is that foreign activity indirectly acts as a form of hedging in that diversifying into other regions.

In South Korea, Byung-Joo Lee (2001) tries to examine the effect of the exchange movement on individual firm and compare between pre and post crisis. It shows that 20 percent of Korean firms' stock performances are statistically significant to the exchange

rate and there are structural changes before and after the economic crisis by transform from the strong positive relationship (depreciation may helps company for stock performance) to weak relationship. This turns to be the majority problem because of short-term debt and other economic conditions. Otherwise, the currency depreciation has obviously different impact between small and large company.

The breakdown of Bretton wood system which switches from fixed to floating exchange rate is the topic for Bartov and Gordon (1996) to consider the exposure in US multinational firms on two five-years around 1973. This is different from the others because they examine the relation between exchange variability and stock return volatility. They find relatively increasing in stock return variance between the fixed exchange rate period and the floating exchange rate period. The relative is larger for US multinational firms than for domestic firms. For the traditional test, only market risk dummy in 1973, they find a significant increase in market risk in US multinational firms corresponding to the increasing to the increasing in exchange rate volatility.

For the advent of Euro currency in 1999, Bartram and Karolyi (2003) consider the effect of this introduction to exchange rate exposure on non-financial firms in Europe, US and Japan. The results show that the Euro currency leads to a significant decrease in the volatility of trade weighted exchange rates for most European countries. The coming of the Euro currency is accompanied with significant reductions in market risk for non-financial firms in Europe as well as in the United States and Japan. The impact is larger for firms with high foreign sales in Europe, high total foreign sales and high market capitalization.

Another interesting issue is the different exposure between developed market (DC) and emerging market (LDC). Doige, Griffin and Williamson (2000) utilize firm data in 21 DCs and 29 LDCs from 1975 to 1999 and regress in traditional model, two-

factor model. They find that exposure is generally greater in LDCs than DCs and small for both. They also re-evaluate exposure by looking at the different return between high foreign sale portfolio and no foreign sale portfolio and find that high foreign sale portfolio is more exposed. For high foreign sale firm, large firms are more sensitive to the exchange rate than small firms. All these results rest on the assumption of constant exchange rate exposure. Moreover, these results are corresponding with the results in the 2002 publication which consider in 18 countries (most of them are DCs). This paper additionally tests the factors that will affect the sensitivity of exchange rate. The conclusion is that large firm with high level of export sale has low return during period of currency appreciation.

The kind of factor used in the model is important because it may yield different result. Gordon and Wang (2000) provide some weight-issue of the market factor. That is the difference result between using equal-weight and market-weight from the sample of the US firms from 1977 to 1996. They use equally weighted market portfolio treats each firm exposure equally in terms of determining the market exposure. They explain that value-weighted market returns are dominated by large firms. And these are more likely to be multinational and/or export oriented and is more likely to experience negative cash flow reactions to home currency appreciations than other firms. Therefore, including the value-weighted market return in an exposure test not only removes the standard macroeconomic effects, but also the more negative cash flow effects of larger firms. This would likely bias tests toward finding no currency exposure. By two-factor model, they demonstrate that different definition of the market portfolio results in important differences in the over all distribution of exposure estimates and the interpretations of the sign, size and significance of many firms currency exposure.

Sometimes response of stock return from exchange rate movement is not contemporaneous and may have lagged distribution of this explanatory variable. He and Ng (1998) investigate Japanese multinational firms from 1979 to 1993 (146 Japanese multinational firms in 6 industries: chemicals iron and steal machinery, electric machinery, transport equipment and precision equipment.). The issues are whether the value of these corporations is affected by change in exchange rate and whether lagged of exchange-rate return have any explanatory power to current stock returns. They find that 25 percent of these firms are significant exposure in whole period and two sub-period of study (depreciation of yen /foreign currency benefit to stock return) and no lagged effects. They also determine the level of firm international operation and size effect. The more foreign activity, the larger exchange exposure. The larger firm size, the more exposure. This result of lagged currency exposure is in contrast to the research of Bartov and Bodnar (1994), who examine US firms from year 1978 to 1989. They find that excess returns of these firms show no correlation with the contemporaneous change in the dollar, while the lagged change in the value of dollar is a significant variable in explaining these returns. This is true even in sub-periods (1978-1983 and 1984-1990). They give the reason that investors do not use all freely available information to predict change in firm value.

In Thailand, there are studies of foreign exchange rate risk to the sector return in Thai stock market (SET). Kamolsakamchorn (1998) examines exchange rate exposure according to the definition following "not only a change in exchange rate may cause a change in the stock prices, but a change in stock prices could also cause a change in exchange rates". He investigates this long-run relationship from 1987 to 1998 (with 2 sub-periods pre-and-post July 2000) by using Vector Auto Regressive (VAR). The result shows no relationship during the fixed exchange period. This is the same as expected because the exchange is pegged to the US dollar and BOT will announce a daily

exchange, so a change in exchange rate and a change in the stock prices have separate movement. After switching the exchange rate regime, the change of returns cause a change in exchange rate instead which may cause from the expectation about the large exchange rate loss of most of the companies in the stock market. Another result is that an increasing exchange rate, or depreciation in domestic currency, has negative effect on the domestic stock market, and vice versa.

There are currency risk studies follow Choi, Hiraki and Takezawa (1998) methodology. The studies concern the main trader which is United State and then use bilateral exchange rate, baht per US dollar. The first one is Koonvisal (2003). He uses the unconditional three-factor model and the conditional model. He uses the sample monthly data in the main trader (US) and emphasizes on the high volume trading sectors include twelve industries during 1992 - 2003 in monthly data return. He also examines the difference between pre-crisis and post-crisis as well as the whole period. The results of unconditional model show that, this risk has no affect on asset returns in pre-crisis and post-crisis period. However, in whole period this risk is the key point for a significant pricing. The conditional model proves that it can absorb the impact of changing market structure and allow for time-variability in pricing of exchange risk coefficient. This conditional model supports the outcome of unconditional model. This risk of any firms or any portfolio can reflect their value.

In contrast to the research of Tirapat and Budsaratragoon (2001), who emphasize on only securities traded on alien board of Stock Exchange of Thailand (SET). During the sample period from 1988 to 1997, by using SUR estimation, the overall results suggest that the foreign exchange risk is not priced. However when the sample is divided in to two sub-periods, this risk is price in recent sub-period.

For unconditional model, the related studies are summarized in table 2.1.

Table 2.1 Summary of related studies

Authors	Scope	Methodology	Results
1. Jorion (1991)	• US stock market. • Period: 1971 – 1987 with monthly frequency.	• Two-factor and multi-factor model with OLS	• Exchange rate risk displays significant exposure. • However, this risk can be diversified and US investors do not require compensation for bearing its risk.
2. Loudon (1993)	• Australian equity market • Period: 1980 – 1991 with monthly frequency.	• Two-factor and multi-factor model with OLS	• Exchange rate risk is not priced in Australian equity returns • The conclusion is the same as Jorion in that investment in Australian equity market is diversifiable.
3. Gordon (1993)	• Canada, Japan and USA. • Period: 1980 – 1991 with monthly frequency.	• OLS estimation. • Use trade-weighted exchange rate.	• Not greater than 35 percent of industries in all three countries have statistically significant to the exchange rate exposure. The impact in Canada and Japan is larger than the US. • Non-trade goods US industry gain from depreciation from home currency. • Industries in all three countries have negative and positive coefficients in export ratio and import ratio respectively. • Internationally-priced input coefficient is positive in Japan and Canada but negative in USA. • The ratio of foreign asset to total asset coefficient is negative in USA and Japan

Authors	Scope	Methodology	Results
4. Khoo (1994)	• Australian listed-mining companies. • Period: 1980 – 1987 with monthly frequency.	• Two-factor model. • OLS estimation.	• The proportion of stock return explained by exchange rate movements is found to be small in both sign.
5. Bartov and Gordon (1996).	• US multinational firms. • Period: 1968 – 1982 Quarterly frequency.	• OLS estimation.	• US-MNCs have more exchange rate risk than for domestic firms. • Testing only market risk dummy in 1973, they find a significant increase in market risk in US-MNCs corresponding to the increasing to the increasing in exchange rate volatility.
6. Choi, Hiraki and Takezawa (1998)	• Main industries in Japan. • Period: 1974 – 1995 with monthly frequency	• Multi-factor model, augmented with interest rate factors. • Unconditional model uses SUR. • Conditional model uses GMM	• In conditional and unconditional model, currency risk is priced in both weak and strong yen periods. • This is still the same when exclude interest rate (regress as two-factor model) and replace national market with world market in the model.
7. He and Ng (1998)	• 146 Japanese multinational firms.	• Two-factor model. • OLS estimation.	• 25 percent of these firms are significant exposure depreciation of yen /foreign currency benefit to stock return).

Authors	Scope	Methodology	Results
	• Period: 1979 – 1993 with monthly frequency	.	• The more foreign activity, the larger exchange exposure. • The larger firm size, the more exchange rate exposure. • In contrast to Bartov and Bodnar (1994) - US firms from 1978 -1989, they find that excess returns of these firms show no correlation with the contemporaneous change in the dollar. They give the reason that investors do not use all freely available information to predict change in firm value.
8. Kamolsakamchorn (1998)	• Stock Exchange of Thailand (SET) • Period: 1987 – 1998 with monthly frequency.	• Vector Auto Regression (VAR).	• No relationship during the fixed exchange period. • After switching the exchange rate regime, increasing exchange rate, or depreciation in domestic currency, has negative effect on the domestic stock market, and vice versa.
9. Ramasamy (2000)	• 146 Malaysian multinational firms. • Period: 1996 – 1998 with monthly frequency.	• Two-factor model. • OLS estimation.	• The results show that approximately 40 percent has currency exposure. In this percentage, roughly 90 percent has negative significant exposure. • A larger firm is more exposed to the foreign rate volatility. • Proportion of foreign sale and proportion of foreign profit shows significant correlation. The larger of foreign involvement, the smaller magnitude of exposure because foreign activity indirectly acts as a form of hedging (diversifying into other regions).

Authors	Scope	Methodology	Results
10. Doige, Griffin and Williamson (2000)	• Use firm data in 21 DCs and 29 LDCs. • Period: 1975 – 1999 with monthly frequency	• Two-factor model. • OLS estimation.	• They find that exposure is generally greater in LDCs than DCs and small for both. • High foreign sale portfolio is more exposed. In high foreign sale firms, large firms are more sensitive to the exchange rate than small firms. • These results are as same as for Doige, Griffin and Williamson (2002) publication which considers in 18 countries (most of them are DCs). Large firm with high level of export sale has low return during period of currency appreciation.
11. Gordon and Wang (2000)	• US firms from 1977 to 1996	• Two-factor model	• Different definition of the market portfolio results in important differences in the over all distribution of exposure estimates and the interpretations of the sign, size and significance of many firms currency exposure.
12. Lee (2001)	• 506 South Korean companies. • Period: 1990 – 2000 with monthly frequency	• Two-factor model. • OLS estimation.	• 20 percent are statistically significant to the exchange rate. • There are structural changes between pre and post economic crisis by transform from strong positive relationship to weak relationship • The currency depreciation has obviously different impact between small and large company.
13. Tirapa and Budsaratragoon (2001)	• Stock Exchange of Thailand • Period: 1990 – 2000 with monthly frequency.	• Follows Choi, Hiraki and Takezawa (1998) methodology.	• The foreign exchange risk is not priced. However when the sample is divided in to two sub-periods, this risk is price in recent sub-period.

Authors	Scope	Methodology	Results
14. Mun and Daniel (2002)	• Korean firms (1985-1996) with yearly frequency.	• OLS estimation.	• The degree of foreign involvement is positively associated with the exchange rate exposure. The ratio of foreign to total sales is an important determinant of its exchange exposure.
15. Bartram and Karolyi (2003)	• 12,821 Non-financial firms in Europe, US and Japan from Jan 1973 – Aug 2001 with monthly frequency.	• Follow Adler and Dumas (1984).	• The Euro currency leads to a significant decrease in the volatility of trade weighted exchange rates for most European countries. • The coming of the Euro currency is accompanied with significant reductions in market risk for non-financial firms in Europe as well as in the United States and Japan. • The impact is larger for firms with high foreign sales in Europe, high total foreign sales and high market capitalization.
16. Koonvisal (2003).	• Stock Exchange of Thailand • 12 high volume trading industries. • Period: 1990 – 2000 with monthly frequency.	• This study follows Choi, Hiraki and Takezawa (1998) methodology.	• The results of both conditional and unconditional model show that this risk is not significant impact on asset returns in pre-crisis and post-crisis period (crisis: 1997). • However, in whole period this risk is the key point for a significant pricing.

This study follows Iorio and Faff (2002) methodology. They provide some insight into the pricing of exchange risk in the Australian equities market for the period 1988-1998. They use daily data for testing a basic version of the model with Generalized Methods of Moments estimation (GMM). The result shows that this risk is priced in the market for the full sample period and the analysis of four sub-periods to test the change of exposure show that the pricing occurs in periods of economics decline and secularly weak Australian dollar (1990-1993 and 1997-1998) They also test a zero beta version and the result supports the initial findings.

For the conditional model, there are many researches such as Dumas and Solnik (1995), Choi, Hiraki and Takezawa (1998), Chiang (1991). This paper, however, does not intent to test conditional model.

Overall, some of the previous research rest on the assumption that the price of exchange is constant through time and most consider the changing of the exposure by investigate in sub-period. There is commonly used monthly return data frequency to test the exposure. These models, especially unconditional model generally use OLS to regress and test results to be robust cross industry correlation, heteroscedasticity and serial correlation in the residuals. Most of the results show insignificant relation between return on stock and return on exchange rate in each country level. There are some reasons to support why the exposure is insignificant, those are

- In multinational company, they often reduce their by diversifying their operations across different countries.
- Companies engage in active risk management and hedge foreign exchange exposure though financial instruments that offset adverse valuation effects.

However, at industry level or firm level, they show significant relation between exchange rate return and stock return. Corresponding with event study which is looking for the period after switching exchange rate regimes, most show that exchange rate exposure are larger after this changing in monetary policy. Most indicate that large firm has large exposure of exchange rate than small firm. The reason to support this point is that larger firms have access to risk management expertise and have economy of scale for hedging costs. On the other hand, there are circumstances where smaller firms have more incentive to hedge than larger firms in that smaller firms face greater bankruptcy cost (He and Ng, 1998). The firm with high percent of export or in kind of multinational firms has higher exposure than others. Some of research also measure causes of sensitivity. They find that the factors that have substantial affect to currency are different in each study.

2.3 In this study

This study will follow the methodology of the Australian research, Iorio and Faff (2002) who uses unconditional multi-factor model. It implies a linear relation between expected returns and the sensitivity to factors such as market, exchange rate and interest rate spread. This follows the definition of the exposure that if value of a firm is influenced by changes in currency values, it is exhibit exchange rate exposure (Adler and Dumas (1984)). This paper differs from other research in this area in many ways as below.

- Most of conditional-model studies use GMM but this paper use unconditional model with GMM (follow Iorio (2002)).

- This study does not use trade weight index like many researches, only use bilateral exchange rate, domestic per foreign currency. Trade weight exchange rate, the rate which generally weighted by industry-specific exports across country, is convenient to use and avoid the problem of multicollinearity that may arise when several exchange rates foreign currency may use an appropriate when regress on country-level. However in industry-level and firm-level, the test lack power because firm structure or industry structure does not corresponding with exchange rate include in the basket. And this research will also consider in industry level, so the study will not use this kind of exchange rate.
- Gordon and Wang (2000) provide an issue about market factor. Anything being equal, value-weight and equal-weight market index yield difference output. In this study, the proxy of market factor uses value-weight index.
- The additional factors that this study includes are the first difference of interest rate spread and domestic (foreign) interest.
- Like Bartov and Gordon (1996), Ramasamy (2000), Lee (2001), Sohnke and Karolyi (2003), this paper will also concern to test the different effect between pre-and-post switching exchange rate regimes

CHAPTER III

METHODOLOGY AND DATA

This chapter outlines the methodology and data. For this reason, there are three specifications to be test. The first specification is based on a basic two-factor model. The second specification adds an additional factor: spread between domestic interest rate and foreign interest rate. While the last specification adds domestic interest rate and foreign interest rate.

3.1 Methodology

This paper estimates factor models of asset pricing, including market factor, exchange rate factor and interest rate spread as well as interest rate. The estimation method employed is Generalized Methods of Moments (GMM).

The GMM has several advantages that make it popular in financial model analysis. First, joint estimation of all model parameters reduces the errors-invariables problem. Second, the GMM does not rely upon the assumption of normally distributed asset returns, that is the disturbance term can be both serially dependent and conditionally heteroskedastic. In fact, the only requirements are that the data is strictly stationary and ergodic (Hansen (1982), MacKinlay and Richardson (1991)). For this reason, GMM is chosen because the disturbance terms are potentially correlated across industries and the daily return data tend to be serially correlated.

3.1.1 The Factor Model Testing

This study starts with the traditional testing procedure by assuming null hypothesis $H_0 : \alpha_i = 0$ [for all i = 1,...,N (N = number of asset)] , α_i - constant term of factor model. Additionally, this allows a direct estimation of the risk premium and test of the null hypothesis. There are three models as below

Model 1: The basic two-factor model (market factor and exchange rate factor)

Model 2: Market factor, exchange rate factor and Spread rate factor

Model 3: Market factor, exchange rate factor and interest rate factor

Model 1: The basic two-factor model (market factor and exchange rate factor)

Investor in different countries face different price of goods at which they consume the income from their investments. Thus, exchange rate premium to compensate this risk come from the deviation of Purchasing Power Parity (PPP).

$$r_{it} = \beta_{im} r_{mt} + \beta_{ix}^{j} r_{xt}^{j} + \varsigma_{it}$$

$$r_{mt} = \lambda_m + v_t$$

$$r_{xt}^{j} = \lambda_x^{j} + \varepsilon_t^{j}$$

While,

r_{it} = the observed excess return on the i^{th} industry on day t.

= $[100 * ln (P_{it} / P_{it-1}) - risk\,free\,rate]$

r_{mt} = the observed excess return on a value-weighted market index.

= $[100 * ln (MKI_t / MKI_{t-1}) - risk\,free\,rate]$

r^{j}_{xt} = the observed excess return on the foreign exchange factor

= [$100 * ln\,(FX_t / FX_{t-1}) - risk\,free\,rate$], FX = domestic per foreign rate

β_{im}, β^{j}_{xt} = coefficients of market excess return and foreign exchange rate excess return, respectively.

λ_m, λ^{j}_{x} = the expected premium of market and exchange rate factor, respectively.

i = subscription of industry

t = subscription of time daily frequency.

j = superscription of the main currencies: US, JP and EU.

The frequency of risk free rate is changed from yearly to daily by

$Daily\ risk\ free\ rate = e^{yearly\ risk\ free\ rate\ *\ (1/360)} - 1$

The CAPM equation below determines the required rate of return (the expected rate of return) for a risky asset.

$$R_i = R_f + \beta_i\,(R_m - R_f)$$

APT offers an alternative theory to explain the rate of return by considers other source of risk. Factor model, a model of a return-generating process, relates returns on securities to the movement of one or more common factors under the assumption that returns of two securities are correlated in some way. Multiple factors models have more than one factor in the return-generating process.

$$\tilde{R}_i = R_i + \sum_{k=1}^{K} \beta_{ik} \tilde{f}_k + \tilde{\varepsilon}_i$$

$\tilde{R}_i$ is the random return. R_i is its expected value. β_{ik} is the loading of factor *k* on asset *i*. Under some assumptions, Ross (1976) shows that expected return R_i must have the following relationships to the factor loadings

$$R_i = \lambda_0 + \sum_{k=1}^{K} \beta_{ik} \lambda_k$$

Here, λ_k is the risk premium of k^{th} factor. Substituting R_i back into the above equation,

$$\tilde{R}_i = \lambda_0 + \sum_{k=1}^{K} \beta_{ik} (\lambda_k + \tilde{f}_k) + \tilde{\varepsilon}_i$$

$$\tilde{R}_i - \lambda_0 = \sum_{k=1}^{K} \beta_{ik} (\lambda_k + \tilde{f}_k) + \tilde{\varepsilon}_i$$

$$\tilde{r}_i = \sum_{k=1}^{K} \beta_{ik} (\lambda_k + \tilde{f}_k) + \tilde{\varepsilon}_i$$

This last equation means that random excess return on asset *i* consists of systematic risk and non-systematic risk compensation. The systematic risk compensation comes from expected risk premium plus factor loading. The coefficient, β_{ik}, measures the sensitivity of asset return is the k^{th} risk factor.

Model 2: Market factor, exchange rate factor and Spread rate factor

Net rate of return on investment abroad is equal to return on investment abroad deducted with cost of capital, negative effect of exchange rate, other transaction cost and

capital flow barrier. The country which higher interest rate tend to have fund inflow of investment abroad because other countries, with lower interest rate, may borrow domestic fund and invest them in the high interest rate countries. Other things being equal, the larger gap between these two rates, the greater incentive for bank to borrow abroad and lending to domestic borrower who has no access to foreign credit. Because this substitutability of foreign debt, change in the gap can also influence capital flows to Thailand.

Theoretically, return from exchange rate may correlate with gap between domestic interest rate and foreign interest rate. This follows from International Fisher Effect (IFE). The implication of this theory is that the gap affects investment flow-fund between countries which have different interest rates.

IFE is violated if return on investment is not equal between the two countries. From correlation between spread and return on exchange rate (Table 3.1), shows that International Fisher Effect does not hold for any currencies during the examined periods because correlation both daily and weekly frequency are not greater than 0.3 (measured in absolute term). This violation is sensible in that there are other factors which cause change in spread rate. These potential factors are tax, efficient used of fund, rate of return from investment and time-lag of return on investment abroad.

Table 3.1 International Fisher Effect Correlation

	Daily			Weekly		
Period	**Jan 1, 1992 - Dec 31, 2004**			**Jan 6, 1992 - Aug 2, 2004**		
	FXUS	**FXJP**		**FXUS**	**FXJP**	
SPRUS	**0.0244**	0.0132		**-0.2382**	-0.1554	
SPRJP	0.0353	**0.0138**		-0.1330	**-0.1566**	
Period	**Jan 1, 1999 - Dec 31, 2004**			**Jan 4, 1999 - Aug 2, 2004**		
	FXUS	**FXJP**	**FXEU**	**FXUS**	**FXJP**	**FXEU**
SPRUS	**-0.0624**	-0.0350	-0.0019	**-0.2039**	-0.0986	-0.0074
SPRJP	0.0003	**-0.0160**	-0.0388	-0.0334	**-0.0439**	-0.0908
SPREU	-0.0240	-0.0103	**-0.0393**	-0.0979	-0.0274	**-0.0992**

Notation on variables:
FX = Return on Exchange Rate
SPR = Spread, the different interest rate between domestic rate and foreign rate

This study uses interest rate spread without multicollinearity problem from IFE. The system of equation is shown below.

$$r_{it} = \beta_{im}\, r_{mt} + \beta_{ix}^{j} r_{xt}^{j} + \beta_{is}^{j}\, s_{t}^{j} + w_{it}$$

$$r_{mt} = \lambda_{m} + v_{t}$$

$$r_{xt}^{j} = \lambda_{x}^{j} + \varepsilon_{t}^{j}$$

$$s_{t}^{j} = \lambda_{s}^{j} + u_{t}^{j}$$

while, s_{t}^{j} = the interest rate spread factor; which is constructed as follow. Foreign rate is subtracted with domestic rate to test IFE correlation with return on exchange rate. Stationarity is a requirement for time series data, thus the interest spread rate is taken the first difference.

β_{is} = coefficients of the interest rate spread.

λ_{s}^{j} = the mean of interest rate spread factor.

Model 3 : Market factor, exchange rate factor and interest rate factor

This model substitute the interest rate spread in model 2 by the domestic interest and the foreign interest. This is allowing the coefficients to be different.

$$r_{it} = \beta_{im} r_{mt} + \beta_{ix}^{j} r_{xt}^{j} + \beta_{i}^{j} I_{t}^{j} + \beta_{i}^{TH} I_{t}^{TH} + \xi_{it}$$

$$r_{mt} = \lambda_{m} + v_{t}$$

$$r_{xt}^{j} = \lambda_{x}^{j} + \varepsilon_{t}^{j}$$

$$I_{t}^{j} = \lambda_{I}^{j} + e_{t}^{j}$$

$$I_{t}^{TH} = \lambda_{I}^{TH} + e_{t}^{TH}$$

While,

I_{t}^{j} = the observed interest rate of each country. As same as interest rate spread factor, stationarity is a requirement for time series data, thus the interest rate is taken the first difference.

β_{I}^{j} = coefficients interest rate factors.

λ_{I}^{j} = the mean of interest rate factor.

TH = superscription of domestic currency.

This system of equations consists of sample moments condition, which are

1. The mean of the error term is equal to zero.
2. The error terms are orthogonal to the excess return in all factors. Those are
    - Market and exchange rate in model 1, there are $3N + 2$ moment equations and $2N + 2$ unknown parameters.

- Market, exchange rate and interest rate spread in model 2, there are *4N + 3* moment equations and *3N + 3* unknown parameters.
- Market, exchange rate and interest rate (both domestic and foreign) in model 3, there are *5N + 4* moment equations and *5N + 5* unknown parameters.

This is over-identify that GMM will estimate with *N* degree of freedom.

GMM = $J(\beta) = (T-N-1)[\breve{g}_t(\delta)' S_t^{-1} \breve{g}_t(\delta)]$

T = time series observations

N = number of asset *i* (industry classification)

S_t^{-1} = the weighting matrix

$\breve{g}_t(\delta)$ = $(1/T)\Sigma f_t(\delta)$, $t = 1,..,T$

= The vector of estimated coefficients across the system of equation

δ = The vector of estimated coefficients and the risk premiums.

$f_t(\delta)$ = The vector of orthogonalized condition

Model 1 = $[\varsigma_{1t} \quad \varsigma_{1t} r_{mt} \quad \varsigma_{1t} r_{xt} \quad .... \varsigma_{Nt} \quad \varsigma_{Nt} r_{mt} \quad \varsigma_{Nt} r_{xt}]^t$

Model 2 = $[w_{1t} \quad w_{1t} r_{mt} \quad w_{1t} r_{xt} \quad w_{1t} r_{st} .... w_{Nt} \quad w_{Nt} r_{mt} \quad w_{Nt} r_{xt} \quad w_{Nt} r_{st}]^t$

Model 3 = $[\xi_{1t} \quad \xi_{1t} r_{mt} \quad \xi_{1t} r_{xt} \quad \xi_{1t} I_t^j \quad \xi_{1t} I_t^{TH} ....\xi_{Nt} \quad \xi_{Nt} r_{mt} \quad \xi_{Nt} r_{xt} \quad \xi_{Nt} I_t^j \quad \xi_{Nt} I_t^{TH}]^t$

A GMM estimator for β is the β that minimizes $J(\beta)$. Deriving and solving the unknown parameter by the first order conditions.

Minimize $J(\beta)$ with respect to β

3.1.2 Hypothesis testing

Hypothesis 1: There is exchange rate exposure in Thai stock market.

$H_0 : \beta_{ix}^{j} = 0$

$H_1 : \beta_{ix}^{j} \neq 0$ by $j =$ *US, JP, EU*

Hypothesis 2: There is exchange rate risk premium to compensate for currency risk.

$H_0 : \lambda_{x}^{j} = 0$

$H_1 : \lambda_{x}^{j} \neq 0$ by $j =$ *US, JP, EU*

3.2 Scope and Data

All data are from DATASTREAM in daily series data.

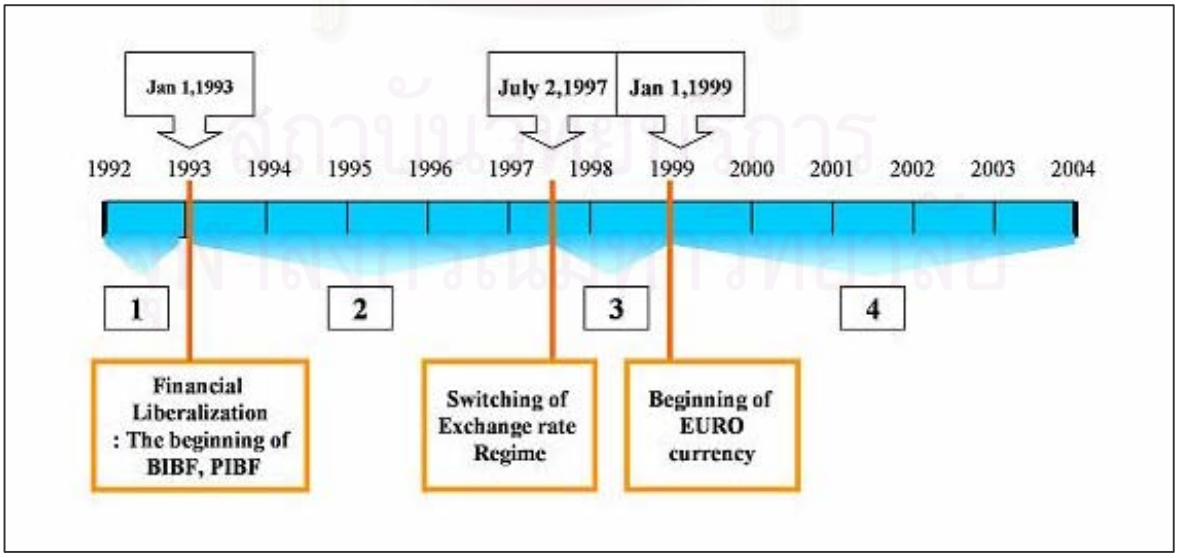
1) The period of this study is 13 year, beginning from Jan 1, 1992 to Dec 12, 2004. This period includes events such as financial liberalization, the switching of exchange rate regime and the advent of Euro currency.

- Period 1: Jan 1, 1992 to Dec 31, 1992
- Period 2: Jan 1, 1993 to July 1, 1997

  1993: monetary policy allows financial liberalization, the advent of the Bangkok International Banking Facilities (BIBF) and the Provincial International Banking Facilities (PIBF).
- Period 3: July 2, 1997 to Dec 31, 1998

  July 2, 1997: the switching of domestic exchange rate regime.
- Period 4: Jan 1, 1999 to Dec 31, 2004

  1999: the advent of Euro currency



2) Spot exchange rate, direct quote: domestic currency per foreign currency rate, use domestic currency (Thai baht) and foreign currency (US dollar, Japanese yen and Euro)

3) The proxies of foreign interest rate are 1-month interbank rate in each countries and domestic interest rate is 1-month interbank rate (the average 1-month interbank rate of two major domestic banks: Bangkok Bank, Siam Commercial Bank).

4) The proxy risk free rate uses 1-month interbank rate (the average 1-month interbank rate of two major domestic banks: Bangkok Bank, Siam Commercial Bank).

5) The proxy of market return uses SET index return.

6) The proxy of industry return use industry index to calculate return. There are totally 26 industries, classified according to DATASTREAM.

	Code		Code		Code
1	BNGKAUT	11	BNGKFIN	21	BNGKPPH
2	BNGKBNK	12	BNGKFDI	22	BNGKPET
3	BNGKCOM	13	BNGKHCS	23	BNGKPRN
4	BNGKCMM	14	BNGKHOT	24	BNGKPFS
5	BNGKCTR	15	BNGKHHG	25	BNGKPDV
6	BNGKEPC	16	BNGKINS	26	BNGKTLO
7	BNGKELC	17	BNGKMEQ		
8	BNGKENG	18	BNGKMIN		
9	BNGKENR	19	BNGKPAK		
10	BNGKFHN	20	BNGKPPM		

CHAPTER IV

EMPIRICAL RESULTS

This chapter presents the result of regression analysis of the model proposed in chapter 3. The first section provides descriptive statistics of both dependent and independent variables, and the correlation among independent variables. The second section summarizes and discusses the results. The results of each model are separated into 3 panels, categorized by trading partner.

4.1 Preliminary Analysis

Table 4.1 and 4.2 exhibit the statistical data composed of mean, standard deviation, minimum, maximum, and median, of studied variables. The studied variables include excess return on 26 industries, market excess return, exchange rate excess return, spread rate, foreign interest rate and domestic interest rate. Referring to the statistics of industries in table 4.1, for the whole period of 1992 to 2004, mining sector records the maximum excess return (25.9163), while the minimum excess return is noted in property development sector (-93.2946). The deviation of excess return is highest in finance & security sector (3.1026) in contrast to insurance sector that records the lowest deviation of excess return (1.0306). For all industries, the average excess returns in percentage range from -0.0818 to 0.0536. From 1993 to 1998, most industries have mean excess return around zero while the volatility is rather high, ranging from 1.0215 to 5.8795. More specifically, after crisis: July 2, 1997 - Dec 31, 1998, property development sector records the minimum excess return (-93.2946) as well as the maximum standard deviation (5.8795). In sub-period: Jan 1, 1999 - Dec 31, 2004, the maximum excess

return (25.9163) and standard deviation (3.0904) are of mining sector. Insurance sector records the smallest deviation after 1993 (1.0215 in 1993 - July 1, 1997, 1.5215 in July 2, 1997-1998 and 0.7838 in Jan 1, 1999 - Dec 31, 2004).

For macro variables in table 4.2, market excess return is highly volatile after the crisis, especially during the period July 2, 1997 - Dec 31, 1998 (2.7779). This excess return is the most volatile among all explanatory variables. Exchange rate excess returns of all currencies fluctuate more after the crisis, especially in July 2, 1997 - Dec 31, 1998. (1.7908 in US dollar and 1.8853 in Japanese yen)

Correlations among explanatory variables are shown in table 4.3. High correlation can cause a multicollinearity problem. There are few high-correlation pairs among explanatory variables, however these pairs are not regressed in the same equation system. Thus, all the models do not suffer from multicollinearity problem.

In unreported results of testing autocorrelation and heteroscadasticity, the error terms of most industry equation have relationship among disturbances and variance of the error terms are not constant**.** The usual approach when facing heteroscadasticity of unknown form and autocorrelation is GMM. GMM makes use of the orthogonality condition to allow for efficient estimation but it may have disadvantage from poor finite sample performance. This study, however, uses large number of observations[1] that should alleviate this problem.

Ergodicity and stationarity are required for GMM. To investigate the stationarity of data, all series, both dependent and independent variable, are tested by Augmented Dickey – Fuller (ADF) procedure. The test which is conducted for excess return on

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[1] In Iorio (2000), the statistic has had the small sample adjustment applied following MacKinley and Richardson (1991).

industry, excess return on market and excess return on exchange rate, show that these series are stationary. For augmented variables, spread and interest rate, the series are taken to the model by first difference because at level these series are non-stationary. Explanatory variable and instrument variable will assume to be ergodic (from asymptotic theory). That is the series are not assumed to be a function of time.

4.2 Empirical Results

In two-factor model (model 1 in table 4.4), the estimates of market coefficient (β_{im}) are positive in all industries. This is not surprisingly in that return on firm move together with market return. Sectors whose market coefficients are greater than 1.0 are banking, financial & securities and property development. These sectors are high growth of market value and stimulate domestic stock market. The sector which has low market coefficient and sometime is not greater than 0.1 is professional service. Risk premium of market factor (λ_m) is not significant in all sub-periods. The robustness is supported by the results of system equation in all regressors of bilateral currency.

Referring to the theory, exchange rate exposure occurs when the changing of exchange rate return statistically influence return on firm (measured by β_{ix}). Investors who invest in foreign currency face this risk and need the compensation when exchange rate risk is price (measured by λ_x). Exchange rate coefficient (β_{ix}) describes how benefit (+) or suffer (-) from depreciation (or appreciation) of domestic currency. The industry status depends on both financial market transaction on foreign currency (long or short) and economic activity (importer, exporter, import competitor and non-traded goods producer). An industry that has net long foreign currency will benefit from depreciation of domestic currency after the crisis because there is no cost of converting foreign debt to

the lender currency. Also, an industry that is net exporter as well as import competitor will benefit from term of trade shift up. Then its net trade value measured in domestic currency is greater.

As anticipated, there is no significant exchange rate coefficient (β_{ix}) in all currency before the crisis. The movement of exchange rate in a small band does not affect return on industry.

After the switching of exchange regime in 1997, daily spot exchange rates in all bilateral currency depreciate rapidly as shown in figure 7. Standard deviations are also higher as shown in table 4.2 panel D. The baht per US dollar exchange rate moved roughly from 25 to 60 within 6 months. In table 4.4 panel A, the high growth of market value sectors (banking, financial & securities and property development) are sensitive to the exchange rate variation. The coefficients (β_{ix}^{US}) are -0.1038 (t-stat = -2.4222) in banking sector, -0.2806 (t-stat = -3.8842) in finance & securities sector and -0.1612 (t-stat = -1.9103) in property development sector. The negative coefficient in this sub-period refers to bad consequence from the switching of exchange rate regime. These sectors are in over-foreign loan status by using off-shore funds and taking them to serve domestic activity. Most firms in these sectors are in situation of mismatching payback period loan, lack of cash flow and, finally, full of non-performing loan (NPL). Corresponding with Japanese yen, table 4.4 panel B, finance & securities and property development are just two sectors in negative sign. The coefficient is smaller than US currency in finance & securities sector (β_{ix}^{JP} = -0.2099, t-stat = -4.0302) and almost equal to US currency in property development sector (β_{ix}^{JP} = -0.1677, t-stat = -2.1130).

Nevertheless, some sectors benefit (suffer) from depreciation (appreciation) of home currency. For the bilateral currency: domestic per US dollar (table 4.4 panel A),

transportation & logistics is the sector with highest coefficient (β_{ix}^{US} = 0.1731, t-stat = 2.4592). Other sectors with large coefficient are electronic component (β_{ix}^{US} = 0.1345, t-stat = 1.9675), energy & utility (β_{ix}^{US} = 0.1031, t-stat = 2.9774) and food & beverages sector (β_{ix}^{US} = 0.0918, t-stat = 1.8712). These sectors are rationally in that they are export growth drivers. The analogous results are shown in table 4.4 panel B when regress the bilateral currency as domestic per Japanese yen. There are also 4 sectors , which are commerce sector (β_{ix}^{JP} = 0.0848, t-stat = 1.7253), energy & utility sector (β_{ix}^{JP} = 0.0718, t-stat = 2.1937), transportation & logistics sector (β_{ix}^{JP} = 0.1161, t-stat = 2.0662) and mining sector (β_{ix}^{JP} = 0.2081, t-stat = 3.3294), the highest β_{ix} in this sub-period: July 2, 1997 - 1998.

The effect of depreciation in domestic currency in this sub-period is not significant. The exchange rate risk premiums (λ_x^{US} , λ_x^{JP}) are not significant for both US dollar and Japanese yen currency.

After 1999, Euro currency is officially used by EU members. During this sub-period, all currency fluctuate less than the sub-period July 2, 1997 – 1998 (figure 7). In table 4.2 panel E, US dollar has the smallest standard deviation while Japanese yen has the largest standard deviation. From table 4.4 panel A, it can be seen that sectors are sensitive to the US exchange rate movement. Household goods sector and health care service sector suffer (benefit) from depreciation (appreciation) of home currency with the coefficient (β_{ix}^{US}) -0.1782 (t-stat = -2.0167) and -0.1518 (t-stat = -2.2661), respectively. The mining sector has positive sensitivity (β_{ix}^{US}) which is 0.3396 (t-stat = 3.3111). This is the highest value comparing with other bilateral currency in this sub-period. This sector also has the highest β_{ix} in the sub-period: July 2, 1997 - 1998. Table 4.4 Panel B shows

the result of exchange rate risk when the regressor of bilateral exchange rate is baht per Japanese yen. Professional service sector states the coefficient (β_{ix}^{JP}) -0.1395 (t-stat = -2.0864), while hotel & travel service sector and petrol & chemical sector exhibit coefficients (β_{ix}^{JP}) 0.0588 (t-stat = 2.0571) and 0.1721 (t-stat = 3.2460), respectively. Also with table 4.4 panel C, electric products & computer and electron component exhibit statistical coefficients (β_{ix}^{EU}) -0.0943 (t-stat = -1.8935) and -0.2363 (t-stat = -2.8269), respectively.

Furthermore, some sectors are exposed to exchange rate risk more from than one currency. Household goods sector exposure to Euro currency (β_{ix}^{EU}) is -0.1432 (t-stat = -2.8076) which, in absolute value, is smaller than β_{ix}^{US}. Construction material sector has the exposures in both Japanese and Euro currency in the same direction with almost equal size. The coefficients in this sector are minimally to both bilateral currencies in this sub-period. The coefficients are not greater than 0.1000 in absolute term, β_{ix}^{JP} = -0.0790 (t-stat = -2.1657) and β_{ix}^{EU} = -0.0793 (t-stat = -1.6499). It means that this sector suffers (benefits) from depreciation (appreciation) of home currency. In contrast to entertainment & recreation sector, this sector benefits (suffers) from depreciation (appreciation) of home currency. Size of coefficient in Japanese yen currency is greater than Euro currency and both are greater than 0.1000 (β_{ix}^{JP} = 0.1731, t-stat = 2.7981 and β_{ix}^{EU} = 0.1477, t-stat = 1.9540). The only sector with statistically significant exposures to exchange rate risk in more than one currency, but with difference direction is energy & utility. This sector sensitizes to Japanese yen with the coefficient β_{ix}^{US} = 0.0934 (t-stat = 2.2801). This size is greater than β_{ix}^{US}, measured in sub-period July 2, 1997 – 1998. While its sensitivity to Euro currency is in opposite sign to US dollar (β_{ix}^{EU} = -0.1059, t-stat = -1.6462)).

Exchange rate risk premium in this sub-period is not as significant as the sub-period July 2, 1997 – 1998. There are no statistical exchange rate risk premium in all currency (λ_x^{US}, λ_x^{JP} and λ_x^{EU}). A possible explanation is that the exchange rate risk is diversified across industries and/or across time.

Extending two-factor model, additional explanatory variables are included to increase explanatory power. These factors are spread (it is domestic interest that is deducted by foreign interest rate), domestic interest rate and foreign interest rate[2]. Figure 6 shows interest rate spread in daily percentage. From 1992 to 1998, all spreads are high and fluctuate widely, especially 1997-1998. Spreads are positive until August 2000. After that EU spread is negative while JP spread is positive. US spread is the lowest but becomes positive after August 2001. All spreads are stable after 2002. Table 4.5 shows the results of regression when the additional explanatory variable is spread. From 1992 to 1993, panel A as well as panel B, there are 6 sectors which have spread coefficient (β_{is}), 4 sectors have positive coefficients and 2 sectors have negative coefficients. Printing & publishing sector have the highest positive coefficient in both US and JP spread, β_{is}^{US} = 0.5321 (t-stat = 3.8834) and β_{is}^{JP} = 0.6541 (t-stat = 4.8148). In contrast, the electronic components sector has the lowest negative coefficient, β_{is}^{US} = -0.7715 (t-stat = -4.5175) and β_{is}^{JP} = -0.5800 (t-stat = -3.4195). In this sub-period, the coefficients are highest in absolute value although the variance of spread is largest in the sub-period: 1993 - July 1, 1997 (But this sub-period exhibits largest number of sector that has significant coefficient). Most effects of spread movement occur before the crisis 1997, the period that monetary policy stimulates domestic growth by financial

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2 These explanatory are multiplied by 10^3 before regressing in equation system to scaling the coefficient.

liberalization. The results of system equation when regressing spread, additional factor, as the difference of domestic rate and US rate are similar to the results when regressing spread as the difference of domestic rate and JP rate. The similarity is shown both by sector and coefficient. Excess return on industry is statistical significant to spread movement in the same sector and coefficients are almost equal. The results do not show that sector that has exchange rate exposure should have spread rate exposure also. Obviously, when the regression is augmented by spread factor, the results support robustness of testing two-factor model. Two-factor model is also augmented by interest rate, both domestic rate and foreign rate. Table 4.6 represents results of equation system. And the result of exchange rate risk supports testing two-factor model also.

Table 4.1. Descriptive statistics on dependent variables.

This table presents the statistics of dependent variables as percentage of daily frequency. The variables are excess return on 26 industries. The statistics are from Jan 1, 1992 to Dec 31, 2004 and also separated into 4 sub-periods: 1) Jan 1, 1992 - Dec 31, 1993 2) Jan 1, 1993 - July 1, 1997 3) July 2, 1997 - Dec 31, 1998 and 4) Jan 1, 1999 - Dec 31, 2004

Panel A: Jan 1, 1992 - Dec 31, 2004

Observations 3393

Industry		Code	Mean	Median	Maximum	Minimum	Std.Dev.	Skewness	Kurtosis
i1	AUTOMOTIVE	BNGKAUT	-0.0124	-0.0251	9.2600	-11.3498	1.4773	-0.0920	9.7400
i2	BANKING	BNGKBNK	-0.0263	-0.0524	18.0134	-15.1156	2.5652	0.7637	8.7998
i3	COMMERCE	BNGKCOM	-0.0381	-0.0299	11.3729	-14.4744	1.6370	0.1080	10.2818
i4	COMMUNICATION	BNGKCMM	0.0116	-0.0267	19.2829	-11.3990	2.4956	0.4388	7.3581
i5	CONSTRUCTION MAT	BNGKCTR	-0.0060	-0.0292	21.7988	-27.9299	2.2052	0.6246	21.8371
i6	ELECTRIC PRODS/COMPUTER	BNGKEPC	-0.0559	-0.0262	9.3518	-9.3300	1.6772	0.1927	7.1552
i7	ELECTRONIC COMPONENTS	BNGKELC	0.0024	-0.0336	18.9356	-16.0376	2.2354	0.4060	9.9186
i8	ENERGY & UTILITIES	BNGKENG	0.0536	-0.0135	13.8923	-15.5006	2.1430	0.3166	7.7444
i9	ENT. & RECREATION	BNGKENR	-0.0120	-0.0281	22.3683	-10.5300	2.3457	0.6504	8.4554
i10	FASHION	BNGKFHN	-0.0348	-0.0192	12.2776	-10.1393	1.3969	0.0430	9.8587
i11	FINANCE &SECURITIES	BNGKFIN	-0.0611	-0.0676	22.4670	-16.1437	3.1026	0.6219	8.3078
i12	FOOD & BEVERAGES	BNGKFDI	-0.0079	-0.0253	8.9737	-7.8961	1.1218	0.1724	8.8233
i13	HEALTH CARE SERVICES	BNGKHCS	-0.0251	-0.0267	9.6323	-7.9485	1.5811	0.4698	7.5155
i14	HOTEL & TRAVEL SERVICE	BNGKHOT	-0.0363	-0.0260	8.6155	-9.6582	1.3624	0.3878	9.1180
i15	HOUSEHOLDGOODS	BNGKHHG	-0.0637	-0.0299	11.9901	-22.1814	1.6113	-0.6434	20.0739
i16	INSURANCE	BNGKINS	-0.0312	-0.0278	7.1493	-9.3763	1.0306	0.3406	12.8587
i17	MACH. & EQUIPMENT	BNGKMEQ	-0.0811	-0.0250	16.2375	-19.9202	2.4928	-0.2725	11.3656
i18	MINING	BNGKMIN	-0.0674	-0.0135	25.9163	-24.6533	2.9942	0.6439	11.8257
i19	PACKAGING	BNGKPAK	-0.0189	-0.0267	15.6770	-16.5697	1.7401	-0.1659	17.9662
i20	PAPER & PRINT MATERIALS	BNGKPPM	-0.0065	-0.0285	19.5347	-18.9428	2.0974	0.5219	15.7324
i21	PERS PROD.& PHARMA	BNGKPPH	0.0002	-0.0135	19.2808	-23.9656	2.5978	-0.6157	17.5850
i22	PETRO & &CHEMICALS	BNGKPET	-0.0013	-0.0260	16.2402	-16.8172	2.4559	0.1373	9.5061
i23	PRINTING & PUBLISHING	BNGKPRN	-0.0415	-0.0326	12.4147	-14.0170	1.7843	0.2180	10.6043
i24	PROF. SERVICES	BNGKPFS	-0.0079	-0.0208	17.6072	-22.1817	2.1504	-0.3964	21.8932
i25	PROPERTY DEVELOPMENT	BNGKPDV	-0.0818	-0.0344	16.9956	-93.2946	2.7757	-10.8949	378.6451
i26	TRANS. & LOGISTICS	BNGKTLO	-0.0234	-0.0299	21.5275	-18.0447	2.5157	0.5168	10.5298

Panel B: Jan 1, 1992 - Dec 31, 1993

Observations 262

Industry		Code	Mean	Median	Maximum	Minimum	Std.Dev.	Skewness	Kurtosis
i1	AUTOMOTIVE	BNGKAUT	0.0901	-0.0141	6.8995	-8.1146	1.5667	0.1122	7.3925
i2	BANKING	BNGKBNK	0.2205	-0.0278	8.8862	-9.3296	1.9267	0.5035	7.0878
i3	COMMERCE	BNGKCOM	0.0321	-0.0264	7.5005	-7.4795	1.3567	0.1232	9.8883
i4	COMMUNICATION	BNGKCMM	0.1269	-0.0299	9.0267	-9.9786	2.0414	0.3092	7.5497
i5	CONSTRUCTION MAT	BNGKCTR	-0.0822	-0.1425	9.0569	-9.0569	1.5163	1.0453	15.6744
i6	ELECTRIC PRODS/COMPUTER	BNGKEPC	0.0283	-0.0033	9.3518	-9.3300	1.7649	0.2884	11.0836
i7	ELECTRONIC COMPONENTS	BNGKELC	-0.0496	-0.0934	8.7615	-6.3779	2.2806	0.4326	4.2500
i8	ENERGY & UTILITIES	BNGKENG	0.1453	-0.0273	8.9437	-9.9191	2.1428	-0.2292	6.7791
i9	ENT. & RECREATION	BNGKENR	0.1334	-0.0299	8.8641	-8.0121	2.9051	0.6077	4.6688
i10	FASHION	BNGKFHN	-0.0304	-0.0273	7.1930	-8.7786	1.4193	-0.3441	11.5054
i11	FINANCE &SECURITIES	BNGKFIN	0.1211	-0.0302	8.8294	-9.7407	2.2021	0.3548	6.7860
i12	FOOD & BEVERAGES	BNGKFDI	0.0561	-0.0250	8.9737	-7.8961	1.4409	0.4497	11.8219
i13	HEALTH CARE SERVICES	BNGKHCS	0.0308	0.0055	7.3890	-5.8887	1.2824	0.0749	8.7215
i14	HOTEL & TRAVEL SERVICE	BNGKHOT	-0.0355	-0.0302	7.5880	-9.6582	1.7710	-0.1914	8.7813
i15	HOUSEHOLDGOODS	BNGKHHG	0.0084	-0.0278	6.9764	-9.2333	1.5143	-0.1398	10.3852
i16	INSURANCE	BNGKINS	-0.0148	-0.0453	7.0045	-8.6861	1.3818	-0.0062	12.0978
i17	MACH. & EQUIPMENT	BNGKMEQ	-0.0687	-0.0299	8.3935	-10.2232	2.4818	0.2045	5.7199
i18	MINING	BNGKMIN	-0.1200	-0.0295	9.4725	-10.5130	2.4866	0.1428	6.8025
i19	PACKAGING	BNGKPAK	-0.0086	-0.0255	6.7504	-6.4024	1.4486	0.2233	7.0403
i20	PAPER & PRINT MATERIALS	BNGKPPM	-0.0501	-0.0299	9.1356	-7.0593	1.6281	0.4159	9.2422
i21	PERS PROD.& PHARMA	BNGKPPH	0.0617	-0.0299	9.1768	-10.1297	2.9829	0.0864	3.8044
i22	PETRO & &CHEMICALS	BNGKPET	0.0545	-0.0264	8.6924	-10.1765	1.9986	0.0950	7.7105
i23	PRINTING & PUBLISHING	BNGKPRN	0.1812	-0.0269	8.9552	-9.8255	1.9769	-0.1300	8.5533
i24	PROF. SERVICES	BNGKPFS	0.2978	-0.0269	17.6072	-16.2709	2.8526	0.0777	12.2822
i25	PROPERTY DEVELOPMENT	BNGKPDV	0.0528	-0.0269	9.2834	-10.2718	2.5458	0.2615	5.8998
i26	TRANS. & LOGISTICS	BNGKTLO	-0.1092	-0.0302	8.9890	-10.3903	1.9704	0.2306	10.5022

Panel C: Jan 1, 1993 - July 1, 1997

Observations 1173

Industry		Code	Mean	Median	Maximum	Minimum	Std.Dev.	Skewness	Kurtosis
i1	AUTOMOTIVE	BNGKAUT	-0.0999	-0.0354	5.5476	-6.8121	1.2561	-0.0170	6.2498
i2	BANKING	BNGKBNK	-0.0327	-0.0344	8.7148	-9.1670	1.7466	0.0031	6.3940
i3	COMMERCE	BNGKCOM	-0.1114	-0.0748	4.2887	-5.9814	1.2803	-0.1942	4.7148
i4	COMMUNICATION	BNGKCMM	-0.0230	-0.0397	9.1127	-9.7420	2.1051	0.3231	6.3669
i5	CONSTRUCTION MAT	BNGKCTR	-0.0905	-0.0448	6.3845	-8.4867	1.5804	-0.1711	6.1666
i6	ELECTRIC PRODS/COMPUTER	BNGKEPC	-0.1289	-0.0522	5.6722	-5.0269	1.2761	0.0407	5.1663
i7	ELECTRONIC COMPONENTS	BNGKELC	0.0073	-0.0397	9.2491	-8.0518	1.8140	0.2859	5.4605
i8	ENERGY & UTILITIES	BNGKENG	0.0839	-0.0281	7.5994	-7.4931	1.9256	0.2518	4.4276
i9	ENT. & RECREATION	BNGKENR	0.0138	-0.0292	9.2312	-10.0567	2.2831	0.3203	6.9947
i10	FASHION	BNGKFHN	-0.0848	-0.0344	6.6296	-5.0590	1.2917	-0.0497	4.8097
i11	FINANCE &SECURITIES	BNGKFIN	-0.1610	-0.0715	8.4308	-9.8173	2.4250	-0.0157	5.0502
i12	FOOD & BEVERAGES	BNGKFDI	-0.0635	-0.0375	4.2758	-5.6612	1.0410	-0.2687	6.8922
i13	HEALTH CARE SERVICES	BNGKHCS	-0.1552	-0.0853	4.9481	-6.0382	1.2828	-0.0602	4.8480
i14	HOTEL & TRAVEL SERVICE	BNGKHOT	-0.1360	-0.0586	6.7615	-4.8955	1.1746	0.2513	5.9625
i15	HOUSEHOLDGOODS	BNGKHHG	-0.1448	-0.0764	5.8058	-5.5336	1.1851	0.0018	6.4941
i16	INSURANCE	BNGKINS	-0.0635	-0.0524	5.2897	-4.2439	1.0215	0.6207	6.7890
i17	MACH. & EQUIPMENT	BNGKMEQ	-0.1145	-0.0342	9.2558	-9.0311	1.8316	0.3685	6.9568
i18	MINING	BNGKMIN	-0.1767	-0.0849	9.2686	-9.7738	2.6451	0.1734	4.7799
i19	PACKAGING	BNGKPAK	-0.0889	-0.0497	4.5665	-5.4904	1.1162	0.1728	5.9707
i20	PAPER & PRINT MATERIALS	BNGKPPM	-0.0121	-0.0365	19.0982	-8.6251	1.9814	1.0265	12.5802
i21	PERS PROD.& PHARMA	BNGKPPH	-0.1027	-0.0295	9.0139	-7.4497	2.0035	0.0077	5.5928
i22	PETRO & &CHEMICALS	BNGKPET	-0.0639	-0.0528	8.1113	-7.1376	1.8118	0.0689	4.8177
i23	PRINTING & PUBLISHING	BNGKPRN	-0.1344	-0.1174	8.0971	-7.1781	1.4524	-0.1039	6.6574
i24	PROF. SERVICES	BNGKPFS	-0.1158	-0.0285	9.2391	-10.6596	1.7297	-0.0105	8.6469
i25	PROPERTY DEVELOPMENT	BNGKPDV	-0.1653	-0.1329	5.8598	-9.0155	1.6613	-0.0442	5.6095
i26	TRANS. & LOGISTICS	BNGKTLO	-0.0690	-0.0465	8.7666	-8.6075	2.0004	0.3470	5.6830

Panel D: July 2, 1997 - Dec 31, 1998

Observations 392

Industry		Code	Mean	Median	Maximum	Minimum	Std.Dev.	Skewness	Kurtosis
i1	AUTOMOTIVE	BNGKAUT	-0.2170	-0.0846	9.2600	-9.2785	2.2046	-0.1067	7.3871
i2	BANKING	BNGKBNK	-0.2203	-0.4638	17.1741	-15.1156	4.6393	0.7669	4.5745
i3	COMMERCE	BNGKCOM	-0.0993	-0.1058	11.3729	-9.8443	2.8314	0.3377	4.6245
i4	COMMUNICATION	BNGKCMM	-0.1949	-0.2770	19.2829	-11.0234	4.0200	0.5588	4.7777
i5	CONSTRUCTION MAT	BNGKCTR	-0.0599	-0.1434	21.7988	-10.8925	4.0231	1.3408	8.0783
i6	ELECTRIC PRODS/COMPUTER	BNGKEPC	-0.1968	-0.0768	8.4241	-8.9762	2.3597	0.1924	5.0097
i7	ELECTRONIC COMPONENTS	BNGKELC	-0.0087	-0.0619	18.9356	-16.0376	3.2848	0.6269	9.6529
i8	ENERGY & UTILITIES	BNGKENG	-0.1183	-0.0802	13.8923	-15.5006	3.4316	0.4392	5.8393
i9	ENT. & RECREATION	BNGKENR	-0.1552	-0.2992	22.3683	-8.6276	3.1427	1.5075	10.5791
i10	FASHION	BNGKFHN	-0.1596	-0.0637	12.2776	-10.1393	2.2389	0.0559	7.3936
i11	FINANCE &SECURITIES	BNGKFIN	-0.1219	-0.5629	22.4670	-16.1437	5.1510	0.7495	5.4551
i12	FOOD & BEVERAGES	BNGKFDI	-0.0233	-0.0637	7.2783	-5.5832	1.5441	0.4291	5.7707
i13	HEALTH CARE SERVICES	BNGKHCS	-0.2273	-0.1520	7.0351	-7.9485	1.9641	-0.0567	4.8754
i14	HOTEL & TRAVEL SERVICE	BNGKHOT	0.0685	-0.0542	7.4191	-7.4313	1.9959	0.6386	5.6520
i15	HOUSEHOLDGOODS	BNGKHHG	-0.1103	-0.1368	11.9901	-22.1814	2.4518	-1.5029	23.5954
i16	INSURANCE	BNGKINS	-0.1742	-0.0902	7.1493	-9.3763	1.5215	0.1502	9.7203
i17	MACH. & EQUIPMENT	BNGKMEQ	-0.6425	-0.2276	13.4904	-19.9202	4.2832	-0.4101	6.3108
i18	MINING	BNGKMIN	-0.1101	-0.0611	19.8042	-11.9378	3.7907	0.5844	6.5676
i19	PACKAGING	BNGKPAK	-0.1492	-0.0540	12.0125	-16.5697	2.5706	-0.9994	16.3898
i20	PAPER & PRINT MATERIALS	BNGKPPM	-0.1886	-0.0613	12.9971	-16.6085	3.0986	-0.3968	8.2227
i21	PERS PROD.& PHARMA	BNGKPPH	-0.2776	-0.0490	19.2808	-22.3699	3.7434	-1.5574	15.4428
i22	PETRO & &CHEMICALS	BNGKPET	-0.2149	-0.1132	16.2402	-16.8172	3.9819	0.1250	6.1895
i23	PRINTING & PUBLISHING	BNGKPRN	-0.1602	-0.1246	9.6731	-14.0170	2.6100	0.1209	7.7966
i24	PROF. SERVICES	BNGKPFS	-0.1542	-0.0542	16.3555	-22.1817	3.0870	-1.1423	16.5098
i25	PROPERTY DEVELOPMENT	BNGKPDV	-0.4079	-0.1937	16.9956	-93.2946	5.8795	-9.8652	160.6737
i26	TRANS. & LOGISTICS	BNGKTLO	-0.0117	-0.0642	21.5275	-16.3245	4.0605	0.7467	7.3251

Panel E: Jan 1, 1999 - Dec 31, 2004

Observations 1556

Industry		Code	Mean	Median	Maximum	Minimum	Std.Dev.	Skewness	Kurtosis
i1	AUTOMOTIVE	BNGKAUT	0.0872	-0.0049	8.6239	-11.3498	1.3773	-0.0153	10.3543
i2	BANKING	BNGKBNK	-0.0143	-0.0328	18.0134	-9.5566	2.4417	0.7363	7.0126
i3	COMMERCE	BNGKCOM	0.0203	-0.0064	9.6017	-14.4744	1.5037	-0.1339	13.9317
i4	COMMUNICATION	BNGKCMM	0.0699	-0.0049	15.5642	-11.3990	2.3303	0.3701	6.6985
i5	CONSTRUCTION MAT	BNGKCTR	0.0836	-0.0054	19.6183	-27.9299	2.0560	-0.8389	31.1342
i6	ELECTRIC PRODS/COMPUTER	BNGKEPC	0.0200	-0.0057	8.4292	-8.2345	1.7179	0.2101	6.3766
i7	ELECTRONIC COMPONENTS	BNGKELC	0.0102	-0.0094	13.5947	-12.0481	2.1915	0.2117	8.3972
i8	ENERGY & UTILITIES	BNGKENG	0.0586	-0.0035	11.4130	-8.0516	1.8600	0.3663	7.1247
i9	ENT. & RECREATION	BNGKENR	-0.0198	-0.0058	12.3581	-10.5300	2.0342	0.1692	6.1103
i10	FASHION	BNGKFHN	0.0331	-0.0035	7.3561	-7.1901	1.1751	0.4389	8.8987
i11	FINANCE &SECURITIES	BNGKFIN	-0.0016	-0.0149	18.3034	-13.0084	3.0008	0.5444	6.8526
i12	FOOD & BEVERAGES	BNGKFDI	0.0269	-0.0058	7.6880	-5.5059	0.9849	0.1375	7.9237
i13	HEALTH CARE SERVICES	BNGKHCS	0.1137	-0.0059	9.6323	-7.0754	1.7044	0.8104	7.9287
i14	HOTEL & TRAVEL SERVICE	BNGKHOT	0.0119	-0.0053	8.6155	-8.5327	1.2079	0.2919	10.4429
i15	HOUSEHOLDGOODS	BNGKHHG	-0.0034	-0.0073	7.8898	-10.6187	1.6374	-0.0749	8.4892
i16	INSURANCE	BNGKINS	0.0260	-0.0036	6.6000	-4.5978	0.7838	0.8028	14.7068
i17	MACH. & EQUIPMENT	BNGKMEQ	0.0822	-0.0059	16.2375	-15.0849	2.2890	0.1736	10.8738
i18	MINING	BNGKMIN	0.0339	-0.0080	25.9163	-24.6533	3.0904	0.8874	16.3922
i19	PACKAGING	BNGKPAK	0.0645	-0.0058	15.6770	-14.2182	1.9010	0.2878	12.5122
i20	PAPER & PRINT MATERIALS	BNGKPPM	0.0505	-0.0083	19.5347	-18.9428	1.9344	1.0894	22.1976
i21	PERS PROD.& PHARMA	BNGKPPH	0.1364	-0.0064	17.6351	-23.9656	2.5671	-0.1511	19.3166
i22	PETRO & &CHEMICALS	BNGKPET	0.0898	-0.0051	14.2764	-15.4398	2.4420	0.2244	8.4781
i23	PRINTING & PUBLISHING	BNGKPRN	0.0205	-0.0081	12.4147	-8.9592	1.7160	0.5175	11.3133
i24	PROF. SERVICES	BNGKPFS	0.0584	-0.0083	14.8287	-18.7225	2.0023	-0.0861	27.4621
i25	PROPERTY DEVELOPMENT	BNGKPDV	0.0399	-0.0058	11.0384	-8.8638	2.2058	0.1462	5.1696
i26	TRANS. & LOGISTICS	BNGKTLO	0.0223	-0.0072	14.3928	-18.0447	2.4390	0.1796	9.1201

Table 4.2 Descriptive statistics on independent variables.

This table presents the statistics of independent variables as percentage of daily frequency. These variables are market excess return (MK), excess return on exchange rate in three bilateral currencies (domestic per foreign rate: US dollar (FXUS), Japanese yen (FXJP) and Euro (FXEU)), 1-month interbank rate (in US (INTUS), Japan (INTJP), Euro (INTEU) and Thai (INTTH) market) and spread rate, the difference between domestic rate and foreign rate (SPRUS, SPRJP and SPREU). Spread rate and interest rate are in first difference form. The statistics are from Jan 1, 1992 - Dec 31, 2004 and also separated into 4 sub-periods: 1) Jan 1, 1992 - Dec 31, 1993 2) Jan 1, 1993 - July 1, 1997 3) July 2, 1997 - Dec 31, 1998 and 4) Jan 1, 1999 - Dec 31, 2004.

Panel A: Jan 1, 1992 - Dec 31, 2004

Observations 3393

	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis
MK	-0.0081	-0.0267	11.9596	-9.5972	1.7336	0.5495	7.8505
FXUS	-0.0054	-0.0271	18.5622	-10.3785	0.7578	4.4914	148.1253
FXJP	0.0021	-0.0172	18.9662	-10.3361	0.9547	2.6108	64.0726
SPRUS	0.0096	0.0091	0.1030	-0.0109	0.0135	1.1145	5.0502
SPRJP	0.0183	0.0148	0.1172	0.0033	0.0147	1.5183	5.6329
INTUS	0.0115	0.0137	0.0189	0.0028	0.0049	-0.4490	1.7697
INTJP	0.0029	0.0013	0.0158	0.0001	0.0039	1.5484	4.3394
INTTH	0.0212	0.0219	0.1188	0.0035	0.0156	1.0044	4.2305

Panel B: Jan 1, 1992 - Dec 31, 1993

Observations 262

	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis
MK	0.0703	-0.0090	9.0230	-8.9026	1.5713	0.2879	12.5458
FXUS	-0.0222	-0.0295	1.1591	-0.6574	0.1455	2.9303	26.7738
FXJP	-0.0208	-0.0295	2.6566	-1.8503	0.5578	0.4687	5.9247
SPRUS	0.0185	0.0187	0.0240	0.0128	0.0027	-0.2372	2.3611
SPRJP	0.0161	0.0166	0.0207	0.0092	0.0026	-0.3738	2.3332
INTUS	0.0104	0.0108	0.0122	0.0083	0.0011	-0.0330	1.4764
INTJP	0.0129	0.0130	0.0158	0.0108	0.0016	0.3415	1.8331
INTTH	0.0289	0.0295	0.0326	0.0250	0.0021	-0.0466	2.2634

Panel C: Jan 1, 1993 - July 1, 1997

Observations 1173

	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis
MK	-0.0639	-0.0321	5.4498	-7.3283	1.4187	-0.1034	5.5692
FXUS	-0.0319	-0.0267	6.3306	-4.4862	0.3739	1.1351	119.8999
FXJP	-0.0226	-0.0271	6.0040	-5.6959	0.7652	0.4182	14.8002
SPRUS	0.0155	0.0146	0.1030	0.0056	0.0069	5.1373	52.2003
SPRJP	0.0245	0.0241	0.1172	0.0122	0.0090	3.1175	25.9944
INTUS	0.0135	0.0151	0.0172	0.0087	0.0031	-0.5877	1.6807
INTJP	0.0046	0.0050	0.0109	0.0011	0.0030	0.2443	1.6138
INTTH	0.0290	0.0278	0.1188	0.0188	0.0076	4.5147	42.3608

Panel D: July 2, 1997 - Dec 31, 1998

Observations 392

	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis
MK	-0.1096	-0.3265	11.9596	-9.5972	2.7779	0.9210	5.2528
FXUS	0.0709	-0.0208	18.5622	-6.0792	1.7908	2.5654	32.3479
FXJP	0.0758	-0.0056	18.9662	-5.4164	1.8853	2.5437	28.5077
SPRUS	0.0316	0.0355	0.0530	0.0040	0.0145	-0.4203	1.8176
SPRJP	0.0456	0.0500	0.0673	0.0180	0.0145	-0.4386	1.8384
INTUS	0.0156	0.0157	0.0167	0.0140	0.0005	-1.1074	6.5062
INTJP	0.0016	0.0016	0.0025	0.0009	0.0003	0.0856	3.1817
INTTH	0.0472	0.0517	0.0688	0.0194	0.0147	-0.4459	1.8343

Panel E: Jan 1, 1999 - Dec 31, 2004

Observations 1556

	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis
MK	0.0461	-0.0059	10.7564	-7.0919	1.6308	0.3748	6.7140
FXUS	-0.0018	-0.0135	11.7179	-10.3785	0.5774	1.7417	180.4812
FXJP	0.0059	-0.0052	11.5912	-10.3361	0.7717	0.7602	57.6498
FXEU	0.0084	0.0007	3.8048	-3.7539	0.6729	0.1903	4.8756
SPRUS	-0.0018	0.0003	0.0075	-0.0109	0.0039	-0.9312	2.5487
SPRJP	0.0071	0.0059	0.0203	0.0033	0.0033	1.0056	3.5695
SPREU	-0.0014	-0.0023	0.0127	-0.0074	0.0034	1.2660	4.3518
INTUS	0.0093	0.0059	0.0189	0.0028	0.0058	0.3759	1.4671
INTJP	0.0003	0.0002	0.0044	0.0001	0.0005	3.8909	24.5969
INTEU	0.0088	0.0087	0.0140	0.0055	0.0026	0.4473	1.9856
INTTH	0.0074	0.0061	0.0215	0.0035	0.0035	1.0524	3.7613

Table 4.3 Correlation among independent variables.

This table reports the correlation among independent variables presented as percentage of daily frequency. These variables are market excess return (MK), excess return on exchange rate in three bilateral currencies (domestic per foreign rate: US dollar (FXUS), Japanese yen (FXJP) and Euro (FXEU)), 1-month interbank rate (in US (INTUS), Japan (INTJP), Euro (INTEU) and Thai (INTTH) market) and spread rate, the difference between domestic rate and foreign rate (SPRUS, SPRJP and SPREU). The statistics are from Jan 1, 1992 - Dec 31, 2004 and also separated into 4 sub-periods: 1) Jan 1, 1992 - Dec 31, 1993 2) Jan 1, 1993 - July 1, 1997 3) July 2, 1997 - Dec 31, 1998 and 4) Jan 1, 1999 - Dec 31, 2004.

Panel A: Jan 1, 1992 - Dec 31, 2004

	MK	FXUS	FXJP	SPRUS	SPRJP	INTUS	INTJP	INTTH
MK	1.0000							
FXUS	-0.1080	1.0000						
FXJP	-0.0667	**0.6741**	1.0000					
SPRUS	-0.0040	-0.0148	0.0070	1.0000				
SPRJP	-0.0063	-0.0138	0.0071	**0.9976**	1.0000			
INTUS	-0.0383	0.0100	-0.0170	-0.0723	-0.0318	1.0000		
INTJP	0.0023	-0.0073	-0.0184	-0.0088	-0.0517	0.2872	1.0000	
INTTH	-0.0062	-0.0143	0.0060	**0.9983**	**0.9982**	-0.0148	0.0077	1.0000

Panel B: Jan 1, 1992 - Dec 31, 1993

	MK	FXUS	FXJP	SPRUS	SPRJP	INTUS	INTJP	INTTH
MK	1.0000							
FXUS	-0.0049	1.0000						
FXJP	-0.0921	0.1639	1.0000					
SPRUS	-0.0382	-0.0656	0.0105	1.0000				
SPRJP	-0.0325	-0.0605	-0.0167	**0.8691**	1.0000			
INTUS	0.0484	0.0280	-0.0672	-0.4153	-0.0468	1.0000		
INTJP	0.0383	0.0128	-0.0037	-0.0301	-0.3327	0.1300	1.0000	
INTTH	-0.0199	-0.0593	-0.0191	**0.9099**	**0.9340**	-0.0004	0.0262	1.0000

Panel C: Jan 1, 1993 - July 1, 1997

	MK	FXUS	FXJP	SPRUS	SPRJP	INTUS	INTJP	INTTH
MK	1.0000							
FXUS	-0.0495	1.0000						
FXJP	-0.0413	0.3585	1.0000					
SPRUS	-0.0149	-0.1054	-0.0244	1.0000				
SPRJP	-0.0183	-0.1056	-0.0221	**0.9992**	1.0000			
INTUS	-0.1052	0.0049	0.0140	-0.0675	-0.0429	1.0000		
INTJP	0.0165	0.0098	-0.0662	-0.0052	-0.0325	0.1005	1.0000	
INTTH	-0.0178	-0.1054	-0.0241	**0.9996**	**0.9995**	-0.0399	-0.0024	1.0000

Panel D: July 2, 1997 - Dec 31, 1998

	MK	FXUS	FXJP	SPRUS	SPRJP	INTUS	INTJP	INTTH
MK	1.0000							
FXUS	-0.1504	1.0000						
FXJP	-0.0811	**0.8541**	1.0000					
SPRUS	0.0375	0.1145	0.1288	1.0000				
SPRJP	0.0330	0.1176	0.1241	**0.9946**	1.0000			
INTUS	-0.0475	0.0080	-0.0420	-0.0662	0.0260	1.0000		
INTJP	0.0072	-0.0303	0.0388	0.1577	0.1137	0.0289	1.0000	
INTTH	0.0331	0.1154	0.1251	**0.9956**	**0.9989**	0.0272	0.1606	1.0000

Panel E: Jan 1, 1999 - Dec 31, 2004

	MK	FXUS	FXJP	FXEU	SPRUS	SPRJP	SPREU	INTUS	INTJP	INTEU	INTTH
MK	1.0000										
FXUS	-0.1061	1.0000									
FXJP	-0.0677	**0.5740**	1.0000								
FXEU	-0.1885	0.2218	0.2143	1.0000							
SPRUS	-0.0163	-0.0954	-0.0329	-0.0722	1.0000						
SPRJP	-0.0182	-0.0843	-0.0279	-0.0846	**0.9591**	1.0000					
SPREU	-0.0222	-0.0742	0.0025	-0.0455	**0.7612**	**0.7495**	1.0000				
INTUS	-0.0253	0.0219	-0.0086	-0.0335	-0.2563	-0.1621	-0.0419	1.0000			
INTJP	-0.0134	-0.0134	-0.0215	0.0159	-0.1213	-0.3049	-0.0320	**0.5113**	1.0000		
INTEU	0.0141	-0.0423	0.0135	-0.0344	-0.0195	-0.0254	0.4539	0.0816	0.0851	1.0000	
INTTH	-0.0235	-0.0930	-0.0363	-0.0836	**0.9671**	**0.9496**	**0.7764**	-0.0019	0.0091	0.0013	1.0000

Table 4.4 Testing two-factor model (Model 1)

The table reports the results of testing two-factor regression by GMM. The independent variables are market excess return (MK), excess return on exchange rate in three bilateral currencies (domestic per foreign rate: US dollar (FXUS), Japanese yen (FXJP) and Euro (FXEU)). The dependent variables are excess return on 26 industries. The samples of daily data lie between periods of 1992 to 2004 and also separated into 4 sub-periods: 1) Jan 1, 1992 - Dec 31, 1993 2) Jan 1, 1993 - July 1, 1997 3) July 2, 1997 - Dec 31, 1998 and 4) Jan 1, 1999 - Dec 31, 2004. The top cell reports system equation with currency of a main trading partner used to measured exchange rate risk.

Panel A This panel presents results when the regressor of bilateral currency is domestic per US dollar.

Equation		$r_{it} = \beta_{im} r_{mt} + \beta_{ix}^{US} r_{xt}^{US} + \varsigma_{it}, \quad r_{mt} = \lambda_m + v_t, \quad r_{xt}^{US} = \lambda_x^{US} + \varepsilon_t^{US}$							
Period		**1) Jan 1, 1992 - Dec 31, 1992**				**2) Jan 1, 1993 - July 1, 1997**			
Variables		**MK**		**FXUS**		**MK**		**FXUS**	
	Industry	**Coef.**	**t-stat**	**Coef.**	**t-stat**	**Coef.**	**t-stat**	**Coef.**	**t-stat**
i1	AUTOMOTIVE	**0.4738** ***	5.8565	0.0631	0.1441	**0.4551** ***	15.6356	-0.0623	-0.9203
i2	BANKING	**0.8973** ***	22.3771	0.7068	1.3164	**1.1049** ***	42.4047	-0.0377	-0.3788
i3	COMMERCE	**0.5746** ***	11.9494	0.1808	0.4785	**0.5393** ***	20.4132	-0.0234	-0.2461
i4	COMMUNICATION	**0.9100** ***	18.4350	0.1169	0.3021	**1.2164** ***	35.6769	0.0566	0.7537
i5	CONSTRUCTION MAT	**0.7795** ***	16.7596	-0.5655	-1.2861	**0.8894** ***	32.5386	-0.2568	-0.0583
i6	ELECTRIC PRODS/COMPUTER	**0.8914** ***	17.7883	-0.5257	-1.6219	**0.5477** ***	21.8837	0.1440	1.5966
i7	ELECTRONIC COMPONENTS	**0.8624** ***	16.3671	-1.6954	-0.8321	**0.8261** ***	23.2349	0.1723	0.8277
i8	ENERGY & UTILITIES	**0.9117** ***	18.3795	-0.0064	-0.0154	**0.8780** ***	24.9254	-0.2118	-0.7499
i9	ENT. & RECREATION	**1.0875** ***	12.3267	-2.2169	-0.3762	**1.0146** ***	16.9275	-0.4264	-0.4287
i10	FASHION	**0.7227** ***	16.5241	-0.0423	-0.1256	**0.6517** ***	22.5715	-0.0018	-0.0214
i11	FINANCE &SECURITIES	**1.2454** ***	29.2854	-0.2527	-0.8033	**1.5376** ***	45.6032	0.2759	0.1258
i12	FOOD & BEVERAGES	**0.6636** ***	11.6244	0.1005	0.3627	**0.3411** ***	12.8390	-0.1666	-1.2040
i13	HEALTH CARE SERVICES	**0.4912** ***	8.8645	-1.1834	-0.0185	**0.5431** ***	20.9469	0.0275	0.3078
i14	HOTEL & TRAVEL SERVICE	**0.8588** ***	20.9955	-0.3771	-1.0812	**0.4579** ***	15.3046	0.3582	0.9875
i15	HOUSEHOLDGOODS	**0.6899** ***	12.8266	0.0116	0.0443	**0.3806** ***	13.8935	0.0172	0.2365
i16	INSURANCE	**0.5524** ***	9.0920	-0.3139	-1.0297	**0.3369** ***	14.8098	-0.0482	-0.7678
i17	MACH. & EQUIPMENT	**0.9086** ***	11.8003	0.0087	0.0138	**0.4322** ***	9.7104	0.1357	0.6065
i18	MINING	**1.0564** ***	19.1037	0.1752	0.3442	**0.9309** ***	16.4614	0.0336	0.1351
i19	PACKAGING	**0.7208** ***	26.6734	-0.5529	-0.8870	**0.4124** ***	15.7320	0.1385	0.9546
i20	PAPER & PRINT MATERIALS	**0.4850** ***	5.8476	-0.4874	-1.3896	**0.4716** ***	10.0039	0.3848	0.5000
i21	PERS PROD.& PHARMA	**0.9263** ***	12.8362	-2.2323	-0.8313	**0.3375** ***	7.3491	-0.0057	-0.0597
i22	PETRO & &CHEMICALS	**0.8936** ***	18.0837	-0.4600	-1.0771	**0.8058** ***	21.4305	0.3890	0.6871
i23	PRINTING & PUBLISHING	**0.9971** ***	22.8754	0.4370	0.7022	**0.4985** ***	11.6154	-0.2075	-0.9465
i24	PROF. SERVICES	**0.4140** ***	4.9351	0.0752	0.0912	**0.3146** ***	6.9566	0.0762	0.9484
i25	PROPERTY DEVELOPMENT	**1.5264** ***	18.2078	0.0051	0.0204	**0.9794** ***	34.7155	0.0848	0.7679
i26	TRANS. & LOGISTICS	**0.5780** ***	6.8698	-0.0396	-0.0677	**0.7181** ***	17.1062	0.2812	1.6250
Risk premium									
MK	Market factor	0.0061	0.0784			-0.0489	-1.1029		
FXUS	Exchange rate (TH/US)			**-0.0240** ***	-3.8221			**-0.0273** ***	-3.6248
J-statistic		0.083858				0.132853			

***indicate coefficient is significantly different from zero at the 0.01 level.
** indicate coefficient is significantly different from zero at the 0.05 level.
* indicate coefficient is significantly different from zero at the 0.1 level.

Table 4.4 Panel A (continue) Testing two-factor model (Model 1)

Equation		$r_{it} = \beta_{im} r_{mt} + \beta_{ix}^{US} r_{xt}^{US} + \varsigma_{it}$, $r_{mt} = \lambda_m + v_t$, $r_{xt}^{US} = \lambda_x^{US} + \varepsilon_t^{US}$							
Period		3) July 2, 1997 - Dec 31, 1998				4) Jan 1, 1999 - Dec 31, 2004			
Variables		MK		FXUS		MK		FXUS	
	Industry	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat
i1	AUTOMOTIVE	**0.3540** ***	9.2659	0.0061	0.0972	**0.3309** ***	12.0073	-0.0189	-0.3623
i2	BANKING	**1.4805** ***	27.3199	**-0.1038** ***	-2.4222	**1.3441** ***	41.5841	-0.0294	-0.8050
i3	COMMERCE	**0.5466** ***	11.5857	0.0609	0.9757	**0.5005** ***	13.5512	0.0026	0.0500
i4	COMMUNICATION	**1.2580** ***	31.0147	0.0039	0.0730	**1.1460** ***	33.1207	0.0246	0.5250
i5	CONSTRUCTION MAT	**1.1671** ***	19.8924	-0.0199	-0.3490	**0.8568** ***	22.0808	-0.0648	-1.2300
i6	ELECTRIC PRODS/COMPUTER	**0.3862** ***	11.9769	0.0254	0.4823	**0.5945** ***	16.8961	-0.0202	-0.3414
i7	ELECTRONIC COMPONENTS	**0.7293** ***	9.9399	**0.1345** **	1.9675	**0.7695** ***	15.3471	-0.0659	-0.9369
i8	ENERGY & UTILITIES	**0.9906** ***	21.1227	**0.1031** ***	2.9774	**0.7758** ***	22.0549	0.0718	1.1220
i9	ENT. & RECREATION	**0.7736** ***	15.1520	0.0594	1.4339	**0.7269** ***	21.5691	0.0719	1.0363
i10	FASHION	**0.3625** ***	10.9941	-0.0959	-1.3125	**0.3437** ***	15.7913	-0.0275	-0.6696
i11	FINANCE &SECURITIES	**1.3774** ***	21.5470	**-0.2806** ***	-3.8842	**1.5054** ***	36.9023	-0.0048	-0.1003
i12	FOOD & BEVERAGES	**0.1999** ***	7.0335	**0.0918** *	1.8712	**0.2496** ***	11.6548	-0.0086	-0.2579
i13	HEALTH CARE SERVICES	**0.2459** ***	10.4647	-0.0375	-0.9846	**0.2817** ***	9.3777	**0.1518** ***	2.2661
i14	HOTEL & TRAVEL SERVICE	**0.2051** ***	6.6460	0.0267	0.5460	**0.2028** ***	9.9711	0.0271	0.7749
i15	HOUSEHOLDGOODS	**0.1403** ***	3.0816	0.0288	0.4562	**0.3388** ***	8.1404	**-0.1782** **	-2.0167
i16	INSURANCE	**0.2014** ***	8.6583	0.0139	0.2674	**0.1441** ***	6.9096	0.0370	1.2199
i17	MACH. & EQUIPMENT	**0.4622** ***	6.6296	0.1022	0.8967	**0.3317** ***	8.6929	-0.0733	-1.0251
i18	MINING	**0.5332** ***	7.8656	0.1011	1.5894	**0.5530** ***	9.8656	**0.3396** ***	3.3111
i19	PACKAGING	**0.2173** ***	7.3895	-0.0335	-0.4257	**0.4289** ***	11.2969	-0.0146	-0.2488
i20	PAPER & PRINT MATERIALS	**0.4294** ***	8.6707	0.0915	1.2827	**0.3247** ***	7.8498	-0.0567	-1.1370
i21	PERS PROD.& PHARMA	**0.2142** ***	2.7649	0.0549	0.9199	**0.0576** ***	2.5029	0.0050	0.0535
i22	PETRO & &CHEMICALS	**0.9248** ***	16.6326	-0.1271	-1.4441	**0.9915** ***	23.0477	0.0845	1.3701
i23	PRINTING & PUBLISHING	**0.3338** ***	8.7109	-0.0614	-0.7301	**0.3426** ***	9.8265	0.0549	0.9870
i24	PROF. SERVICES	**0.1483** ***	3.1388	-0.0053	-0.1299	**0.0696** ***	2.2349	-0.1319	-1.4382
i25	PROPERTY DEVELOPMENT	**0.8942** ***	14.9713	**-0.1612** *	-1.9103	**1.0559** ***	32.2699	-0.0643	-1.2476
i26	TRANS. & LOGISTICS	**1.0154** ***	16.4517	**0.1731** ***	2.4592	**0.9313** ***	19.0740	0.0583	0.8790
Risk premium									
MK	Market factor	-0.0205	-0.1594			0.0455	1.1067		
FXUS	Exchange rate (TH/US)			0.0922	1.1121			-0.0002	-0.0204
	J-statistic	0.061600				0.019910			

***indicate coefficient is significantly different from zero at the 0.01 level.
** indicate coefficient is significantly different from zero at the 0.05 level.
* indicate coefficient is significantly different from zero at the 0.1 level.

Table 4.4 (continue) Testing two-factor model (Model 1)

Panel B This panel presents results when the regressor of bilateral currency is domestic per Japanese yen.

	Equation	$r_{it} = \beta_{im} r_{mt} + \beta_{ix}^{JP} r_{xt}^{JP} + \varsigma_{it}$, $r_{mt} = \lambda_m + v_t$, $r_{xt}^{JP} = \lambda_x^{JP} + \varepsilon_t^{JP}$							
	Period	1) Jan 1, 1992 - Dec 31, 1992				2) Jan 1, 1993 - July 1, 1997			
	Dependent variable	MK		FXJP		MK		FXJP	
	Industry	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat
i1	AUTOMOTIVE	**0.4732** ***	5.8399	-0.2402	-0.1736	**0.4533** ***	15.5517	-0.0578	-1.6026
i2	BANKING	**0.9125** ***	21.4649	-0.0398	-0.3847	**1.1098** ***	41.0028	-0.0357	-1.2125
i3	COMMERCE	**0.5893** ***	12.7957	-0.0806	-0.9553	**0.5324** ***	20.0886	-0.0247	-0.6633
i4	COMMUNICATION	**0.9114** ***	18.4106	-0.0218	-0.1568	**1.2111** ***	35.3500	-0.0081	-0.1995
i5	CONSTRUCTION MAT	**0.7764** ***	16.4455	-0.2101	-0.6687	**0.8816** ***	32.2911	-0.0195	-0.5063
i6	ELECTRIC PRODS/COMPUTER	**0.8913** ***	18.2547	-0.2588	-0.6165	**0.5454** ***	21.4451	0.1146	0.8388
i7	ELECTRONIC COMPONENTS	**0.8561** ***	16.1676	-0.0049	-0.0298	**0.8292** ***	22.4427	-0.1752	-0.5407
i8	ENERGY & UTILITIES	**0.9140** ***	18.6041	-0.1530	-1.0276	**0.8760** ***	24.6551	-0.0006	-0.0127
i9	ENT. & RECREATION	**1.1032** ***	12.9463	-0.1521	-0.5084	**1.0081** ***	16.5860	-0.1262	-0.1883
i10	FASHION	**0.7280** ***	16.9514	-0.1274	-0.7987	**0.6482** ***	21.9734	-0.0546	-1.5511
i11	FINANCE &SECURITIES	**1.2303** ***	29.5626	0.1712	0.6417	**1.5415** ***	45.2731	0.1018	0.9684
i12	FOOD & BEVERAGES	**0.6757** ***	11.7590	0.1286	1.5856	**0.3355** ***	12.4204	-0.0107	-0.3006
i13	HEALTH CARE SERVICES	**0.5061** ***	9.9814	-0.2026	-0.1433	**0.5403** ***	20.4870	0.0821	0.0610
i14	HOTEL & TRAVEL SERVICE	**0.8685** ***	22.2741	0.0332	0.3424	**0.4582** ***	14.9069	0.0569	1.5089
i15	HOUSEHOLDGOODS	**0.7077** ***	13.6405	0.0163	0.1972	**0.3778** ***	13.7031	-0.0647	-0.8214
i16	INSURANCE	**0.5661** ***	9.4920	0.0462	0.4689	**0.3340** ***	14.5366	0.0028	0.0979
i17	MACH. & EQUIPMENT	**0.9071** ***	11.4074	0.1611	0.8226	**0.4322** ***	9.6586	0.1009	0.0703
i18	MINING	**1.0323** ***	18.2753	-0.3802	-0.2393	**0.9414** ***	15.8755	-0.1087	-1.0467
i19	PACKAGING	**0.7170** ***	26.2797	-0.0125	-0.1517	**0.4091** ***	15.4698	0.0040	0.1144
i20	PAPER & PRINT MATERIALS	**0.4803** ***	6.0228	-0.4885	-0.4133	**0.4747** ***	10.3180	0.0198	0.3342
i21	PERS PROD.& PHARMA	**0.9066** ***	12.6481	-0.1155	-0.5507	**0.3330** ***	7.2699	0.0289	0.4565
i22	PETRO & &CHEMICALS	**0.8915** ***	17.7158	-0.0498	-0.3923	**0.7998** ***	21.4173	-0.0680	-1.0920
i23	PRINTING & PUBLISHING	**0.9984** ***	22.0590	0.1697	0.7471	**0.4951** ***	11.4627	-0.0470	-1.0470
i24	PROF. SERVICES	**0.3836** ***	4.3673	-0.4804	-0.9545	**0.3101** ***	6.8660	0.0990	0.8314
i25	PROPERTY DEVELOPMENT	**1.5166** ***	18.3914	0.1001	1.0386	**0.9769** ***	33.3377	0.0277	0.6113
i26	TRANS. & LOGISTICS	**0.5911** ***	6.9110	0.0835	0.6966	**0.7202** ***	17.2342	0.1406	0.8044
	Risk premium								
MK	Market factor	-0.0048	-0.0632			-0.0444	-1.0056		
FXJP	Exchange rate (TH/JP yen)			-0.0096	-0.3334			-0.0306	-1.6908
	J-statistic	0.075427				0.045833			

***indicate coefficient is significantly different from zero at the 0.01 level.
** indicate coefficient is significantly different from zero at the 0.05 level.
* indicate coefficient is significantly different from zero at the 0.1 level.

Table 4.4 Panel B (continue) Testing two-factor model (Model 1)

Equation		$r_{it} = \beta_{im} r_{mt} + \beta_{ix}^{JP} r_{xt}^{JP} + \varsigma_{it}$, $r_{mt} = \lambda_m + v_t$, $r_{xt}^{JP} = \lambda_x^{JP} + \varepsilon_t^{JP}$							
Period		**3) July 2, 1997 - Dec 31, 1998**				**4) Jan 1, 1999 - Dec 31, 2004**			
Dependent variable		**MK**		**FXJP**		**MK**		**FXJP**	
	Industry	**Coef.**	**t-stat**	**Coef.**	**t-stat**	**Coef.**	**t-stat**	**Coef.**	**t-stat**
i1	AUTOMOTIVE	**0.3533** ***	9.4842	0.0259	0.4714	**0.3306** ***	12.1682	-0.0092	-0.2711
i2	BANKING	**1.4813** ***	27.5507	-0.0436	-0.8132	**1.3445** ***	41.5732	-0.0377	-1.1197
i3	COMMERCE	**0.5431** ***	11.8526	**0.0848** *	1.7253	**0.4984** ***	13.6042	-0.0217	-0.5501
i4	COMMUNICATION	**1.2610** ***	31.1097	0.0231	0.4483	**1.1456** ***	33.1486	0.0160	0.4105
i5	CONSTRUCTION MAT	**1.1700** ***	19.9013	-0.0192	-0.3389	**0.8570** ***	22.2905	**-0.0790** **	-2.1657
i6	ELECTRIC PRODS/COMPUTER	**0.3803** ***	12.3483	0.0506	1.1110	**0.5959** ***	17.1600	0.0496	1.2394
i7	ELECTRONIC COMPONENTS	**0.7353** ***	10.1500	0.0451	0.5906	**0.7722** ***	15.4973	-0.0031	-0.0631
i8	ENERGY & UTILITIES	**0.9884** ***	21.2833	**0.0718** **	2.1937	**0.7760** ***	22.0970	**0.0934** ***	2.2801
i9	ENT. & RECREATION	**0.7739** ***	15.2776	0.0600	1.4246	**0.7287** ***	21.8213	**0.1731** ***	2.7981
i10	FASHION	**0.3661** ***	11.6385	-0.0683	-1.1589	**0.3454** ***	16.1361	0.0278	0.8958
i11	FINANCE &SECURITIES	**1.3913** ***	21.4834	**-0.2099** ***	-4.0302	**1.5037** ***	37.2676	-0.0308	-0.6462
i12	FOOD & BEVERAGES	**0.1932** ***	6.9072	0.0668	1.3527	**0.2505** ***	11.8150	0.0192	0.7798
i13	HEALTH CARE SERVICES	**0.2491** ***	10.5184	-0.0436	-1.2642	**0.2758** ***	9.1235	0.0483	1.0726
i14	HOTEL & TRAVEL SERVICE	**0.2037** ***	6.8006	0.0221	0.4869	**0.2033** ***	10.0594	**0.0588** **	2.0571
i15	HOUSEHOLDGOODS	**0.1370** ***	3.0785	0.0499	0.9456	**0.3443** ***	8.3684	-0.0723	-0.9477
i16	INSURANCE	**0.1989** ***	8.7890	0.0172	0.3793	**0.1428** ***	6.8863	0.0124	0.6412
i17	MACH. & EQUIPMENT	**0.4546** ***	6.4880	0.0815	0.8697	**0.3376** ***	8.9789	0.0808	1.0604
i18	MINING	**0.5228** ***	8.1266	**0.2081** ***	3.3294	**0.5408** ***	9.5545	0.1520	1.5574
i19	PACKAGING	**0.2178** ***	7.7994	-0.0114	-0.1741	**0.4271** ***	11.1838	-0.0398	-0.7193
i20	PAPER & PRINT MATERIALS	**0.4283** ***	8.7634	0.0494	0.8087	**0.3280** ***	7.8208	0.0318	0.5061
i21	PERS PROD.& PHARMA	**0.2145** ***	2.7082	0.0484	0.6497	**0.0570** ***	1.4623	-0.0117	-0.1911
i22	PETRO & &CHEMICALS	**0.9310** ***	16.3626	-0.0921	-1.0837	**0.9934** ***	23.2144	**0.1721** ***	3.2460
i23	PRINTING & PUBLISHING	**0.3355** ***	8.6051	-0.0527	-0.7587	**0.3384** ***	9.6036	-0.0137	-0.3308
i24	PROF. SERVICES	**0.1524** ***	3.2897	-0.0424	-1.0256	**0.0713** ***	2.3112	**-0.1395** **	-2.0864
i25	PROPERTY DEVELOPMENT	**0.9038** ***	15.1399	**-0.1677** **	-2.1130	**1.0563** ***	32.5211	-0.0377	-1.0986
i26	TRANS. & LOGISTICS	**1.0106** ***	16.8558	**0.1161** **	2.0662	**0.9278** ***	19.1839	-0.0363	-0.6914
Risk premium									
MK	Market factor	-0.0126	-0.0982			0.0463	1.1264		
FXJP	Exchange rate (TH/JP yen)			0.1221	1.4131			0.0030	0.1964
J-statistic		0.062919				0.020024			

***indicate coefficient is significantly different from zero at the 0.01 level.
** indicate coefficient is significantly different from zero at the 0.05 level.
* indicate coefficient is significantly different from zero at the 0.1 level.

Table 4.4 (continue) Testing two-factor model (Model 1)

Panel C This panel presents results when the regressor of bilateral currency is domestic per Euro.

Equation		$r_{it} = \beta_{im} r_{mt} + \beta_{ix}^{EU} r_{xt}^{EU} + \varsigma_{it}$, $r_{mt} = \lambda_m + v_t$, $r_{xt}^{EU} = \lambda_x^{EU} + \varepsilon_t^{EU}$			
Period		**4) Jan 1, 1999 - Dec 31, 2004**			
Dependent variable		**MK**		**FXEU**	
Industry		**Coef.**	**t-stat**	**Coef.**	**t-stat**
i1	AUTOMOTIVE	**0.3277** ***	11.7016	-0.0451	-0.9894
i2	BANKING	**1.3489** ***	41.4647	0.0365	0.7582
i3	COMMERCE	**0.4979** ***	14.0256	-0.0276	-0.5347
i4	COMMUNICATION	**1.1434** ***	32.2089	-0.0083	-0.1676
i5	CONSTRUCTION MAT	**0.8521** ***	22.9378	**-0.0793** ***	-1.6499
i6	ELECTRIC PRODS/COMPUTER	**0.5878** ***	16.4447	**-0.0943** ***	-1.8935
i7	ELECTRONIC COMPONENTS	**0.7519** ***	14.8504	**-0.2363** ***	-2.8269
i8	ENERGY & UTILITIES	**0.7633** ***	22.1106	**-0.1059** ***	-1.6462
i9	ENT. & RECREATION	**0.7365** ***	21.6334	**0.1477** ***	1.9540
i10	FASHION	**0.3428** ***	15.4978	-0.0209	-0.5303
i11	FINANCE &SECURITIES	**1.5041** ***	37.2634	-0.0171	-0.2312
i12	FOOD & BEVERAGES	**0.2470** ***	11.4587	-0.0340	-0.9529
i13	HEALTH CARE SERVICES	**0.2818** ***	9.3547	0.0762	1.3889
i14	HOTEL & TRAVEL SERVICE	**0.2023** ***	9.7591	0.0049	0.1267
i15	HOUSEHOLDGOODS	**0.3351** ***	8.0122	**-0.1432** ***	-2.8076
i16	INSURANCE	**0.1445** ***	6.8779	0.0231	0.8201
i17	MACH. & EQUIPMENT	**0.3403** ***	8.9582	0.0634	0.7345
i18	MINING	**0.5408** ***	9.6063	0.0489	0.4780
i19	PACKAGING	**0.4350** ***	11.3656	0.0587	0.9291
i20	PAPER & PRINT MATERIALS	**0.3293** ***	7.9895	0.0233	0.3976
i21	PERS PROD.& PHARMA	**0.0491** ***	2.2604	-0.0845	-0.7889
i22	PETRO & &CHEMICALS	**0.9919** ***	23.2602	0.0425	0.5652
i23	PRINTING & PUBLISHING	**0.3448** ***	9.9989	0.0551	0.9145
i24	PROF. SERVICES	**0.0677** ***	3.1019	-0.0816	-1.1795
i25	PROPERTY DEVELOPMENT	**1.0587** ***	32.5243	-0.0016	-0.0295
i26	TRANS. & LOGISTICS	**0.9281** ***	19.1053	-0.0115	-0.1573
Risk premium					
MK	Market factor	0.0462	1.1228		
FXEU	Exchange rat (TH/EU)			0.0110	0.7277
	J-statistic	0.019970			

***indicate coefficient is significantly different from zero at the 0.01 level.
** indicate coefficient is significantly different from zero at the 0.05 level.
* indicate coefficient is significantly different from zero at the 0.1 level.

Table 4.5 Testing two-factor model by an additional factor: spread between domestic interest rate and foreign interest rate (Model 2)

The table reports the results of testing two-factor regression with an additional factor: spread between domestic interest rate and foreign interest rate by GMM. The independent variables are market excess return (MK), excess return on exchange rate in three bilateral currencies (domestic per foreign rate: US dollar (FXUS), Japanese yen (FXJP) and Euro (FXEU)) and spread rate, the difference between domestic rate and foreign rate (SPRUS, SPRJP and SPREU). The spread rates are regressed at the first difference and multiplied by 10^3. The dependent variables are excess return on 26 industries. The samples of daily data lie between periods of 1992 to 2004 and also separated into 4 sub-periods: 1) Jan 1, 1992 - Dec 31, 1993 2) Jan 1, 1993 - July 1, 1997 3) July 2, 1997 - Dec 31, 1998 and 4) Jan 1, 1999 - Dec 31, 2004. The top cell reports system equation with currency of a main trading partner used to measured exchange rate risk.

Panel A This panel presents results when the regressor of bilateral currency is domestic per US dollar.

Equation		$r_{it} = \beta_{im}\, r_{mt} + \beta_{ix}^{US} r_{xt}^{US} + \beta_{is}^{US} s_t^{US} + w_{it}$, $r_{mt} = \lambda_m + v_t$, $r_{xt}^{US} = \lambda_x^{US} + \varepsilon_t^{US}$, $s_i^{US} = \lambda_s^{US} + u_t^{US}$					
Period		**1) Jan 1, 1992 - Dec 31, 1992**					
Dependent variable		**MK**		**FXUS**		**SPRUS**	
	Industry	**Coef.**	**t-stat**	**Coef.**	**t-stat**	**Coef.**	**t-stat**
i1	AUTOMOTIVE	**0.4701** ***	5.7962	0.0551	0.1250	-0.0469	-0.3899
i2	BANKING	**0.8913** ***	21.4794	0.7539	1.4219	-0.0965	-1.5197
i3	COMMERCE	**0.5777** ***	12.2489	0.2055	0.5411	-0.1186	-1.0527
i4	COMMUNICATION	**0.9092** ***	19.2898	0.1300	0.3213	**0.3405** ***	2.5334
i5	CONSTRUCTION MAT	**0.7817** ***	16.8779	-0.6008	-1.3979	0.1245	1.2371
i6	ELECTRIC PRODS/COMPUTER	**0.8971** ***	18.3198	-0.5216	-1.6074	-0.1688	-1.2077
i7	ELECTRONIC COMPONENTS	**0.8694** ***	17.4335	-1.6229	-0.8337	**-0.7715** ***	-4.5175
i8	ENERGY & UTILITIES	**0.9140** ***	18.7656	-0.0199	-0.0477	0.1850	1.2725
i9	ENT. & RECREATION	**1.1055** ***	11.9996	-2.2203	-0.2328	0.2794	0.9105
i10	FASHION	**0.7267** ***	16.9148	-0.0292	-0.0876	**0.1890** ***	2.4122
i11	FINANCE &SECURITIES	**1.2461** ***	29.2761	-0.3140	-1.0245	-0.0984	-1.2260
i12	FOOD & BEVERAGES	**0.6640** ***	11.7267	0.0710	0.2545	-0.0940	-1.0663
i13	HEALTH CARE SERVICES	**0.4939** ***	8.9369	-1.1911	-0.0584	0.0357	0.6176
i14	HOTEL & TRAVEL SERVICE	**0.8656** ***	21.8027	-0.3188	-0.8886	-0.0608	-0.5796
i15	HOUSEHOLDGOODS	**0.6947** ***	12.9248	0.0000	-0.0001	-0.0225	-0.1993
i16	INSURANCE	**0.5558** ***	9.1956	-0.3169	-1.0347	-0.1110	-1.5507
i17	MACH. & EQUIPMENT	**0.9145** ***	12.1994	-0.0429	-0.0689	0.0425	0.2064
i18	MINING	**1.0597** ***	20.1508	0.2329	0.4398	**-0.6254** ***	-2.8656
i19	PACKAGING	**0.7252** ***	27.1562	-0.5232	-0.7521	-0.0673	-0.7113
i20	PAPER & PRINT MATERIALS	**0.4951** ***	6.0187	-0.4657	-1.3935	**-0.3124** **	-1.9488
i21	PERS PROD.& PHARMA	**0.9307** ***	13.0667	-2.2105	-0.8269	0.0670	0.4460
i22	PETRO & &CHEMICALS	**0.8945** ***	18.1352	-0.4837	-1.1416	-0.0545	-0.4725
i23	PRINTING & PUBLISHING	**0.9970** ***	23.9628	0.3827	1.5962	**0.5321** ***	3.8834
i24	PROF. SERVICES	**0.4029** ***	4.7655	0.0922	0.1109	**-0.5268** ***	-2.3865
i25	PROPERTY DEVELOPMENT	**1.5268** ***	18.3194	0.0322	0.1309	-0.0106	-0.1137
i26	TRANS. & LOGISTICS	**0.5815** ***	7.0572	-0.0713	-0.1226	0.0392	0.2704

Equation		$r_{it} = \beta_{im}\, r_{mt} + \beta_{ix}^{US} r_{xt}^{US} + \beta_{is}^{US} s_t^{US} + w_{it}$, $r_{mt} = \lambda_m + v_t$, $r_{xt}^{US} = \lambda_x^{US} + \varepsilon_t^{US}$, $s_i^{US} = \lambda_s^{US} + u_t^{US}$					
Period		**1) Jan 1, 1992 - Dec 31, 1992**					
Dependent variable		**MK**		**FXUS**		**SPRUS**	
	Industry	**Coef.**	**t-stat**	**Coef.**	**t-stat**	**Coef.**	**t-stat**
Risk premium							
MK	Market factor	-0.0045	-0.0590				
FXUS	Exchange rate (TH/US)			**-0.0240** ***	-3.8458		
SPRUS	Δ(TH – US interest rate)*10^3					0.0165	0.5889
J-statistic		0.08316					

***indicate coefficient is significantly different from zero at the 0.01 level.
** indicate coefficient is significantly different from zero at the 0.05 level.
* indicate coefficient is significantly different from zero at the 0.1 level.

Table 4.5 Panel A (continue) Testing two-factor model by an additional factor: spread between domestic interest rate and foreign interest rate (Model 2)

Equation		$r_{it} = \beta_{im}\, r_{mt} + \beta_{ix}^{US} r_{xt}^{US} + \beta_{is}^{US} s_t^{US} + w_{it}$, $r_{mt} = \lambda_m + v_t$, $r_{xt}^{US} = \lambda_x^{US} + \varepsilon_t^{US}$, $s_i^{US} = \lambda_s^{US} + u_t^{US}$					
Period		**2) Jan 1, 1993 - July 1, 1997**					
Dependent variable		**MK**		**FXUS**		**SPRUS**	
	Industry	**Coef.**	**t-stat**	**Coef.**	**t-stat**	**Coef.**	**t-stat**
i1	AUTOMOTIVE	**0.4560** ***	15.6940	-0.0613	-0.8821	-0.0054	-0.6228
i2	BANKING	**1.1030** ***	42.4098	-0.0204	-0.2006	**0.0290** *	1.7383
i3	COMMERCE	**0.5388** ***	20.4221	-0.0361	-0.3560	-0.0070	-0.5289
i4	COMMUNICATION	**1.2169** ***	35.7389	0.0531	0.7284	-0.0089	-0.6282
i5	CONSTRUCTION MAT	**0.8890** ***	33.7272	-0.2728	-0.3392	**-0.0176** *	-1.6550
i6	ELECTRIC PRODS/COMPUTER	**0.5475** ***	21.8729	0.1313	1.3576	-0.0087	-0.6283
i7	ELECTRONIC COMPONENTS	**0.8277** ***	23.2199	0.1488	1.5285	-0.0431	-1.5486
i8	ENERGY & UTILITIES	**0.8797** ***	24.9492	-0.2268	-0.9268	**-0.0198** **	-1.9875
i9	ENT. & RECREATION	**1.0139** ***	16.9350	-0.4427	-0.5616	**-0.0328** ***	-2.3683
i10	FASHION	**0.6539** ***	22.7047	-0.0208	-0.2466	-0.0361	-1.3814
i11	FINANCE &SECURITIES	**1.5377** ***	46.1239	0.2925	0.2424	0.0085	0.8579
i12	FOOD & BEVERAGES	**0.3421** ***	12.9630	-0.1770	-1.2565	**-0.0160** *	-1.8174
i13	HEALTH CARE SERVICES	**0.5416** ***	20.9109	0.0282	0.3136	-0.0032	-0.4273
i14	HOTEL & TRAVEL SERVICE	**0.4590** ***	15.3189	0.3482	0.7981	-0.0179	-0.7893
i15	HOUSEHOLDGOODS	**0.3774** ***	13.5666	0.0472	0.5682	**0.0436** ***	3.8109
i16	INSURANCE	**0.3391** ***	14.9178	-0.0639	-1.0005	**-0.0352** *	-1.9218
i17	MACH. & EQUIPMENT	**0.4304** ***	9.6572	0.1410	0.6402	0.0100	0.4885
i18	MINING	**0.9299** ***	16.5793	0.0326	0.1322	0.0080	0.4985
i19	PACKAGING	**0.4119** ***	15.6903	0.1475	0.2885	0.0074	1.4174
i20	PAPER & PRINT MATERIALS	**0.4712** ***	10.0368	0.3979	0.5139	0.0110	0.8035
i21	PERS PROD.& PHARMA	**0.3385** ***	7.3902	0.0041	0.0429	0.0013	0.0536
i22	PETRO & &CHEMICALS	**0.8042** ***	21.3297	0.4018	0.7188	**0.0282** ***	4.1535
i23	PRINTING & PUBLISHING	**0.4955** ***	11.5380	-0.1892	-0.9054	0.0206	0.6822
i24	PROF. SERVICES	**0.3152** ***	7.0038	0.0578	0.6793	-0.0212	-1.3730
i25	PROPERTY DEVELOPMENT	**0.9807** ***	34.7726	0.0707	0.5915	**-0.0196** ***	-3.2616
i26	TRANS. & LOGISTICS	**0.7181** ***	17.1606	0.2903	1.7144	0.0191	0.9926
Risk premium							
MK	Market factor	-0.0475	-1.0702				
FXUS	Exchange rate (TH/US)			**-0.0274** ***	-3.6409		
SPRUS	Δ(TH – US interest rate)*10^3					-0.0610	-0.9576
	J-statistic	0.044499					

***indicate coefficient is significantly different from zero at the 0.01 level.
** indicate coefficient is significantly different from zero at the 0.05 level.
* indicate coefficient is significantly different from zero at the 0.1 level.

Table 4.5 Panel A (continue) Testing two-factor model by an additional factor: spread between domestic interest rate and foreign interest rate (Model 2)

Equation		$r_{it} = \beta_{im}\, r_{mt} + \beta_{ix}^{US} r_{xt}^{US} + \beta_{is}^{US} s_t^{US} + w_{it}$, $r_{mt} = \lambda_m + v_t$, $r_{xt}^{US} = \lambda_x^{US} + \varepsilon_t^{US}$, $s_i^{US} = \lambda_s^{US} + u_t^{US}$					
Period		**3) July 2, 1997 - Dec 31, 1998**					
Dependent variable		**MK**		**FXUS**		**SPRUS**	
	Industry	**Coef.**	**t-stat**	**Coef.**	**t-stat**	**Coef.**	**t-stat**
i1	AUTOMOTIVE	**0.3465** ***	9.0802	-0.0064	-0.1089	**0.1114** *	1.6688
i2	BANKING	**1.4815** ***	26.9781	**-0.1061** ***	-2.4688	-0.0149	-0.2676
i3	COMMERCE	**0.5381** ***	11.3933	0.0524	0.8575	0.0701	1.0749
i4	COMMUNICATION	**1.2732** ***	30.9299	0.0055	0.1007	0.0028	0.0315
i5	CONSTRUCTION MAT	**1.1803** ***	20.2257	-0.0173	-0.2959	-0.0363	-0.4290
i6	ELECTRIC PRODS/COMPUTER	**0.3850** ***	11.9962	0.0270	0.5262	0.0179	0.3732
i7	ELECTRONIC COMPONENTS	**0.7440** ***	10.3296	**0.1329** *	1.8493	-0.1212	-1.4269
i8	ENERGY & UTILITIES	**1.0050** ***	22.0421	**0.0865** ***	2.4492	-0.0010	-0.0135
i9	ENT. & RECREATION	**0.7829** ***	15.1317	0.0673	1.4972	0.0173	0.2086
i10	FASHION	**0.3560** ***	11.1424	-0.1076	-1.5267	**0.0883** *	1.7296
i11	FINANCE &SECURITIES	**1.3786** ***	21.5432	**-0.2991** ***	-4.0874	0.0690	1.0675
i12	FOOD & BEVERAGES	**0.2021** ***	7.0739	**0.1057** **	2.0140	**-0.1261** ***	-3.5971
i13	HEALTH CARE SERVICES	**0.2421** ***	10.3041	-0.0443	-1.1919	0.0415	0.6940
i14	HOTEL & TRAVEL SERVICE	**0.2062** ***	6.6662	0.0263	0.5216	-0.0224	-0.4152
i15	HOUSEHOLDGOODS	**0.1474** ***	3.2504	0.0065	0.1091	**0.1334** ***	2.2843
i16	INSURANCE	**0.2006** ***	8.7923	-0.0128	-0.2527	**0.1687** ***	3.1328
i17	MACH. & EQUIPMENT	**0.4590** ***	6.4943	0.0790	0.6648	0.2391	1.2670
i18	MINING	**0.5316** ***	7.8392	**0.1069** *	1.6602	-0.0585	-0.4281
i19	PACKAGING	**0.2140** ***	7.3246	-0.0205	-0.2673	-0.0370	-0.8510
i20	PAPER & PRINT MATERIALS	**0.4427** ***	8.9998	0.0891	1.2345	-0.0431	-0.6636
i21	PERS PROD.& PHARMA	**0.2212** ***	2.8451	0.0515	0.8369	-0.0306	-0.2561
i22	PETRO & &CHEMICALS	**0.9230** ***	16.4882	**-0.1499** *	-1.6743	0.1397	1.5148
i23	PRINTING & PUBLISHING	**0.3299** ***	8.7221	-0.0722	-0.8656	0.0539	1.0250
i24	PROF. SERVICES	**0.1528** ***	3.2164	0.0057	0.1449	**-0.1248** *	-1.8807
i25	PROPERTY DEVELOPMENT	**0.8863** ***	14.7569	**-0.1928** ***	-2.4488	**0.2905** ***	2.5926
i26	TRANS. & LOGISTICS	**1.0293** ***	16.4616	**0.1897** ***	2.7702	-0.1661	-1.5725
Risk premium							
MK	Market factor	-0.0495	-0.3904				
FXUS	Exchange rate (TH/US)			0.0870	1.0503		
SPRUS	Δ(TH – US interest rate)*10^3					**-0.1518** **	-2.0338
	J-statistic	0.058740					

***indicate coefficient is significantly different from zero at the 0.01 level.
** indicate coefficient is significantly different from zero at the 0.05 level.
* indicate coefficient is significantly different from zero at the 0.1 level.

Table 4.5 Panel A (continue) Testing two-factor model by an additional factor: spread between domestic interest rate and foreign interest rate (Model 2)

Equation		$r_{it} = \beta_{im}\, r_{mt} + \beta_{ix}^{US} r_{xt}^{US} + \beta_{is}^{US} s_t^{US} + w_{it}$, $r_{mt} = \lambda_m + v_t$, $r_{xt}^{US} = \lambda_x^{US} + \varepsilon_t^{US}$, $s_i^{US} = \lambda_s^{US} + u_t^{US}$					
Period		**4) Jan 1, 1999 - Dec 31, 2004**					
Dependent variable		**MK**		**FXUS**		**SPRUS**	
	Industry	**Coef.**	**t-stat**	**Coef.**	**t-stat**	**Coef.**	**t-stat**
i1	AUTOMOTIVE	**0.3296** ***	11.9501	-0.0226	-0.4124	-0.0220	-0.3036
i2	BANKING	**1.3442** ***	41.7093	-0.0224	-0.6177	**0.0991** *	1.8649
i3	COMMERCE	**0.4999** ***	13.5227	0.0022	0.0415	-0.0346	-0.5947
i4	COMMUNICATION	**1.1468** ***	33.2085	0.0166	0.3641	-0.0923	-1.3782
i5	CONSTRUCTION MAT	**0.8577** ***	21.9937	-0.0591	-1.0895	0.0655	0.8614
i6	ELECTRIC PRODS/COMPUTER	**0.5919** ***	16.7927	-0.0241	-0.3988	-0.0681	-0.8923
i7	ELECTRONIC COMPONENTS	**0.7676** ***	15.2277	-0.0627	-0.8880	0.0600	0.5161
i8	ENERGY & UTILITIES	**0.7772** ***	22.1118	0.0761	1.1961	0.0034	0.0432
i9	ENT. & RECREATION	**0.7278** ***	21.5715	0.0743	1.0990	0.0203	0.1372
i10	FASHION	**0.3421** ***	15.8385	-0.0357	-0.8165	**-0.1044** **	-1.9862
i11	FINANCE &SECURITIES	**1.5033** ***	36.7845	-0.0043	-0.0881	0.0108	0.1217
i12	FOOD & BEVERAGES	**0.2490** ***	11.6435	-0.0047	-0.1478	0.0510	0.5195
i13	HEALTH CARE SERVICES	**0.2812** ***	9.3745	**0.1493** ***	2.2303	-0.0305	-0.5594
i14	HOTEL & TRAVEL SERVICE	**0.2024** ***	9.9462	0.0303	0.8756	0.0375	0.5600
i15	HOUSEHOLDGOODS	**0.3367** ***	8.1579	**-0.1841** ***	-2.1277	-0.0568	-0.6076
i16	INSURANCE	**0.1429** ***	6.8912	0.0321	1.2538	-0.0785	-1.2023
i17	MACH. & EQUIPMENT	**0.3299** ***	8.6759	-0.0799	-1.1069	-0.0653	-0.7307
i18	MINING	**0.5503** ***	9.7013	**0.3376** ***	3.3781	-0.0402	-0.2556
i19	PACKAGING	**0.4282** ***	11.2838	-0.0123	-0.2031	0.0117	0.1461
i20	PAPER & PRINT MATERIALS	**0.3246** ***	7.9098	-0.0614	-1.2076	-0.0658	-0.7301
i21	PERS PROD.& PHARMA	**0.0583** *	1.7253	0.0050	0.0539	0.0174	0.1105
i22	PETRO & &CHEMICALS	**0.9908** ***	23.0828	0.0798	1.2796	-0.0470	-0.5895
i23	PRINTING & PUBLISHING	**0.3417** ***	9.8155	0.0535	1.0613	-0.0772	-0.5771
i24	PROF. SERVICES	**0.0688** **	2.2155	-0.1360	-1.4346	-0.0588	-0.5976
i25	PROPERTY DEVELOPMENT	**1.0562** ***	32.2097	-0.0542	-1.0741	0.1133	1.1625
i26	TRANS. & LOGISTICS	**0.9280** ***	19.2100	0.0397	0.6078	-0.1590	-0.9819
Risk premium							
MK	Market factor	0.0464	1.1292				
FXUS	Exchange rate (TH/US)			0.0000	0.0007		
SPRUS	Δ(TH – US interest rate)*10^3					-0.0090	-0.8900
	J-statistic	0.019772					

***indicate coefficient is significantly different from zero at the 0.01 level.
** indicate coefficient is significantly different from zero at the 0.05 level.
* indicate coefficient is significantly different from zero at the 0.1 level.

Table 4.5 (continue) Testing two-factor model by an additional factor: spread between domestic interest rate and foreign interest rate (Model 2)

Panel B This panel presents results when the regressor of bilateral currency is domestic per Japanese yen.

Equation		$r_{it} = \beta_{im}\, r_{mt} + \beta_{ix}^{JP} r_{xt}^{JP} + \beta_{is}^{JP} s_t^{JP} + w_{it}$, $r_{mt} = \lambda_m + v_t$, $r_{xt}^{JP} = \lambda_x^{JP} + \varepsilon_t^{JP}$, $s_i^{JP} = \lambda_s^{JP} + u_t^{JP}$					
Period		**1) Jan 1, 1992 - Dec 31, 1992**					
Dependent variable		**MK**		**FXJP**		**SPRJP**	
	Industry	**Coef.**	**t-stat**	**Coef.**	**t-stat**	**Coef.**	**t-stat**
i1	AUTOMOTIVE	**0.4693** ***	5.7649	-0.2494	-0.2455	0.0213	0.1906
i2	BANKING	**0.9076** ***	21.1467	-0.0335	-0.3230	-0.0016	-0.0264
i3	COMMERCE	**0.5979** ***	13.3232	-0.0580	-0.6928	**-0.2351** *	-1.9212
i4	COMMUNICATION	**0.9076** ***	19.0921	-0.0368	-0.2618	**0.3523** ***	2.4148
i5	CONSTRUCTION MAT	**0.7793** ***	16.4802	-0.2255	-0.8890	0.1623	1.6059
i6	ELECTRIC PRODS/COMPUTER	**0.9002** ***	18.7912	-0.2474	-0.4891	-0.2016	-1.3401
i7	ELECTRONIC COMPONENTS	**0.8659** ***	16.9843	0.0170	0.1012	**-0.5800** ***	-3.4195
i8	ENERGY & UTILITIES	**0.9162** ***	18.9784	-0.1361	-0.9071	0.1520	1.0580
i9	ENT. & RECREATION	**1.1212** ***	12.4002	-0.1958	-0.6447	0.2628	0.7873
i10	FASHION	**0.7317** ***	17.3505	-0.1246	-0.8076	**0.1544** ***	2.4104
i11	FINANCE &SECURITIES	**1.2298** ***	29.6474	0.1856	0.7983	-0.1009	-1.1713
i12	FOOD & BEVERAGES	**0.6769** ***	11.9057	0.1185	1.4592	-0.0728	-0.7466
i13	HEALTH CARE SERVICES	**0.5123** ***	10.1503	-0.2093	-0.2025	-0.0025	-0.0312
i14	HOTEL & TRAVEL SERVICE	**0.8760** ***	22.8836	0.0410	0.4157	-0.1533	-1.2139
i15	HOUSEHOLDGOODS	**0.7144** ***	13.8787	0.0188	0.2267	-0.0744	-0.6255
i16	INSURANCE	**0.5703** ***	9.6275	0.0541	0.5570	-0.0905	-1.4608
i17	MACH. & EQUIPMENT	**0.9122** ***	11.6436	0.1801	0.9284	-0.0155	-0.0735
i18	MINING	**1.0370** ***	18.9778	-0.3598	-0.1202	**-0.4865** ***	-2.3457
i19	PACKAGING	**0.7211** ***	26.6467	-0.0085	-0.1036	-0.0277	-0.2727
i20	PAPER & PRINT MATERIALS	**0.4948** ***	6.1764	-0.4918	-0.4463	**-0.2804** *	-1.6798
i21	PERS PROD.& PHARMA	**0.9112** ***	12.8925	-0.0978	-0.4647	0.0024	0.0112
i22	PETRO & &CHEMICALS	**0.8896** ***	17.6386	-0.0240	-0.1897	0.0462	0.4839
i23	PRINTING & PUBLISHING	**0.9906** ***	23.1136	0.1406	1.4942	**0.6541** ***	4.8148
i24	PROF. SERVICES	**0.3770** ***	4.1745	-0.4342	-0.7919	**-0.5691** ***	-2.8963
i25	PROPERTY DEVELOPMENT	**1.5141** ***	18.5275	0.0885	0.9316	-0.0757	-0.7708
i26	TRANS. & LOGISTICS	**0.5992** ***	7.1288	0.0826	0.6889	-0.1287	-0.7182
Risk premium							
MK	Market factor	-0.0128	-0.1710				
FXJP	Exchange rate (TH/JP)			-0.0124	-0.4304		
SPRJP	Δ(TH – JP interest rate)*10^3					0.0176	0.6658
	J-statistic	0.074499					

***indicate coefficient is significantly different from zero at the 0.01 level.
** indicate coefficient is significantly different from zero at the 0.05 level.
* indicate coefficient is significantly different from zero at the 0.1 level.

Table 4.5 Panel B (continue) Testing two-factor model by an additional factor: spread between domestic interest rate and foreign interest rate (Model 2)

Equation		$r_{it} = \beta_{im}\, r_{mt} + \beta_{ix}^{JP} r_{xt}^{JP} + \beta_{is}^{JP} s_t^{JP} + w_{it}$, $r_{mt} = \lambda_m + v_t$, $r_{xt}^{JP} = \lambda_x^{JP} + \varepsilon_t^{JP}$, $s_i^{JP} = \lambda_s^{JP} + u_t^{JP}$					
Period		**2) Jan 1, 1993 - July 1, 1997**					
Dependent variable		**MK**		**FXJP**		**SPRJP**	
	Industry	**Coef.**	**t-stat**	**Coef.**	**t-stat**	**Coef.**	**t-stat**
i1	AUTOMOTIVE	**0.4546** ***	15.6366	-0.0592	-0.6422	-0.0049	-0.6021
i2	BANKING	**1.1055** ***	40.7601	-0.0278	-0.9255	**0.0422** ***	1.7612
i3	COMMERCE	**0.5324** ***	20.1341	-0.0295	-0.7782	-0.0095	-0.6761
i4	COMMUNICATION	**1.2137** ***	35.5937	-0.0108	-0.2675	-0.0248	-1.1000
i5	CONSTRUCTION MAT	**0.8796** ***	32.7583	-0.0200	-0.5249	-0.0012	-0.0636
i6	ELECTRIC PRODS/COMPUTER	**0.5463** ***	21.5176	0.1112	0.7166	-0.0153	-0.8936
i7	ELECTRONIC COMPONENTS	**0.8362** ***	22.5268	-0.1869	-0.6211	**-0.0722** *	-1.6410
i8	ENERGY & UTILITIES	**0.8780** ***	24.6522	-0.0071	-0.1475	**-0.0219** *	-1.8338
i9	ENT. & RECREATION	**1.0095** ***	16.5991	-0.1363	-0.3749	**-0.0360** ***	-2.5590
i10	FASHION	**0.6537** ***	21.9837	-0.0630	-0.7719	-0.0545	-1.4690
i11	FINANCE &SECURITIES	**1.5414** ***	45.4437	0.1053	0.0428	0.0024	0.2215
i12	FOOD & BEVERAGES	**0.3367** ***	12.5062	-0.0137	-0.3782	**-0.0118** *	-1.7651
i13	HEALTH CARE SERVICES	**0.5401** ***	20.4800	0.0821	0.0566	-0.0080	-0.8555
i14	HOTEL & TRAVEL SERVICE	**0.4616** ***	14.9701	0.0514	1.3440	-0.0388	-1.1429
i15	HOUSEHOLDGOODS	**0.3739** ***	13.3295	-0.0576	-0.6230	**0.0470** ***	3.3863
i16	INSURANCE	**0.3388** ***	14.7392	-0.0055	-0.1875	**-0.0458** *	-1.8411
i17	MACH. & EQUIPMENT	**0.4289** ***	9.5505	0.1042	0.1339	0.0216	0.7656
i18	MINING	**0.9416** ***	15.9252	-0.1105	-0.0630	0.0005	0.0241
i19	PACKAGING	**0.4097** ***	15.5185	0.0047	0.1331	-0.0001	-0.0205
i20	PAPER & PRINT MATERIALS	**0.4738** ***	10.3192	0.0229	0.3871	0.0038	0.3407
i21	PERS PROD.& PHARMA	**0.3318** ***	7.2448	0.0306	0.4825	0.0212	0.5845
i22	PETRO & &CHEMICALS	**0.7974** ***	21.3033	-0.0675	-1.0834	**0.0172** ***	3.0193
i23	PRINTING & PUBLISHING	**0.4901** ***	11.3047	-0.0408	-0.9014	0.0383	0.9547
i24	PROF. SERVICES	**0.3115** ***	6.9417	0.0951	0.7537	-0.0283	-1.4380
i25	PROPERTY DEVELOPMENT	**0.9784** ***	33.3373	0.0270	0.5867	**-0.0174** ***	-2.7899
i26	TRANS. & LOGISTICS	**0.7197** ***	17.2020	0.1438	0.8436	0.0216	0.9595
Risk premium							
MK	Market factor	-0.0436	-0.9906				
FXJP	Exchange rate (TH/JP)			**-0.0319** *	-1.7600		
SPRJP	Δ(TH – JP interest rate)*10^3					-0.0605	-0.9738
	J-statistic	0.045599					

***indicate coefficient is significantly different from zero at the 0.01 level.
** indicate coefficient is significantly different from zero at the 0.05 level.
* indicate coefficient is significantly different from zero at the 0.1 level.

Table 4.5 Panel B (continue) Testing two-factor model by an additional factor: spread between domestic interest rate and foreign interest rate (Model 2)

Equation		$r_{it} = \beta_{im}\, r_{mt} + \beta_{ix}^{JP} r_{xt}^{JP} + \beta_{is}^{JP} s_t^{JP} + w_{it}$, $r_{mt} = \lambda_m + v_t$, $r_{xt}^{JP} = \lambda_x^{JP} + \varepsilon_t^{JP}$, $s_i^{JP} = \lambda_s^{JP} + u_t^{JP}$					
Period		**3) July 2, 1997 - Dec 31, 1998**					
Dependent variable		**MK**		**FXJP**		**SPRJP**	
	Industry	**Coef.**	**t-stat**	**Coef.**	**t-stat**	**Coef.**	**t-stat**
i1	AUTOMOTIVE	**0.3463** ***	9.2480	0.0152	0.2915	**0.1120** ***	1.6542
i2	BANKING	**1.4802** ***	27.3113	-0.0404	-0.7668	-0.0251	-0.4418
i3	COMMERCE	**0.5356** ***	11.7119	**0.0798** ***	1.6835	0.0531	0.8539
i4	COMMUNICATION	**1.2779** ***	31.1077	0.0183	0.3480	0.0294	0.3224
i5	CONSTRUCTION MAT	**1.1872** ***	20.2989	-0.0139	-0.2347	-0.0565	-0.6724
i6	ELECTRIC PRODS/COMPUTER	**0.3828** ***	12.4433	0.0487	1.0805	0.0213	0.4323
i7	ELECTRONIC COMPONENTS	**0.7497** ***	10.5781	0.0297	0.3629	-0.1000	-1.1066
i8	ENERGY & UTILITIES	**1.0029** ***	22.3341	0.0434	1.2532	0.0424	0.5398
i9	ENT. & RECREATION	**0.7869** ***	15.3445	0.0682	1.5072	0.0159	0.1929
i10	FASHION	**0.3589** ***	11.6866	-0.0750	-1.3128	0.0646	1.2209
i11	FINANCE &SECURITIES	**1.3942** ***	21.4906	**-0.2247** ***	-4.2510	0.0798	1.2416
i12	FOOD & BEVERAGES	**0.1958** ***	6.9872	0.0770	1.4411	**-0.1338** ***	-3.7831
i13	HEALTH CARE SERVICES	**0.2451** ***	10.3692	-0.0498	-1.4914	0.0514	0.8468
i14	HOTEL & TRAVEL SERVICE	**0.2049** ***	6.8289	0.0241	0.5138	-0.0325	-0.6178
i15	HOUSEHOLDGOODS	**0.1517** ***	3.4359	0.0287	0.5775	**0.1123** **	2.0085
i16	INSURANCE	**0.2026** ***	9.0719	-0.0075	-0.1709	**0.1417** ***	2.8411
i17	MACH. & EQUIPMENT	**0.4544** ***	6.4067	0.0618	0.6310	0.2625	1.3800
i18	MINING	**0.5224** ***	8.1451	**0.2247** ***	3.5352	-0.0922	-0.6788
i19	PACKAGING	**0.2116** ***	7.6216	0.0018	0.0289	-0.0376	-0.8589
i20	PAPER & PRINT MATERIALS	**0.4439** ***	9.2113	0.0351	0.5608	0.0013	0.0178
i21	PERS PROD.& PHARMA	**0.2219** ***	2.7877	0.0368	0.4813	0.0324	0.2786
i22	PETRO & &CHEMICALS	**0.9314** ***	16.3134	-0.1148	-1.3149	**0.1807** *	1.8627
i23	PRINTING & PUBLISHING	**0.3346** ***	8.6632	-0.0583	-0.8567	0.0342	0.6652
i24	PROF. SERVICES	**0.1571** ***	3.3835	-0.0246	-0.5876	**-0.1323** **	-1.9696
i25	PROPERTY DEVELOPMENT	**0.8997** ***	14.9157	**-0.2019** ***	-2.6946	**0.3011** ***	2.6491
i26	TRANS. & LOGISTICS	**1.0233** ***	16.8642	**0.1310** ***	2.3590	-0.1742	-1.6359
Risk premium							
MK	Market factor	-0.0370	-0.2914				
FXJP	Exchange rate (TH/JP)			0.1141	1.3206		
SPRJP	Δ(TH – JP interest rate)*10^3					**-0.1725** ***	-2.3720
	J-statistic	0.058835					

***indicate coefficient is significantly different from zero at the 0.01 level.
** indicate coefficient is significantly different from zero at the 0.05 level.
* indicate coefficient is significantly different from zero at the 0.1 level.

Table 4.5 Panel A (continue) Testing two-factor model by an additional factor: spread between domestic interest rate and foreign interest rate (Model 2)

Equation		$r_{it} = \beta_{im}\, r_{mt} + \beta_{ix}^{JP} r_{xt}^{JP} + \beta_{is}^{JP} s_t^{JP} + w_{it}$, $r_{mt} = \lambda_m + v_t$, $r_{xt}^{JP} = \lambda_x^{JP} + \varepsilon_t^{JP}$, $s_i^{JP} = \lambda_s^{JP} + u_t^{JP}$					
Period		4) Jan 1, 1999 - Dec 31, 2004					
Dependent variable		MK		FXJP		SPRJP	
	Industry	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat
i1	AUTOMOTIVE	**0.3296** ***	12.1340	-0.0091	-0.2695	-0.0086	-0.1261
i2	BANKING	**1.3443** ***	41.7034	-0.0364	-1.0850	0.1006	1.6257
i3	COMMERCE	**0.4982** ***	13.6083	-0.0217	-0.5475	-0.0340	-0.6010
i4	COMMUNICATION	**1.1469** ***	33.2690	0.0129	0.3315	-0.1085	-1.4316
i5	CONSTRUCTION MAT	**0.8579** ***	22.2007	**-0.0784** ***	-2.1504	0.0680	0.9229
i6	ELECTRIC PRODS/COMPUTER	**0.5936** ***	17.0831	0.0502	1.2563	-0.0615	-0.8428
i7	ELECTRONIC COMPONENTS	**0.7704** ***	15.4205	-0.0040	-0.0811	0.0160	0.1442
i8	ENERGY & UTILITIES	**0.7769** ***	22.1595	**0.0954** ***	2.3286	-0.0023	-0.0307
i9	ENT. & RECREATION	**0.7292** ***	21.7904	**0.1730** ***	2.8100	0.0441	0.2977
i10	FASHION	**0.3443** ***	16.2501	0.0267	0.8635	**-0.0954** *	-1.8284
i11	FINANCE &SECURITIES	**1.5022** ***	37.1958	-0.0328	-0.6896	-0.0116	-0.1446
i12	FOOD & BEVERAGES	**0.2499** ***	11.7909	0.0217	0.8781	0.0677	0.6994
i13	HEALTH CARE SERVICES	**0.2752** ***	9.1104	0.0481	1.0652	-0.0222	-0.3791
i14	HOTEL & TRAVEL SERVICE	**0.2029** ***	10.0510	**0.0591** **	2.0599	0.0218	0.3520
i15	HOUSEHOLDGOODS	**0.3430** ***	8.3858	-0.0720	-0.9425	-0.0098	-0.1073
i16	INSURANCE	**0.1418** ***	6.8886	0.0115	0.6059	-0.0926	-1.4471
i17	MACH. & EQUIPMENT	**0.3368** ***	8.9994	0.0824	1.0830	-0.0383	-0.4908
i18	MINING	**0.5378** ***	9.3552	0.1486	1.5131	-0.1116	-0.7237
i19	PACKAGING	**0.4264** ***	11.1699	-0.0388	-0.7000	0.0286	0.3405
i20	PAPER & PRINT MATERIALS	**0.3281** ***	7.8587	0.0322	0.5137	-0.0681	-0.6931
i21	PERS PROD.& PHARMA	**0.0577** *	1.6829	-0.0123	-0.2012	-0.0387	-0.2728
i22	PETRO & &CHEMICALS	**0.9929** ***	23.2775	**0.1703** ***	3.2175	-0.0716	-0.8136
i23	PRINTING & PUBLISHING	**0.3374** ***	9.5783	-0.0138	-0.3376	-0.1126	-0.8815
i24	PROF. SERVICES	**0.0710** ***	2.3045	**-0.1418** **	-2.1046	-0.0662	-0.7165
i25	PROPERTY DEVELOPMENT	**1.0564** ***	32.4723	-0.0355	-1.0412	0.0751	0.8630
i26	TRANS. & LOGISTICS	**0.9261** ***	19.3344	-0.0373	-0.7079	-0.0852	-0.6144
Risk premium							
MK	Market factor	0.0477	1.1615				
FXJP	Exchange rate (TH/JP)			0.0031	0.2045		
SPRJP	Δ(TH – JP interest rate)*10^3					-0.0120	-1.2242
	J-statistic	0.019832					

***indicate coefficient is significantly different from zero at the 0.01 level.
** indicate coefficient is significantly different from zero at the 0.05 level.
* indicate coefficient is significantly different from zero at the 0.1 level.

Table 4.5 (continue) Testing two-factor model by an additional factor: spread between domestic interest rate and foreign interest rate (Model 2)

Panel C This panel presents results when the regressor of bilateral currency is domestic per Euro.

Equation		$r_{it} = \beta_{im}\, r_{mt} + \beta_{ix}^{EU} r_{xt}^{EU} + \beta_{is}^{EU} s_t^{EU} + w_{it}$, $r_{mt} = \lambda_m + v_t$, $r_{xt}^{EU} = \lambda_x^{EU} + \varepsilon_t^{EU}$, $s_i^{EU} = \lambda_s^{EU} + u_t^{EU}$					
Period		**4) Jan 1, 1999 - Dec 31, 2004**					
Dependent variable		**MK**		**FXEU**		**SPREU**	
	Industry	**Coef.**	**t-stat**	**Coef.**	**t-stat**	**Coef.**	**t-stat**
i1	AUTOMOTIVE	**0.3275** ***	11.6984	-0.0455	-0.9920	-0.0185	-0.4173
i2	BANKING	**1.3495** ***	41.4983	0.0380	0.7854	0.0474	1.0953
i3	COMMERCE	**0.4976** ***	14.0283	-0.0285	-0.5506	-0.0250	-0.6011
i4	COMMUNICATION	**1.1425** ***	32.1557	-0.0102	-0.2059	-0.0553	-1.1285
i5	CONSTRUCTION MAT	**0.8529** ***	22.8763	-0.0769	-1.6068	0.0793	1.5990
i6	ELECTRIC PRODS/COMPUTER	**0.5875** ***	16.4756	**-0.0957** **	-1.9175	-0.0510	-1.1229
i7	ELECTRONIC COMPONENTS	**0.7518** ***	14.8680	**-0.2368** ***	-2.8204	-0.0174	-0.2686
i8	ENERGY & UTILITIES	**0.7637** ***	22.1582	**-0.1054** *	-1.6442	0.0152	0.2254
i9	ENT. & RECREATION	**0.7368** ***	21.5963	**0.1494** **	1.9751	0.0183	0.1723
i10	FASHION	**0.3421** ***	15.5739	-0.0230	-0.5918	-0.0563	-1.4118
i11	FINANCE &SECURITIES	**1.5034** ***	37.3009	-0.0188	-0.2517	-0.0286	-0.4584
i12	FOOD & BEVERAGES	**0.2472** ***	11.4689	-0.0333	-0.9486	0.0193	0.2802
i13	HEALTH CARE SERVICES	**0.2819** ***	9.3809	0.0767	1.3930	-0.0016	-0.0245
i14	HOTEL & TRAVEL SERVICE	**0.2021** ***	9.7701	0.0044	0.1130	-0.0160	-0.3963
i15	HOUSEHOLDGOODS	**0.3347** ***	8.0301	**-0.1443** ***	-2.8222	-0.0182	-0.2992
i16	INSURANCE	**0.1440** ***	6.8722	0.0210	0.7635	-0.0548	-1.1327
i17	MACH. & EQUIPMENT	**0.3402** ***	8.9550	0.0633	0.7308	-0.0006	-0.0085
i18	MINING	**0.5384** ***	9.4551	0.0437	0.4331	-0.1555	-1.2706
i19	PACKAGING	**0.4347** ***	11.3503	0.0583	0.9118	-0.0140	-0.2471
i20	PAPER & PRINT MATERIALS	**0.3291** ***	8.0463	0.0224	0.3804	-0.0309	-0.5999
i21	PERS PROD.& PHARMA	**0.0487** *	1.6504	-0.0851	-0.7948	-0.0092	-0.0822
i22	PETRO & &CHEMICALS	**0.9912** ***	23.3440	0.0397	0.5257	**-0.0913** **	-1.9598
i23	PRINTING & PUBLISHING	**0.3443** ***	9.9994	0.0538	0.8998	-0.0525	-0.5717
i24	PROF. SERVICES	**0.0668** **	2.0754	-0.0850	-1.2274	-0.0837	-1.0826
i25	PROPERTY DEVELOPMENT	**1.0592** ***	32.4808	0.0011	0.0201	0.0638	1.1352
i26	TRANS. & LOGISTICS	**0.9272** ***	19.1645	-0.0132	-0.1795	-0.0312	-0.3278
Risk premium							
MK	Market factor	0.0459	1.1167				
FXEU	Exchange rate (TH/EU)			0.0110	0.7284		
SPREU	Δ(TH – EU interest rate)*10^3					-0.0053	-0.4392
	J-statistic	0.019945					

***indicate coefficient is significantly different from zero at the 0.01 level.
** indicate coefficient is significantly different from zero at the 0.05 level.
* indicate coefficient is significantly different from zero at the 0.1 level.

Table 4.6 Testing two-factor model by additional factors: domestic interest rate and foreign interest rate (Model 3).

The table reports the results of testing two-factor regression with an additional factor: spread between domestic interest rate and foreign interest rate by GMM. The independent variables are market excess return (MK), excess return on exchange rate in three bilateral currencies (domestic per foreign rate: US dollar (FXUS), Japanese yen (FXJP) and 1-month interbank rate (in US (INTUS), Japan (INTJP), Euro (INTEU) and Thai (INTTH) market). The interest rates are regressed at the first difference and multiplied by 10^3. The dependent variables are excess return on 26 industries. The samples of daily data lie between periods of 1992 to 2004 and also separated into 4 sub-periods: 1) Jan 1, 1992 - Dec 31, 1993 2) Jan 1, 1993 - July 1, 1997 3) July 2, 1997 - Dec 31, 1998 and 4) Jan 1, 1999 - Dec 31, 2004. The top cell reports system equation with currency of a main trading partner used to measured exchange rate risk.

Panel A This panel presents results when the regressor of bilateral currency is domestic per US dollar.

Equation		$r_{it} = \beta_{im}\, r_{mt} + \beta_{ix}^{US} r_{xt}^{US} + \beta_i^{US}\, I_t^{US} + \beta_i^{TH}\, I_t^{TH} + \xi_{it}$, $r_{mt} = \lambda_m + v_t$, $r_{xt}^{US} = \lambda_x^{US} + \varepsilon_t^{US}$, $I_t^{US} = \lambda_I^{US} + e_t^{US}$, $I_t^{TH} = \lambda_I^{TH} + e_t^{TH}$							
Period		**1) Jan 1, 1992 - Dec 31, 1992**							
Dependent variable		**MK**		**FXUS**		**INTUS**		**INTTH**	
	Industry	**Coef.**	**t-stat**	**Coef.**	**t-stat**	**Coef.**	**t-stat**	**Coef.**	**t-stat**
i1	AUTOMOTIVE	**0.4570** ***	5.5448	0.1665	0.3798	0.1644	0.8861	-0.0635	-0.4824
i2	BANKING	**0.8912** ***	20.9303	0.7420	1.4115	0.1395	0.6717	-0.0877	-1.3088
i3	COMMERCE	**0.5696** ***	11.7738	0.1913	0.5005	**-0.3042** *	-1.9015	-0.1753	-1.4029
i4	COMMUNICATION	**0.9027** ***	18.9919	0.0361	0.0886	-0.1317	-0.5043	**0.3901** ***	2.5387
i5	CONSTRUCTION MAT	**0.7658** ***	16.0140	-0.7013	-0.6577	0.0477	0.2564	0.1585	1.3463
i6	ELECTRIC PRODS/COMPUTER	**0.8922** ***	17.7396	-0.4733	-1.4548	-0.3339	-1.0031	**-0.2804** *	-1.6986
i7	ELECTRONIC COMPONENTS	**0.8525** ***	17.5372	-1.7245	-0.2736	**2.4356** ***	3.5199	**-0.5357** ***	-3.2955
i8	ENERGY & UTILITIES	**0.9086** ***	18.5077	-0.0411	-0.0979	0.0086	0.0328	0.1975	1.2551
i9	ENT. & RECREATION	**1.1063** ***	12.0947	-2.0522	-0.9428	0.1856	0.6105	0.3614	1.0330
i10	FASHION	**0.7170** ***	16.3411	-0.0993	-0.2997	-0.0954	-0.3224	**0.1907** ***	3.2005
i11	FINANCE &SECURITIES	**1.2558** ***	28.5355	-0.2608	-0.8405	**0.2218** *	1.6631	-0.0936	-1.0063
i12	FOOD & BEVERAGES	**0.6490** ***	11.1051	0.0618	0.2194	**0.3091** *	1.7663	-0.0701	-0.7171
i13	HEALTH CARE SERVICES	**0.4760** ***	8.1019	-1.1090	-0.8178	-0.2327	-0.9282	0.0051	0.0830
i14	HOTEL & TRAVEL SERVICE	**0.8624** ***	21.4919	-0.3414	-0.9507	0.0496	0.2249	-0.0483	-0.4048
i15	HOUSEHOLDGOODS	**0.6733** ***	12.0534	0.0575	0.2192	0.2743	1.5468	0.0028	0.0235
i16	INSURANCE	**0.5408** ***	8.7094	-0.2229	-0.7085	**0.3794** ***	2.5398	-0.0750	-1.0449
i17	MACH. & EQUIPMENT	**0.9088** ***	12.0283	-0.0285	-0.0460	-0.2377	-0.7524	-0.0201	-0.0877
i18	MINING	**1.0551** ***	19.9563	0.1605	0.2959	**1.4075** ***	6.9091	**-0.5414** ***	-2.2518
i19	PACKAGING	**0.7220** ***	26.8464	-0.6108	-0.0959	**0.3382** ***	2.7016	-0.0375	-0.3474
i20	PAPER & PRINT MATERIALS	**0.4994** ***	6.0498	-0.5372	-0.6754	-0.0517	-0.1904	**-0.3427** *	-1.8595
i21	PERS PROD.& PHARMA	**0.9317** ***	12.9087	-2.1828	-0.8142	**-0.7387** *	-1.6814	-0.019	-0.1369
i22	PETRO & &CHEMICALS	**0.8845** ***	17.7878	-0.4505	-1.0385	**0.7577** ***	3.5822	0.0491	0.5090
i23	PRINTING & PUBLISHING	**0.9862** ***	23.9324	0.4206	0.7315	**0.3860** *	1.7077	**0.5972** ***	4.2417
i24	PROF. SERVICES	**0.4226** ***	4.9364	0.1904	0.2335	**-0.9084** ***	-2.2419	**-0.7498** ***	-3.0820
i25	PROPERTY DEVELOPMENT	**1.5512** ***	17.8801	0.0119	0.0477	**-0.4875** ***	-2.5760	-0.0720	-0.7230
i26	TRANS. & LOGISTICS	**0.5536** ***	6.5269	0.1423	0.2475	**-0.4691**	-1.9261	-0.0147	-0.0947

Equation		$r_{it} = \beta_{im}\, r_{mt} + \beta_{ix}^{US} r_{xt}^{US} + \beta_{i}^{US}\, I_{t}^{US} + \beta_{i}^{TH}\, I_{t}^{TH} + \xi_{it}$, $r_{mt} = \lambda_{m} + v_{t}$, $r_{xt}^{US} = \lambda_{x}^{US} + \varepsilon_{t}^{US}$, $I_{t}^{US} = \lambda_{I}^{US} + e_{t}^{US}$, $I_{t}^{TH} = \lambda_{I}^{TH} + e_{t}^{TH}$							
Period		**1) Jan 1, 1992 - Dec 31, 1992**							
Dependent variable		**MK**		**FXUS**		**INTUS**		**INTTH**	
	Industry	**Coef.**	**t-stat**	**Coef.**	**t-stat**	**Coef.**	**t-stat**	**Coef.**	**t-stat**
Risk premium									
MK	Market factor	0.0124	0.1607						
FXUS	Exchange rate (TH/US)			**-0.0248** ***	-3.9995				
INTUS	Δ(US interest rate) *10^3					**-0.0219** *	-1.9348		
INTTH	Δ(Domestic interest rate)*10^3							-0.0095	-0.3863
J-statistic		0.084428							

***indicate coefficient is significantly different from zero at the 0.01 level.
** indicate coefficient is significantly different from zero at the 0.05 level.
* indicate coefficient is significantly different from zero at the 0.1 level.

Table 4.6 Panel A (continue) Testing two-factor model by additional factors: domestic interest rate and foreign interest rate (Model 3)

Equation		$r_{it} = \beta_{im}\, r_{mt} + \beta_{ix}^{US} r_{xt}^{US} + \beta_i^{US}\, I_t^{US} + \beta_i^{TH}\, I_t^{TH} + \xi_{it}$, $r_{mt} = \lambda_m + v_t$, $r_{xt}^{US} = \lambda_x^{US} + \varepsilon_t^{US}$, $I_t^{US} = \lambda_I^{US} + e_t^{US}$, $I_t^{TH} = \lambda_I^{TH} + e_t^{TH}$							
Period		**2) Jan 1, 1993 - July 1, 1997**							
Dependent variable		**MK**		**FXUS**		**INTUS**		**INTTH**	
	Industry	**Coef.**	**t-stat**	**Coef.**	**t-stat**	**Coef.**	**t-stat**	**Coef.**	**t-stat**
i1	AUTOMOTIVE	**0.4582** ***	15.8597	-0.0580	-0.8315	0.5542	1.5377	-0.0042	-0.4977
i2	BANKING	**1.1034** ***	41.9631	-0.0153	-0.1498	**0.3914** *	1.8206	**0.0279** *	1.7425
i3	COMMERCE	**0.5418** ***	20.6509	-0.0340	-0.3346	-0.2733	-1.1042	-0.0087	-0.6171
i4	COMMUNICATION	**1.2239** ***	35.7114	0.0523	0.7186	0.1501	0.4625	-0.0058	-0.4416
i5	CONSTRUCTION MAT	**0.8908** ***	33.5726	-0.2718	-0.3288	-0.0915	-0.3530	**-0.0194** **	-1.9454
i6	ELECTRIC PRODS/COMPUTER	**0.5440** ***	21.6379	0.1363	1.4308	-0.4484	-1.5136	-0.0097	-0.6788
i7	ELECTRONIC COMPONENTS	**0.8265** ***	23.3201	0.1465	1.5029	0.0463	0.0731	-0.0389	-1.5107
i8	ENERGY & UTILITIES	**0.8951** ***	24.4506	-0.2224	-0.8393	**1.1318** ***	2.9234	**-0.0162** *	-1.8375
i9	ENT. & RECREATION	**1.0230** ***	16.8818	-0.4515	-0.5620	-0.2721	-0.6042	**-0.0317** ***	-2.2882
i10	FASHION	**0.6511** ***	22.3140	-0.0252	-0.2997	-0.2003	-0.7640	-0.0330	-1.3490
i11	FINANCE &SECURITIES	**1.5317** ***	45.6670	0.2931	0.2343	-0.1357	-0.3909	0.0080	0.7929
i12	FOOD & BEVERAGES	**0.3395** ***	12.8742	-0.1785	-1.2648	**-0.6752** *	-1.8910	**-0.0175** *	-1.9264
i13	HEALTH CARE SERVICES	**0.5443** ***	20.7770	0.0219	0.2389	0.1173	0.3408	-0.0018	-0.2500
i14	HOTEL & TRAVEL SERVICE	**0.4626** ***	15.3640	0.3487	0.8391	-0.1432	-0.5099	-0.0162	-0.7445
i15	HOUSEHOLDGOODS	**0.3737** ***	13.1283	0.0496	0.5927	**-0.5754** *	-1.7541	**0.0420** ***	3.7888
i16	INSURANCE	**0.3379** ***	14.6589	-0.0681	-1.0497	-0.0368	-0.1167	**-0.0330** *	-1.9294
i17	MACH. & EQUIPMENT	**0.4328** ***	9.6074	0.1428	0.6753	-0.2189	-0.4602	0.0070	0.3656
i18	MINING	**0.9310** ***	16.5469	0.0305	0.1235	-0.0292	-0.0387	0.0079	0.4789
i19	PACKAGING	**0.4123** ***	15.4496	0.1430	0.1199	**-0.5369** **	-1.9494	0.0064	1.2202
i20	PAPER & PRINT MATERIALS	**0.4903** ***	10.4484	0.3905	0.5220	**2.3071** ***	2.7608	0.0175	1.1691
i21	PERS PROD.& PHARMA	**0.3435** ***	7.4181	-0.0036	-0.0372	-0.1101	-0.2456	-0.0028	-0.1188
i22	PETRO & &CHEMICALS	**0.8186** ***	21.3920	0.4031	0.7309	**0.7365** *	1.6657	**0.0297** ***	4.3119
i23	PRINTING & PUBLISHING	**0.4890** ***	11.1563	-0.1922	-0.9414	-0.8201	-1.2101	0.0145	0.5258
i24	PROF. SERVICES	**0.3222** ***	7.0341	0.0545	0.6334	0.2717	0.6647	-0.0197	-1.3229
i25	PROPERTY DEVELOPMENT	**0.9719** ***	34.2031	0.0664	0.5560	**-0.7333** ***	-3.5317	**-0.0233** ***	-3.9277
i26	TRANS. & LOGISTICS	**0.7198** ***	17.0194	0.2909	0.7196	-0.1486	-0.3650	0.0204	1.0139
Risk premium									
MK	Market factor	-0.0502	-1.1329						
FXUS	Exchange rate (TH/US)			**-0.0276** ***	-3.6744				
INTUS	Δ(US interest rate) *10^3					**0.0054** *	1.8663		
INTTH	Δ(Domestic interest rate)*10^3							-0.0507	-0.7918
	J-statistic	0.0438393							

***indicate coefficient is significantly different from zero at the 0.01 level.
** indicate coefficient is significantly different from zero at the 0.05 level.
* indicate coefficient is significantly different from zero at the 0.1 level.

Table 4.6 Panel A (continue) Testing two-factor model by additional factors: domestic interest rate and foreign interest rate (Model 3)

Equation		$r_{it} = \beta_{im}\, r_{mt} + \beta_{ix}^{US} r_{xt}^{US} + \beta_i^{US}\, I_t^{US} + \beta_i^{TH}\, I_t^{TH} + \xi_{it}$, $r_{mt} = \lambda_m + v_t$, $r_{xt}^{US} = \lambda_x^{US} + \varepsilon_t^{US}$, $I_t^{US} = \lambda_I^{US} + e_t^{US}$, $I_t^{TH} = \lambda_I^{TH} + e_t^{TH}$							
Period		**3) July 2, 1997 - Dec 31, 1998**							
Dependent variable		**MK**		**FXUS**		**INTUS**		**INTTH**	
	Industry	**Coef.**	**t-stat**	**Coef.**	**t-stat**	**Coef.**	**t-stat**	**Coef.**	**t-stat**
i1	AUTOMOTIVE	**0.3439** ***	9.0432	-0.0052	-0.0886	-0.4165	-1.0763	**0.1256** *	1.8784
i2	BANKING	**1.4815** ***	27.0405	-0.1121	-2.6709	-0.0758	-0.2139	-0.0142	-0.2558
i3	COMMERCE	**0.5438** ***	11.3405	0.0489	0.8095	0.1563	0.1602	0.0704	1.0981
i4	COMMUNICATION	**1.2788** ***	31.4265	0.0053	0.0945	0.7509	1.5312	0.0124	0.1392
i5	CONSTRUCTION MAT	**1.1863** ***	21.0119	-0.0152	-0.2599	-1.2725	-1.2970	-0.0379	-0.4617
i6	ELECTRIC PRODS/COMPUTER	**0.3898** ***	12.2551	0.0234	0.4608	0.3381	0.5270	0.0357	0.7320
i7	ELECTRONIC COMPONENTS	**0.7350** ***	10.2198	**0.1354** *	1.8897	-0.3594	-0.6816	-0.1191	-1.3966
i8	ENERGY & UTILITIES	**1.0052** ***	22.3093	**0.0806** ***	2.3011	**1.0854** ***	2.4637	0.0163	0.2155
i9	ENT. & RECREATION	**0.7915** ***	15.3595	0.0710	1.5834	-0.1547	-0.2634	0.0036	0.0442
i10	FASHION	**0.3512** ***	11.0182	-0.1029	-1.4596	0.2206	0.3051	0.0771	1.4809
i11	FINANCE &SECURITIES	**1.3829** ***	21.7205	**-0.3051** ***	-4.1772	0.7105	1.0869	0.0818	1.2610
i12	FOOD & BEVERAGES	**0.2047** ***	7.1230	**0.1049** **	2.0016	-0.3132	-0.6496	**-0.1291** ***	-3.7561
i13	HEALTH CARE SERVICES	**0.2418** ***	10.2729	-0.0419	-1.1441	0.0224	0.0556	0.0578	0.9588
i14	HOTEL & TRAVEL SERVICE	**0.2045** ***	6.5205	0.0240	0.4657	-1.2011	-1.0315	-0.0269	-0.5322
i15	HOUSEHOLDGOODS	**0.1529** ***	3.3785	0.0062	0.1052	-0.3240	-0.6222	**0.1410** ***	2.4260
i16	INSURANCE	**0.1994** ***	8.7245	-0.0116	-0.2260	**-0.9494** ***	-2.2358	**0.1630** ***	3.0528
i17	MACH. & EQUIPMENT	**0.4503** ***	6.3773	0.0724	0.6061	**-0.8926** *	-1.7471	0.2793	1.4669
i18	MINING	**0.5338** ***	7.8733	**0.1070** *	1.6921	-0.7183	-0.6723	-0.0263	-0.1936
i19	PACKAGING	**0.2168** ***	7.4901	-0.0180	-0.2366	**0.8778** ***	3.6592	-0.0272	-0.6280
i20	PAPER & PRINT MATERIALS	**0.4477** ***	9.1883	0.0816	1.1396	**1.1488** **	2.0336	-0.0107	-0.1549
i21	PERS PROD.& PHARMA	**0.2423** ***	3.2390	0.0462	0.8084	**4.6802** **	2.0181	0.0213	0.1858
i22	PETRO & &CHEMICALS	**0.9293** ***	16.5544	-0.1440	-1.6118	**1.3553** ***	2.4857	**0.1790** *	1.8660
i23	PRINTING & PUBLISHING	**0.3284** ***	8.8066	-0.0701	-0.8427	-1.2284	-1.0689	0.0563	1.0843
i24	PROF. SERVICES	**0.1591** ***	3.3851	0.0067	0.1720	-0.2604	-0.5389	**-0.1292** **	-1.9584
i25	PROPERTY DEVELOPMENT	**0.8769** ***	14.8319	**-0.1874** ***	-2.3952	**-1.6799** **	-2.1237	**0.2934** ***	2.6838
i26	TRANS. & LOGISTICS	**1.0272** ***	16.4503	**0.1981** ***	2.9067	0.1441	0.2121	**-0.1984** *	-1.8531
	Risk premium								
MK	Market factor	-0.0339	-0.2631						
FXUS	Exchange rate (TH/US)			0.0879	1.0669				
INTUS	Δ(US interest rate) *10^3					-0.0053	-0.8374		
INTTH	Δ(Domestic interest rate)*10^3							**-0.1654** ***	-2.2741
	J-statistic	0.057073							

***indicate coefficient is significantly different from zero at the 0.01 level.
** indicate coefficient is significantly different from zero at the 0.05 level.
* indicate coefficient is significantly different from zero at the 0.1 level.

Table 4.6 Panel A (continue) Testing two-factor model by additional factors: domestic interest rate and foreign interest rate (Model 3)

Equation		$r_{it} = \beta_{im}\, r_{mt} + \beta_{ix}^{US} r_{xt}^{US} + \beta_{i}^{US}\, I_{t}^{US} + \beta_{i}^{TH}\, I_{t}^{TH} + \xi_{it}$, $r_{mt} = \lambda_{m} + v_{t}$, $r_{xt}^{US} = \lambda_{x}^{US} + \varepsilon_{t}^{US}$, $I_{t}^{US} = \lambda_{I}^{US} + e_{t}^{US}$, $I_{t}^{TH} = \lambda_{I}^{TH} + e_{t}^{TH}$							
Period		**4) Jan 1, 1999 - Dec 31, 2004**							
Dependent variable		**MK**		**FXUS**		**INTUS**		**INTTH**	
	Industry	**Coef.**	**t-stat**	**Coef.**	**t-stat**	**Coef.**	**t-stat**	**Coef.**	**t-stat**
i1	AUTOMOTIVE	**0.3312** ***	11.9904	-0.0227	-0.4126	-0.0193	-0.0973	-0.0255	-0.3264
i2	BANKING	**1.3422** ***	41.6030	-0.0231	-0.6312	**-0.6053** ***	-2.2520	0.0515	1.0571
i3	COMMERCE	**0.5036** ***	13.6109	0.0033	0.0621	**0.6591** ***	2.5940	0.0157	0.2503
i4	COMMUNICATION	**1.1479** ***	33.1223	0.0181	0.3942	**0.5644** ***	2.4367	-0.0521	-0.7857
i5	CONSTRUCTION MAT	**0.8597** ***	21.9703	-0.0594	-1.0934	0.1936	0.6724	0.0909	1.0712
i6	ELECTRIC PRODS/COMPUTER	**0.5954** ***	16.8354	-0.0203	-0.3447	0.3534	0.8544	-0.0410	-0.5118
i7	ELECTRONIC COMPONENTS	**0.7714** ***	15.1810	-0.0571	-0.8195	-0.4410	-1.4548	0.0391	0.3264
i8	ENERGY & UTILITIES	**0.7751** ***	21.9501	0.0720	1.1182	-0.2006	-0.7785	-0.0080	-0.0891
i9	ENT. & RECREATION	**0.7285** ***	21.6196	0.0747	1.1007	-0.0582	-0.1964	0.0205	0.1275
i10	FASHION	**0.3443** ***	16.0359	-0.0344	-0.7973	0.2699	1.2078	-0.0919	-1.6291
i11	FINANCE &SECURITIES	**1.5041** ***	36.6896	-0.0039	-0.0795	-0.4342	-0.8928	-0.0225	-0.2289
i12	FOOD & BEVERAGES	**0.2512** ***	11.7448	-0.0037	-0.1170	0.1002	0.3361	0.0657	0.6286
i13	HEALTH CARE SERVICES	**0.2818** ***	9.4037	**0.1499** ***	2.2310	-0.1330	-0.5210	-0.0419	-0.7605
i14	HOTEL & TRAVEL SERVICE	**0.2022** ***	9.9260	0.0301	0.8743	**-0.4584** ***	-3.7585	0.0059	0.0909
i15	HOUSEHOLDGOODS	**0.3422** ***	8.2395	**-0.1812** **	-2.0693	**0.7138** *	1.9031	-0.0126	-0.1383
i16	INSURANCE	**0.1445** ***	6.9728	0.0335	1.2904	0.0887	0.6267	-0.0753	-1.0783
i17	MACH. & EQUIPMENT	**0.3351** ***	8.7607	-0.0763	-1.0578	0.4097	1.1499	-0.0388	-0.4027
i18	MINING	**0.5495** ***	9.5444	**0.3384** ***	3.3715	-0.5932	-1.2002	-0.0957	-0.5570
i19	PACKAGING	**0.4306** ***	11.3365	-0.0127	-0.2097	-0.0600	-0.2087	0.0083	0.1032
i20	PAPER & PRINT MATERIALS	**0.3250** ***	7.8990	-0.0600	-1.1739	**0.7708** **	2.2264	0.0017	0.0177
i21	PERS PROD.& PHARMA	**0.0554** ***	1.4433	0.0016	0.0171	-1.1908	-1.3646	-0.0612	-0.4506
i22	PETRO & &CHEMICALS	**0.9936** ***	23.2155	0.0808	1.2946	0.0225	0.0622	-0.0382	-0.5137
i23	PRINTING & PUBLISHING	**0.3415** ***	9.8028	0.0532	1.0559	-0.1788	-0.7537	-0.0882	-0.6418
i24	PROF. SERVICES	**0.0693** ***	2.2219	-0.1345	-1.4258	0.3095	1.2061	-0.0414	-0.3965
i25	PROPERTY DEVELOPMENT	**1.0571** ***	32.2659	-0.0544	-1.0841	**-0.7089** **	-2.1472	0.0717	0.7646
i26	TRANS. & LOGISTICS	**0.9359** ***	19.2895	0.0462	0.7007	**1.7285** ***	3.7584	-0.0591	-0.4237
	Risk premium								
MK	Market factor	0.0443	1.0767						
FXUS	Exchange rate (TH/US)			0.0000	-0.0015				
INTUS	Δ(US interest rate) *10^3					-0.0037	-1.1545		
INTTH	Δ(Domestic interest rate)*10^3							-0.0122	-1.1489
	J-statistic	0.019946							

***indicate coefficient is significantly different from zero at the 0.01 level.
** indicate coefficient is significantly different from zero at the 0.05 level.
* indicate coefficient is significantly different from zero at the 0.1 level.

Table 4.6 (continue) Testing two-factor model by additional factors: domestic interest rate and foreign interest rate (Model 3).

Panel B This panel presents results when the regressor of bilateral currency is domestic per Japanese yen.

Equation	$r_{it} = \beta_{im}\, r_{mt} + \beta_{ix}^{JP} r_{xt}^{JP} + \beta_i^{JP}\, I_t^{JP} + \beta_i^{TH}\, I_t^{TH} + \xi_{it}$, $r_{mt} = \lambda_m + v_t$, $r_{xt}^{JP} = \lambda_x^{JP} + \varepsilon_t^{JP}$, $I_t^{JP} = \lambda_I^{JP} + e_t^{JP}$, $I_t^{TH} = \lambda_I^{TH} + e_t^{TH}$								
Period		**1) Jan 1, 1992 - Dec 31, 1992**							
Dependent variable		**MK**		**FXJP**		**INTJP**		**INTTH**	
	Industry	**Coef.**	**t-stat**	**Coef.**	**t-stat**	**Coef.**	**t-stat**	**Coef.**	**t-stat**
i1	AUTOMOTIVE	**0.4588** ***	5.6321	-0.2619	-0.3337	-0.2424	-0.9638	-0.0140	-0.1127
i2	BANKING	**0.9143** ***	21.5721	-0.0168	-0.1596	**-0.5986** *	-1.8077	-0.0907	-1.4473
i3	COMMERCE	**0.5897** ***	13.0314	-0.0690	-0.8185	0.4798	1.1766	-0.1839	-1.4304
i4	COMMUNICATION	**0.9069** ***	18.9923	-0.0556	-0.3962	-0.4457	-1.3777	**0.3540** ***	2.2991
i5	CONSTRUCTION MAT	**0.7687** ***	16.0449	-0.2347	-0.0345	0.0156	0.0816	**0.1946** *	1.7061
i6	ELECTRIC PRODS/COMPUTER	**0.8946** ***	18.5881	-0.2573	-0.6122	0.1029	0.2807	-0.2136	-1.3173
i7	ELECTRONIC COMPONENTS	**0.8589** ***	16.7595	-0.0191	-0.1143	0.4530	0.9452	**-0.5728** ***	-3.3230
i8	ENERGY & UTILITIES	**0.9092** ***	18.8169	-0.1548	-1.0141	-0.1079	-0.3199	0.1600	1.0739
i9	ENT. & RECREATION	**1.1188** ***	12.6382	-0.1550	-0.5053	**0.6057** *	1.7007	0.3490	0.9730
i10	FASHION	**0.7229** ***	17.0672	-0.1201	-0.7402	0.0996	0.3723	**0.2004** ***	3.4311
i11	FINANCE &SECURITIES	**1.2312** ***	29.5746	0.1850	1.5835	0.1500	0.5674	-0.0747	-0.8232
i12	FOOD & BEVERAGES	**0.6674** ***	11.6220	0.1071	1.3143	0.2160	0.6908	-0.0682	-0.6854
i13	HEALTH CARE SERVICES	**0.4991** ***	9.7220	-0.2054	-0.1642	0.1500	0.4382	0.0043	0.0634
i14	HOTEL & TRAVEL SERVICE	**0.8692** ***	22.6110	0.0403	0.4087	**0.6699** **	2.0026	-0.0847	-0.7080
i15	HOUSEHOLDGOODS	**0.7030** ***	13.7684	0.0213	0.2606	**0.7683** ***	3.2673	-0.0028	-0.0233
i16	INSURANCE	**0.5618** ***	9.4605	0.0661	0.6952	0.1491	0.6344	-0.0852	-1.2278
i17	MACH. & EQUIPMENT	**0.9104** ***	11.7490	0.2333	1.1823	0.1223	0.2169	0.0113	0.0478
i18	MINING	**1.0318** ***	18.7218	-0.3327	-0.0038	0.3107	0.6620	**-0.5252** ***	-2.3201
i19	PACKAGING	**0.7140** ***	25.7619	-0.0149	-0.1844	0.0943	0.2908	-0.0262	-0.2480
i20	PAPER & PRINT MATERIALS	**0.4983** ***	6.1942	-0.4437	-0.0985	**-0.4424** *	-1.7605	**-0.3596** **	-1.9767
i21	PERS PROD.& PHARMA	**0.9100** ***	12.8857	-0.1632	-0.7711	-0.4754	-0.3509	-0.0272	-0.1797
i22	PETRO & &CHEMICALS	**0.8851** ***	17.5871	-0.0418	-0.3254	-0.3916	-1.1461	0.0083	0.0870
i23	PRINTING & PUBLISHING	**0.9875** ***	23.1456	0.1412	1.4941	-0.2240	-0.7064	**0.6594** ***	4.4431
i24	PROF. SERVICES	**0.3727** ***	4.1589	-0.4022	-0.6327	0.1017	0.2681	**-0.6445** ***	-2.8666
i25	PROPERTY DEVELOPMENT	**1.5261** ***	18.6362	0.0960	1.0035	-0.0678	-0.2847	-0.0751	-0.7128
i26	TRANS. & LOGISTICS	**0.5865** ***	7.1298	0.0331	0.2849	1.1224	1.1510	-0.0205	-0.1385
	Risk premium								
MK	Market factor	-0.0084	-0.1119						
FXJP	Exchange rate (TH/JP)			-0.0188	-0.6462				
INTJP	Δ(JP interest rate) *10^3					**-0.0191** **	-2.0817		
INTTH	Δ(Domestic interest rate)*10^3							-0.0047	-0.1867
	J-statistic	0.072944							

***indicate coefficient is significantly different from zero at the 0.01 level.
** indicate coefficient is significantly different from zero at the 0.05 level.
* indicate coefficient is significantly different from zero at the 0.1 level.

Table 4.6 Panel B (continue) Testing two-factor model by additional factors: domestic interest rate and foreign interest rate (Model 3)

Equation		$r_{it} = \beta_{im}\, r_{mt} + \beta_{ix}^{JP} r_{xt}^{JP} + \beta_{i}^{JP}\, I_{t}^{JP} + \beta_{i}^{TH}\, I_{t}^{TH} + \xi_{it}$, $r_{mt} = \lambda_m + v_t$, $r_{xt}^{JP} = \lambda_x^{JP} + \varepsilon_t^{JP}$, $I_t^{JP} = \lambda_I^{JP} + e_t^{JP}$, $I_t^{TH} = \lambda_I^{TH} + e_t^{TH}$							
Period		**2) Jan 1, 1993 - July 1, 1997**							
Dependent variable		**MK**		**FXJP**		**INTJP**		**INTTH**	
	Industry	**Coef.**	**t-stat**	**Coef.**	**t-stat**	**Coef.**	**t-stat**	**Coef.**	**t-stat**
i1	AUTOMOTIVE	**0.4578** ***	15.7422	-0.0529	-1.4567	-0.0931	-0.3272	-0.0056	-0.6695
i2	BANKING	**1.1026** ***	40.7601	-0.0288	-0.9586	**-0.4547** ***	-2.2733	**0.0415** *	1.7686
i3	COMMERCE	**0.5330** ***	20.1119	-0.0302	-0.7990	0.1370	0.7191	-0.0099	-0.6945
i4	COMMUNICATION	**1.2087** ***	35.4306	-0.0076	-0.1897	**0.7710** ***	2.2927	-0.0221	-1.0602
i5	CONSTRUCTION MAT	**0.8815** ***	32.9218	-0.0151	-0.3898	-0.2746	-1.1192	-0.0016	-0.0908
i6	ELECTRIC PRODS/COMPUTER	**0.5453** ***	21.4898	0.1151	0.8225	0.4002	1.3898	-0.0142	-0.8662
i7	ELECTRONIC COMPONENTS	**0.8334** ***	22.3784	-0.1767	-0.5135	0.5002	1.1222	**-0.0711** *	-1.6495
i8	ENERGY & UTILITIES	**0.8742** ***	24.7282	-0.0045	-0.0940	**0.9941** ***	2.3498	**-0.0169** *	-1.8833
i9	ENT. & RECREATION	**1.0024** ***	16.5246	-0.1277	-0.2068	0.3668	0.7227	**-0.0350** ***	-2.5706
i10	FASHION	**0.6553** ***	22.0183	-0.0638	-0.7918	-0.1592	-0.6292	-0.0556	-1.4799
i11	FINANCE &SECURITIES	**1.5460** ***	45.5538	0.0989	0.9065	-0.0734	-0.1980	0.0018	0.1612
i12	FOOD & BEVERAGES	**0.3343**	12.3948	-0.0155	-0.4268	-0.2502	-1.4423	**-0.0132** *	-1.7993
i13	HEALTH CARE SERVICES	**0.5414** ***	20.7126	0.0875	0.2508	**1.3124** ***	3.9003	-0.0044	-0.5766
i14	HOTEL & TRAVEL SERVICE	**0.4552** ***	14.8511	0.0521	1.3866	**0.7940** ***	3.9366	-0.0360	-1.1239
i15	HOUSEHOLDGOODS	**0.3742** ***	13.3464	-0.0641	-0.8122	**-0.4439** ***	-2.3077	**0.0450** ***	3.4751
i16	INSURANCE	**0.3411** ***	14.8869	0.0009	0.0300	0.3449	1.3118	**-0.0454** *	-1.8482
i17	MACH. & EQUIPMENT	**0.4296** ***	9.6423	0.1086	0.2513	0.2324	0.4812	0.0225	0.7866
i18	MINING	**0.9441** ***	15.8983	-0.1226	-1.1616	**-1.0841** *	-1.7860	-0.0050	-0.2179
i19	PACKAGING	**0.4091** ***	15.5995	0.0015	0.0428	**0.3501** *	1.7787	-0.0003	-0.0474
i20	PAPER & PRINT MATERIALS	**0.4781** ***	10.4019	0.0215	0.3634	0.2162	0.5574	0.0052	0.4507
i21	PERS PROD.& PHARMA	**0.3220** ***	7.0266	0.0422	0.6515	0.5887	1.2173	0.0242	0.6401
i22	PETRO & &CHEMICALS	**0.7993** ***	21.3640	-0.0619	-0.9874	0.5330	1.3893	**0.0192** ***	3.6509
i23	PRINTING & PUBLISHING	**0.4917** ***	11.3230	-0.0382	-0.8304	**0.7802** **	2.0270	0.0404	0.9823
i24	PROF. SERVICES	**0.3049** ***	6.8299	0.1017	0.8686	**0.8730** *	1.8875	-0.0259	-1.4292
i25	PROPERTY DEVELOPMENT	**0.9833** ***	33.3832	0.0231	0.4985	0.1342	0.4456	**-0.0183** ***	-3.0506
i26	TRANS. & LOGISTICS	**0.7192** ***	17.1919	0.1486	0.9170	**0.8706** **	2.1143	0.0258	1.0379
Risk premium									
MK	Market factor	-0.0476	-1.0793						
FXJP	Exchange rate (TH/JP)			**-0.0297** *	-1.6403				
INTJP	Δ(JP interest rate) *10^3					**-0.0090** ***	-3.0622		
INTTH	Δ(Domestic interest rate)*10^3							-0.0680	-1.1032
	J-statistic	0.0458296418657							

***indicate coefficient is significantly different from zero at the 0.01 level.
** indicate coefficient is significantly different from zero at the 0.05 level.
* indicate coefficient is significantly different from zero at the 0.1 level.

Table 4.6 Panel B (continue) Testing two-factor model by additional factors: domestic interest rate and foreign interest rate (Model 3)

Equation		$r_{it} = \beta_{im}\, r_{mt} + \beta_{ix}^{JP} r_{xt}^{JP} + \beta_i^{JP}\, I_t^{JP} + \beta_i^{TH}\, I_t^{TH} + \xi_{it}$, $r_{mt} = \lambda_m + v_t$, $r_{xt}^{JP} = \lambda_x^{JP} + \varepsilon_t^{JP}$, $I_t^{JP} = \lambda_I^{JP} + e_t^{JP}$, $I_t^{TH} = \lambda_I^{TH} + e_t^{TH}$							
Period		**3) July 2, 1997 - Dec 31, 1998**							
Dependent variable		**MK**		**FXJP**		**INTJP**		**INTTH**	
	Industry	**Coef.**	**t-stat**	**Coef.**	**t-stat**	**Coef.**	**t-stat**	**Coef.**	**t-stat**
i1	AUTOMOTIVE	**0.3436** ***	9.2429	0.0210	0.4095	-1.0080	-0.8395	**0.1204** *	1.7414
i2	BANKING	**1.4853** ***	27.3061	-0.0398	-0.7508	-0.3545	-0.3359	-0.0338	-0.5744
i3	COMMERCE	**0.5367** ***	11.7228	0.0774	1.6329	0.4493	0.3998	0.0528	0.8323
i4	COMMUNICATION	**1.2777** ***	31.1982	0.0156	0.2994	-0.7418	-0.6265	0.0288	0.3105
i5	CONSTRUCTION MAT	**1.1911** ***	20.3992	-0.0242	-0.4135	1.5423	1.4371	-0.0600	-0.7012
i6	ELECTRIC PRODS/COMPUTER	**0.3782** ***	12.2450	0.0526	1.1853	-1.1387	-0.9505	0.0287	0.5746
i7	ELECTRONIC COMPONENTS	**0.7396** ***	10.3310	0.0375	0.4572	-0.1388	-0.1216	-0.1048	-1.1469
i8	ENERGY & UTILITIES	**1.0017** ***	22.2845	0.0433	1.2509	-0.9496	-0.9655	0.0474	0.5988
i9	ENT. & RECREATION	**0.7902** ***	15.3407	0.0752	1.6351	-1.9053	-1.0993	0.0197	0.2408
i10	FASHION	**0.3573** ***	11.6427	-0.0750	-1.2916	**1.9430** ***	2.5458	0.0483	0.9250
i11	FINANCE &SECURITIES	**1.3922** ***	21.4210	**-0.2232** ***	-4.1979	0.5602	0.3479	0.0910	1.4087
i12	FOOD & BEVERAGES	**0.1960** ***	6.9831	0.0766	1.4305	0.1054	0.1724	**-0.1327** ***	-3.7198
i13	HEALTH CARE SERVICES	**0.2460** ***	10.4754	-0.0496	-1.4880	1.2309	0.7265	0.0534	0.8776
i14	HOTEL & TRAVEL SERVICE	**0.2072** ***	6.9030	0.0239	0.5261	**-2.1860** ***	-3.1648	-0.0163	-0.3052
i15	HOUSEHOLDGOODS	**0.1435** ***	3.2013	0.0261	0.5005	**4.5523** ***	3.4540	**0.0922** *	1.7299
i16	INSURANCE	**0.2020** ***	8.9131	-0.0124	-0.2736	**3.7773** **	2.1433	**0.1155** ***	2.9938
i17	MACH. & EQUIPMENT	**0.4422** ***	6.2789	0.0611	0.6396	**5.9242** **	2.0212	0.2516	1.2864
i18	MINING	**0.5303** ***	8.2155	**0.2199** ***	3.4977	**2.0715** *	1.6967	-0.0878	-0.6333
i19	PACKAGING	**0.2125** ***	7.6046	0.0015	0.0233	1.7655	1.3490	-0.0537	-1.1694
i20	PAPER & PRINT MATERIALS	**0.4424** ***	9.1692	0.0339	0.5464	-0.8896	-0.5793	0.0119	0.1631
i21	PERS PROD.& PHARMA	**0.2075** ***	2.5783	0.0369	0.4849	**4.8800** ***	2.8142	0.0062	0.0538
i22	PETRO & &CHEMICALS	**0.9312** ***	16.2915	-0.0995	-1.1074	-0.0664	-0.0461	**0.1826** *	1.8807
i23	PRINTING & PUBLISHING	**0.3327** ***	8.6430	-0.0606	-0.8793	1.7330	1.5076	0.0299	0.5721
i24	PROF. SERVICES	**0.1599** ***	3.5300	-0.0218	-0.5367	**3.0771** ***	2.4094	**-0.1463** **	-2.1140
i25	PROPERTY DEVELOPMENT	**0.8892** ***	14.6254	**-0.1966** ***	-2.6264	0.6404	0.3364	**0.3222** ***	2.8836
i26	TRANS. & LOGISTICS	**1.0346** ***	17.0996	**0.1261** ***	2.2796	1.5998	1.3085	**-0.1949** *	-1.8682
	Risk premium								
MK	Market factor	-0.0383	-0.3041						
FXJP	Exchange rate (TH/JP)			0.1162	1.3454				
INTJP	Δ(JP interest rate) *10^3					-0.0033	-1.0783		
INTTH	Δ(Domestic interest rate)*10^3							**-0.1757** ***	-2.4195
	J-statistic	0.058314							

***indicate coefficient is significantly different from zero at the 0.01 level.
** indicate coefficient is significantly different from zero at the 0.05 level.
* indicate coefficient is significantly different from zero at the 0.1 level.

Table 4.6 Panel B (continue) Testing two-factor model by additional factors: domestic interest rate and foreign interest rate (Model 3)

Equation		$r_{it} = \beta_{im}\, r_{mt} + \beta_{ix}^{JP} r_{xt}^{JP} + \beta_{i}^{JP}\, I_{t}^{JP} + \beta_{i}^{TH}\, I_{t}^{TH} + \xi_{it}$, $r_{mt} = \lambda_{m} + v_{t}$, $r_{xt}^{JP} = \lambda_{x}^{JP} + \varepsilon_{t}^{JP}$, $I_{t}^{JP} = \lambda_{I}^{JP} + e_{t}^{JP}$, $I_{t}^{TH} = \lambda_{I}^{TH} + e_{t}^{TH}$							
Period		4) Jan 1, 1999 - Dec 31, 2004							
Dependent variable		MK		FXJP		INTJP		INTTH	
	Industry	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat
i1	AUTOMOTIVE	**0.3295** ***	12.1256	-0.0096	-0.2821	-0.1118	-1.4017	-0.0199	-0.2628
i2	BANKING	**1.3436** ***	41.7046	-0.0383	-1.1402	**-0.5207** ***	-2.9536	0.0616	1.2803
i3	COMMERCE	**0.4991** ***	13.6463	-0.0195	-0.4942	**0.4952** ***	4.0217	0.0072	0.1157
i4	COMMUNICATION	**1.1475** ***	33.2434	0.0153	0.3917	**0.6236** ***	5.5879	-0.0612	-0.9334
i5	CONSTRUCTION MAT	**0.8583** ***	22.1849	**-0.0776** **	-2.1223	0.1408	0.6477	0.0867	1.0430
i6	ELECTRIC PRODS/COMPUTER	**0.5946** ***	17.1412	0.0520	1.3053	0.3226	1.4164	-0.0376	-0.4843
i7	ELECTRONIC COMPONENTS	**0.7713** ***	15.4378	-0.0032	-0.0633	0.1355	0.5485	0.0304	0.2576
i8	ENERGY & UTILITIES	**0.7766** ***	22.1421	**0.0947** ***	2.2988	-0.0936	-0.6921	-0.0107	-0.1237
i9	ENT. & RECREATION	**0.7289** ***	21.7645	**0.1717** ***	2.8009	-0.2701	-1.4216	0.0254	0.1527
i10	FASHION	**0.3446** ***	16.2888	0.0275	0.8904	**0.2365** ***	2.5583	-0.0827	-1.4692
i11	FINANCE &SECURITIES	**1.5023** ***	37.2388	-0.0328	-0.6852	-0.0593	-0.1800	-0.0182	-0.1907
i12	FOOD & BEVERAGES	**0.2500** ***	11.8177	0.0214	0.8616	-0.0980	-0.9475	0.0639	0.6132
i13	HEALTH CARE SERVICES	**0.2745** ***	9.1087	0.0457	1.0158	**-0.3821** **	-2.0506	-0.0590	-1.0546
i14	HOTEL & TRAVEL SERVICE	**0.2026** ***	10.0165	**0.0580** **	2.0097	**-0.2182** *	-1.8648	0.0039	0.0596
i15	HOUSEHOLDGOODS	**0.3438** ***	8.4070	-0.0703	-0.9138	0.2379	0.7661	0.0102	0.1073
i16	INSURANCE	**0.1421** ***	6.9050	0.0122	0.6430	**0.1787** ***	2.3553	-0.0856	-1.2111
i17	MACH. & EQUIPMENT	**0.3377** ***	9.0310	0.0832	1.0916	0.2005	1.1958	-0.0235	-0.2585
i18	MINING	**0.5379** ***	9.2933	0.1494	1.5201	-0.0157	-0.0377	-0.1221	-0.7194
i19	PACKAGING	**0.4263** ***	11.1645	-0.0401	-0.7210	-0.2853	-1.2147	0.0046	0.0596
i20	PAPER & PRINT MATERIALS	**0.3287** ***	7.8612	0.0358	0.5657	**0.7673** ***	4.1173	-0.0035	-0.0372
i21	PERS PROD.& PHARMA	**0.0571** ***	2.4646	-0.0139	-0.2278	-0.2351	-0.4334	-0.0629	-0.4618
i22	PETRO & &CHEMICALS	**0.9940** ***	23.3539	**0.1719** ***	3.2381	**0.3782** *	1.7740	-0.0421	-0.5454
i23	PRINTING & PUBLISHING	**0.3374** ***	9.5695	-0.0144	-0.3526	0.1601	0.8803	-0.1093	-0.7839
i24	PROF. SERVICES	**0.0713** ***	2.3192	**-0.1403** **	-2.0816	**0.4026** ***	3.3075	-0.0361	-0.3526
i25	PROPERTY DEVELOPMENT	**1.0565** ***	32.4840	-0.0356	-1.0432	-0.1015	-0.3862	0.0729	0.7936
i26	TRANS. & LOGISTICS	**0.9271** ***	19.3700	-0.0362	-0.6937	0.4208	0.9776	-0.0575	-0.4207
	Risk premium								
MK	Market factor	0.0475	1.1571						
FXJP	Exchange rate (TH/JP)			0.0032	0.2105				
INTJP	Δ(JP interest rate) *10^3					-0.0015	-0.5081		
INTTH	Δ(Domestic interest rate)*10^3							-0.0134	-1.2559
	J-statistic	0.019862							

***indicate coefficient is significantly different from zero at the 0.01 level.
** indicate coefficient is significantly different from zero at the 0.05 level.
* indicate coefficient is significantly different from zero at the 0.1 level.

Table 4.6 (continue) Testing two-factor model by additional factors: domestic interest rate and foreign interest rate (Model 3)

Panel C This panel presents results when the regressor of bilateral currency is domestic per Euro.

Equation		$r_{it} = \beta_{im}\, r_{mt} + \beta_{ix}^{EU}\, r_{xt}^{EU} + \beta_{i}^{EU}\, I_{t}^{EU} + \beta_{i}^{TH}\, I_{t}^{TH} + \xi_{it}$, $r_{mt} = \lambda_{m} + v_{t}$, $r_{xt}^{EU} = \lambda_{x}^{EU} + \varepsilon_{t}^{EU}$, $I_{t}^{EU} = \lambda_{I}^{EU} + e_{t}^{EU}$, $I_{t}^{TH} = \lambda_{I}^{TH} + e_{t}^{TH}$							
Period		**4) Jan 1, 1999 - Dec 31, 2004**							
Dependent variable		**MK**		**FXEU**		**INTEU**		**INTTH**	
	Industry	**Coef.**	**t-stat**	**Coef.**	**t-stat**	**Coef.**	**t-stat**	**Coef.**	**t-stat**
i1	AUTOMOTIVE	**0.3256** ***	11.6423	-0.0472	-1.0184	0.0448	0.9362	-0.0283	-0.3725
i2	BANKING	**1.3485** ***	41.4274	0.0367	0.7611	**-0.1608** **	-2.2002	0.0692	1.4403
i3	COMMERCE	**0.4981** ***	13.9903	-0.0276	-0.5344	-0.0808	-1.2002	0.0066	0.1065
i4	COMMUNICATION	**1.1457** ***	32.1258	-0.0088	-0.1783	0.1081	1.2778	-0.0613	-0.9418
i5	CONSTRUCTION MAT	**0.8538** ***	22.8217	-0.0726	-1.5011	0.0924	1.6266	0.0868	1.0407
i6	ELECTRIC PRODS/COMPUTER	**0.5841** ***	16.3298	**-0.0973** *	-1.9276	0.0091	0.1355	-0.0557	-0.7088
i7	ELECTRONIC COMPONENTS	**0.7491** ***	14.7738	**-0.2361** ***	-2.7932	0.1951	1.2553	0.0029	0.0249
i8	ENERGY & UTILITIES	**0.7640** ***	22.2321	-0.1031	-1.6058	**0.2227** ***	4.5571	-0.0370	-0.4331
i9	ENT. & RECREATION	**0.7377** ***	21.6198	**0.1551** **	2.0429	0.1296	1.4303	0.0354	0.2243
i10	FASHION	**0.3409** ***	15.5998	-0.0268	-0.6957	-0.0045	-0.1216	-0.0892	-1.6105
i11	FINANCE &SECURITIES	**1.5025** ***	37.3127	-0.0181	-0.2385	0.0813	0.9653	-0.0169	-0.1714
i12	FOOD & BEVERAGES	**0.2464** ***	11.5519	-0.0323	-0.9417	**-0.1075** ***	-2.6594	0.0590	0.5683
i13	HEALTH CARE SERVICES	**0.2801** ***	9.3186	0.0772	1.3981	**0.2324** ***	3.6030	-0.0523	-0.9471
i14	HOTEL & TRAVEL SERVICE	**0.2012** ***	9.7458	0.0049	0.1260	0.0373	0.4489	0.0013	0.0196
i15	HOUSEHOLDGOODS	**0.3337** ***	8.0555	**-0.1436** ***	-2.7829	-0.0013	-0.0149	-0.0036	-0.0398
i16	INSURANCE	**0.1428** ***	6.8587	0.0174	0.6425	-0.0369	-0.8806	-0.0819	-1.1484
i17	MACH. & EQUIPMENT	**0.3389** ***	8.9562	0.0614	0.7054	0.1535	1.3083	-0.0213	-0.2222
i18	MINING	**0.5364** ***	9.2920	0.0435	0.4238	0.2629	0.9809	-0.1286	-0.7619
i19	PACKAGING	**0.4343** ***	11.3654	0.0593	0.9092	-0.0594	-0.8410	0.0156	0.1943
i20	PAPER & PRINT MATERIALS	**0.3289** ***	8.0271	0.0220	0.3670	0.0519	0.3963	-0.0025	-0.0252
i21	PERS PROD.& PHARMA	**0.0489** ***	1.2545	-0.0886	-0.8328	**0.2890** ***	2.4405	-0.0776	-0.5790
i22	PETRO & &CHEMICALS	**0.9910** ***	23.2947	0.0407	0.5381	0.0800	0.5123	-0.0496	-0.6774
i23	PRINTING & PUBLISHING	**0.3429** ***	9.9620	0.0512	0.8516	-0.0250	-0.3554	-0.0974	-0.6989
i24	PROF. SERVICES	**0.0672** **	2.0987	-0.0868	-1.2581	-0.1811	-1.4319	-0.0296	-0.2894
i25	PROPERTY DEVELOPMENT	**1.0591** ***	32.4885	0.0029	0.0548	0.0802	1.2924	0.0763	0.8340
i26	TRANS. & LOGISTICS	**0.9265** ***	19.3452	-0.0186	-0.2553	**-0.2814** *	-1.9605	-0.0628	-0.4676
	Risk premium								
MK	Market factor	0.0481	1.1694						
FXEU	Exchange rate (TH/EU)			0.0110	0.7305				
INTEU	Δ(EU interest rate) *10^3					0.0047	0.8066		
INTTH	Δ(Domestic interest rate)*10^3							-0.0134	-1.2563
	J-statistic	0.019744							

***indicate coefficient is significantly different from zero at the 0.01 level.
** indicate coefficient is significantly different from zero at the 0.05 level.
* indicate coefficient is significantly different from zero at the 0.1 level.

CHAPTER V

CONCLUSION, LIMITATION AND ADDITIONAL SUGGESTION

5.1 Conclusion

Exchange rate is one of the macroeconomic variables that plays an important role in the economic condition at both microeconomic and macroeconomic level. Due to the economic crisis that starts in Thailand and spread to other countries in the Asia Pacific in 1997, Thai monetary policy in exchange rate regime had changed from fixed (to a basket of currency) exchange rate to manage floating exchange rate on July 2, 1997. The change causes more fluctuation in exchange rate movement and becomes the main issue of this study that how the movement of exchange rate does effects stock return.

To explicit the exposure of exchange rate risk, this study uses an unconditional two-factor model. This version of the two-factor model composes of market factor and exchange rate factor that is employed to estimate exchange rate exposure of 26 industries, classified by Stock Exchange of Thailand (SET). The exchange rates used are bilateral exchange rate with three main trading partners: US, Japan and EU. Additionally, this paper will augment additional factors to test factor risk and robustness of exchange rate risk. These factors are spread (the difference between domestic interest rate and foreign rate) foreign interest rate and domestic interest rate. The period of the study range from 1992 to 2004, included various economic condition such as financial liberalization in 1993, the switching of exchange rate regime in 1997 and the advent of Euro currency in 1999. The test will consider mainly the different effect between pre-and-post crisis.

Before testing hypothesis, the data employed to estimate are no multicollinearity problem, and in stationary form. The series are assumed to be ergodic to serve GMM requirement.

The results show there is no significant exchange rate exposure (β_{ix}) in all currencies before the crisis. The movement of exchange rate in a small band does not affect return on industry. After the switching of exchange regime, during July 2, 1997-1998, 3 sectors: banking sector, finance & securities sector and property development sector have negative coefficients. This refers to bad consequence from use off-shore funds, taken to serve domestic activity. Most firms in these sectors are full of non-performing loan (NPL). Nevertheless, some sectors benefit from depreciation of home currency and nationally these are export growth drivers. After 1999, in all currency there are sectors that suffer (benefits) from depreciation (appreciation) of home currency as well as sectors that benefit (suffers) from depreciation (appreciation) of home currency. Furthermore, some sectors are exposed to exchange rate risk more than one currency. These sectors are household goods, construction material and energy & utility. The last sector is the only sector with statistically significant exposures to exchange rate risk in more than one currency, but with difference direction. After the crisis in 1997, exchange rate risk premium in this sub-period is not significant. There are no exchange rate risk premium in all currencies (λ_x^{US}, λ_x^{JP} and λ_x^{EU}). A possible explanation is that the exchange rate risk is diversified across industries and/or across time.

Extending two-factor model, additional explanatory variables are included to increase explanatory power. These factors are spread (the difference between domestic and

foreign interest rate) and interest rate (both domestic rate and foreign rate).. The results do not show that sector that has exchange rate exposure should have spread rate exposure and/or interest rate exposure also. Obviously, when the regression is augmented by these additional factors, the results support robustness of testing two-factor model.

5.2 Limitation and additional suggestion

The results of this study are empirical result that mainly considers the crisis event. Limitation on this study and discussions in this field of risk are as below.

5.2.1 Limitation

This study is considering in three bilateral exchange rates, base on the most important trading partner, and employs these rates separately in the regression model. However, in reality some industries (and may be in some year) may expose exchange rate exposure contemporaneously in all bilateral rates and it is more suitable to pricing this risk for the currency which that industry significant faces in intercurrency transaction. Practically, the investigated data to know which industry is faced to what currency is time consume and the disclosure of financial statement is not clear to apply for this method.

5.2.2 Additional suggestion

The Euro currency dominates monetary relations with in the European region and may even extend its influence to some neighboring areas, such as the Mediterranean and sub-Saharan Africa. But Euro currency is not enough to be another international currency

for Thai market. However, EU member has been rapid growth until now[1]. As soon as possible, Euro currency may become another currency that may large influence to Thai market.

[1] The European Union has grown from 6 to 15 countries since its beginnings in 1951, and is now preparing for its fifth and largest round of expansion. Ten countries from central Europe and the Mediterranean signed an accession treaty in April 2003 and are on course to join the EU in May 2004. Two more countries, Bulgaria and Romania, may join in 2007. Turkey could start membership talks in 2005.

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APPENDIX

APPENDIX: EXCHANGE RATE EXPOSURE EXTENSION

This section is the extension of exchange rate exposure that has been explained in chapter 2.

Exchange rate exposure

There are many definitions of exchange rate exposure. The standard definition of exchange rate exposure is a measure of the correlation between real asset value and real exchange rate. In the same meaning, asset value and exchange rate are determined simultaneously by underlying factors in the economy (Bodnar & William (1993)). However, the most widely used definition of the exposure is as follow: if value of a firm share is influenced by changes in currency values, it is exhibit exchange rate exposure (Adler and Dumas (1984)). In general, the impact of a given exchange rate is determined by the position in foreign currency of the firm, long or short. The firm with net long position in foreign currency will benefit (suffer) from depreciation (appreciation) of the home currency, while the firm with net short position in foreign currency will suffer (benefit) from depreciation (appreciation) of the home currency. It is regarded as exposure because it influences cash flow, revenue or expense stream. The direction of exposure depends on activities of the firm such as import, export, or its foreign investment.

Indeed, change in exchange rate will affect traded goods and non-traded goods differently. The difference between traded goods and non-traded goods is transportation cost. Non-traded goods have no transportation cost because they can not exchange goods and service across country. In non-traded sector, a shift in resources from traded sector to non-traded sector comes from the relative price change due to an appreciation

of home currency measured by real effective exchange rate (REER)[1]. Real effective exchange rate increases when relative price of tradable goods per non-tradable goods increases. This shows positive relation between the value of non-traded goods sector and appreciation of home currency. In traded sector, the movements of exchange rate change relative price (domestic price to foreign price), input price and output price. These will affect operating cash flow of the firms and finally it will affect the value of the firms.

The economic activities of firms depend on appreciation or depreciation of home currency caused by movement of exchange rate. An appreciation of home currency introduces relative price (domestic price per foreign price) to be higher. Term of trade (export price per import price) is shift up also. This is beneficial for import sector and at the same time it cost export and import-competing sector. Moreover, for exporter, an appreciation of home currency causes reduction in foreign demand, resulting in lower profit margin. For importer, it causes increase in foreign demand and cause higher profit margin.

Additionally, the effect also depends on the percentage change adjustment to push the effect in price to its trader by exchange rate change. Sign of effect (negative or positive) and size of firm become less distinct for firm that value of import as well as value of export. In this case, the sensitivity of the firm value to exchange movements depends on the elasticity of its import demand relative to its export demands (He and Ng (1998)). For the firms which use pure foreign input or internationally-priced input (whose price is determined by world market) will benefit from an appreciation of home

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[1] There are two definitions of **Real Effective Exchange Rate (REER)**

Definition 1 Real effective exchange rate
= Nominal exchange rate * (Foreign price index / Domestic price index)

Definition 2 Real effective exchange rate = ($P^{\text{Tradable goods}}$ / $P^{\text{Non-tradable goods}}$)

currency. This is because it reduces cost of input and increases profit as well as increases value of firm. Their impact is similar for importer.

All above is the exposure from transaction. In translation of value from one currency to another, a depreciation of the home currency increases the value of firms with net foreign dominated asset, and vice versa. The summary effect of an appreciation of the home currency on the value of firm involved in different activities is shown below.

Activity	**Sign of effect**
Non-trade good producer	+
Exporter	-
Importer	+
Import competitor	-
User of internationally-priced inputs	+
Foreign investor	-

Source: Bodnar & William (1993)

BIOGRAPHY

Miss.Chatchaya Lertpiyatas was born on December 23, 1980 and graduated from high school at Satri Withaya School in 1998. Upon completion of the bachelor degree of Economics from Thammasat University in 2002, I entered the Master of Science Program in Finance at Chulalongkorn University in 2002. Then I started work at office of the National Economic and Social Development Board (NESDB) in 2004.