

The Determinants of Capital Flows in Emerging Countries: The Case of Thailand

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Market index, macroeconomic policies, as well as economic growth have already been shown to influence capital flows in emerging markets. The present paper conducts an empirical study by relating macroeconomic policies, market index, market return, and economic growth to direct investment and portfolio investment in Thailand. Macroeconomic policies and economic growth together have a positive and significant effect on direct investment. Portfolio investment is explained positively by market return and country rating. Surprisingly, macroeconomic policies are sometimes sufficient to explain the percentage of portfolio investment per GDP but not the percentage of direct investment per GDP.

1. Introduction

During the 1980s and 1990s, many developing countries had induced and received substantial foreign capital flows to help expand their economy because the funds raised internally were not adequate. These capital inflows were in many forms but mainly were direct and portfolio investments. The direct and portfolio flows into emerging countries were determined by several factors. Those factors included political stability, investment opportunities, macroeconomic variables, financial and non-financial incentives provided by host governments, and etc.

Several studies give evidence that there exists a relationship

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between macroeconomic and financial variables on the one hand, and direct investment and portfolio investment on the other hand. For example, Alesina and Perrotti (1996) and Mauro (1993) found an inverse relationship between political instability and growth on investment. Jokung (1998) studied the optimal timing of investment in emerging markets and showed that economic growth and country rating are sometimes sufficient to explain the amount of direct investment. Williamson (1993) claimed that portfolio equity flows are expected to be extremely sensitive to a country's openness, particularly to rules concerning the repatriation of capital and income. The country rating defined by Gwartney, Lawson and Block (1996) takes into account this fact. According to Bekaert (1995), credit rating is likely to be important in determining capital flows as well.

Calvo, Leiderman and Reinhart (1996) pointed out two classes for those factors that encourage or inhibit capital flows: pull and push factors. Pull factors (domestic) are related to recipient countries whereas push factors (external) are related to investor's countries. The most important push factor is the world interest rate. Low interest rates in industrialized countries caused an outflow of capital into emerging market economies of Asia and Latin America. Investors were attracted to these economies because of their high investment yields and improving economic prospects. In this study, we mainly focus on the pull factors of capital flows.

Most of the previous studies of the relationship between pull and push factors and investment have concentrated only on one aspect at a time, ignoring potential feedback or multilateral relationships. Evidence has generally supported the belief of a positive linkage between portfolio investment and stock market performance measured by the market index, market return or country rating. Macroeconomic theory unambiguously associated a lower inter-bank rate with higher portfolio flows. Mandelker and Tandon (1985) proposed a link between macro-

economic variables and the stock market and, therefore, between portfolio investment and economic factors. Chuhan, Claessens and Maningi (1993) found that portfolio flows in emerging countries are about equally sensitive to pull and push factors in Latin America, and three to four times more sensitive in East Asia during 1988-1992.

In a similar vein, another group of studies has examined the relationship between direct investment and country rating, local incentives and economic growth. They found a positive relation i.e., high economic growth invited more capital flows. Sianesi (1995) related the location choice of foreign direct investment with macroeconomic conditions of the host country e.g., economic growth, market size of the domestic economy, labor costs, labor quality, market integration, openness and political factors. He also pointed out three main locational factors: demand conditions, cost factors, and political factors. Kravis and Lipsey (1982) studied macroeconomic conditions of the host countries in order to determine what host country characteristics affect a firm's investment decisions. They argued that host market size and openness are the major determinants for location decisions but labor costs are also taken into account.

This paper focuses on the special case of Thailand as it was tipped to become the fifth Asian tiger. During the period of 1988-1996, Thailand had been the largest recipient of capital flows among ASEAN countries. Moreover, during 1980-1996, the average economic growth rate was about 8 %, which was the highest in Southeast Asia comparing to 3 %, 3.5 %, and 1.8 % for US, Japan and European Community (EC), respectively. The market capitalization of the Thai stock market also grew at an average of 33 % per annum during the 1980s.

Even though Thailand had been blessed with impressive economic expansion during the past years before the 1997 Asian economic crisis, the literature on the relationships between direct and portfolio

investments on one part and macroeconomic factors and behavior of stock markets of Thailand on the other has been relatively scarce. The purpose of this paper is, therefore, to offer evidence concerning the sign and the significance of the relationship between investment and macroeconomic or financial factors. The study examines the extent to which macroeconomic and financial variables are able to explain direct investment and portfolio investment flows into Thailand.

The paper is organized as follows. The next section discusses the liberalization of financial and capital accounts in Thailand. Section 3 presents data and methodology used in this study. Section 4 reports the empirical results. Section 5 addresses potential future research and the last section concludes the paper.

2. Liberalization of Financial and Capital Accounts in Thailand

The key factor in the initiation of liberalization reforms in Thailand was the need to mobilize resources for use in the industrial sector to capture continued economic growth. In 1974, the Thai government enacted the Stock Exchange of Thailand Act. Later in April 1975, the Stock Exchange of Thailand (SET) was established. Then from 1990, the SET experienced a rapid growth as a consequence of the liberalization process in Thailand.

Before 1990, the Bank of Thailand had played a significant role in maintaining a long period of stable monetary policy and low inflation in Thailand. To achieve these, the fixed exchange rate system had been used as a major instrument along with very strict controls over the capital movements into and out of the country. However, after 1990, most of those controls were lifted in the hope that Bangkok could replace Hong Kong as a regional financial center after Hong Kong was handed over to China in 1997.

2.1 Deregulation of the Financial Market

In the early 1990s, the Ministry of Finance took several steps to deregulate the Thai financial market. Two three-year “Financial System Development” plans were implemented. The first plan (1990-1992) focused on (1) deregulating and liberalizing the interest rates, foreign exchange transactions, and scope of financial institutions’ businesses, (2) improving supervision and examination of financial institutions, and adopting the Bank for International Settlements (BIS) capital adequacy ratio, (3) developing new financial instruments, facilities and services, and (4) developing payments systems.

The second plan (1993-95) targeted to (1) enhance financial market efficiency, (2) mobilize domestic savings through pension systems, and (3) transform Bangkok into a regional financial center through the establishment of Bangkok International Banking Facilities (BIBFs). At the end of the second three-year plan, many of these goals were achieved. After the deregulation of the financial market, banks and finance companies in Thailand had been competing fiercely in fund mobilization. As mentioned in Chunhachinda and Jumreornvong (1999), by 1996, Thai banks held about 70 percent of financial institutions assets while finance companies held about 20 percent. The remaining 10 percent were held by other specialized financial institutions.

2.2 Liberalization of Capital Account

In the 1980s, the Thai Government introduced several measures to induce inward foreign direct investment and portfolio investment. The Board of Investment (BOI) was established to take charge of the granting of investment incentives to local as well as foreign direct investors. The success of the pro-FDI policy and the rebound of the Thai economy in the second half of the 1980s led to a massive growth of FDI inflows. The high economic growth rates exemplified the beneficial circle of FDI inflows i.e., stimulating exports and economic growth and in turn

attracting more foreign direct investment.

In the late 1980s, Thailand continued to liberalize foreign investment in the Stock Exchange of Thailand even though foreigners were not permitted to hold more than 49 percent of shares of the listed companies. The Foreign Board was introduced in 1987 to allow foreign investors to trade some listed stocks in the Main Board with no voting right. The foreign investment in the SET and the stock prices continued to rise until the early years of the 1990s.

In the 1990s, Thailand embarked on substantial liberalization of financial capital flows and foreign exchange transactions. By accepting article 8 of the IMF Agreements in 1990 and removing foreign exchange restrictions on current account related transactions, the cross-border transactions by financial institutions had increased significantly. As a result of the financial market deregulation and capital account liberalization, Thailand witnessed a massive inflow of short-term bank loans, portfolio investment, and non-resident baht deposits. In addition, the BIBFs played a crucial role in inducing the high volume of international bank loans into Thailand.

3. Methodology and Data

3.1 Methodology

This section presents the regression models of the determinants of investments for both direct and portfolio. The models consist of explanatory variables employed in previous research, e.g., Chuhan, Claessens and Mamingi (1993), Gooptu (1993), Williamson (1993), Jokung (1998). The proposed models are as follows:

$$DI_t = \alpha_0 + \alpha_1 RETURN_t + \alpha_2 RATING_t + \alpha_3 GROWTH_t + \alpha_4 RATE_t + \varepsilon_t \quad (1)$$

$$PI_t = \beta_0 + \beta_1 RETURN_t + \beta_2 RATING_t + \beta_3 GROWTH_t + \beta_4 RATE_t + v_t \quad (2)$$

$$DI / GDP_t = \delta_0 + \delta_1 RETURN_t + \delta_2 RATING_t + \delta_3 GROWTH_t + \delta_4 RATE_t + \varepsilon_t^* \quad (3)$$

$$PI / GDP_t = \gamma_0 + \gamma_1 RETURN_t + \gamma_2 RATING_t + \gamma_3 GROWTH_t + \gamma_4 RATE_t + v^*_t \quad (4)$$

where DI is the direct investment, PI is the portfolio investment, RETURN is the market return measured by the rate of return on the SET index, RATING measures the economic freedom of Thailand, GROWTH is the economic growth measured by the GDP growth rate, RATE is the inter-bank rate in Thailand, and SET index is the index of the Stock Exchange of Thailand.

We ran two variations of the above models and the estimations are controlled for auto-correlation and heteroscedasticity. Equation (3) and (4) allow us to point out the relative impact to the economy of portfolio and direct investments.

In the above models, the relations between direct investment and growth, and direct investment and rating, are expected to be positive. Rating takes into account the degree of financial liberalization. The relation between direct investment and interest rate is expected to be positive. On the other hand, portfolio investment is expected to be positively related with market return and rating. In presence of high domestic rates, banks incur open foreign exchange positions by financing local currency lending with foreign currency borrowing. Therefore, high interest rates will attract capital flows. There is also a tendency for countries with lower credit worthiness to attract larger shares of investment by raising the interest rate, and therefore, inducing positive relationships between interest rate and investment. However, the theory unambiguously associates a lower inter-bank rate with higher portfolio flows.

The sign predictions can be summarized as follows. We generally expect α_2 , α_3 , and α_4 to be positive. The expected signs for β_1 and β_2 are positive. Finally we expect β_4 either to be positive or negative. Equation (3) and (4) express the capital flows as a percentage

of the GDP. We expect δ_2 , δ_3 , γ_1 and γ_2 to be positive.

We also analyze the direct effect of SET index on portfolio investment and the direct effect of economic growth on direct investment using the following equations.

$$DI_t = a_0 + a_1 GROWTH_t + \eta_t \quad (5)$$

$$PI_t = b_0 + b_1 SET\ Index_t + \eta^*_t \quad (6)$$

According to the economic theory, a_1 and b_1 are both expected to be positive and significant.

3.2 Data

The data of direct investment, portfolio investment, GDP are obtained from various issues of the International Financial Statistics Year Book of the International Monetary Fund and the International Finance Corporation. The sample period used for this study spans January 1980 through December 1996. The data after 1996 are excluded in order to avoid the unusual effect of 1997's Asian economic crisis. For return data, they are calculated on an annual return interval.

The data of country rating comes from a recently published work by Gwartney, Lawson and Block (1996) which contain estimates of economic freedom for more than one hundred countries over the 1975-1995 period. Those estimates are based on objective information for each country in four component areas: money and inflation, government operations and regulations, taxing and discriminatory taxation, and restriction on international exchange. The component scores range from 0 to 10, with 10 representing the highest possible rating. From these ratings, a summary index for each country, namely the country rating, is calculated. The data of stock market index and inter-bank interest rate come from various issues of economic reports of the Bank of Thailand.

4. Empirical Results

Tables 1 and 2 present the means, standard deviations, minimum and maximum and some information on their statistical properties (skewness, kurtosis) for the different variables utilized in this study. In Table 1, the data was split into two sub-periods 1980-1990 and 1990-1996, due to the fact that 1990 was the year that witnessed the liberalization results and sustainable growth in Thailand. The evidence is quite consistent in the sense that direct investment, portfolio investment, and SET index of the sub-period 1990-1996 are substantially higher than those of the sub-period 1980-1990. However, the stock market return for the second sub-period turns out to be much lower than that of the first sub-period.

In general, the coefficient of variations of direct investment is usually much smaller than that of other capital flows, and this is also true with the data in this study. We found that the coefficient for direct investment is 0.881 and portfolio investment is 1.528 as reported in Table 2.

Table 3 presents the correlation matrix for the relevant variables in the model. The significant positive correlation between direct investment and growth indicates that economic growth is a positive determinant of direct investment. Interestingly, the result with country rating is the same. The market index is also positively and significantly related to the amount of direct investment. As expected, the variables of market return and market index and portfolio investment are positively correlated, thus confirming the evidence of a direct relationship between portfolio flows and the performance of the stock market. The correlation is significantly positive between portfolio investment and market return and the relation is also positive with country rating. The interest rate is found to be negatively but not significantly related with portfolio investment.

Table 4 reports the results of an estimated regression model of direct investment which suggest a positive relation between direct investment on one side and country rating and economic growth on the other side. The highly significant coefficient for the country rating variable provides strong evidence of the role of economic freedom in order to attract foreign direct investment. The direct investment appears to respond to the quality of the economy given by the country rating. The coefficient for the growth variable is highly statistically significant meaning that high growth rates sustain direct investment flows. The financial factor modeled by the return of the market index is not significant in the case of Thailand. Consistent with previous findings, the interest rate is positively and significantly related to direct investment at the 10% level.

The estimated equation for the ratio of direct investment to GDP is reported in Table 6. The ratio DI/GDP allows us to assess the relative impact of direct investment to the economy. Consistent with previous studies, the ratio is positively and significantly related to economic growth and the interest rate. We find also a positive relationship between DI/GDP and market return. However, it is not significant.

Focusing only on growth effect leads us to the following estimate:

$$DI_t = -12545.98 + 4403.37 GROWTH_t$$

(-1.030) (2.982)**

$$R^2 = 0.372, DW = 1.542$$

As predicted by the theory, the coefficient of the economic growth is positive and highly significant at the 1% level. This result is consistent with evidence from Pacific Basin countries as well as other developing countries.

The next issue to be examined are the determinants of portfolio

investment. The results are reported in Table 5. The evidence indicates that country rating and market return are both statistically and positively significant. This means that good market performance attract portfolio investment from foreign investors. The sign of the coefficient related to the interest rate is positive but the statistic is not significant.

In order to deal with portfolio investment expressed as a percentage of GDP, we ran equation (4) and the results are reported in Table 7. The general conclusion at the 1% level of significance is that PI/GDP is positively and significantly related to country rating. The relationship between the ratio of portfolio investment to GDP and the market return is positive and significant at the 5% level. It can be implied that an improvement in the rating is more beneficial than the same improvement in the market return.

According to the theory, portfolio investment must be related to market index. The result of the estimate is as follows;

$$PI_t = -10153.00 + 59.269 \text{ SET Index}_t$$

(-1.179) (5.237)**

$$R^2 = 0.646, DW = 1.880$$

The coefficient of the market index is positive and significant as predicted. This result is consistent with evidence for emerging markets which implies that the development of the local financial market attracts portfolio flows.

5. Future Research

Due to the nature of variables used in this study, we have some limitations and difficulties in gathering up-to-date data. In addition, after 1996 the financial crisis severely affected the Thai economy and has thus distorted the economic figures. Therefore, we decided to include data, in this study, only up to 1996 to avoid such distortions. However, for

future research, we will apply the proposed models in this study to the data of the post-crisis when such a period is long enough. This will enable us to compare the result of the post-crisis with that of the pre-crisis periods. We believe that the result of this extension will provide more contributions and a more complete picture of the determinants of capital flows in Thailand.

6. Conclusions

A number of studies found that there is a relationship between macroeconomic and financial variables on one part and direct and portfolio investment on the other. This paper extends the literature by considering the relationship within an emerging market context specifically to the case of Thailand. We propose a multi-factor model for the direct and portfolio investments that incorporates the country rating, the interest rate, the economic growth, and the market index return.

We find that improving the country rating is always beneficial to both direct and portfolio investments. In order to attract capital flows, emerging countries must, therefore, improve their rating. In addition, the evidence indicates that previous direct investment appears to be more sensitive to the economic growth whereas portfolio investment is more sensitive to the stock market returns. Direct investment is found to be positively related to economic growth, whereas portfolio investment depends positively on stock market index. Surprisingly, the country rating is sometimes sufficient to explain the percentage of portfolio investment per GDP, but not the ratio of direct investment to GDP.

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สำนักหอสมุด

**Table 1. Preliminary Statistics of the Variables
(1980-1996)**

Variables	Sub-period	Sub-period	Period
	1980-1990	1990-1996	1980-1996
GDP growth (%)	7.65	8.64	7.82
DI (Million of baht)	16,477.18	36,096.85	21,929.88
PI (Million of baht)	7,313.81	49,290.28	24,351.58
SET Index	285.15	1,053.28	582.16
Market Return (%)	19.85	5.66	16.96
Rating	5.10	6.40	5.57
Inter-bank rate (%)	11.90	10.13	11.15
DI/GDP (%)	1.11	1.24	1.07
PI/GDP (%)	0.47	1.35	0.83

Sources: International Financial Statistics Year-Book of the IMF and IFC (various years), Economic Report of the Bank of Thailand (various years).

**Table 2. Summary Statistics of the Variables
(1980-1996)**

Panel 1	DI (M baht)	PI (M baht)	RATING	SET Index	GDP (M baht)
mean	21,929.88	24,351.58	5.57	582.16	2,006,890.00
standard deviation	19,335.47	37,212.16	0.77	504.80	1,286,057.70
coefficient of variation	0.88	1.52	0.13	0.86	0.64
minimum	2,802.00	-92.00	4.70	106.62	684,930.00
maximum	61,119.00	122,628.00	6.90	1,682.85	4,689,600.00
skewness	0.62	1.77	0.35	0.86	0.86
kurtosis	-0.98	2.19	-1.19	-0.32	-0.47

Panel 2	GROWTH (%)	RATE (%)	RETURN (%)	DI/GDP (%)	PI/GDP (%)
mean	7.82	11.14	16.94	1.07	0.83
standard deviation	2.67	2.93	42.64	0.75	1.04
coefficient of variation	0.34	0.26	2.51	0.70	1.26
minimum	4.60	5.91	-35.07	0.08	-0.01
maximum	13.30	17.25	127.34	2.79	3.86
skewness	0.70	0.37	1.26	1.09	1.76
kurtosis	-0.49	-0.28	1.67	0.47	3.21

**Table 3. Pearson Correlation Coefficients
between Variables (1980-1996)**

	DI	PI	DI/GDP	PI/GDP
GROWTH	0.61**	0.21	0.67**	0.39
RATING	0.62**	0.67**	0.17	0.54*
RATE	-0.25	-0.37	-0.07	-0.46
RETURN	0.18	0.20*	0.32	0.47
SET Index	0.50*	0.80**	0.14	0.78**

Number of observations is 17. ** Significant at the 1% level. *Significant at the 5% level.

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**Table 4. Estimated Regression Model
of Direct Investment**

$$DI_t = \alpha_0 + \alpha_1 RETURN_t + \alpha_2 RATING_t + \alpha_3 GROWTH_t + \alpha_4 RATE_t + \varepsilon_t \quad (1)$$

Model	I	I Adjusted	II	II Adjusted	III	III Adjusted
Constant	-145,688.00 (-3.42)**	-136,000.83 (-2.85)*	-114,756.50 (-2.96)*	-106,856.36 (-2.42)*	-68,609.66 (-2.78)*	-74,977.44 (-2.17)*
RETURN	141.467 (1.48)	110.64 (1.33)				
GROWTH	3,430.68 (2.38)*	2,928.33 (1.80)*	4,093.35 (2.86)*	3,256.46 (1.96)*	3,205.24 (2.36)*	2,623.51 (1.57)*
RATING	18,441.12 (3.46)**	18,671.98 (2.94)**	14,562.69 (2.99)**	15,236.96 (2.52)*	11,735.80 (2.51)*	13,710.17 (2.22)*
RATE	3,186.00 (2.08)#	2,616.86 (1.61)#	2,101.07 (1.50)	1,647.99 (1.09)		
Adjusted R ²	0.58	0.39	0.54	0.33	0.50	0.28
DW	1.52	1.73	1.46	1.70	1.25	1.66

**Significant at the 1% level. * Significant at the 5% level. # Significant at the 10 % level.

Model I, II and III are adjusted for auto-correlation with Cochrane-Orcutt Method.

**Table 5. Estimated Regression Model
of Portfolio Investment**

$$PI_t = \beta_0 + \beta_1 RETURN_t + \beta_2 RATING_t + \beta_3 GROWTH_t + \beta_4 RATE_t + v_t \quad (2)$$

Model	I	I Adjusted	II	II Adjusted	III	III Adjusted
Constant	-226,504.00 (-2.45)*	-236,761.31 (-2.34)*	-174,233.40 (-3.56)**	-177,915.78 (-3.14)**	-172,417.40 (-3.51)**	-184,732.41 (-2.94)*
RETURN	424.05 (2.05)*	452.84 (2.28)*	357.48 (2.01)*	384.19 (2.20)*	268.47 (1.70)#	367.58 (2.38)*
GROWTH	-2,770.63 (-0.88)	-2,392.88 (-0.70)	-3,184.83 (-1.06)	-3,184.83 (-1.06)		
RATING	43,130.75 (3.72)**	43,867.13 (3.38)**	38,995.34 (4.06)**	39,316.19 (3.61)**	34,468.89 (3.99)**	36,577.17 (3.31)**
RATE	2,227.71 (0.67)	2,515.84 (0.71)				
Adjusted R ²	0.47	0.38	0.49	0.41	0.48	0.41
DW	1.61	1.79	1.68	1.84	1.57	1.83

**Significant at the 1% level. * Significant at the 5% level. # Significant at the 10 % level.

Model I, II and III are adjusted for auto-correlation with Cochrane-Orcutt Method.

**Table 6. Estimated Regression Model of
Direct Investment per GDP**

$$DI / GDP_t = \delta_0 + \delta_1 RETURN_t + \delta_2 RATING_t + \delta_3 GROWTH_t + \delta_4 RATE_t + \varepsilon_t^* \quad (3)$$

Model	I	I Adjusted	II	II Adjusted	III	III Adjusted
Constant	-3.459 (-1.86)*	-3.099 (-1.49)	-2.050 (-2.18)*	-1.658 (-1.63)	-1.913 (-2.06)*	-1.448 (-1.47)
RETURN	0.005 (1.25)	0.004 (1.09)	0.003 (0.95)	0.003 (0.85)		
GROWTH	0.218 (3.47)**	0.192 (2.70)*	0.233 (3.87)**	0.205 (3.01)**	0.245 (4.19)**	0.208 (3.08)**
RATING	0.205 (0.88)	0.227 (0.81)				
RATE	0.142 (2.13)*	0.120 (1.71)#	0.111 (1.98)*	0.097 (1.55)#	0.095 (1.79)*	0.079 (1.35)
Adjusted R ²	0.483	0.257	0.492	0.288	0.495	0.292
DW	1.469	1.802	1.400	1.703	1.400	1.708

**Significant at the 1% level. * Significant at the 5% level. # Significant at the 10 % level.

Model I, II and III are adjusted for auto-correlation with Cochrane-Orcutt Method.

**Table 7. Estimated Regression Model of
Portfolio Investment per GDP**

$$PI / GDP_t = \gamma_0 + \gamma_1 RETURN_t + \gamma_2 RATING_t + \gamma_3 GROWTH_t + \gamma_4 RATE_t + v_t^* \quad (4)$$

Model	I	I Adjusted	II	II Adjusted	III	III Adjusted
Constant	-5.34 (-2.10)*	-5.39 (-2.00)*	-5.42 (-2.23)*	-5.47 (-2.14)*	-4.08 (-3.15)**	-4.09 (-3.01)**
RETURN	0.01 (2.83)*	0.01 (2.75)*	0.01 (3.02)**	0.01 (2.97)*	0.01 (3.31)**	0.01 (3.21)**
GROWTH	-0.01 (-0.19)	-0.01 (-0.17)				
RATING	0.97 (3.06)**	0.97 (2.90)**	0.96 (3.24)**	0.96 (3.08)**	0.83 (3.67)**	0.84 (3.51)**
RATE	0.05 (0.58)	0.05 (0.56)	0.05 (0.66)	0.05 (0.64)		
Adjusted R ²	0.49	0.44	0.53	0.48	0.55	0.51
DW	1.85	1.88	1.82	1.87	1.88	1.89

*Significant at the 1% level. * Significant at the 5% level. # Significant at the 10 % level.

Model I, II and III are adjusted for auto-correlation with Cochrane-Orcutt Method.