INVESTMENT AND EXPORT-LED INDUSTRIALIZATION: FINANCIAL CONSTRAINTS AND EXPORT PROMOTION OF EAST ASIAN FIRMS

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This paper aims to empirically examine the determinants that influence the investment decisions of firms in East Asia, a region that propelled its growth through a predominantly export-led industrialization strategy. Empirical results suggest that a firm's cash flow, representing internal funding capability, have significantly positive relationship on firm investment decisions in all the sample countries in the region. In addition, the study found that export expansion led to increasing internal funding capability, which had a positive influence on the firm's investment decision.

1.   INTRODUCTION

Export-led industrialization was the backbone of the East Asian economic miracle that began in the 1980s. Emulating the example and success of Japan and Korea, East Asian countries promoted their export sector in response to the rapid growth of international trade and the expansion of the economies of the United States and other industrialized nations particularly in the 1990s.

The success of the export-led industrialization strategy in spurring the growth of the region gave rise to the popular terminology - "Asian Tigers" - in referring to the countries around the region: The name initially was used for Taiwan, Hong Kong, Singapore and Korea and was later adopted by academicians and other observers for the other countries in the region.

Governments provided the impetus for the development of the export industrial sector. However, apart from public incentives, private corporations took the lead in financing and building up manufacturing capacities to take advantage of external trade opportunities. In light of the unique investment climate that firms faced in each of the countries in the region, the basic question has arisen: What determines investment and

financing strategies for firms operating under the export-led industrialization environment?

Throughout the 1990s in East Asia, statistical linkages between firm export revenues and domestic investment were corroborated by many researchers and government officers. This study has attempted to take a broader perspective and has developed a conceptual framework to examine the relationship between investment, financing and export promotion under a regime of export-led industrialization in the four countries in East Asia.

Specifically, this study investigates the effect of two factors in determining a firm's financing strategy: agency costs, and export promotion. We sought to verify the empirical validity of two hypotheses. First, we attempted to examine whether agency costs caused by asymmetric information also affect a firm's investment decision in East Asia.

In previous micro-economic studies in the U.S. and other industrialized countries, firms preferentially choose internal funds to finance capital investments. This study takes note that unlike firms in industrialized countries, East Asian firms tend to significantly depend upon external or export demand for their over-all sales performance in view of the success of the export promotion strategy of the countries under study.

Thus, under a regime of export-led growth, our second hypothesis postulates that export promotion improves a firm's internal funding ability and mitigates financial constraints brought about by the prevailing level of development of the financial system in the countries under study, as well as problems such as insufficient corporate financing instruments, inadequate bankruptcy laws and disproportionate financial liberalization.

The availability of trade discounting bills and other trade-related instruments in funding export shipments in a number of East Asian countries have lessened the impact of immature financial markets. Consequently, it can be concluded that the expansion of export industries has mitigated the financial constraints present in such markets.

2.   REVIEW OF LITERATURE

Literature on the subject under study has yielded often conflicting empirical results. Since the middle of the 1960s, the prevailing belief as put forward by Modigliani-Miller was that a firm's investment activity was not dependent upon the different financing tools and techniques present in the financial system. However, Fazzari, Hubbard and Petersen (1988) pointed out the dependency of a firm's investment decision on the availability of financing tools and instruments.

The advent of the concept of asymmetric information in the 1980s focused on the relationship between corporate insiders and outsiders, and the differences in information costs between various financing techniques. It also brought attention to the concept of agency cost that arises when a firm chooses an external financing strategy, as well as its effect on firm investment behavior. Succeeding investigations also examined the influence of the real estate and forex markets in determining asset values.

Many empirical studies on the subject have lent support to this more recent theory and have attested to the positive relationship between information cost and agency cost on a firm's investment.

On the other hand, other literature focused on the financial hierarchy caused by the existence of asymmetric information and agency cost. Of those previous studies, Deverex and Schiantarelli (1990), Hayashi and Inoue (1991), and Asako *et al.* (1991) recognized that utilizing internal funds had the lowest information cost, which in turn influenced a firm's investment activity. Most of the researches concluded that the availability and ability to raise internal funds had a positive correlation with a firm's investment decisions.

Hoshi, Kashyap and Scharfstein (1991) and Okazaki and Horiuchi (1992) concentrated on studying the relationship between a firm's investment and external financing options. They verified that the existence of a main bank system coupled with the traditional business norm of business affiliation lowered agency costs between creditors and debtors. They concluded that a close relationship between principal and agent and lower agency costs encouraged firms to undertake investments. Conversely, these studies also found that independent firms that keep a distance from the "main" bank had less access to funds and therefore liquidity constraints.

In addition to the above-described empirical research, a number of studies that investigated Japanese companies in the 1990s focused on the causal relationship between the firm's investment on the one hand, and asset prices and foreign exchange rates on the other. Hoshi, Kashyap and Scharfstein (1991) postulated the possibility of principal-agent relationship in the context of the Japanese financial system after it experienced dramatic changes in the second half of 1980s to the early 90s. The empirical studies entirely supported the hypothesis that appreciation of asset price, through the rise in the nominal value of collateral, lowers the agency cost that exists between creditors and debtors, and promotes investment.[1, 2]

There are few similar studies in East Asia. The reason for the dearth of literature on similar studies focusing on East Asian countries partly stems from the unavailability of historically maintained micro financial data. In addition, since corporate finance in this region was regarded as an immature system, few empirically focused on the relationship between corporate finance and firm's investment from a viewpoint of asymmetric information.

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[1] See Bernanke and Gertler (1989), and Kiyotaki and Moor (1995), for example.

[2] Ogawa, Kitasaka, Watanabe, Maruyama, Yamaoka and Iwata (1994) and Ogawa and Suzuki (1995) also conclude that real estate prices positively influence a firm's investment activity. However, on the other hand, both Iwamoto (1993) and Takeda (1993) suggest that a rise in stock price does not significantly influence a firm's investment. As for studies concerning the relationship between foreign exchange rate appreciation and firm's investment, Miyagawa (1997) and Miyagawa and Takeda (1994) conclude that the yen's appreciation held down a firm's investment.

Of a few previous studies performed, Laeven (2001) estimated the investment functions of 13 countries in South America and East Asia, and verified the relationship between a firm's financial constraint and financial deregulation. Laeven employed principal component analysis to evaluate the progress of financial deregulation.[3] However, what Laeven (2001) focused on was specifically the relationship between financial deregulation and financial constraint. The indexation methodology employed by the researcher measuring the progress of deregulation is considered questionable.

3.   OBJECTIVES OF THE STUDY

Summarizing recent literature on the subject, this study is expected to generate better understanding of the inter-relationship between firm investment and finance in the context of the export-led growth of East Asian countries.

First, this empirical study examines the existence of asymmetric information and attempts to determine the effect of agency cost in influencing a firm's investment behavior. Second, as a region-specific effect, the study empirically verifies whether export promotion contributes to the mitigation of financial constraints and influences a firm's investment behavior under the export-led industrialization strategy of East Asia.

4.   COVERAGE AND LIMITATIONS OF THE STUDY

This empirical study covers publicly listed industrial and manufacturing corporations in four ASEAN countries in the region, namely, Indonesia, Malaysia, the Philippines, and Thailand. The study also includes de-listed and newly listed firms during the sample period. By definition, commercial banks, securities firms, insurance companies and other financial companies are excluded in the study.

The data were collected from secondary sources and used for two distinct sample periods for two crisis countries, i.e., Indonesia and Thailand 1994-1997 and 1999-2002.

The study does not take into account the impact of foreign direct investments (FDI) in the development of export-oriented industrial establishments in the countries covered in the study. FDIs constituted a considerably large source of financing and investment that fueled the growth of the export manufacturing sector in the region. Analysts have estimated that as much as 50% of all new investment in industrial ventures in the 1990s were infused by multinational companies in the countries within the region.

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[3] Laeven (2001) concluded that financial deregulation contributed to the mitigation of financial constraints of small-sized firms, but the effect on the large-sized firms is relatively small.

5.   HYPOTHESES AND EMPIRICAL RESULTS

5.1.   Conceptual Framework and Model

This study builds upon the model put forward by Gilchrist and Himmelberg (1998) that postulates that under assumptions of substitutability of internal and external funds, a firm's investment behavior is independent of its financing strategy. The model allows for imperfect capital markets and recognizes variances between the cost of internal and external financing strategies due to information asymmetry. Specifically, it predicts that information asymmetry leads to a significant relationship between the balance sheet net worth of the firm, the cost of external financing and investment.

The model below assumes that a firm maximizes its present value, which is equal to the expected value of future dividends, subject to capital accumulation and external financing constraints.

$$V(K_t, B_t, \xi_t) = \max_{\{I_{t+s}, B_{t+s+1}\}_{s=0}^{\infty}} D_t + E_t \left[\sum_{s=1}^{\infty} \beta_{t+s} D_{t+s} \right], \tag{1}$$

$$D_t = \Pi(K_t, \xi_t) - C(I_t, K_t) - I_t + B_{t+1} - (1 + r_t)(1 + \eta(B_t, K_t, \xi_t))B_t,$$
$$K_{t+1} = (1 - \delta)K_t + I_t, \tag{2}$$
$$D_t \geq 0,$$

K: Firm's capital stock at the beginning of period t, ξ : A Productivity stock to the firm's capital stock,   B: Firm's net financial liabilities, η : An external finance premium, Π : Firm's profit,   r: risk-free rate of return,   I: Investment expenditure, δ : Depreciation rate, C: total cost, D: Dividend, E: expectations operator conditional on time t information, β : Discount factor

Under the model's specifications, external financing agents (lenders) demand an external finance premium from borrowers due to agency costs and it is predicted that this premium increases in direct proportion to rise in the level of debt to equity ratio ($\partial \eta / \partial B$). For simplicity, influences of taxes are not taken into consideration.

As Laeven (2001) proposed, we also use an adjustment cost function $C(I_t, K_t) = \frac{\alpha}{2} \left(\frac{I_t}{K_t} - \gamma \frac{I_{t-1}}{K_{t-1}} - \nu \right)^2 K_t$, originally employed by Love (2000), and estimate Equation (3), which can be empirically estimated directly:

$$\frac{I_{it}}{K_{it}} = c + \beta_1 \frac{I_{it-1}}{K_{it-1}} + \beta_2 MPK_{it} + \beta_3 FIN_{it} + f_i + d_t + \varepsilon_{it}. \tag{3}$$

MPK: Marginal profitability of capital, FIN: Internal funding resource, f : Firm's fixed effect, d : year effect, ε : error term

Although most previous literature employed cash-flow as the internal funding ability, we estimated two types of Equations (3) and we substituted instead export sales to capital ratio in the second equation to enable us to verify the influence of export promotion in determining corporate investment.[4]

A methodological issue arises when the above type of investment function is estimated due to the fact that the variable that represents internal funding resource also correlates with a firm's profitability. Our study holds that Tobins' q represents a firm's future growth opportunity.

The critique, in other words, indicates that the parameter of β_3 cannot identify the statistical effect of either internal funding ability or profitability. Ogawa and Suzuki (1995) suggest that a complete solution to this problem cannot be derived to the satisfaction of all parties.

$$\frac{I_{it}}{K_{it}} = c_1 + \beta_{11} \frac{I_{it-1}}{K_{it-1}} + \beta_{12} MPK_{it} + \beta_{13} CF_{it} + f^1{}_i + d^1{}_t + \varepsilon^1{}_{it} , \qquad (3.1)$$

$$\frac{I_{it}}{K_{it}} = c_2 + \beta_{21} \frac{I_{it-1}}{K_{it-1}} + \beta_{22} MPK_{it} + \beta_{23} EXP_{it} + f^2{}_i + d^2{}_t + \varepsilon^2{}_{it} . \qquad (3.2)$$

I: Investment expenditure （＝(End of Period Fixed Assets－Beginning Fixed Assets)×Rate of Increase in CPI ＋Depreciation Cost×Percentage of Depreciation）、 EXP：Export Sales／Fixed Assets、CF：Cash Flow／Fixed Assets, MPK：(Total Liability + Market Capitalization)／Total Assets

In summary, the study sought to test the empirical validity of the model in accordance with two hypotheses. The first hypothesis predicts the sign of parameter β_3 to be positive when a firm's internal funding capability is the principal determinant in investment activity. When the hypothesis is empirically verified, it supports the corollary thesis that information cost or asymmetric information also influences a firm's investment in East Asia. The second hypothesis postulates that under an export-led industrialization environment, firms in East Asia tend to have increasing internal funding ability through export promotion, and that export promotion mitigates

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[4] The reason why this study did not employ export sales to total sales to total sales, but export sales to fixed assets is because a standardization by the same variable in (3.1) and (3.2) is consideredto be appropriate in this paper. However, in this paper. However, in this case, this variable in (3.2) may capture the effect of marginal profit of capital on firms' investment.

short-term financial constraints that limit investment. Therefore, the sign of parameter β_{23} is expected to be positive when the hypothesis is supported.

5.2.   Date

Financial data on individual firms were obtained from Bloomberg LP. Sample data sets were obtained from publicly traded corporations, including delisted firms and newly listed firms during the sample period. Commercial banks, securities firms, insurance companies and other financial companies are excluded in the study.

Export sales data were available for corporations in Indonesia and Thailand, and the ratio of export sales to tangible asset was employed as a proxy measure for export promotion for these countries. However, similar data were not available for the other two countries; the variable was substituted by the ratio of total sales to tangible assets.

5.3.   Empirical Results

This study adopted the GMM-FD estimator to estimate Equation (3.1) and (3.2) as recommended by Arellano and Bond (1991). To eliminate a firm's individual effect, first-differentiated variables were used. The sample period of Indonesia and Thailand was divided into two periods, i.e., 1994-1997, and 1999-2002 to minimize the effects caused by the financial crisis. In addition to the first-differentiated variables, a year dummy variable was exogenously added to independent variables to eliminate time-specific effects.

I/K_{t-2}, I/K_{t-3} and I/K_{t-4} are basically employed as Instrument variables, but either MPK or EX is used when the Sargan test from the one-step homoskedastic estimator rejects the null hypothesis that the over-identifying restrictions are valid. The reason why this paper employed additional instrumental variables, although the rejection of the above null hypothesis may suggest the empirical models are misspesified, is because Equation (3.1) and (3.2) and derived under the theoretical framework. The Arellano-Bond test for first and second-order autocorrelation in the first-differenced residuals is also reported in Table 1.

Overall, all the equations indicate that the null hypothesis of the Sargan tests are rejected. As for the first-order autocorrelation in the first-differenced residuals, 10 equations reject the null hypothesis, but two of them and three equations of second-order autocorrelation do not reject the hypothesis.

5.3.1. Internal Funds and Investment

The empirical results indicate that internal funds positively and significantly influence a firm's investment in all the four countries. In particular, two countries, i.e., Indonesia and Thailand, indicate a significant positive relationship both in 1994-1997, and 1999-2002. The finding establishes that internal funding is one of the dominant financing sources for investment even during the restructuring of industrial organizations after the financial crisis.

5.3.2. Export Promotion and Investment

The study supports the hypothesis that a rise in a firm's internal funding ability caused by export expansion significantly influences corporate investments in both sample periods in all the four countries. Particularly, two crisis countries, i.e., Indonesia and Thailand, indicated positive significant parameters during both periods, indicating a stable relationship between the two variables even after the period that financial turmoil did not perfectly terminate. In non-crisis countries, i.e., Malaysia and the Philippines, export promotion is significantly positive throughout the sample period, although two parameter might have not been eliminated by cyclical effect. Therefore, in spite of the experiences of financial crisis, the relationship between investments, export promotion and internal funding ability is concluded to be stable.

6. DISCUSSION AND INTERPRETATION OF THE FINDINGS

The empirical results validate the hypothesis that cash flow is a significant determinant in corporate investment. They also support the information asymmetry thesis that postulates that information cost influences a firm's investment activity.

The findings were *a priori* anticipated because countries in the region have a relatively lower level of development in their respective financial and banking systems compared to that of industrialized countries. Firms therefore do not have the same level and kind of access to external financial instruments such as equity finance, long-term bank debt and corporate bond issues as their Western counterparts.

What is worth noting is that the relationship between corporate internal funds and investments was consistent both in the crisis and non-crisis countries in this study. In particular, following the drastic industrial reforms typically carried out in crisis countries in the latter period, the relationship appears to have strengthened as most firms increased their reliance on internal funds.

The findings remain valid from the standpoint of information asymmetry for firms located in Indonesia and Thailand where companies widely avail of and use intra-group financing. The empirical results suggest corporate internal funds are utilized prior to other funding options.

The study likewise obtained significant statistical validation of the second hypothesis of the study that postulates that export expansion has a positive determining relationship in a firm's investment. An analysis of the prevailing conditions in the financial and banking systems prevailing in many of the countries in the study provides a basis for the empirical results. Much of the financing techniques and instruments related to international trade have been developed in response to the export-oriented industrialization program of the respective governments of these countries. Exporter-firms in this region regularly utilize discounting of trade bills, bankers/trade acceptance and other credit instruments in addition to bank loans as external funding sources

Other than these private sector-initiated financing options, government agencies in several countries have opened various financing and credit facilities for exporters. The Malaysian Ex-im Bank offers various export promotional financing windows, for instance.

7. CONCLUSION

Economists, government officers and other interested observers recognize the role of investments in the continuous development of East Asian countries, particularly in the wake of industrial restructuring efforts following the 1997 Asian financial crisis.

The study applied investment models developed in industrialized countries to generate a better understanding of the East Asian firm's financing strategy in relation to investments under the regime of export-led industrialization and growth.

In summary, the empirical findings provide three key points that have policy implications. First, there is a remarkable dependency on internal funds among East Asian firms possibly due to the relatively lower level of development of financial markets in the region. The implication is that future corporate investment (that in turn fuel industrialization and growth) depends significantly on the development of the financial market.

The second finding is that export-led industrialization strengthened corporate investment. Firms with export revenues have higher marginal profitability and are therefore better able to mitigate financial constraints and to undertake expansion through higher investments. In particular, the study found stronger linkage between investment and export promotion in countries with a liberalized banking sector and which have export trade financing schemes.

Clearly, there is a need to conduct further studies on the subject. Future studies have to enhance and refine methodologies in the statistical estimation of variables. There are insignificant equations for the Arellano-Bond test in our empirical study. Further development of this study needs to be robust. For example, this paper employed an adjustment cost function originally used by Love (2000), but empirical results shown in Table 1 suggested that it did not always support the above theoretical framework. In

addition, the sample period could be extended. Future study also needs to examine if empirical study also obtains the same implications of this study in the extended sample period.

Appendix Descriptive Statistics of the Sample Data

	Indonesia				Malaysia				Philippines				Thailand			
	I/K	MPK	EX/K	CF/K	I/K	MPK	EX/K	CF/K	I/K	MPK	EX/K	CF/K	I/K	MPK	EX/K	CF/K
1994	0.297	0.888	0.345	0.323	0.150	2.205	2.637	0.342	0.174	1.343	1.491	0.084	0.299	1.047	2.256	0.294
	0.178	0.855	0.804	0.225	1.005	1.028	4.448	0.665	0.331	1.800	2.869	1.512	0.226	0.852	4.465	0.519
1995	0.264	0.687	0.357	0.294	0.228	1.756	2.484	0.303	0.220	1.078	1.756	0.194	0.261	0.834	1.962	0.251
	0.399	0.840	0.752	0.225	0.342	2.803	4.333	0.536	0.496	1.350	4.640	1.668	0.218	0.699	2.816	0.466
1996	0.258	0.784	0.315	0.282	0.244	2.374	2.756	0.254	0.159	1.353	1.603	0.265	0.187	0.695	1.741	0.191
	0.226	0.661	0.639	0.331	0.285	2.134	7.381	0.831	4.979	2.708	4.538	1.495	0.759	0.737	2.107	0.426
1997	-1.736	0.772	0.280	-0.642	0.245	1.477	2.391	0.234	-0.157	1.037	1.317	0.222	0.178	0.661	1.564	0.153
	3.457	0.561	0.578	10.342	0.242	3.495	8.295	0.350	11.130	3.582	3.889	2.298	2.246	0.591	1.746	0.341
1998	0.179	0.855	0.929	0.213	0.109	0.703	1.765	0.102	-0.296	2.472	1.110	0.000	0.109	0.553	1.445	0.088
	1.622	0.648	4.103	2.191	0.470	1.081	2.319	0.714	2.279	2.944	2.943	0.596	4.262	2.646	1.584	0.414
1999	0.124	1.144	0.668	0.305	1.132	0.876	1.892	0.156	0.081	0.845	0.933	0.004	-0.012	1.610	1.391	0.109
	0.458	0.770	1.797	0.629	0.442	1.468	2.272	0.455	0.456	1.349	2.069	0.321	1.020	0.707	1.496	0.272
2000	0.273	1.066	0.461	0.244	0.034	0.912	1.598	0.172	1.800	1.243	0.851	0.033	0.099	0.450	1.550	0.113
	0.919	1.106	0.974	0.471	0.752	1.676	3.107	0.554	1.429	1.824	1.224	0.473	0.259	0.593	1.662	0.443
2001	0.222	0.907	0.467	0.248	0.047	0.677	1.675	0.118	0.413	1.464	0.846	0.012	0.120	0.488	1.651	0.171
	0.399	1.167	1.117	0.383	0.575	1.392	1.903	1.136	1.325	1.806	1.227	0.509	0.166	0.678	1.797	0.245
2002	0.128	1.193	0.131	0.671	0.222	1.119	1.652	0.111	0.768	1.015	1.750	1.379	0.200	0.573	1.419	0.155
	0.546	1.222	1.063	1.031	0.447	0.839	4.892	0.323	1.753	0.817	1.250	0.911	0.242	0.558	1.672	0.384
Total	0.125	0.898	0.495	0.154	0.149	1.265	1.083	0.196	0.330	1.612	1.232	0.102	0.152	0.666	1.690	0.169
	0.971	0.864	0.910	0.809	0.775	1.668	1.650	0.711	0.528	1.087	1.793	1.301	1.508	1.712	2.392	0.407

Note: Upper values are average of sample firms and the lowers are standard deviation.

REFERENCES

Anthony, M., and R. MacDonald (1999), "The Width of the Band and Exchange Rate Mean-reversion: Some Further ERM-based Resultsm," *Journal of International Money and Finance*, 18(3), June 1999, 411-428.

Asako, K., M. Kuninori T. Inoue, and H. Murase (1996), "Real Estate Market and Investment: 1977-1994," Asako, K., and M. Ohtaki eds., *Modern Macroeconomic*

Dynamics, Toyo-Keizai Shimpo-sha.

Bayoumi, T., and P. Mauro (1999), "The Suitability of ASEAN for a Regional Currency Arrangement," *IMF Working Paper WP/99/162*, December 1999, Washington D.C.

Bernanke, B., and M. Gertler (1989), "Agency Costs, Net Worth, and Business Fluctuations," *American Economic Review* 79, March, 14-31.

Cespedes, L.F., R. Chang, and A. Velasco (2002), "Balance Sheets and Exchange Rate Policy," *NBER Working Paper Series*, #7840.

Chan, L.L., and R.S. Rajan (1999), "Regional Responses to the Southeast Asian Economic Crisis: A Case of Self-help or No Help?" *IPS Working Papers* No. 8.

Devereux, M., and F. Schiantarelli (1990), "Investment Financial Factors and Cash Flow: Evidence from U.K. Panel Data," R. Hubbard ed., *Asymmetric Information, Corporate Finance and Investment*, The University of Chicago Press, Chicago.

Fazzari, S.M., R.G. Hubbard, and B.C. Petersen (1988), "Financing Constraints and Corporate Investment," *Brookings Papers on Economic Activity*, 1: 141-195.

Iwamoto, Y. (1993), "A Speculative Equity Price and Firm's Investment," *JCER, Economic Journal*, No. 26, 1993. 30-52.

Kawai, M., and S. Akiyama (2000), "Implications of the Currency Crisis for Exchange Rate Arrangements in Emerging East Asia," mimeo, October 2000, World Bank, Washington D.C.

Kiyotaki, N., and J. Moor (1995), "Credit Cycles," *NBER Working Paper*, No. 5083.

Hayashi, F., and T. Inoue (1991), "The Relation between Firm Growth and Q with Multiple Capital Goods: Theory and Evidence from Panel Data on Japanese Firms," *Econometrica* 59, (May), 731-753.

Hoshi, T., A.K. Kasyap, and D. Scarfstein (1991), "Corporate Structure, Liquidity and Investment: Evidence from Japanese Panel Data," *Quarterly Journal of Economics* 106, February, 33-60.

Labhard, V., and C. Wyplosz (1996), "The New EMS: Narrow Bands inside Deep Bands, *American Economic Review* 86," Papers and Proceedings, 143-146.

Laeven, L. (2001), "Financial Liberalization and Financing Constraints: Evidence Panel Data on Emerging Economies," *World Bank Working Paper Series*, 002467.

Marston, R.C. (1990), "Pricing to market in Japanese manufacturing," *Journal of International Economics*, Vol. 29, No. 3/4, 217-236.

Modigliani, F., and M.H. Miller (1958), "The Cost of Capital, Corporation Finance, and the Theory of Investment," *American Economic Reveiew* 48, 261-297.

Okazak, R., and A. Horiuchi (1992), "Investment and Main Bank," A. Horiuchi and N. Yoshino, eds., *Financial Analysis of Japanese Economy*, University of Tokyo Publications.

Ogawa, K., S. Kitasaka T. Watanabe T. Maruyama H. Yamaoka, and Y. Iwata (1994), "Asset Markets and Business Fluctuations in Japan," Economic Research Institute, Economic Planning Agency, *The Economic Analysis*, October.

Ogawa, K., and K. Suzuki (1995), "Land Value and Corporate Investment: Evidence from Japanese Panel Data," The Institute of Social and Economic Research, *Osaka*

University, Discussion Paper No. 373.

Reinhardt, C. (1994), "Devaluation, Relative Prices and International Trade: Evidence from Developing Countries," *IMF Working Paper* WP/94/140 Washington. D.C.

Svensson, L.E.O. (1992), "An Interpretation of Recent Research on Exchange Rate Target Zones," *Journal of Economic Perspectives-Volume* 6, Number 4-Fall 1992, 119-144.

Takeda, Y. (1993), "Firm's Investment and Stock Market," *JCER Economic Journal*, No. 24, 116-141.

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<div align="center">**Table 1.** Estimation Results</div>

	Indonesia		Malaysia		Philippines		Thailand	
	1994-1997		1994-2002		1994-2002		1994-1997	
Variable	(I)	(II)	(I)**	(II)	(I)	(II)*	(I)**	(II)**
I/K_{t-1}	-0.134 **	-0.166 **	0.009	-0.060	0.105	0.092	0.418	0.488
	(-2.070)	(-2.520)	(0.350)	(-0.960)	(0.840)	(0.740)	(0.690)	(0.400)
MPK_t	0.348 ***	0.015	0.152 ***	0.212 ***	1.040 ***	0.922 ***	0.060 **	0.050 *
	(2.510)	(0.290)	(3.710)	(2.860)	(2.530)	(2.830)	(2.260)	(1.910)
CF_t/K_t	0.446 *		0.678 ***		0.604 **		0.301 *	
	(1.750)		(5.740)		(2.990)		(2.080)	
Ex_t/K_t		0.710 ***		4.421 ***		0.000 ***		0.176 ***
		(3.270)		(32.690)		(4.740)		(5.730)
Constant	0.053 ***	0.038 *	-1.209	-2.891	-2.308 ***	-1.951	0.002	-0.015
	(2.710)	(1.830)	(-0.570)	(-0.540)	(-7.040)	(-0.670)	(0.110)	(-0.710)
Wald Test of Joint Significance	8.350	8.140	37.370	1,136.600	53.650	50.630	31.660	64.080
Sagan Test	19.050 ***	26.920 ***	62.190 ***	148.220 ***	45.000 **	45.320 **	2.760 ***	22.910 ***
First Order Serial Correlation	-2.350 **	-1.730 *	-35.640 ***	-6.210 *	-2.080 **	-2.100 **	-6.020 ***	-5.180 ***
Second Order Serial Correlation			-1.800 *	-0.960	-0.350	-0.320		
Instruments	t2	t2	t-2,t-3,t-4	t-2,t-3,t-4	t-2,t-3,t-4	t-2,t-3,t-4	t2	t2
Number of Observations	290	516	2615	3104	622	614	423	423
Number of Firms	162	122	599	622	136	135	240	240
	1999-2002						1999-2002	
Variable	(I)	(II)					(I)	(II)
I/K_{t-1}	-0.343 *	-0.840 ***					-0.448	-0.096
	(-1.890)	(-11.630)					(-0.240)	(-0.050)
MPK_t	0.286 ***	0.338 ***					-0.872	-0.262
	(4.230)	(6.940)					(-0.410)	(-1.190)
CF_t/K_t	0.555 ***						2.692 ***	
	(2.800)						(7.330)	
Ex_t/K_t		0.259 *						3.155 ***
		(1.950)						(4.340)
Constant	-0.226 ***	-0.163 ***					-2.192	0.170
	(-5.030)	(-4.150)					(-0.900)	(0.090)
Wald Test of Joint Significance	115.350	209.400					60.760	25.020
Sagan Test	19.970 ***	9.820 ***					15.920 ***	47.420 ***
First Order Serial Correlation	-1.760 *	-3.020 ***					0.040	0.250
Second Order Serial Correlation								
Instruments	t2	t2					t2	t2
Number of Observations	298	220					361	311
Number of Firms	168	127					208	186

Note 1: (I)*, (I)**indicate CF and both CF and MPK are employed as instrument variables in addition to I/K_{t-k}, respectively.

Note 2: (II)*, (II)**indicate EX and both EX and MPK are used as additional instrument variables, respectively.