Flexibility and Performance of MNEs: Evidence from Taiwan

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ABSTRACT

Flexibility has become the key strategy of multinational enterprises (MNEs) to successfully operating in the currently turbulent environment (Kogut and Kulatilaka, 1994; Kuo et al., 2003). This research analyzes flexibility in terms of the three levels of operational environment that firms have to confront—external environment, task environment, and internal environment (Buckley and Casson, 1998). We adopt a resource base theory, treating flexibility as a special resource of an enterprise, and manipulate operating flexibility in order to perform an empirical study of whether flexibility can effectively reduce the impacts caused by environmental changes. The Asian financial crisis provides an appropriate opportunity to investigate whether operating flexibility functions during the shock of international environment. The empirical results show that flexibility has positive and significant effects on MNEs' performance. Furthermore, Chow test finds that the contribution of flexibility to MNEs' performance does not reveal a significant structure change following external shock.

JEL Classification: F23, L25, L60, M19.

Keywords: Flexibility; MNEs, Chow test; Asian financial crisis.

I.   INTRODUCTION

The economy has been undergoing changes and, globalization has enlarged competition for almost every type of multinational enterprises (MNEs). Kogut (1985) posited that international competition results from the change in government policies, the uncertainty in the exchange rate, and the unforeseeable reaction of competing opponents. MNEs now have to be more flexible and more responsive to their environment. Volatility and uncertainty have characterized the international environment in recent decades. One of the reasons resulted from the increased speed and ease of transportation and communication. Hence, shocks are easily transmitted all over the world. Other reasons include a variety of market demands and keen competition among all competitors. These have made the international business environment fluctuate more vehemently than before. Therefore, the risks undertaken by MNEs are higher than those of domestic firms (Vernon, 1985; Ghoshal, 1987; Miller and Bromiley,1990; Werner et al., 1996). Miller (1993) also addressed the fact that MNEs are exposed to a wide range of risks, such as the uncertainty of government policies, macroeconomic situation, resources and services, product market and demand, competition, as well as technology in the industry. Hence, MNEs have to take appropriate strategies to lessen the impact of environmental fluctuations on firms' operations.

Since 1980s, the flexibility of an enterprise has become a pivotal factor for an enterprise to be competitive in the international market because of the speed of changes in product technology, a tendency towards free trade, deregulation in the capital market, and an increasing range of exchange rate fluctuation. Rangan (1998) postulated three different points of views concerning flexibility: flexibility optimism, flexibility pessimism, and flexibility realism. Flexibility optimism focuses on individual efficiencies and reaction to environmental changes and MNEs can react to a change in the international environment by their flexibility (Little, 1987). Flexibility pessimism begins from the viewpoint of the organization as a whole. It argues that the flexibility of an enterprise is likely to be rather tardy because of its large size and complexity. The flexibility of an enterprise is not necessarily able to function better (Kogut, 1985; Collis, 1991). Flexibility realism views flexibility as a kind of property of initial positions (Jones and Ostroy, 1984). Therefore, if a firm wants to ensure flexibility under a present condition, it must have invested in it in the previous period or it might not have an improved flexibility at the present time. Kogut (1983, 1985, 1989), Kogut and Kulatilaka (1994), and Kuo et al. (2003) debated the operating flexibility for MNEs adjusting to an external shock and re-allocating their production sites, or for MNEs undertaking an arbitrage decision according to different tax regulations in different countries. Buckley and Casson (1998) constructed an international business model through flexibility. They argued that the international business model should put more emphasis on the uncertainty and fluctuation of the market, the border of the enterprise operation, flexibility, managerial knowledge, entrepreneurship, organization changes, enterprise culture, inner empowerment, and so on. They also indicated that flexibility could effectively lower the fluctuations of performance caused by environmental changes.

Flexibility could be seen as one of the intangible assets owned by the enterprise. The degree and size of this intangible asset will cause different levels of core competence. Moreover, international activity networks provide operating flexibility gained by cooperating among various operating sites, enjoying arbitrage, escaping taxes by transfer pricing, benefiting from financial inducements offered by the local government, and acquiring market information effectively. This article proposes that flexibility is a special resource of an enterprise and tries to investigate whether operating flexibility does contribute positively to MNEs' performance, and whether operating flexibility could effectively reduce the impact brought by the shock of the international business environment. The Asian financial crisis in 1997 has hugely impacted the Asian market. It resulted in the reallocation of resources in many countries and in turn, has caused tremendous shock in the international operational environment. Under its influence, South Korea and Hong Kong, two of the four dragons in Asia, had a negative economic growth rate in 1998. Japan, likewise, experienced negative growth in spite of its renowned economic power. The Asian financial crisis provides an appropriate opportunity to investigate whether the flexibility functions during the shock of international environment. We would test whether there is a structure change of flexibility contribution to MNEs' performance before and after the Asian financial crisis.

The outline of this study is as follows. In Section II, we construct a conceptual framework and establish hypotheses corresponding to the relationship between flexibility and performance. Section III states the data sources, specifies variables that represent firms' performance, operating flexibility, and control variables that should be included in the empirical model, and employs a statistical method used in this study. Section IV presents the empirical results, the Chow test, and discusses the finding, and Section V concludes our work.

II.   CONCEPTUAL FRAMEWORK

The conceptual framework of this study is shown in Figure 1. This study introduces the time dimension to indicate an external shock observed at time T. We argue that flexibility is positively related to MNEs' performance with and without shock. This research will further investigate whether or not a structure change in performance occurs at time T. We propose that the contribution of flexibility to performance with a shock is greater than that without a shock.

Previous literature studied the operational performance of foreign investment from different points of view. They focused on variables such as the investment experience of parent firms, the motive of founding the foreign subsidiary, and the entry mode of the foreign subsidiary, etc. We view these variables as control variables in order to truly reveal the relationship between flexibility and operational performance.

Figure 1
Conceptual Framework for Flexibility and Performance

Shock point

T

0   Without   With   Time
         the shock   the shock

Enterprise's flexibility before time*T*

Enterprise's flexibility after time*T*

H1

H1

Operational performance before time*T*

Operational performance after time*T*

H2

The contribution of flexibility to MNEs' performance with the shock is greater than that without the shock
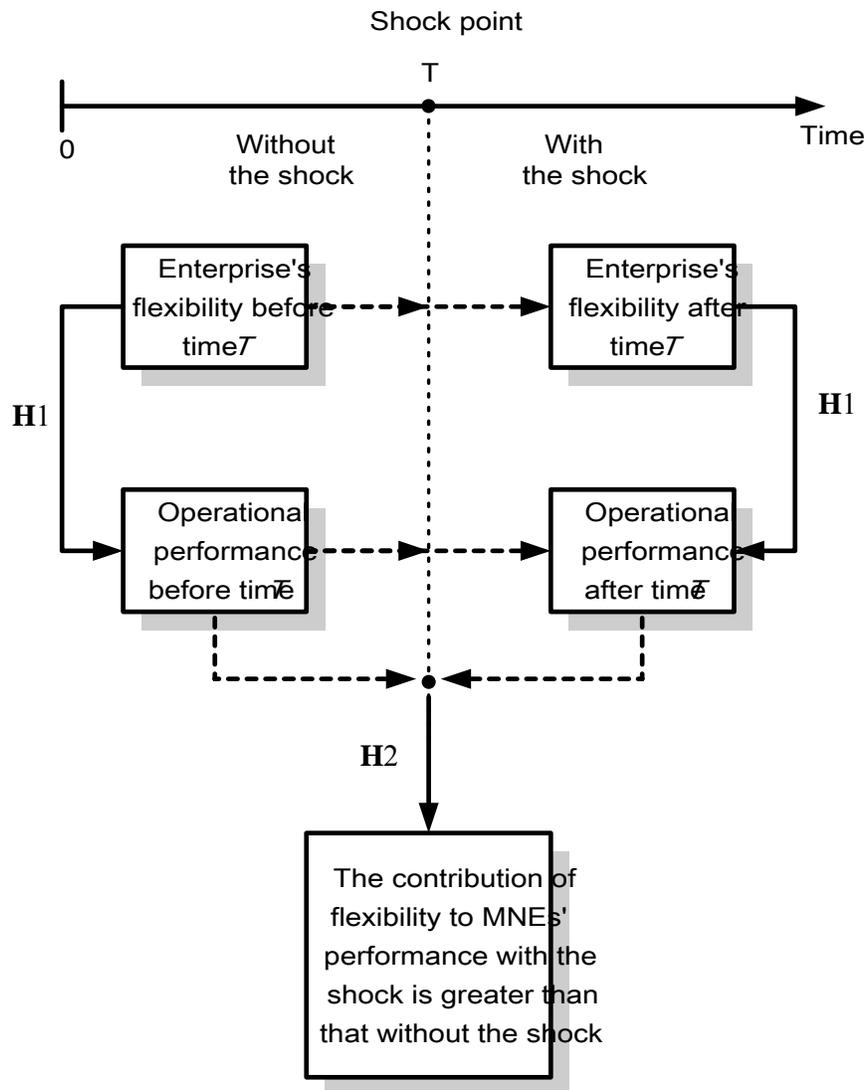
Flexibility can be defined as the ability to reallocate resources quickly and smoothly in response to a change in an international operational environment (Buckley and Casson, 1998). We deal with flexibility as one of the competences of an MNE, as

well as a controllable factor inside the enterprise. In other words, flexibility is seen as one of the intangible assets owned by the enterprise. The different degree and size of this intangible asset will result in different flexibility for each enterprise, and will cause different levels of competence.

Resource base theory emphasizes enterprise advantage and the special resource or ability of an enterprise, and focuses on the controllable factors inside the enterprise (Barney, 1991). This study adopts the resource base theory, treating flexibility as a special resource of an enterprise. We handle flexibility in terms of the three levels of operational environment that an enterprise has to confront: external environment, task environment, and internal environment (Buckley and Casson, 1998). According to the three aforementioned aspects of flexibility, we construct the hypotheses of this research and describe the related inferences as below:

A.   The relationship between the flexibility of MNEs in reacting to external environment changes and operational performance

All enterprises, especially MNEs, have to confront the restrictions imposed by the external environment, such as government regulations and policies, or macroeconomic and cultural aspects. Miller (1993) indicated that government policy would affect the operational strategy of enterprises; for example, they must be coordinated in order to obey related law or tax regulations whenever they are altered. Kogut (1985) argued that fierce global competition is due to uncertainty in the exchange rate, the alteration of government policies, and the unpredictable reaction of competing opponents. When the external environment changes, whether an enterprise can respond in time and with what effect both have a huge influence over its operational goal and performance. The lack of an appropriate strategy to adjust to external environment changes will cause great impact upon enterprises' operation. Hence, we measure the flexibility of an enterprise in terms of its ability to react to change in the external environment.

B.   The relationship between the adroitness in defining the business boundary of MNEs and operational performance

Business boundary means that enterprises find out their most appropriate surviving space and most suitable position. It should find its most appropriate surviving space or its best position in a task environment. Setting up a fitting business boundary is accomplished by confirming the goal market, the form of product service and the enterprise service. Jones and Ostroy (1984) suggested that if a firm wants to ensure flexibility under a present condition, it must invest in it in the previous period or it might not have been able to improve flexibility in the present time. Recently, there has been a tendency towards diversity in market needs, and market competition also has become more and more fervent. An enterprise has to react to conditions based on market need and its relationship with competitors by means of defining its business boundary with the expectation towards allocating enterprise resources rapidly and smoothly. Therefore, this research measures flexibility of an enterprise in terms of adroitness in choosing the business boundary.

C.   The relationship of the inner organizational mobility of MNEs and operational performance

Buckley and Casson (1998) argued that an enterprise can react to the particular changing influence by continuous monitoring of environmental changes, and the gathering, storage, and analysis of information. When confronting fierce changes in the external environment, market needs, and uncertainty of competing opponents, an enterprise must have appropriate tactics in order to distinguish clearly the possibility of environmental changes. Nevertheless, without suitable support from an internal organization, firms will not know when or how to adjust. Therefore, the mobility of an internal organization within enterprises plays a considerably important role in utilizing flexibility. An internal organization with better mobility can gather and process relatively more complete information and fully endow a foreign subsidiary with the right to undertake adjustment to assure the achievement of operational performance. As a result, this study measures the flexibility of an enterprise in terms of the mobility of an organization within an enterprise.

According to the inference above, this research establishes Hypothesis 1 as follows:

H1:   *The higher the ability to react to changes in the external environment of MNEs, the more adroitness there is in their business boundary, or the higher the mobility of their internal organization, the better the operational performance they have.*

In other words,

H1-1: *The ability to react to external environment changes has a positive influence on MNEs' operational performance.*
H1-2: *The adroitness in choosing a business boundary has a positive influence on MNEs' operational performance.*
H1-3: *The internal mobility of a foreign subsidiary has a positive influence on MNEs' operational performance.*

We propose that flexibility is the key strategy of MNEs to operating in the current environment characterized by uncertainty and volatility. Buckley and Casson (1998) viewed flexibility as the ability to reallocate resources quickly and smoothly in response to a change in an international operational environment. They argued that flexibility could effectively lower the fluctuation of performance caused by environmental shock. Hence, the contribution of flexibility with the shock should be higher than that without the shock. We then induce Hypothesis 2:

H2:   *The contribution of flexibility to MNEs' performance with the shock is greater than that without the shock.*

More specifically,

H2-1: *The contribution of the ability to react to external environment changes in the performance of MNEs with the shock is greater than that without the shock.*

H2-2: *The contribution of adroitness in a business boundary to the performance of MNEs with the shock is greater than that without the shock.*

H2-3: *The contribution of internal mobility to the performance of MNEs with the shock is greater than that without the shock.*

III.   DATA AND MODEL

A. Data

The sample frames of this study consist of two parts: (1) "The Firms' Directory of Foreign Direct Investment" published by the Investment Commission, Ministry of Economic Affairs, R.O.C., in May 1998; (2) "The Directory of Taiwan Businessmen Invested in Mainland China" issued by the Chinese National Federation of Industries in September 1998. A random sample was selected from the following industries: electronic and electrical manufacturing, chemical, metal manufacturing, shoe manufacturing, and textile. These industries have had the largest oversea investments of Taiwan in cases and amount since the middle of the 1980s. The questionnaire included two parts, before and after the Asian financial crisis. Six hundred and fifty companies were sampled, and a research questionnaire was sent to 627 following confirmation by telephone that 23 did not have an overseas operation. One hundred and thirteen questionnaires were returned with a return rate of 18.02%. After eliminating 20 due to incomplete information, there remained 83 usable questionnaires. The actual return rate of usable questionnaires was thus 13.24 percent.

B.   Variables

1.   Operational Performance

Different foreign subsidiaries may have different goals because of distinctive investment motives. The means of evaluating the performance of foreign subsidiaries should be consistent with the objective. Some scholars utilize strategic performance as a measurement (Murray et al., 1995), which includes market share, sales growth, etc. This study evaluates the operational performance of the foreign subsidiary of MNEs by the degree of satisfaction in selected operational functions of MNEs, including "production," "marketing," "R&D," "financial management," and "importing key production and managerial technology" (measured by Likert 5 scales). Factor analysis is applied to simplify the dimensions. The first factor accounts for 55% of the total sample variance and the estimated factor loadings are very close. Hence, the first factor is used to represent operational performance and termed "overseas operational performance." Nevertheless, the higher the portion of stocks of the foreign subsidiary that are held by the parent firm, the more controllability the parent firm has, and in consequence, the more a foreign subsidiary coordinates with the instructions of the parent firm. Thus, the data may not reflect the real situation if one evaluates the degree

of satisfaction of only the parent firm. Hence, we include the variable "the shares held by the parent firm" to the empirical model so that other explanatory variables could truly reflect their influence on the operational performance.

2.   Operating Flexibility

This research adopts the resource base theory, treating flexibility as a special resource of an enterprise. We measure flexibility in terms of the three levels of operational environments: external environment, task environment, and internal environment. Miller (1993) indicated that government policy would affect the operational strategy of enterprises; for example, they must be coordinated in order to obey related law or tax regulations whenever they are altered. Moreover, the exchange rate is another crucial factor causing a change in international operational environment. Therefore, this study measures flexibility of MNEs when facing changes in the external operational environment in terms of two variables: "the ability to react to a change in government policy and regulations," and "the ability to react to the fluctuation of exchange rates."

Enterprises have to meet the market need in order to survive. Consequently, adroitness in reacting to a change in a competitor's strategy will enable an enterprise to make an appropriate reaction, and achieve operation and profit goals. Whether an enterprise is capable of adapting to production or operation in time and with smoothness involves the issue of resource deployment. Hence, we measure the flexibility of business boundary of MNEs in terms of five variables: "the ability to react to a change in market need," "the ability to react to a change in competitor's strategy," "the ability to adjust and deploy employees," "the ability to obtain related raw material and parts," and "the ability to utilize factory and production equipment."

Buckley and Casson (1998) remarked that an enterprise can react to the influence by continuous monitoring of environmental changes, and the gathering, storage, and analysis of information. The extent to which the parent firm empowers the foreign subsidiary is also a pivotal factor that influences the inner enterprise mobility of the foreign subsidiary. If the extent of empowerment the foreign subsidiary receives from its parent firm is higher, the chief managers in charge can immediately respond to a market change and in a competitive situation in the external environment. Of course, the moral-hazard problem is the potential risk of empowerment. An MNE has to handle this trade-off problem. We measure the flexibility of the foreign subsidiary of MNEs in terms of three variables: "the extent of empowerment from the parent firm to its subsidiary," "the degree of communication circulation inside the subsidiary," and "the ability to gather and handle information."

According to the above disscusion, we utilize ten variables to measure the flexibility of firms. Factor analysis is used to simplify the dimensions. The value of Cronbach's alpha is 0.83, indicating that the questionnaire has very good reliability. The first five factors are selected to represent the flexibility. According to the factor loadings, each factor is termed accordingly: the first factor as a "reaction to market," the second as "resource deployment," the third as "adaptation to environment," the fourth as "information circulation," and the fifth as "autonomy." Based on our work, "reaction to market" and "resource deployment" are termed as flexibility in the

dimension of business boundary, and "adaptation to environment" is flexibility in the dimension of external environment, while "information circulation" and "autonomy" are used to represent mobility of the inner organization environment. The cumulative proportion of the total sample variance explanation is 83%.

3.   Control Variables

In addition to the five variables representing flexibility, previous studies suggested that additional variables, such as experience with foreign direct investment (FDI), motives, and so on, would influence firms' performance (Mitchell et al., 1992). We add them into the empirical model as control variables to enable flexibility to truly reflect its influence over operational performance. Whether the foreign subsidiary of MNEs focuses on local market or other exporting markets is likely to have an influence on the operational performance of the subsidiary, such as the fluctuation of the local currency. Hence, we include the variable concentration of the local market into the model.

Casson (1994) observed that the experience of an FDI of the parent firm can help foreign subsidiaries perceive possible problems in investing in the region.   The accumulation of investing experience, regardless of the regions invested in, ought to have similarities to a certain degree for transference. The transferring of experience will increase the ability of the foreign subsidiary to solve problems and enable the subsidiary to achieve the goal set by the parent firm. Therefore, the investing experience of the parent firm should have a positive influence on the operational performance of the foreign subsidiary of MNEs.

The motive for founding a foreign subsidiary will also influence how the parent firm orients the foreign subsidiary. Different motives will generate different goals for the foreign subsidiary. Thus, this study includes the pursuit of resources, following major clients, expanding markets, and capitalizing on investing incentives, under the category of motives. The definition and the sample mean of the variables are presented in Table 1.

C.   Empirical Model

A regression model is used to analyze the relationship between flexibility and performance. We further investigate whether or not there is a structure change of flexibility contribution to MNEs' performance with and without the shock of international environments, the Asian financial crisis. The Chow test is most commonly used for testing structure change. However, if the operation of the enterprise spans from the time prior the crisis to the time after the crisis, it will provide information on the two time spans. Thus, information provided by the same firm but at different time periods may be correlated. If we stack the observations of two periods and then use ordinary least squares to estimate the coefficients, the estimators may be inefficient. To remedy this problem, this research applies the generalized least square (GLS) method to estimate the coefficients and then perform the Chow test.

Table 1
The definition of variables and sample means

Variables	Definition	Sample Means	
		Before Crisis	**After Crisis**
Overseas operational performance	Factor values gained from factor analysis of satisfaction degree of particular operational functions	−0.006	0.0052
FLEX1	The factor score of reaction to market	−0.0260	0.0225
FLEX2	The factor score of resource deployment	0.0055	−0.0048
FLEX3	The factor score of adaptation to environment	0.1012	−0.0875
FLEX4	The factor score of information circulation	−0.1082	0.0936
FLEX5	The factor score of autonomy	−0.0809	0.0700
Share	Percentage of stocks of foreign subsidiary held by the parent firm	78.68	78.68
Exp	Year(s) since the first investment of the parent firm	4.85	7.70
Motive1	1 if the motive of pursuit of resource is considered; 0 otherwise.	0.2697	0.2697
Motive2	1 if the motive of following major clients is considered; 0 otherwise.	0.6180	0.6180
Motive3	1 if the motive of expanding markets is considered; 0 otherwise.	0.2584	0.2584
Motive4	1 if the motive of capitalizing on investing incentives is considered; 0 otherwise.	0.2135	0.2135
Local	1 if the subsidiary only sells to the local market; 0 otherwise.	0.3523	0.3523
Mainland China [a]	1 if the operational region of the subsidiary is mainland China; 0 otherwise.	0.4832	0.4832
Europe, U.S. and Japan [a]	1 if the operational region of the subsidiary is Europe, U.S., and Japan; 0 otherwise.	0.1798	0.1798
Other regions*	1 if the operational region of the subsidiary is other regions; 0 otherwise.	0.0562	0.0562

*Southeast Asia serves as the reference group.

To apply the GLS method, we have to first find the covariance structure. The multiple regression model of each period can be described as:

$$Y_{i1} = X_{i1}\beta_1 + \varepsilon_{i1}, \quad i = 1,2,...,n_1 \tag{1}$$

$$Y_{j2} = X_{j2}\beta_2 + \varepsilon_{j2}, \quad j = 1,2,...,n_2 \tag{2}$$

where equation (1) and (2) represent the regression model before and after the crisis, respectively; ε_{i1} and ε_{j2} are random disturbances with mean zero, $E(\varepsilon_{i1}) = E(\varepsilon_{j2}) = 0$. We assume that observations for different firms are independent, but within the same

firm they are correlated. In other words, the relationship between ε_{i1} and ε_{j2} can be written as:

$$E\left(\varepsilon_{it}\varepsilon_{jl}\right)=\begin{cases} 0 & \text{if } i \neq j \\ \sigma_{tl} & \text{if } i = j \end{cases}, \quad t, l = 1, 2. \tag{3}$$

We further perform two tests, $\sigma_{11} = \sigma_{22}$ and $\sigma_{12} = 0$. The whole picture of the covariance structure is then available. Since we do not observe the actual values of σ_{11}, σ_{22}, and σ_{12}, these values have to be replaced by the estimated values. This study will then utilize the feasible GLS method to estimate the relevant coefficients and to perform the Chow test.

IV.   RESULT and DISCUSSION

A.   GLS Analysis

We first test $\sigma_{11} = \sigma_{22}$ and $\sigma_{12} = 0$ in order to construct the covariance structure. The estimated value of σ_{11}, σ_{22}, and σ_{12} are generated from the estimated residuals of equation (1) and (2). The results suggest that $\sigma_{11} = \sigma_{22}$ and $\sigma_{12} \neq 0$ (See Table 2). We then construct the covariance structure using the test results and replace these covariance parameters with their corresponding estimated values. Hence, the feasible GLS method can be used to estimate the relevant coefficients.

Table 2
The test of variance and covariance

H₀: $\sigma_{11} = \sigma_{22}$			H₀: $\sigma_{12} = 0$	
Degrees of Freedom	F-value	P-value	Pearson Correlation Coefficients	P-value
72, 83	1.0626	0.7863	0.55127	0.0001

Table 3 shows the empirical results of the Feasible GLS model with the dependent variable "overseas operational performance." The R-square and adjusted R-square are 0.5235 and 0.4054, respectively, which suggest that both models provide very good explanatory capability. The significant variables include all variables representing the flexibility ("reaction to market (FLEX1)," "resource deployment (FLEX2)," "adaptation to environment (FLEX3)," "information circulation (FLEX4)," and "autonomy (FLEX5)") for the model before the crisis, and "reaction to market," "resource deployment," "adaptation to environment," "information circulation," and "pursuit of resource (Motive1)" following the crisis.

Table 3
Empirical results by feasible GLS method

	Before Crisis		After Crisis	
Constant			-0.5867^*	(-1.719)
DD [a]			0.6886	(1.509)
FLEX1	0.3802 ***	(4.257)	0.4784 ***	(5.966)
FLEX2	0.2343 ***	(2.643)	0.3270 ***	(3.857)
FLEX3	0.1690 **	(1.991)	0.2199 ***	(3.031)
FLEX4	0.4645 ***	(5.049)	0.4091 ***	(4.842)
FLEX5	0.1649 *	(1.880)	0.1278	(1.413)
Share	0.0020	(0.479)	0.0013	(0.335)
Exp	0.0082	(0.797)	0.0060	(0.607)
Motive1	0.2384	(1.151)	0.4578 **	(2.344)
Motive2	0.0196	(0.096)	0.2672	(1.448)
Motive3	-0.2012	(-0.911)	0.1870	(0.936)
Motive4	-0.2290	(-1.039)	-0.2074	(-1.010)
Local	-0.0090	(-0.041)	-0.1772	(-0.899)
Mainland China	-0.0386	(-0.166)	0.2486	(1.142)
Europe, U.S., and Japan	-0.0806	(-0.283)	0.1807	(0.697)
Other regions	0.3182	(0.637)	0.4716	(1.060)
R-square		0.5235		
Adjusted R-square		0.4054		
Number of Observations		72	83	

Notes: * P<0.1 ** P<0.05 *** P< 0.01. Numbers in parentheses are t-ratio.
a: *DD* is a dummy variable; *DD* = 1 if the performance is before the crisis; 0 otherwise.

B.   Chow Test

Although the contribution of flexibility in reacting to the external environment and in choosing the business boundary after the crisis tend to be greater than those before the crisis in both estimated coefficients and t-value, we will apply the Chow test to investigate these findings. The results of the Chow test are presented in Table 4. The contribution of flexibility to MNEs' performance does not reveal a significant structure change. The P-value of overall flexibility is 0.5820. Moreover, all flexibility as we proposed is insignificant at 26% level of significance. We may conclude that there is no significant difference between the contribution of flexibility on operational performance before and after the Asian financial crisis.

Table 4
The test of structure change (Chow test)

	Degree of Freedom	F-value	P-value
Overall	16, 125	0.8900	0.5820
Flexibility	5, 125	0.5836	0.7125
FLEX1	1, 125	1.2284	0.2698
FLEX2	1, 125	0.9819	0.3237
FLEX3	1, 125	0.2791	0.5982
FLEX4	1, 125	0.3444	0.5584
FLEX5	1, 125	0.1519	0.6974

C. Discussion

The empirical result, that the variable of "adaptation to environment (*FLEX3*)" has a positive and significant influence over operational performance, supports the hypothesis H1-1, which means, the higher the "adaptation to environment" of the foreign subsidiaries of MNEs, the better the operational performance they have. In other words, if the foreign subsidiary of an MNE has a better ability to handle the external environment changes, its operational performance will be better. We further note that the contribution of "adaptation to environment" to MNEs' performance following the crisis is greater than that prior to the crisis (both in estimated coefficients and t-value), although it is not statistically significant. All these might suggest that in order to lower the risks generated from an external environment fluctuation, the flexibility of adaptation to environment is a crucial factor.

Both "reaction to market (FLEX1)" and "resource deployment (FLEX2)" have a positively significant influence over operational performance. That is, the more adroitness there is in choosing the business boundary of an enterprise, the better operational performance it has. These results support Hypothesis H1-2. The estimated coefficients of both variables in the models after the crisis are larger than those before the crisis (but not statistically significant according to the Chow test) as well as the result of "adaptation to environment." This evidence illustrates that adroitness in defining a business boundary has an important effect on the operational performance, especially when MNEs face a change in the international environment.

The empirical results in Table 3 indicate that "information circulation (FLEX4)" has a positive and significant influence over operational performance. Hence, we may conclude that the better the manipulating and circulating of information MNEs can do the better operational performance they will have.

The variable of "autonomy (FLEX5)" is due the extent of empowerment from the parent firms to subsidiaries. Empirical results do not provide a concrete conclusion. The contribution of "autonomy" has a positive influence on operational performance, but it is only statistically significant in the models before the crisis. Furthermore, if we reduce the level of significance to 0.05, then the influence of "autonomy" is insignificant in both models. This may suggest that the contribution of "autonomy" is

not as important as the other variables of flexibility. The possible reason for this might be that there exists a moral-hazard problem of empowerment from the parent firms to the subsidiary. Therefore, the Hypothesis H1-3 only receives partial support. Another reason might be that the Asian financial crisis is an overall and worldwide change in the international operation environment. All enterprises are affected, regardless of their locations and industries. Hence, an individual foreign subsidiary cannot react and handle a crisis by itself, but rather needs the overall design of parent firms in relation to the overall operation of the whole enterprise to achieve the operational objective. Combining this fact and the empirical finding, we might conclude that there is a tendency towards centralization in the relationship between parent firms and the foreign subsidiary following the financial crisis.

The results of the Chow test show that there is not a significant structure change in the contribution of flexibility to MNEs' performance. Although the contribution of the flexibility in reacting to the external environment and in choosing a business boundary after the crisis tend to be greater than those before the crisis in both estimated coefficients, they are not statistically significant. Hence, the results of the Chow test do not significantly support Hypothesis 2. The possible explanation for our finding is that compared to other Asian countries, Taiwan suffered limited damage during the financial crisis and was thus praised as "the harbor in the storm" by the international media. As a result, the contribution of flexibility to the firm's performance is not statistically different before and after the crisis.

The higher the portion of subsidiary's stock held by parent firms, the more promise there is for resources to the subsidiary. Consequently, the higher portion of stocks held, the better the foreign operational performance the parent firms might have. This research includes the variable "the shares held by parent firm" to the empirical model so that other explanatory variables could truly reflect the influence over operational performance. The empirical results indicate that although the estimated coefficient has the right direction as we expect, it is only significant in terms of overall satisfaction following the crisis.

We include the motivation of pursuit of resources, following primary customers, pursuit of market, and utilizing an investment advantage to analyze the relationship between motives of starting a foreign subsidiary and the operational performance. According to the results of regression analysis, the motive of pursuit of resources is the only one to affect operational performance following the crisis.

V.   CONCLUSION

International investments are exposed to a wide range of risks. The risks undertaken by MNEs are higher than those of domestic firms. Hence, when confronting high uncertainty and a risky operational environment, MNEs must apply appropriate strategies to lower the fluctuations of profit and performance and to achieve the operational goals. Buckley and Casson (1998) highlighted the uncertainty that is generated by the volatility of the international business environment. They pointed out that flexibility could effectively lower the fluctuations of performance caused by environmental changes.

This research discusses operating flexibility in terms of the three levels of operational environment firms have to confront—external environment, task environment, and internal environment. We adopt the resource based theory, treating operating flexibility as a special resource of an enterprise, so as to construct the definition of operating flexibility in order to perform the empirical study of whether operating flexibility can effectively reduce the impacts caused by environmental changes. The empirical results show that operating flexibility has positive and significant effects on MNEs' performance.

We apply the Chow test to investigate whether or not the contribution of operating flexibility to the performance of MNEs has a structure change before and after the Asian financial crisis. The results indicate that the contribution of the flexibility to firms' performance does not reveal a significant structure change. The possible explanation may be that Taiwan suffered limited damages during the financial crisis.

In addition to the satisfaction degree this study uses, the evaluation of the operational performance can also include gathering of related financial data such as operating income, return on investment, return on assets, return on sales and so on. As for the consideration of transfer pricing, if there is a longer time span spent gathering financial data with fewer errors, it can also be utilized to testify the viewpoints more thoroughly.

ENDNOTES

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