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POLITICAL AND ECONOMIC FACTORS AS DETERMINANTS OF EXPORT-ORIENTED FOREIGN  
DIRECT INVESTMENT AND REVERSE INVESTMENT: A POOLED TIME-SERIES AND CROSS-  
SECTIONAL ANALYSIS

BY

Ching-Min Weng

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## ABSTRACT

# POLITICAL AND ECONOMIC FACTORS AS DETERMINANTS OF EXPORT-ORIENTED FOREIGN DIRECT INVESTMENT AND REVERSE INVESTMENT: A POOLED TIME-SERIES AND CROSS-SECTIONAL ANALYSIS

BY

Ching-Min Weng

The rapid increase in foreign direct investment (FDI) and reverse direct investment (RDI), coupled with their effects on host as well as home countries, has heightened research interest in this area. Among other aspects, the determinants of FDI have been widely studied. This study examines the joint effect of economic and political determinants on both FDI and RDI from the vantage point of Taiwan. Time-series and cross-sectional data were pooled to test the hypotheses.

The findings are that efficiency wage differences, investment incentive policies, and political instability played crucial roles in determining the inflow of FDI and outflow of RDI in the case of Taiwan during 1955-1980. The results verified that the widening wage differential between Taiwan and major capital exporting countries for the past three decades has been the deciding factor behind the expansion of FDI and RDI in Taiwan. The study results also indicated that the 1966 revisions of the Statutes for Encouragement of Investment had a significant effect on attracting FDI to Taiwan over time; a tremendous upsurge in investment occurred thereafter. The 1971 modifications of the statutes, however, had no effect; this insignificance may be due in large part to the political setback that year.

This study verified that foreign investors dislike and shy away from an uncertain political environment (both in the FDI and RDI cases).

The market size, trade relationship, and exchange rate variables had a limited effect on FDI and RDI. The results of this study show that Taiwan's market size is **not** a crucial determinant in attracting FDI. For the RDI case, the findings support the rationale of the market size hypothesis. As to whether FDI and trade are complete substitutes or complements in terms of Kojima's hypothesis, the statistical results of this study do not yield a definitive answer. Moreover, it is suggested that the exchange rate has a limited effect in the case of Taiwan.

This study also identifies three areas of future research: (1) FDI and RDI as a process, not as a one-time decision; (2) the possibility of simultaneous interaction among FDI or RDI and the explanatory variables; and (3) a combined approach which examines country-, industry-, and firm-specific perspectives. The latter would yield better and more specific public policy recommendations.

The data utilized in this dissertation were made available (in part) by the Intra-university Consortium for Political and Social Research. The data for the Conflict and Peace Data Bank (COPDAB), 1948-1978: Daily Events were originally collected by Edward E. Azar. Neither the collector of the original data nor the Consortium bears any responsibility for the analyses or interpretations presented here.

To my family and to my godson, Christopher Robert Meade

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Finally, and most important, I want to give God the full glory.

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### 1.1 INTRODUCTION

The rapid increase in foreign direct investment (FDI) and reverse direct investment (RDI), coupled with their effects on host as well as home countries, has heightened research interest in this area.<sup>1</sup> Among other aspects, the determinants of FDI have been widely studied, and generally this research falls into three categories: country-specific, industry-specific, and firm-specific studies. The first utilizes a macro-theoretical method, while the second and third utilize a micro-theoretical method.

A review of the FDI and RDI literature suggests the following gaps:

- (1) No study, utilizing either macro- or micro-methods, has assessed the determinants or effects of FDI and RDI together.
- (2) The empirical literature investigating the determinants of FDI deals insufficiently with the joint influence of economic and

---

<sup>1</sup> Foreign direct investment, as defined by the U.S. Department of Commerce, is the direct or indirect ownership of 10 percent or more of the voting securities of an incorporated business, or an equivalent interest in an unincorporated business enterprise, by a foreign entity. FDI inflows throughout the world more than doubled in nominal terms from 1975-1985; the developing countries, share was 23 percent of FDI in 1985. (United Nations Centre on Transnational Corporations 1988, p. 74).

Reverse direct investment (RDI) is defined as the situation in which a domestic corporation invests capital individually or in association with another domestic corporation or corporations jointly with a foreign government, juristic persons, or individuals to establish a new enterprise abroad, or increases capital to expand an existing overseas enterprise, or purchases the stock of existing foreign companies.

political factors. Some stress one factor to the neglect of the other. Others include an integrated and well-balanced combination of economic and political factors influencing FDI flows but have shortcomings. These shortcomings relate to either an insufficient theoretical base or a poorly conceived statistical design.<sup>2</sup>

(3) The literature on FDI often treats determinants and consequences as independent of each other. Very few studies attempt to clarify the reverse causal relationship,<sup>3</sup> let alone discuss policy implications.

(4) The investigation of the investment development cycle often is based on cross-sectional data.<sup>4</sup> No studies have examined investment development by looking at time-series data for an individual country over a long period.

Thus, to advance the understanding of FDI and RDI, more research is needed in these four areas. This study attempts to make such a contribution.

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<sup>2</sup> See the explanation by Schneider and Frey (1985).

<sup>3</sup> It seems logical that foreign direct investment influences domestic economic and political stability.

<sup>4</sup> Dunning (1981a) suggests that the propensity of a country to attract FDI is a function of its stage of economic development--both absolutely and relative to that of other countries. Four development stages are portrayed in his hypothesis.

## **1.2 RESEARCH OBJECTIVES**

The primary objective of this study is to examine the extent to which political and economic factors are joint determinants of FDI and RDI. This will be done by analyzing the effects of inter- and intranational political risks as well as economic growth and policy variables. First, what factors determine the inflow of FDI and the outflow of RDI? Second, what is the effect of these factors and economic policies on FDI and RDI? The case of a developing country, the Republic of China in Taiwan, will be used to seek insight into these questions. To date, the theories of FDI have focused primarily on the investment decisions of U.S.-based multinational corporations (MNCs).

The second objective of this study is to investigate how FDI and RDI relate to current trade patterns. As the flow of direct investment into developing countries intensifies and the outflow back to developed countries consequently increases, the need arises to explore both the motivation behind current trade trends as well as product life-cycle theory.<sup>5</sup>

Theories of FDI have centered on three sets of interdependent variables: firm-specific factors, location- or country-specific factors, and internalization factors (ownership, market structure, or industry-specific factors). All of these are included in the "eclectic theory" advanced by Dunning (1979, 1981). The third objective of this study thus has three components. The first is to examine the importance of location-

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<sup>5</sup> See Wells (1972) for a summary, underlying assumptions, and empirical studies of the product-life cycle theory of FDI. See also Vernon (1966, 1979) and Giddy (1978) for further interpretation.

specific factors, especially political and economic ones, in determining Taiwan's FDI and RDI. The second is to contribute to a better understanding of eclectic theory by providing a possible linkage between theories of FDI and RDI. The third component is to use time-series data for Taiwan over a thirty-year period to examine investment policy.

The Republic of China-Taiwan has been chosen as the case study. Three features make it ideal for an examination of political and economic determinants of FDI and RDI as well as their effect on host and home countries. First, since the decolonization and retrocession of Taiwan to China in 1945 and, later, the break with China, Taiwan has experienced tremendous political adversity during the last three decades.<sup>6</sup> Domestic political instability often has affected the flow of trade, investment, and technology on which Taiwan's prosperity depends. Second, Taiwan has a strong investment incentive program, based on the Statute for the Encouragement of Investment (enacted in 1960 and revised extensively in 1966 and 1971<sup>7</sup>), as well as a stable economic development policy. As a result, Taiwan's foreign trade grew in size more than 500 times between 1952 and 1986. By 1986, the export share in the GNP had increased to more than 50 percent.<sup>8</sup> Third, the statistical records of economic development

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<sup>6</sup> Few countries have formal diplomatic relations with Taiwan. This insulation will increase if the Asian Development Bank (ADB), the last international organization in which Taiwan still has a seat, accepts the People's Republic of China as an official member in place of Taiwan.

<sup>7</sup> See Appendix A.

<sup>8</sup> *Taiwan Statistical Data Book*--Executive Yuan, Taipei, Taiwan, different issues.

in Taiwan over the past three decades are ideal for the combined analysis of FDI and RDI.<sup>9</sup>

### 1.3 ORGANIZATION OF THIS STUDY

Chapter 2 is a literature review which seeks to answer several questions. What options do MNCs have in exploiting their comparative advantages internationally? Why do MNCs prefer FDI to other options, such as joint ventures or licensing, when engaging in international activities? What criteria do they employ in selecting sites (host countries)? What factors determine their direct investment decisions? What are the welfare and policy implications for the host country? What is the structural relationship between the investment position and the economic development of the home country when its MNCs decide to operate abroad?

The theories that address these questions will be reviewed in Chapter 2, which is divided into six sections. Section one is an introduction. In section two, the parameters of the research will be defined by discussing the definitions of direct investment and portfolio investment and their possible substitutability. Section three presents FDI theories in historical perspective and identifies three stages in their development. Next, theories of market imperfections as motivation for MNCs to engage in FDI are reviewed in section four, and internalization theory, which may explain why MNCs prefer FDI to other options when they exploit their advantages internationally, are reviewed in section five. Finally, in

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<sup>9</sup> For a comprehensive study such as this, a large inflow of FDI and a remarkable increased in GDP are ideal.

section six, three macro-theoretic approaches to the study of FDI will be applied to determine why MNCs locate their investments in certain countries (location-specific advantage).

Since this study emphasizes that FDI and RDI in developing countries are simultaneously determined by economic and political factors,<sup>10</sup> the objectives of Chapter 3 are to identify and discuss the common macro-oriented economic and political determinants of direct investment; these are considered the independent variables in this study. The theoretical background of each variable and its empirical implementation in the literature also are highlighted.

Chapter 4 describes how the variables are operationalized in this study and indicates the data sources used. It also presents the hypotheses to be tested, the research models, and the methodology employed.

Chapter 5 reports on the results of the research and discusses their implications.

Chapter 6 discusses the findings, offers conclusions, notes research limitations, and suggests future research areas.

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<sup>10</sup> See the discussion in Agarwal (1980), Schneider and Frey (1985), Yu (1987), and Rana (1988).

### 2.1. INTRODUCTION

What options do MNCs have in exploiting their comparative advantage internationally? Why do MNCs prefer FDI to other entry options, such as joint ventures or licensing, when engaging in international activities? If firms decide to invest abroad, what criteria do they employ to select the sites (host countries)? What factors determine their direct investment decisions? What are the welfare and policy implications for the host country? What is the structural relationship between investment position and economic development in the home country when its MNCs decide to operate abroad? The theories which address these questions are reviewed in this chapter.

In section two, the parameters of the research area are defined by discussing the definitions of direct investment and portfolio investment and their possible substitutability.

Section three places FDI theories in historical perspective and identifies three stages in their development. These are distinguished as market imperfection hypotheses, (Johnson's) global welfare implication, and internalization theory.

Section four and five review theories of market imperfections as motivation for MNCs to engage in FDI and internalization theory, which explains why MNCs prefer FDI to other options.



In section six, three macro-theoretic approaches to the study of FDI are applied to determine why MNCs locate their investments in certain countries (location-specific advantage). The three approaches are: Aliber's (1970) currency area hypothesis, Dunning's (1981a, 1981b) investment development cycle proposition, and Kojima's (1973, 1975, 1982) "dynamic" comparative advantage hypothesis.

## **2.2. DIRECT INVESTMENT VS. PORTFOLIO INVESTMENT**

Conceptually, direct investment and portfolio investment should be analyzed separately since they respond to different economic and political stimuli, have dissimilar effects on international economics, and appear to be motivated by different factors. Simply defined, if a citizen of one country makes an investment in another country with the intention of actively managing the physical assets and organization acquired or created as a result of the investment, the investment is commonly termed a foreign direct investment.<sup>11</sup> If, by contrast, the investor intends only to hold the foreign investment in anticipation of financial gain and does not intend to manage the investment, it is termed a foreign portfolio investment or simply a portfolio investment.

The literature on MNCs frequently assumes that FDI does not displace any other private flows and simply adds to the existing stock of capital invested abroad. Several authors, however, have noted that the spread of

---

<sup>11</sup> As defined by the IMF (Balance of Payments Manual 1977), foreign direct investment is "investment that is made to acquire a lasting interest in an enterprise operating in an economy other than that of the investor, the investor's purpose being to have an effective voice in the management of the enterprise."

MNCs need not involve any transfer of new capital (for example, Kindleberger 1969). In other words, FDI and other private flows could be perfect substitutes, and an increase (decrease) in one type of flow may be offset by an equivalent decrease (increase) in the other type. To test the hypothesis that FDI and portfolio investment are perfect substitutes, Ruffin and Rassekh (1986) specified a portfolio balance model.<sup>12</sup> They found that the coefficient of direct investment variable is statistically significant and not different from -1, which led them to support the hypothesis. Rana (1988) modified the Ruffin and Rassekh model and reestimated a new equation using Japanese data; he found the goodness of fit to be poor, and none of the independent variables were statistically significant in explaining the outflow of portfolio investment in Japan.<sup>13</sup> In fact, he found many independent variables had the wrong sign, contradicting the Ruffin and Rassekh hypothesis. The results of Rana's study, therefore, do not support the substitutability hypothesis for the Japanese case.

Since foreign portfolio investment is behaviorally and functionally the same as domestic portfolio investment, and since substitutability is

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<sup>12</sup>  $PI = a_0 + a_1 \Delta\pi + a_2 \Delta m + a_3 \Delta y + a_4 \Delta r + a_5 \Delta FDI + a_6 \Delta w + a_7 \Delta z^* + a_8 \Delta G + \epsilon$

where PI = portfolio investment

$\pi$  = expected inflation rate

FDI = foreign direct investment

m = money supply

y = real GNP

r = real rate of return

z\* = real private assets own by foreigners

G = price of gold

w = stock of real financial wealth owned by home country.

<sup>13</sup> The samples chosen by Ruffin and Rassekh (1986) are the United Kingdom, Canada, and West Germany.



possible, this study is confined to foreign direct investment and excludes portfolio investment.<sup>14</sup>

### 2.3 AN HISTORICAL PERSPECTIVE OF FDI THEORY

Calvet (1981) has attempted to distinguish among three stages of thinking about foreign direct investment. The first began when Hymer (1960) linked FDI to the study of market imperfections in industrial organization and thereby ended a period in which FDI had been associated with capital flow.<sup>15</sup> Kindleberger (1969) then provided the first comprehensive survey of the various theories of FDI along the lines expressed by Hymer. Kindleberger approached the issue from the standpoint of the perfectly competitive model of neoclassical economics by assuming that in a world of pure competition direct investment could not exist. The Hymer-Kindleberger school of thought has its roots in traditional market theory; market imperfections (either factor or goods markets) are dealt with in a partial equilibrium framework, and the monopolistic nature of FDI is emphasized. The thinking of this stage is aptly summarized by Kindleberger (1969):

The nature of the monopolistic advantages which produce direct investment can be indicated under a variety of headings: (1) departures from perfect competition in goods markets, including product differentiation, special marketing skills, retail price maintenance, administered pricing, and so forth; (2) departures

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<sup>14</sup> The data sources of FDI and portfolio investment often differ. For example, in the United States, data for the former come from the Survey of Current Business, U.S. Department of Commerce, and for the latter from the International Financial Statistics of IMF.

<sup>15</sup> For the contributions of Hymer to FDI theories, see Dunning (1981), Dunning and Rugman (1985), and Teece (1985).

from perfect competition in factor markets, including the existence of patented or unavailable technology, of discrimination in access to capital, of differences in skills of managers organized into firms rather than hired in competitive markets; (3) internal and external economies of scale, the latter being taken advantage of by vertical integration; (4) government limitations on output or entry (pp. 13-14).

The second stage in the development of FDI theories originated with Johnson (1970), who attempted to go beyond the Hymer-Kindleberger framework by investigating the efficiency and welfare implications of international transfers of knowledge--the central theme of FDI. Obviously, Johnson placed FDI issues in a broader and more fundamental perspective by relating them to the welfare economics of technological and managerial knowledge as a factor of production.<sup>16</sup>

Placing FDI in the global discussion of welfare economics has advantages, perhaps the most important being to show how limited is the monopolistic market imperfections perspective. A major disadvantage, however, is that welfare economics has little to say if prices are not taken as given, for then the resulting equilibrium need not be Pareto efficient.<sup>17</sup> Although Johnson's ambitious effort raises interesting questions--concerning, for example, the production of knowledge, its appropriability,<sup>18</sup> and the effects on global welfare--it raises more questions than the welfare economics theory can answer. Hymer was aware of this problem when he showed that, to the extent MNCs erode the effectiveness of government policies, they similarly prevent corrective

<sup>16</sup> Johnson (1970), p. 36.

<sup>17</sup> See the comment Varian (1975), p. 234.

<sup>18</sup> See Magee (1976, 1981).

government action in situations where it is necessary to achieve social efficiency.

One contribution Johnson made was to realize that economic theory offers two approaches for explaining determinants of FDI. One is the microeconomic approach of industrial organization theory, and the other is the general macroeconomic equilibrium approach of international trade theory. Kojima (1973, 1978, 1982), who compared Japanese-type and American-type FDI by using an analysis based on welfare economics and by discussing its policy implications, exemplifies a macroeconomic approach.

The third stage in FDI theories began with such authors as MaManus (1972), Magee (1976), Buckley and Casson (1976, 1981), Lessard (1979), Hennart (1982, 1986), Parry (1980, 1985), Rugman (1981, 1986), and McClintock (1988). The most salient feature of this stage is an emphasis on the theory of MNCs rather than on the theory of FDI. This perspective certainly goes beyond the view that MNCs create market imperfections.<sup>19</sup> The major contributions of this stage are the appropriability, the internalization, and the diversification theory.

The appropriability theory, best represented in the work of Magee (1976 and 1981), consolidates the industrial organization approach to FDI and neoclassical ideas on the private appropriability of the returns from investments in information. This theory stresses that valuable information is generated by MNCs at five different stages: new product discovery,

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<sup>19</sup> Dunning (1979) believes that in this stage there is a "switch in attention from the act of foreign direct investment...to the institution making the investment" (p. 274).

product development, creation of the production function, market creation, and appropriability.<sup>20</sup>

The theory postulates that because sophisticated technologies are less prone to be imitated, MNCs are more successful in appropriating the returns from these technologies than from simple ones. Furthermore, sophisticated information is transferred more efficiently via internal channels than by market means. These two factors taken together enable Magee to assert that there is built-in incentive in the economic system to generate the sophisticated information--to the detriment of users' needs; for example, those of less developed countries. Magee goes on to say that production is information-saving, so that ultimately there is a decline in the production of new information. In sum, there is a technology cycle at the industry level; young industries are those in which information is being created at a fast pace, which in turn implies that the size of the firm expands because of the internalization of the information produced. As the industry matures, the amount of information being created is minimal, and optimum firm size diminishes accordingly. In terms of the international expansion of the firm, the assertion that optimum firm size declines after the innovation stage suggests that, after a certain point, licensing should increase relative to direct investment.

The appropriability theory also predicts that products in Vernon's product cycle will move to stage II when developed countries start successful emulation of the product and to stage III when developing

<sup>20</sup> Appropriability means the ability of private originators of ideas to obtain for themselves the pecuniary value of the idea to society (Magee 1976).

countries start successful emulation. The profit-maximizing price strategy an innovating MNC should follow is to sell new products at below the monopoly price and slowly cut the price of the product as appropriability mechanisms erode. In the long run, the MNC will be forced to sell at the perfectly competitive price. If the MNC has no long-run profit advantage over other producers, its long-run market shares should approach zero as the perfectly competitive price is approached. Since the appropriability theory emphasizes the conflict between innovators and emulators of new technologies, its implication for the development of MNC theory is limited.

The internalization theory states that the modern business sector carries out many activities apart from the routine production of goods and services. All these activities, including R&D, marketing, and training of labor, are interdependent and are related through flows of intermediate products, mostly in the form of knowledge and expertise (Buckley and Casson 1976, p. 33). Thus MNCs are created whenever markets are internalized across national boundaries. Because potential MNCs possess firm-specific advantage in such knowledge and information, the imperfections in these markets, at an international level, tend to encourage MNCs to exploit their advantages internationally through FDI (Rugman 1982). The development of internalization theory as well as the formation of general theory will be discussed in section five.

Whereas most discussions of imperfections focus on goods or factor (knowledge) markets, theories of diversification focus on financial (or security) market imperfections. These--such as exchange control arbitrage, credit market arbitrage, and equity market arbitrage--encourage MNCs to



internalize financial transactions across national boundaries. The most publicized competitive advantage accruing to MNCs is that which derives from equity market arbitrage, that is, risk reduction through diversification.

Tests of the diversification theory of MNCs have suffered from serious shortcomings. Agmon and Lessard (1977) show limited evidence that investors recognize the international involvement of U.S. MNCs. Jacquillat and Solnik (1978) find, however, that portfolios made up of MNCs' shares are poor substitutes for international portfolio diversification and that the extent of foreign influence on stock prices is very limited when compared to the extent of firms' foreign involvement. The work of Errunza and Senbet (1980) attempts to avoid some of the shortcomings of other studies by using a value-added rather than price-based method to assess the effects of international operations in financial markets. They demonstrate that (1) there must be a positive and systematic relationship between the current degree of international involvement and the excess market value of U.S. MNCs over a certain time span, and (2) the monopoly rents derived by these firms are stronger during the subperiod in which barriers to capital flows are in effect. That is to say, the stronger relationship between international involvement and monopoly rents during the period characterized by barriers to capital flows is indicative of the benefits to be derived from financial market imperfections, over and above those to be attributed to real market imperfections.

These three theories of international production undoubtedly are steps forward in explaining the propensity of firms to choose FDI over other

options, such as licensing or joint ventures, in order to exploit foreign markets. All three theories, however, provide a double-edged view of the MNCs. On the one hand, MNCs appear to take advantage of imperfections to enhance their already competitive advantage; on the other hand, MNCs facilitate the transfer of factors, goods, and services which otherwise would be handled inefficiently or not at all. Future empirical work may shed further light on whether MNCs create, extend, and/or perpetuate market imperfections, or whether they are a vehicle for overcoming natural imperfections to the benefit of all parties.<sup>21</sup>

Despite the progress made by these approaches, one can elucidate further the institutionalization of international production within the MNC by combining ideas drawn from these new explanations with earlier theoretical contributions to the FDI literature.

#### **2.4 MARKET IMPERFECTIONS CONDUCTIVE TO FDI**

Kindleberger (1969) provided the first comprehensive survey of the various theories of FDI along the lines expressed by Hymer (1960). Kindleberger first analyzed the question of direct investment from the standpoint of the perfectly competitive model of neoclassical economics by asserting that in a world of pure competition direct investment should not exist (1969. p. 13). He consequently hypothesized that FDI evolves from four types of market imperfections: imperfections in goods markets,

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<sup>21</sup> As is claimed in Teece (1976).

imperfections in factor markets, internal and external scale economies, and government-imposed disruptions.<sup>22</sup>

Calvet (1981) proposed a more comprehensive taxonomy composed of four classes of market imperfections: (1) the market disequilibrium hypothesis, (2) the government-imposed distortions hypothesis, (3) the market structure imperfections hypothesis, and (4) the market failure imperfections hypothesis. These are discussed in some detail below.

#### 2.4.1 The market disequilibrium hypothesis

The market disequilibrium hypothesis suggests that flows of FDI will take place when factor markets and foreign exchange markets are in disequilibrium and will last until the markets return to stability. Disequilibrium conditions that provide incentives to invest abroad are not confined to just these markets. In factor markets, capital market imperfections and low factor costs in a country can increase the flow of FDI (Ragazzi 1973), and the greater the ability of a country to develop new technologies, the higher the outflows of its FDI. In exchange markets, interest rates and currency overvaluation are the most salient variables determining the flows of FDI (Kindleberger 1969, Ragazzi 1973, and Gruber et al. 1967). If the foreign exchange rate does not reflect the true value of a currency or if too much variation of exchange rates is associated with a currency, FDI can be encouraged or discouraged. Once rates return to equilibrium, the flow of FDI should cease; foreign

---

<sup>22</sup> This classification is known as the "market imperfection paradigm."

investors would sell their foreign assets, pocket the capital gains, and return to domestic operation.

#### 2.4.2 The government-imposed distortions hypothesis

Government-imposed distortions conceivably could be factors in the disequilibrium hypothesis. Policies regarding exchange rates, wages, and the migration of labor often create unstable conditions apt to foster FDI. The main difference between the two hypotheses, however, is that there appear to be no equilibrating forces which correct the distortions imposed by governments. Tariffs, other trade barriers (such as quotas), and non-tariff barriers (for example, regulations on imported products) in the host countries can induce foreign firms to invest in local production facilities (Horst 1972, 1979; Yu 1987). That is, other things being equal, to increase trade, firms may establish a subsidiary inside the protected market rather than export to it. Certainly, government-related disruptions can take many forms--from price and profit regulation to antitrust laws, from trade barriers to any other change in the institutional setting in which business operates. All these actions can draw the flow of FDI (Grieco 1986).

Another essential type of government-imposed distortion is taxes. Not surprisingly, the incentive to invest abroad can originate in the differences in the tax laws among countries (Horst 1979, Riedel 1975, Cheng 1986). If the host country's tax laws (such as a deferral system) encourage expatriation of capital, the incentive would be even stronger to set up foreign operations.

### 2.4.3 The market structure imperfections hypothesis

Both the disequilibrium and the government distortions hypotheses are compatible with a "relatively" competitive market structure. The market structure imperfections hypothesis, in contrast, refers to the deviation from purely market determined prices brought about by monopolistic or oligopolistic characteristics. From this perspective, FDI can be explained by industrial organization theory.

Two essential features distinguish oligopolistic industries from competitive ones. First, in the former, maximizing decisions--whether with respect to growth or profit--are interdependent; each firm must speculate on the reactions of the few other firms in the industry. Second, barriers to entry into oligopolistic markets are essential in order to prevent a surge of competition (Calvet 1981). Both features have been cited extensively to explain the formation of FDI.

Caves (1971) considered product differentiation in the home market as the critical element giving rise to foreign investment (p. 270). Successful firms producing a differentiated product control knowledge about serving the domestic market, knowledge which can be used at little or no cost in international markets. Product differentiation hence provides the motivation for investing abroad, as long as the means to protect the product exist (such as copyrights or patents). Other models take into account the interdependence of firms in an industry (Knickerbocker 1974); for example, the "exchange of threats" motivation among firms in different countries (Terpatra and Yu 1988) can contribute to a firm's decision to go abroad.

Despite its usefulness in explaining the formation of FDI, industrial organization theory has serious problems. Aliber (1970) stresses that it may explain the advantages of FDI for home country firms but cannot predict which host country will be chosen or the pattern FDI will take. Nor can it explain adequately FDI through takeovers (p. 20). Explanations derived from industrial organization theory lack "foreignness" in the sense that the variables do not include the distinguishing features of national economies, including participation in different customs nations, currency areas, and tax jurisdictions. Aliber (1970, 1982) shows that the result is not a theory of FDI but rather theories of firms' growth in a national economy applied to an international setting.

Furthermore, in many cases, the causal factors in the investment decision are not isolated (for example, Knickerbocker 1974), nor is the decision integrated with various options, such as exporting or licensing, for exploiting the foreign firms' advantages in the host country. Recent evidence based on Japanese direct investment abroad tends to confirm some of the shortcomings of the industrial organization approach, since the Japanese experience shows a compatibility of international investment with a relatively competitive market structure at home (Kojima 1973, 1978, 1982; Kojima and Ozawa 1984; Lee 1984).

#### 2.4.4 The market failure imperfections hypothesis

Market failure imperfections are characteristics in production, techniques, and commodity properties which prevent a market mechanism from allocating resources efficiently. Market failure imperfections have been explored in the literature by Johnson (1970) with respect to the public

good nature of knowledge, by Rugman (1981, 1986) in terms of dissipating the firm's advantages by not using them internally, by Teece (1976, 1981) regarding the effective transfer of technologies to other firms, and by Magee (1976, 1981) and Magee and Young (1982) as to the appropriability of the return on a firm's new technologies. Market failure imperfections may explain why firms choose FDI as an entry mode.

The market failure imperfections hypothesis also creates problems with respect to production and international transfer of knowledge. First, reasons of social efficiency would dictate that existing knowledge be made available as a free good. Hence the dilemma: How is the production of new knowledge to be motivated, if no property rights are granted? Second, the natural characteristics of knowledge would favor its transfer within a single firm, hence "justifying" FDI over other options for exploiting foreign markets. Indeed, if markets for knowledge are difficult to organize, internalization within the firm achieves two objectives: (1) it provides channels for the transfer of this knowledge at lower costs than via external modes (Teece 1976), and (2) it avoids or slows dissipation of this knowledge to competitors.

## 2.5 INTERNALIZATION THEORY AS A GENERAL THEORY OF FDI

Internalization is the process of making a market within a firm. The internal market of the firm substitutes for the missing regular (or external) market and solves the problems of allocation and distribution by the use of administrative fiat. The internal (or transfer) prices of the firm lubricate the organization and permit the internal market to function

(Rugman 1981). If there is a market failure or imperfection, or if the transaction costs of the regular market are excessive,<sup>23</sup> then there will be a reason for internalization. Since the economy is characterized by many market failures and imperfections, there is a strong incentive for firms to create internal markets. Worldwide, numerous trade barriers, government interventions, and other types of market imperfections create even stronger motivation for the emergence of MNCs. They often internalize international market imperfections as well as domestic ones and thereby increase global welfare.

Market failures or imperfections may be both structural and cognitive (Dunning 1981a). Uncertainty over future market conditions in the absence of competitive forces or due to government policies is one kind of imperfection. In the structural category are barriers to competition, high transaction costs, or the inability to capture the economies of interdependent activities. Cognitive imperfections arise when information about the product or service is unavailable or costly to acquire.

The internalization theory demonstrates that an MNC uses its internal market to produce and distribute products efficiently when a regular international market fails to operate. In particular, MNCs allocate intermediate products (such as knowledge, expertise, and human capital embodied in patents) to world markets. Since there is no regular

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<sup>23</sup> Arpan et al. (1981, p. 143) cite the research reporting that the relatively lower cost in the United States of buildings, equipment, energy, land, and raw materials were significant reasons for some foreign firms investing in the United States. But, to the extent that the main source of FDI into the United States is other developed countries, the RDI may not be concentrated competitive industries.



(external) market to price the intermediate product, it is important for an MNC to assign the property rights to itself in order to maintain institutional control and cover the expenditures in research and development for its intermediate product.

An internal market also gives the MNC the ability to produce and distribute goods and services which are information intensive. The MNC can use overseas subsidiaries to produce goods similar to those developed in the home market, making use of the information monopoly of the MNC. The MNC will exploit its advantage in all available markets and will keep the use of information internal to the firm in order to recoup its expenditures on research and knowledge generation (Rugman 1980).

Furthermore, internalization can occur in response to any type of externality in goods or factor markets. It explicitly recognizes worldwide market imperfections which in practice prevent the efficient operation of international trade and investment. It is noteworthy that internalization does not allow the firm to avoid the market, merely shifts the firm/market interface by replacing a series of market (or contractual) transactions with one single employment contract.

The concept of internalization can be traced back to Hymer's 1960 dissertation, subsequently published in Hymer (1976). He identifies imperfections in both factor and goods markets, such as monopoly control of raw materials or managerial and research skills, any one of which has led to the development of a firm-specific advantage for the MNC. As Dunning and Rugman (1985) state,

the great contribution of Stephen Hymer's seminal dissertation was to escape from the intellectual straight jacket of neoclassical-type trade and financial theory, and move us towards an analysis of the multinational enterprise based upon industrial organization theory (p. 228).

The internalization theory is based on three very simple postulates:

- (1) Firms maximize profit in a world of imperfect markets; (2) when markets in intermediate products are imperfect, there is an incentive to bypass them by creating internal markets. This involves bringing under common ownership and control the activities which are linked by the market; and (3) internalization of markets across national boundaries generates MNCs (Buckley and Casson, 1976, p. 33).

Four main groups of factors are relevant to internalization decisions.

- (1) Industry-specific factors relate to the nature of the product and the structure of the external market.
- (2) Region-specific factors relate to the geographical and social characteristics of the regions linked by the market.
- (3) Nation-specific factors relate to the political and fiscal relations between the nations concerned.
- (4) Firm-specific factors reflect the ability of management to organize an internal market.

As various studies have pointed out, internalization theory in its current form has weaknesses (Calvet 1981, Buckley 1983). First, the analysis employed is static rather than dynamic. The effect of changes in environmental and firm-specific factors on a firm's choice of governance (or entry) modes through time has not been fully explored. Current theory also pays little attention to the effect of internal control costs on the

MNC's choice of modes.<sup>24</sup> The costs of managing a transaction within an internal organizational setting have not been specified.

Robinson (1986), therefore, extends the internalization theory to the "value-added chain," which he sees as a useful tool for assessing a company's international competitive advantage. Under this concept, a product is nothing other than a bundle of services linked together, but often divisible, ranging from initial information gathering and sorting, to research and development, production, and financing, through servicing the final consumer. A plant, the production part of the value-added chain, is simply a bundle of processes, some of which may be performed in other facilities in another country.

There can be real cost advantages in maintaining the linkages in the value-added chain internal to the firm; indeed, it exists because of those advantages. Hence, a firm (an MNC in the international context) must evaluate each link in that chain by measuring the cost and benefit of internalization against the cost and benefit of externalization. In most cases, the choice often is between internalizing or externalizing each link. The value-added chain model focuses on the "linking" and "de-linking" for both internalization and externalization instead of using the traditional analysis of internalization theory. Thus the model has drawn more attention from international business practitioners.

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<sup>24</sup> Such as foreign direct investment, joint venture, licensing, franchising, and exporting.

Another conceptualization is offered by Hennart (1986), who describes a firm as a set of contractual relationships (employment contracts) by which a group of agents (the firm's employees) delegates to a central party the right to constrain their behavior. When that delegation is total, the subsequent organization mode is "hierarchical"; the employees totally relinquish to a central party (the employer) their right to make decisions about the allocation of their own resources (such as their labor-hour or effort) and instead agree to do what they are told (within the constraints established by social customs). Certainly, no individual would let someone else allocate his or her productive time and effort if s/he were paid in proportion to his or her output measured at market prices; s/he would run the risk of being ordered to perform tasks which would not maximize his or her income and thus personally would bear the costs of this misallocation. Consequently, a pure hierarchical system does not reward employees by function of their market-measured output but according to their obedience to managerial directives. Employees thus will be indifferent about the allocation of their resources within the firm because they will not bear the monetary consequences, and the detailed direction of tasks will be easily performed by managerial fiat. Hennart's speculation is fundamentally akin to the value-added chain concept.

Internalization as a general theory of FDI has been discussed by Buckley and Casson (1976), Rugman (1980, 1986), and Hennart (1986).<sup>25</sup> Buckley and Casson (1976) show that, with one or two exceptions, other

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<sup>25</sup> See Parry (1985), Hennart (1985), and Rugman (1985) for a debate on this issue.

alternative theories of FDI can be synthesized within the general theory of internalization. Rugman (1980a, 1985) argues that theories of FDI proposed by Vernon (1967, 1971), Caves (1971), Johnson (1970), Aliber (1970), Knickerbocker (1974), Magee (1976), Kojima (1978), Kojima and Ozawa (1984), and others are basically subsets of the general theory of internalization. Rugman (1985, 1986) examines the literature lying at the core of the new theories of the MNC and stresses that internalization is still a general theory of FDI.

## **2.6 MACROECONOMIC APPROACHES TO FDI THEORY**

The essence of FDI is the transmission to the host country of a "package" of capital, managerial skills, production technologies, and product knowledge (Ragazzi 1973). The major issue posed for FDI theory is why the transmission of such a package is more profitable than transmitting either the capital or the knowledge or both separately, and what the welfare implications are for the home and host country (Glover 1986). A related and important empirical issue is how individual firms maximize profits and/or enlarge market share through widening territorial horizons and which industries are likely to be chosen for FDI. Economic theory offers two approaches to these issues, industrial organization and traditional trade theory. These must be used as complements, since the former is microeconomic and the latter stresses general macroeconomic equilibrium (Johnson 1972, p. 1).

The microeconomic-theoretic concept of FDI, which currently dominates the MNC literature, is exemplified by six theories: industrial organization

(Hymer 1960, Kindleberger 1969, Caves 1971), product life cycle (Vernon 1966), appropriability (Magee 1976), risk diversification (Agmon and Lessard 1977, Rugman 1979), intermediate-market internalization (Buckley and Casson 1976, Casson 1979, Rugman 1980), and eclectic (Dunning 1977, 1979, 1980, and 1981a). In terms of the latter (Dunning 1979, 1980), Gray (1982) posits the advantages of ownership and internalization as micro-oriented variables and location-specific advantages as macro-oriented variables. All the micro-theoretic models are concerned only with private cost and benefit analysis, totally ignoring social costs and benefits.

This section attempts to assess the contribution to FDI theory of models which attribute a primary, if not an exclusive, role to national-level as distinct from firm- or industry-level determinants. The three macro-oriented theories of FDI are: Aliber's (1970) currency area (or currency-premium, or capitalization rates) hypothesis, Dunning's (1981) investment development cycle (or level of development stage) proposition, and Kojima's (1973, 1975, 1982) "dynamic" comparative advantage hypothesis. The first two look at macroeconomic variables or phenomena but are not concerned with how MNC investment affects the national welfare of the home and host country. Kojima, by contrast, addresses the effect of FDI on national welfare.

#### 2.6.1 The currency area hypothesis

The key factor in Aliber's theory is that the world is divided into different currency areas, and a bias exists in the market's estimate of exchange risk. This bias determines whether a country is likely to be a source (home) or host country for FDI. The home country is likely to have

high capitalization rates; the host country is likely to have low rates. Aliber demonstrates that this hypothesis explains, which the industrial organization/market imperfections theory does not, the country and industry pattern of FDI over time, as well as the motivation for takeovers and the decision to license or make a direct investment. The country pattern reflects changing premiums over time, while the industry pattern reflects the role of capital (and R&D) in the production process. Takeovers and licensing decisions occur as a result of variations in differences in capitalization rates applied to source-country and host-country firms' earnings. Any cross-investment within the same industry can be explained by the differences or variations in currency areas over time.

Strictly speaking, Aliber's hypothesis has not been tested empirically. Studies have focused primarily on the relation between FDI and exchange rates, which is not to be confused with his hypothesis. A few studies have shown that currency devaluation often discourages the inflow of foreign investment, although Boatwright and Renton (1975) suggest that the depreciation of the pound sterling raised the value of FDI in the United Kingdom, instead of having a negative effect.

Moreover, Aliber seems to restrict consideration of FDI to the enterprise's investment in different currency areas. While this usually may be the case, it is by no means universally so (Dunning 1988).

#### 2.6.2 The investment development cycle proposition

Dunning's schema of investment development stage demonstrates that the emerging phenomenon of outward direct investment by developing countries

can be explained by the eclectic theory of international production, as can differences in the level and composition of that investment among developing countries.

The investment development path or cycle concept suggests that a country's propensity to engage in outward direct investment (or RDI) or to host FDI will vary according to its stage of economic development, the structure of its factor endowments and markets, its political and economic systems, and the nature and extent of market failure in the transfer of intermediate products across national boundaries.

By paying special attention to the dynamics of both inward and outward direct investment, Dunning suggests that the propensity of a country to host FDI is a function of its stage of economic development--both absolutely and relative to that of other countries. Plotting the net outward investment (NOI) position against per capita GNP produces a well-defined J-curve (or inverted L-shape); a country's NOI tends to grow as per capita income increases from abject poverty.

This investment development pattern can be explained by use of the eclectic theory, as summarized in Table 2-6-1. Figure 2-6-2 plots the relationship between NOI per capita and GNP per capita.

In stage one, there is no outward investment because poor countries have no corporations with ownership-specific advantages, nor are they a very attractive host for FDI (insufficient location-specific advantages). This may be so because domestic markets are not large enough or because the country lacks an adequate or appropriate industrial, commercial, legal,



transport, and communications infrastructure as well as the backup resources required to make the exploitation of such resources as are available profitable.

Table 2-6-1 Inward and outward direct investment and stages of economic development

	<i>Inward Investment</i>		<i>Outward Investment</i>	
Stage 1	Of	Substantial	Od	None
	I	Substantial	I	Not applicable
	Ld	Few	Lf	Not applicable
Stage 2	Of	Substantial	Od	Few
	I	Substantial	I	Few
	Ld	Improving	Lf	Few
Stage 3	Of	Declining/ more specialized	Od	Growing
	I	Declining	I	Growing
	Ld	Declining	Lf	Growing
Stage 4	Of	Declining/ more specialized	Od	Increasing
	I	Declining	I	Substantial
	Ld	Declining	Lf	Increasing

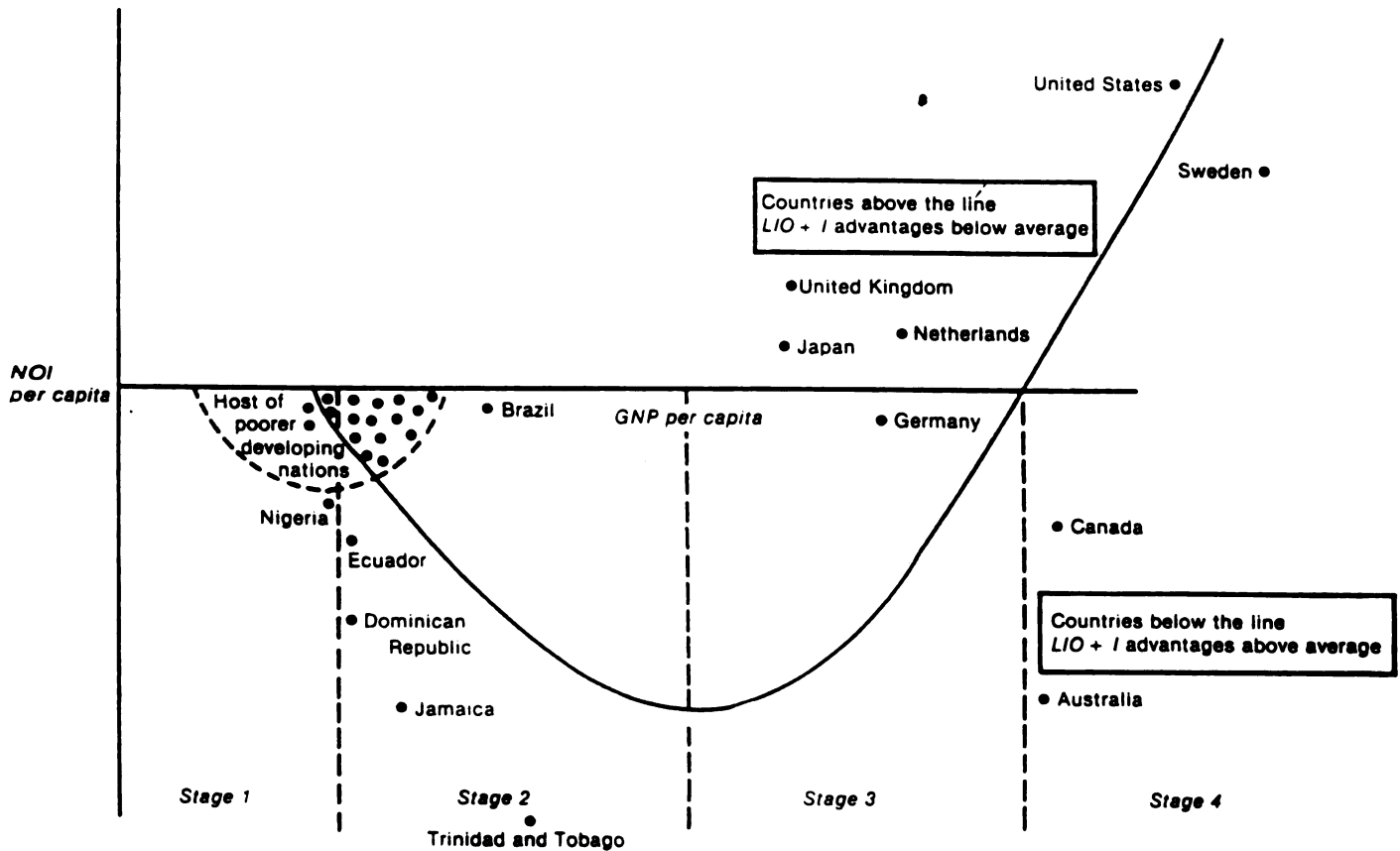
*Key to symbols: O = ownership advantages; L = locational advantages; I = internalization advantages; f = foreign; and d = domestic.*

Source: Dunning (1981a), p. 8.

In stage two, inward direct investment becomes profitable as domestic markets enlarge and/or the local infrastructure is improved. At the same time, since backup indigenous resources remain insufficient, most capital inflow is likely to be internalized, unless government policies restrict inward direct investment. As in stage one, outward direct investment remains negligible simply because local enterprises have not yet established ownership advantages sufficient for them to overcome the disadvantages of international production. Some exporting of the kind that

eventually may lead to outward investment may take place. In this stage, per capita income ranges from \$400 to \$1,500.

Figure 2-6-2 Illustration of the investment development cycle



Source: Dunning (1981a), p. 11.

In stage three, NOI starts to increase but is still negative. The ownership advantages of foreign affiliates may fall as local firms, stimulated by the presence of these affiliates or by government aid, become more competitive. Outward investment may start to rise as the local firms develop their own particular ownership advantages, which they find it best to exploit through FDI. This may mark the beginning of a country's

international investment specialization. It may seek to attract inward foreign investment in those industries for which its comparative location advantages are strongest but the comparative ownership advantages of local firms are weakest, and local firms may invest abroad in those industries for which their comparative ownership advantages are strongest but the comparative location advantages of local firms are weakest.

Stage four identifies with positive NOI and, therefore, with strong ownership advantages in MNCs and an increasing propensity to exploit these advantages from a foreign rather than a domestic location. This may be so because of high labor costs, or the need to export resources (including some types of labor) to help sustain competitive position in world markets, or increasing barriers to trade in the kinds of goods exported by these countries. This stage does not necessarily reflect weak location-specific advantages, since gross inward investment per capita increases steadily as income increases.

Dunning's (1981) interpretation certainly sheds interesting light on the investment pattern of different countries. Even so, its weakness derives inevitably from its macroeconomic or aggregating nature and from the use of net investment flows as the dependent variable. The approach also is predestined to ignore the very important component of intragroup FDI (Gray 1982, p. 184).

In addition, Dunning's statistical analysis (1980, 1982) is based on cross-sectional country data and concludes that a country's international investment position is related to its level of development as measured by

GNP per capita. Future study may use time-series data for a country over a long period and properly test the proposition that a country passes through identifiable development stages.

### 2.6.3 The "dynamic" comparative advantage hypothesis

The traditional comparative advantage hypothesis, which points to national resource endowments as determinants of the pattern of international trade, is essentially macroeconomic in scope. Kojima (1973, 1978, 1982) explored evolutionary changes in "dynamic" comparative advantage, since a nation's relative factor endowments change through time. Much of his theorizing is devoted to Johnson's welfare analysis of the relative social benefits of FDI. Consequently, Kojima's hypothesis is connected to industrial organization theorists' view of the monopolistic or oligopolistic attributes of MNCs. Macro-oriented analysis of FDI based on the dynamic hypothesis with welfare implication is a major step forward. As Kojima writes:

Foreign direct investment has produced a conflict of interests with national objectives in both investing and host countries alike, since national (macro) economic objectives remain paramount under circumstances where national populations, by and large cannot practically and institutionally move internationally with ease. Resolution of this conflict so that foreign direct investment may contribute harmoniously both to investing and recipient country development requires a new macro-economic approach to the problem (Kojima 1973, p. 1).

Elsewhere he adds that "the most serious weakness of the micro-theoretic approach of foreign direct investment is a total disregard of social costs and benefits" (Kojima 1982, p. 16).

In order to explore this hypothesis, Kojima classifies FDI motives into five categories: natural resource oriented, labor oriented (trade oriented or trade reorganized investment), trade barrier induced, oligopolistic foreign direct investment, and internationalization of production and marketing through vertical and horizontal integration of MNCs. He attempts to characterize only two types in his studies: trade oriented (Japanese type) and antitrade oriented (American type). Kojima shows that Japanese-type FDI goes from a comparatively disadvantaged home country industry (which is potentially a comparatively advantaged industry in the host country) and harmoniously promotes an upgraded industrial structure on both sides, thus accelerating trade between the two countries. American-type FDI does not conform to this comparative profitabilities formula, mainly due to the dualistic structure of the U.S. economy, a mixture of oligopolistic industries and traditional price-competitive industries. Kojima demonstrates that American-type FDI is antitrade oriented and results in balance-of-payments difficulties, job export, the prevention of structural adjustment, and trade protectionism. He concludes that FDI should be trade oriented, since this is most beneficial for both countries, and this type of investment should be encouraged so as to accelerate the reorganization of North-South trade. Within the limits of Kojima's analysis, the welfare criterion that trade-creating FDI is superior to trade-supplanting FDI is valid, but his approach has been criticized for several reasons.

First, the neglect of the natural resource orientation is somewhat surprising since it is a fundamentally macroeconomic approach and generates

very large comparative advantage in certain primary products, such as mining. Gray (1982) criticizes Kojima's analysis as being so narrow that it inevitably presents a much stronger case for the comparative advantage theory than can be justified.

Second, the pattern of investment of MNCs often is attributable mainly to microeconomic phenomena, not macroeconomic factors, as Kojima claims (Arndt 1974). This pattern of FDI is in sharp contrast to that of Japanese MNCs, which transfer technology in standardized goods at the center or dividing line of the ranking of goods by comparative advantage. Hence the arguments made for Japanese- and American-type trade are questionable.

Third, Kojima confines himself to a purely static analysis by looking only at the trade effects of international investment (Kohlhagen 1978, p. 171; Lee 1984). He thus ignores all the dynamic benefits of investment, such as job creation, upgrading of the labor force, and increased technological capacity. Kojima (1982) replies that he deals with the dynamic effects through a comparative static method for lack of a real dynamic model of the international division of labor, inclusive of trade and investment. But he admits that his hypotheses requires further development.

Fourth, Kojima's argument is theoretical, lacking the support of empirical evidence or hypothesis testing. Kojima and his colleague (1984) show, however, that this type of study can be done either through time-series analysis for a certain country or through cross-country comparison.

Macroeconomic analysis of the kind done by Kojima does explain certain types of FDI, as do the other theories discussed above. In the next chapter we focus on the macro-criteria MNCs employ in their FDI and RDI decisions.

### 3.1 INTRODUCTION

Many empirical studies have tried to identify variables which may be statistically associated with FDI. Although this kind of analysis often faces the problem of specifying cause and effect, its usefulness for mapping future patterns of FDI hardly can be denied. This study, however, attempts to explore possible determining variables through a macro-quantitative approach based on country-level analysis, instead of firm- or industry-level analysis.

Knowledge is far from comprehensive about what makes host countries attractive to FDI, and this is all the more true when LDCs are considered. Many inductive experiments have sought to pinpoint the variables particularly relevant for these countries, and a large number have been explored. They include not only economic but also social, cultural, and political aspects, probably because it is believed that the relatively slower movement of capital from rich to poor countries is attributable to local noneconomic factors that make the Third World less hospitable to foreign capital than the already developed countries.

Obviously, FDI is influenced by both economic and political factors. A country in which there is unrest or a threat of nationalization of property without adequate compensation assuredly will be less attractive to investors. It is surprising, therefore, that research on FDI determinants deals insufficiently with the joint influences of economic and political



factors. Some stress one aspect but ignore the other, and some present a vague catch-all category. Only a few studies offer a well-integrated and well-balanced analysis, such as those by Schneider and Frey (1985) and Rana (1988).<sup>26</sup>

Schneider and Frey (1985) and Rana (1988) compare four models: (1) a model which concentrates exclusively on political determinants, (2) a framework which concentrates exclusively on economic determinants, (3) a schema which simultaneously includes the economic and political determinants, and (4) an amalgamated model which uses an international risk indicator as sole determinant.<sup>27</sup> It turns out that with respect to both goodness of fit and forecast quality (measured *ex post*) the political-economic model performs significantly better than the other three. Thus, it may be concluded that FDI in developing countries is simultaneously determined by economic and political factors. The amalgamated model apparently does not adequately treat the complexity of political and economic interdependence.

Schneider and Frey (1985) and Rana (1988) include an integrated and well-balanced combination of economic and political factors influencing FDI

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<sup>26</sup> The studies by Schneider and Frey (1985) and Rana (1988) are the result of a certain dissatisfaction with the existing empirical literature analyzing the determinants of FDI in LDCs. In particular, most studies concentrate exclusively on either political or economic determinants, instead of taking into account their joint and simultaneous effect.

<sup>27</sup> The amalgamated model uses the Institutional Investor's Credit Rating Indicators, composed of both economic and political factors, as the determinant. Country credit ratings range between 0-100, with 0 least credit worthy and most likely to default on debt. The evaluation is done by 75 of the world's leading bankers. Data come from *Institutional Investor Magazine*, monthly issues.

flows, but their studies have shortcomings. These are due to an insufficient theoretical base as well as a poorly conceived statistical design.<sup>28</sup> The following sections will elaborate upon the major macroeconomic and political determinants given for FDI in the literature. Section 3.2 examines economic factors affecting FDI: market size, government policy, Kojima's hypothesis, labor cost, and Aliber's exchange rate hypothesis. Section 3.3 discusses political determinants of FDI and examines how this variable has been defined and manipulated in the literature.

### 3.2 ECONOMIC DETERMINANTS OF FDI

#### 3.2.1 The output and market size hypotheses

The literature often uses what is known as the output hypothesis and the market size hypothesis to explain the attractiveness of host countries for FDI.<sup>29</sup> The output hypothesis is applied at the micro level and assumes a positive relationship between FDI and output (usually sales) in the host country. The market size hypothesis is applied at the macro level, and it also considers FDI to be a function of output or sales, approximated by the size of the market (usually GDP or GNP) of the host country.

The rationale of both hypotheses is provided by the domestic behavior of firms, which increase their investment in response to sales, and by the

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<sup>28</sup> Schneider and Frey (1985) predicted FDI in 1980 by employing the results of cross-sectional data in 1976 and 1979; the historical trend of FDI decisions was totally ignored.

<sup>29</sup> Agarwal (1980) states that these two hypotheses are practically two sides of the same coin.

fact that domestic investment in a country rises with its GDP. Theoretical output models generally are derived from neoclassical domestic investment theories, the most popular of which is a generalized form of flexible accelerator (or Koyck model). The market size hypothesis in most cases is not very explicit about assumptions and objective functions, so it is not possible to say whether its theoretical background is the same as for the output hypothesis. The latter is more prestigious, owing to its rigorous theoretical treatment, but the former is the most popular of all hypotheses on FDI tested in the last two or three decades (Agarwal 1980).

Among those who have attempted to apply an investment model to FDI are Bandera and White (1968). They found a statistically significant correlation between U.S. FDI in EEC countries and their incomes (GNP). The authors conclude that various motives given in surveys by investors can be adequately summarized as a desire to penetrate a growing market, defined in terms of size of GNP of host countries. Goldberg (1972) contradicts this hypothesis but maintains that U.S. FDI in EEC countries can be explained by growth of the market. Reuber (1973) found that the flows of FDI (on a per-capita basis) into LDCs correlate with their GDP but not with the growth of their GDP, a point emphasized by Bandera and White (1968).

While investigating the political effect on FDI by using the COPDAB data file, Schollhammer and Nigh (1984, 1986), Nigh (1985), and Tallman (1988) included market size and growth variables in their studies. All conclude that both variables have a positive effect on FDI.

The size and the growth of the market, as determinants of FDI, are considered in almost every study. Despite differences in the assumptions, data, methodology, and specification of the variables, most of the research supports the dependent relation of FDI to the output of the foreign subsidiary and/or the market size of the host country. Although this relation cannot be rejected outright, one must be very careful in assessing the significance of this relationship for the following reasons.

First, market size and growth in the host country are likely to influence FDI undertaken to produce goods for the domestic market but not for export. Most of the studies on the market size hypothesis fail to distinguish between various types of FDI, at least in a statistical sense. Second, there may be a problem of intercorrelation. GDP and FDI are mutually related, and the statistical association found between the two does not explain their relationship. Third, the output hypothesis should consider only the investments incurred on plant and equipment in the host country, as is the case in the domestic investment theory. But the statistics on FDI include inventory as well as financial assets, and it is not correct to equate these investments with plant and equipment expenditure (Agarwal 1980). Fourth, the decision of firms to initiate FDI and to expand FDI should be guided by different aims, as direct foreign investment and portfolio investment are separate. Agarwal (1980) believes that expansionary investments have to be analyzed differently from initial FDI.

Since the market size hypothesis is applied at the macro level and is the most popular of all those regarding FDI tested in the last two decades, this study includes this hypothesis in the regression model.

### 3.2.2 Low labor costs

The supply of relatively inexpensive labor in LDCs always has been regarded as one of their comparative advantages in international trade, but its recognition as a factor in FDI is relatively recent (Agarwal 1980). Neoclassical investment theory often provides a point of departure for many studies of FDI, and in a two-input model the demand for capital, and hence investment flows, will be influenced by labor costs. For example, Kwack (1972), Boatwright and Renton (1975), and Cushman (1985) all include wage rates in their theoretical equations for firm profitability, but in none of these are the effects of wage changes explicitly discussed. The evidence from survey reports in support of this variable has been rather weak,<sup>30</sup> and no consistently significant effects have been reported.

Agarwal (1978) shows a significant positive correlation between German FDI and relative wage cost in Brazil, India, Iran, Israel, Mexico, and Nigeria (cited in Agarwal 1980). The relative wage cost in his study is the share of wages and salaries in value-added per employee in Germany divided by the corresponding quotient in host countries. Similar results are reported by Juhl (1979) at the sectoral level for German FDI in South American countries. Schneider and Frey (1985) and Yu (1987) also verify the significant influence of labor cost on FDI. Little (1978), however,

<sup>30</sup> Review of a number of studies reveals the general belief that FDI will flow from high labor cost to low labor cost areas, but explicit theoretical models are not presented.

using cross-sectional data, reports a negative relationship between wage levels and the location of FDI within the United States, but she does not address the question of aggregate FDI in the United States. Meredith (1984) included relative U.S. and Canadian wages at the industry level in a cross-sectional study of Canadian industries but found no significant effects.

The failure of various cross-sectional studies to find a consistent effect from labor costs may indicate that wages are a proxy for other important variables relevant to production location choice at a given time. Assuming these factors remain constant over time and are captured by other variables in a correctly specified regression, time-series data can better detect the pure effects of wages. Indeed, a number of studies analyzing FDI in various LDCs have found significant effects using time-series data. Riedel (1975) found that relatively lower wage costs have been a major determinant of export-oriented FDI in Taiwan. Cushman (1987) empirically analyzed FDI flows between the United States and five other countries using time-series data. The possibility of simultaneous interaction among FDI and several of the independent variables also was allowed for by using a three-stage least-squares approach. His findings support the general belief that rising wages and falling productivity encourage FDI outflows and discourage inflows. In most cases, the coefficients are highly statistically significant in his study.

The influence of wage levels obviously is relatively greater in the case of FDI in industries producing labor-intensive products and

components. In this study, the wage level variable is included in the model.

### 3.2.3 The trade-substitution or -complementary hypothesis

Recently, there has been some discussion on whether FDI is a "substitute" for or a "complement" to international trade. Assuming identical production functions for two countries within the framework of the ordinary Heckscher-Ohlin-Samuelson theory of trade, Mundell (1968) shows that both are complete substitutes. If production functions vary in the two countries, however, Schmitz and Helmberger (1970) and Purvis (1972) demonstrate that FDI is complementary to international trade. Kojima (1975, 1978, 1982) attempted to differentiate succinctly the case in which FDI works as a complement (is trade creating) from the case in which it is a substitute (is trade destroying); as noted earlier, he concluded that Japanese-type FDI is trade oriented, while American-type FDI is antitrade oriented. Ramstetter (1986) studied the impacts of FDI on host country trade and output, he concluded that Kojima's hypothesis is not very strong in Korean, Taiwan, and Thailand.

Recently, the issue of entry mode has been widely discussed by scholars (such as Caves 1982, Kindleberger 1984, Contractor 1984, and Anderson and Gatignon 1986). An MNC seeking to expand beyond traditional domestic markets must choose an appropriate way to enter foreign markets.<sup>31</sup> Entrants may choose from a large array, including wholly owned subsidiaries

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<sup>31</sup> An international entry mode is an institutional arrangement whereby the enterprise enters a foreign country (Root 1985). Entry modes are suggested as a frontier issue in international marketing (Wind and Perlmutter 1977).

(FDI), contractual joint venture, licensing, franchising, and exporting (simple trade).<sup>32</sup> The costs and benefits are difficult to evaluate and are little understood (Blair 1983; Contractor and Lorange 1988). The literature indicates that few MNCs consciously examine entry mode options using cost-benefit or return-risk analysis.

Furthermore, the issue of substitution or complementarity among the different entry modes has not been explored empirically in the literature. This study tests FDI and RDI in Taiwan for whether there are complementary or substitutive effects on trade. This variable is operationalized by using the trade data for both the FDI and the RDI model; consequently, the rationale of Kojima's hypothesis is tested. Then, the import entry mode in the FDI model as well as export entry mode in the RDI model are replaced in the regressions for reasons of simplicity and theoretical clarity.

#### 3.2.4 The exchange rate hypothesis

Aliber (1970) demonstrates that exchange rates explain, whereas the industrial organization/market imperfections theory does not, the country and industry pattern of FDI over time, as well as the motivation for takeovers and the decision to license rather than invest directly. The country pattern reflects changing premiums over time, while the industry pattern reflects the role of capital (and R&D) in the production process. Under his hypothesis, takeovers and licensing decisions occur as a result of variations in exchange rates applied to home country and host country

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<sup>32</sup> See Cavusgil (1980) for the stages of the firm's internationalization process.



firms' earnings. Any cross-investment within the same industry can be explained by the differences or variations in currency areas over time.

Aliber believes there is a bias in the market's estimate of exchange risk, and this bias determine whether a country is likely to be a source of or a host for FDI. Capitalization rates are likely to be high in source countries and low in host countries. Strictly speaking, Aliber's exchange rate hypothesis has not been empirically tested. Research (such as Kohlhagen 1977, Cushman 1985, and Demirag 1988) has focused primarily on the relation between FDI and exchange rates, which is not to be confused with Aliber's hypothesis. A few studies have shown that currency devaluation often discourages the inflow of FDI, although Boatwright and Renton (1975) suggest that the depreciation of the pound sterling raised the value of FDI in the United Kingdom.

Undoubtedly, monetary stability is a key factor in FDI (Hughes and Dorrance 1987, p. 57). Most East Asian countries generally have kept domestic inflation below the world level. Exchange rate policies not only are key to monetary stability (and sustained growth) but also directly affect the volume and characteristics of the FDI a country can attract. Conservative monetary policies that discourage inflationary trends combined with market-oriented exchange rate policies will make local business operations attractive. Exchange rate repression, in contrast, not only discourages overall growth but also specifically impedes FDI.<sup>33</sup> Since this variable influences FDI, and given the macro-theoretic nature of this

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<sup>33</sup> See Hughes (1972).

study, it will be included in the model; thus, Aliber's hypotheses also will be tested.

### 3.2.5 Government incentives

Almost all the governments of LDCs provide fiscal incentives in the belief that these encourage FDI.<sup>34</sup> A corollary is that the greater the generosity of these incentives, the greater will be the level of FDI attracted. One, however, often encounters the opinion, generally unencumbered by hard empirical data, that incentives--or at least that certain incentives do not work.

The arguments take various forms. One is that most incentives, such as tax holidays, are simply too small to matter much to investors. Another argument is that investors select host countries on the basis of real and enduring factors--such as market size and labor cost--rather than in response to artificial and fleeting factors. Still another argument is that governments waste incentives on foreign MNCs that were going to make an investment anyway. The cost of these windfall gains may exceed the benefits of any induced investment.

The inducements range from tax holidays (short or long run), to incentives that lower costs (such as accelerated depreciation), the investment allowance, and the investment subsidy.<sup>35</sup> The literature has argued that if tax incentives do, indeed, stimulate FDI, then the cost-

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<sup>34</sup> Shah and Teye (1978) and Guisinger (1985) provide detailed and systematic descriptions of the incentives offered by LDCs.

<sup>35</sup> Lim (1983) divides incentives into three groups: the pure tax holiday, modified tax holiday, and cost-lowering incentives (such as accelerated depreciation allowance).

lowering incentives have a more stimulative effect than a tax holiday. Two reasons are cited.

First, the time-perspective is too limited. The tax holiday is granted under the assumption that firms maximize profits in the short run and that such profit expectations are formulated clearly enough for the effects of the tax holiday to be meaningful. Firms which extend investment plans over a long period may not find any incentive in having a tax exemption over the normal holiday period (usually two to five years), but if the period is extended and firms become profitable, then the exemption is not needed. Incentives that lower costs are granted over a much longer period and with a much less precise profit perspective in mind, and they are meant primarily to minimize production costs in the often difficult early years of operation. Second, unlike cost-lowering incentives, the tax holiday offers little incentive to risky investment, as the exemption only materializes when profits are made.

These considerations of time period and risk may have special relevance for FDI. Thus, industry- or firm-level studies of determinants of FDI suggest different types of incentive programs. For country-level studies, the analysis often adopts a 0-1 dummy variable for the incentive package offered by a country.

According to Reuber (1973), host incentives may be of some help, especially to smaller firms with limited experience in LDCs, but their overall effect on FDI is marginal at best. They probably do not affect the total flow of FDI, but they may influence its distribution. The evidence

is clearer in this area than with respect to the influence of political instability, but it does not support the hypothesis that these two variables necessarily would be positively associated (Agarwal 1980).

Ahmed (1975) shows the incentive variable to be statistically insignificant, as does Lim (1983). Lim concludes that what matters are natural resources and a proven record of economic performance; the provision of incentives cannot compensate for the absence of either.

The main explanation for the insignificant effect of incentives is that generally they are accompanied by a number of disincentives, such as restrictions on ownership, size, location, dividends, and entry into certain industries, as well as mandatory provisions concerning local purchases and exports, so that the positive effect of incentives is cancelled out (Balasubramanyam 1984). Riedel (1975), however, found that incentives have a statistically positive effect on the inflow of FDI.

One difficulty in conducting empirical studies of the effectiveness of fiscal incentives is that very few country keeps a good record of the incentive measures granted to new investors. Another problem was the definition of effectiveness. When countries compete for foreign investment, several of them often offer more or less the same investment package. The slight disadvantage that the incentives of one country may have over another's package generally makes little difference in the site selected. In surveys of the importance that decision makers attach to various factors affecting the investment location, other considerations--

the cost of labor, infrastructure availability, proximity to markets-- frequently rank well above incentives (Guisinger 1986).

### 3.3 POLITICAL DETERMINANTS OF FDI

The concern of this study is country-specific (or macro political) risk as distinguished from industry- or firm-specific (or micro political) determinants of FDI and RDI. Admittedly, this artificially narrows the focus and keeps out of purview many aspects of comprehensive risk analysis. Political risk for FDI in a given country is not uniformly distributed over all industries. Research has revealed many industry-specific characteristics affecting the risk of FDI (Kobrin 1980). The macro view of the political risk analysis will miss the richness of such detailed micro insights. Nevertheless, the constraints and the resultant limitations are considered unavoidable from a practical point of view.

In light of the emphatic importance reportedly placed by MNCs on political determinants, a number of macro quantitative studies have attempted to verify whether the empirical results confirm survey responses. Some findings indicate no significant relationship, and others suggest a connection. What is even more interesting is that in many cases the same authors have come up with two different types of results. A literature review indicates that most of the studies have been concerned with only one element of political risk at a time and that few have dealt with political risk in its totality. The incongruous results obtained may be due largely to the fragmented research approaches, resulting in a somewhat misspecified relationship. To date, no categorical statement about the relationship

between political risk and FDI seems to be warranted, and hence a look at the problem with a view to reconciling divergent findings is appropriate and necessary.

One of the earliest attempts to explore the statistical link between political instability and FDI is by Benett and Green (1972). Controlling for GNP per capita, they found no statistically significant relationship between manufacturing FDI and political instability either in their overall sample or for developed and less developed countries. Only in Asian countries did they come across a significant negative relationship. Benett and Green concluded that "political instability did not affect the overall allocation of U.S. foreign direct manufacturing investment throughout the world" (p. 158). The same results were obtained by Green and Smith (1972) when they examined political instability as a determinant of U.S. FDI. Similarly, Green and Cunningham (1975) found no significant relationship between this factor and U.S. FDI, a finding which they admit is difficult to explain.

The contribution of Green lies in the fact that he made the first serious attempt to test objectively the effect of political instability on FDI decisions, rather than accept the self-reported decision criteria revealed by MNC executives. His studies, however, suffer from serious methodological problems which dilute the quality of the findings. The selection of the sample countries is highly questionable; by excluding those largely avoided by U.S. MNCs, much of the purpose was defeated; the primary objective was to discover whether politically unstable countries commonly are bypassed in the selection of sites for FDI. Also

controversial is his bracketing of developed and developing countries. Most research implies that the former group is generally perceived as politically stable by investors; combining the two may mask an existing relationship between political instability and FDI in developing countries (Levis 1979).

Kobrin, by employing the regression technique (1976) and cross-tabulation (1978) in investigating the relationship between political instability and FDI, surprisingly obtained totally different findings. Such economic factors as market size, however, still proved to be crucial determinants in both studies.

Thunell (1977) attempted an intensive statistical analysis by using a time-series technique rather than the cross-sectional data used by other researchers. Only those countries with 30 or more new investments recorded in the Harvard MNC project data were included in his sample. Although Thunell failed to find meaningful relationships between political events and the level of new FDI, he obtained indications that political events may be related to the "trend change" of foreign investment.

Stepwise discriminant analysis was used by Root and Ahmed (1979) to account for differences between three groups of countries based on per-capita inflows of nonextractive FDI. Their sample consisted of 58 developing countries. Only one political factor emerged as a determinant at the 5 percent level of significance: the number of regular changes in government leadership over the period 1956-1967. Their study further

suggests that frequent changes in government, even when constitutional (regular), deter nonextractive FDI.

Levis (1979) obtained additional evidence that political stability counts as a location-specific factor in FDI, although it is not the prime determinant. Two different dimensions were taken into account in his study: absence of violence and legitimacy. The regression analysis revealed that political instability is important, but the prime determinants of FDI are the economic variables. Levis believes that political events are meaningful for FDI only when considered in conjunction with a number of other relevant factors. Any attempt to separate political stability from general economic conditions may be questioned, however, since economic discontent often creates political instability.

The conflicting results of these studies are quite apparent. Apart from varying kinds of data and analytical methods, a very important source of this conflict is the definition of political instability (Brewer 1981). Upheaval does not always heighten risk for FDI; for example, a shift in power from an extremely leftist to a more democratic government or even a dictatorship may reassure investors. Moreover, the degree of risk emanating from political instability in a country is likely to vary for FDI of different origins and in different industries. Another source of conflicting results is that some developed countries offer guarantees (or insurance) against political risks to firms investing abroad, but these guarantees generally are not taken into account in research on the political variable.



Another controversial issue is the assumed one-way relationship between political instability and FDI. It is conceivable that, by improving the prospects for the host society's aspirations and achievements, FDI contributes to stability. Most studies assume away any bidirectional relationship for the sake of simplification.

Extending the definition of political instability to include both inter- and intranational cooperative and conflict activities, Schollhammer and Nigh (1984, 1986), Nigh (1985), and Tallman (1988) found that negative relationships exist between FDI and political events. They employed COPDAB files to measure political cooperation and conflicts and obtained quite satisfactory results. COPDAB has been reported as an efficient tool for measuring political risk in the political and social science fields. A unique characteristics of COPDAB is its two-way relationship, either conflict or cooperative, among the selected countries or organizations (135 in all). Political risk in a certain country may not be perceived the same by all countries contemplating FDI. German MNCs, for example, may decide to invest in the Philippines due to Germany's two-way diplomatic, cooperative relationship with that country, while U.S. MNCs may disinvest because of the political instability. A certain degree of theoretical generality is lost when so many studies focus on U.S. FDI. Thus the COPDAB data file is chosen in this study to measure the political two-way relationship between the home and host countries.

#### 4.1 INTRODUCTION

This chapter discusses the operationalization of the variables, hypotheses, research models, and methodology used. The rationale for the variables chosen, justification for the hypotheses derived, clarification of data sources, formulation of research models, and adoption of methodology are presented in the following sections.

Section 4.2 elaborates on the six key variables examined in this study: market size, labor cost, trade volume, exchange rates, investment incentive policy, and intra- and international political instability.

Section 4.3 discusses the seven hypotheses, formulated from the variables defined in section 4.2, to be tested for the FDI model. The hypotheses for the RDI model are identical and therefore are not presented.

Section 4.4 presents the research models and indicates the data sources of the variables. Two models are elaborated, the FDI and RDI models. Several alternative frameworks as well as possible logarithmic specifications of the FDI and RDI models also are examined.

Section 4.5 examines the pooling time-series and cross-sectional methodologies based on fixed- and random-effect treatments. Three widely employed techniques are chosen to estimate the FDI and RDI multiple regression models in this study: classical pooling ordinary least-squares

(OLS), ordinary least-squares with variables (OLSDV), and error component (EC).

## 4.2 OPERATIONALIZATION OF VARIABLES

### 4.2.1 Market size

Several studies have found market size to be the most important economic consideration in FDI and RDI decisions: Green and Cunningham (1975), Kobrin (1976), Schollhammer and Nigh (1984, 1986), O'Sullivan (1985), Tallman (1988), and Vasconcellos (1988), among others. Most of these studies employ gross domestic product ( $GDP_t$ ) as the measure of market size.<sup>36</sup> Because the explanatory power of market size has been confirmed in the literature, this variable ( $GDP_t$ ) will be employed in the regression.

### 4.2.2 Labor cost

Labor costs have worked extensively to Taiwan's advantage in attracting FDI (see, for example, Riedel 1975). The labor cost variable employed here is the comparative wage difference between Taiwan and investor (host in RDI model) countries. More specifically, this variable is first deflated by the productivity price index of each country in order to yield the efficiency wage differential. This reflects more accurately the real comparative advantage accruing to a low-wage country.

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<sup>36</sup> Gross national product ( $GNP_t$ ) also has been employed widely in the literature to measure market size.

#### 4.2.3 Trade-substitute or -complement hypothesis

Recently, there has been some discussion as to whether FDI is a "substitute" for or "complement" of international trade. Under the assumption of identical production functions for two countries within the framework of the ordinary Heckscher-Ohlin-Samuelson theory of trade, Mundell (1968) shows that both are complete substitutes. To the contrary, if production functions vary in the two countries, Purvis (1972) demonstrates that FDI is complementary to international trade. Kojima (1975, 1978, 1982) concludes that Japanese-type FDI is trade oriented, while American-type FDI is antitrade oriented. In this study, the actual volume of trade between Taiwan and investor countries is used to test this hypothesis.

#### 4.2.4 Exchange rates

The exchange rate often is considered by economists as a determinant of FDI and RDI. In the case of Taiwan, although the exchange rate often is regarded as a constant, it is an important factor over time.<sup>37</sup> The government has manipulated the exchange rate to stabilize economic development (see, for example, Riedel 1975, Kuo 1983, Hiemenz 1983, and Lee 1986), but the interactions of a currency with others in the international market can influence FDI and RDI. The comparative devaluation of currency, as Aliber hypothesizes (1970), may discourage the inflow of FDI and encourage the outflow of RDI. This variable is operationalized here by

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<sup>37</sup> Since the longstanding ratio of the New Taiwan (N.T.) dollar to the U.S. dollar remained unchanged at 40:1 until late 1985, some viewed the exchange rate as having a limited effect on FDI.

using the ratio of the N.T. dollar to the currency of the other countries to capture effectively the comparative fluctuation.

#### 4.2.5 Investment incentive policy

Governmental investment incentives certainly are not a quantifiable ingredient. Two dichotomous "dummy" variables are introduced here in an effort to capture the effect of major changes in the emphasis and form of economic policy affecting FDI over time. The Taiwanese government's first efforts to encourage the inflow of foreign capital were taken in 1954 and 1955 with the promulgation of the Statutes for Investment by Foreign Nationals and Overseas Chinese. The primary incentive for foreign (as well as local) investment provided by the 1966 Statute for the Encouragement of Investment was in the form of tax concessions (see Appendix A for details). In 1971 the statute was once again revised extensively to allow investors to opt for accelerated depreciation in place of a five-year tax holiday, a change which clearly reflects the gains Taiwan achieved in terms of shifting relative factor abundance during the decade after the investment laws were introduced. The laws have been amended several times since to keep the domestic investment climate as attractive as possible, but these amendments are not considered to have a primary effect on investment. Therefore, the 1966 amendments of the Statute for the Encouragement of Investment and 1971 revisions are chosen as dummy variables to study the effect of investment incentive programs.

#### 4.2.6 Intra- and international political variables

domestic political stability plays a crucial role in attracting FDI, as do international relations. Few countries have formal diplomatic relations

with Taiwan, and the Taiwanese government has sought to limit the harmful effects of diplomatic isolation. The government not only has promulgated laws to make the domestic investment climate as attractive as possible but also has attempted to strengthen bilateral cooperative relations. As Taiwan suffers one defeat after another on the diplomatic front, the maintenance of these ties becomes an important factor in the inflow of FDI. Reverse direct investment also can strengthen bilateral trade relations, and Taiwan has used this option. The benefits to host countries (such as inflow of capital, increased employment, and transfer of appropriate technology) help ensure a friendly atmosphere and reinforce interdependency.

In the literature, there are different views about the definition of domestic political stability. It may mean the absence of violence, government longevity/duration, the presence of a legitimate constitutional regime, the absence of structural change, or a complex of societal attributes. Just as its meaning differs among researchers, so does its operationalization or measurement. In this study, in an attempt to capture bilateral cooperative and conflictive relationships to measure political instability, the data from Azar and Sloan's Conflict and Peace Data Bank (COPDAB) are employed with a slight modification. COPDAB incorporates basic political events from a large number of newspapers and other sources to create a descriptive record. At present there are records for about 135 countries (or organizations, such as the World Bank-IMF and the United Nations) regarding their internal and external affairs from 1948 to 1978.

In essence, COPDAB indicators reflect the frequency and the intensity of inter- and intranational political events for a country during a particular year. The international events are scaled and can range from highly cooperative (a score of 1, for example, if nation A and nation B unite into one state) to highly conflictive (a score of 15, for example, if total war occurs). On the domestic scale, a score of 1 is also the most cooperative (such as major governmental programs and policies to increase substantially socioeconomic freedom and equity), and a scale of 15 is the most conflictive and violent (namely, civil war). (See Appendix B for descriptions, scaling, and weights.) In the FDI literature these four dimensions have been employed to measure political risk; for example, Nigh (1981, 1985), Schollhammer and Nigh (1984, 1986), Sun and Bennett (1988), and Tallman (1988). The results indicate that the COPDAB file can efficiently capture the fluctuation in political risk and instability.

COPDAB is selected here in preference to other political risk measurements for four reasons:<sup>38</sup> (1) It is based upon multiple news sources (70 in all); (2) the period covered is appropriate for the present study; (3) its indicators reflect the frequency as well as intensity of inter- and intranational political events for a country during a particular year; and (4) its international file is well suited for the operationalizations needed.<sup>39</sup> This study integrates four COPDAB dimensions into two net scores, as suggested by Tallman (1988): one net intranational (or domestic)

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<sup>38</sup> Other political risk measurements include World Political Risk Forecasts (WPRF), Political System Stability Index (PSSI), and Business International's Country Assessment Service (BI).

<sup>39</sup> COPDAB data contain a unique bidirectional characteristic lacking in other political measurements.

conflict factor and one net international cooperative factor. The net intranational conflict factor is obtained by subtracting the intranational cooperative scale from the intranational conflictive scale. The net international cooperative factor is obtained by subtracting the international conflictive scale from the international cooperative one.

#### **4.3 HYPOTHESES**

According to Helleiner (1973), four factors have been identified as the major determinants of export-oriented FDI and RDI in developing countries: labor costs, adjusted for productivity; distance costs; governmental influences; and political stability. Although the factors affecting FDI have been discussed extensively in the literature (for example, Riedel 1978, Franko 1978, Blair 1983, O'Sullivan 1985, Lee 1986, Vasconcellos 1988), very few studies include the political risk variable. Until recently, the time-series quantitative data for this variable have been difficult, if not impossible, to obtain; the development of COPDAB provides a needed measure of political factors.

In investigating the determinants of export-oriented FDI and RDI, this study focuses on both economic and political factors. The economic variables chosen are market size, labor cost, exchange rates, trade volume, and government policy. The political variables are the net domestic cooperative measure and the net international cooperative measure. Therefore, FDI is expected to be a function of home country economic factors modified by home country political risk conditions and bilateral home/foreign political relations. Furthermore, it is expected that there



will be some delay between the decision to invest and completion of the transaction. Also, historical trends in decision factors should influence the investment decision.<sup>40</sup> In this study, the lag  $t-k$  is tested to determine the period of delay by clarifying the optimum size of the lag value  $k$ . Therefore, the FDI models were tested with explanatory variables containing  $k$ -year lagged values. Hence, it is assumed that:

- H1: A positive relationship exists between FDI from an investor country in year  $t$  and the size of the host country economy as expressed by the GDP in year  $t-k$ , *ceteris paribus*.
- H2: A positive relationship exists between FDI from an investor country in year  $t$  and the efficiency wage difference between investor and host countries in year  $t-k$ , *ceteris paribus*.  
(Note: The efficiency wage difference is first deflated by the productivity price index of each country in order to yield the efficiency wage differential.)
- H3: A positive relationship exists between FDI from an investor country in year  $t$  and the trade volume between the host and investor countries in year  $t-k$ , *ceteris paribus*.
- H4: A negative relationship exists between FDI from an investor country in year  $t$  and the comparative fluctuation of exchange rates between host and investor countries in year  $t-k$ , *ceteris paribus*.
- H5: A positive relationship exists between FDI from an investor country in year  $t$  and the investment incentive program promulgated by the host government, expressed by two pairs of dummy variables in the case of Taiwan:  $X_{1,t} = 0$  for 1955 to 1966,  $X_{1,t} = 1$  for 1967 to 1980,  $X_{2,t} = 0$  for 1955 to 1971,  $X_{2,t} = 1$  for 1972 to 1980, *ceteris paribus*.
- H6: A negative relationship exists between FDI from an investor country in year  $t$  and net domestic conflictive political events ( $NCODOP_{t-k}$ ) in the host country in year  $t-k$ , *ceteris paribus*.
- H7: A positive relationship exists between FDI from an investor country in year  $t$  and net international cooperative political

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<sup>40</sup> Tallman (1988), p. 225.

events ( $NCOINP_{i,t-k}$ ) between the investor country and the host country for year  $t-k$ , *ceteris paribus*.

For the RDI case, the economic factors in this study include market size (expressed as  $GDP_{i,t}$  in host countries), comparative exchange rate fluctuation, trade volume, and efficiency wage differences. The political instability factors are the net domestic conflictive measure and net international cooperative measure. Therefore, RDI is expected to be a function of host country economic development factors modified by the host country's political risk and bilateral home/host political relations. The RDI hypotheses are identical to those for the FDI model, except there is no government investment incentive hypothesis (H5).

#### 4.4 RESEARCH MODELS

##### 4.4.1 Model of foreign direct investment

Multiple regression analysis is employed to estimate the relationship among home country economic variables, political risk, and direct investment from a specific foreign country. The analysis of either FDI or RDI is inherently dynamic and is best suited to time-series analysis. The low incidence of events in terms of both dependent and independent variables, however, makes annual aggregates for any one foreign country inadequate. Therefore, data for investor countries are pooled for the period tested to provide the aggregate data base for estimating the regression. Because pooling time-series and cross-sectional data reduces the variance of the estimators of the regression and increases the

possibility of significant results,<sup>41</sup> the commonly accepted pooling techniques were used to estimate the FDI and RDI multiple regression models. Therefore, FDI (as well as RDI) is expected to be a function of home country economic development factors modified by home country political risk and bilateral home/foreign political relations. The FDI model is expressed as:<sup>42</sup>

$$\begin{aligned} \text{FDI}_{i,t} = & \alpha_0 + \alpha_1 \text{MKTSZ}_{t-k} + \alpha_2 \text{EWD}_{i,t-k} + \alpha_3 \text{TRD}_{i,t-k} + \alpha_4 X_{1,t-k} \\ & + \alpha_5 X_{2,t-k} + \alpha_6 \text{NCODOP}_{t-k} + \alpha_7 \text{NCOINP}_{i,t-k} + \epsilon_{i,t} \end{aligned}$$

$i = 1, 2, \dots, N_1$  country

$t = 1, 2, \dots, T$  year

where

$\text{FDI}_{i,t}$  = stock of completed FDI transactions in Taiwan from country  $i$  in year  $t$ ;

$\text{MKTSZ}_{t-k}$  = market size as indicated by gross domestic product (GDP) in Taiwan for year  $t-k$ ;

$\text{EWD}_{i,t-k}$  = efficiency wage difference between Taiwan and country  $i$  in year  $t-k$ . This variable is deflated by the productivity price index of the investor country and Taiwan in order to yield the efficiency wage differential;

$\text{TRD}_{i,t-k}$  = trade volume between Taiwan and country  $i$  for year  $t-k$ ;

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<sup>41</sup> Pooling unrelated observations also can increase the likelihood of violations of basic least-squares assumptions, that is, homoskedasticity, nonmulticollinearity, or no first-order serial correlation of data. Therefore, pooling ability had to be tested first.

<sup>42</sup> Data sources: see Appendix C.  
( $t-k$ ) indicates a lagged effect for the explanatory variables with the time lag to be determined,  $k = 1$ , or  $k = 2$ . The time structure of the FDI is expected to show some delay between the decision to invest and the completion of the transaction. And the historical trends in investment decision factors should influence the decision.

$X_{1,t-k} = 0$  for  $t-k = 1955-1966$ ;  $X_{1,t-k} = 1$  for  $t-k = 1967-1978$ . The Statutes of Encouragement on Investment were amended considerably in 1966. Thus, 1966 is chosen as a policy dummy variable;

$X_{2,t-k} = 0$  for  $t-k = 1955-1971$ ;  $X_{2,t-k} = 1$  for  $t-k = 1972-1978$ . In 1971, the Statutes of Encouragement on Investment were amended extensively. Thus, 1971 is chosen as another policy dummy variable;

$NCODOP_{t-k}$  = net conflict domestic political events in Taiwan for year  $t-k$ . That is the difference in  $INTRACON_{t-k}$  (intranational or domestic conflictive events score for Taiwan in year  $t-k$ ) and  $INTRACOO_{t-k}$  (intranational or domestic cooperative events score for Taiwan in year  $t-k$ );

$NCOINP_{i,t-k}$  = net international cooperation score between Taiwan and country  $i$  in year  $t-k$ . That is the difference of  $INTERCOOP_{i,t-k}$  (international cooperative events score between Taiwan and country  $i$  in year  $t-k$ ) and  $INTERCON_{i,t-k}$  (international conflictive events score between Taiwan and country  $i$  in year  $t-k$ ).

#### 4.4.2 Model of reverse direct investment

Similar to the FDI model, the RDI model also will be based on political as well as economic factors. Thus, a linear relationship of the RDI model is expressed as follows:<sup>43</sup>

$$RDI_{i,t} = \beta_0 + \beta_1 MKTSZ_{i,t-k} + \beta_2 EWD_{i,t-k} + \beta_3 XPR_{i,t-k} + \beta_4 EXC_{i,t-k} \\ + \beta_5 NCODOP_{i,t-k} + \beta_6 NCOINP_{i,t-k} + \epsilon_{i,t}$$

$i = 1, 2, \dots, N_2$  country

$t = 1, 2, \dots, T$  year

where

$RDI_{i,t}$  = stock of completed RDI transactions from Taiwan to country  $i$  in year  $t$ ;

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<sup>43</sup> Ibid.

$MKTSZ_{i,t-k}$  = market size as indicated by gross domestic product (GDP) for host country  $i$  in year  $t-k$ ;

$EWD_{i,t-k}$  = efficiency wage difference between host country  $i$  and Taiwan in year  $t-k$ . This variable is deflated by the productivity price index of the host country and Taiwan in order to yield the efficiency wage differential;

$XPR_{i,t-k}$  = export volume from Taiwan to host country  $i$  in year  $t-k$ ;

$EXC_{i,t-k}$  = comparative fluctuation of exchange rates between Taiwan and host country  $i$  for year  $t-k$ ;

$NCODOP_{i,t-k}$  = net domestic conflict score between Taiwan and host country  $i$  in year  $t-k$ . That is the difference of  $INTRACON_{i,t-k}$  (intranational or domestic conflictive events score for country  $i$  in year  $t-k$ ) and  $INTRACOO_{i,t-k}$  (intranational or domestic cooperative events score for country  $i$  in year  $t-k$ ).

#### 4.4.3 Alternative models with logarithmic specification

To improve the model's performance in explaining the variability of the sample, one possible alternative is to change the model's specification. A logarithmic specification model is introduced here. A linear relationship of the logarithmic FDI model is assumed as follows:<sup>44</sup>

$$\ln FDI_{i,t} = \alpha_0 + \alpha_1 \ln MKTSZ_{t-k} + \alpha_2 EWD_{t-k} + \alpha_3 \ln TRD_{i,t-k} + \alpha_4 X_{1,t-k} + \alpha_5 X_{2,t-k} + \alpha_6 \ln NCODOP_{t-k} + \alpha_7 \ln NCOINP_{i,t-k} + \epsilon_{i,t}$$

$i = 1, 2, \dots, N_1$  country

$t = 1, 2, \dots, T$  year

The logarithmic RDI model is:

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<sup>44</sup> Ibid.

$$\ln RDI_{i,t} = \beta_0 + \beta_1 \ln MKTSZ_{i,t-k} + \beta_2 EWD_{i,t-k} + \beta_3 \ln XPR_{i,t-k} + \beta_4 \ln EXC_{i,t-k} + \beta_5 \ln NCODOP_{i,t-k} + \beta_6 \ln NCOINP_{i,t-k} + \epsilon_{i,t}$$

$i = 1, 2, \dots, N_2$                       country  
 $t = 1, 2, \dots, T$                       year

Several other alternative frameworks are proposed. First, the exchange rate variable is added to the FDI and RDI models. Second, import and export, respectively, are substituted for trade volume in two models. Third, the logarithmic form is employed for all the models.<sup>45</sup> These alternative regressions also are run for the lag one- and two-year cases.

#### 4.5 METHODOLOGY

The common model for pooling time-series and cross-sectional (or panel) data can be formed as:

$$Y_{i,t} = X_{i,t} \beta + \alpha_i + \epsilon_{i,t}$$

$i = 1, 2, \dots, N$   
 $t = 1, 2, \dots, T$

where  $\alpha_i$  specifies the country effect, which depends on  $i$  (individual) not  $t$  (time). Since there is no indication that time affect the stock or trend of FDI, the time effect has been excluded in the above model. Consequently, one can deal with the above equation by (1) fixed effects treatment and (2) random effects treatment while attempting to pool time-series and cross-sectional data.

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<sup>45</sup> The policy dummy variables and negative efficiency wage differences will not be given the logarithmic form.

#### 4.5.1 Fixed effects treatment

Let  $\alpha_i$  be a parameter (independent variable), and assume  $\epsilon_{i,t}$  is i.i.d.  $N(0, \sigma^2)$ .<sup>46</sup> Therefore, one can estimate this equation (1) by an OLS with dummy variables for countries, called OLSDV (analysis of covariance with N-1 dummies), and (2) by a within transformation method, called OLSDV (within). The latter is equivalent to estimating the following equation by OLS:

$$(Y_{i,t} - \bar{Y}_i) = (X_{i,t} - \bar{X}_i) \beta + \epsilon_{i,t}$$

$$\text{where } \bar{Y}_i = 1/T \sum_{t=1}^T Y_{i,t} ; \quad \bar{X}_i = 1/T \sum_{t=1}^T X_{i,t}.$$

These two methods are in fact identical.

#### 4.5.2 Random effects treatment

Another type of pooling, known as variance or error components,<sup>47</sup> is based on the treatment of random effect.<sup>48</sup> In this treatment, it is assumed that  $\epsilon_{i,t}$  is i.i.d.  $N(0, \sigma^2)$ , as in the fixed-effects treatment. It also is assumed that (1)  $X_{i,t}$  contains the intercept term, (2)  $\alpha_i$  is i.i.d.  $N(0, \sigma_\alpha^2)$ , and (3)  $\alpha_i$  is uncorrelated with  $X_{i,t}$ . Thus, one can estimate the following equation by OLS:

$$Y_{i,t} = X_{i,t} \beta + (\alpha_i + \epsilon_{i,t})$$

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<sup>46</sup>  $\epsilon_{i,t}$  i.i.d.  $N(0, \sigma^2)$  means that error terms are independently and identically distributed with zero mean and common variance  $\sigma^2$ .

<sup>47</sup> The terms error component and variance component are used interchangeably by econometricians.

<sup>48</sup> Balestra and Nerlove (1966) found fixed-effect treatment unsatisfactory in their study of the demand for natural gas and suggested the use of the variance component model.

where  $i = 1, 2, \dots, N$   
 $t = 1, 2, \dots, T$

Estimation by OLS is consistent but **not** efficient. In order to improve efficiency, one can replace OLS by GLS. GLS, however, requires a transformed equation, as follows:

$$[Y_{i,t} - (1-\theta) \bar{Y}_i] = [X_{i,t} - (1-\theta) \bar{X}_i] B + \epsilon_{i,t}$$

where  $\theta^2 = \sigma_\epsilon^2 / (\sigma_\epsilon^2 + T \sigma_\alpha^2)$ .

For the value of  $\theta^2$ , one first can obtain the value of  $\sigma_\epsilon^2$  and  $(\sigma_\epsilon^2 + T \sigma_\alpha^2)$ , respectively.

(1) For the value of  $\sigma_\epsilon^2$ , one can obtain  $\widehat{\sigma_\epsilon^2}$  from the within regression, as in section 4.5.1. It equals to  $(1 / N (T-1)) * SSE_{within}$ .

(2) For the value of  $(\sigma_\epsilon^2 + T \sigma_\alpha^2)$ , one can obtain the value of  $(\sigma_\epsilon^2 + T \sigma_\alpha^2)$  from the between regression. It equals to  $T * (1 / N) * SSE_{between}$ . The between regression is stated as follows:

$$Y_i = X_i B + \epsilon_{i,t} \quad i = 1, 2, \dots, N.$$

Certainly there are several more alternatives for pooling the time-series and cross-sectional data (see Judge et al. 1985 ). In this study, only three of the most commonly used pooling techniques are employed.

The first is ordinary least-squares (OLS), which assumes constant slope and intercept parameters across time and country variations. For  $N$  countries and  $T$  time intervals, OLS assumes a homogeneous data set of  $NT$  observations.



The second is ordinary least-squares with dummy variable (OLSDV), which presuppose the existence of significant unidentified country-specific effects in the OLS model. As used in our study, OLSDV allows for different, but constant, intercepts across countries by the use of country dummy variables, while assuming constant intercepts across time.<sup>49</sup>

The third is error component (EC), which also assumes nonhomogeneous intercepts but assumes that these are independent, identically distributed random variables rather than constants. This independence permits constant autocorrelation of disturbances from different time periods. As stated above, the EC model creates a coefficient matrix which is a weighted average of the OLSDV coefficient (within estimator) and a coefficient matrix for a regression on the individual across-time means (between estimator).<sup>50</sup>

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<sup>49</sup> See Judge et al. (1982), p. 477.

<sup>50</sup> Ibid., p. 494.

The FDI multiple regression model includes the following explanatory variables: market size (measured by GDP); efficiency wage difference (EWD); trade (TRD); two policy dummy variables (Dummy 1 for the 1966 amendments of investment incentive programs, Dummy 2 for the 1971 revisions); net domestic conflict score (INTRACON); and net international cooperation score (INTERCO).

The RDI multiple regression model includes: market size (GDP); efficiency wage difference (EWD); trade (TRD); net domestic conflict score (INTRACON); and net international cooperation score (INTERCO).

Since the INTERCO political data from the COPDAB file are judged inadequate because of insufficient yearly information, only INTRACON is used in this study for measuring political instability. Because the COPDAB file contains four dimensions, it is possible and logical to combine them into one (or two) political instability variable(s) for research purposes. Tallman (1988), for instance, reduced these four measures to two net political cooperation variables: one domestic and one international. He found them to be effective in capturing the fluctuation of political instability for his sample countries. Hence, the elimination of the INTERCO political variable in this study is judged to be acceptable.

In order to improve model specification, several alternatives were attempted in this study. First, the exchange rate variable was added to the FDI and RDI models, and the specifications were found to be

unsatisfactory.<sup>51</sup> Second, import and export were substituted for the trade variable in the FDI and RDI models, respectively; again, this did not improve the specifications. The logarithmic form was used in all the models; from the results (see Appendix D) it can be seen that changing the specification form did not seem to improve the results.<sup>52</sup> At best, results from the alternative appear to be mixed, and in general the significance of the explanatory variables decreased.

In addition to the foregoing nonlagged models, alternatives were run for lagged one- and two-year cases. The models with trade data (for FDI and RDI), import and exchange rates (for FDI), and export and exchange rates (for RDI) were found to have the better overall specification. Thus, the findings and discussion in this chapter are based on these models.

Section 5.1 presents the empirical results for the FDI models. The model with trade variable (henceforth FDI Model I), model with import and exchange rate variables (henceforth FDI Model II), and both FDI Model I and II lagged one and two years are exhibited and elaborated upon in this section. The FDI models include the United States, Japan, Hong Kong, the Philippines, and Malaysia.

Section 5.2 reports the empirical results for the RDI models. The model with trade data (henceforth RDI Model I), model with export and

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51 Measuring the model's performance by t-values and adjusted-  $R^2$ , it is found that the alternative models have fewer significant coefficients and lower adjusted- $R^2$ .

52 The dichotomous policy dummy (both 1966 and 1971), the possible negative efficiency wage difference variables are not taken the logarithmic form.

exchange rate (henceforth RDI Model II), and both RDI Model I and II lagged one year are exhibited and elaborated upon.<sup>53</sup> The RDI models include the United States, Hong Kong, the Philippines, Malaysia, Thailand, Singapore, and Indonesia.

The summary of tests of hypotheses is reported in Section 5.3. Section 5.4 provides a detailed explanation of and implications for the statistical findings from the test results.

### 5.1 EMPIRICAL RESULTS FROM THE FDI MODELS

The hypotheses were tested by estimating two FDI models: one with the trade variable and one with the import and comparative exchange rate variables. As shown by several studies (for example, Kojima 1974, 1978; Ramstetter 1986), one-way trade volume often provides a better measurement for testing the Kojima hypotheses (FDI's substitutive or complementary role in trade). Since trade and import variable are highly correlated, combining them in a regression model may cause estimation problems. Because commonly used approaches to solving problems of multicollinearity are not applicable here, the model was estimated separately with general trade data and import data.

The two FDI models are given below:

#### FDI Model I:<sup>54</sup>

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<sup>53</sup> Some mixed results appear for lagged two-year RDI models. Therefore, these were excluded from the study.

<sup>54</sup> This estimation excludes the lag effect specification from the model.

$$FDI_{i,t} = \alpha_0 + \alpha_1 MKTSZ_t + \alpha_2 EWD_{i,t} + \alpha_3 TRD_{i,t} + \alpha_4 X_{1,t} + \alpha_5 X_{2,t} \\ + \alpha_6 INTRACOP_t + \epsilon_{i,t}$$

$i = 1, 2, \dots, N_1$  country

$t = 1, 2, \dots, T$  year

where

$FDI_{i,t}$  = stock of completed foreign direct investment transactions in Taiwan from country  $i$  for year  $t$ ;

$MKTSZ_t$  = market size as indicated by gross domestic product (GDP) in Taiwan for year  $t$ ;

$EWD_{i,t}$  = efficiency wage differences between Taiwan and country  $i$  for year  $t$ . This variable is deflated by the productivity price index of the investor country and Taiwan in order to reflect more accurately the real comparative return;

$TRD_{i,t}$  = trade volume between Taiwan and investor country  $i$  for year  $t$ ;

$X_{1,t} = 0$  for  $t = 1955-1966$ ;  $X_{1,t} = 1$  for  $t = 1967-1978$ . The Statutes of Encouragement on Investment were modified considerably in 1966. Thus, 1966 is chosen as a policy dummy variable;

$X_{2,t} = 0$  for  $t = 1955-1971$ ;  $X_{2,t} = 1$  for  $t = 1972-1978$ . In 1971, The Statutes were amended extensively; thus, it is chosen as another policy dummy variable;

$INTRACON_t$  = net domestic political conflict score in Taiwan for year  $t$ .

### FDI Model II:<sup>55</sup>

$$FDI_{i,t} = \alpha_0 + \alpha_1 MKTSZ_t + \alpha_2 EWD_{i,t} + \alpha_3 IMPORT_{i,t} + \alpha_4 EXC_{i,t} \\ + \alpha_5 X_{1,t} + \alpha_6 X_{2,t} + \alpha_7 INTRACOP_t + \epsilon_{i,t}$$

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<sup>55</sup> The definitions of other notations are identical to those in the FDI Model I.

$i = 1, 2, \dots, N_1$  country

$t = 1, 2, \dots, T$  year

where

$IMPORT_{i,t}$  = import volume from country  $i$  to Taiwan for year  $t$ ;

$EXC_{i,t}$  = the comparative fluctuation in exchange rate between Taiwan and the investor country  $i$  for year  $t$ .

To examine the appropriateness of pooling (or ability to pool) all data together, F-statistics were employed to test the homogeneity. The hypotheses may be stated as:

$$H_0: \beta_1 = \beta_2 = \beta_3 = \dots = \beta_N = \beta,$$

$$H_1: \text{not all coefficient vectors are equal,}$$

where  $\beta_i = [\beta_{0i} \beta_{1i} \beta_{2i} \beta_{3i} \dots \beta_{ki}]'$  is the vector of regression coefficients for country  $i$ . The test statistic, a special case of the F-statistics, is:

$$F = \frac{(\text{SSE}_R - \text{SSE}_U) / \text{Number of Restrictions}}{\text{SSE}_U / \text{Degrees of Freedom}}$$

where

$\text{SSE}_R$  = SSE of joint regression;

$\text{SSE}_U = \text{SSE}_1 + \text{SSE}_2 + \dots + \text{SSE}_N$ ;

Number of restrictions =  $(N - 1) * K$ ;

Degrees of freedom (henceforth, d.f.) =  $NT - NK$  = total number of observations - total number of coefficients in all the regressions.

The F-statistic value is 0.5025 for FDI Model I (d.f. are 28 and 83), and 0.5193 for FDI Model II (d.f. are 32 and 78). It is found that:

Critical F 0.05, (28,83)  $\approx 1.74 > 0.5025$

Critical F 0.05, (32,78)  $\approx 1.71 > 0.5193$

Therefore, the null hypotheses cannot be rejected. The results reveal the plausible pooling of all country data together.<sup>56</sup> Consequently, the models are estimated by OLS, OLSDV (within), and EC techniques, as shown in Table 5-1.<sup>57</sup> The results revealed by the three equations are quite similar, and most of the significant variables have the expected signs.

TABLE 5-1 Foreign Direct Investment Model I

	FDI	Constant	GDP	Efficiency Wage Diff.	Trade	Dummy01	Dummy02	IntraCon	R <sup>2</sup>	adj.R <sup>2</sup>	F
OLS(all)	FDI	6423.41 (1.656)	232.21 (0.847)	6141.94 (4.99)***	1.755 (1.181)	6917.07 (2.46)**	2579.34 (0.709)	-250.62 (-2.17)**	0.67	0.65	37.04
OLSDV (Within)	FDI		437.302 (1.635)	16519.80 (3.16)***	-4.5690 (-1.46)	5596.66 (2.08)**	1840.31 (0.540)	-238.15 (-2.21)**	0.61	0.59	34.63
EC	FDI		204.169 (0.748)	6398.51 (4.85)***	1.4075 (0.936)	9306.34 (4.0)***	2761.88 (0.782)	-111.79 (-2.23)**	0.64	0.63	40.41

- F-test for all estimate significant at the 1% level.
- The figure in ( ) parentheses are t-stat.
- Coefficients statistically significant on the  
5% (2-tails) are indicated by an asterisk \*;  
1% (2-tails) by two asterisks \*\*;  
0.1% (2-tails) by three asterisks \*\*\*.
- Sample ranges from 1955 to 1990 for five countries. Total 118 observations.

In FDI Model I (see Table 5-1), the efficiency wage differences are found to have a positive effect on the inflow of FDI to Taiwan, whereas political instability has a negative influence. The Statutes of

<sup>56</sup> The results of the F-test also show the appropriateness of pooling for the lag models in the study. The values of the F-test are 0.7542 (one-year lag) and 0.9237 (two-year lag) for FDI Model I, and 0.6044 (one-year lag) and 0.9233 (two-year lag) for FDI Model II. The null hypotheses for these lagged models cannot be rejected.

<sup>57</sup> An OLSDV with dummy variables for countries also was run in this study, and the coefficient and t-value were found to be the same as OLSDV (within); two methods are in fact identical. Moreover, due to some missing observations, there are only 118 observations in the model.





Encouragement on Investment amended considerably in 1966 have a positive effect, but the 1971 revisions of the statutes were not significant, perhaps offset by the political variable; in 1971, Taiwan was replaced as a member of the United Nations by the People's Republic of China.

One must be very careful in explaining the results for the error component (EC) equations in the models. For the EC model with time and individual components, Swamy and Arora (1972) have studied the small sample properties of their estimators. They show that the technique may be less efficient than classical pooling if  $N$  and  $T$  and the true value of  $\sigma_\epsilon^2$  and  $\sigma_\alpha^2$  are large. As guidelines, they suggest that  $N-K$  and  $T-K$  (where  $K$  is the number of independent variables) both be greater than ten **before** the GLS estimator is considered. Under the assumption that time effects are absent, Swamy and Mehta (1979) have reduced the choice of estimators to depend on *a priori* information concerning relative magnitudes of error variance. Taylor (1980) also examines the model with individual components. His results suggest that the only ambiguity in choice of an estimator will be when  $N-K \leq 10$ . In cases where  $N-K > 10$ , GLS using estimated variance components will be more efficient than classical pooling (OLS) or ANCOVA. Although the "within regressions" in FDI Model I and II are consistent and asymptotically normal as  $N$  or  $T \rightarrow \infty$ , the GLS estimators are **inconsistent** because of the small number of observations ( $N = 5$ ). Thus, it is highly risky to explain the results of the EC equation in Table

5-1, even though the significant variables are found to be similar to those of the other equations.<sup>58</sup>

Table 5-2 shows the results of FDI Model II. The efficiency wage difference is found to be a major determinant of levels of FDI in Taiwan, and the political variable has a negative influence. The 1966 government investment policy also was important in attracting the FDI to Taiwan, as was the exchange rate variable.

TABLE 5-2 Foreign Direct Investment Model II

	FDI	Constant	GDP	Efficiency Wage Diff.	Import	Exch.Rate	Dummy01	Dummy02	IntraCon	R <sup>2</sup>	adj.R <sup>2</sup>	F
OLS(all)	FDI	8883.7 (2.21)**	403.30 (1.528)	11955.08 (4.45)***	-5.066 (-1.231)	-396.41 (-2.17)**	6067.09 (2.18)**	2130.50 (0.582)	-253.96 (2.23)**	0.68	0.66	33.16
OLS0V (Within)	FDI		365.55 (1.45)	13679.2 (3.04)***	-5.868 (-1.159)	138.95 (0.33)	6166.41 (2.31)**	2228.70 (0.650)	-237.82 (-2.19)**	0.61	0.59	28.57
EC	FDI		594.311 (2.7)***	9617.35 (2.95)***	-1.5836 (-0.391)	-88.103 (-0.26)	3404.05 (1.69)*	-77.152 (-0.024)	-365.53 (-3.91)***	0.58	0.56	25.82

- F-test for all estimate significant at the 1% level.
- The figure in ( ) parentheses are t-stat.
- Coefficients statistically significant on the 5% (2-tails) are indicated by an asterisk \*;
- 1% (2-tails) by two asterisks \*\*;
- 0.1% (2-tails) by three asterisks \*\*\*.
- Sample ranges from 1955 to 1980 for five countries. Total 118 observations.

It is expected that there will be some delay between the decision to invest and completion of the transaction. Also, historical trends in decision factors should influence the investment decision.<sup>59</sup> In this study, the lag t-k is tested to determine the period of delay by clarifying the optimum size of the lag value k. Therefore, the FDI models were tested

<sup>58</sup> In Tallman's (1988) study of the determinants of FDI, using a pooled time-series and cross-sectional technique, the value of N-K also was smaller than ten in his EC regressions.

<sup>59</sup> Tallman (1988), p. 225.

with explanatory variables contain one- or two-year lagged values. The lags were selected based on those widely used by such scholars as Nigh (1981), Schollhammer and Nigh (1984), and Tallman (1988).<sup>60</sup>

Table 5-3 and Table 5-4 indicate the results for FDI Model I with the explanatory variables lagged one year ( $k = 1$ ) and two years ( $k = 2$ ). The same results are found in the model with a one-year lag as those for the model without the lag. Moreover, the trade variable has a positive effect on attracting FDI both without lag and in both lag cases. For FDI Model I with a two-year lag ( $k = 2$ ), the efficiency wage difference and the 1966 investment policy have a positive effect, but political instability is insignificant.

TABLE 5-3 Foreign Direct Investment Model I (Lagged One Year)

	FDI	Constant	GDP	Efficiency Wage Diff.	Trade	Dummy01	Dummy02	IntraCon	R <sup>2</sup>	adj. R <sup>2</sup>	F
OLS(all)	FDI1	3307.56 (0.835)	105.999 (0.376)	6376.21 (5.03)***	3.0296 (1.98)**	10383.2 (3.61)***	1421.47 (0.380)	-141.60 (-1.68)*	0.70	0.69	43.44
OLSDV (Within)	FDI1		330.983 (1.212)	17538.95 (3.28)***	-3.770 (-1.18)	8881.07 (3.25)***	599.43 (0.172)	-136.37 (-1.64)*	0.64	0.63	40.42
EC	FDI1		411.675 (1.650)	7327.955 (2.63)***	1.971 (0.967)	6833.07 (3.32)***	-718.322 (-0.210)	-195.76 (-2.53)**	0.62	0.61	38.95

- F-test for all estimate significant at the 1% level.
- The figure in ( ) parentheses are t-stat.
- Coefficients statistically significant on the 5% (2-tails) are indicated by an asterisk \*;
- 1% (2-tails) by two asterisks \*\*;
- 0.1% (2-tails) by three asterisks \*\*\*.
- Sample ranges from 1955 to 1980 for five countries. Total 119 observations.

<sup>60</sup> The lags of one and two years are arbitrary, although they seem reasonable. See also Aharoni (1966 p. 174) and Riedel (1975 p. 511). Knudsen (1974) finds a lag of five years to be effective. He was, however, dealing with fundamental causes of political unrest--welfare of the people relative to their aspirations--and not the overt political acts on which most research is based, the effects of which should be felt in the short term. Daniels and Quigley (1980) also find five-year lags can be expected between investment decisions and start-up, but this claim has not been tested yet.

TABLE 5-4 Foreign Direct Investment Model I (Lagged Two Years)

	FDI	Constant	GDP	Efficiency Wage Diff.	Trade	Dummy01	Dummy02	IntraCon	R <sup>2</sup>	adj.R <sup>2</sup>	F
OLS(all)	FDI2	1017.8 (0.234)	241.31 (0.791)	6033.92 (4.42)***	6.3564 (3.85)***	11823.2 (3.80)***	-3149.2 (-0.778)	-50.39 (-0.39)	0.75	0.73	54.06
OLSIV (Within)	FDI2		419.61 (1.406)	14239.2 (2.41)**	1.1897 (0.34)	10963.2 (3.84)***	-3717.5 (-0.977)	-34.62 (-0.29)	0.69	0.67	48.97
EC	FDI2		382.6825 (1.346)	5769.79 (2.59)**	6.1219 (3.21)***	10015.4 (4.37)***	-3826.19 (-1.030)	-55.91 (-2.11)**	0.69	0.66	50.28

- F-test for all estimate significant at the 1% level.
- The figure in ( ) parentheses are t-stat.
- Coefficients statistically significant on the 5% (2-tails) are indicated by an asterisk \*;
- 1% (2-tails) by two asterisks \*\*;
- 0.1% (2-tails) by three asterisks \*\*\*.
- Sample ranges from 1955 to 1990 for five countries. Total 119 observations.

Table 5-5 and Table 5-6 show the results for FDI Model II with the explanatory variables lagged one year ( $k = 1$ ) and two years ( $k = 2$ ). Similar results are found in the model with and without one-year lag ( $k=1$ ). Political instability is found to have a negative but insignificant effect on FDI; the import variable has a negative effect. The latter indicates that the entry of FDI can be a substitute for import entry. In the OLS (classical pooling) equation, exchange rates have a significantly negative effect on FDI for the one-year lag. For FDI Model II with a two-year lag ( $k = 2$ ) in the explanatory variables, the efficiency wage difference and the 1966 policy variable have the same effect on the stock of FDI with and without lag. The import variable is found to play an insignificant role in attracting FDI.

TABLE 5-5 Foreign Direct Investment Model II (Lagged One Year)

	FDI	Constant	GDP	Efficiency Wage Diff.	Import	Exch.Rate	Dummy01	Dummy02	IntraCon	R <sup>2</sup>	adj.R <sup>2</sup>	F
OLS(all)	FDI1	6550.53 (1.598)	397.62 (1.47)	14890.8 (5.41)***	-7.2090 (-1.72)*	-548.192 (-2.9)***	9082.84 (3.2)***	794.11 (0.216)	-149.35 (-1.28)	0.72	0.70	39.59
OLS0V (Within)	FDI1		350.473 (1.38)	19905.5 (4.46)***	-10.789 (-2.14)**	22.776 (0.05)	8788.86 (3.3)***	650.515 (0.189)	-136.002 (-1.25)	0.66	0.64	35.21
EC	FDI1		346.347 (1.54)	12045.23 (3.92)***	-6.596 (-1.75)*	-326.079 (-1.33)	7346.94 (3.6)***	-281.178 (-0.081)	-260.125 (-3.09)***	0.63	0.61	31.40

- F-test for all estimate significant at the 1% level.
- The figure in ( ) parentheses are t-stat.
- Coefficients statistically significant on the 5% (2-tails) are indicated by an asterisk \*;
- 1% (2-tails) by two asterisks \*\*;
- 0.1% (2-tails) by three asterisks \*\*\*.
- Sample ranges from 1955 to 1980 for five countries. Total 119 observations.

TABLE 5-6 Foreign Direct Investment Model II (Lagged Two Years)

	FDI	Constant	GDP	Efficiency Wage Diff.	Import	Exch.Rate	Dummy01	Dummy02	IntraCon	R <sup>2</sup>	adj.R <sup>2</sup>	F
OLS(all)	FDI2	3175.34 (0.690)	616.34 (2.05)*	14853.35 (4.85)***	-1.949 (-0.41)	-505.52 (-2.38)**	10401.46 (3.3)***	-3833.15 (-0.93)	-51.738 (-0.398)	0.74	0.73	45.41
OLS0V (Within)	FDI2		544.234 (1.94)*	20507.83 (4.12)***	-5.734 (-1.02)	40.353 (0.086)	10287.37 (3.5)***	-4028.44 (-1.05)	-25.8451 (-0.214)	0.69	0.67	41.06
EC	FDI2		693.638 (2.82)**	12210.23 (3.52)***	-2.8633 (-0.65)	-314.35 (-1.095)	8138.88 (3.5)***	-5420.65 (-1.43)	-183.43 (-1.930)*	0.66	0.65	36.65

- F-test for all estimate significant at the 1% level.
- The figure in ( ) parentheses are t-stat.
- Coefficients statistically significant on the 5% (2-tails) are indicated by an asterisk \*;
- 1% (2-tails) by two asterisks \*\*;
- 0.1% (2-tails) by three asterisks \*\*\*.
- Sample ranges from 1955 to 1980 for five countries. Total 119 observations.

## 5.2 EMPIRICAL RESULTS FROM THE RDI MODEL

The RDI hypotheses were tested by estimating two models: one with the trade variable (RDI Model I) and one with export and comparative exchange rate variables (RDI Model II).

The two RDI models are given below.

RDI Model I:

$$RDI_{i,t} = \beta_0 + \beta_1 MKTSZ_{i,t} + \beta_2 EWD_{i,t} + \beta_3 TRD_{i,t} + \beta_4 INTRACON_{i,t} + \epsilon_{i,t}$$

$i = 1, 2, \dots, N_2$  country

$t = 1, 2, \dots, T$  year

where

$RDI_{i,t}$  = stock of completed RDI transactions from Taiwan to host country  $i$  for year  $t$ ;

$MKTSZ_{i,t}$  = market size as indicated by gross domestic product (GDP) for the host country  $i$  for year  $t$ ;

$EWD_{i,t-k}$  = Efficiency wage differences between host country  $i$  and Taiwan for year  $t$ . This variable is also deflated by the productivity price index of the host country and Taiwan in order to reflect more accurately the real comparative return;

$TRD_{i,t}$  = trade volume between Taiwan and host country  $i$  for year  $t$ ;

$INTRACON_{i,t}$  = net political conflict score for host country  $i$  in year  $t$ .

RDI Model II.<sup>61</sup>

$$RDI_{i,t} = \beta_0 + \beta_1 MKTSZ_{i,t} + \beta_2 EWD_{i,t} + \beta_3 XPR_{i,t} + \beta_4 EXC_{i,t} + \beta_5 INTRACON_{i,t} + \epsilon_{i,t}$$

$i = 1, 2, \dots, N_2$  country

$t = 1, 2, \dots, T$  year

where

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<sup>61</sup> The definitions of other notations are identical to those in RDI Model I.

$XPR_{i,t}$  = export volume from Taiwan to host country  $i$  for year  $t$ ;

$EXC_{i,t}$  = comparative fluctuation of exchange rates between Taiwan and host country  $i$  for year  $t$ .

First, the appropriateness of pooling all data together was examined, and F-statistics were employed to test homogeneity. The F-statistic value is 1.0297 for RDI Model I (d.f. are 30 and 89) and 1.1842 for RDI Model II (d.f are 36 and 82). It was found that:

$$\text{Critical } F_{0.05, (30, 89)} \approx 1.71 > 1.0297$$

$$\text{Critical } F_{0.05, (36, 82)} \approx 1.64 > 1.1842.$$

Therefore, the null hypotheses cannot be rejected. The results again reveal the appropriateness of pooling all data together.<sup>62</sup> Consequently, the RDI models also were estimated by OLS, OLSDV (within), and EC techniques. The results revealed by the three equations are similar, and most of the significant variables have the expected signs. Because of the small number of observations ( $N = 7$  countries) in the RDI models, the GLS estimators are **inconsistent**. Again, one must be very careful in explaining the results of the EC equations (GLS estimators) in the tables.

In RDI Model I (see Table 5-7), efficiency wage differences are found to have a negative effect on the flow of Taiwan's investment abroad. Since these are operationalized through absolute nominal manufacturing wage differences between the host country and Taiwan, a negative effect is expected in the RDI models (a positive effect in the FDI models).

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<sup>62</sup> The F-test results also show the appropriateness of pooling for the lag RDI models in the study. The values of the F-test are 0.9371 (one-year lag) for Model I and 0.9806 (one-year lag) for Model II. The null hypotheses for these lagged models cannot be rejected.

Political instability of the host country is found to have a negative effect on RDI. Market size in the host country also has a positive effect on Taiwan's RDI but only in the classical OLS pooling equation. The trade volume between the host country and Taiwan also has a positive effect on RDI in the OLSDV equation.

TABLE 5-7 Reverse Direct Investment Model I

	RDI	Constant	GDP	Efficiency Wage diff.	Trade	InterCon	R <sup>2</sup>	adj.R <sup>2</sup>	F
OLS(all)	RDI	1042.80 (2.72)**	2.967 (2.07)**	-1037.2 (-2.56)**	0.159 (0.92)	-19.836 (-3.35)***	0.52	0.44	11.29
OLSDV (Within)	RDI		1.2440 (0.695)	-1155.6 (-1.87)*	0.5806 (1.84)*	-23.438 (-3.71)***	0.51	0.49	7.99
EC	RDI		1.3024 (0.871)	-1091.47 (-1.91)*	0.5011 (1.66)	-20.4105 (-3.35)***	0.50	0.47	7.31

- F-test for all estimate significant at the 1% level.
- The figure in ( ) parentheses are t-stat.
- Coefficients statistically significant on the 5% (2-tails) are indicated by an asterisk \*; 1% by two asterisks \*\*; 0.5% by three asterisks \*\*\*.
- Sample ranges from 1960 to 1980 for seven countries. Total 124 observations.

Table 5-8 shows the results for RDI Model II. The findings indicate that efficiency wage differences and political instability of the host country have the same negative effects as in RDI Model I. Export volume from Taiwan to the host country has a positive effect on RDI, showing that export entry and RDI are complements. The comparative fluctuation in exchange rates has a positive effect on RDI for the OLSDV and EC pooling equations.



TABLE 5-8 Reverse Direct Investment Model II

	RDI	Constant	GDP	Efficiency Wage Diff.	Export	Exch.Rate	InterCon	R <sup>2</sup>	adj.R <sup>2</sup>	F
OLS(all)	RDI	918.69 (4.14)***	3.509 (2.3)**	-1446.26 (-2.42)**	0.690 (1.70)*	79.646 (0.965)	-20.423 (-3.43)***	0.50	0.42	11.19
OLSDV (Within)	RDI		0.2784 (0.157)	-1710.38 (-1.76)*	0.8499 (2.00)**	175.61 (1.756)*	-24.7384 (-3.96)***	0.42	0.39	10.66
EC	RDI		-0.1105 (-0.09)	-1198.53 (-1.98)*	0.9145 (2.55)**	96.806 (1.730)*	-17.420 (-2.90)***	0.35	0.32	7.25

- F-test for all estimate significant at the 1% level.
- The figure in ( ) parentheses are t-stat.
- Coefficients statistically significant on the 5% (2-tails) are indicated by an asterisk \*;
- 1% (2-tails) by two asterisks \*\*;
- 0.1% (2-tails) by three asterisks \*\*\*.
- Sample ranges from 1960 to 1980 for seven countries. Total 124 observations.

It is expected that there will be some delay between the decision to make reverse direct investment and completion of the transaction. Historical trends in decision factors also should influence the decision (Tallman 1988, p. 225). In this study, the lag t-k was tested to determine the period of delay by clarifying the optimum size of the lag value k. Therefore, the RDI models for which the explanatory variables contain one-year lagged value were tested.<sup>63</sup>

For RDI Model I with a one-year lag (see Table 5-9), efficiency wage differences were found to have a negative effect compared to the case without lag. The market size of the host country and the trade volume between the host country and Taiwan had a positive effect on RDI for the classical OLS pooling and OLSDV equations. However, the political instability of the host country was not found to be significant in the one-year lag case.

<sup>63</sup> Equations with a two-year lag were also run, but the F-statistics showed insignificant results.

TABLE 5-9 Reverse Direct Investment Model I (Lagged One Year)

	RDI	Constant	GDP	Efficiency Wage Diff.	Trade	InterCon	R <sup>2</sup>	adj.R <sup>2</sup>	F
OLS(all)	RDI1	195.96 (0.970)	3.3229 (2.08)**	-1124.06 (-2.04)**	0.3764 (1.93)*	-1.4537 (-0.7681)	0.52	0.50	11.23
OLSDV (Within)	RDI1		3.7449 (2.09)*	-1255.62 (-1.87)*	0.5806 (1.84)*	-3.4381 (-0.545)	0.50	0.47	12.90
EC	RDI1		3.5300 (1.41)	-769.669 (-1.74)*	0.3495 (1.66)*	-1.9827 (-0.935)	0.48	0.45	9.97

- F-test for all estimate significant at the 1% level.
- The figure in ( ) parentheses are t-stat.
- Coefficients statistically significant on the  
5% (2-tails) are indicated by an asterisk \*;  
1% (2-tails) by two asterisks \*\*;  
0.1% (2-tails) by three asterisks \*\*\*.
- Sample ranges from 1960 to 1980 for seven countries. Total 125 observations.

For RDI Model II (see Table 5-10), efficiency wage differences were found to have a negative effect on RDI flows from Taiwan in a one-year lag case. The market size of the host country has a positive effect for the classical OLS pooling and OLSDV equations. The comparative fluctuation in exchange rates also has a positive effect on RDI.

TABLE 5-10 Reverse Direct Investment Model II (Lagged One Year)

	RDI	Constant	GDP	Efficiency Wage Diff.	Export	Exch.Rate	InterCon	R <sup>2</sup>	adj.R <sup>2</sup>	F
OLS(all)	RDI1	603.379 (2.05)*	3.0576 (1.78)*	-1870.117 (-2.28)*	-0.0003 (-0.001)	29.5557 (2.06)*	-11.781 (-1.451)	0.69	0.55	10.12
OLSDV (Within)	RDI1		4.9999 (2.48)**	-1484.73 (-1.76)*	0.2971 (0.434)	3.9678 (2.24)**	-1.9136 (-0.311)	0.66	0.51	8.37
EC	RDI1		2.5031 (1.72)*	-1087.11 (-2.21)**	0.4371 (0.994)	10.7459 (1.90)*	-2.7612 (-0.399)	0.65	0.62	17.02

- F-test for all estimate significant at the 1% level.
- The figure in ( ) parentheses are t-stat.
- Coefficients statistically significant on the  
5% (2-tails) are indicated by an asterisk \*;  
1% (2-tails) by two asterisks \*\*;  
0.1% (2-tails) by three asterisks \*\*\*.
- Sample ranges from 1960 to 1980 for seven countries. Total 125 observations.

### 5.3 SUMMARY OF TESTS OF HYPOTHESES

#### Market size hypothesis:

Only in the two-year lag case was a positive relationship found between FDI and the size of the market in Taiwan (Table 5-6; FDI Model II), *ceteris paribus*. This hypothesis is partially supported.

For the RDI case, a positive relationship was found only for a one-year lag (see Table 5-9 and Table 5-10). This hypothesis is partially supported.

#### Efficiency wage difference hypothesis:

A negative relationship was found between FDI from an investor country in year  $t$  and the efficiency wage difference between the investor country and Taiwan in year  $t-k$ , *ceteris paribus*, for all the FDI models (see Table 5-1 through Table 5-6). This hypothesis is strongly supported.

For the RDI case, a positive relationship was found for the efficiency wage difference in all the models. Thus, this hypothesis is strongly supported.

#### Kojima's hypothesis:

Only in a few cases was a positive relationship found between the inflow of FDI and the trade variable (see Table 5-3 and Table 5-4; FDI Model I). Thus, this hypothesis is partially supported for FDI cases. When imports instead of the trade variable, coupled with the comparative fluctuation in exchange rates, are used, a negative relationship is found

in the one-year lag case (see Table 5-5; FDI Model II). Surprisingly, this hypothesis is partially rejected for FDI in this alternative model.

For the RDI case, a positive relationship was found between the inflow of RDI and the trade variable (see Table 5-7 and Table 5-9). When using exports instead of the trade variable, coupled with the comparative fluctuation in exchange rates, a positive relationship was found (see Table 5-8). This hypothesis is partially supported and partially rejected.

Aliber's exchange rate hypothesis:

Only in the OLS equation was a negative relationship found between FDI and the comparative fluctuation in exchange rates between Taiwan and investor countries (see OLS in Table 5-2, Table 5-3, Table 5-5, and Table 5-6). This hypothesis is partially supported.

A positive relationship was found between RDI and the comparative fluctuation in exchange rates (see Table 5-8 and Table 5-10). This hypothesis is strongly supported.

Investment incentive program hypothesis:

For the 1966 policy dummy variable, a positive relationship was found between the stock of FDI and the year in which the investment incentive program was promulgated by the government in Taiwan. This hypothesis is strongly supported.

The 1971 policy dummy variable, however, was found not at all significant. This hypothesis is not supported for the 1971 modifications of the program.

Political instability hypothesis:<sup>64</sup>

A negative relationship was found between FDI and domestic political instability in Taiwan (see TABLE 5-1 and TABLE 5-2). For the one- and two-year lag FDI cases, this variable was not significant. Thus, this hypothesis is partially supported.

A negative relationship was found between RDI and the political instability of host countries. This variable was not significant in the one-year lag case, however. This hypothesis is partially supported.

#### 5.4 EMPIRICAL IMPLICATIONS FOR THE TAIWAN CASE

This study is largely positive in nature, but some of the findings may have normative implications. Since some results are relevant to the determinants of FDI or RDI in the case of Taiwan, there are implications for Taiwan's political and economic policy. Some can be generalized to other less developed countries. There are also a few implications which may be of interest to future researchers. The macro-policy implications for the Taiwanese government will be discussed in sections 5.4.1 (economic implications) and 5.4.2 (political implications).

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<sup>64</sup> Since the INTERCO political data from the COPDAB file were excluded from the study due to insufficient yearly information, the H6 and H7 were combined into one political instability hypothesis.

#### 5.4.1 Economic implications

Market size: This variable, measured by  $GDP_t$  at the macro level, has been considered in the literature as the most important economic determinant of FDI. The results of this study show that Taiwan's market size is **not** a crucial determinant in attracting FDI. Prior to 1960, with a population of less than 12 million and per capita income below U.S. \$100, Taiwan did not have enough market potential to attract foreign investment. Instead, it attempted to strengthen its market infrastructure and circumvent trade barriers by following investment policies similar to those of the larger Latin American countries in the 1960s.<sup>65</sup>

It has been widely accepted that internal market size is an important factor in host country efforts to promote FDI, regardless of the time frame. This study indicates that the size of internal market is only important in the two-year lag case.<sup>66</sup>

In terms of RDI, the statistical results show that the market potential of host countries in attracting Taiwanese investors is still critical over time. The findings support the rationale of the market size hypothesis, provided by domestic experience, that (1) firms increase investments in response to their sales, and (2) domestic investment of a country rises with GDP.<sup>67</sup>

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<sup>65</sup> See comments by Riedel (1975), p. 508.

<sup>66</sup> It could be that specific industries within a country have certain infrastructure requirements for FDI which may not be subject to the two-year lag limitation. This is a subject for further study.

<sup>67</sup> See Reuber et al. (1973), Agarwal (1980), Nigh (1985), and Tallman (1988).

One must be very careful, however, in interpreting this significant relationship. First, market size of the host country is likely to influence RDI undertaken to produce goods for domestic markets but not for export. Most of the studies on the market size hypothesis fail to distinguish between various types of RDI, at least for statistical reasons, whereas the decision of MNCs about initial RDI and expansionary RDI should be guided by different aims. Second, GDP growth and RDI are related, but the statistical association between the two does not explain their relationship. In this study, the RDI considered is a one-time investment, not an expansionary or portfolio investment.

Efficiency wage differences: The supply of low-cost labor in LDCs always has been regarded as one of their comparative advantages in the international economy, but recognition of its role in FDI is relatively recent (Agarwal 1980). Neoclassical investment theory, which provides a point of departure for many studies of FDI, posits that in a two-input model the demand for capital, and hence investment flows, will be influenced by labor costs. Supporting evidence from surveys has been rather weak, and no consistently significant effects have been reported. Some studies show a significant positive correlation, while others report a negative relationship between wage levels and FDI. The failure of various cross-sectional studies to find consistent effects from labor costs may indicate that the wage proxy for other important variables is relevant to the production location choice at a given time. Time-series data can better detect the pure effects of wage changes when the assumption that

these factors remain constant over time is captured by other variables in a correctly specified regression model.

Labor cost in this study, as measured by comparative efficiency wage differences between Taiwan and the investor country and deflated by the productivity price index, was found to be significant for all the regressions for the period 1955-1980. The findings verify that the wage gap plays a crucial role in attracting FDI. The results support the general belief that rising wages and falling productivity discourage FDI inflows and encourage RDI outflows. The results also verify that the widening wage differential between Taiwan and major capital exporting countries for the past three decades (together with governmental influences) have been the major factors behind the expansion of FDI in Taiwan.

Whether MNCs are capital or labor intensive, however, depends on their industry type and how they judge cost advantage. Furthermore, whether other nearby LDCs<sup>68</sup> will emulate Taiwan in attempting to attract FDI depends upon how foreign MNCs judge the relative costs and benefits from various kind of economic activity. These issues are beyond the scope of this study, but the comparison of overall efficiency wage differences for all industries, over time, does reveal where the important benefits and costs are likely to exist.

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<sup>68</sup> Such as South Korea and Hong Kong, which have similar economic infrastructures.



Many observers attribute Taiwan's success in attracting foreign and indigenous investment to its social stability and growth potential, which are related to the labor climate.<sup>69</sup> This social stability, these observers maintain, derives from the government's strong internal security apparatus; it limits social unrest by restricting potentially disruptive gatherings, curbing labor unions, restricting strikes, and infiltrating potentially disruptive organizations. When combined with generally good economic conditions, conservative values, and traditionally strong family ties, these practices presumably have helped guarantee the relative efficiency and docility of the labor force, a major factor in the island's appeal to foreign investors.

Coupled with seemingly endless labor strikes and street demonstrations, the recent dramatic growth of wage costs in Taiwan certainly could jeopardize the country's strong international competitive advantage. Moreover, the upsurge in illegal and inexpensive labor from adjacent countries poses a challenge for the future. Unless there is a proper policy adjustment, Taiwan's international competitive advantage in labor may eventually erode.

Trade as a substitute for or complement to FDI: Assuming identical production functions for two countries within the framework of the ordinary Heckscher-Ohlin-Samuelson theory of trade, Mundell (1968) shows that FDI and trade are complete substitutes. If production functions vary in the two countries, as Schmitz and Helmberger (1970) and Purvis (1972)

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<sup>69</sup> See Sutter (1988).

demonstrate, then FDI is a complement to international trade. Kojima (1975, 1978, 1982) attempted to differentiate succinctly between the two cases in which FDI works either as a complement (is trade creating) or as a substitute (is trade destroying). He concludes that Japanese-type FDI is trade oriented, while American-type FDI is antitrade oriented.

The entry mode issue has been widely discussed by scholars (for example, Caves 1982, Kindleberger 1984, Root 1985, Anderson and Gatignon 1986). The costs and benefits of different entry modes are difficult to evaluate and are little understood. Also, the issue of substitutive or complementary effect has not been investigated and empirically tested in the literature. In the case of Taiwan, the statistical results of this study do not yield a definitive answer. For the one- and two-year lag cases, the finding is that international trade complements FDI entry (has a trade-creating effect). For the RDI case, international trade or exports also are significant determinants, which is to say that exports and RDI entry modes go abroad hand-in-hand for the Taiwanese investor. Because diversification among different international entry modes typically reduces risks and increases overall returns, the Taiwanese government could exploit this complementary effect to strengthen its international operations.

Exchange rates: Aliber (1970) postulates that there is a bias in the market's estimation of exchange risk, and that bias determines whether a country is likely to be a source of or host for FDI. Capitalization rates are likely to be high in source countries and low in host countries. A few studies have shown that currency devaluation often discourages the inflow of FDI. In the case of Taiwan, the exchange rate often is considered to

have a limited effect,<sup>70</sup> since the longstanding ratio of the New Taiwan (N.T.) dollar to the U.S. dollar of 40:1 was unchanged until late 1985.

In this study, the comparative fluctuation in exchange rates between Taiwan and the investor (or source, in the case of RDI) country was used to operationalize this variable.<sup>71</sup> The results show that only in the classical pooling OLS equation was there an influence on FDI. For the RDI case, the statistical results show that exchange rate fluctuation has a positive effect on Taiwanese investors over time. The significant results revealed that comparative appreciation of the home currency with respect to others encourages the outflow of RDI.<sup>72</sup> Our findings on RDI support the Boatwright and Renton (1975) study on inward FDI and outward RDI for the United Kingdom, which indicated (indirectly) that the depreciation of the pound sterling raised the value of FDI in that country.

Nevertheless, the current undervaluation of the N.T. dollar is widely expected to continue. Currency appreciation would make Taiwan's exports more expensive in relation to foreign currency (notably the U.S. dollar), thus reducing exports. This simultaneously would make imports in Taiwanese dollars less expensive and would encourage more imports into Taiwan. As

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<sup>70</sup> Because of the macro-theoretical nature of this study, the micro-implications of exchange rate policy on FDI, such as strategic response/coordination for an industry, have to be left for future research.

<sup>71</sup> We operationalized this variable by using the ratio of the N.T. dollar to the currency of the other countries to capture the comparative fluctuation of exchange rates.

<sup>72</sup> This study focuses primarily on the relation between FDI (or RDI) and the fluctuation in comparative exchange rates, which should not be confused with Aliber's exchange rate hypotheses; strictly speaking, that has not been empirically tested.

the study shows in the FDI case (see Table 5-6), imports play a substitution role for FDI in the one-year lag case; therefore, FDI entry into Taiwan would not be as attractive as before. Although the substitutive effect is limited, it could be crucial for the Taiwanese government to commit to a stable exchange rate policy in order to keep the local market as attractive as possible, especially if the benefits to the local economy from the inflow of FDI remain imperative.<sup>73</sup>

Investment incentive policy: A brief review of economic policy in Taiwan over the period under consideration (1955-1980) reveals two clear shifts in policy which one would expect *a priori* to have affected the inflow of FDI.

The initiative was taken in 1960 with the promulgation of Statutes for Encouragement of Investment, along with several other laws. These have been amended from time to time to keep the domestic investment climate as attractive as possible.<sup>74</sup> In 1971, these laws were amended extensively. The study results indicate that the 1966 revisions had a significant effect on attracting FDI to Taiwan over time; a tremendous upsurge in investment occurred thereafter.

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<sup>73</sup> Such as introducing new technology, improving existing technology, providing managerial training, reducing trade deficits, accelerating global competition, providing new technology training, and providing access to world markets.

<sup>74</sup> The Statutes for Investment by Foreign Nations of 1983 had been amended seven times since 1954; the Statutes for Investment by Overseas Chinese of 1983 had been amended five times since 1955; the Statutes for Encouragement of Investment of 1984 had been amended twelve times since 1960.

This study shows that the 1971 modifications of the statutes had no influence on the inflow of FDI into Taiwan over time (for example, lag = 1, 2). Their insignificance may be due in large part to the political setback that year: The People's Republic of China replaced Taiwan in the United Nations. The offsetting effects of political setbacks on FDI usually are assumed as constant by researchers, that is, political instability is pervasive, although important.<sup>75</sup>

This study combined government investment incentive programs (policy dummy 1 and dummy 2) and political instability into one regression. The significant results for policy dummy 1 and political instability indicate that government incentives and political instability have to be considered separately. (The significant results for political instability will be discussed later.)

Coupled with the easing of trade restrictions, the guarantees offered in the Statutes for Encouragement of Investment indicate that the government influenced the flow of FDI into Taiwan in the 1970s. The dramatic upsurge in FDI in Taiwan coincided with these measures, which provides strong but circumstantial evidence that a liberal economic policy is a necessary condition to attract export-oriented FDI. Furthermore, the evidence from Taiwan suggests that governmental effects can compensate to some extent for a declining wage advantage in drawing foreign investment.

Generally, the literature considers investment incentives as playing a minimal role in FDI decision-making. A recent survey of 52 major MNCs

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<sup>75</sup> For example, Riedel (1975), p. 507

based in 12 countries confirms that the dominant factors in their FDI decisions are the need to gain access to local or regional markets and to avoid trade barriers.<sup>76</sup> This is as true of foreign investment in Taiwan as elsewhere, although "in the case of LDCs, higher risk and lower-than-expected growth rates were beginning to offset the desire to gain access to new markets."<sup>77</sup> Therefore, doubt continues as to **how many** and **what kind** of incentives are necessary to attract FDI. It certainly would be erroneous to think that all FDI that benefits from incentive programs represents investment that would have occurred otherwise; incentives do help. Yet, there is bound to be some redundancy in incentive programs, that is, some investors receiving subsidies would have invested anyway.<sup>78</sup>

In Taiwan, modifications in the Statutes for Encouragement of Investment should be guided by the following considerations: limiting access by foreign firms to local markets;<sup>79</sup> the overall contribution to national economic development over time; the improvement of technological

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<sup>76</sup> Group of Thirty, Foreign Direct Investment 1973-87 (New York: 1984), p. 31.

<sup>77</sup> Ibid.

<sup>78</sup> Therefore, for industry- or firm-level studies of determinants of FDI, it is suggested that different types of incentive program be handled separately.

<sup>79</sup> Controls such as high tariffs, import licensing, or local component requirements are likely to protect domestic markets.

infrastructure; competition among countries;<sup>80</sup> and investors' discounted cash-flow calculations.<sup>81</sup>

#### 5.4.2 Political implications

The present study examines country-specific (that is, macro-level) risk as contrasted with industry- or firm-specific (micro-level) risk in making FDI or RDI. This narrow concept of political risk artificially keeps out of purview many aspects of a comprehensive risk analysis. Political risk for direct investment in a given country is not uniformly distributed across industries; research has revealed many industry-specific characteristics affecting forced divestment (Kobrin 1980). The macro view of political risk misses the rich details of micro analysis, but practical constraints make the macro approach unavoidable.

This study accepts the view that the average foreign investor prefers stability in a host nation. There is ample evidence confirming that, *ceteris paribus*, the foreign direct investor thrives in stable and contented societies. Foreign investors dislike and shy away from an uncertain political environment (both in the FDI and RDI cases). Stability is essential in order to recoup the initial foreign investment.

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80 In the competition for FDI, the effectiveness of any individual country's policies clearly depends on other countries' reactions. (Helleiner 1987, p. 72.)

81 For example, Taiwan can retain opportunities for national firms by limiting the right of a foreign firm to expand into further business areas. Thus, the controls will not affect investors' discounted cash-flow, but they will still increase national benefits without having a strong negative effect on international business decisions.

Taiwan's social stability often is credited with creating the necessary conditions for its rapid economic development. Its stability and growth have been conducive to both foreign and indigenous investment.<sup>82</sup> In this study, the political instability measure, based on scaling and weights for intranational political events from the COPDAB file, was found effective in capturing the essence of the preconditions of political instability (see also the studies by Nigh 1984, Tallman 1988, and Sun and Bennett 1988). The results show that political instability in Taiwan indeed has a negative effect on FDI, but a meaningful linkage between that factor and the level of FDI over time was not found. Perhaps Taiwan offers sufficiently strong investment incentives to offset political risk.

The negative effect on FDI of political instability indicates that the host country (Taiwan), in trying to provide a stable environment for foreigners to invest, should reduce the frequency of intranational political conflicts (for example, abolition of civil rights, intra-governmental tensions, physical violence and military unrest, and general opposition to socioeconomic freedom). By the same token, it should increase the frequency of intranational political or economic cooperation (for example, promotion of political rights, policies to improve physical and human resources, and verbal agreements to mobilize public support).

For the RDI case, political instability of the host country also has a negative influence on the Taiwanese investor. Again, the statistical results fail to find meaningful relationships between political instability

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<sup>82</sup> Sutter (1988), p. 18.



and the level of RDI for the one-year lag case. The reason may be that Taiwanese RDI is a one-time investment, not expansionary RDI, or perhaps it is due to the policy investment nature of some RDI.<sup>83</sup>

Moreover, bilateral international political relationships are important in determining the level of FDI from an investor country to Taiwan. Since few countries have formal relations with Taiwan, diplomatic isolation will be even more keenly felt when the Asian Development Bank (ADB), the last international organization in which Taiwan still has a seat, considers accepting the People's Republic of China as an official member. Under these circumstances, Taiwan is anxious to find a way to minimize its isolation as much as possible. Naturally, the maintenance of economic ties and improved cooperative political relationships become flexible and important options.

One way to achieve cooperative ties with other countries is to strengthen bilateral trade and investment. The inflow of FDI and outflow of RDI help keep in touch with the rest of the world. This study shows that Taiwan's RDI to other countries has been strongly influenced by political instability in the host country, but not over time.<sup>84</sup> In the future, to protect against political risk in host countries, Taiwan may strengthen its international business operations through such measures as

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<sup>83</sup> In order to strengthen a bilateral relationship, some RDI from Taiwan to a host country has been made through government agreements, which often are not determined by the normal economic and political factors.

<sup>84</sup> The study shows that one- and two-year lags in the political instability of host countries do not have a significant effect on RDI.

subsidized political-risk insurance and loan programs for overseas investment.

If indigenous MNCs are not strong enough to compete in R&D and scale of operations with foreign MNCs, the Taiwanese government could assist its MNCs, perhaps through government aid, incentives for overseas investment,<sup>85</sup> or a protected home market.

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<sup>85</sup> Before 1978, there were no incentives for RDI in Taiwan. On 20 June, 1979, a five-year exemption of income tax for overseas investment was introduced in the Statute for Encouragement of Investment, which came into force on January 1, 1980. The scope of encouragement was later enlarged by the 1984 amendment.

This study has examined the joint effect of economic and political determinants on FDI and RDI, respectively, from the vantage point of Taiwan. Since the empirical literature investigating the determinants of FDI and RDI often deals insufficiently with the joint influence these factors, this study has attempted to integrate these with a sound theoretical base and an appropriate statistical design. The economic factors selected were market size, efficiency wage differences, exchange rates, trade volume, and investment incentive policies. Data on political instability were taken from the COPDAB file, which provides measures of the frequency and intensity of intranational political events in a country during a particular year.

Because the pooling of time-series and cross-sectional data would reduce the variance of the regression estimators and increase the possibility of significant results,<sup>86</sup> three of the most commonly employed pooling techniques were used to estimate the FDI and RDI multiple regression models.

In testing the hypothesized relationship of various economic and political factors to FDI and RDI, using Taiwan as the case study, empirical examination was made of two different models. The findings are summarized and the implications of the research are elaborated in section 6.1.

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<sup>86</sup> Pooling unrelated observations also can increase the likelihood of violating such basic least-squares assumptions as homoskedasticity, nonmulticollinearity, or no first-order serial correlation of data. Therefore, pooling ability was tested first.

Section 6.2 points out the limitations of the study. Suggestions for future research are outlined in section 6.3.

### **6.1 RESEARCH FINDINGS AND IMPLICATIONS**

Recognizing the possible benefits of FDI and RDI to the domestic economy, host governments usually seek to design investment programs to attract foreign investors as well as stimulate domestic investors to go abroad. This study attempted to answer a number of questions about this process. Is trade a complement to or substitute for FDI or RDI? What is the effect of market size on attracting FDI and RDI? What options do MNCs have in exploiting their comparative advantages internationally? What criteria do MNCs employ in selecting sites (host countries)? What factors will determine direct investment decisions? What is the effective investment policy for the host country? What is the structural relationship between a country's investment position and its level of economic development when its MNCs decide to operate abroad?

The hypothesized effect of joint economic and political factors on FDI and RDI were tested, and empirical studies of two different models were conducted. The findings and their policy implications can be summarized as follows.

#### **Market size variable**

Prior to 1960, with a population of less than 12 million and per capita income below U.S. \$100, Taiwan did not possess the market potential to attract foreign investment. Nevertheless, it is widely accepted in the

literature that internal market size is an important factor in FDI, regardless of the time frame. This study indicates that its importance is limited only to the two-year lag case and verifies that the market size of Taiwan is **not** a crucial determinant in attracting FDI.

In terms of RDI, the statistical results of this study show that the market potential of a host country is critical over time in attracting Taiwanese investors. The findings support the general belief that without a large internal market, other devices to promote foreign investment are less effective.

#### Efficiency wage differences variable

Many observers often attribute Taiwan's success in attracting foreign and indigenous investment to its social stability and growth potential, which contribute to its a competitive wage advantage. When combined with generally good economic conditions, conservative values, and traditionally strong family ties, these practices have helped guarantee the relative efficiency and docility of the labor force, a major factor in the island's ability to attract foreign investment. This variable, as measured by efficiency wage differences between Taiwan and investor countries and deflated by the productivity price index, was found to be significant for all the regressions for 1955-1980, the period examined. The findings verify that the wage gap has played a crucial role in attracting FDI for the past three decades.

Recently, along with seemingly endless labor strikes and street demonstrations, the dramatic growth in wage costs in Taiwan could

jeopardize the country's strong international competitive advantage. Without a proper policy adjustment, Taiwan may see its international competitive advantage in labor erode.<sup>87</sup>

#### Trade variable

In the literature, there is a debate on whether FDI and trade are complete substitutes (such as Mundell 1968) or complement (for example, Schmitz and Helmberger 1970, Purvis 1972). Kojima (1975, 1978, 1982) attempted to differentiate succinctly the two cases in which FDI works as a complement to international trade (is trade creating) or as a substitute (is trade destroying). He concluded that Japanese-type FDI is trade oriented, while the American type is antitrade oriented.

In the FDI case in Taiwan, the statistical results without lag show no substitutive or complementary effect, but the findings from the lagged one- and two-year cases indicate that international trade complements FDI (is trade creating). For the RDI case, the statistical results show that international trade and exports also have a complementary effect. This finding verifies the general belief that exports and RDI entry modes are closely connected for Taiwanese investors. Because diversification among different international entry modes typically reduces risks and increases overall returns, the Taiwanese government could exploit this complementary effect in order to strengthen international operations.

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<sup>87</sup> Another recent development, the upsurge in illegal and inexpensive labor from nearby countries, could have various effects in Taiwan's economy, but it is too early to assess these.

### Exchange rate variable

A few studies have shown that currency devaluation often discourages the inflow of foreign investment. In the case of Taiwan, however, the exchange rate frequently is considered to have a limited effect on attracting FDI, since the longstanding ratio of the New Taiwan (N.T.) dollar to the U.S. dollar of 40:1 did not change until late 1985. The study findings verify that the exchange rate has a limited influence on Taiwan's FDI. For the RDI case, on the contrary, the statistical results show that the exchange rates have a positive effect on Taiwanese investors over time. The significant results reveal that comparative appreciation of a currency does encourage the outflow of investment.

### Investment incentive policy variable

The study results indicate that the 1966 amendments of statutes indeed had a significant effect in attracting FDI to Taiwan over time, as a tremendous upsurge in investment occurred after the 1960s. The 1971 policy seems to have had limited effect, possibly due to political events. The statistical results with respect to the 1966 amendments of statutes, coupled with an easing of trade restrictions at about the same time, indicate that the government can influence to some extent the flow of FDI into Taiwan.

Because the Statutes for Encouragement of Investment are not as attractive as they once were, their modification, adoption of other forms, or new trade policies appear to be a must in Taiwan. In the future, the efforts to keep the domestic economy attractive for FDI should be guided by several considerations: the contribution to national economic development

over time, limiting access of foreign firms to local markets,<sup>88</sup> competition among countries,<sup>89</sup> linking of incentives and disincentives,<sup>90</sup> selectivity of industrial priorities, and improvements to the technology infrastructure.

#### Political instability variable

The political instability measure, based on the scaling and weights for intranational political events from the COPDAB file, captures the essence of the preconditions of political instability. The results of this study show that political instability in Taiwan indeed can have a negative effect on FDI. The results, however, fail to find a meaningful relationship between political instability and the level of FDI for the one- or two-year lag cases. This may be because Taiwan offers strong investment incentives which offset the political risk to foreign investors.

The statistical findings indicate that a host country trying to provide a stable environment for foreign investment should reduce the frequency of

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<sup>88</sup> Controls such as high tariffs, import licensing, or local component requirements are likely to protect domestic markets. The United States has already raised the question of international constraints on the host-country performance requirements and investment incentives within the General Agreements on Tariffs and Trade (GATT). If Taiwan wishes to avoid pressures on this issue from the U.S. and other members of GATT, it must consider accepting some form of limitation on the use of its power to attract and control foreign MNCs.

<sup>89</sup> In the market for foreign investment, a prisoner's dilemma arises among countries when one country's increase in incentives is matched by increased incentives from a competitor.

<sup>90</sup> Countries vary in the extent to which they link incentives to performance and other requirements that act as disincentives. Thus, linking can take place implicitly when the Taiwanese government grants incentives to projects that are likely to meet certain performance requirements, such as exports, use of domestic inputs, and so on. Without such implicit linking, foreign MNCs have more discretion in their management decisions, but the result--in term of the government's objectives--may be same.



domestic political conflicts (for example, abolition of civil rights, intra governmental tensions, physical violence and military unrest, and general opposition to socioeconomic freedom). It should increase the frequency of local political or economic cooperative events (for example, governmental actions to promote political rights, policies to improve physical and human resources, and verbal agreements to mobilize public support).

For the RDI case, it was found that political instability in a host country has a negative effect on Taiwanese investors. Again, the statistical results fail to find a meaningful relationship between political instability and the level of RDI for the one-year lag case. This may be due to Taiwanese RDI being a one-time investment, not expansionary RDI. In the future, to counter the political instability of host countries, Taiwan might strengthen its international business operations through such measures as subsidized political risk insurance and loan programs for overseas investments. If indigenous MNCs are not strong enough to compete in R&D and scale of operations with foreign MNCs, the Taiwanese government could assist through government aid, incentives to overseas investment,<sup>91</sup> or protected home investments.

## **6.2 RESEARCH LIMITATIONS**

This study suffers from several limitations. First, its focus on Taiwan restricts its generalizability, and it must be considered a

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<sup>91</sup> Under 1979 legislation, a corporation eligible to enjoy this incentive must have been engaged solely in extractive industry, exploited foreign natural resources, and shipped the products thereof back for domestic use.

preliminary effort. Moreover, due to the unavailability of data about the political variable from the COPDAB file and wage difference data from the World Bank, this study covers only the period 1955-1980. Recent economic developments (such as changes in the exchange rate<sup>92</sup>) and political events (such as more street demonstrations following the end of martial law on July 14, 1987) are not included. Extension of the study to more current years would be very useful in terms of policy implications. A longer time-frame also would improve the estimation of the models and increase the explanatory power of the multiple regressions.

Second, because of the macro-theoretical nature of this study, only country-specific variables have been considered. For example, political instability is a country-specific (macro-level) risk as contrasted with industry- or firm-specific (micro-level) determinants of FDI or RDI. Admittedly, this narrow concept of political instability keeps out of purview many aspects of comprehensive risk analysis. Furthermore, any benefits of the Statute for Encouragement of Investment at the industry and the firm level are not included. Studies examining FDI and RDI at the country, industry, and firm level would yield better and more specific public policy recommendations for attracting investment.

Third, this study maintains that the relationships between the determinant variables and FDI/RDI are fundamentally the same for all countries. The possible differences between LDCs and developed countries have been ignored. Bennett and Green (1972) and Kobrin (1976) already have

<sup>92</sup> Over the past years, Taiwan has relaxed foreign exchange controls, allowed people to invest more freely abroad, and permitted the value of the N.T dollar to rise relative to the U.S. dollar.

recognized these differences in their studies. Levis (1979, p. 60) argues that including developed countries in his sample would have masked the relationship that may exist between political instability and FDI in less developed countries. In this study, since the appropriateness of pooling (using the F-statistic) has been verified, the differences among countries are considered minimal, but a researcher must be prudent in drawing conclusions when the sample covers a number of developed and less developed countries.

Finally, this study considers only the economic and political determinants, and other important factors may have been excluded.<sup>93</sup> Therefore, the findings may be limited in their generalizability.<sup>94</sup>

### **6.3 SUGGESTIONS FOR FUTURE RESEARCH**

This study identifies three areas of future research: (1) FDI and RDI as a process, not as a one-time decision; (2) the possibility of simultaneous interaction among FDI or RDI and the explanatory variables; and (3) a combined approach which examines country-, industry-, and firm-specific perspectives.

#### **6.3.1 FDI and RDI as a process**

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<sup>93</sup> Possibilities are distance cost, ethnic similarity, language similarity, controls on imports, and spatial distribution of inputs and markets.

<sup>94</sup> This is particularly true for the RDI models because of their low  $R^2$  value.

Kogut (1980, p. 38) has argued that there is a fallacy "of explanation of genesis in failing to distinguish between the initial investment decision and the subsequent incremental investment flow." Therefore, FDI or RDI should be analyzed as a flow; the MNC engages in this flow of foreign investment in order to capitalize on the flexibility inherent in the firm's multinationality. This type of study could be firm or industry specific yet still provide insights for macro policy.

#### 6.3.2 Simultaneous interaction among FDI or RDI and the explanatory variables

Several researchers are aware that a reverse causal relationship may operate between FDI (or RDI) and determinant variables, and this may affect the economic and political variables used as determinants.<sup>95</sup> In general, however, this aspect has been neglected in the literature. Moreover, the possibility of simultaneous interaction between variables, such as, efficiency wage differences and trade volume, also has been ignored. These issues would be an interesting focus for future research.

#### 6.3.3 A combined approach which examines country-, industry-, and firm-specific perspectives

Studies conducted on the determinants of FDI and RDI can be categorized into three groups: country-specific (such as Caves 1971, Ehrman and Hamburg 1986, and Tallman 1988), industry-specific (for example, Buckley and Dunning 1976), and firm-specific studies (such as Aharoni 1966, Grubaugh 1987). Mixed studies incorporating all these perspectives would yield more comprehensive public policy recommendations.

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<sup>95</sup> For example, Schneider and Frey (1985), p. 173.

## APPENDICES

**Appendix A: Statutes for Encouragement of Investment in Taiwan**

During the past thirty-five years, foreign capital has played an important role in Taiwan's economic life. At the early stage, U.S. aid was the main source of foreign capital. Even before it ceased in 1965, the Taiwanese government realized that it could not be relied on indefinitely. Therefore, in addition to implementing financial and economic reforms, it promulgated several statutes to encourage foreign investment in Taiwan. These statutes have been amended from time to time to keep the domestic investment climate as attractive as possible.<sup>96</sup>

The main purposes of the Statute for Encouragement of Investment were to facilitate the acquisition of plant sites and to provide tax exemptions and deductions. The salient features were as follows.

(1) Income tax holiday: The strongest incentive was the five-year tax holiday set forth in Article 5, whereby a productive enterprise conforming to the statute's criteria was exempted from income tax for five consecutive years.

(2) Business income tax: The maximum rate of income tax, including all forms of surtax payable by a productive enterprise, would not exceed 18 percent of the firm's total annual income, compared to 32.5 percent for ordinary profit-seeking enterprises.

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<sup>96</sup> The Statutes for Investment by Foreign Nations of 1983 had been amended seven times since 1954; Statutes for Investment by Overseas Chinese of 1983 had been amended five times since 1955; Statutes for Encouragement of Investment of 1984 had been amended twelve times since 1960.

(3) Tax exemption for undistributed profit: The amount reinvested for productive purposes was deductible from taxable income.

(4) Exemption or deduction of the stamp tax: This tax was either waived or reduced in a large number of cases.

(5) Tax deduction for exports: Within certain limits a deduction from taxable income of 2 percent of annual export proceeds was permissible.

(6) Exchange rate reverse: Productive enterprises were allowed to set aside 7 percent, to be regarded as profits before taxation, of the unpaid balance of foreign currency debt calculated in local currency as a reserve against possible loss caused by exchange rate revision.

In this study, 1966 and 1971, years in which these statutes were amended extensively, are chosen for investment policy dummy variables.

**Appendix B: Data Base: Conflict and Peace Data Bank (COPDAB)**

Scale Point	Type of Political Event	Weighted Value	
<b>A) Scaling and weights of Inter-nation Political Events</b>			
15	Extensive acts of war at high strategic cost	102	
14	Limited acts of war	65	
13	Small scale military acts	50	
12	Political-military hostile actions	44	
11	Diplomatic-economic hostile actions	29	conflictive
10	Strong verbal expressions displaying hostility in interaction	16	
9	Mild verbal expression displaying discord in the interaction	6	
8	Neutral or non-significant acts for the inter-nation situation	1	neutral
7	Minor official exchanges, mild verbal support	6	
6	Official verbal support of goals, values and regime	10	
5	Cultural and scientific agreement and support	14	
4	Non-military economic, technological and industrial agreement	27	cooperative
3	Military, economic and strategic support	31	
2	Major strategic alliance (regional or interregional)	47	
1	Voluntary unification into one nation	92	
<b>B) Scaling and Weights for Intra-nation Political events</b>			
15	Highest level of structural violence and acts of internal war	85	
14	Abolition of Civil Rights	70	
13	Physical violence and military unrest	55	
12	Major governmental actions and policies to restrict free movement of people, denial of civil rights	44	conflictive
11	Minor restrictions on socio-economic freedoms	25	
10	General opposition to governmental policies	13	
9	Intra-governmental tensions	9	
8	Routine, purposive actions	1	neutral
7	Events of national symbolic value	5	
6	Verbal agreements to mobilize public support	13	
5	Policies to improve physical and human resources	17	
4	Activities to reduce domestic instability and economic hardships	28	cooperative
3	Easing of internal tensions, reduction of economic inequality between groups in the society	52	
2	Governmental actions to promote political rights	60	
1	Major governmental programs to substantially increase socio-economic freedom and equality	70	



### Appendix C: Data Sources

Foreign direct investment ( $FDI_{i,t}$ ):

*Statistics on Approved Foreign Investment by Year & Area* (1952-1989), Investment Commission, Ministry of Economic Affairs, Taipei, Taiwan, and Council for International Economic Cooperation and Development, Planning Division, Executive Yuan, Taipei, Taiwan (unpublished data); *Taiwan Statistical Data Book*, annual issues; Economic Research Center, Republic of China, Taipei, Taiwan.

Market size ( $MKTSZ_{i,t}$ ):

International Finance Statistics, IMF;  
Key Indicators of developing member countries by Asian Development Bank (ADB), different issues.

Efficiency wage difference ( $EWD_{i,t}$ ): Compiled and calculated from

World Development Report, World Bank, Washington D.C. (different issues);  
Yearbook of Statistics, United Nations;  
Yearbook of Labor Statistics, International Labor Office, Geneva;  
*Annual Report*, Department of Labour, Hong Kong;  
*Report on the Family Living Survey in Djakarta*, 1957-1980, Ministry of Labour, Indonesia  
*Monthly Report on the Labor Force* (Employment, Unemployment, Hours and Earnings), Department of Labor, Bureau of Labor Statistics, United States.

Trade ( $TRD_{i,t}$ ): Compiled from

World Development Report, World Bank, Washington D.C. (different issues);  
Yearbook of Statistics, United Nations;  
International Finance Statistics, IMF;  
Key Indicators of developing member countries by Asian Development Bank (ADB), different issues.

Import ( $IMPORT_{i,t}$ ): Compiled from

World Development Report, World Bank, Washington D.C. (different issues);  
Yearbook of Statistics, United Nations;  
International Finance Statistics, IMF;  
Key Indicators of developing member countries by Asian Development Bank (ADB), different issues.

Export ( $XPR_{i,t}$ ): Compiled from

World Development Report, World Bank, Washington D.C. (different issues);  
Yearbook of Statistics, United Nations;  
International Finance Statistics, IMF;  
Key Indicators of developing member countries by Asian Development Bank (ADB), different issues.

Comparative fluctuation of exchange rate ( $EXC_{i,t}$ ): Compiled and calculated from

World Development Report, World Bank, Washington D.C. (different issues);

Yearbook of Statistics, United Nations;

International Finance Statistics, IMF;

Key Indicators of developing member countries by Asian Development Bank (ADB), different issues;

*Hong Kong Report for the Year*, Government Press, Hong Kong.

Net intranational conflict score ( $INTRACO_{i,t}$ ): COPDAB

Net international cooperative score ( $INTERCON_{i,t}$ ): COPDAB

Reverse direct investment ( $RDI_{i,t}$ ): same as  $FDI_{i,t}$ .

## Appendix D: A Logarithmic Model (FDI Model I)

	FDI	Constant	GDP	Efficiency Wage Diff.	Trade	Dummy01	Dummy02	IntraCon	R <sup>2</sup>	adj.R <sup>2</sup>	F
OLS(all)	FDI	2.957 (4.74)***	0.6670 (2.32)**	-0.0223 (-0.438)	0.691 (6.49)***	0.1729 (0.957)	-0.465 (-2.43)**	-0.851 (-2.11)**	0.72	0.70	46.55
OLSIV (Within)	FDI		0.1024 (0.204)	-0.0743 (-0.807)	1.215 (3.03)***	1.023 (0.403)	-0.360 (-1.95)*	-0.767 (-2.19)**	0.67	0.61	30.63
EC	FDI		0.5051 (1.70)*	-0.005 (-0.013)	0.407 (0.936)	1.003 (0.339)	-0.694 (-3.76)**	-0.547 (-1.65)*	0.64	0.57	29.41

- F-test for all estimate significant at the 1% level.
- The figure in ( ) parentheses are t-stat.
- Coefficients statistically significant on the  
5% (2-tails) are indicated by an asterisk \*;  
1% (2-tails) by two asterisks \*\*;  
0.1% (2-tails) by three asterisks \*\*\*.
- Sample ranges from 1955 to 1980 for five countries. Total 116 observations.

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