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Ching-huei Chang and Peter W. H. Cheng

## 12.1 Introduction

Over the past three decades, Taiwan has experienced one of the world's highest sustained economic growth rates. From 1953 to 1988, real gross national product (GNP) grew at an average annual rate of 8.82 percent. Foreign trade has grown at an even faster pace. Over the same thirty-five-year period, for example, exports and imports increased at average annual rates of 21.87 percent and 19.25 percent, respectively. Consequently, the foreign sector has become the most important sector of Taiwan's economy. Exports of goods and services have accounted for more than 50 percent of GNP since 1978. Taiwan's persistent trade surplus, which occurred during most years in the 1970s and 1980s, has resulted in huge international currency reserves and has become a major source of economic instability in recent years.<sup>1</sup>

A number of previous studies have argued that foreign direct investment (FDI) contributed to the growth process in Taiwan by providing funds for capital formation and facilitating technology transfers.<sup>2</sup> Furthermore, FDI with a high export orientation also contributed significantly to Taiwan's trade

Ching-huei Chang is a research fellow at Sun Yat-sen Institute for Social Sciences and Philosophy, Academia Sinica, Taiwan. Peter W. H. Cheng is an associate professor at the Department of Public Finance and Taxation, National Chengchi University, Taiwan.

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1. Taiwan's international reserves have been at around U.S. \$65 billion since 1987, ranking third in the world behind Japan and West Germany. Not surprisingly, Taiwan's currency appreciated from New Taiwan (N.T.) \$39.85 per U.S. dollar at the end of 1985 to N.T. \$25.90 per U.S. dollar in June of 1989. The external imbalance not only created tensions and disputes with major trading partners but also generated excess liquidity and raised strong inflationary pressures in the domestic economy.

2. These conclusions have been reached mostly by qualitative analysis. For a brief review, see Lee and Hu (1989) and Tsai (1991).

surplus, which helped alleviate the foreign exchange shortages prevalent in previous decades.<sup>3</sup>

In fact, more than 40 percent of Taiwan's gross domestic capital formation (GDCF) in 1952–60 was financed by foreign capital, predominantly U.S. aid. However, the importance of foreign capital has declined significantly since the termination of U.S. aid in 1965. Although private FDI has risen steadily in nominal terms since then, FDI as a percentage of GDCF has dropped from 8.03 percent in 1966–70 to 2.94 percent in 1976–80 before swinging back to 4.39 percent in 1981–86 (R. Wu 1989). In addition, FDI in Taiwan as a percentage of global FDI has remained quite stable between 0.2 and 0.5 percent during 1965–84 (Tsai 1991).

In general, government policies have been very favorable toward FDI in Taiwan, though there were various forms of government manipulation that affected the amount and direction of FDI.<sup>4</sup> The treatment afforded foreign enterprises in Taiwan has been essentially the same as that given to the corresponding types of local enterprises. Since before 1980 Taiwan followed the dual development strategies of import substitution and export promotion, foreign investors could enjoy all kinds of tariff and nontariff protection if they produced for the domestic market.<sup>5</sup> They could also take advantage of various assistance measures such as export processing zones, tax rebates, and export loans if they produced for international markets.

Furthermore, since the major concern of national tax policy has been stimulation of investment, in addition to low corporate income tax rates very generous tax incentives have been provided. The highest marginal tax rate on corporate income remained 25 percent for most of the years after 1956, with the exception of 1974–85.<sup>6</sup> Major tax incentive measures, such as tax holidays and a tax ceiling, were first introduced in 1960, and accelerated depreciation and investment tax credit were added in the 1970s and 1980s. Nowadays Taiwan has one of the most complex tax incentive systems in the world.<sup>7</sup>

Taiwan's major economic objective in recent years, however, has been the establishment of an international and more liberalized economy. Strategies adopted include loosening restraints on foreign exchange control, reducing tariff and nontariff barriers, and opening domestic markets.<sup>8</sup> Foreign invest-

3. Though the export ratio of foreign firms in Taiwan has declined gradually in recent years, it was over 50 percent before 1985. The exports of foreign firms in 1980–84 accounted for about 20 percent of Taiwan's total exports and caused more than 30 percent of the trade surplus in Taiwan (cf. R. Wu 1989, table 13).

4. Like most developing countries, Taiwan applies restrictions on the ownership, size, foreign exchange transactions, scope of operation, etc. Cf. Peat, Marwick, Mitchell and Co. (1987).

5. For an analysis of industrial and trade policies in Taiwan, see R. Wu (1989).

6. The highest marginal tax rate on corporate income has been adjusted many times over the past three decades. It was 18 percent in 1961–66; 25 percent in 1956–60, 1967–73, and 1986–90; 30 percent in 1985; and 35 percent in 1974–84.

7. A brief review of the major tax incentives in Taiwan and a comparison with selected other countries is presented in tables 12.1 and 12.2.

8. As regards foreign exchange transactions involving international commodities, the tariff rate dropped from 20.1 percent in 1987 to 12.8 percent in 1988. Moreover, a constantly increasing

ment is now permitted in almost all industries. Domestic shareholding and business operations requirements and restrictions on the repatriation of profits and capital have also been greatly reduced. Conspicuously, Taiwan has attracted more FDI in recent years, both in absolute and in relative terms.<sup>9</sup>

Against this background, the current tax policy toward FDI has been under critical review. The effectiveness of tax incentives in attracting FDI has been an area of controversy (Riedel 1975; Wu et al. 1980). A recent study (Tsai 1991) found that FDI in Taiwan was likely to be determined by supply-side factors, rather than by government policy. The side effects of FDI's contribution to Taiwan's trade surplus have also called for reconsideration of existing policies that were designed largely to cope with the earlier problem of a serious exchange shortage (R. Wu 1989). Furthermore, the cost of tax incentives in terms of losses in equity and efficiency has brought about a comprehensive review of national income taxation (Chen and Cheng 1990).

The ROC Tax Reform Commission (1987-89) has proposed a comprehensive package of income tax reforms that includes the integration of individual and business income taxes and the abolishment of most current tax incentives.<sup>10</sup> How FDI in Taiwan will be affected by the proposed tax policy change and how important this effect will be should be a subject for serious scrutiny. Current empirical results from cross-national studies can make little contribution to an evaluation of the suggested policy change (Agarwal 1980).

This paper provides some observations based on empirical studies of the effects of tax policy on FDI in Taiwan. For that purpose, firm-specific FDI data for 1984-86 and also aggregate time-series FDI data for 1972-87 are analyzed. While the data are severely limited, some basic policy implications may still be explored. Further investigations should be made to evaluate the impact of abolishing tax incentives in those industries where international competition to attract investment is severe.

This paper is organized as follows. Section 12.2 reviews some studies of the effects of tax policy on capital inflows in developing countries. Section 12.3 discusses tax preferences in Taiwan. Section 12.4 analyzes FDI in Taiwan by industry, sources of origin, and export orientation in order to display its changing characteristics. Section 12.5 presents the regression results ob-

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number of imported goods are exempted from Taiwan's prior-permit requirements, and the range of allowable foreign investment, for which favorable status is granted, has been significantly extended from the manufacturing to the service industries.

9. Approved FDI has increased from U.S. \$395 million (1981) to \$2,418 million (1989), and its share as a percentage of domestic nonresidential investment increased from 3.56 percent (1981) to 8.56 percent (1989); see table 12.3. That table also shows that actual FDI as a percentage of FDI in nonoil developing countries increased from 1.03 percent (1981) to 6.03 percent (1987).

10. Since the government of Taiwan has taken a piecemeal, approach to tax reform, the extent to which reform proposals will be put into effect remains to be seen. According to the draft of a new act currently under consideration by the Legislative Yuan, however, only tax holidays will be eliminated entirely, while accelerated depreciation, tax credits, and other incentives will remain. For a brief summary of the proposed changes in Taiwan's income taxation made by the Tax Reform Commission, see Chen and Cheng (1990).

tained from firm-specific and time-series data to ascertain the relationship between FDI and tax policy. Section 12.6 summarizes some important results found in this study and discusses their policy implications.

## 12.2 Review of Literature

In theory the tax policy of both host country and home country should have a significant impact on international capital flow. Consider this simple example. A dollar investment in the home country yields the risk-adjusted, net rate of return  $(1 - t)r$  each year, where  $t$  and  $r$  are the income tax rate and the before-tax rate of return, respectively. On the other hand, the investment earns  $(1 - t_h)r_h$  in the host country, where subscript  $h$  represents the host country. If the subsidiary firm repatriates its earnings immediately, how much will the parent firm have at its disposal? Apparently, the answer depends on the tax policy on foreign source income that the home country adopts.<sup>11</sup>

Since the major sources of FDI in Taiwan are the United States and Japan, we will take the "residence approach" in our analysis where foreign tax credits are allowed.<sup>12</sup> We will also explicitly assume  $t_h < t$ .<sup>13</sup> In this case, the tax liability to the home country is  $(t - t_h)$  for each dollar that the parent company receives, and total tax payments are  $(t - t_h) + t_h = t$ . Thus, the net rate of return on foreign investment is  $(1 - t)r_h$ , and the firm benefits by investing abroad if  $r_h > r$ . Neither the home country tax nor the host country tax affects the firm's international investment decision. This conclusion is consistent with the previous research in this area, which argued that taxing foreign income at the domestic rate with a credit provides for "capital export neutrality." It follows that any tax concessions offered by the host country will result in a transfer of tax revenue to the home country's government without affecting the firm's investment.

In the above discussion, we explicitly assume that the foreign subsidiary repatriates earnings immediately. The result may be different if this assumption is relaxed, since the tax the home country imposes on the firm's foreign investment is typically deferred until earnings are repatriated. In the most extreme case, the foreign subsidiary retains all of the earnings, and the effective tax rate on foreign income is equal to  $t_h$ , the host country's tax. This is the basis under which previous studies argued that, under the tax-sum-credit sys-

11. This assumes that the host country does not impose a withholding tax on repatriation.

12. In the United States and Japan, however, a deduction from taxable income may be taken in lieu of the tax credit. As such, the firm should invest in the foreign country if  $(1 - t_h)r_h > r$ . Then it is of interest to see that the home country tax applied to foreign source income,  $t$ , plays no role in the firm's marginal investment decision. Moreover, a tax reduction in the host country can potentially encourage capital flow.

13. The corporate income tax rates for the United States and Japan are currently 34 percent and 40 percent, respectively, compared with 25 percent in Taiwan. Cf. table 12.2.

tem, the ability to defer taxation on foreign source income confers a tax advantage on foreign investment.

The above view has recently been challenged by Hartman (1984, 1985). He correctly draws attention to the distinction between investment financed out of earnings abroad and investment financed by transfers from the home country. If the subsidiary is investing out of retained earnings, the home country tax on foreign source income does not affect the marginal investment decision. On the other hand, if the planned investment by the subsidiary is not sufficient to exhaust totally its retained earnings (i.e., if repatriation of earnings must take place), then the home country tax is unavoidable and its present value does not depend on the length of deferral. Thus the decision for investment out of retained earnings should depend only on net returns available in the home country or the host country.

Hartman's argument can easily be illustrated by using the simple example cited above. Suppose that the subsidiary has a dollar of after-tax earnings (previously taxed at the host country rate  $t_h$ ), which can be either repatriated or reinvested. If the subsidiary firm repatriates the earnings immediately, after paying the home country tax the parent has at its disposal  $(1 - t)/(1 - t_h)$  dollars. If the dollar is reinvested, the dollar plus the one-period earnings will be repatriated at the end of the period. Upon receipt of the dividend, the parent must pay the home country tax on the original dollar of earnings and the return earned during the period, but it can claim a credit for the taxes paid to the host country. So the parent receives  $(1 - t) [1 + r_h (1 - t_h)] / (1 - t_h)$ . The present value of this amount is equal to  $(1 - t) / (1 - t_h)$ , when discounted at the rate of return, net of the host country tax,  $[1 + r_h (1 - t_h)]$ .

Return to the case where the subsidiary repatriates its profits immediately; the dollar is in the form of a dividend to the parent company. After investing in the home country at a net rate of return,  $(1 - t)r$ , the parent has  $(1 - t) [1 + r (1 - t)] / (1 - t_h)$  at the end of the period. Comparing these two results, we see that the dollar should be reinvested in the host country rather than repatriated if  $r_h (1 - t_h) > r(1 - t)$ . Note that this is exactly the result obtained when the home country adopts the "territorial approach" to taxation of foreign source income. Hartman called this "capital import neutrality," that is, the same tax rates influence the decision of both domestic firms and foreign firms in the host country that finance investment through retained earnings.

The discussions above imply that fiscal incentives offered by developing host countries that lower the value of  $t_h$  will in most cases be effective in attracting FDI. How responsive FDI is to these tax concessions is of course an empirical question. There is no clear-cut conclusion about the effectiveness of these measures in attracting FDI. Most empirical evidence suggests that their overall impact on FDI is marginal at best (Root and Ahmed 1978, Shah and Toye 1978, Lim 1983, Goldsborough 1985, Balasubramanyam 1986).

In his survey of the literature, Agarwal (1980) attributed the failure of these

tax measures in attracting FDI to a host of disincentives that generally accompany the incentives provided by a host country. These include restrictions on ownership, size, location, dividends, royalties, fees, entry into certain industries and mandatory provisions for local purchases, as well as the requirement of being export-oriented. Moreover, the incentive policies of developing countries are generally quite restrictive in the sense that foreign investors must fulfill a number of conditions to be eligible for them. For example, in Taiwan the Investment Commission of the Ministry of Economic Affairs has been known to manipulate its power to regulate the inflow of capital (R. Wu 1989).

Many authors have also pointed out that tax incentives are so pervasive among developing nations that the benefits these measures confer on a country are very small (for example, Root and Ahmed 1978). However, Goldsborough (1985) postulated that an individual country might lose much new investment were it to lower or abolish all its incentives unilaterally. This issue is particularly relevant for newly industrialized economies that wish to attract capital inflow on the one hand, while reducing unnecessary tax incentives on the other hand.

From the point of view of a host country, it is even more important to identify the demand-side determinants that it can control to some extent. For that purpose, case studies rather than cross-national analyses would be more relevant. In the case of Taiwan, Wu et al. (1980) found in their survey that most U.S. firms are concerned with tax concessions. Riedel (1975) concluded from his econometric results that the incentives in Taiwan have no impact on U.S. FDI, though they are effective in attracting capital inflow from Japan and Hong Kong. However, Tsai's recent study (1991) found that neither government incentive measures nor Taiwan's extraordinary economic performance were themselves significant factors in attracting FDI. Therefore, it is likely that FDI in Taiwan is determined by supply-side factors.

Since the variety and complexity of incentives make it difficult to evaluate their effectiveness, one would need more relevant data and a better methodology to ascertain clearly the relationship between FDI and tax policy. It is exactly in these areas that the present paper hopes to make a contribution to the existing literature.

### **12.3 Tax Preferences**

There are two methods by which foreign investors may fulfill the requirements for capital investment in Taiwan. One requires approval by the ROC Investment Commission pursuant to the Statute for Investment by Foreign Nationals or the Statute for Investment by Overseas Chinese. The other is to set up branches or subsidiaries without foreign investment approval if the firm meets the requirements of minimal capital contribution, a resident manager, domiciled national stockholders and shareholdings, and a domiciled national chairman and supervisors. In either case, foreign firms and their local coun-

terparts are treated equally.<sup>14</sup> In this section, we will discuss the tax preferences that have been enjoyed both by FDI and domestic investment over the past three decades.

Almost all of Taiwan's major tax incentives are provided through the Statute for Encouragement of Investment, which was originally promulgated in September 1960. This statute was initially supposed to be effective for only ten years; however, it has been extended and expanded for two decades. Current major tax incentives and their history are compiled and shown in table 12.1. Four types of businesses are identified, according to the tax preferences for which they qualify: general profit-seeking enterprises, general productive enterprises, important productive enterprises, and firms eligible for tax holidays.<sup>15</sup>

Four major measures were gradually introduced during the past three decades: tax holidays and tax ceilings in the 1960s, accelerated depreciation in the late 1960s and 1970s, and more-specific depreciation measures and tax credits in the 1980s. With few exceptions, the provisions for tax preferences became more and more generous over time; the whole incentive system is now very complex. For example, an important productive enterprise may claim ten tax preferences that are listed in table 12.1. Some of them may be redundant (for example, tax ceilings), while some have multiple benefits (for example, tax credits and accelerated depreciation).

Table 12.2 compares tax and incentive systems among Taiwan, its major FDI sources, i.e., the United States and Japan, and its major FDI competitors, such as Korea, Singapore, and Thailand. Clearly, Taiwan currently has the lowest corporate income tax rate among these countries. Furthermore, Taiwan also provides the most generous incentives (except for tax holidays). Not only are tax credits and depreciation preferences provided for general capital investment rather than for specific industries or purposes, but the degree to which both preference items are enjoyed by firms in Taiwan is quite large. It is clear that the incentive measures have actually reduced the tax burden of firms in Taiwan.

To give an idea of the extent of tax preferences for FDI, table 12.3 compares the average effective tax rates for foreign and domestic manufacturing firms in 1984–86. It should be noted that the highest marginal business income tax rate decreased annually during this period from 35 percent in 1984 to 30 percent in 1985 and 25 percent in 1986. The average rate on profit-seeking enterprises nationwide was 21.19 percent over the same period (Lee and Chu 1990). Table 12.3 indicates that foreign firms, as a whole, bore a

14. However, it should be noted that nontax favorable treatment is provided to foreign investment with approval. For example, the restrictions on the percentages of foreign ownership and stockholders and on the chairman and supervisors may be waived. Moreover, there is a twenty-year guarantee against government expropriation or forced requisition. Cf. Peat, Marwick, Mitchell and Co. (1987).

15. For the definitions of the different types of firms, see the notes to table 12.1.

Table 12.1 Major Tax Incentives for Firms in Taiwan

Type of Firm	Tax Incentive	Beginning Year and Later Revisions
General profit-seeking enterprises <sup>a</sup>	2-year depreciation for pollution-control facilities	1981
	2-year depreciation for energy-saving facilities	1981
	30% tax credit for capital investment in major high-tech enterprises	1987
	20% tax credit for capital investment in venture capital projects	1987
General productive enterprises <sup>b</sup>	Tax ceiling	1960 (18%), 1971 (25%), 1987 (20% for large trade and venture capital)
	Accelerated depreciation for renovation of machinery and equipment	1965 (1/3), 1981 (1/2)
	Accelerated depreciation for R&D facilities	1977
	5–20% tax credit for machinery and equipment	1981
	20% tax credit for R&D expenses	1984
	All preferences enjoyed by profit-seeking enterprises	
Important productive enterprises <sup>c</sup>	Tax ceiling	1960 (18%), 1971 (22%), 1988 (20%)
	All preferences enjoyed by general productive enterprises	
Firms eligible for tax holidays <sup>d</sup>	5-year exemption for new firms	1960
	4-year exemption for expansion firms	1960 (5 yrs), 1971 (4 yrs)
	May elect to adopt accelerated depreciation	1971
	May elect to defer commencement of tax holiday	1977 (1–4 yrs), 1982 (2–4 yrs)

Source: *Study on Tax Incentive Measures in the Statute for Encouragement of Investment* (in Chinese), ROC Tax Reform Commission Technical Report no. 37 (Ministry of Finance, June 1989).

<sup>a</sup>Any public or private organization that engages in activities for profit-seeking purposes, organized in any form.

<sup>b</sup>A firm that is organized as a "company limited by shares" and operates in a set of specified industries including manufacturing, mining, agriculture, and most other industries except major service sectors.

<sup>c</sup>A firm in the metal, heavy machinery, or petrochemical industry that is capital-intensive and technology-intensive and "confirms the need for development of economic and national defense industries."

<sup>d</sup>A productive enterprise that conforms to regulated categories and criteria of encouragement and is newly established or effects an expansion of equipment through an increase of capital.

**Table 12.2 Comparison of Taxes and Incentives on Corporate Income, 1989**

Taxes and Incentives	Japan	Korea	Singapore	Taiwan	Thailand	United States
Highest marginal corporate tax rates	40%	27, 30, or 33%	Flat 32%	25%	Flat 30 or 35%	34%
Withholding tax rate on dividend income <sup>a</sup>	20%	25%	32% to be paid out of corporate tax	20% <sup>b</sup>	20%	30%
Tax holidays	Nil	Up to 5 years for FDI only	Up to 10 years	Up to 5 years	Up to 8 years	Nil
Other major incentives	Up to 7% tax credit or up to 30% special depreciation for energy savings. 20% tax credit for incremental R&D.	30% special depreciation for exports. Up to 10% tax credit or up to 50% special depreciation for energy savings, pollution control, R&D, etc.	Reduced rate, up to 5 years for international trade and services. Up to 50% investment allowances.	Up to 20% tax credit. Up to 2-year depreciation.	—	20% tax credit for incremental R&D

Sources: *Corporate Taxes: A Worldwide Summary, 1988* (New York: Price Waterhouse); *1988 International Tax Summaries* (New York: Coopers and Lybrand); *Asian Pacific Taxation, 1989* (Tokyo: KPMG Peat Marwick).

<sup>a</sup>Rates may be reduced in accordance with the provisions in the double taxation agreements.

<sup>b</sup>Thirty-five percent is levied on nonapproved investment. However, these foreign investors may elect to file an income final return subject to progressive tax rates, in which case the effective tax rate may be lower than 20 percent.

**Table 12.3 Comparison of Effective Tax Rates for Foreign and Domestic Manufacturing Firms in Taiwan, 1984–86 Average (%)**

Industry	Foreign Firms with Tax Holiday					All Foreign Firms		All Domestic and Foreign Firms with Tax Holiday	
	Sample Size	Before Tax Concessions	Tax Holiday Benefit	Other Tax Benefit	After All Concessions	Number	Average Tax Rate	Sample Size	After All Concessions
Food and beverage	5	14.67	8.00	0	6.67	115	36.03 <sup>a</sup>	7	11.20
Chemicals	32	17.00	9.00	3.00	5.00	342	16.03	80	10.60
Nonmetallic	3	24.00	1.67	09	22.33	87	17.19	11	21.80
Basic metals	9	19.00	6.67	0.33	12.00	296	18.13	21	19.30
Machinery	34	16.45	3.77	0.35	12.33	212	22.50	74	15.97
Electronics	109	17.73	4.50	0.90	12.33	604	17.22	212	11.31
Other manufacturing	8	17.67	1.33	1.00	15.33	419	20.64	25	21.72
Average <sup>b</sup>	200	17.46	5.11	1.09	11.26	2075	19.47	430	13.31

*Sources:* Effective tax rates for all domestic and foreign firms with tax holidays in Taiwan are calculated from the corporate income tax returns of the sampled data in Lee and Chu (1990). Effective tax rates and tax concessions for foreign firms with tax holidays are calculated from the subfile data used by Lee and Chu (1990). Effective tax rates for all foreign firms in Taiwan are calculated from the data in *An Analysis of Operations and Economic Effects of Foreign Enterprises* (in Chinese) (ROC, Investment Commission, Ministry of Economic Affairs, 1987).

<sup>a</sup>While the highest marginal tax rates were 35 percent (1984), 30 percent (1985), and 25 percent (1986), the exceptionally high average effective tax rate for food and beverage processing was due to the aggregation of positive profits of some firms with the large losses of other firms.

<sup>b</sup>Weighted average of the sample size or number of firms in each industry.

lower tax burden (19.47 percent) than the national average. It further shows that the effective tax rate for the foreign firms eligible for tax holidays and other incentives was 11.26 percent, only about one-half of the national average effective tax rate (21.29 percent), and about 2 percentage points lower than the average effective tax rate for all domestic and foreign firms eligible for tax holidays (13.31 percent).

However, to measure the extent of tax preferences more meaningfully, one should compare the after-tax concession rate (11.26 percent) with the before-tax concession rate (17.46 percent). This gives about a one-third, or 6.20 percent, tax savings to foreign firms eligible for tax holidays. This tax savings can be further decomposed into two parts: 5.11 percent for tax holidays, and 1.09 percent for other tax preferences, major tax credits, and tax ceilings.<sup>16</sup>

## 12.4 Changing Characteristics of FDI in Taiwan

### 12.4.1 FDI Trends

Summary data for the amount of approved and actual FDI in Taiwan are presented in table 12.4. Though approved investment figures vary annually, they were generally less than U.S. \$1 billion before 1987, and clearly exhibited a pattern of gradual increase. In relative terms, however, approved FDI displayed a large swing during 1952–89. FDI was an important supplement to inadequate domestic savings in the 1960s and early 1970s. It accounted for 12.5 percent of nonresidential domestic investment in 1970. The importance of approved FDI has declined since then; however, it swung back to over 5 percent after 1984. Nevertheless, it should be noted that Taiwan has had a large amount of excess savings in recent years, totaling over 9 percent of GNP.<sup>17</sup> Table 12.4 also reveals that about one-third of annual approved FDI went into the expansion of old projects, while two-thirds went for new projects.

The annual data on the actual amount of FDI show the same increasing pattern as for approved FDI.<sup>18</sup> Before 1986, the ratio of actual to approved FDI remained relatively constant at about 40 percent. In the last two years, however, the realization ratio of approved FDI has been high: 81.07 percent in 1988 and 66.34 percent in 1989. The major reason for the large discrepancy between actual and approved FDI remains unknown, and future trends deserve

16. Since accelerated depreciation has been included as an expense in calculating before-tax profit, its degree of tax preference cannot be identified. In other words, the tax preferences enjoyed by foreign firms, such as tax holidays (as shown in table 12.3), are underestimated because of the exclusion of accelerated depreciation.

17. The percentages are 11.88 (1984), 14.83 (1985), 21.34 (1986), 18.39 (1987), 11.68 (1988), and 9.32 (1989). See *Quarterly National Economic Trends*, Directorate-General of Budget, Accounting Statistics, Executive Yuan, ROC, February 1990.

18. Both the approved and actual amounts of FDI in the Taiwanese data include equity investment and reinvested earnings, but the data do not include loans from parent firms to subsidiaries. Also, it should be noted that these two FDI statistics are obtained from different sources.

Table 12.4 Trends in Taiwan's Foreign Direct Investment

Year	Approved FDI			Actual FDI		
	Amount (millions of U.S. \$)	Percentage of Expansion Projects	Percentage Nonresidential Investment <sup>a</sup>	Amount (millions of U.S. \$)	Percentage of Approved FDI	Percentage of FDI in Nonoil LDCs
1952	1.067	—	2.43	—	—	—
1960	15.470	—	6.93	5.77	37.30	—
1970	138.900	44.05	12.50	61.93	44.59	4.80
1980	466.000	36.93	4.28	165.70	35.56	1.47
1981	395.800	42.50	3.56	150.90	38.13	1.03
1982	380.000	29.21	3.60	104.00	27.37	0.80
1983	404.500	38.51	3.98	149.00	36.84	1.48
1984	558.700	38.97	5.29	200.90	35.96	1.91
1985	702.500	30.72	7.32	340.20	48.43	3.06
1986	770.400	29.52	6.25	326.00	42.34	3.44
1987	1,419.000	35.30	7.75	715.00	50.39	6.03
1988	1,183.000	43.83	5.49	959.00	81.07	—
1989	2,418.000	32.87	8.51	1,604.00	66.34	—
Total/ average	10,950.000 <sup>b</sup>	36.95 <sup>d</sup>	5.99 <sup>c</sup>	—	45.35 <sup>c</sup>	2.67 <sup>c</sup>

Sources: For approved FDI, *Statistics on Overseas Chinese and Foreign Investment* (Taipei: ROC Investment Commission, Ministry of Economic Affairs, various years). For actual FDI, *Balance of Payments Statistics* (Taiwan: Central Bank of China, 1989). For FDI in non-oil-exporting LDCs, *Balance of Payments Statistics Yearbook* (Washington, D.C.: International Monetary Fund, various years). For non-residential domestic investment, *Quarterly National Economic Trends* Directorate-General of Budget, Accounting Statistics, Executive Yuan, ROC, Taipei February 1990.

<sup>a</sup>Gross fixed capital formation, excluding residential buildings.

<sup>b</sup>Total for the period from 1952 to 1989.

<sup>c</sup>Simple average for the selected years shown in the table.

to be followed closely.<sup>19</sup> The other important figure in table 12.4 is the share of Taiwan's FDI in total FDI of all non-oil-exporting LDCs. Tsai (1991) mentioned that the ratio remained quite stable during 1958–85. However, table 12.4 clearly shows that Taiwan has attracted an increasing share of the total FDI since 1982. Therefore, the demand-side determinants of FDI in Taiwan in recent years deserve further scrutiny.

#### 12.4.2 Composition of FDI

Three aspects of the changing composition of FDI in Taiwan are presented in tables 12.5 and 12.6. From panel A of table 12.5, it can be seen that the dominant sector of FDI has been manufacturing. However, its share has dropped from 77.58 percent in the 1960s to 68.01 percent in 1985–89. The largest decline has been in the electronic and electrical appliance sector, which went from 36.61 percent of all FDI in the 1960s down to 21.21 percent in

19. Though the time lag for realizing investment may be part of the cause of the discrepancy, it cannot account for the size of the gap between approved and actual FDI. See Schive (1987).

**Table 12.5**      **Composition of Foreign Direct Investment in Taiwan, 1960–89 (in millions of U.S. dollars)**

	1960–69		1970–79		1980–84		1985–89	
	Amount	Percentage	Amount	Percentage	Amount	Percentage	Amount	Percentage
Total	400.16	100.00	1,895.00	100.00	2,205.00	100.00	6,492.00	100.00
	A. By industry							
Electronics	146.48	36.61	596.00	31.45	638.00	28.93	1,377.00	21.21
Chemicals	64.26	16.06	183.00	9.66	306.00	13.88	1,150.00	17.71
Machinery	12.51	3.13	137.00	7.23	267.00	12.11	513.00	7.90
Other manufacturing	87.18	21.79	457.00	24.12	563.00	25.53	1,440.00	22.18
Services	51.55	12.88	335.00	18.73	366.00	16.60	1,895.00	29.19
Others	38.18	9.45	187.00	9.87	65.00	2.95	117.00	1.80
	B. By area							
United States	169.78	42.43	624.00	32.93	829.00	37.60	1,476.00	22.74
Japan	66.03	16.50	342.00	18.05	621.00	28.16	1,947.00	29.99
Major European countries <sup>a</sup>	25.28	6.32	147.00	7.76	167.00	7.57	828.00	12.75
Other Asian countries <sup>b</sup>	113.88	28.46	556.00	29.34	434.00	19.68	968.00	14.91
Others	25.19	6.29	226.00	11.93	154.00	6.98	1,273.00	19.61 <sup>c</sup>

Source: *Statistics on Overseas Chinese and Foreign Investment* (Taipei: ROC Investment Commission, Ministry of Economic Affairs, 1989).

<sup>a</sup>Including United Kingdom, West Germany, France, The Netherlands, and Switzerland.

<sup>b</sup>All Asian countries except Japan.

<sup>c</sup>The sharp increase is due to FDI from tax havens. It is calculated by the Investment Commission that FDI from tax havens in 1989 was U.S. 564% \$ million, accounting for 23.33 percent of total FDI in that year.

Table 12.6 Export Ratios of Foreign Firms in Taiwan, 1978–87 (%)

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
Total	60	54	53	54	55	51	52	49	46	47
Electronics	70	66	67	71	71	80	77	80	72	75
Chemicals	51	43	44	41	39	31	25	26	20	22
Machinery	31	25	28	34	48	20	30	18	33	19
Other manufacturing	59	57	52	52	50	52	48	51	38	47
Services	28	19	17	16	19	20	17	14	9	7
Others	76	78	69	67	80	79	77	71	74	80

Source: *An Analysis of Operations and Economic Effects of Foreign Enterprises* (in Chinese) (Taipei: ROC Investment Commission, Ministry of Economic Affairs, 1987).

1985–89. In contrast, there was a sharp rise in the share going to services, from 16.60 percent in 1980–84 to 29.19 percent in 1985–89. The change in the service industry is quite conspicuous, reflecting that Taiwan's domestic service markets have begun to open up to foreign competition.<sup>20</sup>

Panel B of table 12.5 also shows that the sources of FDI have substantially changed during the past three decades. The share of U.S. investment has declined from 42.43 percent in the 1960s to 22.74 percent in 1985–89. The United States' dominant role was taken over by Japanese investors whose share has increased from 16.50 percent to 29.99 percent in the same period. In the last five years, investment from the major European countries has also increased from 7.57 percent to 12.75 percent. However, the most conspicuous increase in recent years has been in investment from so-called tax haven countries or areas. It was estimated by the Investment Commission that as much as U.S. \$564 million of FDI in 1989 came from such places, accounting for 23.33 percent of total FDI in that year. These investments are suspected to have been made by Taiwan residents so as to avoid Taiwan's highly progressive personal income tax rates.<sup>21</sup> This issue has prompted suggestions that the international and domestic aspects of income taxation should be regarded as an integrated rather than a separate system.

One of the major effects of FDI in Taiwan has been export expansion. Many believe that, in the past, foreign investors came mainly to take advantage of cheap labor in Taiwan and to produce for international markets where they had a comparative advantage. A survey by the Investment Commission revealed

20. It is also recognized that the openness of the service sector is one of the major topics that will be discussed during the upcoming Taiwan-U.S. trade negotiation sessions. Cf. *The Analysis of FDI in 1989*, prepared by the ROC Investment Commission, Ministry of Economic Affairs, 1990.

21. Tax havens are defined to include those countries without an income taxation system, those applying very low income tax rates, or those that exempt the foreign source income of their residents. Ironically, Taiwan still takes the territorial approach toward its residents' foreign source income and thus should be classified as a tax haven by the Investment Commission. For a review of the current international income taxation system in Taiwan, see Chen and Cheng (1990).

that direct and indirect exports made by foreign firms in Taiwan accounted for 29.06 percent of total national exports in 1978. This ratio declined to 17 percent in 1987.<sup>22</sup> Two factors contributed to the changes in the importance of FDI in national exports. One reflects the shift in the industrial structure of FDI. Specifically, electronics became the single most important export industry in Taiwan, with export values accounting for two-thirds to three-quarters of the total exports made by foreign firms in 1978–87. As shown in panel A of table 12.5, however, the electronics industry's share of total FDI has steadily declined over the last three decades. In contrast, other more domestic-oriented manufacturing industries such as chemicals and machinery have gained a greater share of total FDI. Needless to say, the increasing amount of FDI in the service sector is mainly geared toward the domestic market.

The second factor that may have contributed to the relative decline in the export share of foreign firms is the shift in the market orientation of each FDI industry. Table 12.6 exhibits the export ratio of foreign firms in Taiwan during 1978–87. Two different market tendencies can be observed. For export-oriented industries, mainly electronics and the “other” category, export ratios slightly increased over 1978–87. For domestic-oriented industries, such as chemicals, machinery, and services, a decline in export ratios during the decade is rather clear.

In summary, Taiwan's FDI has increased substantially in both absolute and relative terms during the 1980s, and structurally its focus has begun to turn more toward domestic markets. Since a foreign investor may have many locations to choose from in deciding where to produce for international markets, it makes sense to distinguish between export- and domestic-oriented FDI in order to evaluate the potential impact of tax incentives on the inducement of both kinds of FDI. It is also reasonable to conjecture that FDI in export-oriented industries, such as electronics, would be more likely to respond to tax incentives. In the following section we will present the regression results of our analysis on total FDI in Taiwan, FDI in manufacturing, and FDI in the electronics industry.

## 12.5 Effects of Tax Incentives on FDI in Taiwan

Econometric attempts to ascertain the effects of tax policy on FDI have been unsuccessful for both theoretical and statistical reasons. Tax incentives in Taiwan, as shown in table 12.1, are so pervasive that they cannot be represented well by the dummy variable proxy commonly used in empirical studies. Our study tries to overcome this difficulty by measuring the extent of tax preferences that FDI has enjoyed. Two regression analyses are made, one using time-series data and the other using firm-specific data.

22. *An Analysis of Operations and Economic Effects of Foreign Enterprises* (in Chinese) (Taipei: ROC Investment Commission, Ministry of Economic Affairs, 1987).

### 12.5.1 Time-Series Studies

According to Riedel (1975), Wu et al. (1980), and Tsai (1991), the potential demand-side determinants of FDI in Taiwan include the domestic market, incentive policies, and cheap cost. Since we are interested in explaining increasing FDI in Taiwan during the 1980s, we will use data from 1972–87.<sup>23</sup> However, the cost of labor in Taiwan during this period was not what could be called cheap. After having adjusted for the effects of foreign exchange rates, the increase in the unit labor cost in Taiwan reached 13 percent over 1970–82, which was higher than labor cost increases in the United States, Japan, Korea, and Singapore (Tsai 1991). Hence, in this study, we try to test for the adverse impact of rising labor costs on the inflow of FDI. Since strong export orientation is one characteristic of FDI in Taiwan, it is considered explicitly in the model.

The estimated regression equation is specified as follows:<sup>24</sup>

$$(1) \quad \text{FDI} = b_0 + b_1 \text{GNP} + b_2 \text{Export} + b_3 \text{Wage} + b_4 \text{Tax Pref},$$

where FDI = approved FDI in Taiwan in a given year, GNP = gross national product in a given year, Export = the ratio of foreign firms' exports to total national exports in a given year, Wage = wage index, and Tax Pref = tax preferences enjoyed by foreign firms in a given year, measured by the difference between the highest marginal corporate income tax rate and the average effective tax rate.

This equation is applied to the inflow of total FDI in Taiwan and disaggregate FDI, such as FDI from Japan and the United States, and FDI in the electronics industry. All coefficients except  $b_3$  are expected to be positive. To eliminate supply-side effects, relative FDI, expressed as Taiwan's share of total FDI in non-oil-exporting LDCs, is also estimated using equation (1).

Table 12.7 gives the results of the estimation and provides comparisons with the results of a previous study (Tsai 1991). Three major findings can be summarized:

1. In terms of goodness-of-fit, as measured by the adjusted  $R^2$ , all equations, except FDI from the United States, perform very well.
2. In terms of testing hypotheses, the results consistently show that GDP has a positive effect, while rising labor costs have a negative effect; the other two variables, export orientation and tax preferences, have no significant effect.
3. Contrary to Tsai (1991), this study finds that Taiwan has attracted relatively more FDI than other non-oil-exporting LDCs. This may be due to the policy change that opened Taiwan's domestic markets, witnessed by

23. One of the other major reasons for using this time period is that more detailed data on tax preferences were made available beginning in 1972.

24. Other variables such as the growth rate of GDP, the political climate, and the status of the public infrastructure are also considered. However, no significant effects have been shown to be related to these variables.

**Table 12.7 Comparison of Time-Series Regression Results for Foreign Direct Investment in Taiwan**

Independent Variable	Approved FDI (1972–87)					Actual FDI (1958–85)	
	FDI	FDI in Nonoil LDCs (%)	FDI from Japan	FDI from U.S.	FDI in Electronics	FDI	FDI in Nonoil LDCs, 1965–85 (%)
Intercept	-355,871 (-1.095)	7.9873 (2.3816)	-76.2681 (-0.590)	-6.0743 (-0.025)	-244.66 (-1.616)	0.2447 (0.385)	-0.0239 (-0.083)
GDP	1.6038 (5.423)**	0.00002 (4.958)**	0.0005 (4.142)**	0.0003 (1.374)	0.0005 (3.276)**		(RPCGDP) 0.2448 (0.763)
$\Delta$ GDP						0.3313 (2.783)*	( $\Delta$ AGDP) -0.0331 (-0.153)
Export ratio	14,901 (1.409)	-0.1390 (-1.274)	2.6505 (.06299)	0.9023 (0.114)	8.1398 (1.708)		
Dummy for export orientation						-0.5953 (-2.646)*	0.7716 (2.531)*
Wage index	-24,847 (-4.523)**	-0.2856 (-5.037)**	-7.5687 (-3.463)**	-4.0810 (-0.994)	-7.5706 (-2.686)*		
Dummy for export processing zones						1.3162 (3.739)**	
Tax preferences	4,871 (0.867)	0.1002 (1.729)	1.3916 (0.6228)	0.6769 (0.161)	3.6975 (1.156)		
Dummy for tax preferences						0.3769 (1.06)	
Adjusted $R^2$	0.9033	0.8301	0.8594	0.5543	0.7645	0.85	0.20
Durbin-Watson statistic	2.5396	2.5018	1.6656	2.6139	2.1260	1.54	1.95
$N$	16	16	16	16	16	28	20

Sources: Computational assistance for this study was provided by Hui-hse Chen. Actual FDI from Tsai (1991).

Notes: The numbers in parentheses are  $t$ -statistics; \* and \*\* indicate results significantly different from zero at either the 5 percent or 1 percent levels, respectively. RPCGDP =  $(RCGDP/PCGDPW) \cdot 100$ , where PCGDP is per capita GDP in Taiwan and PCGDPW is the average of per capita GDP in all non-oil-exporting LDCs.  $\Delta$ AGDP =  $(\Delta GDP/\Delta GDPW) \cdot 100$ , where  $\Delta$ GDP is annual change of GDP in Taiwan and  $\Delta$ GDPW is the average of annual change of GDP in all non-oil-exporting LDCs.

the increasing share of FDI going to domestic-oriented investment, particularly the service sector, as shown in table 12.5. However, both studies agree that the effect of tax preferences on FDI is insignificant.

### 12.5.2 Cross-sectional Studies

The data for the cross-sectional studies come from the financial statements of fifty-six foreign manufacturing firms that were eligible for tax holidays and reported their corporate income in 1984–86.<sup>25</sup> The dependent variable is the increase in net worth, which reflects both equity investment and reinvested earnings. The independent variables include the year of establishment, the before-tax profit rate, and tax preferences. Since the before-tax profit rate can be accounted for by a firm's characteristics, the following equation is estimated:

$$(2) \quad \Delta \text{Net worth} = c_0 + c_1 Y + c_2 ks + c_3 g + c_4 A + c_5 T_1 + C_3 T_2,$$

where  $\Delta \text{Net worth}$  = the average of the increases in net worth of a given firm during 1984–85 and 1985–86;  $Y$  = the year of establishment;  $ks$  = capital structure, measured by the average of liabilities divided by total assets of a given firm in 1984 and 1985;  $g$  = growth rate of a firm, measured by the average of the increases in sales divided by the total sales of a given firm in 1984 and 1985;  $A$  = size of a firm, measured by the average of total assets of a given firm in 1984 and 1985;  $T_1$  = the average of tax holiday benefits divided by before-tax profits of a given firm in 1984 and 1985; and,  $T_2$  = the average of other tax preferences divided by before-tax profits of a given firm in 1984 and 1985.

All  $c$ 's except  $c_1$  and  $c_2$  are expected to be positive. Equation (2) is estimated for the manufacturing sector and for the electronics industry only.

The regression results, as presented in table 12.8, can be summarized as follows:

1. The effect of the year of establishment is mixed. In each equation, one of the alternative factors of the before-tax profit rate has the expected sign and is significant.

2. The effects of tax policy are also mixed. In the manufacturing equations, neither a tax holiday nor any of the other tax preferences is significant. However, for the electronics industry, we find that tax holidays have a significant effect. The corresponding elasticity of the increase in net worth with respect to tax holidays, calculated at mean values, is approximately 0.42. This seems to imply that the abolition of tax holidays would lead to a 42 percent cut in the increase of the net worth of the electronics industry. The marginal impact would be very strong. The overall adverse effect is not so great, however,

25. These data are confidential for tax purposes and are supposed to be more reliable than those obtained from surveys. The data source for this study is the subfile of data used by Lee and Chu (1990).

**Table 12.8** Cross-sectional Regression Results of Foreign Manufacturing Firms in Taiwan, 1985–86 (in millions of N.T. dollars)

Independent Variable	Manufacturing Increase in Net Worth	Electronics Increase in Net Worth
Intercept	-490,680 (-0.54)	-1,328,100 (-0.83)
Year of establishment	-13,081 (-1.71)*	642.03 (0.05)
Liability/total assets	-34,342 (-0.38)	-323,890 (-1.79)*
Increase in sales/sales	4,224 (0.78)	1,470.5 (0.19)
Total assets	105,350 (2.69)**	114,130 (1.66)
Tax holiday preferences	392,540 (0.99)	908,630 (1.73)*
Other tax preferences	28,948 (0.06)	290,090 (0.35)
Adjusted R <sup>2</sup>	26.74	20.41
N	56	31

Source: Computational assistance for this study was provided by Yon-chin Tsen. Data are from Lee and Chu (1990).

Notes: The numbers in parentheses are *t*-statistics; \* and \*\* indicate results significantly different from zero for one-tailed tests at the 5 percent and 1 percent significance levels, respectively. All these firms were eligible for either five-year or four-year tax holidays during 1985–86.

since it accounts for only 6.7 percent of total net worth.<sup>26</sup> The adverse effect is also exaggerated in the sense that a firm not receiving a tax holiday can still enjoy the other tax preferences shown in table 12.1. Obviously, it is impossible for this study to project the whole potential impact of abolishing tax holidays on FDI in Taiwan, since the effects of tax incentives on other domestic-oriented industries would be much smaller, and the electronics industry's share of total FDI has decreased substantially in recent years.

The methodological inadequacy of this study is quite clear. No sophisticated theoretical model has been developed. D. Wu (1989) used a neoclassical model to study the determination of Japanese direct investment in Taiwan for the period 1970–84. However, a lag structure was not incorporated into the model due to data limitations.

Tsai (1991) pointed out that, to determine whether the demand-side determinants in Taiwan were relatively more important than those in other countries, all variables should be expressed in relative terms. Given the difficulty of estimating labor costs and tax preferences in various countries, a cross-national comparison is hardly feasible. Therefore, the findings of this study, using only the data of Taiwan, are at best tentative. However, these findings may be qualitatively valid if the twin trends of rising labor costs and increasing tax preferences in Taiwan continue.

In spite of these qualifications, the overall regression results seem to confirm the changing characteristics of FDI in Taiwan in recent years. As mentioned in section 12.4, the structure of Taiwan's FDI has become more ori-

26. This is calculated by multiplying 0.42 by 0.1588 (increase in net worth/total net worth).

ented to the domestic market, and it is expected that the effects of tax incentives are going to be less important than in the past. This conjecture is supported by the regression results of the time-series studies and by the firm-specific study on total manufacturing FDI in Taiwan. At the same time, high export-oriented investors have more countries to choose from nowadays, and they can expect to gain more from the provision of tax incentives. This is also confirmed by findings that tax holidays have a significant effect on increases in net worth in the electronics industry.

One important policy implication that may be derived from these findings can be related to income tax reform in Taiwan. As mentioned before, Taiwan currently has a relatively low corporate income tax, while it provides generous tax incentives. The questionable effectiveness of tax incentives and their costs in terms of equity and efficiency have raised growing doubts about their usefulness. The reforms proposed by the Tax Reform Commission (Chen and Cheng 1990) would broaden both the individual and business income tax bases, lower the income brackets for individual income tax, and reduce the highest marginal tax rate from 50 percent to 40 percent. Meanwhile, the business income tax rate would be raised from a marginal 25 percent to a flat rate of 35 percent, and complete dividend relief would be allowed for distributed profits.<sup>27</sup>

Under this reform package, current tax holidays and most of the other major incentives would be abolished. Therefore the effective tax rate for FDI in Taiwan would increase from 11.26 percent or 19.47 percent (table 12.2) to 35 percent or 48 percent, depending on whether the withholding tax on repatriated profits is paid out of business income tax. If the tentative results of this study are reliable, they imply that some highly export-oriented FDI would be heavily affected, while the overall impact on total FDI might be less substantial. This policy change, however, would improve the neutrality of resource allocation and meet the need for a more internationalized and liberalized economy.

## 12.6 Summary and Implications

This paper provides some observations taken from empirical studies and examines the possible effects of a change in tax policy on FDI in Taiwan. In theory, the fiscal incentives offered by a developing host country, which lower its effective tax rate, will in most cases be effective in attracting FDI. How responsively FDI reacts to these tax concessions, however, is *a priori* unclear.

In the case of Taiwan, we observe that the island increasingly attracted FDI during the 1980s, both in absolute and in relative terms. Meanwhile, the

27. In Taiwan all profit-seeking enterprises, including proprietorships and partnerships as well as corporations, are subject to a business income tax. In making comparisons with other countries, however, we have used the term "corporate income tax" as the equivalent of Taiwan's "business income tax."

structure of FDI has moved towards the service sector and other domestic-oriented industries.

Current tax incentives in Taiwan are very generous: eligible firms may, on average, enjoy approximately a one-third tax savings. On the basis of new data, the time-series regression for the period 1972–87 reveals that GDP has a positive effect on FDI, while rising labor costs have a negative effect. The effect of tax preferences is found to be insignificant, however, as was shown in previous studies.

The findings from firm-specific data are mixed. For all manufacturing firms, it is found that tax preferences have no significant effect on increases in net worth. On the other hand, tax holidays were found to have a significant effect on increases in net worth in the electronics industry. The marginal impact of abolishing tax holidays on investment in the electronics industry is predicted to be substantial, perhaps causing as much as a 42 percent reduction. However, the adverse impact is overestimated in the sense that other incentives may cushion or make up for part of the impact. The overall adverse impact on total FDI is also expected to be considerably less because of differences in the market orientation of industries and the electronics industry's decreasing share of total FDI.

While the limited supply of data is a severe problem, two basic policy implications can be derived from these findings. First, to understand whether and to what extent foreign capital may be withdrawn from Taiwan in response to the unilateral abolition of tax incentives, further studies should be performed focusing on those industries that face severe competition for foreign capital. Second, since Taiwan's domestic and foreign investment is now undergoing structural changes, both industrial and tax policies should be adjusted rapidly, in a coordinated way, by taking into account both domestic and international considerations. As Taiwan's economy becomes more internationalized, the neutrality of resource allocation should be more important than before, and thus dependence on tax incentives should be gradually reduced.

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## Comment Kwang Choi

Overall, Ching-huei Chang's and Peter Cheng's paper is excellent, providing a good summary of theoretical issues in general and the characteristics of foreign direct investment (FDI) in Taiwan.

Kwang Choi is professor of public economics at the Hankuk University of Foreign Studies.

The contribution of the paper lies in its attempts, based on new data and new models, to ascertain the effects of tax policy on FDI in Taiwan. However, the attempts have been only partly successful for both theoretical and statistical reasons. Two technical points must be mentioned with regard to the time-series econometric testing of relationships between tax incentives and inflow of FDI into Taiwan.

First, I would like to ask whether Chang and Cheng have ever run time-series regressions based on time-lag specifications. Since it takes time for corporate managers or owners (particularly foreigners) to make decisions on FDI, one might say that there must be better specifications with regard to the time lag.

Second, one may ask a rather fundamental question about the role that tax preferences play in inducing FDI. *Ceteris paribus*, the decision to invest in the home country or a foreign country depends on the relative tax advantage between the two. Accordingly, tax preferences enjoyed by foreign firms should be measured by the difference between the effective corporate tax rate in the host country and the effective corporate rate in the rest of the world, including the home country, rather than by the difference between the highest marginal corporate income tax rate and the average effective tax rate.

With regard to the cross-sectional studies based on the financial statements from fifty-six foreign manufacturing firms in Taiwan, I cannot clearly see how the specifications (equations [2] and [3]) examine the effects of Taiwanese tax policy on inducing FDI. What equations (2) and (3) attempt is to examine the effects of tax preferences on the increase in net worth (not on FDI) within Taiwan (not between countries).

One important factor that might have exerted strong influences on the inflow of FDI into Taiwan but has not been mentioned at all is investment by overseas Chinese. It should be interesting to investigate the size of FDI in Taiwan by overseas Chinese and the area in which it is found.

Finally, I have one minor technical suggestion for presenting the average figure in the note to table 12.4. How about showing a simple average for 1952–1989, instead of a “simple average for the selected years shown in the table.”

Chang and Cheng should be congratulated on their excellent efforts to elucidate tax policy and FDI in Taiwan.

## Comment Toshihiro Ihori

Ching-huei Chang's and Peter Cheng's paper investigates empirically the impact of tax policy on foreign direct investment (FDI) in Taiwan. Their review

of the literature shows that the tax incentives will in most cases be effective in attracting FDI. However, section 12.4 shows that the effect of tax preferences is actually insignificant. I found the empirical results quite interesting.

I think that there are three possible reasons why the theoretical conjecture is not confirmed by the empirical study. First, the real world may be characterized by “resident”-based taxation in the tax credit case, so that neither the home country tax nor the host country tax affects the firm’s international investment decision, theoretically.

Second, the measurement of the tax preferences may be inaccurate. I am not convinced that the tax preferences can be measured by the difference between the highest marginal tax rate and the average effective tax rates.

Finally, even if the tax incentives are attracting FDI, it might take time or require some adjustment costs to make an actual investment. It seems quite possible that the short-term effect of the tax incentives on FDI is small but the long-term effect is large. I think that the paper would be improved by being more explicit about the dynamic behavior of FDI and by incorporating some lag structures into the regression.