

An Analysis of the Trade-Investment Relationship Across the Taiwan Strait

Allen Y. Tso

Associate Research Fellow
Institute of International Relations
National Chengchi University

Over the past decade, there have been many studies of cross-Strait trade and investment relations based on the theories of comparative advantage. However, none have provided a satisfactory explanation of the cross-Strait trade-investment complementarity. In this paper, the author attempts to use a footloose specific factors model to analyze the moving forces which shape the patterns of cross-Strait trade and investment. The model shows that Taiwan's investment in the Chinese mainland has been determined by the comparative advantages of the two sides, as well as the absolute advantages that Taiwan enjoys relative to the mainland and other institutional factors. The model also helps clarify some commonly-confusing issues linked to cross-Strait trade and direct investment.

Keywords: cross-Strait trade and investment; trade-investment complementarity; comparative advantage; footloose specific factors

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Over the past decade, the fast economic integration of the Chinese mainland, Hong Kong, and Taiwan has become a major issue in studies of Asia-Pacific economic development. With prospering trilateral trade and large-scale capital flows, the three economic entities that have a common cultural background and geographic proximity have been in a dynamic process of economic integration, with a rosy prospect for the formation of a Chinese Economic Area. According to statistics released by the World Trade Organization (WTO), the total trade volumes of the three areas in 1994 amounted to US\$731 billion, which exceeded Japan and ranked only next to the United States and the European Union (EU). An estimate made by the World Bank also shows that by the year 2010, the three fast-growing economic entities together will yield one-sixth of the world's total gross production. If they are measured using Purchasing Power Parity (PPP), the size of their combined economies would be roughly

equal with those of the United States and the EU.¹

Up to now, most studies on the economic integration of the three entities have adopted the theories of comparative advantage developed by Heckscher-Ohlin and Ricardo. However, a careful examination of cross-Strait economic data shows that the theories, although conducive to a qualitative understanding of cross-Strait economic relations, fail to explain satisfactorily the trade-investment complementarity in the data. To address this deficiency, this paper will attempt to use a footloose specific factors model to analyze the division of labor and economic integration of the three areas.

The first section of the paper will give a retrospect of cross-Strait trade and investment since 1979. Next, a model will be built to study the underlying factors and forces that have shaped the pattern of cross-Strait investment. The third section will discuss the implications of the model, with suggestions for further studies.

Cross-Strait Trade Development Since 1979

Before 1979, some indirect trade was conducted between the two sides of the Taiwan Strait, although its volume was quite small (less than US\$80 million in 1979). But since Beijing's implementation of reform and opening-up policies, it has continually increased. By the year 1987, the sum of all available trade statistics reached US\$1.5 billion. That year marked a new stage for the cross-Strait economic and trade relationship, thanks to Taipei's lifting of the ban on visits to mainland family members. Since then, cross-Strait trade has maintained a 35 percent growth rate each year, outpacing the individual growth rates of the two sides. According to statistics released by the Board of Foreign Trade (BOFT) under the Ministry of Economic Affairs (MOEA), cross-Strait trade in 1994 was worth US\$16.5 billion, of which US\$14.65 billion consisted of Taiwan's exports to the Chinese mainland and US\$1.85 billion was Chinese exports to Taiwan. The trade volume between January and June 1995 alone amounted to US\$1.13 billion. Extrapolated with simple linear methods, the projected trade value of the whole year would be over US\$20 billion (see table 1).

¹*Liang 'an jingmao yuebao* (Cross-Strait Economic and Trade Monthly) (Taipei), July 1995.

Table 1
Volume, Growth Rate, and Interdependence of Cross-Strait Indirect Trade

Year	Total Trade Volume			Estimated Exports to Mainland China			Imports from Mainland China		
	Amount (US\$m)	Growth rate (%)	Ratio (%)	Amount (US\$m)	Growth rate (%)	Ratio (%)	Amount (US\$m)	Growth rate (%)	Ratio (%)
1979	77.8	—	0.25	21.5	—	0.13	56.3	—	0.38
1980	311.2	300.0	0.79	235.0	993.0	1.19	76.2	35.3	0.39
1981	459.4	47.6	1.05	384.2	63.5	1.70	75.2	-1.3	0.35
1982	278.5	-39.4	0.68	194.5	-49.4	0.88	84.0	11.7	0.44
1983	247.7	-11.1	0.55	157.8	-18.9	0.63	89.9	7.0	0.44
1984	553.3	123.4	1.06	425.5	169.6	1.40	127.8	42.2	0.58
1985	1,102.7	99.3	2.17	986.8	131.9	3.21	115.9	-9.3	0.58
1986	955.5	-13.3	1.49	811.3	-17.8	2.04	144.2	24.4	0.60
1987	1,515.4	58.6	1.71	1,226.5	51.2	2.28	288.9	100.3	0.83
1988	2,702.9	78.4	2.45	2,224.2	81.3	3.67	478.7	65.7	0.96
1989	3,831.7	131.7	3.23	3,244.8	45.9	4.89	586.9	22.6	1.12
1990	4,936.7	28.8	4.05	4,171.3	28.6	6.21	765.4	30.4	1.40
1991	8,054.2	63.1	5.79	6,928.3	66.1	9.09	1,125.9	47.1	1.79
1992	10,815.8	34.3	7.05	9,696.8	40.0	11.90	1,119.0	-0.6	1.55
1993	13,831.4	27.9	8.44	12,727.8	31.3	14.88	1,103.6	-1.4	1.43
1994	16,511.7	20.1	9.30	14,653.0	15.7	15.70	1,858.7	83.0	2.20

Source: *Dalu jingji xingshi pinggu (1994)* (An appraisal of mainland China's economic situation, 1994) (Taipei: MOEA, June 1995), 42.

From table 1, we find that before 1979, cross-Strait trade volume accounted for less than one percentage point of the respective total trade volumes of the two sides. Although some growth was reported between 1979 and 1985, a steady and systematic growth did not emerge until 1987. However, between 1986 and 1994, the ratio of cross-Strait trade to mainland Chinese total trade volume rose from 1.3 percent to 7 percent; the ratio to Taiwan total trade increased from 1.49 percent to 9.3 percent. In 1994, Taiwan exports to the mainland accounted for 15.7 percent of its total exports, while its imports from the latter accounted for 1.5 percent of its total imports. In the same year, the mainland's imports from Taiwan accounted for 12.7 percent of the former's total imports. Because of Taipei's restriction of final product imports from the mainland, mainland exports to Taiwan totalled a mere 2.2 percent of its total exports. As a high degree of economic interdependence has been developed between the two sides, Taiwan has become the mainland's fourth largest trading partner, after Hong Kong, the United States, and Japan.

Taiwan's exports to the mainland have been composed mostly of capital goods like machinery equipment and intermediate goods such as synthetic fibers, yarns, electric equipment, electronic parts

Table 2
Cross-Strait Entrepôt Trade Through Hong Kong

1995 (Jan.-July)(US\$m)rate (%) (US\$m)rate (%) (US\$m)rate (%) Balance							
Year	Total Trade Volume		Exports to the Mainland		Imports from the Mainland		Balance
	Value (US\$m)	Growth rate (%)	Value (US\$m)	Growth rate (%)	Value (US\$m)	Growth rate (%)	
1979	77.8	—	21.5	—	56.3	—	-34.8
1980	311.2	300.0	235.0	994.0	76.2	35.4	158.8
1981	459.2	47.6	384.2	63.5	75.2	-1.4	309.0
1982	278.5	-39.4	194.5	-49.4	84.0	11.8	110.4
1983	247.7	-11.1	157.8	-18.8	89.9	6.9	68.0
1984	553.2	123.3	425.5	169.6	127.8	42.2	297.7
1985	1,102.7	99.3	986.8	132.0	115.9	-9.3	870.9
1986	955.6	-13.4	811.3	-17.8	144.2	24.4	667.1
1987	1,515.5	58.6	1,226.5	51.2	288.9	100.4	937.6
1988	2,720.9	79.5	2,242.2	82.9	478.7	65.7	1,763.5
1989	3,483.4	28.0	2,896.5	29.9	586.9	22.6	2,309.6
1990	4,043.6	16.1	3,278.3	13.2	765.4	30.4	2,512.9
1991	5,793.1	43.3	4,667.2	42.4	1,126.0	47.1	3,541.2
1992	7,406.9	27.9	6,287.9	34.7	1,119.0	-0.6	5,169.0
1993	8,689.0	17.3	7,585.4	20.6	1,103.6	-1.4	6,481.8
1994	9,809.5	12.9	8,517.2	12.3	1,292.3	17.1	7,224.9
1995 (Jan.-July)	6,591.9	22.2	5,698.5	21.4	893.4	27.5	4,805.1
July	968.5	17.3	834.0	14.3	134.5	39.8	699.5

Source: *Liang'an jingji tongji yuebao* (Monthly Report on Cross-Strait Economic Statistics) (Taipei), September 1995, 20.

and accessories, and plastic raw materials. Mainland imports have focused on primary goods such as agricultural and industrial raw materials (e.g., coal, zinc, lumber, granite, Chinese herbal medicine, and feathers), and industrial semifinished products (e.g., semifinished steel articles, shoes or boots). Such a trade pattern conforms with the current economic development of the two sides; that is, Taiwan tends to provide capital-intensive, high value-added goods, while the Chinese mainland tends to export labor-intensive, low value-added goods, with relatively low technology required in their production.

For years, thanks to Taipei's official restriction of direct trade with the mainland, Hong Kong, with its geographic advantages, has been the major entrepôt in cross-Strait indirect trade. In the first half of 1995, indirect trade through Hong Kong amounted to 49.86 percent of total cross-Strait trade, with a volume of US\$5.6 billion: US\$4.86 billion for exports to the mainland and US\$759 million for

imports. Table 2 shows that 61 percent of Taiwan's total exports to Hong Kong in this period were reexported to the mainland, and 35 percent of Hong Kong's total exports to Taiwan were reexported from the mainland.

Despite Taipei's official restrictions on direct trade, *de facto* direct trade has existed between the two sides by way of transshipment and cargo in transit. As these two modes of trade are contrary to Taiwan's insistence on indirect trade, their data, like that of illegal direct shipments, have been difficult to obtain. In recent years, the continual expansion of cross-Straits trade has raised expectations among Taiwan firms that direct transport links between the two sides will be eventually opened. As a result, the above two modes of direct trade have become increasingly popular in order to improve transport efficiency and save on transport costs. The statistics thus reflect a continuous decline in the ratio of the indirect trade to the total cross-Straits trade volume: a drop from 89.67 percent to 49.86 percent between 1989 and the first half of 1995. In the meantime, the ratio of direct trade has gone up from 10.23 percent to 50.14 percent, or over half of total cross-Straits trade volume.²

The Relationship Between Cross-Straits Trade and Investment

Since Taipei lifted the ban on visits to family members on the mainland in 1987, Taiwan has increased direct investment in the Chinese mainland. According to the statistics of the MOEA's Investment Commission, direct investment to the Chinese mainland totalled US\$174 million by the end of 1991, escalated to US\$247 million in 1992, and reached US\$3.17 billion with 9,329 projects in 1993. But in comparison with the contractual figures released by the PRC's Ministry of Foreign Trade and Economic Cooperation, the figures given by Taiwan each year have been at least five to six times less (see table 3). Even the realized investment figures of the mainland could still be two times as large as Taiwan's.

It is widely believed that at the end of 1995, Taiwan had established nearly 30,000 factories in the Chinese mainland, with a total investment of US\$24.4 billion.³ These factories were mostly

²Allen Y. Tso, "Calculating Cross-Straits Trade: An Analysis of Statistical Methods," *Issues & Studies* 32, no. 6 (June 1996): 37-54.

³This data does not include Taiwan-funded investment registered in Hong Kong.

Table 3
Taiwan's Indirect Investment in the Chinese Mainland

Unit: US\$ Million

Year/Month	MOEA's Approved Projects			Projects Approved by the Chinese Mainland			
	No. of projects	Value	Value per project	No. of projects	Negotiated value (A)	Value per project	Realized value (B) Ratio of B/A (in %)
1991 (including those before 1991)	237	174.16	0.73	3,800	3,450	0.91	872 25.28
1992	264	246.99	0.94	6,430	5,540	0.86	1,053 19.01
1993	9,329	3,168.41	0.34	10,948	9,970	0.91	3,139 31.48
1994	934	962.21	1.03	6,247	5,397	0.86	3,391 62.83
To 1994	10,764	4,551.78	0.43	27,425	24,357	0.89	8,455 34.71
Jan.-Aug. 1995	344	736.96	2.14	—	—	—	—
To Aug. 1995	11,108	5,288.73	0.48	—	—	—	—

Source: *Liang'an jingji tongji yuebao*, September 1995, 20.

scattered in coastal provinces such as Jiangsu, Fujian, Zhejiang, and Guangdong. The lion's share of investment went to light industries, including electronics, electric equipment, food and soft drinks, plastic manufactures, and textiles. Presently, Taiwan ranks second in foreign direct investment to the Chinese mainland, beyond the United States and Japan and only after Hong Kong/Macao.

With a careful study of Taiwan's trade with and direct investment in the Chinese mainland, we find that there is a very close relationship between cross-Strait trade patterns and capital flow. Based on a survey made in 1995 by the Chung-Hua Institution for Economic Research in Taipei, Taiwan-funded factories in the Chinese mainland have heavily relied on imported machinery equipment, parts and accessories, and raw materials from home. It is estimated that nearly two-thirds of mainland Chinese imports from Taiwan have originated from this demand for capital and intermediate goods. Since Beijing still controls its domestic market, most of these imported intermediate goods are turned into final goods through the value-adding process and then reexported to the United States, Japan, and Europe. This has resulted in a conspicuous complementarity between the growth of cross-Strait trade and that of investment.

Many Taiwan scholars have attempted to interpret the relationship between cross-Strait trade and investment with theories of comparative advantage. Their argument is that the trade between the two sides is chiefly inter-industry trade, as intra-industry trade has been quite insignificant in both ratio and volume. This phenomenon reflects the influence of productivity differentials and factor endowment differences on cross-Strait trade. Therefore, despite distortions due to both sides' policies, many scholars think that the Heckscher-Ohlin or Ricardian theories should apply in explaining the dominating factors which determine the patterns of cross-Strait trade interactions.⁴

But if one adopts the Heckscher-Ohlin theory of factor endowments, he will encounter difficulty in applying Robert Mundell's related theory to explain the relationship between cross-Strait trade and direct investment. According to Mundell, when a relatively

⁴For instance, because of Taipei's restrictions on the importing of final products from the Chinese mainland, imports from the latter are distorted and cannot reflect the comparative advantages of both sides in manufactured products.

capital-abundant country invests in a labor-abundant country, the flow of capital will create a “substitute” phenomenon for bilateral trade.⁵ As the inflow of foreign capital would help the labor-abundant country enhance its productivity in capital-intensive commodities and thus reduce its imports for those goods, a negative correlation between trade and direct investment would result. This rationale is obviously contrary to the complementary phenomenon revealed in the cross-Strait data.

Likewise, if one adopts the Ricardian productivity differential theory, he would encounter difficulty in applying James Markuson's related theory. Markuson believes that the exports of products with an absolute advantage in labor productivity would result in an increase of a country's real income and wages.⁶ Under the condition of free labor movement, the higher wages would attract an inflow of foreign laborers, which would further enhance the competitiveness of related export industries. Under such conditions, trade and investment would complement each other. Yet, Markuson's theory cannot be applied to the interpretation of capital flows across the Strait because it is limited by the labor theory of value. In addition, Taiwan still bans the inflow of mainland Chinese workers.

In short, although Heckscher-Ohlin's and Ricardo's theories may be helpful in qualitatively interpreting cross-Strait economic and trade relations, a more suitable theoretical model is needed to explain the complementarity between cross-Strait trade and investment.

The Footloose Specific Factors Model

This section introduces an economic model to analyze the relationship between cross-Strait trade and investment. In order to properly model cross-Strait trade and investment, the author believes that the following stylized facts need to be considered:

1. In terms of products' life cycles, Taiwan's investment mostly concentrates on mature, labor-intensive products.
2. In these invested industries, Taiwan holds an absolute technical advantage over the Chinese mainland, instead of a comparative

⁵Richard E. Caves, Jeffrey A. Frankel, and Ronald W. Jones, *World Trade and Payments* (Glenview, Ill.: Scott, Foresman, 1990), 170-90.

⁶*Ibid.*

advantage based on resource endowment as described by Heckscher and Ohlin.

3. These industries require support from related upstream industries for raw materials, parts, and components. Thanks to its past experience, Taiwan enjoys an absolute advantage in these areas, which at this time the Chinese mainland still cannot match.

4. In addition to the domestic intermediate products, these industries also use intermediate inputs produced in a third country.

5. The model should explain why investment in the mainland may cause competition between Taiwan and the mainland's products in the U.S. and Japanese markets.

In the model, we assume that the home country sells a manufactured product to the world market. Its production requires two kinds of factors: "general purpose" factors such as labor force and land, and "specific factors" which are specific only to the production of this product and cannot be transferred for other uses, such as specific capital (factories, equipment), technology, managerial know-how and past production experience, and specific intermediate inputs. The inclusion of the specific factors in our specifications makes the model markedly different from the traditional Heckscher-Ohlin and Ricardo models.

For simplicity, we assume constant returns to scale in production. With this assumption, the roundabout production system or the value-added processes for the product can be briefly presented as follows:⁷

Raw materials, semifinished goods, parts and components → final goods → international marketing

Similar to conventional trade theories, the model assumes no international mobility of labor and land. Yet, in contrast to the former, the model assumes that the specific factors like capital, factory equipment, and technical experience are internationally mobile. That is, the production process using these specific factors can migrate from country to country, depending on economic conditions.

Furthermore, in the model it is assumed that the home country,

⁷Take the textile industry, for instance. The different stages of production for ready-made garments include production of synthetic or natural fabrics, production of yarns and textile articles, dyeing, and tailor work.

with its expertise and experience in production, has the absolute advantage in those industries providing specific intermediate inputs. Thus, no matter where the final goods are produced, be it at home or abroad, the production of related upstream or intermediate-stream specific intermediate factors is completely specialized at home.

In an international market with perfect competition, a firm faces the problem of how to choose an appropriate location for the processing of the final product. Again, to make it simple, we assume that the firm has only two alternatives for location. One is production in the home country, utilizing domestic primary factors in combination with domestic and imported intermediate inputs to produce the final product and sell it in the world market. The other is the adoption of the forward vertical integration strategy: making investments abroad (here the Chinese mainland), importing specific machinery equipment, as well as intermediate inputs from home and foreign countries, and after they have been processed, selling the final goods in the international market or the host country's market.⁸

Even in an environment with perfect competition, the differences in economic conditions and cost structures at home and abroad will cause a difference in profits in both locations. Therefore, comparing the cost structures of the home and host countries allows us to decide which location holds the production advantage.

We can denote the factor requirements for each unit of final goods produced at home as follows: labor hours (a_L), land service (a_q), capital service (a_K), domestically-produced intermediate goods (a_D), and foreign-produced intermediate goods (a_F). The factor requirements for each unit of final goods produced abroad are labor hours (b_L), land service (b_q), capital service (b_K), domestically-produced intermediate goods (b_D), and foreign-produced intermediate goods (b_F).

Further, let us denote domestic wage rate as w_T , domestic costs of land as q_T , and the domestic returns to capital as r_T . Let us also denote host country's wage rate as w_c , its costs of land as q_c , and its rate of returns to capital as r_c . In addition, we define the international price of the final goods as P , the price of domestically-produced

⁸Other two kinds of integration for international investment are backward vertical integration and horizontal integration. Here, because of the space limitations, only forward vertical integration is discussed.

intermediate goods as P_I , the price for foreign-produced intermediate goods as P_F , and the transport costs for intermediate goods as t .

Under perfect competition with zero abnormal profits, the cost-price relations for production at home can be expressed in the following equation:

$$a_L w_T + a_q q_T + a_K r_T + a_I P_I + a_F P_F = P \quad (1)$$

Based on the equation, for each unit of final good, the home country creates a value of $a_L w_T + a_q q_T + a_K r_T + a_I P_I$, and the third country contributes to the value addition with an amount of $a_F P_F$.

The cost-price relation for production abroad would be:⁹

$$b_L w_C + b_q q_c + b_K r_c + b_I (P_I + t) + b_F P_F = P \quad (2)$$

in which the value added by the home country for every unit of final products sold in the international market is $a_K r_T + a_I + P_I$; the value added by the third country remains $a_F P_F$, and the host country's contribution of labor and land is $b_L w_c + b_q q_c$. $b_I t$ is the transport cost for intermediate inputs.

The assumption that specific factors can migrate from country to country enables the firm to choose the optimal production location according to relative factor returns of specific capital (hereafter referred to as capital returns).¹⁰ The firm can also first decide on the required rate of returns for the specific capital and then choose the location with the lowest production cost and therefore the greatest international competitiveness. In symbols, only when $r_c > r_T$ will the firm be motivated to choose investment abroad.

Assuming that the labor and specific capital are more productive at home relative to the host country, we have:

$$a_K < b_K, a_L < b_L$$

In addition, to simplify the comparison of capital returns between home and abroad, we can assume:

$$a_q = b_q, a_I = b_I, a_F = b_F$$

⁹The equation assumes that the transport costs of foreign-produced intermediate goods are the same to the home and host countries.

¹⁰Here, the specific capitals include both physical capital (e.g., machinery equipment) and human capital (e.g., managerial and technological know-how, experience). In this paper, capital returns includes proper summation of the two kinds of capitals.

With the above assumptions, the difference in capital returns between home and abroad can thus be calculated as follows:

$$r_C - r_T = \frac{1}{b_K} [(1-g)P + (g-1)a_I P_I - b_I t + (g-1)a_F P_F + (g - \frac{b_L w_C}{a_L w_T}) a_L w_T + (g - \frac{q_C}{q_T}) a_q q_T \dots\dots\dots (3)$$

in which $g = b_K/a_K$ is the relative efficiency of the specific capital in two locations. Based on the above formula, we can analyze the following factors for choosing the best location for production.

1. The relative efficiency (or productivity) of capital at home and abroad (b_K/a_K): Affected by various operating environments, an investor's willingness to make investment abroad is inversely related to the differences of capital efficiency between home country and host country. The higher the capital efficiency at home compared to the host county, the less likely a foreign direct investment will be made. On the other hand, the lower the former, the more likely foreign direct investment will be.

2. The international price of final goods (P): Generally, for mature products which carry a low price and are produced with outdated technology, labor cost plays an important role in comparing the rates of returns to capital at home and abroad. The lower the international price of the final goods, the more relative advantages the location with lower labor costs will enjoy. Conversely, for goods which require advanced technology and enjoy a high international price, relative capital efficiency will play a deciding role; and the location with lower labor costs would be at a disadvantage in attracting investment.

3. The price of the intermediate products of both home country (P_I) and the third country (P_F): Other things unchanged, the higher the price of intermediate goods, the lower the added value in producing the final product and the more prominent the role of wages in comparing relative capital returns. Thus, the location with lower wages becomes a more attractive choice for the production of the final goods.

4. The relative labor productivity (b_L/a_L): The higher the labor productivity of the home country relative to that of the foreign country, the more attractive is the choice to produce at home. On the other hand, if the relative labor productivity of the home country is low compared to abroad, the more likely a firm would choose to

produce abroad.

5. The relative wages (w_C/w_T): In general, developed countries have higher wages than developing countries, the wage difference causing a difference in capital returns. The lower the relative wages (w_C/w_T), the more attractive it is for a firm to transfer its production process abroad. Nonetheless, from equation (3), we see that relative wage differences are not the only factor in deciding on the optimal production location. Factors such as relative labor productivity and relative capital efficiency should also be considered.

6. The relative cost for land (q_C/q_T): When the cost of using land at home is relatively higher than in the host country, the rate of return to capital will be higher in the host country. The latter's higher capital returns will increase the attractiveness of transferring production abroad.

7. The transport costs for intermediate goods (t): The transport cost includes expenses for transportation, insurance, and customs taxes. The higher the transport costs, the higher would be the cost of production abroad, and the less likely an enterprise will make a foreign investment. Given this, direct transport between the two sides of the Taiwan Strait would reduce the transport costs for intermediate goods and thus would increase Taiwan's investment in the mainland. In contrast, Beijing's recent decision to abolish from this year the preferential measures given to foreign enterprises for machinery equipment imports will negatively affect the inflow of foreign direct investment to the mainland.

In addition to the aforementioned factors, other variables can be readily incorporated into the model. The following briefly discusses these factors:

8. General investment environments: The relative capital efficiency (b_K/a_K) is affected not only by factory management but the investment environment factors. These environmental factors include regulations, government administrative efficiency, and infrastructure conditions (i.e., transportation and energy supply). As these factors will directly affect relative profits, they will also be considered by an enterprise in its decision on foreign investment.

9. Home and host countries' taxation policies: Obviously, other conditions being equal, these taxation policies would significantly affect the relative after-tax returns to capital at home and abroad. For instance, we can define x_T as the home country's profit tax and x_C as the host country's profit tax. An investor can calculate the relative after-tax returns by $(1 - x_C) r_C - (1 - x_T) r_T$, and decide which

location is more profitable.

10. The substitutability of the host country to produce intermediate goods: In the model, it is assumed that the host country does not produce intermediate inputs required for the production of the final goods. However, if the host country can produce substitutes for these imported intermediate inputs, the presence of transport costs will place the home country at a disadvantage in supplying these intermediate inputs. To avoid being replaced by their competitors in the host country, some of these upstream industries supplying intermediate inputs will have an incentive to move simultaneously to the host country. This would result in the so-called "industrial hollowing-out" in the home country.

11. Transport costs for shipping the final goods to the international market: Other things being equal, a firm would choose a location with relatively lower transport costs so as to enhance the competitiveness of the final goods in the international market. This can easily explain the fact that most export-oriented foreign enterprises in the Chinese mainland are located in the coastal areas.

12. Preferential trading arrangements: For instance, if the host country enjoys preferential arrangements in customs tariffs (such as MFNs) from other countries, the firms in the home country will have an incentive to transfer their production to the former in order to enhance their products' competitiveness.

13. Exchange rate: An appreciation of the exchange rates would reduce the international competitiveness of domestic firms, particularly for those industries with greater elasticity of exports. This could lead to an increase in direct investment abroad.¹¹

Judging from the foregoing analysis, we find that Taiwan investment in the Chinese mainland has been affected by various factors. The model, simple as it is, provides a systematic structure for the analysis of these factors. It shows that cross-Strait direct investment is affected not only by the comparative advantages of both sides, but also by the absolute advantage that Taiwan has enjoyed, as well as some other institutional factors. As the results of the analysis mirror many Taiwanese businessmen's experiences, it proves the model's adaptability in interpreting cross-Strait economic and trade relations.

¹¹This will take place only when the exchange rate is at a disequilibrium.

This model can also apply to other countries' investment behavior in the Chinese mainland, including South Korea, Hong Kong, and Japan. For instance, according to a survey made by the Trade Association of South Korea, Korean enterprises which invest in the Chinese mainland only had to pay monthly wages to Chinese workers which amounted to merely 12.6 percent of wages paid to native workers at home (if including fringe benefits valued at around one hundred percent of the wages, then 25 percent). According to the investigation, the Chinese mainland's labor productivity is equivalent to 56 percent of South Korea's, while the quality of the goods it produces is equivalent to 66.3 percent. In addition, average expenses for the rent and maintenance of factories in the Chinese mainland are only 45.6 percent of those in South Korea, and the management costs are only 63.1 percent.¹² All these factors have been incentives for the growth of Korean direct investment in the Chinese mainland.

Other Related Discussions

With increasing global liberalization of trade and investment, multinational enterprises have actively sought to establish global production networks by moving factors of production across the world and choosing the best investment locations according to factor returns. This perspective of the international movement of specific factors, which establishes a global production system based on the most efficient intra-industry division of labor, may shed some light on the following issues concerning cross-Straits investment and trade:

1. *The relationship between trade and investment.* If we denote K as the home country's investment abroad, Q/K as the output-capital ratio, and EX as home country's exports of intermediate inputs for overseas production, we have the following equation:

$$EX = b_1 P_1 (Q/K) K$$

which reveals a direct link between a country's foreign investment and its exports. This can immediately explain the complementarity between cross-Straits trade and investment.

¹² *Dalu jingmao touzi yuebao* (Mainland Economic, Trade, and Investment Monthly) (Taipei), no. 41 (July 1995).

From the equation, we see that Taiwanese direct investment in the mainland, which is a capital account transaction, is followed by an increase in the exports of machinery equipment and intermediate goods to the latter. Therefore, when studying the balance-of-payments effect of Taiwanese investment in the mainland, we should consider not just its effect on the capital account, but also its chain effect on the current account.

2. *The competition between mainland Chinese goods and Taiwan goods in international markets.* This is an issue which has concerned many Taiwan government officials and scholars. From tables 4 and 5, we have a picture of the increases in mainland Chinese exports and the decline of Taiwan exports to Japan and the United States between 1984 and 1994. It should be pointed out, however, the so-called "mainland Chinese products" or "Taiwan products" are mostly defined according to the locations where the final products are finished, neglecting the services of those production factors which add value.

There is no doubt that Taiwanese investment in the Chinese mainland will create a trade diversion to its final goods in the international market. Yet, this will not necessarily lead to a reduction in exports of the services of Taiwan's production factors. This is because Taiwanese investment in the mainland also produces an indirect trade-creation effect, which must also be taken into account when calculating the gross national product (GNP) of Taiwan. In short, a correct understanding of the effect of Taiwanese investment in the mainland on Taiwan's production factors relies on paying attention not only to the changes in final goods' export volumes, but also to the value added by production factors which are indirectly exported from Taiwan-funded factories in the mainland to the United States and Japan. It is necessary to consider the latter effect so as to correctly assess the impact of Taiwanese foreign direct investment on national income generated by Taiwan's production factors.

3. *The impact of Taiwan's direct investment in the Chinese mainland on employment at home.* Based on the model, such an investment is basically one involving division of labor in production factors between two different locations, and is an indirect way for Taiwan to produce factor services with more efficiency. Taken from the angle of partial equilibrium, the outflow of capital may cause unemployment problems, but in terms of general equilibrium, this outflow will generate an effect equivalent to the import of the mainland Chinese labor and land to Taiwan.

Table 4

A Comparison of U.S. Imports from Taiwan and Mainland China

Year	Imports from Taiwan (A)			Imports from Mainland China (B)			A/B (times)
	Value (US\$m)	Growth rate (%)	% of U.S.'s total imports	Value (US\$m)	Growth rate (%)	% of U.S.'s total imports	
1984	14,765	31.8	4.57	3,064	36.5	0.95	4.82
1985	16,396	11.0	4.77	3,860	26.0	1.12	4.25
1986	19,791	20.7	5.37	4,711	23.6	1.29	4.15
1987	24,622	24.7	6.12	6,194	31.9	1.54	3.91
1988	24,804	0.7	5.67	8,512	35.2	1.95	2.91
1989	24,326	-1.9	5.20	11,988	40.8	2.56	2.03
1990	22,667	-6.8	4.62	15,224	27.0	3.10	1.49
1991	22,941	1.2	4.75	18,855	23.9	3.90	1.22
1992	24,530	6.9	4.68	25,514	35.3	4.87	0.96
1993	24,891	1.8	4.35	31,425	23.2	5.47	0.79
1994	26,586	6.4	4.04	38,572	22.7	5.86	0.69

Source: *Dalu jingji xingshi pinggu*, 46.

Table 5

A Comparison of Japanese Imports from Taiwan and Mainland China

Year	Imports from Taiwan (A)			Imports from Mainland China (B)			A/B (times)
	Values (US\$m)	Growth rate (%)	% of Japanese total imports	Value (US\$m)	Growth rate (%)	% of Japanese total imports	
1984	3,214	22.70	2.35	5,979	17.53	4.37	0.54
1985	3,387	5.38	2.62	6,484	8.45	5.01	0.52
1986	4,689	38.44	3.71	5,679	-12.42	4.49	0.83
1987	7,150	52.48	4.77	7,422	30.69	4.95	0.96
1988	8,749	22.36	4.67	9,865	32.92	5.26	0.89
1989	8,979	2.63	4.26	11,146	12.99	5.29	0.81
1990	8,471	-5.66	3.62	12,011	7.76	5.13	0.71
1991	9,493	12.06	4.01	14,216	18.36	6.01	0.67
1992	9,449	-0.46	4.06	16,953	19.25	7.28	0.56
1993	9,678	2.42	4.02	20,565	21.31	8.54	0.47
1994	10,754	11.11	3.91	27,566	34.04	10.03	0.39

Source: *Dalu jingji xingshi pinggu*, 51.

If we assume that Taiwan can directly import labor and land from the Chinese mainland for the production of the goods it has invested there, the domestic value added for each unit of output would be $a_{KT} + a_{LP}$; the value added by the mainland Chinese labor and land would be $b_{LW_C} + b_{qC}$; and that of the third country would

be $a_F P_F$.¹³ In short, if transport costs are excluded, it bears no big difference from direct investment in the Chinese mainland. This assumption carries two implications. One is that because of the shortage of unskilled labor and land services, as well as Taiwan's restrictions on the inflow of mainland Chinese workers, Taiwan's direct investment has transformed the mainland into a backyard for production. Another is that such an investment should not lead to structural problems for Taiwan's employment. This is because the outflow of capital has been caused mainly by some industries' loss of international competitiveness. The relocation of labor becomes inevitable no matter whether these industries transfer their production abroad or not. In the process of economic growth, the recurrent relocation of production factors is a normal phenomenon. Given this, the relocation should not obstruct natural economic growth just as equitable distribution should not hinder the efficiency of resource allocation.

4. *The impact on cross-Strait economic growth.* According to theories of international trade, free trade and investment will promote economic growth. First, they can enhance the efficiency of allocating domestic production factors. Next, from the perspective of macroeconomics, the investment of one country in another will promote the economic growth of the host country, which in turn will expand the foreign market for the home products. As Taiwan scholar Wei Chi-lin points out, if the two sides of the Taiwan Strait can have direct trade, the decrease of cross-Strait transaction costs would contribute nearly one percent to Taiwan's rate of economic growth.¹⁴

Conclusion

Since 1987, cross-Strait trade and investment have seen rapid growth. Nonetheless, owing to restrictions on the part of Taipei, quite a few cross-Strait transactions have been conducted without government approval, and caused difficulty in obtaining accurate data for empirical studies. In the meantime, those data which

¹³To facilitate the comparison, it is assumed that Taiwan utilizes mainland labor and land with mainland wages and land costs.

¹⁴Wei Chi-lin, "The Impact of Direct Transport Links Across the Strait" (Research report funded by the Mainland Affairs Council, July 1995).

are available mostly focus on merchandise trade. There is a lack of systematic calculation of service trade. Without exact information about the exports or imports of services (i.e., investment incomes, the expenses of travelling in the Chinese mainland), one cannot calculate accurately the current account, capital account, and balance of payments of Taiwan with respect to the mainland. It would also hinder one from making sound judgments about the impact of cross-Strait economic integration on the economies of both sides and cause incorrect judgments in policymaking.

Recently, studies in Taiwan about cross-Strait economic interaction have mostly focused on import and export volume, the growth rate of trade, and the degree of trade interdependence with the mainland. There has been a lack of rigorous theoretical study to make a systematic analysis of the underlying factors or forces which shape the basic nature of cross-Strait economic and trade relations. The model in the paper may not suffice in providing a full explanation of cross-Strait economic and trade relations. Yet, the author hopes that it can help us surpass the limits of current literature and enhance our understanding of the economic interactions across the Strait.