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Impact of Foreign Direct Investment Liberalization: The Case of Korea

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**KOREA INSTITUTE FOR
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Abstract

This paper seeks to investigate the impact of Korea's foreign direct investment (FDI) liberalization on its economy. Estimation of externalities in production using the available aggregate data reveals that increased production of foreign invested enterprises (FIEs) has a significantly positive effect on the production of domestic firms during 1984–86. Through technology transfer, FIEs helped the semiconductor industry to develop into a world-wide dominance in memory chips. They also contributed to the pharmaceutical industry in inventing new drugs by raising research capabilities. Besides technology transfer, opening-up of the domestic market to FDI is changing Korea's industrial structure. The FDI liberalization in the retail industry has replaced the manufacturer-dominated structure with the retailer-dominated ones.

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I. Introduction

Since the 1960s, Korea has accomplished remarkable economic growth, overcoming the devastation caused by the Korean War. A large portion of Korea's economic development was financed by external borrowings rather than foreign direct investment (FDI). In fact, FDI played a negligible role in Korea's economic development in contrast to other South-Asian countries.

This is because the Korean government feared that the economy would become dominated by foreign firms. Moreover, the Korean government wanted to channel the limited amount of capital resources to industries vital to long-term economic growth (Kim and Wang 1996, pp. 10). With this strategy in mind, the Korean government preferred foreign borrowing which brought foreign resources under its control.

However, even in the early periods when the Korean government did not pay much attention to FDI, it was foreign firms that brought key technologies to the Korean economy. These foreign firms -- wholly-owned subsidiaries as well as joint ventures -- helped develop strategic industries such as semiconductor and pharmaceuticals.

The role of foreign invested enterprises (FIEs) in Korea's economic development has been gaining importance recently. In fact, as the economy reached a bottleneck in its growth due to a lack of technological background, the Korean government changed its basic policy direction on FDI. In order to upgrade the technology and industrial structure, the Korean government started to encourage FDI, especially in the high-tech industries.

This paper seeks to investigate the impact of Korea's FDI

liberalization on its economy. First, it attempts to examine whether the production of FIEs has positive external effects on the production of domestic firms. Due to the lack of relevant aggregate data for conducting other empirical tests, this paper focuses on the case studies of specific industries. For the industrial case studies, semiconductor, pharmaceutical, and retail industries are chosen. For the semiconductor and pharmaceutical industries, FDI has contributed significantly to the successful development of these industries from their incipient periods. Concurrently, the retail industry has become the newly opened sector for foreign investment. Already, FDI into the retail industry has made a significant impact by changing its industrial structure.

This paper is organized as follows: in Section II, Korea's foreign direct investment policy is reviewed as well as the current FDI regime in Korea. In Section III, the trends and patterns of FDI inflows into Korea is first presented. It is followed by an estimation of production externalities of FIEs on domestic firms using available aggregate data. Three industrial case studies -- semiconductor, pharmaceutical, and retail -- are then investigated. Concluding remarks are provided in Section IV.

II. Foreign Direct Investment Policy in Korea

Korea's economic development was based on outward-oriented strategies executed by domestic firms. The government's policy was thus to restrict FDI unless domestic firms became competitive enough. Even when it opened some sectors to FDI, the government aimed to control foreign firms and incorporate them into the government's developmental framework.

Recently, the basic direction of the Korean government's FDI policy has changed towards liberalization in order to foster technology transfer. In doing so, Korea can raise international competitiveness by inducing world-class foreign investors to invest in high-tech industries in Korea. In addition, the government's aim is to open Korea's domestic market to FDI to enhance competition.

In this regard, the government promotes FDI by providing investment incentives to high-tech businesses and by improving the investment environment. The government's policy is also to protect the rights necessary for foreign companies to do business in Korea. Transfer of invested capital and profits is guaranteed by law, and foreigners can expect the same judiciary treatment as nationals except in a few cases where there are specific restrictions by individual laws.

1. Historical Overview of Foreign Direct Investment Policy

After the Korean War, the 1950s were characterized by an import-

substituting industrialization strategy, financed largely by American aid. In the late 1950s, a set of chronic problems normally associated with import substitution arose in Korea: a lack of domestic demand, low levels of manufactured exports, and aggravated balance of payments. Korea also faced the challenge of earning foreign exchange. Significant economic reforms, primarily in the exchange rate and import-control systems, shifted the incentive system toward a more outward-looking system which emphasized export promotion.

Institutionalization (1960–83)

The new emphasis on an exported-led growth strategy went hand-in-hand with policies of introducing FDI. In 1960, the Korean government enacted the Foreign Capital Inducement Act (FCIA) and related decrees. Since then, the FCIA has been the primary law regulating inward direct investments in Korea. The government wanted to use FDI for easing balance-of-payment difficulties, supplying

Historical Overview of Korea's FDI Policy

| Period | Main contents |
|--|---|
| Institutionalization (1960–'83) | <ul style="list-style-type: none">· Enacting the Foreign Capital Inducement Act (1960)· Establishing two Free Export Zones (1970, 1974) |
| Liberalization (1984–'93) | <ul style="list-style-type: none">· Adopting the negative list system (1984)· Abolishing performance requirements (1989)· Adopting the notification-oriented system (1992) |
| Further Liberalization (1994–present) | <ul style="list-style-type: none">· Reducing the processing period for application (1994)· Introducing a one-stop service system (1995)· Five-Year Foreign Investment Liberalization Plan (1996)· Amendment of Foreign Capital Inducement Act (1996) |

needed technology and expertise, and opening the market channel required for an outward-looking development strategy. Foreign direct investors were welcomed in the light manufacturing export sector, especially into the two Free Export Zones at Masan and Iri. However, foreign investments was still discouraged in import-substituting sectors.

A major change occurred in the early 1980s as the Korean economy began to experience serious difficulties due to the negative effects of the Heavy and Chemical Industry Promotion Plan of the 1970s. A new industrial strategy was thus adopted in the early 1980s in an attempt to upgrade Korea's industrial structure into more technology- and skill-intensive ones. A key component of this technological upgrade was to liberalize FDI.

Liberalization of Foreign Direct Investment (1984-93)

A fundamental FDI policy shift occurred in 1984. The Korean government replaced the positive list system with a negative list system in which all industries not listed were qualified for FDI approval. This increased the percentage of manufacturing subsections open to FDI from 80% to 86%.

In December 1989, various performance requirements imposed on foreign controlled firms, such as export, local content, and technology transfer requirements, were abolished. At present, foreign-controlled firms can engage in business freely without any performance requirements.

In 1991, a notification procedure was introduced, whereby FDI in designated categories could be processed by notification as long as they met pre-announced criteria. Prior to 1993, the notification system

only applied to projects in liberalized sectors that had foreign equity holding of less than 50%. Since 1993, though, all liberalized sectors except for a few restricted ones have been covered by this notification system regardless of the foreign investors' equity shares.

Further Liberalization (1994 to Present)

The conclusion of the Uruguay Round negotiations and the deepening of integration and globalization of the world economy has led to great changes in the international economic climate. Consequently, the need for the Korean economy to upgrade its industrial structure and enhance its international competitiveness is greater than ever. Thus, the Korean government has been pursuing a more active investment liberalization policy by expanding liberalization measures which have been implemented thus far.

First, notification procedures for FDI were delegated to foreign exchange banks in 1994. It reduced the processing period for notification from 20–30 days to no more than 3 hours. The processing period for applications subject to approval was also reduced from 30 days to 5 days (15 days, if consultation with related ministries is required). This was accomplished by transferring the approval authority from the Ministry of Finance and Economy to other related ministries.

In April 1995, the Korean government established a One-Stop Service System for FDI in Seoul and other provinces. This service system was intended to resolve grievances of foreign-controlled firms, arrange linkages to joint venture partners, and provide comprehensive information and administrative services.

In May 1996, the Korean government announced a Five-Year

Foreign Investment Liberalization Plan. Starting from 1997, the new plan will further expand Korea's FDI liberalization scope by liberalizing FDI in a total of 39 business categories by the year 2000 (Table 2-1). According to the new plan, the number of restricted business categories after 2000 will be brought down to 18, among which are fishing, broadcasting and gambling.

Table 2-1. Korea's FDI Liberalization Plan (1996-2000)

(Unit: Number of business categories)

| Classification | Total | Restricted as of 1996 | Liberalized* | | | | Not liberalized after 2000 |
|----------------|-------|--------------------------|--------------|------|------|------|----------------------------------|
| | | | 1997 | 1998 | 1999 | 2000 | |
| Manufacturing | 585 | 2 | 1 | - | - | - | 1 |
| Services | 495 | 41 | 16 | 9 | 1 | 1 | 14 |
| Others* | 68 | 14 | 10 | - | - | 1 | 3 |
| Total | 1,148 | 57 | 27 | 9 | 1 | 2 | 18 |

Note: "Others" denote agriculture, fisheries and mining.

"Liberalized" include both the complete and the partial liberalization.

Source: Five-Year Foreign Investment Liberalization Plan, Ministry of Finance and Economy, May 1996.

In December 1996, the Korean government amended the Foreign Capital Inducement Act into the "Act on Foreign Direct Investment and Foreign Capital Inducement". Its main purpose is to remove restrictive measures and to realign Korea's foreign direct investment system in line with international norms and standards. For example, the concept of FDI was expanded to encompass the acquisition of outstanding shares of Korean enterprises and long-term loans of five years or more. This amendment also aimed to provide an institutional framework for promoting FDI into Korea by improving the service system for FDI.

2. Current Foreign Direct Investment Regime

The basic law governing FDI is the Act on Foreign Direct Investment and Foreign Capital Inducement, which took effect starting in January 1997. It is accompanied by Presidential Decrees, working rules, and enforcement measures. There is also the Regulation on FDI which provides the necessary framework for enforcement.

The Notification System

Previously, a foreign investor was required to obtain an approval from the pertinent ministries in partly liberalized business sectors. This approval system was, in principle, replaced by a notification system as of January 1, 1997. Currently, a foreign investor can make an investment with a simple notification (except in the case of acquiring outstanding stock). To be more specific, greenfield investments no longer require approval.

Allowance of Mergers and Acquisitions

Previously, only greenfield investments, such as the establishment of a foreign invested enterprise and the acquisition of newly issued shares, were allowed as foreign direct investment. However, starting from January 1997, foreign investors are allowed to acquire outstanding shares of Korean companies through “friendly” mergers and acquisitions (M&A’s), with the consent of the board of directors of the targeted company.

However, M&A’s of the enterprises having total assets of 2 trillion won or more require the approval of the Minister of Finance and

Economy. This is because the role of such companies in the national economy are considered significant. In particular, M&A's of those enterprises subject to prior government approval will not be automatically approved if the ratio of acquiring outstanding shares against the total share is 15 percent or more, or the foreign investor becomes the largest shareholder of the targeted company.

Long-term Loans

Before 1997, foreign loans were not treated as foreign direct investment. However, from January 1997, the definition of FDI was expanded to include long-term loans of five years or longer that have the purpose of establishing lasting economic relationships with an enterprise by exercising effective influence on the management thereof.

There is, however, a ceiling for long-term loans. Foreign invested enterprises are only allowed to induce up to 100 percent of their foreign invested amount for long-term loans. These loans should also be used for the importation of capital goods, but this is likely to change in the future. For FIEs in the manufacturing sector, this restriction in the usage of loans was removed in July 1997.

National Treatment

Unless otherwise specified, a foreign investor and a foreign invested enterprise shall be treated as a national, or a legal person, of the Republic of Korea with respect to its business conducted in the Republic of Korea. Tax exemptions or reductions pertaining to Korean firms are also equally applicable to foreign investors or foreign invested firms.

Guarantee of the Right to Repatriate Funds and Foreign Investors' Property

With respect to the dividend income arising from stock or shares acquired by a foreign investor, the proceeds from the sales of the said stock or shares, the principal amount and commission received pursuant to a loan or public loan agreement, the price received pursuant to technology inducement contract, and the right to repatriate such funds are guaranteed in accordance with the contents of authorization, accepted notice, or agreement as of the time when such repatriations are to be made. The property rights of a foreign investor or a foreign-invested enterprise are also protected pursuant to those laws.

Business Categories in which Foreign Direct Investment is restricted

Foreign investment is restricted in some business categories, and the Minister of Finance and Economy selects and gives notice of specifically restricted business categories after consulting with the relevant ministries. As of January 1997, in principle, foreign investment is not allowed in 30 categories and partially restricted in 14 categories. Except for 18 categories, investment in these restricted business categories will be liberalized in full or in part by the year 2000, pursuant to the Five-Year Foreign Investment Liberalization Plan (Table 2-1).

Incentives for Foreign Direct Investment

The Korean government is providing tax incentives and other

Criteria for Restricting Foreign Investment

Business operated by the state or public institutions: water and sewerage works, postal service, railroad transportation, and tobacco manufacturing, etc

Business that cause harm to public morals: operation of casinos

Business substantially affecting the livelihood of farmers and fishermen: the growing of cereal grains, and inshore and coastal fishing

Business for which protection is deemed necessary for a certain period under national industrial policy: banking, telecommunications

Business which has strong public functional character: newspaper publishing, and television and radio broadcasting

support for foreign invested enterprises that bring in technology that is deemed necessary for achieving an advanced industrial structure or are located in a Free Export Zone.

In the case of a business which accompanies advanced technology, exemption from corporate taxes or income tax is provided for five years after the occurrence of positive profits, followed by a 50% tax reduction in the subsequent three year period. Exemption or deduction of acquisition tax, property tax, and aggregate land tax is given for the first five years from the initial date of operation, followed by a 50% reduction in the three years thereafter.

With regard to a business which is located in a Free Export Zone, exemption of corporate tax or income tax is given for the first three years from the initial date of operation, followed by a 50% reduction in the succeeding two years. With respect to acquisition tax, property tax, and aggregate land tax, the incentive is a 50% tax reduction for the first five years from the initial date of business operation.

Production costs such as costs of land are extremely high as compared to those found in Korea's foreign competitors. Combined with an incomplete domestic financial market, these high land costs have been regarded as one of the major deterrents to foreign investment in Korea. Against this background, the government announced in January 1997 that it will provide rent exemptions or reduction up to 20 years when certain foreign invested enterprises (FIEs) located in state-owned industrial parks.¹⁾

Improvement of Service System

Due to a lack of manpower and coordination between the central and the local authorities, the One-Stop service system established in 1995 was not fulfilling its objective (Kim 1996, pp. 14–16). To overcome its drawbacks, the One-Stop service system was reorganized into the "Investing in Korea Service Center" in April 1997. This Center is supposed to handle all the necessary procedures for foreign direct investment such as investment applications, guidance, counseling, handling of grievances, and matters relating to factory construction.

The Korea Trade-Investment Promotion Agency (KOTRA), under the Ministry of Trade and Industry, is also assisting prospective foreign investors in selecting proper factory sites and in recruiting local

1) The foreign investment projects eligible for rent exemptions or reductions are (1) projects accompanying advanced technologies whose foreign invested amount is US\$ 20 million or more, (2) projects in the manufacturing sector whose foreign invested amount is US\$ 100 million or more, (3) projects which significantly contribute to the expansion of social overhead capital, the adjustment of industrial structure, or the increase in the level of fiscal independence of local governments.

business executives.

3. Future Directions

Korea has been liberalizing its foreign direct investment regime in accordance with the principle of the OECD capital movement liberalization. This process will be given further momentum when the Multilateral Agreement on Investment (MAI) is launched in 1998. At that time, the government policy on FDI will be fully liberalized in principle, guaranteeing both the National Treatment and Most Favored Nation (MFN) Treatment. Hence, foreign investors will be doing business in Korea on a level-playing field.

III. Impact of Foreign Direct Investment Liberalization in Korea

1. Trends and Patterns of FDI in Korea

Inward foreign direct investment in Korea showed no significant change during the initial period of implementation from the 1960's until the mid-1980's (Table 3-1). During this period FDI played a very minor role in Korea's industrialization (Westphal, Rhee and Pursell, 1981).²⁾ Since the mid-1980's, however, foreign direct investment into Korea has increased dramatically, from an annual average of US\$ 500 million to over US\$ 1 billion.

The robust growth of inward FDI into Korea during the latter half of the 1980's is attributed both to Korea's booming domestic economy and to improved market access for FIEs following the implementation of foreign investment liberalization policies.

After peaking in 1988, however, inward FDI declined. This decline is attributed to the following factors:

- Increased labor disputes and the ensuing wage hikes in the late 1980s made Korea less attractive as a source of low-cost labor
- Rises in real estate prices, and difficulties of FIEs in procuring funds in domestic financial markets worsened business environ-

2) Koo (1985) also pointed out that the effects of foreign firms in improving sectoral efficiency in Korea during 1960s and 1970s appear to have been insignificant.

Table 3-1. FDI inflows into Korea, 1962-96

(Unit: US\$ million, %)

| | '62-'86' | '87-'90' | '91-'93' | '94-'95' | '96 | Cumulat- ed '62-'96 |
|------------------------|-----------------|------------------|------------------|------------------|-------------------|---------------------------|
| Total | 145.35 | 1060 | 1111.58 | 1628.97 | 3202.65 | 17669.15 |
| Manufacturing | 92.83 (63.9) | 707.37 (66.7) | 748.01 (67.3) | 642.62 (39.4) | 1930.16 (60.3) | 10609.67 (60.0) |
| Chemicals | 18.2 (19.6) | 195.42 (27.6) | 207.32 (27.7) | 140.66 (21.9) | 388.53 (20.1) | 2528.45 (23.8) |
| Textiles and Clothing | 8.45 (5.8) | 14.69 (1.4) | 13.8 (1.2) | 32.24 (2.0) | 21.05 (0.7) | 396.94 (2.2) |
| Electric & Electronics | 20.97 (22.6) | 169.88 (24.0) | 78.64 (10.5) | 145.52 (22.6) | 435.65 (22.6) | 2166.32 (20.4) |
| Transport Equipment | 13.51 (14.6) | 95.12 (13.4) | 44.64 (6.0) | 69.16 (10.8) | 271.38 (14.1) | 1261.83 (11.9) |
| Service | 51.4 (35.4) | 350.03 (33.0) | 362.41 (32.6) | 986.02 (60.5) | 1254.26 (39.2) | 6764.36 (38.3) |
| Hotel | 36.47 (71.0) | 198.93 (56.8) | 55.22 (15.2) | 254.57 (39.6) | 228.36 (18.2) | 2610.6 (38.6) |
| Wholesale & Retail | 0.68 (1.3) | 10.03 (2.9) | 36.01 (9.9) | 80.00 (12.4) | 296.92 (23.7) | 585.89 (8.7) |
| Trading | 0.18 (0.4) | 24.49 (7.0) | 80.11 (22.1) | 104.09 (16.2) | 126.16 (10.1) | 677.19 (10.0) |
| Financing & Insurance | 6.97 (13.6) | 110.15 (31.5) | 87.42 (24.1) | 368.15 (37.3) | 265.73 (21.2) | 1879.28 (27.8) |
| By Home Country | | | | | | |
| Japan | 76.08 (52.3) | 474.04 (44.7) | 222.45 (20.0) | 423.37 (26.0) | 254.59 (7.9) | 5566.93 (31.5) |
| Malaysia | 0.00 (0.0) | 0.08 (0.0) | 0.03 (0.0) | 111.43 (6.8) | 672.53 (21.0) | 895.76 (5.1) |
| Hong Kong | 5.24 (3.6) | 23.75 (2.2) | 31.41 (2.8) | 50.57 (3.1) | 228.54 (7.1) | 649.82 (3.7) |
| U. S. A. | 42.9 (29.5) | 292.61 (27.6) | 338.72 (30.5) | 477.92 (29.3) | 876.11 (27.4) | 5091.12 (28.8) |
| Netherlands | 2.13 (1.5) | 37.65 (3.6) | 258.14 (23.2) | 118.63 (7.3) | 204.83 (6.4) | 1420.27 (8.0) |
| Germany | 2.55 (1.8) | 58.20 (5.5) | 74.79 (6.7) | 52.44 (3.2) | 94.92 (3.0) | 720.69 (4.1) |
| Ireland | 0 (0.0) | 0.02 (0.0) | 0.35 (0.0) | 118.65 (7.3) | 410.01 (12.8) | 648.4 (3.7) |

Note: * denotes annual average. Percentage shares in total investment are in parentheses.

Source: Ministry of Finance and Economy

ment for foreign investors

- Korea's foreign investment climate became relatively less attractive than those of Southeast Asian countries after the second half of the 1980's.

Foreign investment inflows improved again in 1994, totaling US\$ 1.3 billion and equaling the previous peak level. It increased further to US\$ 1.9 billion in 1995, and US\$ 3.2 billion in 1996. This climb is mainly due to the Korean government's foreign investment liberalization, including the expansion of business categories eligible for foreign investment and the simplification of its procedures.

For the sectoral distribution of FDI inflows into Korea, the manufacturing sector was the largest recipient during the early liberalization period, comprising 63.9% of total inward FDI during 1962–1986. This trend continued until 1993, when the share of manufacturing sector was over 65% of total FDI inflows. As the service sector has been gaining importance in the overall Korean economy, FDI into the service sector increased significantly, comprising the largest portion of total FDI (60.5%) in 1994–95. However, FDI into the manufacturing sector restored its previous share in 1996, taking 60.3% of total FDI.

In the manufacturing sector, the distribution of inward FDI was changing towards more investment into the heavy and chemical industries. Since the mid-1980s FDI into labor-intensive and low-technology industries such as textiles and clothing has been significantly reduced due to the rise in labor costs. Instead, electric and electronics sectors as well as transport equipment are receiving more foreign investments due to the development of related industries.

The composition of the service sector has also changed. The share of FDI into the hotel industry declined from 71% in 1962–86 to 18.2%

in 1996. Meanwhile, FDI into wholesale, retail, financing, and insurance increased in proportion during the 1990s.

Table 3-1 also shows that FDI into Korea was largely from Japan and the US in the past. Recently, investments from European countries, including the Netherlands, have increased in order to exploit the growing Korean market. In 1996, investments from Malaysia and Ireland significantly increased, taking more than 33% combined in total FDI. These investments are presumed to be capital flows which seek to exploit tax benefits of offshore banking in these countries.

2. Externalities on Production of Domestic Firms

Foreign invested firms may have positive external effects on domestic firms through transfers of technology and management know-how. In particular, expansion of production levels of FIEs may increase domestic firm production in the same industry via technology spillovers. This intraindustry externalities of FIEs in Korea is estimated using a simple simultaneous equation model for production and employment as follows.³⁾

$$Y_d = \alpha_0 + \alpha_1 L_d + \alpha_2 K_d + \alpha_3 Y_f + \varepsilon_1 \quad (3.1)$$

$$L_d = \beta_0 + \beta_1 Y_d + \beta_2 W + \beta_3 L_f + \varepsilon_2 \quad (3.2)$$

where Y_d and Y_f are production of domestic firms and FIEs, respectively; L_d and L_f are employment in domestic firms and FIEs,

3) The same model as Lee and Ramstetter (1991) was used to compare the results.

respectively; K_d is capital stock in domestic firms; W is wage rate for all firms.⁴⁾

The coefficient on production of FIEs in (3.1), a_3 , can be interpreted as a proxy for the intraindustry externalities that expansion of FIE production imposes on domestic firm production. The estimation results by SUR method using 1984–86 annual data on the eight manufacturing subsectors are presented in Table 3–2.⁵⁾

The estimate of a_3 turned out to be 1.66, which is significant with a t -statistic of 2.27. It denotes that production of domestic firms increased by 1.66 dollars per one dollar increase in production of FIEs during 1984–86. This result is in contrast to the previous study that the intraindustry spillovers from foreign invested firm production to domestic firm production were minimal at best in 1978 (Lee and Ramstetter 1991, pp. 118). This difference in estimation results is presumed to be mainly due to the change of distribution of FDI in Korea. Since the mid-1980s, the distribution of FDI changed towards more investments in technology-intensive industries, which brings about more technology spillovers than labor-intensive industries.⁶⁾

4) Detailed information on each variable, data sources, and summary statistics are given in the Appendix.

5) Due to a small number of observations, industry-specific externalities were not estimated. However, time-specific factors were controlled for by inserting year dummies, which also correct problems arising from using nominal values.

6) Choi and Hyun (1991) estimated the total productivity elasticities of FDI in the Korean manufacturing industry. The estimate was higher in the technology-intensive industries (0.25 for electric and electronics) than in the labor-intensive industries (0.08 for textiles and clothing).

**Table 3-2. Externalities of FIEs on domestic firm production
in Korea, 1984-86**

| Variable | (3.1) Y_d | (3.2) L_d |
|--------------------|-----------------|------------------|
| L_d | 69.97 (2.63) | - |
| K_d | 1.85 (4.70) | - |
| Y_i | 1.66 (2.27) | - |
| Y_d | - | 0.003 (7.07) |
| W | - | -0.15 (-5.09) |
| L_i | - | 0.01 (0.01) |
| Adjusted R^2 | 0.91 | 0.81 |
| No. of observation | 24 | 24 |

Note: t-statistics are in parentheses.

3. Industrial Case Studies

(1) Semiconductor Industry

Overview

The Korean semiconductor industry has played a large role in the successful and rapid development of the Korean economy. Since the latter half of the 1980s, the semiconductor industry has emerged as a leading sector in the larger electronics industry. In 1992, Korea became the third largest semiconductor maker in the world. In memory chips,

Korean firms, led by Samsung, came to dominate the world market. This remarkable growth was largely due to huge facilities investments and booming exports. Exports of the Korean semiconductor industry increased up to US\$ 14.7 billion in 1995, accounting for 11.9% of Korea's total exports.

In the early years, it was foreign firms which brought the technology and constructed a basis for the Korean semiconductor industry. In 1965, to build the semiconductor industry as one of the targeted industries for export-led growth, the Korean government began to attract multinational companies, mainly from the US and Japan. It encouraged multinational firms to invest in assembly and testing operations in Korea, following a similar strategy taken by Taiwan (Mathews 1995, pp. 121).

First, it was transnational corporations (TNC) from the US, such as Komy and Fairchild, which invested in transistor production facilities in Korea. Signetics and KMI followed in the same year, and Motorola in 1967. By 1974, there were nine such US-owned facilities in Korea, compared with eight in Hong Kong, three in Taiwan, nine in Singapore, eleven in Malaysia, and six throughout the rest of Asia.

After Korea and Japan normalized relations in the mid-1960s, Japanese electronic multinationals also established assembly and test facilities, led by Toshiba and Sanyo in 1969. By 1973, there were at least seven such Japanese facilities, operated by such firms as Toko, Rohm and Sanken.

Since the mid-1970s, Korean firms took their first steps towards indigenous semiconductor manufacturing through joint ventures with foreign firms. One was Goldstar's initiative in 1972 to produce transistors with the US multinational National Semiconductor, which soon ended in failure. Another was a small-scale operation, Korea

Semiconductor (KSEC), founded by a Korean-American engineer in 1975, importing LSI technology for the production of CMOS chips destined for electronic watches. This was a 50:50 joint venture between the Korean engineering firm KEMCO and ICIL, a US semiconductor firm. This venture was not a success either. However, it provided Samsung an opportunity to take it over and make its entry into the semiconductor industry. Goldstar also recommenced in 1978 its production of transistors in the form of a joint venture with American Microsystems of the US.

In the 1990s, Korean firms moved into the supply industry through joint ventures. Samsung has led the way with a joint venture with Japan's Dai Nippon Screen (DNS) to form DNS Korea, producing spinners and wet stations from its base at Chunan. In 1994 it expanded its plant at Chunan to produce 8-inch wafers for 16M DRAM production. Samsung is also the instigator of a joint venture with POSCO Steel and MEMC (USA), known as POSCO-Huls, to supply silicon wafers. In addition, there are other numerous joint ventures in the supply of pure chemical materials needed for chip fabrication.

Technology Transfer

Besides setting up a subsidiary or joint venture in Korea, foreign firms have assisted in developing Korea's semiconductor industry via technology transfer agreement. Technology transfer was arranged not only between Korean firms and TNCs but also between research institutes across the borders (Table 3-3).

In the early stage, the Korean government played a critical role in technology transfer. During the 1970s strenuous efforts were made by the Korean government to deepen Korea's electronics industry through

the creation of an indigenous semiconductor capacity. In 1974, a six-year plan was formulated to promote the production of electronic components, including semiconductors. It was to be achieved through the creation of research institutes, tertiary training of electronics engineers, technology acquisition achieved via licenses from overseas firms, and use of consultants.

The first experimental semiconductor fabrication facility was established in the Korea Institute of Electronics Technology (KIET), which was set up in 1976 on the Kumi electronics manufacturing complex with technology transferred from the US firm, VLSI Technology. KIET also opened a liaison office in the Silicon Valley in 1978. This enabled Koreans to build contacts with American high-tech

**Table 3-3. Technology transfer agreements
in the Korean semiconductor industry, 1972-80**

| Korean Organization | Foreign Partner | Year | Technology |
|---------------------|------------------------------|------|--------------------------------------|
| Goldstar | Nat Sem. (US) | 1972 | Transistor production ¹ |
| KSEC | ICII (US) | 1975 | LSI IC fabrication ² |
| Taihan | Fujitsu (Japan) | 1976 | LSI IC fabrication ³ |
| KTC | ITT (US) | 1977 | Telecom ICs fabrication ⁴ |
| Korea Explosives | Nat Sem (US) | 1978 | Transistor/IC fabrication |
| KIET | VLSI Tech (US) | 1978 | VLSI IC fabrication: pilot |
| Korea Electronics | Toshiba (Japan) | 1979 | Transistor production |
| Goldstar | Western Electric (AT&T) (US) | 1980 | Telecom ICs fabrication |

Note: ¹ Failed operation

² Taken over by Samsung in 1977-78

³ Taken over by Goldstar in 1979

⁴ Taken over by Samsung in 1980

Source: Mathews (1995), pp. 128

firms and keep up with the latest semiconductor trends.

The leadership role played by the government in securing Korea's foundations in the semiconductor industry was relatively short-lived, lasting for around a decade from the mid-1970s to the later-1980s. As the Korean Chaebol picked up the production of semiconductors, the direct role of government through research institutes changed. Indeed, KIET abandoned its R&D capacity in semiconductors, and sold its fabrication facilities to Goldstar. Most of the research and development was actually carried out within the companies themselves after the later-1980s. The search for advanced technology by Korean firms was further intensified in the 1990s, as they acquired US firms such as AST and Zenith.

Individual Firm Case

Company A is a wholly-owned subsidiary of a leading US semiconductor-producing company. It was established in 1967 as the first overseas subsidiary of the parent company. Due to its aggressive investments, Company A has established itself as a pioneer company in Korea's semiconductor assembling industry.

It also constructed a molding factory and a nitrogen-producing factory which are essential for the production of semiconductors. By training and releasing skilled workers and managers for operating these factories, Company A has thus set up a precision molding industry in Korea. It has transferred molding machinery to the leaving employees at a cheap price and encouraged their business by purchasing their products. There are about 10 companies which started as semiconductor molding companies in this way. Company A has contributed to these companies for their world-wide recognition.

Company A has also assisted the development and growth of local semiconductor companies through OEM contracts, training of skilled workers, and transfer of production technology. It has made OEM production contracts with Anam and LG since the 1970s and its former employees are now leading the industry. It has also introduced a partnership system with local companies which produce raw materials for semiconductors. Through technical guidance and factory training, Company A helped these local companies in producing lead frame, wire and compound, provisions of which formerly depended on imports.

As shown in Table 3-4, Company A exports have totaled about US\$ 3.8 billion since 1967. It also created total employment of 9,700 workers per year during this period. Company A is now contributing to upgrading the Korean economy by producing high technology products. Recently it invested an additional US\$ 13 million to produce technology-intensive high value-added products such as radio frequency modules and CRT (Cathode Ray Tube) drivers for personal computers.

Table 3-4. Exports and Employment of Company A, 1968-95

| Year | Exports (US\$ million) | Employment |
|-------|------------------------|------------|
| 1968 | 0.02 | 690 |
| 1970 | 13.0 | 1,729 |
| 1975 | 28.3 | 3,822 |
| 1980 | 115.7 | 3,832 |
| 1985 | 183.0 | 4,342 |
| 1990 | 198.0 | 2,750 |
| 1995 | 304.8 | 2,783 |
| Total | 3,756.5 | 97,464 |

Source: Company A's Public Information Department.

(2) Pharmaceutical Industry

Overview

The Korean pharmaceutical industry has expanded and developed remarkably during the last four decades. It has been growing at 10–15% per year and is currently the tenth-largest pharmaceutical market in the world with 1994 sales of about US\$ 3.7 billion. The total number of firms has increased to around 350 which produced 14,000 items in 1994.

Until the late 1950s, the pharmaceutical industry remained at a primitive stage. Most of the production was based on herbal drugs and the supply of modern drugs completely depended on imports, including smuggling as well as the United States supplies. Since the Foreign Capital Inducement Act was enacted in 1962, many wholesale merchants and importers established joint ventures with foreign partners and became pharmaceutical manufacturers. Five joint ventures were established during the 1960s. Due to the implicit desire of both the government and entrepreneurs to obtain managerial control, technology licensing was much more prevalent than joint ventures during this period.

From 1965, the effort to localize raw materials intensified. The Government provided a series of policy measures to promote the local production of raw materials. Therefore, this period can be designated as the internalization or localization stage. At this early phase of internalization, more sophisticated technology such as chemical synthesis, fermentation etc., were developed with a combination of foreign technology and imitative efforts. The processes of drug manufacturing were expanded from the final fabrication using imported raw materials, to a series of processes including both final

fabrication and raw material manufacturing.

The internalization of pharmaceutical technology was further enhanced in the late 1970s with the introduction of a series of measures consistent with the liberalization policy on the import of foreign products and technology. In addition to liberalization, a number of important policy instruments were implemented such as the adoption of a nationwide medical insurance system. Consequently, the number of foreign invested pharmaceutical firms including joint ventures increased drastically in the 1980s (Table 3-5).

**Table 3-5. The Number of Foreign Invested Pharmaceutical Firms
in Korea, 1971-96**

| Year | 1971 | 1976 | 1980 | 1985 | 1990 | 1994 | 1995 | 1996 |
|--------------|------|------|------|------|------|------|------|------|
| No. of Firms | 10 | 18 | 24 | 52 | 62 | 62 | 63 | 64 |

Source: Ministry of Finance and Economy

Foreign technology has flowed via formal channels such as joint ventures and technology licensing. A total of 64 foreign invested firms (of which 30 firms were joint ventures) were established and 70 cases of technology licensing were recorded after the Foreign Capital Inducement Act was enacted in 1962. During this period, nearly 6,000 new drugs were permitted for production and the development of about 300 items depended on foreign technology.

Individual Firm Cases⁷⁾

A. Company A

Company A began as a drug wholesaler in 1932, became a manufacturer in 1942 and incorporated in 1947. The firm grew rapidly owing to its popular tonic drink. The product as well as the technology process was primitive—manually operated machines that were available locally.

The first major upgrade of technology occurred when the firm installed a set of modern equipment to produce antibiotics using the United States foreign aid currency in 1957. At that time, the equipment or technology process relied on foreign sources through import of capital goods.

As a fermentation plant for digestive enzymes was constructed in 1966 through technical collaboration with a Japanese firm, company A became a raw material producer. Since that time, it participated in 20 technology licensing agreements for the production of 50 drugs. Technology imports with contractual agreements included ganamyan technology from Meiji Co., Japan; technology of medicine for liver ailments from Fujizawa Co., Japan; antibiotic technology from a Japanese firm; etc.

Besides technology licensing, Company A also participated in a joint venture with a foreign pharmaceutical company in order to produce raw materials. In 1973, it set up a joint venture with a

7) A good case study which discusses the role of Multinational Firms in the technological development of the pharmaceutical industry of Korea was presented in ESCAP/UNCTC (1987). This section draws heavily on that study.

Japanese firm to produce the raw material for sulfuric ganamyin. The Japanese firm was the original innovator of the new antibiotics. Later, the assimilation of imported technology and accumulation of its own know-how began to materialize from in-house R&D efforts and innovation. Some of the in-house technological developments were protein dissolving enzymes, a new manufacturing process for chlorasepade, talampicillin, new fabrication method for digestive enzymes, long-duration effect drug, etc.

B. Company B

Company B is a joint venture established in 1964 with a Transnational Corporation (TNC) from the Federal Republic of Germany. The firm produces about 80 different drugs. Its sales volume in 1994 was 65.2 billion won (about US\$ 81 million) and it had 700 employees.

Company B was originally incorporated in 1954 as an import agent and wholesaler of drugs. In 1959, it decided to enter the pharmaceutical industry as a manufacturer and constructed its first plant with technical assistance from a German TNC collaborator. This German TNC provided plant designs, equipment, and other technical support in addition to the dispatch of two engineers.

Company B later decided to expand into synthesis with fundamental and intermediate raw materials rather than mere fabrication. For this purpose, Company B established a joint venture with its collaborator from Germany in 1964. The German partner invested a 25 per cent equity share for the installation of blood plasma manufacturing facilities utilizing the technology of one of its subsidiaries. Company B became the best subsidiary of the German TNC in terms of local

market share, acquiring 10 per cent of the Korean market in just five years.

At this time, however, Company B realized that the fast growth for the first five years would not be possible thereafter if it were to sell only those drug items supplied by its TNC partner. After some negotiation, Company B signed an agreement with its partner to enlarge its range of products to include those of other firms. Consequently, Company B concluded a new technology licensing agreement with a Swiss TNC and another from France in 1971 and 1972 respectively.

Company B also began to build up its own in-house technical capabilities, whereby it successfully developed its first localized drug for liver tonic as well as some vitamins. In 1976, its local research institute developed the chemical synthesis technology for ethambutol which is the raw material of tuberculin.

The technological development and internalization in Company B follows a typical pattern shown in the industry. During the first stage, import of raw material and its fabrication as a final product is the typical process used for acquiring foreign technology. In the second stage, firms initiate the local production of raw materials which were previously supplied by TNCs. This stage of technological development was possibly enhanced in Korea by government support measures such as import bans on products competing with locally produced items for a certain period of time. In the following stage, Company B expanded its technological sources to include other TNCs, in-house, and other local sources. This strategy enabled Company B to maintain its leading position in the industry in terms of technology.

(3) Retail Industry

Overview

Retailing is one of the least developed industries in Korea along with financial industry. The share of mom-and-pop grocery stores and traditional local markets which are usually run by one or two family members accounted for around 80% of Korea's \$116 billion retail market in 1996. The rest of retail sales was made by big department stores which are usually owned by large conglomerates, *Chaebol*.

A large transformation is occurring in Korea's retail industry ever since the government lifted some of restrictions that kept foreign retailers out of the country until the end of 1995 (Table 3-6 and Table 3-7).

**Table 3-6. Liberalization of FDI-restricted Business Categories
in the Korean Retail Industry, 1995-97**

| Year | Business Categories |
|--------------------------|---|
| 1995. 1 | Retail of Fruits |
| | Retail of Medicine and Medical Products |
| | Retail of Cosmetics |
| | Retail of Books and Newspapers |
| | Retail of Liquid Fuels |
| | Retail of Gas Fuels |
| 1996. 1 | Retail of Meat |
| 1997. 1 | Retail of Grains |
| | Retail of Art Products and Antiques |
| | LPG Station for automobiles |
| Restricted after 1997 | Operation of Gas Station |

Source: Ministry of Industry and Trade (1994).

**Table 3-7. Improvement in the Permissible Market Access
for Liberalized Business Categories in the Korean Retail Industry,
1981-96**

| Year | Permitted Market Access |
|---------|--|
| 1981. 7 | Store no larger than 330m ² (in area) with single commodity |
| 1984. 7 | Single store no larger than 700m ² |
| 1991. 7 | no more than 10 stores, each smaller than 1,000m ² |
| 1993. 9 | no more than 20 stores, each smaller than 3,000m ² |
| 1996. 1 | Complete Liberalization |

Source: Ministry of Industry and Trade (1994).

Especially, large-sized discount stores or hyper-markets (HPMs) has been established by FIEs since 1996. They offer a variety of products, ranging from food to household appliances and clothing at cheaper prices than department stores.

Also, 24-hour convenient stores (CVSs) are encroaching upon the traditional small-sized local markets with better technology, more polished marketing and better supply networks.

Structural Change

The most significant impact of investment liberalization on Korea's retail industry is the change of its structure. The retailing industry in Korea has a characteristically manufacturer-dominated structure, in which manufacturing firms not only produce but also conduct retail sales at the same time or participate in retail sales as a dominant player.⁸⁾ This system may bring about unfair business conduct such

8) This manufacturer-dominated structure is perceived to originate from government policies to promote the manufacturing industry (Chun 1991,

as tie-in selling by manufacturers to take advantage of their dominant position. It can also deter productivity improvement and price competition.

The increasing number of HPMs is changing this manufacturer-dominated structure in that increased buying-power now puts the price determining into the hands of retailers rather than manufacturers (Discount Merchandiser, January 1997, pp. 24). Due to the fear of losing price determining power to the HPMs, the big *Chaebol* manufacturers are now planning to enter the retail industry by setting up HPMs on their own (Table 3-8). In this sense, a Big-Bang is occurring in the Korean retail industry (Korea Economic Daily, 1997. 5. 23).

Technology Transfer

The HPMs are also helping small and medium sized manufacturers by selling their products which department stores have not given attention to. These small and medium sized firms account for more than 60% of the product composition of HPMs. Also, in the process of purchasing from domestic producers, foreign invested HPMs provide technical assistance in production methods, training of workers, financial assistance, and marketing information (Lim 1990, pp. 127).

Foreign CVS firms also contributed to the Korean retail industry via technology transfer in the area of merchandising, inventory management, and Point of Sales (POS) System, among others (Table 3-9).

pp. 25-26). The percentage of retail sales by manufacturing firms is 100% for automobiles, 90% for consumer electronics, 80% for apparel, and 70% for food (Ministry of Trade and Industry 1994, p. 10).

Table 3-8. Establishment of HPMs in Korea, 1993-2000

| Year | Total Number of Stores | Domestic | Foreign |
|------------------------|------------------------------|-----------------------|------------------------------|
| 1993 | 1 | E-MART (1) | - |
| 1994 | 4 | PRICE CLUB (1) | - |
| | | E-MART (1) | |
| | | 2001 OUTLET (1) | |
| | | SAMCHUNLEE-MART (1) | |
| 1995 | 18 | KIMS CLUB (8) | - |
| | | E-MART (2) | |
| | | MEGA-MART (1) | |
| | | GRAND-MART (2) | |
| | | BIG-MART (1) | |
| | | 2001 OUTLET (2) | |
| 1996 | 50 | KIMS CLUB (4) | MAKRO (2) CARREFOUR (2) |
| | | E-MART (2) | |
| | | HAITAI SUPER-MART (2) | |
| | | LG-MART (1) | |
| By 2000 (Estimated) | 200 | SAMSUNG (60) | MAKRO (10) CARREFOUR (30) |
| | | LG-MART (30) | |
| | | DAEWOO (14) | |
| | | HYUNDAI (22) | |
| | | LOTTE (58) | |
| | | E-MART (30) | |

Note: Number of stores are in parentheses.

Source: Discount Merchandiser, January 1997, pp. 22.

Benefits to Consumers and Needed Adjustment

Above all, the greatest beneficiary is the consumer. HPMs create one-stop shopping and provide a variety of goods at inexpensive prices.⁹⁾ Thus HPMs are better suited for satisfying Korean shoppers

who have gradually demanded more choice, and at the same time shown a rising concern for bargain hunting. The gain in consumer surplus via reduced prices was estimated to surpass the loss in producer surplus. In particular, for 11 consumer electronic goods including TVs, refrigerators and camcorders, the increase in the social welfare (defined by the consumer surplus minus the producer surplus) was estimated to be more than 17% of total sales of these products (Shin 1992, pp. 79–80).

However, these changes to the Korean retail industry induced by the liberalization of foreign investment calls for some structural adjustment. The HPMs and CVSs will force the inefficient mom-and-pop grocery stores and traditional local markets out of business. Therefore adjustment policy is needed towards these small and medium sized retail businesses whose low-educated owners tend to have difficulty in getting into another type of business.¹⁰⁾

9) A recent survey by the Korea Chamber of Commerce shows that Korean consumers assess the positive impact of HPMs on their shopping as low prices (56.3%) and range of commodities (15.9%). See Korea Chamber of Commerce 1996, pp. 61.

10) From the above survey by Korea Chamber of Commerce, 80% of the owners of small and medium sized retail stores experienced loss in sales after the establishment of HPMs nearby. See Korea Chamber of Commerce 1996, pp. 65.

Table 3-9. Technology Transfer of CVSs in Korea, 1988-94

| CVSs | Company | Source | Year | Technology |
|-------------|--------------------|----------------------------|-----------|--|
| 7-eleven | Korea Seven | Southland Corp.(USA) | 1988-1993 | Trade Mark, Trade Secret (7-eleven system) |
| Circle.K | Circle.K Korea | Circle.K (USA) | 1989-1994 | Management Know-how (Sales/Operation/Product Development) |
| By the way | Dong-Yang Mart | Snkus (Japan) | 1990 | Business Alliance |
| AM. PM | Sam-Yang Petroleum | AM. PM International (USA) | 1991-2001 | Trade Mark, Technology Guidance |
| Family Mart | Bo-Kwang | Family Mart Co. (Japan) | 1990-1995 | POS System |
| MINI-STOP | Miweon | MINI-STOP Co.(Japan) | 1990-1995 | Comprehensive Know-how on CVS |
| Lawsons | KOLON | Dairy Mart CVS (USA) | 1989-1994 | Management Know-how (Product Development) |
| Spa-Metro | Spa-Metro | KASUMI CV Network(Japan) | 1993 | Operation Advice |
| LG25 | LG | (Domestic) | 1990 | - |
| Bestore | Jinro | (Domestic) | 1994 | - |

Source: Korea Chamber of Commerce 1995, pp. 74-75 and Korea Chamber of Commerce 1997, pp. 158.

IV. Concluding Remarks

Throughout Korea's development, FDI has played a negligible role. Even in 1996, FDI accounted for less than 1% of total domestic fixed capital formation in Korea. However, despite its quantitative insignificance, FDI has had a significant impact on the Korean economic development qualitatively.

The development of Korea's semiconductor industry into world-wide dominance in memory chips was based on technology transfer by foreign firms, in the form of wholly-owned subsidiaries or joint ventures. Also, multinational pharmaceutical firms helped the pharmaceutical industry develop raw material production, and recently to invent new drugs by raising research capabilities.

Transfer of technology and management know-how by FIEs also made an impact on the production of domestic firms. Estimation of externalities in production using the available aggregate data reveals that the intraindustry spillovers from production of FIEs to domestic firm production were significant during 1984–86.

Besides technology transfer, opening-up of the domestic market to FDI is changing Korea's industrial structure. The FDI liberalization in the retail industry has replaced the previous manufacturer-dominated structure with the retailer-dominated ones. Although liberalization requires some adjustment by inefficient domestic retailers, it also brings gains in consumer welfare via lowered prices and expanded variety of goods.

When the Multilateral Agreement on Investment is launched, more liberalized FDI will make a greater impact on the Korean economy.

In particular, through acquisitions of the Korean firms and participation in privatization, foreign firms are expected to change the current competitive structure of the Korean economy. Moreover, by creating a level-playing field for both domestic and foreign firms, the Korean economy will be closer to a “contestable market”.

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Appendix

1. Definitions and Data Sources for Variables in Section III.2

| Variables | Definitions | Sources |
|-----------|--|---|
| Y_d | production of domestic firms (100 million won), calculated by subtracting Y_f from total production | Bureau of Statistics Korea Credit Company (1987) |
| L_d | employment in domestic firms (1,000 persons), calculated by subtracting L_f from total employment | Bureau of Statistics Korea Credit Company (1987) |
| K_d | capital stock in domestic firms (100 million won), calculated by subtracting FDI stock from total domestic capital formation | Bureau of Statistics Ministry of Finance |
| W | average wage rate (1,000 won) | Bureau of Statistics |
| Y_f | production of FIEs (100 million won) | Korea Credit Company (1987) |
| L_f | employment in FIEs (1,000 persons) | Korea Credit Company (1987) |

Note: The eight manufacturing subsectors are food, textiles and clothing, petroleum and chemicals, non-metal minerals, basic metal, fabricated metal, and others.

2. Summary Statistics and Cross Correlations of Variables in Section III.2

Summary Statistics

| Variables | Mean | Standard Errors |
|-----------|--------|-----------------|
| Y_d | 93,022 | 67,484 |
| L_d | 290 | 236 |
| K_d | 32,197 | 21,636 |
| W | 3,429 | 737 |
| Y_f | 7,097 | 8,526 |
| L_f | 23 | 45 |

Cross Correlations

| Variables | Y_d | L_d | K_d | W | Y_f | L_f |
|-----------|-------|-------|-------|------|-------|-------|
| Y_d | 1.00 | – | – | – | – | – |
| L_d | 0.78 | 1.00 | – | – | – | – |
| K_d | 0.93 | 0.77 | 1.00 | – | – | – |
| W | 0.16 | –0.31 | 0.28 | 1.00 | – | – |
| Y_f | 0.83 | 0.52 | 0.78 | 0.13 | 1.00 | – |
| L_f | 0.72 | 0.60 | 0.86 | 0.15 | 0.78 | 1.00 |

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