THE ROLE OF INTELLECTUAL PROPERTY RIGHTS IN ENCOURAGING FOREIGN DIRECT INVESTMENT AND TECHNOLOGY TRANSFER

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I. INTRODUCTION

The global system of intellectual property rights (IPRs) is undergoing profound change as we approach the next century. Recently numerous developing countries significantly strengthened their IPR regimes.[1] Regional trading arrangements, such as the North American Free Trade Agreement (NAFTA)[2] and a series of Partnership Agreements under negotiation between the European Union and various Eastern European and Middle Eastern nations,[3] now pay significant attention to IPR issues. Most important of these agreements is the multilateral Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS). Under the terms of TRIPS, current and future members of the World Trade Organization (WTO) must adopt and enforce strong, non-discriminatory minimum standards of intellectual property protection. While considerable controversy persists over international means of protecting key information

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1. Examples of developing countries that have strengthened their IPR regimes include Republic of Korea, China, Taiwan, Argentina, and Mexico. *See* U.N. CONFERENCE ON TRADE AND DEV. at 7, U.N. Doc. UNCTAD/ITE/1, U.N. Sales No. 96.II.D.10 (1996); Keith E. Maskus, *Strengthening Intellectual Property Rights in Asia: Implications for Australia*, 37 AUSTL. ECON. PAPERS 346, 348-49 (1998).

2. *See* North American Free Trade Agreement Dec. 8, 1992 Can.-Mex.-U.S., 32 I.L.M. 289. The North American Free Trade Agreement has a full chapter devoted to intellectual property rights (Chapter 17 of the NAFTA). *See* Keith E. Maskus, *Implications of Regional and Multilateral Agreements for Intellectual Property Rights*, 20 WORLD ECON. 681, 685-87 (1997).

3. The Partnership Agreements with the European Union are preferential trade areas negotiated on a bilateral basis between the European Union, on the one hand, and a number of North African and Mediterranean states, on the other hand. Examples of the latter include Tunisia, Morocco, Egypt, Jordan, and Lebanon. The preferences offered regarding market access vary across the agreements. *See* Robert Z. Lawrence, *Preferential Trading Arrangements: The Traditional and the New, in* REGIONAL PARTNERS IN GLOBAL MARKETS: LIMITS AND POSSIBILITIES OF THE EURO-MED AGREEMENTS 13, 28-30 (Ahmed Galal & Bernard Hoekman eds., 1997).

technologies, including databases and electronic information transfer, there is nevertheless an evident commitment to achieving strong protection in these areas.[4]

This global trend toward markedly stronger IPR protection is not surprising when viewed in the context of economic globalization, which is the transcendent commercial and political force of this era. Globalization is the process by which national and regional markets become more tightly integrated through the reduction of governmental and natural barriers to trade, investment, and technology flows.[5] In this global economy, the creation of knowledge and its adaptation to product designs and production techniques are increasingly essential for commercial competitiveness and economic growth.[6] But this process acquires growing political saliency in light of the fact that the international mobility of capital and technology has risen significantly relative to that of most types of labor.[7] Therefore, globalization tends to reward creative and technically skilled workers and to place its largest pressures on lower-skilled workers.[8]

When discussing globalization, it is important to distinguish between the *mechanisms*, the *channels*, and the *outcomes*. The *mechanisms* by which markets become more integrated include changes in both natural forces and government policies.[9] Key trends in natural forces associated with various forms of technological changes consist of reductions in international transportation costs, improvements in global communications, and massive increases in computational power permitted by the microprocessor.[10] Equally important are

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4. *See* WORLD TRADE ORGANIZATION, ELECTRONIC COMMERCE AND THE ROLE OF THE WTO 59-64 (1998).

5. *See* Edward E. Leamer, A Trade Economist's View of U.S. Wages and 'Globalization' 1, 14 (Jan. 11, 1995) (unpublished manuscript, on file with author).

6. *See* Keith E. Maskus, *Intellectual Property Rights in the Global Information Economy*, *in* POLICY FRAMEWORKS FOR A KNOWLEDGE ECONOMY 231, 234-60, (Thomas J. Courchene ed., 1996).

7. *See* James R. Markusen, *The Boundaries of Multinational Enterprises and the Theory of International Trade*, 9 J. ECON. PERSP., Spring 1995, at 169, 174; Keith E. Maskus & Guifang Yang, *Intellectual Property Rights, Foreign Direct Investment, and Competition Issues in Developing Countries*, 17 INT'L J. TECH. MGMT. (forthcoming 1999).

8. *See* ADRIAN WOOD, NORTH-SOUTH TRADE, EMPLOYMENT AND INEQUALITY: CHANGING FORTUNES IN A SKILL-DRIVEN WORLD 287-89 (1994); J. David Richardson, *Income Inequality and Trade: How to Think, What to Conclude*, 9 J. ECON. PERSP., Summer 1995, at 33, 51-53.

9. *Cf.* Paul R. Krugman, *Growing World Trade: Causes and Consequences*, BROOKINGS PAPERS ON ECON. ACTIVITY, 1995, at 337-343 (listing political factors, boundary issues, and technological change as reasons for increased global integration).

10. *See id*; Edward E. Leamer, Foreigners and Robots: Assistants of Some, Competitors of

changes in government policies that allow international firms greater access to domestic markets.[11] This improved market access has been a central feature of policy making in many emerging economies in the 1990s through both unilateral policy reform and adherence to regional and multilateral trade agreements.[12]

The *channels* through which globalization affects economies include expanded trade in merchandise and services, product and technology licensing, greater international portfolio investment, and foreign direct investment (FDI).[13] FDI, the establishment or acquisition of production subsidiaries abroad by multinational enterprises (MNEs), is particularly important because it is a source of capital and knowledge about production techniques.[14]

In truth, these channels are responses to globalization, but, at least in the public eye, are generally viewed as detrimental to the ultimate *outcomes* of the process.[15] These outcomes include, in the first instance, stronger tendencies toward arbitrage of international prices of goods and tradable services and greater access by consumers and firms in each liberalizing country to new and more varied products and technologies on international markets.[16] In turn, those initial outcomes result in stronger competition, reductions in domestic market power of formerly concentrated industrial concerns, re-allocation of economic resources into areas of greatest comparative advantage, declining production costs in sectors with increasing returns to scale, and contraction or elimination of uncompetitive firms.[17] This last re-

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Others, 4-5 (April 5, 1998) (unpublished manuscript presented at Conference on Social Dimensions of U.S. Trade Policies, on file with Maskus).

11. Such changes are, for example, trade liberalization, deregulation of investment and licensing restrictions, provision of establishment rights in services, privatization of state-owned enterprises, adoption of freely-traded currencies, and tax reform. *See generally* JOHN WEISS, ECONOMIC POLICY IN DEVELOPING COUNTRIES: THE REFORM AGENDA (1995).

12. *See* THE URUGUAY ROUND AND THE DEVELOPING COUNTRIES 1-2, 125-26 (Will Martin & L. Alan Winters eds., 1996) [hereinafter THE URUGUAY ROUND].

13. *See* Keith E. Maskus, *The International Regulation of Intellectual Property, Band* 134 WELTWIRTSCHAFTLICHES ARCHIVE [REV. OF WORLD ECON.] 186, 186 (1998); Markusen, *supra* note 7, at 170, 171; RICHARD E. CAVES, MULTINATIONAL ENTERPRISE AND ECONOMIC ANALYSIS 25 (2d ed. 1996); PETER J. BUCKLEY & MARK CASSON, THE ECONOMIC THEORY OF THE MULTINATIONAL ENTERPRISE 113-44 (1985).

14. *See* Markusen, *supra* note 7, at 173-75.

15. *See* I.M. DESTLER, AMERICAN TRADE POLITICS 8-9 (3d ed. 1995).

16. *See* THE WORLD BANK, *Integration with the Global Economy*, *in* WORLD DEVELOPMENT REPORT 88, 88-90, 103-08 (1991).

17. *See* JAMES R. MARKUSEN ET AL., INTERNATIONAL TRADE: THEORY AND EVIDENCE 105, 181-86 (1995); THE WORLD BANK, THE EAST ASIAN ECONOMIC MIRACLE 82, 302, 316-20 (1993); David Greenaway, *Trade and Foreign Direct Investment*, 52 EUR. ECON. 103, 112-14

sult, what economists label "firm exit," is a key source of efficiency gains in liberalizing economies, but it also leads to strong political forces against deregulation.[18]

Over the long term, stronger competitive forces encourage adoption of frontier technologies and the development of high-quality, differentiated products for both domestic and export markets.[19] Meeting rigorous quality demands is particularly important to break into export markets,[20] and a key component of innovation and product adaptation.[21] Stronger, liberalized markets lead to permanently higher growth rates, which explains why countries with outward-oriented commercial policies have outperformed other developing economies in recent decades.[22]

While there is considerable evidence to support this optimistic view of globalization, such gains do not come without potential costs. Foremost among these costs is that greater competition changes the demand for labor in each country, with unskilled workers bearing the brunt of competitive pressures through declining real wages or rising unemployment.[23] Also important are potential abuses of market power to the extent that international firms are placed in a position of market dominance by virtue of their marketing advantages or technological superiority, although the likelihood of such abuses diminishes with stronger international competition.[24]

This brief review of globalization suggests that emerging countries should have strong and growing interests in attracting trade, FDI, and technological expertise. However, such interests must be tempered and supported by accompanying programs to build local skills and to ensure that the benefits of globalization actually occur. Such broader programs should include 1) promoting political stability

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(1993).

18. *See* Richard G. Harris, *Applied General Equilibrium Analysis of Small Open Economies with Scale Economies and Imperfect Competition*, 74 AM. ECON. REV. 1016, 1026-27 (1984); STEPHAN HAGGARD & STEVEN WEBB, VOTING FOR REFORM 18-20 (Stephan Haggard & Steven Webb eds., 1994).

19. *See* THE WORLD BANK, *supra* note 16, at 90.

20. This is supported by recent experiences in Chile, Mexico, Columbia, Morocco, and Turkey. *See* INDUSTRIAL EVOLUTION IN DEVELOPING COUNTRIES: MICRO PATTERNS OF TURNOVER, PRODUCTIVITY, AND MARKET STRUCTURE 9, 84-89, 202, 263, 287, 315 (Mark Roberts & James Tybout eds., 1996)

21. *See* THE CHINA CIRCLE 13, 21 (Barry Naughton ed., 1997).

22. *See* THE WORLD BANK, *supra* note 17, at 37-38, 84-86.

23. *See* WOOD, *supra* note 8; Richardson, *supra* note 8.

24. *See* GLOBAL COMPETITION POLICY 20 (Edward M. Graham & J. David Richardson eds., 1998).

and economic growth, 2) encouraging flexible labor markets and building labor skills, 3) continued market liberalization, and 4) developing forward-looking regulatory regimes in services, investment, intellectual property, and competition policy. IPRs are an important element of this broader policy designed to maximize the benefits of expanded market access and to promote dynamic competition in which local firms can meaningfully take part.

It is beyond the scope of this Article to consider each of these issues and their complex interrelationships in detail. Rather, this Article focuses on issues of attracting FDI and technology, with a particular emphasis on the role of IPRs in this process. The first section gives an overview of recent trends in international investment and licensing, using U.S. data as a particular illustration. The second section then analyzes the main determinants of FDI, both in theory and according to available economic evidence. A similar treatment is provided for licensing. The third section discusses, from the standpoint of an emerging economy, the potential benefits and costs of incoming FDI and technology transfer, focusing on issues of information spillovers and diffusion. Throughout, the impact of IPRs is considered. With this background, the fourth section presents the broad outlines of a competitive strategy for attracting investment and technology. Inevitably, such strategies vary somewhat across countries by level of economic development and technological capability, but there are important common denominators. The final section concludes with observations on the role of IPRs in linking developing countries to an information-based global economy.

II. DETERMINANTS OF FOREIGN DIRECT INVESTMENT AND TECHNOLOGY TRANSFER

MNEs have several ways to serve foreign markets. Firms may choose simply to export at arm's-length to a particular country or region.[25] Alternatively, they may decide to undertake FDI, which requires selecting where to invest and in what kind of facilities, whether to purchase existing operations or construct new plants (so-called "greenfield investments"), which production techniques to pursue, and how large an equity position to take with potential local partners.[26] Sometimes, firms may prefer a joint venture with some de-

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25. *See* Keith E. Maskus & Mohan Penubarti, *How Trade-Related are Intellectual Property Rights?*, J. INT'L ECON., Nov. 1995, at 227, 229-30.

26. *See* Markusen, *supra* note 7, at 173; CAVES, *supra* note 13, at 77-78.

fined share of input costs, technology provision, and profits or losses, especially in unknown or regulated markets, for example, China.[27] Finally, MNEs may opt to license a technology, product, or service, leading to complicated issues of bargaining over license fees and royalty payments.[28]

For any firm, the decision of how to invest depends on a host of complex factors regarding local markets and regulations.[29] This section discusses the most significant of these factors for attracting FDI, (for example licensing and technology transfer) and reviews the available economic evidence. IPRs play an important role in these processes, though their importance varies by industry and market structure.

A.   Review of Data on Foreign Direct Investment Flows

It is helpful to begin with a glance at recent international data on FDI and licensing.[30] Table 1 lists aggregate figures on FDI for representative nations. One immediate observation is that reported FDI is quite volatile.[31]   For example, while inward FDI into the United States remained fairly steady at between $48 billion and $60 billion between 1987 and 1995, outward FDI more than tripled from 1990 to 1995. Japan's outward FDI rose sharply in the late 1980s, but fell by more than half between 1990 and 1995.

Despite this volatility, the data shows sharply rising FDI flows in the last decade for both the developed countries and most of the key developing countries.[32] Spain experienced a dramatic increase in inward FDI in the late 1980s after its accession to the European Union, but this inflow has since moderated. The United Kingdom continues

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27. *See* Markusen, *supra* note 7, at 170; CAVES, *supra* note 13, at 77-78.

28. *See* Guifang Yang & Keith E. Maskus, Intellectual Property Rights, Licensing, and Innovation 12-16 (April 5, 1998) (unpublished manuscript, on file with author); Ashish Arora, *Contracting for Tacit Knowledge: the Provision of Technical Services in Technology Licensing Contracts*, 50 J. DEV. ECON. 233, 234-38 (1996); FAROK J. CONTRACTOR, INTERNATIONAL TECHNOLOGY LICENSING: COMPENSATION, COSTS, AND NEGOTIATION 33-51 (1980).

29. *See* Markusen, *supra* note 7, at 173-74; Maskus, *supra* note 13, at 189-93.

30. Reliable and comprehensive data on these flows are not compiled by many countries, so the overview is constrained by limited data availability.

31. This volatility suggests that one should be cautious about making inferences on the basis of a single year of data. Further, it indicates that FDI flows are strongly influenced in the short term by macroeconomic factors, such as fluctuations in the business cycle and shifts in exchange rates. While this fact should be kept in mind, the Article is more concerned with microeconomic determinants of FDI.

32. These figures are in nominal dollars and are not adjusted for inflation or changes in real exchange rates.

to be a net supplier of FDI, but annual investment in that country has doubled over the period. Japan remains, in relation to its GNP, a very small recipient of inward FDI, but a large supplier of outward FDI.[33] Poland's rapid liberalization and deregulation program and its increasing commercial ties with Western Europe led to a forty-fold increase in inward FDI in the early 1990s.

As is well known, FDI in China has mushroomed in recent years, rising by a factor of ten between 1990 and 1995. China received 52% of the inward FDI in 1995 among the listed developing countries, a share that rose dramatically from 15% in 1990.[34] Malaysia, Indonesia, and Thailand have also received rising inward FDI flows. In the 1990s, Thailand's investment abroad rose sharply and Singapore became a significant supplier of FDI.

The two listed African countries, Kenya and Egypt, both displayed declining trends in inward FDI over the last decade, indicative of severe economic problems on that continent. In contrast, Mexico experienced a sharp rise in FDI in the 1990s, some of it undoubtedly related to the negotiation and passage of NAFTA. Brazil and Chile similarly received large increases in FDI since 1990.

From this review it appears that the last decade has been a period of substantially rising FDI, with a larger proportion of investment flowing to the emerging economies. The one "dark spot" on this trend is the declining ability of very poor and inward-looking economies, such as those in Africa, to attract investment. Overall, the review points to rapid growth and increasing openness as the key encouraging factors.

Table 2 provides figures on net receipts[35] for royalties and licensing fees, other business services, and direct investment income. Royalties and license fees are the most direct available measure of international earnings on patents, trademarks, copyrights, and trade secrets.[36] Among the developed nations, the data indicates a split.

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33. It is this feature, Japan's remarkable effective closure to inbound FDI, that continues to characterize it as unique among developed economies.

34. China's receipt of nearly $36 billion in FDI in 1995 marks it as easily the largest destination for investment in the developing world.

35. Meaning credits less debits.

36. This is a standard view in economics. It should be noted that these fees could be imperfect measures of the value of technology exchange. *See* Keith E. Maskus, *Trade-Related Intellectual Property Rights*, 52 EUR. ECON. 157, 158-59, 163 (1993). Within the multinational firm, the fees charged a subsidiary may be dependent on international tax structures. *See* Denise Eby Konan, *Strategic Taxation of the Multinational Enterprise: A New Argument for Double Taxation*, 63 J. PUB. ECON. 301, 303 (1997). Further, optimal pricing of information is

The United States remains, by far, the largest recipient of such fees, earning a net $20.7 billion in 1995. The United Kingdom is also a net recipient, signaling a net export of technologies and product designs. In contrast, Japan, Germany, and Spain pay out more in royalties and fees than they take in, indicating they are net purchasers of technologies and product designs. Furthermore, the developing countries, as technology importers, are all net purchasers of royalties and license fees. Interestingly, for almost all those developing countries,[37] the net payments have risen markedly over the last decade. Thus, it appears the international exploitation of intellectual property is becoming increasingly important in the globalization process.

Table 3 lists the stock of U.S.-owned foreign capital[38] for key countries.[39] The top row demonstrates that U.S. ownership of foreign direct capital nearly tripled from 1985 to 1994.[40] Despite the increasing attractiveness of developing economies as investment targets, the bulk of U.S. investment remained in the developed countries. The twelve countries of the European Union actually increased their share of U.S. investment stock from 36% to 41% over this period, while Japan's share rose from 4% to 6%. Surprisingly, by 1994 the United Kingdom had supplanted Canada as the host of the largest U.S. foreign investment position, with Canada's share falling considerably over the period. Together Europe, Canada and Japan attracted 66.9% of the global U.S. foreign capital stock in 1994. But because each country or region listed saw a large increase in the U.S.-owned capital stock, with the exception of Africa, it is likely that recent relative increases in investment will change these shares over time in favor of the emerging economies.[41]

Within the developing countries, however, the distribution of FDI remains uneven. In the 1990s, China's share of U.S. FDI tripled and investment stock in Hong Kong doubled. Mexico's share also rose sharply, which likely is partly a result of NAFTA—as did Chile's. In contrast, Africa experienced an absolute decline in in-

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a complex problem and receipts of license fees and investment income may be poor indicators of the economic value of intellectual assets. Nonetheless, these data are worth considering. *See* Maskus, *supra*, at 163.

37. With the possible exception of India.

38. Meaning foreign investment position at historical cost.

39. The foreign investment position is a more informative measure of investment activity than is current FDI, because the latter flow is so variable.

40. Because these data are in nominal dollars at historical cost, they should be viewed with caution.

41. *See* BRIAN J.L. BERRY ET AL., THE GLOBAL ECONOMY IN TRANSITION 382 (1997).

vestment stock over the period, indicating a sizable disinvestment, with its share falling from 2.6% to 0.9%.

This uneven development was particularly acute in the 1980s.[42] In that decade, a total of fifteen countries received 80% of all FDI inflows to the developing areas.[43] These flows were highly concentrated within regions as well. For example, Singapore, China, Hong Kong, Malaysia, Indonesia, Korea, Taiwan, and Thailand absorbed more than 90% of investments in Asian developing countries over the decade.[44] While this concentration has moderated somewhat in the 1990s, it is still in evidence.

Table 4 points to another important feature of FDI in today's economy: much investment is complementary across sectors. The data shows that the global stock of capital in banking and finance is nearly as large as that in total manufacturing, and that investments in wholesale trade are also significant. This demonstrates that a strong manufacturing presence in a foreign economy typically goes hand-in-hand with investments in finance and distribution in order to help with local marketing efforts and in financing further expansion of facilities. Such investments are also strongly complementary with merchandise trade flows, particularly those within MNEs. Thus, the traditional view that FDI tends to substitute for trade in goods, that is that trade falls as FDI and local production rise, is outdated and largely inaccurate today.[45]

The bottom two rows in Table 4 crudely indicate the breakdown of the sectoral investment into stocks in developed and developing countries. The manufacturing sector with the highest representation in emerging economies is electrical equipment, followed by food and related products and other manufacturing goods. These industries are those in which it could be expected that developing economies with low-wage labor and abundant agricultural endowments have a comparative advantage in important subsectors.[46] The chemicals sector should also have a fairly high presence in emerging economies,

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42. *See* Hooshang Amirahmadi & Weiping Wu, *Foreign Direct Investment in Developing Countries*, 28 J. DEVELOPING AREAS 167, 168 (1994).

43. *See id.* at 173.

44. *See id.*

45. *See* James R. Markusen, *Factor Movements and Commodity Trade as Complements*, 14 J. INT'L ECON. 341, 355 (1983); Kar-yiu Wong, *Are International Trade and Factor Mobility Substitutes?*, 21 J. INT'L ECON. 25, 26 (1986); Bruce A. Blonigen, In Search of Substitution Between Foreign Production and Exports 1-3 (1997) (unpublished manuscript, on file with the *Duke Journal of Comparative & International Law*).

46. *See* MARKUSEN ET AL., *supra* note 17, at 100-02.

particularly in the pharmaceuticals sub-sector.[47] The data in Table 4 confirms this, with chemicals having the largest stock among sectors investing in China and also being prominent in Latin America. The data thus shows that FDI between the United States and developing countries tends to follow comparative advantages based on factor costs.[48]

The banking and finance sectors have a large presence in developing economies—38% of their FDI stocks are located there. But much of this investment is in Panama and Bermuda because of special tax and operating advantages, indicating that some forms of FDI are sensitive to regulatory regimes.[49] Without Panama and Bermuda, the data suggests that 77% of FDI in these sectors is based more on long-term microeconomic factors existing in the developed countries. Investment in services sectors (largely hotels, engineering and business services) is heavily located in developed economies. However, a substantial portion (25%) of investment in wholesale trade activities exists in developing economies, reflecting the complementary relationship between finance and distribution, on the one hand, and trade and FDI in goods, on the other hand. It should be noted that services bear the particular characteristic that their provision often physically requires the local presence of either the facility itself (hotels, hospitals) or of professionals (engineers, consultants). Thus, rights of establishment are especially important in attracting FDI in services.

Table 5, which lists data on U.S. investment abroad by high-technology manufacturing and services industries in 1989, provides further perspective on the sectoral characteristics of FDI. First, there exists significant variation across industries in the number of foreign affiliates per U.S. parent, which indicates the relative importance of investing in either numerous foreign subsidiaries of fairly small size or fewer foreign facilities of larger size. The pharmaceuticals industry tops this list with 33.8 affiliates per firm. Pharmaceuticals are

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47. *See* Maskus & Penubarti, *supra* note 25, at 238, 242-43.

48. *See* David Carr et al., Testing the Knowledge-Capital Model of the Multinational Enterprise 22-23 (July 1998) (unpublished manuscript, on file with the *Duke Journal of Comparative & International Law*); CAVES, *supra* note 13, at 215-17. A similar finding for U.K. investment was detected by Maskus and Webster. *See* Keith E. Maskus & Allan Webster, *Comparative Advantage and the Location of Inward Foreign Direct Investment: Evidence from the UK and South Korea*, 18 WORLD ECON. 315, 320-23 (1995).

49. *See* Harry Grubert & John Mutti, *Taxes, Tariffs, and Transfer Pricing in Multinational Corporate Decision Making*, 73 REV. ECON. & STAT. 285, 288-290 (1991); U.N. CONFERENCE ON TRADE AND DEV., INCENTIVES AND FOREIGN DIRECT INVESTMENT at 18-26, U.N. Doc. UNCTAD/DTCI/28, U.N. Sales No. E.96.II.A.6 (1996) [hereinafter UNCTAD, INCENTIVES].

characterized by having large numbers of foreign affiliates producing under license.[50] Advertising and industrial chemicals are next, with other industries trailing behind. Second, the stock of foreign assets owned by U.S. firms is shown again to be sparsely located in emerging countries (ECs). The highest proportions of investment in ECs are in electric components and circuits and telecommunications equipment. Each of these sectors includes considerable electronics production that is fairly standardized and labor-intensive.[51] Health services are unusually high in this context among the service sectors. Third, the proportion of intra-firm sales, which are largely between the parent and its affiliates, differs considerably across industries. In comparison to the stock of foreign assets, intra-firm trade is quite high in electronic components, office machines and computers, and motor vehicles and parts. This situation reflects substantial trade in inputs among vertically differentiated firms. Intra-firm trade is much smaller in chemicals, pharmaceuticals, and printing and publishing, in which MNEs tend to be horizontally integrated. Unsurprisingly, there is virtually no intra-firm trade in high-technology services, which essentially requires direct contact between supplier and customer.

B. Factors Influencing Foreign Direct Investment Flows

Foreign direct investment is the act of establishing or acquiring a foreign subsidiary over which the investing firm has substantial management control.[52] Firms that engage in FDI operate in more than one country and are MNEs. The location of the firm headquarters is called the home or source country, while the location of the subsidiary is called the host or recipient country.[53] However, it is increasingly difficult to identify major MNEs with a particular host country, since they may establish facilities in several countries that each undertake "headquarters operations" (such as research and development, marketing, and organizational design) for local markets and tax jurisdictions.[54]

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50. *See* Maskus & Penubarti, *supra* note 25, at 238, 242-43.

51. *See* THE CHINA CIRCLE, *supra* note 21, at 11-17.

52. *See* CAVES, *supra* note 13, at 1.

53. *See* MARKUSEN ET AL., *supra* note 17, at 4.

54. The BASF corporation, for example, was originally identified with Germany, but has moved much of its cancer and immune-system research to Massachusetts. *See* MICHAEL R. CZINKOTA ET AL., INTERNATIONAL BUSINESS 355 (1994). Otis Elevator recently designed an elevator using six research centers in five countries. *See id.*

Multinational enterprises may undertake horizontal FDI, in which the subsidiary produces products and services similar to those produced at home,[55] or vertical FDI, in which the subsidiary produces inputs or undertakes assembly from components.[56] In the latter case, international production is fragmented across borders, taking advantage of locational considerations and input costs (especially wage differences) at various stages of production.[57] Vertical FDI is more prevalent among MNEs that invest in developing (low-wage) economies, while horizontal FDI tends to characterize the investment decisions of MNEs operating across borders within the industrialized, developed nations.[58] Horizontal subsidiaries tend to produce for local or regional markets only, without exporting much output to the host country.[59] In contrast, the output of vertical subsidiaries is more likely to be exported within MNEs, both to the host country and to other countries with similar demand characteristics.[60]

It is also important to note that FDI embodies two distinctive assets: 1) capital and 2) technology or some intangible advantage.[61] While the capital for financing FDI may come from the host country or from global financial markets, it may also be raised on the local capital markets of the recipient nation.[62] Thus, FDI may or may not be associated with a net external addition to the local capital stock, although in economic terms this should be of little consequence since it is investment itself that matters, whether raised from domestic or foreign sources. Therefore, FDI should be viewed less as a source of finance.[63] Instead it should be seen as a source of investment in capital and technology or related assets, the variables capable of improving productivity and wages in a recipient economy.[64]

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55. *See* CAVES, *supra* note 13, at 2.

56. *See id.* at 13.

57. *See id.* at 47, 217-19.

58. *See id.* at 7-8, 15-16.

59. *See* Markusen, *supra* note 7, at 174-75.

60. *See* Gordon H. Hanson, *Localization Economies, Vertical Organization, and Trade*, 86 AM. ECON. REV. 1266, 1266 (1996).

61. *See* Markusen, *supra* note 7, at 174-75.

62. *See* CAVES, *supra* note 13, at 64-71; MARKUSEN ET AL., *supra* note 17, at 394-95. Raising the capital on the local market is the most common approach for financing horizontal investments among industrialized nations. *See* CAVES, *supra* note 13, at 65-71; MARKUSEN ET AL., *supra* note 17, at 394-95. External financing more commonly characterizes FDI in emerging countries. *See* MARKUSEN ET AL., *supra* note 17, at 394-95.

63. This is even more so, as global FDI flows are small in relation to flows of portfolio capital.

64. *See* INDUSTRIAL EVOLUTION IN DEVELOPING COUNTRIES: MICRO PATTERNS OF

What are the underlying determinants of a firm's decision to engage in FDI? Generally, for firms to become a MNE, they must have a cost advantage or technical product superiority over firms in the host country sufficient to overcome the disadvantages they face.[65] Thus, MNEs must enjoy some efficiency advantages, meaning that they bring potential gains to host countries. A convenient framework to illustrate those advantages is the ownership-location-internalization (OLI) paradigm.[66] Under the OLI paradigm, MNEs are characterized by some *ownership advantage.* While this could be a tangible asset, such as a proprietary claim in facilities producing key natural resources, far more commonly the advantage is an intangible asset, such as a trademark, reputation for quality, a product or production process to which other firms do not have access—such as a patent or trade secret.[67] Such advantages confer market power and cost efficiencies that provide sufficient incentives to undertake multinational organization and operation.

These ownership advantages are strongly associated with technology development, information management, and marketing strategies due to certain key attributes of MNEs.[68] These characteristics include: the tendency of such firms to be important in industries with high levels of research and development (R&D); large employment of professional and technical workers; significant reliance on the introduction of new and technically sophisticated products; and substantial product differentiation and advertising.[69] For two key reasons, FDI[70] is more likely to be important in industries with significant firm-specific, intangible, knowledge-based assets (KBAs).[71]

TURNOVER, PRODUCTIVITY, AND MARKET STRUCTURE, *supra* note 20, at 185.

65. These difficulties include, for example, the need for international management, including language and cultural barriers, jurisdiction-specific tax treatments, distance from headquarters, and monitoring local operations. *See* STEPHEN H. HYMER, THE INTERNATIONAL OPERATIONS OF NATIONAL FIRMS: A STUDY OF DIRECT FOREIGN INVESTMENT 32-36 (1976); CAVES, *supra* note 13, at 3-5; Markusen, *supra* note 7, at 174-75.

66. This paradigm was developed by Dunning. *See* JOHN H. DUNNING, INTERNATIONAL PRODUCTION AND THE MULTINATIONAL ENTERPRISE 110, 113 (1981).

67. *See* Markusen, *supra* note 7, at 174-75.

68. *See* CAVES, *supra* note 13, at 3-5. For further studies supporting these points, see generally S. Lael Brainard, *An Empirical Assessment of the Proximity-Concentration Tradeoff Between Multinational Sales and Trade*, 87 AM. ECON. REV. 520 (1993); Stephen G. Grubaugh, *Determinants of Direct Foreign Investment*, 69 REV. ECON. STAT. 149 (1987); Markusen, *supra* note 7; and Randall Morck & Bernard Yeung, *The Quality of Licensed Technology*, 33 INT'L. J. IND. ECON. 41 (1992).

69. *See* Markusen, *supra* note 7, at 172; Brainard, *supra* note 68, at 538.

70. Remember that by definition FDI is only done by MNEs.

71. For example, such KBAs include superior production processes, reputations for qual-

First, information advantages can easily be transferred across borders at low cost.[72] Second, knowledge is similar to a public good; unlike labor or capital, a particular technology or trade secret can be used in several production facilities without reducing its availability for others.[73] This knowledge is embodied in blueprints, software, chemical formulas, and managerial or engineering manuals, which may be re-used repeatedly at low marginal cost.[74]

The key implication of these characteristics of KBAs is that MNEs enjoy scale economies from multiplant production, sometimes called "economies of scope".[75] A multinational firm can produce technical knowledge in one location and apply it at plants in different countries, spreading the investment cost of technology development and marketing across numerous facilities.[76] In contrast, two independent firms, each of which must make this same investment, operate at a cost disadvantage. Thus, significant multinational activity can be seen in industries where the development of transferable knowledge and product quality is a prime goal. Potential for capitalizing on multiplant economies is now considered one of the most important determinants of a firm's decision to undertake FDI.[77]

Efficiency gains are particularly relevant for horizontal FDI, in which firms base their strategies for penetrating markets on the economic value of their KBAs. Because economic value is increasingly related to the performance of systems, MNEs also find it crucial to support their investments with complementary operations such as add-on products, services, information, maintenance, technical upgrades, and close relations between producers and clients.[78] Therefore, in today's world, FDI is far less attracted by protectionist tariff walls than by economies with open access to global markets and strong IPRs.[79]

To summarize, MNEs are essentially exporters of KBA, including technology, engineering, management, marketing, and financial

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ity, performance and service, and even lifestyle images. *See* CAVES, *supra* note 13, at 3-5; Markusen, *supra* note 7, at 174.

72. *See* James R. Markusen, *Multinationals, Multiplant Economics, and the Gains from Trade*, 16 J. INT'L ECON. 205, 207-08 (1984); Markusen, *supra* note 7, at 174.

73. *See* Markusen, *supra* note 72, at 207-08; Markusen, *supra* note 7, at 174.

74. *See* Markusen, *supra* note 72, at 207-08; Markusen, *supra* note 7, at 174.

75. *See* Markusen, *supra* note 72, at 207-08; Markusen, *supra* note 7, at 174.

76. *See* Markusen, *supra* note 72, at 206.

77. *See* Markusen, *supra* note 7, at 175.

78. *See* THE URUGUAY ROUND, *supra* note 12, at 389-90.

79. *See id.*

services. Human capital skills are important in generating these KBAs. Multinational firms also sell the services of devices that protect the value of their KBAs, including patents, trademarks, trade secrets, and copyrights. Indeed, it is common for economists to refer to owned IPRs as the relevant knowledge-based assets.[80] Local subsidiaries pay for these services with royalties, license fees, shared outputs, and profit repatriations.[81]

But even with ownership advantages, MNEs must still decide on investment destinations. These decisions depend on "location advantages," particular characteristics of target countries that make it profitable for the firm to produce abroad rather than at home.[82] Obvious examples of such location advantages include market size and growth, local demand patterns, transport costs and distance from markets, low wage costs in relation to labor productivity, abundant natural resources, and trade protection that could encourage "tariff-jumping" investments.[83] Also important are a modern infrastructure and transparent government regulatory procedures.[84] Recently, these KBA-enhancing location characteristics have taken on crucial importance.[85] Among these attributes are an adequate supply of high-skilled labor that can absorb and use new technology and management techniques,[86] close proximity to customers, an unimpeded ability to build supplier-customer networks, and a vibrant business-services sector that can handle localized needs for marketing and finance.[87] Further, the strength of each country's IPRs is a locational

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80. *See* Markusen, *supra* note 7, at 175.

81. *See id.*; CONTRACTOR, *supra* note 28, at 33-37; Arora, *supra* note 28, at 236.

82. *See* DUNNING, *supra* note 66, at 266-68; Markusen, *supra* note 7, at 175-81.

83. Trade protection, however, declines in importance over time. *See* MARKUSEN ET AL., *supra* note 17, at 346-49.

84. Infrastructure investments include public projects that lower transport and communications costs such as roads, port facilities, and telecommunications linkages. Education is important for raising the technical skills of the population. Such investments provide inducements for multinational enterprises to expand to countries where costs are accordingly lower. *See* THE WORLD BANK, WORLD DEVELOPMENT REPORT 1994: INFRASTRUCTURE FOR DEVELOPMENT 14-20 (1994). Government regulations are "transparent" in that they are codified, enforceable, well-understood, and not subject to abuses and corruption. Regulatory transparency also lowers the costs of investing and producing in a particular location, attracting foreign direct investment. *See* THE WORLD BANK, WORLD DEVELOPMENT REPORT 1997: THE STATE IN A CHANGING WORLD 36-38, 99, 134 (1997) [hereinafter WORLD BANK 1997]; BERRY, ET AL., *supra* note 41, at 10, 268; UNCTAD, INCENTIVES, *supra* note 49, at 42.

85. *See* Brainard, *supra* note 68, at 539; MARYANN P. FELDMAN, THE GEOGRAPHY OF INNOVATION 18-21 (1994); UNCTAD, INCENTIVES, *supra* note 49, at 17-19.

86. *See* FELDMAN, *supra* note 85, at 18-21.

87. *See* Brainard, *supra* note 68, at 539.

factor of growing importance.[88]

If location advantages are important for horizontal FDI, they are crucial for vertical FDI. In a vertical FDI regime, firms build production networks across borders with engineering, design, and marketing operations remaining in the source country and resource extraction, assembly, and data processing established in the host countries.[89] The construction of such vertically integrated networks, also referred to as "production fragmentation," "delocalization," or "outsourcing,"[90] is the most significant recent trend in FDI. This process underlies the rapid expansion of intrafirm trade in goods and services between developed and developing economies.[91] Vertical FDI is most attractive in low-wage, high-growth economies with sufficiently large markets to take advantage of scale economies in assembly.[92] While these production networks may threaten low-skilled workers in high-wage economies, they generate overall efficiency gains in both the source and host countries and are therefore a critical component of modern competitive strategies.[93]

In this context, it is interesting to observe that both the volume and character of inward FDI change dramatically as countries develop.[94] The least-developed countries of the world attract virtually no FDI (except in extractive sectors) due to extremely low productivity, education, and skills.[95] Other factors hurting those countries

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88. Survey evidence points to multinational enterprises placing more importance on IPRs in deciding on FDI programs. *See* EDWIN MANSFIELD, INTELLECTUAL PROPERTY PROTECTION, FOREIGN DIRECT INVESTMENT, AND TECHNOLOGY TRANSFER 19-21 (International Fin. Corp. Discussion Paper 19, 1994); Maskus, *supra* note 13, at 192-93; Jeong-Yeon Lee & Edwin Mansfield, *Intellectual Property Protection and U.S. Foreign Direct Investment,* 78 REV. ECON. & STAT. 181, 185-86 (1996).

89. *See* Hanson, *supra* note 60, at 1277 (analyzing effects of trade liberalization on Mexican apparel industry); *see also* BERRY ET AL., *supra* note 41, at 234-38.

90. Hanson, *supra* note 60, at 1277; BERRY ET AL., *supra* note 41,.

91. Examples include the extensive fragmentation of electronics and machinery production into design in the United States and assembly in the *maquiladora* plants in Mexico. *See* Hanson, *supra* note 60, at 1266-67. Similar processes characterize investment and trade by Japanese and Korean multinationals in East Asia. *See* THE CHINA CIRCLE, *supra* note 21, at 211.

92. *See* CAVES, *supra* note 13, at 17-18; THE CHINA CIRCLE, *supra* note 21, at 165.

93. *See* MARKUSEN ET AL., *supra* note 17, at 395-96, 400-01, 406; Kevin H. Zhang, Theory and Evidence Regarding Multinational Enterprises and International Trade 59-64, 91-93 (1996) (unpublished Ph.D. dissertation, University of Colorado (Boulder)) (on file with author).

94. *See* Zhang, *supra* note 93, at 62-64, 166.

95. *See* Zhang, *supra* note 93, at 16, 166; UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT, THE TRIPS AGREEMENT AND DEVELOPING COUNTRIES 18, U.N. Doc. UNCTAD/ITE/1, U.N. Sales No. 96.II.D.10 (1997) [hereinafter UNCTAD, THE TRIPS AGREEMENT].

are underdeveloped infrastructures, relatively closed markets, and poorly designed, intrusive, and non-transparent government regulations that encourage corruption.[96] To the extent that these countries can marshal effective investments in infrastructure, capital, education, and skills, their per-capita income levels will rise over time.[97] As income levels rise, MNEs find these economies attractive locations for vertical FDI for labor-intensive assembly operations and intra-firm trade grows.[98] This process expands until real wages rise to the extent that the economies lose their competitive advantages in assembly production, the FDI itself playing a positive role in raising wages.[99] As vertical FDI begins to fall off, horizontal FDI takes its place. By this stage of the cycle, the host countries achieve income levels high enough to make them attractive markets for the production of high-quality, differentiated consumer and capital goods and even for the establishment of local R&D programs.[100] Rapidly developing economies, such as Korea, Singapore, and Mexico, may move through this investment cycle in a single generation.[101]

Key location characteristics for horizontal MNEs include market size, income level and growth, transport costs, complementary business services and regulations, and market openness.[102] As noted earlier, IPRs take on increasing importance as investment becomes more horizontal in nature. It is therefore not surprising that a country moving through the FDI cycle, from vertical to horizontal FDI, has a growing economic interest in adopting stronger IPRs—an interest congruent with its own expanding abilities to develop new products and technologies.

But ownership and location advantages do not fully explain FDI as they do not account for the advantages of internal organization over selling goods and licensing technologies on the open market.

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96. *See* Zhang, *supra* note 93, at 65-66; WORLD BANK 1997, *supra* note 84, at 36-38.

97. *See* Zhang, *supra* note 93, at 93-94.

98. *See id.* at 65-66, 91, 165.

99. *See id.* at 65-66, 91, 166.

100. *See* Markusen, *supra* note 7, at 178; JAMES R. MARKUSEN ET AL., A UNIFIED TREATMENT OF HORIZONTAL DIRECT INVESTMENT, VERTICAL DIRECT INVESTMENT, AND THE PATTERN OF TRADE IN GOODS AND SERVICES 17-18 (National Bureau of Econ. Research Working Paper No. 5696, 1996). While horizontal FDI displaces vertical FDI, the cumulative stock of FDI nevertheless should rise over time. Thus, there is an important dynamic element to growth and investment. This process is summarized schematically in Figure 1.

101. For an econometric analysis of the FDI cycle, see Carr et al., *supra* note 48, at 7-8.

102. *See* Brainard, *supra* note 68, at 521; Carr et al., *supra* note 48, at 24-25; David Wheeler & Ashoka Mody, *International Investment Location Decisions: the Case of U.S. Firms*, 33 J. INT'L ECON. 57, 71-72 (1992).

MNEs also have *internalization advantages*, which relate to gains from exploiting their KBAs within the confines of their international operations.[103] It is this aspect of the process that explains the decision to acquire a subsidiary rather than to license an asset with an independent foreign firm.

There are numerous reasons why the costs of international transactions may be lower if performed by a subsidiary rather than at arm's-length. Most of these relate to difficulties involved in writing and enforcing contracts between independent firms where licensing is costly and information is imperfect. For example, because the potential subject of a licensing contract (the KBA) is valuable, but perhaps easily copied, the original firm may not wish to reveal its technology to an unrelated licensee during contract negotiations for fear the latter could decline the contract and copy the technology for its own purposes.[104] The licensee, on the other hand, would be unwilling to sign a contract and agree to royalty terms unless it knows the particulars and value of the technology.[105] In such cases, it may be impossible to develop a satisfactory and enforceable contract, forcing the original firm to acquire a subsidiary to which it transfers the KBAs.[106] This is an informational imperfection in the market for technology that implies, other things being equal, that firms would be more likely to engage in FDI in countries with weaker IPRs and contract-enforcement procedures.[107] Another implication is that as IPRs in a particular nation become stronger, firms tend to choose more technology licensing and joint ventures and less FDI.[108] This negative association of stronger IPRs and reduced FDI applies most readily to firms with proprietary technologies that are expensive to develop but easily copied, such as pharmaceuticals, agricultural chemicals, and computerized processes. A similar phenomenon is that MNEs may be more willing to train and retain technical and managerial employees who learn the technology and who might otherwise defect from a

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103.   *See* Alan M. Rugman, *New Theories of the Multinational Enterprise: An Assessment of Internalization Theory*, 38 BULL. ECON. RESEARCH 101, 114-15 (1986).

104.   *See* DAVID J. TEECE, THE MULTINATIONAL CORPORATION AND THE RESOURCE COST OF INTERNATIONAL TECHNOLOGY TRANSFER 27, 87 (1976); Markusen, *supra* note 7, at 182.

105.   *See* TEECE, *supra* note 104, at 19-20; Markusen, *supra* note 7, at 182.

106.   *See* TEECE, *supra* note 104, at 19-20.

107.   See Ignatius Horstmann & James R. Markusen, *Licensing Versus Direct Investment: A Model of Internalization by the Multinational Enterprise*, 20 CAN. J. ECON. 464, 471-74 (1987); Maskus, *supra* note 13, at 196-99.

108.   *See* Horstmann & Markusen, *supra* note 107, at 472; Maskus, *supra* note 13, at 197.

licensee and form their own competing firms. An additional contracting problem is that a potential independent licensee may attempt to convince MNEs that the market is smaller than it really is, or will grow to be, thereby limiting its royalties and fees.[109] If there is wide uncertainty on this point, MNEs may prefer FDI to avoid having to share any potential profits.[110] This situation explains why some firms set up complementary foreign distribution and servicing facilities.[111]

FDI is prevalent in technology-intensive industries, such as those mentioned above, in part because of technological transfer costs.[112] MNEs usually incur higher transfer costs through arm's-length transactions because it is difficult to transfer qualities resident in the firm's human capital, management, know-how, and corporate culture.[113] This factor increases in importance with more complicated technology or management processes. Because transfer costs also depend on the recipient country's ability to absorb the technology efficiently, technology licensing in complicated products and processes should increase as the human capital base of the host economy rises.[114]

Firms whose KBAs include their reputation for high quality, have an additional motivation for FDI. Once a contract is signed, local licensees may not have sufficient incentive to maintain product or service quality, tarnishing the original firm's reputation and profitability.[115] Similarly, product quality may suffer with licensees who shirk their marketing or distribution duties, or who sign contracts

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109. This problem arises because the local licensee may have better intelligence about the true size and characteristics of its home market (such as impending economic fluctuations, government policies, and consumer demand) than the foreign licensor. Since the parties must bargain over the terms of the licensing contract, the licensee has an incentive to under-represent the true size and demand characteristics of its market in order to reduce its royalties and fees. For its part, if the licensor is uncertain about the demand for its product and therefore cannot strike an acceptable bargain over royalties and fees, it may prefer to internalize this uncertainty by engaging in foreign direct investment and maintaining control over the technology and sales operations. This is a standard bargaining problem in contract theory. *See* Markusen, *supra* note 7, at 182-83; Nancy T. Gallini & Brian D. Wright, *Technology Transfer Under Asymmetric Information,* 21 RAND J. ECON. 147, 157 (1990).

110. *See* Markusen, *supra* note 7, at 182.

111. For an examination of the behavior of American and Japanese MNEs, see Eric D. Ramstetter & William E. James, *Transnational Corporations, Japan-United States Economic Relations, and Economic Policy: The Uncomfortable Reality,* TRANSNAT'L CORP., Dec. 1993, at 68-69 (1993).

112. *See* CAVES, *supra* note 13, at 8-9; Randall Morck & Bernard Yeung, *Why Investors Value Multinationality,* 64 J. BUS. 165, 165-67 (1991); Markusen, *supra* note 7, at 172.

113. *See* TEECE, *supra* note 104, at 46-47.

114. *See* TEECE, *supra* note 104, at 49-55; MANSFIELD, *supra* note 88, at 19-20; CONTRACTOR, *supra* note 28, at 94-96.

115. *See* Markusen, *supra* note 7, at 183-84.

with competitors, devoting more attention to their products.[116] These problems are most significant in economies where monitoring is costly and difficult, the supply of technologies and products to licensees is highly competitive, and contracts are not well enforced.[117] While a firm can attempt to deter such behavior through careful contract construction, it nevertheless may be easier to exercise control through FDI.[118]

This analysis suggests strongly that internalization issues favor FDI, especially horizontal FDI, in industries where KBAs are important. In such sectors, which tend to be associated with intensive R&D programs, advertising efforts, and frequent introduction of complex products,[119] technology transfers are likely to be made internally within the firm, especially when there are contracting, monitoring, and enforcement difficulties.[120]

There are also internalization advantages for vertical FDI. Largely, these advantages relate to difficulties in setting contract prices when MNEs propose to purchase inputs or services, such as a natural resource or assembly operation, from a single seller.[121]   In markets where oligopolistic markets may exist on both sides of the transaction, firms are likely to find it advantageous to integrate the activities and establish profit-maximizing internal pricing.[122]

C.   The Role of Intellectual Property Rights

This review of the determinants of FDI leaves room for IPRs to affect investment flows and the operations of MNEs. The various means by which IPRs influence FDI are subtle and complex. Moreover, it must be emphasized that strong IPRs alone do not sufficiently generate strong incentives for firms to invest in a country.[123]   If that

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116. *See id.*

117*. See* MANSFIELD, *supra* note 88, at 19-20; CONTRACTOR, *supra* note 28, at 136-37.

118. *See* Horstmann & Markusen, *supra* note 107, at 470-71.

119*. See* Morck & Yeung, *supra* note 112, at 167-68; Markusen, *supra* note 7, at 172.

120*. See* Horstmann & Markusen, *supra* note 107, at 467-71.

121*. See* CAVES, *supra* note 13, at 13-14; F.M. SCHERER, INDUSTRIAL MARKET STRUCTURE AND ECONOMIC PERFORMANCE 299-302 (2d ed. 1980).

122*. See* CAVES, *supra* note 13, at 103-05; SCHERER, *supra* note 121, at 299-302.

123. Strong IPRs attract FDI, but are not sufficient for this purpose. Several studies show that a country hoping to attract FDI requires, among other factors, political and economic stability, adequate infrastructure, a strong educational system, a skilled labor force, and a large market or proximity to markets. *See generally* Wheeler & Mody, *supra* note 102 (studying inter-government competition for foreign investment with tax and other short run incentives); Grubert & Mutti, *supra* note 49 (studying the impact of host country taxes and tariffs on international trade patterns); Brainard, *supra* note 68 (finding that FDI increases relative to exports

were the case, recent FDI flows to developing economies would have gone largely to sub-Saharan Africa and Eastern Europe.[124] In contrast, China, Brazil, and other high-growth, large-market developing economies with weak IPRs would have attracted less FDI.[125]

IPRs are an important component of the general regulatory system, including taxation, investment regulations, production incentives, trade policies, and competition rules. The joint implementation of an overall pro-competitive business environment matters most for FDI. This section does not review the joint implementation, but focuses strictly on mechanisms by which the strength of IPRs affect FDI decisions, in light of economists' theories of why investment takes place.

What ultimately matters to MNEs is the likelihood that FDI will raise expected profits.[126] Although numerous factors influence profitability, the IPRs issue is the firm's perception that it will be able to earn a higher return on its protected KBAs through FDI, relative to other means of earning such returns.[127]

The factors influencing a firm's perception of profitability on its KBAs through FDI is a complex subject that permits few definitive conclusions. To sketch an idea of this complexity, consider that a

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the higher the transport costs and trade barriers and the lower the investment barriers and scale economics at the plant level relative to the corporate level); Markusen, *supra* note 7 (focusing on the circumstances that lead a firm to serve a foreign market by exports versus foreign production and why firms choose FDI versus some alternative mode of entry, such as a joint venture or a licensing arrangement).

124. If IPRs alone were sufficient to attract FDI, FDI would have gone to many sub-Saharan, African, and Eastern European economics where strong intellectual property laws are poorly enforced. *See* Richard T. Rapp & Richard P. Rozek, *Benefits and Costs of Intellectual Property Protection in Developing Countries*, J. WORLD TRADE, Oct. 1990, at 77-83. China, Brazil, and other high-growth, large-market economies have weak intellectual property laws. Yet, the former attract very little FDI because they are small and poor, whereas the latter attract much FDI, because they are large and getting richer. *See id.* (finding that sub-Saharan and Eastern European countries have stronger intellectual property laws than China and Brazil); Maskus & Penubarti, *supra* note 25, at 244; Juan Carlos Ginarte & Walter G. Park, *Determinants of Patent Rights: A Cross-National Study*, 26 RES. POL'Y 283, 297-98 (1997) (presenting an index of patent rights for 110 countries between 1960 and 1990 and analyzing the underlying factors which influence patent protection levels). That FDI avoids small, poor countries and gravitates to large, growing countries was discussed in the context of Table 3 in this Article.

125. *See* Rapp & Rozek, *supra* note 124, at 77-83 (finding that sub-Saharan and Eastern European countries have stronger intellectual property laws than China and Brazil); *see also* Maskus & Penubarti, *supra* note 25, at 244; Ginarte & Park, *supra* note 124, at 297-98 (presenting an index of patent rights for 110 countries between 1960 and 1990 and analyzing the underlying factors which influence patent protection levels).

126. *See* Stephen G. Grubaugh, *Determinants of Direct Foreign Investment*, 69 REV. ECON. & STAT. 149, 149 (1986).

127. *See* Horstmann & Markusen, *supra* note 107, at 471; Maskus, *supra* note 13, at 197.

firm with a KBA (reputation for quality, new technology, or a new product) has several choices in deciding how to service a particular foreign market. First, it can export the goods through standard, arm's-length trade channels. Second, it can choose to produce locally by undertaking FDI and controlling the production process. Third, it can license or franchise its KBA to an unrelated firm in the host country and allow local production in return for royalties and fees. Finally, it can undertake a joint venture involving a form of joint production or technology-sharing agreement.[128] These decisions are not made independently, and it is possible to observe more than one mode of supply in certain circumstances.[129]

Exports are likely to be the primary mode of supply when transport costs and tariffs are low in comparison to the costs of FDI and licensing.[130] But the volume of exports also depends on the strength of local IPRs.[131] Strong IPRs in all forms—patents, trademarks, copyrights, and trade secrets—provide protection for exporting firms against local copying of the product, thereby increasing the potential market for exporters and inducing them to sell more.[132] This "market-expansion effect" is likely to be strongest in countries with large markets (either in absolute size or in terms of per-capita gross national product (GNP) that have significant technical capabilities for imitating products and technologies.[133] At the same time, strong IPRs give exporting firms greater market power, allowing them to charge higher prices. But concerns about this "monopoly effect" are often overstated in light of competitive realities.[134] It is more likely to be important in countries with small markets and limited technological abilities. Overall, empirical evidence indicates that, other factors being equal, countries with stronger IPRs attract more imports, though the effect varies across industries.[135] It is interesting to note that the effect of stronger trademarks seems particularly important in

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128. A further option—not supplying the market at all—may pertain to small, poor markets with limited IPRs but is not considered further.

129. *See* Carr et al., *supra* note 48, at 7; Maskus, *supra* note 13, at 200.

130. *See* Carr et al., *supra* note 48, at 7; Markusen, *supra* note 7, at 173.

131. This point has been discussed most fully by Maskus & Penubarti, *supra* note 25, at 228.

132. *See id.* at 244.

133. *See id.*

134. *See* Keith E. Maskus & Denise Eby-Konan, *Trade-Related Intellectual Property Rights: Issues and Exploratory Results*, *in* ANALYTICAL AND NEGOTIATING ISSUES IN THE GLOBAL TRADING SYSTEM 411, 401-46 (Alan V. Deardoff & Robert M. Stern eds., 1994).

135. *See* Maskus & Penubarti, *supra* note 25, at 237-43.

increasing exports[136] of relatively low-technology goods, such as clothing and other consumer goods, because the ease of knocking off such products under weak trademarks limits foreign firms' incentives to sell them locally.[137] Stronger trademarks effectively lower the costs of exporting, because a firm faces a smaller need to discipline local imitators through lower prices.[138] Trade in goods that are difficult to imitate (certain kinds of machinery), or for which trademarks are not as significant (basic metal manufactures), is less sensitive to variations in IPRs since there is little threat of losing market share to local infringing firms.[139]

FDI is likely to supplant direct exports of a good where trade and transport costs are high,[140] the fixed costs of building foreign plants are low, local productivity is high, labor costs are low, the size of the host market is large, and R&D and/or the marketing intensity is substantial.[141] As discussed earlier, R&D and marketing intensity are critical for horizontal FDI in differentiated goods and advanced technologies as it is the knowledge base—or intellectual component—of the firm's advantage that induces it to conduct FDI.

FDI exists because firms with some ownership advantage prefer to exploit it through internal organization of multinational activity, with the location of activity depending on local market characteristics. This analysis suggests that IPRs should take on different levels of importance in different sectors with respect to encouraging FDI. Investment in lower-technology goods and services, such as textiles and apparel, electronic assembly, distribution, and hotels, depends less on the strength of IPRs and relatively more on input costs and market opportunities.[142] Investors with a product or technology that

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136. The term "export" means those exports from the source to the host country. From the host countries perspective those are imports. However, because this Article focuses on the MNE perspective, the term "export" is used.

137. *See* Maskus & Penubarti, *supra* note 25, at 244.

138. *See id.*; M. Scott Taylor, *TRIPs, Trade, and Technology Transfer*, 26 CAN. J. ECON. 625, 626-27 (1993).

139. *See* Maskus & Penubarti, *supra* note 25, at 230-31; RICHARD C. LEVIN ET AL., APPROPRIATING THE RETURNS FROM INDUSTRIAL RESEARCH AND DEVELOPMENT 796-97 (Brookings Papers on Economic Activity No. 3, 1987).

140. *See* Carr et al., *supra* note 48, at 7. This is a relative comparison only. Raising trade barriers would not necessarily attract FDI; rather, high tariffs in relation to fixed costs are associated with FDI. In general, however, significant trade liberalization tends to attract FDI.

141. *See id.*; Brainard, *supra* note 68, at 520; JAMES R. MARKUSEN, TRADE VERSUS INVESTMENT LIBERALIZATION 2 (National Bureau of Econ. Research Working Paper No. 6231, 1997).

142. *See* MANSFIELD, *supra* note 88, at 3-4 (finding that in relatively high-technology indus-

is costly to imitate may also pay little attention to local IPRs in their decision making. However, the fact that imitation has become markedly easier over time in many sectors points to the rising importance of IPRs.[143] Firms with easily copyable products and technologies, such as pharmaceuticals, chemicals, food additives, and software, are more concerned with the local IPR system's ability to deter imitation.[144] Firms considering investing in a local R&D facility pay particular attention to local patent protection.

Reported surveys support the view that IPRs become more important as the ease of imitation increases. One survey asked intellectual-property executives in firms representing six industries about the importance of IPRs in their FDI and licensing decisions. They were also asked to provide their assessments of the adequacy of IPRs in sixteen countries.[145] None of the industries showed much concern about IPRs protecting the operation of sales and distribution outlets. However, all sectors showed concern about IPRs protecting production. The level of concern increased with the stage of production.[146] Overall, the chemical industry was the most affected in its decisions to invest, but all sectors expressed strong concerns about local IPRs in locating R&D operations. Another survey demonstrated that these findings also hold for Japanese and German firms considering foreign investments.[147]

Table 7 presents additional results for selected countries with weak IPRs at the time of the first survey. In particular, firms expressed great concern over IPR protection in India. Fully 80% of the chemical firms surveyed indicated they did not feel they could engage in joint ventures or transfer new technologies to subsidiaries or unrelated firms in India due to weak IPRs protection. Interestingly, in the chemical industry there is little difference between joint ventures and subsidiaries in this regard. Both investments evidently provide foreign firms with approximately the same level of security for their

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tries, a country's IPRs system has a significant effect on the amount and kinds of investments that foreign corporations will make).

143. *See id.* at 1.

144. *See id.* at 13.

145. *See id.* (surveying 100 major U.S. firms with international operations in 1991). Table 6 reproduces the results regarding type of investment facility.

146. For example, in the chemical industry, which includes pharmaceuticals, 46% of firms are concerned about protection for basic production and assembly facilities, 71% for components manufacture, 87% for complete products manufacture, and 100% for R&D facilities.

147. *See generally* MANSFIELD, *supra* note 88 (finding that the strength or weakness of a country's IPRs effected investment decisions for Japanese and German firms).

technologies.[148] However, in all countries, licensing to unrelated firms was seen as the riskest option because of weak IPRs. This situation seems to be true for machinery as well. In the other sectors, however, there is little difference in the willingness to transfer technology through various modes according to weaknesses in IPRs.

In countries with weak IPRs, licensing is seen as insecure relative to investment in the high technology sectors. This view illuminates a subtle aspect of intellectual property protection. In theory, firms are more likely to undertake FDI than licensing when they have a complex technology and highly differentiated products and when costs of transferring technology through licensing are high.[149] Under these circumstances, it is more efficient to internalize the costs of technology transfer through wholly-owned or majority-owned subsidiaries.[150] As IPRs improve, licensing costs should fall as it becomes easier to discipline licensees against revelation or appropriation of proprietary technology and against misuse of a trademark.[151] Thus, for a given level of complexity of innovations, licensing should displace FDI as IPRs are strengthened.

It is useful to summarize the previous observations about IPRs, FDI, and technology transfer. First, investment and technology transfer are relatively insensitive to international differences in IPRs in sectors with old products and standardized, labor-intensive technologies. Here, FDI is influenced by factor costs, market sizes, trade costs, and other location characteristics. Second, other factors being equal, for complex but easily copied technologies, FDI is likely to increase as IPRs are strengthened. The reason is that patents, copyrights, and trademarks increase the value of KBAs, which may be efficiently exploited through internalized organization. Third, to the extent that stronger IPRs reduce licensing costs, efficient licensing could displace FDI over time. Therefore, whatever the mode, the likelihood that the most advanced technologies will be transferred rises with the strength of IPRs.

One interesting implication of the fact that stronger IPRs increases the likelihood that advanced technologies will be transferred

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148. But there is more concern about joint ventures in Mexico and Indonesia.

149. *See* TEECE, *supra* note 104, at 19-20; William H. Davidson & Donald G. McFetridge, *Key Characteristics in the Choice of International Technology Transfer Mode* J. INT'L BUS. STUD., Summer 1985, at 5, 8; Horstmann & Markusen, *supra* note 107, at 465.

150. *See* Horstmann & Markusen, *supra* note 107, at 465; Davidson & McFetridge, *supra* note 149, at 5, 8.

151. *See* Markusen, *supra* note 7, at 182-86; Maskus & Yang, *supra* note 7.

is that rapidly growing, developing countries should develop a natural interest in improving their IPRs regime as they increase their ability to absorb and even develop more sophisticated innovations. This is, perhaps, the best argument in favor of adopting stronger IPRs protection for nations such as Korea, Brazil, Mexico, and Malaysia. [152] In the early stages of their industrial growth, developing countries have an interest in limited protection, because they want to be able to freely imitate imported technologies.[153] As they develop, however, they should become increasingly interested in tightening IPRs, both in order to attract the most advanced technologies and to encourage their own innovation.[154] This prediction is confirmed by the varying degrees of patent protection across countries according to the level of economic development.[155]

Economists cannot be entirely optimistic about the implications of stronger IPRs for technology transfer. Technological information is transferred from one firm to another, or from one country to another, through numerous channels.[156] Patents themselves have potentially ambiguous effects. On the one hand, they directly facilitate additional information transfer, and even technology diffusion, by disclosing the details of inventions in application materials.[157] Local firms can use this information to develop follow-up products that do not violate the scope of the original patent. As more countries provide and enforce patents, global innovation and patenting should increase, with a positive impact on follow-on innovation. On the other hand, patents can slow technology diffusion by limiting the use of key technologies through restrictive licensing arrangements. This negative view of patents has long been the policy of numerous developing nations and still commands widespread respect in some quarters.[158]

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152. *See* Robert E. Evenson, *Intellectual Property Rights for Appropriate Invention*, *in* THE ECONOMICS OF COOPERATION: EAST ASIAN DEVELOPMENT AND THE CASE FOR PRO-MARKET INTERVENTION 51, 66-73 (James A. Roumasset & Susan Barr eds., 1992).

153. *See id.* at 67.

154. *See id.* at 67-68.

155. *See* Maskus & Penubarti, *supra* note 25, at 240.

156. *See* Edwin Mansfield, *How Rapidly Does Industrial Technology Leak Out?*, 34 J. INDUS. ECON. 217, 221 (1985); Jonathan Eaton & Samuel J. Kortum, *Trade in Ideas: Patenting and Productivity in the OECD*, 40 J. INT'L ECON. 251, 252 (1996); David Coe & Elhanan Helpman, *International R&D Spillovers*, 39 EUR. ECON. REV. 859, 860 (1995); WOLFGANG KELLER, TRADE AND THE TRANSMISSION OF TECHNOLOGY 3 (National Bureau of Econ. Research Working Paper No. 6113, July 1997).

157. *See* UNCTAD, THE TRIPS AGREEMENT, *supra* note 95, at 15; Eaton & Kortum, *supra* note 156, at 260-1.

158. *See* Constantine Vaitsos, *Patents Revisited: Their Function in Developing Countries*, 9

Recent theoretical growth models on the impact of IPRs on technology diffusion also bear mixed messages. In some models, technology is transferred through imitation by firms in developing countries.[159] When the global IPRs system is strengthened by the adoption of minimum standards, imitation becomes harder as foreign patents are enforced.[160] Thus, the rate of imitation declines.[161] However, contrary to what might be expected, the global rate of innovation slows as well.[162] Innovation slows because it takes longer for firms to lose their technological advantage. Firms can therefore earn higher profits per innovation and reduce their R&D efforts.[163]

The idea that firms can earn higher profits per innovation and reduce their R&D efforts is sensitive to model assumptions and does not hold up to alternative specifications. If production is transferred through FDI rather than through imitation, product innovation and technology diffusion are strengthened under tighter IPRs.[164] This points to the need for developing economies to remove impediments to inward FDI as they strengthen their intellectual property systems. Studies based on game theory demonstrate that, while the mode of technology transfer is affected by the level of IPRs protection,[165] the quality of the transferred technologies rises with stronger IPRs.[166] Another theoretical study shows that technology transfer expands with stronger patents when there is competition between foreign and domestic innovators.[167] Failure to provide patents removes the incentive for the foreign firm to license its best-practice technologies.[168] Finally, in cases where local imitation requires knowledge that is

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J. DEV. STUD., October 1972, at 71, 71-73; R. MICHAEL GADBAW & TIMOTHY J. RICHARDS, INTELLECTUAL PROPERTY RIGHTS: GLOBAL CONSENSUS, GLOBAL CONFLICT 1-2 (1988); UNCTAD, THE TRIPS AGREEMENT, *supra* note 95, at 15.

159. *See* Elhanan Helpman, *Innovation, Imitation, and Intellectual Property Rights*, 61 ECONOMETRICA 1247, 1247 (1993); Amy Glass & Kamal Saggi, Intellectual Property Rights, Foreign Direct Investment, and Innovation 1-2 (August 1997) (unpublished manuscript, on file with the *Duke Journal of Comparative and International Law*).

160. *See* Helpman, *supra* note 159.

161. *See id.*

162. *See id.* at 1257; Glass & Saggi, *supra* note 159, at 21.

163. *See* Helpman, *supra* note 159, at 1248, 1261; Glass & Saggi, *supra* note 159, at 21.

164. *See* Edwin L.C. Lai, *International Intellectual Property Rights Protection and the Rate of Product Innovation*, 55 J. DEV. ECON. 133 (1998).

165. For example, internalization through FDI is the preferred mechanism in countries with weak patents.

166. *See* Sharmila Vishwasrao, *Intellectual Property Rights and the Mode of Technology Transfer*, 44 J. DEV. ECON. 381, 399 (1994).

167. *See* M. Scott Taylor, *Trips, Trade, and Growth*, 35 INT'L ECON. REV. 361, 377 (1994).

168. *See id.*

available only through the licensed use of technology, the foreign licensors make lower-quality technologies available.[169]   This reduces the licensee's incentive to imitate the technology, reducing both the quality and extent of knowledge transfer.[170]

Studies of international patenting behavior provide an optimistic view.[171]   While the value of patent rights varies across countries and technology fields, it is usually significant in developing countries, suggesting that stronger patents would induce further R&D and patent applications.[172]   Considerable spillovers of technological knowledge appear through patenting and trade in patented products.[173]

The importance of technology transfer through trade in technologically advanced inputs[174] should also be emphasized. Evidence indicates that such trade is responsible for significant productivity gains across borders and is a crucial part of the technology convergence that has emerged among the developed economies in recent decades.[175]   This suggests that emerging economies have a joint interest in trade liberalization and linking their IPRs systems with those of developed countries. The resulting gains in productivity spillovers could easily outweigh any costs associated with additional market power.

While all these studies point to the significance of IPRs, ultimately IPRs may no longer play much of a role in determining locational choices. To the extent that *different* levels of IPRs across nations currently act as locational determinants of FDI and technology transfer, the trend toward harmonization of IPRs within TRIPS will offset such advantages.[176]   That is, the attractiveness of countries that are strengthening their IPRs will increase, the *relative* attractiveness of those already affording strong IPRs will decrease.[177]   This harmonization of global minimum standards presents great opportunities for firms that develop technologies and products because they will no longer have to pay as much attention to local protection and en-

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169. *See* Katharine Rockett, *The Quality of Licensed Technology*, 8 INT'L J. INDUS. TECH. 559, 559-60 (1990).

170. *See id.*

171. *See* Eaton & Kortum, *supra* note 156, at 275-76.

172. *See id.* at 252.

173. *See id.* (claiming that, except for the United States, the OECD countries have derived substantial productivity growth from importing knowledge through patents).

174. For example, machinery, chemicals, software, and producer services.

175. *See* Coe & Helpman, *supra* note 156, at 861, 875.

176. *See* Maskus, *supra* note 13, at 201-202.

177. *See id.*

forcement problems in safeguarding their proprietary information.[178] In turn, they can focus their R&D programs on those areas with the highest global payoffs.

D. Intellectual Property Rights in a Broader Context

So far the narrow focus of this Article has been on the interaction between IPRs and incentives for FDI and technology transfer. Many analysts, however, claim that strong IPRs play a much larger role in signaling to potential investors that a particular country recognizes and protects the rights of foreign firms to make strategic business decisions with few government impediments.[179] In this view, trade liberalization (the removal of market restrictions at the border) is insufficient to provide assurances that an economy is becoming more open to international commerce.[180] Market access could remain blocked by inefficient investment regulations, limited rights of establishment, domestic credit, production and marketing controls, arbitrary or punitive taxes, licensing restrictions, and weak IPRs.[181] Stronger IPRs are also considered a signaling device to convey a commitment to move from opaque to transparent legal systems, from arbitrary pronouncements to unbiased enforcement of commercial laws, and from corruption to professionalism in public management.[182] The objective is to attract more FDI through this signal, whatever the particular incentives that may be generated in various sectors by stronger IPRs.[183] To date, there is little evidence supporting the responsiveness of investment to this signal, but there is a widespread and growing belief in its importance in emerging econo-

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178. *See id.* at 196.

179. *See* ROBERT M. SHERWOOD, INTELLECTUAL PROPERTY AND ECONOMIC DEVELOPMENT 6, 8, 191-93 (1990).

180. *See* Bernard Hoekman, *Focal Points and Multilateral Negotiations on the Contestability of Markets, in* QUIET PIONEERING: ROBERT M. STEM AND HIS INTERNATIONAL ECONOMIC LEGACY 171, 172 (Keith E. Maskus et al. eds., 1997).

181. *See id.* at 172, 178 (arguing that the issue of attaining market access through rationalization of these internal barriers to competition is now at the top of the international trade-policy agenda).

182. *See* SHERWOOD, *supra* note 179, at 109, 193. One prominent example is the negotiation of the North American Free Trade Agreement, in which Mexico agreed to strengthen its standards for intellectual property protection to a level virtually equivalent to those in the United States. *See* Maskus *supra* note 2, at 685-88. Mexico did so in part to convey that it would respect business rights in a transparent manner and would commit itself not to undoing that change in policy. *See id.*

183. *See* SHERWOOD, *supra* note 179, at 192.

mies.[184] This explains why, despite serious questions about the wisdom of doing so, several poor countries with limited technical capabilities have unilaterally strengthened their IPRs laws and enforcement in the 1990s.[185] They prefer not to be left behind in the global competition for capital and technology. It also helps explain the universal acceptance of TRIPS.

III. THE ECONOMETRIC EVIDENCE ON FDI, TECHNOLOGY TRANSFER, AND GROWTH

Despite the apparent importance that IPRs could play in FDI decisions, until recently IPRs have not been incorporated into empirical work on the determinants of FDI.[186] This reflects both skepticism about the significance of IPRs and the difficulty of measuring both IPRs and their impacts.[187] Economists have instead focused on variables capturing the influence of macroeconomic factors, risk, wage costs, trade impediments, industrial structures, taxes, infrastructure, and other incentives or disincentives to FDI.[188]

A. Main Determinants of FDI

The following discussion lists the major influences on the decision of MNEs to invest in various countries by grouping them into types.[189] Within each type, an attempt is made to assess the relative importance of each factor, though this is difficult to do in general terms because the factors are interrelated and vary across countries and time periods. In interpreting these factors, it is important to note that a decision to invest depends positively on the investment's expected future profitability and negatively on its expected profit variability, or risk.[190]

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184. *See id.* at 67, 92.

185. *See id.* at 178; Maskus *supra* note 2, at 682 (including Indonesia, Philippines, and Viet Nam.).

186. *See* Maskus *supra* note 13, at 198.

187. *See* Carlos A. Primo Braga & Carsten Fink, *International Transactions in Intellectual Property and Developing Countries*, 17 INT'L J. TECH. MGMT. (forthcoming 1999).

188. *See* discussion *infra* Part IV.

189. *See* Wheeler & Mody *supra* note 102, at 71-72; Ray Barrell & Nigel Pain, *An Econometric Analysis of U.S. Foreign Direct Investment*, 78 REV. ECON. STAT. 200, 206 (1996); Irving B. Kravis & Robert E. Lipsey, *Location of Overseas Production and Production for Export by U.S. Multinational Firms*, 12 J. INT'L ECON. 201, 202-03, 221-22 (1982); Claudy G. Culem, *The Locational Determinants of Direct Investments Among Industrialized Countries*, 32 EUR. ECON. REV. 885, 888-90 (1988); Grubert & Mutti, *supra* note 49, at 290-93; Amirahmadi & Wu, *supra* note 42, at 173-84.

190. *See* Wheeler & Mody, *supra* note 102, at 60. *See generally* David O. Cushman, *Real*

1. *Macroeconomic Factors.* Market size[191] in the recipient country is a major factor in attracting FDI.[192] The larger the market, the greater the incentive to enter through FDI in order to take advantage of scale economies.[193] To the extent regional trade agreements expand the size of the region that local production can service without restrictions, the importance of market size favors such agreements as a means of encouraging inward FDI.[194]

The rate of growth of real gross domestic product also has a strong positive effect on incoming FDI[195] because additional investment, including FDI, is often required to meet the needs of a growing economy.[196] This is consistent with the concentration of FDI in the developing economies of East Asia and Latin America in the last ten years.[197]

As predicted by theoretical studies,[198] the level of GNP per capita affects both the amount of FDI and its nature. Total investment rises with the level of economic development because such increases shift preferences toward goods with a higher technology content or with more product differentiation and higher quality.[199] This factor also causes FDI to become more horizontal as development proceeds.[200]

Some analysts also emphasize the role of exchange rate changes in influencing FDI flows. A current real appreciation of the dollar induces U.S. firms to move forward their planned FDI in Organization for Economic Cooperation and Development (OECD) countries because of cheaper local acquisition costs, affecting the temporal pat-

Exchange Rate Risk, Expectations, and the Level of Direct Investment, 32 REV. ECON. STAT. 299-300 (1985).

191. *See* Wheeler & Mody, *supra* note 102, at 59; Kravis & Lipsey, *supra* note 189, at 216; Culem, *supra* note 189, at 888. (measuring market size by real GNP or GDP).

192. *See* Wheeler & Mody, *supra* note 102, at 59-60; Barrell & Pain, *supra* note 189, at 106; Brainard, *supra* note 68, at 523.

193. *See* Wheeler & Mody, *supra* note 102, at 59-60. The elasticity of incoming manufacturing FDI with respect to real GDP is estimated at 1.24 and this coefficient is highly significant. *See* Wheeler & Mody, supra note 102, at 67. Thus, a one-percent increase in real GDP could be expected to increase FDI by more than one percent. *See id.* This elasticity rises sharply with the level of development; for poor countries the elasticity of FDI with respect to market size is 0.24. *See id.*

194. *See* Greenaway, *supra* note 17, at 118-22.

195. *See* Barrell & Pain, *supra* note 189, at 205.

196. *See id.*

197. *See* Amirahmadi & Wu, *supra* note 42, at 170-71.

198. *See id.* at 180; Culem, *supra* note 189, at 888.

199. *See* STEVEN HUSTED & MICHAEL MELVIN, INTERNATIONAL ECONOMICS 139-42 (4th ed. 1997); Zhang, *supra* note 93, at 91, 94; MARKUSEN ET AL., *supra* note 17, at 197, 203, 205.

200. *See* Zhang, *supra* note 93, at 60-61, 91, 94.

tern of investment if not the long term stock value of the firms.[201] However, an expected future real appreciation of the dollar tends to postpone U.S. investment.[202] Considerable riskiness in real exchange rates tends to increase FDI because MNEs find it profitable to reduce exports, but offset this reduction by increasing foreign production.[203] Overall, however, there is relatively little agreement among economists that such exchange-rate factors are systematic and important in the long run.

2. *Relative Input Costs.* Differences in real unit labor costs between the source and host countries are an important determinant of locational decisions.[204] With regard to input costs, vertical investment is more sensitive to wage differences than is horizontal investment.[205]

Several studies include differences in relative costs of capital[206] between the host and source countries to account for decisions of MNEs on where to finance the investment.[207] While these costs do influence the location of financing, they seem to have relatively little impact on the extent of FDI.[208]

Finally, much of the vertical investment in extractive sectors is driven by abundant local availability and low cost of natural resources.[209] This has some effect on decisions on where to locate assembly operations that rely on resource inputs.[210]

3. *Agglomeration Effects.* Agglomeration occurs if, as the number of firms in a particular location rises, the costs of production for all firms fall together.[211] A primary reason for this is that

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201. *See* Barrell & Pain, *supra* note 189, at 205.

202. *See id.*

203. *See* Cushman *supra* note 190, at 297, 301-02, 306.

204. *See* Wheeler & Mody, *supra* note 102, at 66, 68. This study found that this is the most significant variable in explaining U.S. investment in the electronics industry, with an average elasticity of 1.99. That is, a fall in relative labor costs of one percent raises FDI by 1.99% in electronics. This elasticity is even higher in the poorest countries. For total manufacturing investment, however, the relative-wage effect is much smaller, though significant. *See id.* at 66.

205. This can be seen when using electronics FDI as a proxy for vertical FDI. *See id.*

206. Measured as interest rate or user costs of capital.

207. *See* Culem, *supra* note 189, at 886; Grubert & Mutti, *supra* note 49, at 285.

208. *See* Culem, *supra* note 189, at 900; Grubert & Mutti, *supra* note 49, at 293.

209. *See* CAVES, *supra* note 13, at 13.

210. For example, firms are often able to minimize transport costs, including damages from spoilage, by locating food-processing operations, such as sugar refineries and canning facilities, near sources of agricultural supply.

211. *See* Donald F. Smith, Jr. & Richard Florida, *Agglomeration and Industrial Location:*

concentrated investment activities encourage the development of higher quality, differentiated producer inputs, such as engineering skills and finance.[212] As the pool of specialized labor expands, new firms find it advantageous to locate in the area.[213]

The effectiveness of agglomeration in attracting FDI[214] depends on the amount and quality of supporting infrastructure in the economy[215] and on market size.[216] Infrastructure refers to facilities for trade, transportation, communication, and energy use. Thus, if a country is interested in industrial development through attracting investment into a particular region, it must pay attention to developing infrastructure and establishing a large and vibrant market (even if exported) for the output.

4. *Policy Variables*. There is some evidence that in corporate tax rates, FDI is sensitive to differences across countries.[217] But, while taxes are potentially important in attracting FDI, these findings are apparently controversial among economists and await further verification.[218]

Disincentives to investment, for example, investment regulations such as local content requirements, ownership limits, and profit repatriation controls, have been found to have a strong negative effect on inward FDI.[219] Thus, if limiting investment is the goal, such policies

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An Econometric Analysis of Japanese-Affiliated Manufacturing Establishments in Automotive-Related Industries, 36 J. URB. ECON. 23, 23-24 (1994). Hanson, *supra* note 60, at 1270-77, finds considerable evidence of such effects in the Mexican apparel sector. On the concept of agglomeration, *see generally* Paul R. Krugman, *Increasing Returns and Economic Geography*, 99 J. POL. ECON. 483, 494-98 (1991); PAUL R. KRUGMAN, GEOGRAPHY AND TRADE (1991); Keith Head et al., *Agglomeration Benefits and Location Choice: Evidence from Japanese Manufacturing Investment in the United States*, 38 J. INT'L ECON. 223 (1995); Wheeler & Mody *supra* note 102; Culem, *supra* note 189.

212. *See* James R. Markusen, *Trade in Producer Services and in Other Specialized Intermediate Inputs*, 79 AM. ECON. REV. 85, 85 (1989); Krugman, *Increasing Returns and Economic Geography*, *supra* note 211; Hanson *supra* note 60, at 1266.

213. *See* Markusen, *supra* note 212, at 85-86; Krugman, *Increasing Returns and Economic Geography*, *supra* note 211.

214. For example, the significance in FDI decisions has been shown by Wheeler & Mody, *supra* note 102, at 66-72.

215. *See id.* at 69.

216. This follows logically from the whole idea of agglomeration. *See id.* at 63-64.

217. *See* Grubert & Mutti, *supra* note 49, at 286-90. The authors found that a reduction in the host-country tax rate from 20% to 10% could increase the stock of plant and equipment owned by U.S. affiliates in a particular country by 65%. *See id.*

218. *See* Markusen, *supra* note 7, at 171, 186-87.

219. *See* Grubert & Mutti, *supra* note 49, at 290 (using dummy variables for countries that do not allow more than 50% equity ownership for foreign investors); Wheeler & Mody, *supra*

are effective. In contrast, tax breaks and other production incentives, such as those found in "Export Processing Zones," have variable effectiveness at encouraging FDI across countries.[220]

Trade policy also strongly affects incentives for FDI. The traditional view held that high tariffs would encourage incoming FDI in order to produce behind the tariff walls what could not be exported to a protectionist country.[221] As globalization proceeded in the last decade, however, the issue became more ambiguous. On the one hand, trade barriers provide a protected market for firms, which encourages location of final goods production.[222] However, the same barriers also restrict access of MNEs to the latest international technologies, as those are only available by importing machinery, chemicals, and other key inputs.[223] Because international firms place increasing importance on the ability to buy producer inputs at cheapest cost and highest quality, closed economies are likely to attract less investment today than they may have in the past.[224] Moreover, it is in-

note 102, at 60.

220. *See* Amirahmadi & Wu, *supra* note 42, at 183. Those incentives seem to have been particularly effective in China, with over 12% of FDI going to such zones in the 1980s, though this finding does not control for other Chinese influences. *See id.*

221. A number of studies from the 1970s and early 1980s were consistent with this theory. *See* Robert E. Baldwin, *Determinants of Trade and Foreign Investment: Further Evidence*, 61 REV. ECON. & STAT. 40, 40-48 (1979); Edward J. Ray, *The Determinants of Foreign Direct Investment in the United States, 1979-85*, *in* TRADE POLICIES FOR INTERNATIONAL COMPETITIVENESS 53, 66 (Robert C. Feenstra ed., 1989); Kar-Yiu Wong, *Optimal Threat of Trade Restriction and Quid Pro Quo Foreign Investment*, 1 ECON. & POL. 277, *passim* (1989); Robert E. Lipsey & Merle Yahr Weiss, *Foreign Production and Exports in Manufacturing Industries*, 63 REV. ECON. & STAT. 488, *passim* (1981); Thomas Horst, *Firm and Industry Determinants of the Decision to Invest Abroad: An Empirical Study*, 54 REV. ECON. & STAT. 258, 259-61 (1972); Irving B. Kravis & Robert E. Lipsey, *The Location of Overseas Production and Production for Export by U.S. Multinational Firms*, 12 J. INT'L ECON. 201, 209-11 (1982); Culem, *supra* note 189, 889. However, such protection rarely attracted much investment into developing countries, as their governments also tended to impose significant investment barriers in order to reserve local markets for domestic firms. *See* THE WORLD BANK, *supra* note 16, at 77-79.

222. *See* THE WORLD BANK, *supra* note 16, at 77-79.

223. *See id.*

224. *See* Wheeler & Mody, *supra* note 102, at 64, 66-67; Zhen Quan Wang & Nigel J. Swain, *The Determinants of Foreign Direct Investment in Transforming Economies: Empirical Evidence from Hungary and China*, 131 WELTWIRSCHAFTLICHES ARCHIV [REV. WORLD ECON.] 359, 373 (1995). In Wheeler and Mody's study, they show that U.S. firms have tended to invest more in restrictive economies than in open economies. *See* Wheeler & Moody, *supra* 102, at 67. The data, however, is contradicted by the more recent study done by Wang and Swain, which shows that FDI in China and Hungary FDI was negatively related to tariff rates. Indeed, high tariff rates appear to reduce FDI in China markedly. *See* Wang & Swain, *supra*, at 373. Comparing these two studies, one can infer that firms have changed their approach to FDI with regard to the relative openness of a host economy to favor more open rather then more restrictive economies. *See id.*

creasingly apparent that in rapidly growing economies, FDI flows and merchandise trade increase together, rather than substitute for one another.[225] Thus, trade liberalization is now an important complement to programs encouraging investment.

Finally, both FDI and technology transfer through licensing are likely to rise as an economy's technological capacities improve.[226] Key in this process is the development of an abundant human capital stock, because labor skills are required for absorbing, using, and improving incoming technology.[227] Thus, educational competence, particularly in technical and managerial areas, is significant.[228] Also important are professional support programs for technology transfer and technology diffusion.[229]

5. *Risk Factors.* Multinational enterprises are less likely to invest in countries with risks of expropriation, limited and variable profit repatriation rules, terrorism and violence, corruption, bureaucracy and red tape, ineffective legal systems, and considerable income inequality.[230] Thus, both macroeconomic certainty and political stability are important to MNEs. How significant this factor is in relation to others depends on the type and duration of investment.

One related finding worth mentioning is that countries that repress labor organization rights, in the hope that a stable, quiescent, and low-wage labor force will attract FDI, do not receive more investment as a result.[231] Apparently, it is far less important to provide firms with artificial advantages and far more important to develop a stable and transparent set of rules for business operation.

B. Evidence on Intellectual Property Rights

A few studies have included the strength of IPRs as a potential determinant of FDI. Three early studies did not find any relationship

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225. *See* Markusen, *supra* note 7, at 180-81.

226. *See* CAVES, *supra* note 13, at 10; TEECE, *supra* note 104, at 43-55.

227. *See* TEECE, *supra* note 104, at 43-55; Maskus, *supra* note 13, at 200.

228. *See* TEECE, *supra* note 104, at 43-55.

229. *See* UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT, FOSTERING TECHNOLOGICAL DYNAMISM: EVOLUTION OF THOUGHT ON TECHNOLOGICAL DEVELOPMENT PROCESSES AND COMPETITIVENESS: A REVIEW OF THE LITERATURE U.N. TDBOR, at 14-24, U.N. Doc. UNCTAD/DST/9 (1996) [hereinafter UNCTAD, TECHNOLOGICAL DYNAMISM].

230. *See* THE WORLD BANK, *supra* note 16, at 94-95, 128-32.

231. *See* ORGANIZATION FOR ECONOMIC COOPERATION AND DEVELOPMENT, TRADE, EMPLOYMENT, AND LABOUR STANDARDS 112-21 (1996).

between crude measures of intellectual property protection and the international distribution of FDI by U.S. multinational enterprises.[232] But as these articles suffered from methodological problems,[233] their results should be largely discounted.

There are two recent studies that discuss the role of IPRs as a determinant of FDI that are more noteworthy than previous studies. The first study found that weak IPRs have a significant negative impact on the location of U.S. FDI.[234] It also found that the proportion of FDI devoted to final production or R&D facilities is negatively and significantly associated with weakness of IPRs protection.[235] Moreover, the weakness of IPRs had much less impact on the decisions of firms with limited ownership (less than 50%) of local affiliates, because such firms would be unlikely to transfer their frontier technologies in any case. From these results, it appears both the volume and quality of investment are diminished in countries with limited IPRs.[236]

The second study[237] used equations[238] to measure the impact of stronger patent rights on FDI decisions, as shown in Table 8.[239] It appears that FDI, as measured by the asset stock, reacts positively to

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232. *See* Michael J. Ferrantino, *The Effect of Intellectual Property Rights on International Trade and Investment*, 129 WELTWIRTSCHAFTLICHES ARCHIV [REV. WORLD ECON.] 300, 322-23 (1993); Edwin Mansfield, *Unauthorized Use of Intellecutal Property: Effects on Investment, Technology Transfer, and Innovation*, *in* GLOBAL DIMENSIONS OF INTELLECTUAL PROPERTY RIGHTS IN SCIENCE AND TECHNOLOGY 107, 114 (Mitchel B. Wallerstein et al. eds., 1993); Maskus & Eby-Konan, *supra* note 134, at 414-15.

233. Problems like limited specification of models and poor measurements of IPRs.

234. *See* Lee & Mansfield, *supra* note 88, at 185-86. The study used survey results to develop an index of perceived weakness of IPRs in destination countries on the part of U.S. firms. *See id.* at 182. They regressed the volume of U.S. direct investment in various countries over the period 1990-1992 on this index, along with measures of market size, the past investment stock, the degree of industrialization, a measure of openness, and a dummy variable for Mexico to control for its special investment relationship with the United States. *See id.* at 183.

235. *See id.*

236. *See id.*

237. *See* Maskus, *supra* note 13, at 186-208. The study argues that the prior literature is incorrectly specified in that it does not recognize the joint decisions made by MNEs. *See id.* at 198. In particular, multinational firms may choose to export, raise sales from existing foreign operations, increase investment, or transfer technology directly in response to stronger patent rights. *See id.*

238. Maskus estimates a simultaneous set of equations to capture these joint impacts, controlling for market size, tariff protection, the level of local R&D by affiliates, distance from the United States, and investment incentives and disincentives provided by local authorities. *See* Maskus, *supra* note 13, at 199. This is done for a panel of forty-six destination countries, using annual data from 1989-1992. *See id.*

239. The coefficients express elasticities.

patent strength in developing countries.[240] While these results await further confirmation, they suggest that FDI is sensitive to patent rights, consistent with the first study discussed previously.

Other studies support the conclusion that a policy of weak IPRs in technology-recipient nations reduces the quality of technology transferred.[241] Evidence also exists that the effectiveness of IPRs protection in inducing technical innovation and technology transfer depends on the trade orientation of an economy. For example, one study found that firms' propensities to develop their own technologies or to purchase them from foreign sources are both negatively related to the degree of trade protection they enjoyed.[242] Thus, in closed economies, protecting IPRs may not expand innovation much because the competitive conditions are inadequate to stimulate it. Another study showed that as countries liberalize their trade regimes, accompanying strengthening of IPRs provides a more affirmative path to economic growth.[243]

IV. POLICIES TO ATTRACT BENEFICIAL FDI AND TECHNOLOGY TRANSFER

In theory, investment and licensing flows do not necessarily increase with a strengthening of IPRs. The foregoing review indicates

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240. These elasticities suggest that a 1% rise in the extent of patent protection would expand the stock of U.S. investment in that country by 0.45%, other things being equal. *See* Maskus, *supra* note 13, at 199. This is a significantly positive elasticity and, indeed, trails only the responsiveness of FDI to policy incentives.

241. *See* Howard Davies, *Technology Transfer Through Commercial Transactions*, 26 J. IND. ECON. 161, 174 (1977) (concluding that difficulties in securing property rights over the profits accruing to technical information raise powerful barriers to information trades between developed and developing economies); CONTRACTOR, *supra* note 28, at 121 (reviewing a sample of 102 technology licenses provided by U.S. firms and his regression results support the hypothesis that returns to a technology supplier increase with patent protection in the recipient nation. He found that technologies transferred to developing countries tend to be significantly older than those transferred to industrialized economies. While these findings are dated, they point to the significance of patent regimes in attracting technology through licensing).

242. *See* Helson Braga & Larry Wilmore, *Technological Imports and Technological Effort: An Analysis of Their Determinants in Brazilian Firms*, 39 J. IND. ECON. 421, 429 (1991) (using a survey of more than 3000 Brazilian companies).

243. *See* David M. Gould & William C. Gruben, *The Role of Intellectual Property Rights in Economic Growth*, 48 J. DEV. ECON. 323, 338-46 (1996) (performing cross-country growth regressions using data on patent protection, openness of trade regimes, and country-specific characteristics. They found that patent strength is an important determinant of economic growth across countries and that this effect is stronger in relatively open economies. In their preferred specification, estimates suggested that growth induced by IPRs protection (at moderate levels of protection among developing countries) is approximately 0.66% higher per year in open economies than in closed economies).

emerging empirical evidence in favor of that hypothesis. The idea that foreign direct investment and the acquisition of new technologies through FDI and licensing are beneficial for the recipient country seems to be increasingly taken for granted. While a strong presumption in this direction exists, it is not a necessary outcome in all situations. Rather, to ensure these gains for the long term, it is important that such flows result in stronger competition. After a brief review of the potential benefits and costs of these activities, this section discusses the components of a coherent policy approach to enhance the likelihood that stronger IPRs in an emerging economy will contribute to such a dynamic competition.

A. Benefits and Costs of Inward FDI and Licensing

Although their impacts vary across countries and over time, FDI and licensing bear considerable promise for improving efficiency and growth in developing countries, particularly those that have scarce capital, are far away from the efficient production frontier, and have limited managerial and entrepreneurial talents.[244] These arrangements provide access to the technological and managerial assets of foreign MNEs, which provide both a direct spur to productivity and significant spillover benefits as they diffuse throughout the economy.[245] This diffusion comes through numerous channels, including the movement of newly trained labor among enterprises, the laying out of patents, product innovation through the legitimate "inventing around" of patents and copyrights, and the adoption of newer and more efficient specialized inputs that reduce production costs.[246] Further, the introduction of efficient and competitive international enterprises can stimulate local entrepreneurship and innovation by increasing competition and raising demands for sub-contracting.[247] Additional benefits include access to a wider variety of specialized products, inputs, and technologies, a deeper and better-trained skilled labor pool, and rising real wages.[248] Finally, there could also

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244. *See* THE WORLD BANK, *supra* note 16, at 88-96.

245. *See* GENE GROSSMAN & ELHANAN HELPMAN, INNOVATION AND GROWTH IN THE GLOBAL ECONOMY 238, 336-38 (1991); THE WORLD BANK, *supra* note 16, at 88-96; Amirahmadi and Wu, *supra* note 42, at 185.

246. *See* GROSSMAN & HELPMAN, *supra* note 245, at 336-38; THE WORLD BANK, *supra* note 16, at 88-96; Coe & Helpman, *supra* note 156, at 875-76. Software is particularly important in this context.

247. *See* THE WORLD BANK, *supra* note 16, at 88-96; Coe & Helpman, *supra* note 156, at 875-76.

248. *See* GROSSMAN & HELPMAN, *supra* note 245, at 334-39; Paul R. Krugman, *A Model of*

be a beneficial demonstration effect for local firms.[249] Thus, successful adoption of competition-enhancing FDI and licensing should materially improve the knowledge base of those developing economies and move them towards the globally efficient production frontier.

Currently, developing countries suffer from significantly lagging labor productivity and managerial efficiency, related in part to a failure to adopt newest technologies.[250] But recent experiences in numerous developing economies indicate that liberalization of trade policies and investment regimes can have significantly positive growth impacts, even if there is some initial economic adjustment period.[251] There is little doubt that a major determinant of the relatively rapid economic growth and industrial restructuring in East Asia has been access to foreign technologies through both licensing and FDI, in addition to importation of advanced machinery and other technical inputs.[252] Because wider access to knowledge allows economic expansion to continue without necessarily running into diminishing returns, these growth effects can be expected to be long-lasting.[253]

However, the beneficial impact of inward FDI and technology transfer does not come without costs. If there are insignificant linkages to other economic sectors, FDI may operate in enclaves with limited spillovers into technologies adopted and wages earned by local firms and workers.[254] This limited diffusion could be insufficient to compensate emerging economies for the payments to MNEs.[255] Because of those payments (i.e., profit repatriation and license fees), the terms of this exchange could be unfavorable in a social sense, if

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Innovation, Technology Transfer, and the World Distribution of Income, 87 J. POL. ECON. 253, 263-66 (1979).

249. The "demonstration effect" refers to the possibility that, by virtue of observing the successful management efforts of local subsidiaries of foreign firms, locally owned firms would choose to adopt improved management techniques and to innovate more rapidly.

250. *See* Daniel Trefler, *The Case of the Missing Trade and Other Mysteries*, 85 AM. ECON. REV. 1029, 1033 (1995); WILLIAM J. BAUMOL ET AL., PRODUCTIVITY AND AMERICAN LEADERSHIP 86-87 (1989).

251. *See* THE WORLD BANK, *supra* note 16, at 98; THE WORLD BANK, *supra* note 17, at 13.

252. *See* THE WORLD BANK, *supra* note 17, at 7-8.

253. *See* GROSSMAN & HELPMAN, *supra* note 245, at 336; Paul M. Romer, *Endogenous Technological Change*, 98 J. POL. ECON. S71, S99 (Supp. 1990).

254. *See* Brian Aitken et al., *Wages and Foreign Ownership: A Comparative Study of Mexico, Venezuela, and the United States*, 40 J. INT'L ECON. 345, 353 (1996). For example, U.S. multinationals operating in Mexico and Venezuela pay significantly higher wages than average to their own employees but these wage impacts have not spread to other parts of the economy. *See id.* at 353-54.

255. *See* MARKUSEN ET AL., *supra* note 17, at 403.

not in a private sense.[256] This situation is aggravated to the extent that MNEs engage in abusive practices of their protected market positions in exploiting stronger IPRs. Such abuses could emerge in setting restrictive licensing conditions, requiring technology grant-backs, engaging in tied sales, tying up technology fields through cross-licensing agreements, establishing vertical controls through distribution outlets that prevent product competition, and engaging in price discrimination as well as predation against local firms.[257] Thus, countries could find certain sectors of their economies increasingly coming under the control of MNEs through exploitation of their specific advantages, including brand names, patented technology, marketing skills, and economies of scale.

While these are possible and real costs, there is little evidence they are systematic problems in many countries. More fundamentally, those costs relate to the failure to develop a policy system that promotes the maximum gains from FDI.[258] Enclave production, for example, makes sense only when the subsidiary is encouraged to produce only for export rather than to compete locally as well.[259] Firms that are provided full access to local and regional markets are more likely to erect complementary business systems (production, distribution, and services) that compete more widely in the economy and generate greater spillover benefits.[260] Abusive practices are possible only to the extent that monopoly positions are protected and tolerated.[261] Many developing economies have not yet developed appropriate competition rules to deal with these issues, preferring instead to forego the benefits of FDI and licensing by claiming an unwillingness to suffer such abuses, at least at the hands of foreign firms.[262]

B.   Intellectual Property Rights

IPRs do not necessarily generate monopoly market positions that result in high prices, limited access, and exclusive use of tech-

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256. *See id.* at 400-03.

257. *See* ORGANIZATION FOR ECONOMIC COOPERATION AND DEVELOPMENT, COMPETITION POLICY AND INTELLECTUAL PROPERTY RIGHTS 104-06 (1989).

258. *See* UNCTAD, THE TRIPS AGREEMENT, *supra* note 95, at 17; Maskus, *supra* note 13, at 203.

259. *See* THE WORLD BANK, *supra* note 16, at 88-108.

260. *See id.* at 95.

261. *See* Maskus, *supra* note 13, at 191; Maskus & Yang, *supra* note 7.

262. Examples of countries that have not adopted competition policies include Indonesia, Bangledesh, and Nigeria. *See* WORLD TRADE ORGANIZATION, ANNUAL REPORT: SPECIAL TOPICS: TRADE AND COMPETITION POLICY 46-47 (1997).

nologies. Those rights are similar to standard property rights in that they define the conditions within which a right owner competes with rivals.[263] Except in particular sectors, cases in which a patent holder or copyright owner becomes a strong monopolist are infrequent.[264] Usually there will be competing products and technologies, including new ones, that do not infringe the property right.[265] Much depends on the scope of the product and process claims protected and on the technical characteristics of the invention.[266]

Thus, IPRs can encourage dynamic competition even if they may sometimes diminish competition among existing products. For example, survey evidence indicates that patent disclosure requirements are significant mechanisms for diffusing technical information to competitors within a short period.[267] The information may then be used to develop a new product or process that competes with the original.[268] This incremental nature of innovation is a key factor in most technical progress and generally builds dynamic competition rather than investing unassailable market power.[269] Thus, patents, copyrights, and other IPRs can raise the costs of imitation, but likely do not materially retard competing product introduction.[270] Moreover, patents and trademarks provide greater certainty to firms, lower the costs of transferring technology, and facilitate monitoring of licensee operations.[271] Additional licensing could then result in greater adaptive innovation in user firms.

In this view, stronger IPRs in developing economies promise long-term growth and efficiency benefits as they attract additional FDI and licensing and spur further follow-on innovation and tech-

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263. *See* UNCTAD, THE TRIPS AGREEMENT, *supra* note 95, at 13, 15.

264. *See id.* at 15.

265. *See id.* For example, narrow patent claims are relatively easy to invent around in generating follow-on innovation. *See id.*

266. *See id* at 15, 19.

267. *See* Mansfield, *supra* note 156, at 217-23.

268. *See* UNCTAD, THE TRIPS AGREEMENT, *supra* note 95, at 15; Suzanne Scotchmer, *Standing on the Shoulders of Giants: Cumulative Research and the Patent Law*, 5 J. ECON. PERSP. Winter 1991, at 29, 33; JEROME H. REICHMAN, RATIONALIZING NATIONAL INNOVATION POLICIES: A PRO-COMPETITIVE STRATEGY FOR COMPLIANCE WITH THE TRIPS AGREEMENT 10 (1996).

269. *See* Scotchmer, *supra* note 268, at 30; UNCTAD, THE TRIPS AGREEMENT, *supra* note 95, at 15.

270. *See* Scotchmer, *supra* note 268, at 31; Edwin Mansfield, et al., *Imitation Costs and Patents: An Empirical Study*, 91 ECON. J. 910, 913 (1981); UNCTAD, THE TRIPS AGREEMENT, *supra* note 95, at 15.

271. *See* Maskus & Yang, *supra* note 7; CONTRACTOR, *supra* note 28, at 133-35; SHERWOOD, *supra* note 179, at 191-93.

nology spillovers. This outcome is far more likely, however, if the implementation of stronger IPRs is accompanied by complementary policies that promote dynamic competition.

C. Broader Policy Approaches

Overall, wider market access to the local economy, in conjunction with sensible competition rules and related regulatory systems, promises the greatest net benefits from FDI.[272]   Thus, emerging economies that wish to increase their attractiveness to foreign investors should first proceed with significant market liberalization. While the Uruguay Round committed most countries to cut their trade barriers,[273] further reduction of tariffs and removal of non-tariff barriers on a credible and irrevocable schedule would be an important signal of openness to foreign investors. Regional trade integration, particularly with developed economies that could be the source of additional FDI, could assist in this process. However, such agreements also bear potential for trade and investment diversion and should be considered carefully in each instance.

In light of the complementary nature of FDI in production and services with merchandise trade, developing countries also need to expand rights of establishment in services. Removal or rationalization of various investment regulations, such as local content requirements, equity restrictions, and limitations on profit repatriation, would further expand investment incentives.[274]   Finally, continued privatization of state-owned enterprises could attract further capital as it raises domestic competition.

In light of the econometric studies on the determinants of FDI,[275] it is important for emerging economies to pursue sound and stable macroeconomic policies.[276] The development of a modern and efficient infrastructure is also important and could be instrumental in promoting agglomeration gains that attract cumulatively higher amounts of both domestic and foreign investment. There is also evidence that FDI flows are sensitive to international variations in taxes

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272. *See* THE WORLD BANK, *supra* note 16, at 88; David M. Gould & William C. Gruben, *The Role of Intellectual Property Rights in Economic Growth*, 48 J. DEV. ECON. 323, 345-46 (1996).

273. *See* THE URUGUAY ROUND, *supra* note 12, at 4.

274. Especially, as it is likely that such regulations generate net welfare losses for the countries imposing them, in any case.

275. *See* discussion *supra* Part III.A.

276. *See* THE WORLD BANK, *supra* note 16, at 101-02; Grubaugh, *supra* note 126, at 150-51.

and incentives.[277] While this provides some argument for fiscal advantages,[278] it primarily suggests the importance of relatively low tax rates and uniform tax treatment of all investors, both domestic and foreign. Certainty and stability in taxes are more effective in promoting investment than are discriminatory and arbitrary policies, while uniform tax schedules can generate considerable efficiencies in resource usage.[279] Similarly, there is no evidence that repression of labor rights aids in attracting FDI or promoting exports.[280] Rather, firms are more interested in market size, stability, and growth. [281]

An important component of any program to attract high-quality FDI and technology transfer is the development of a competent indigenous technological capacity. In the first instance, this calls for public and private investments in education and training and the removal of impediments to the acquisition of human capital.[282] It also points toward the development of national innovation systems that promote dynamic competition.[283] This involves supporting basic research capabilities, removing disincentives for applied R&D and its commercialization, instituting incentive structures that help stimulate local innovation, and taking greater advantage of access to scientific and technical information that exists within the global information infrastructure.[284] To date, governments and firms in many developing countries have made inadequate progress in this regard.[285]

IPRs are an important component of any technology development program. In implementing stronger IPRs, as required by TRIPS or other policy initiatives,[286] emerging economies will need to

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277. *See* Grubert & Mutti, *supra* note 49, at 293.

278. Like, for example, tax holidays, accelerated depreciation allowances, tariff exemptions, and EPZs.

279. *See* Denise Konan & Keith E. Maskus, Joint Trade Liberalization and Tax Reform in a Small Open Economy: The Case of Egypt 13-15 (August 1998) (manuscript on file with the *Duke Journal of Comparative & International Law*).

280. *See* ORGANIZATION FOR ECONOMIC COOPERATION AND DEVELOPMENT, TRADE, EMPLOYMENT, AND LABOR STANDARDS: A STUDY OF CORE WORKERS' RIGHTS AND INTERNATIONAL TRADE 123 (1996).

281. *See* THE WORLD BANK, *supra* note 16, at 98. In any case, the technical superiority of any investments that would be so attracted in labor-intensive sectors is likely to be quite limited.

282. *See* UNCTAD, TECHNOLOGICAL DYNAMISM, *supra* note 229, at 31, 35; UNCTAD, THE TRIPS AGREEMENT, *supra* note 95, at 22.

283. *See* UNCTAD, TECHNOLOGICAL DYNAMISM, *supra* note 229, at 67.

284. *See* UNCTAD, TECHNOLOGICAL DYNAMISM, *supra* note 229, at 114-16; UNCTAD, THE TRIPS AGREEMENT, *supra* note 95, at 22.

285. *See* UNCTAD, TECHNOLOGICAL DYNAMISM, *supra* note 229, at 115.

286. *See* UNCTAD, THE TRIPS AGREEMENT, *supra* note 95, at 1-2; Keith E. Maskus, *Im-*

strike a balance between needs for technology acquisition, market access, and diffusion. Most nations will wish to adopt a set of IPRs regulations that do not significantly disadvantage follow-on inventors and creators by making use of sensible fair-use exemptions and compensated compulsory licensing under tightly defined conditions and by carefully defining the scope of protection. Furthermore, it will be important to implement effective competition rules to ensure that IPRs systems are used advantageously.[287] Such measures will require considerable administrative and judicial expertise.

V. CONCLUSION

While there is evidence that strengthening IPRs can be an effective means of inducing additional inward FDI, it is only one component among a broad set of important factors. Emerging economies must recognize the strong complementary relationships among IPRs, market liberalization and deregulation, technology development policies, and competition regimes. Given the complexity and the tradeoffs for market participants, governments of emerging economies should devote considerable attention and analysis to strategies to achieve net gains from stronger IPRs.

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plications of Regional and Multilateral Agreements for Intellectual Property Rights, 20 WORLD ECON. 681, 683 (1997).

287. For example, countries may wish to monitor the terms of key technology licensing agreements or to intervene in contracts for the development of indigenous public resources.

TABLE 1. TOTAL FOREIGN DIRECT INVESTMENT FLOWS, SELECTED
COUNTRIES ($ MILLION)

Country	1987		1990		1995	
	Inward	Outward	Inward	Outward	Inward	Outward
United States	58220	28360	47920	29950	60230	95530
Canada	8040	8540	7855	4725	10786	5761
Japan	1170	19520	1760	48050	60	22660
Germany	1820	9760	2530	24210	8940	34890
United Kingdom	15696	31335	32430	19320	32210	40330
Spain	4571	745	13987	3522	6250	3574
Poland	12	8	89	n/a	3659	42
China	2314	645	3487	830	35849	2000
Korea	616	540	788	1056	1776	3529
Malaysia	423	n/a	2332	n/a	4348	n/a
Indonesia	385	n/a	1093	n/a	4348	603
Singapore	2836	206	5575	2034	6912	3906
Thailand	352	170	2444	140	2068	886
Egypt	948	19	734	12	598	93
Kenya	39	31	57	n/a	33	n/a
Turkey	115	9	684	16	885	113
Mexico	2621	n/a	2634	n/a	6963	n/a
Argentina	-19	n/a	1836	n/a	1319	155
Brazil	1169	138	989	665	4859	1384
Chile	891	6	590	8	1695	687

Source: The statistics in this table were generally compiled by the author from Inter-
national Monetary Fund, 1987, 1990, and 1995 BALANCE OF PAYMENTS Y.B.

TABLE 2. NET RECEIPTS ON ROYALTIES, LICENSE FEES, BUSINESS SERVICES,
AND DIRECT INVESTMENT INCOME, SELECTED COUNTRIES ($ MILLION)

Country	1987			1990			1995		
	R & LF	Bus Serv	DIL	R & LF	Bus Serv	DIL	R & LF	Bus Serv	DIL
United States	8320	10200	32190	13500	14810	55600	20660	12870	57480
Japan	-2520	-6630	2000	-3550	-11200	2550	-3350	-7500	6850
Germany	-1290	-1670	-1400	-1810	-1980	-510	-2660	-5270	-640
United Kingdom	16	14334	6373	-450	7010	15460	1710	7160	20270
Spain	-350	661	-1482	-932	-670	-2098	-1073	-1407	-1179
Poland	n/a	178	n/a	n/a	-22	n/a	-40	-231	-1028
China	n/a	630	8	n/a	575	n/a	n/a	-3190	-9952
Korea	-47	-65	-88	-99	-892	-145	-2086	830	-242
Malaysia	n/a	-318	-1077	n/a	-527	-1863	n/a	-1492	-3785
India	-40	-144	n/a	-71	252	n/a	-68[a]	-256[a]	n/a
Egypt	n/a	-482	43	n/a	-322	233	-50	694	-149
Turkey	n/a	827	-80	n/a	1622	-161	n/a	2883	-272
Mexico	-212	-371	-794	-307	-636	-2304	-370	-749	-2664
Brazil	-36	-560	-1527	-42	-1151	-1865	-497	-370	-2044
Chile	-30	0	-218	-37	-142	-333	-49	22	-890

Source: The statistics in this table were generally compiled by the author from International Monetary Fund, 1987, 1990, 1992, and 1995 BALANCE OF PAYMENTS Y.B.

Note: [a]Data for 1992.

TABLE 3. U.S. FOREIGN DIRECT INVESTMENT POSITION IN SELECTED
COUNTRIES ($MILLION)

Country	1985	% Total	1990	% Total	1994	% Total
World	230250	100.0	426958	100.0	612109	100.0
Europe	105171	45.7	213368	50.0	300177	49.0
EU-12	83898	36.4	179102	41.9	251149	41.0
Germany	16764	7.3	27480	6.4	39886	6.5
U.K.	33024	14.3	72343	16.9	102244	16.7
Spain	2281	1.0	7802	1.8	8048	1.3
Turkey	234	0.1	515	0.1	1084	0.2
Canada	46909	20.4	69106	16.2	72808	11.9
Asia-Pacific	33983	14.8	63585	14.9	108402	17.7
Japan	9235	4.0	22511	5.3	37027	6.0
China	n/a	n/a	356	0.1	1699	0.3
Hong Kong	3295	1.4	5994	1.4	11988	2.0
Korea	743	0.3	2677	0.6	3612	0.6
Malaysia	1140	0.5	1513	0.4	2382	0.4
India	383	0.2	368	0.1	818	0.1
Latin America	28261	12.3	70752	16.6	114985	18.8
Mexico	5088	2.2	10255	2.4	16375	2.7
Brazil	8893	3.9	14268	3.3	18977	3.1
Chile	88	0.0	1876	0.4	4457	0.7
Africa	5891	2.6	3592	0.8	5472	0.9

Source: The statistics in this table were generally compiled by the author from issues of the Office of Business Economics, U.S. Department of Commerce, SURVEY OF CURRENT BUSINESS, for 1985, 1990, and 1994.

Note: Data are on Historical Cost Basis.

TABLE 4. U.S. FOREIGN DIRECT INVESTMENT POSITION BY MAJOR SECTOR IN
SELECTED COUNTRIES, 1994 ($ MILLION)

Country	TMF	F&K	CHEM	MET	MAC	EEQ	TREQ	OMF	TRD	B&FIN	SVC
World	220328	28796	51638	10974	30425	20922	28057	49516	67303	204574	22994
Europe	108655	13678	29239	5481	16773	8631	11731	23121	36435	107384	14813
EU-12	101009	11453	28328	5105	15527	7671	11042	21883	23584	86595	12825
Germany	22131	2103	4152	1469	4359	1306	5180	3562	4049	8999	946
U.K.	27247	3327	4560	1656	5022	2941	3201	6539	5564	47477	5034
Spain	4512	775	754	171	444	441	1104	821	824	2014	413
Turkey	693	139	130	n/a	n/a	4	133	86	19	110	n/a
Canada	35037	3600	5856	2822	2024	1820	8548	10369	7006	12951	3509
Asia-Pacific	41577	4205	8870	1189	9019	7915	2875	7504	16829	20685	3259
Japan	15844	1121	3634	298	4425	1665	1842	2860	6844	6820	496
China	765	128	188	10	29	n/a	n/a	89	131	n/a	n/a
Hong Kong	1902	n/a	99	n/a	435	492	n/a	652	4209	4107	698
Korea	1391	261	291	66	40	195	78	460	422	1630	29
Malaysia	1582	5	66	n/a	n/a	1209	0	208	142	210	0
India	308	25	166	9	84	5	5	14	37	442	23
Latin America	31932	6949	6534	1237	2436	1989	4819	7968	6574	61019	885
Mexico	10697	2792	2169	n/a	n/a	579	1949	2390	994	1982	261
Brazil	13681	1794	2268	732	1904	935	2271	3777	402	3657	129
Chile	376	56	154	n/a	2	n/a	n/a	190	262	1954	n/a
Africa	1274	292	n/a	207	n/a	47	82	266	248	922	86
% Developed	72	64	75	78	76	58	79	73	75	62 (77)	82
% Developing	28	36	25	22	24	42	21	27	25	38 (23)	18

Source: The statistics in this table were generally compiled by the author from issues of the Office of Business Economics, U.S.
Department of Commerce, SURVEY OF CURRENT BUSINESS, for 1994.

Abbreviations: TMF = total manufacturing; F&K = food and kindred products; CHEM = chemicals and allied products;
MET = primary and fabricated metals; MAC = industrial machinery; EEQ =electrical equipment; TREQ = transport equipment;
OMF = other manufacturing; TRD = wholesale trade; B&FIN = banking and finance; SVC = services.

TABLE 5. INDICATORS OF MULTINATIONAL ACTIVITY IN U.S. HIGH
TECHNOLOGY INDUSTRIES, 1989[A]

Sector	Affiliates per Parent	Total Assets Abroad ($bil)	Assets in ECs (%)[b]	Intrafirm Sales (%)[c]	Intrafirm Trade with U.S. ($bil)
Industrial Chemicals and Polymers	14.3	63.9	10.6	31.8	5.9
Pharmaceuticals	33.8	40.5	11.0	21.9	2.2
Industrial Machinery	6.4	22.4	19.2	29.4	6.4
Office Machines and Computers	11.1	86.8	23.3	49.8	16.1
Telecommunications Equipment	11.3	20.0	34.3	30.1	1.9
Electronic Components and Circuits	5.2	10.1	41.3	49.4	11.4
Electrical Machinery	9.1	11.0	22.9	18.5	2.2
Motor Vehicles and Parts; Aircraft	10.5	122.3	12.2	19.4	50.6
Printing, Publishing, Re-cordings	5.3	5.7	5.5	4.4	0.1
Precision Instruments	5.8	21.9	12.0	33.1	4.8
All Manufacturing	8.5	593.8	15.6	30.8	114.8
Advertising	14.9	4.4	15.9	0.1	0.0
Motion Pictures	8.9	5.0	10.0	0.1	0.0
Health Services	2.9	1.6	31.7	0.0	0.0
Engineering, Architec-tural Services	4.6	2.0	18.4	8.5	0.01
Finance, except banking	6.0	171.6	24.6	23.8	0.0
All Services[d]	5.0	219.9	21.2	17.7	31.8

Source: Bureau of Econ. Analysis, U.S. Dep't of Commerce, Benchmark Survey of U.S. Direct Investment Abroad, 1989 (1992).

Notes: [a]Data are for majority-owned non-bank affiliates of non-bank U.S. parents; [b]Percentage of assets not located in Canada, Europe, Japan, or Australia; [c]Intrafirm sales as a percentage of total sales; [d]Wholesale trade, finance (except banking), and services.

TABLE 6. PERCENTAGE OF FIRMS CLAIMING THAT THE STRENGTH OR WEAKNESS OF INTELLECTUAL PROPERTY RIGHTS HAS A STRONG EFFECT ON WHETHER DIRECT INVESTMENTS WILL BE MADE, BY TYPE OF FACILITY, 1991

Sector	Sales and Distribution	Basic Production and Assembly	Component Manufacture	Complete Products Manufacture	R&D Facilities	Average
Chemicals	19	46	71	87	100	65
Transport Equipment	17	17	33	33	80	36
Electrical Equipment	15	40	57	74	80	53
Food Products	29	29	25	43	60	37
Metals	20	40	50	50	80	48
Machinery	23	23	50	65	77	48
Average	20	32	48	59	80	48

Source: EDWIN MANSFIELD, INTELLECTUAL PROPERTY PROTECTION, FOREIGN DIRECT INVESTMENT, AND TECHNOLOGY TRANSFER (International Fin. Corp. Discussion Paper 19, 1994).

TABLE 7. PERCENTAGE OF FIRMS CLAIMING THAT INTELLECTUAL
PROPERTY PROTECTION IS TOO WEAK TO PERMIT TYPES OF
INVESTMENT, 1991

Country	Chemicals	Transport Equip.	Electrical Equip.	Food Products	Metals	Machinery	Average
Panel A: Joint Ventures with Local Partners							
Argentina	40	0	29	12	0	27	18
Brazil	47	40	31	12	0	65	32
India	80	40	39	38	20	48	44
Indonesia	50	40	29	25	0	25	28
Mexico	47	20	30	25	0	17	22
Korea	33	20	21	12	25	26	23
Thailand	43	80	32	12	0	20	31
Average[a]	49	34	30	19	6	33	
Panel B: Transfer of Newest or Most Effective Technology to Wholly Owned Subsidiaries							
Argentina	44	20	21	12	0	14	18
Brazil	50	40	24	12	0	39	28
India	81	40	38	38	20	41	43
Indonesia	40	20	31	25	0	23	23
Mexico	31	20	21	25	0	22	20
Korea	31	20	28	12	40	22	26
Thailand	60	80	31	12	0	18	20
Average[a]	48	34	28	19	9	26	
Panel C: Licensing of Newest or Most Effective Technology to Unrelated Firms							
Argentina	62	0	26	12	0	29	22
Brazil	69	40	29	25	0	73	39
India	81	40	38	38	20	50	44
Indonesia	73	20	33	25	0	37	31
Mexico	56	20	28	25	0	36	28
Korea	38	20	34	12	40	29	29
Thailand	73	80	36	12	0	25	38
Average[a]	65	31	32	21	9	40	

Source: EDWIN MANSFIELD, INTELLECTUAL PROPERTY PROTECTION, FOREIGN
DIRECT INVESTMENT, AND TECHNOLOGY TRANSFER (International Fin. Corp. Dis-
cussion Paper 19, 1994).

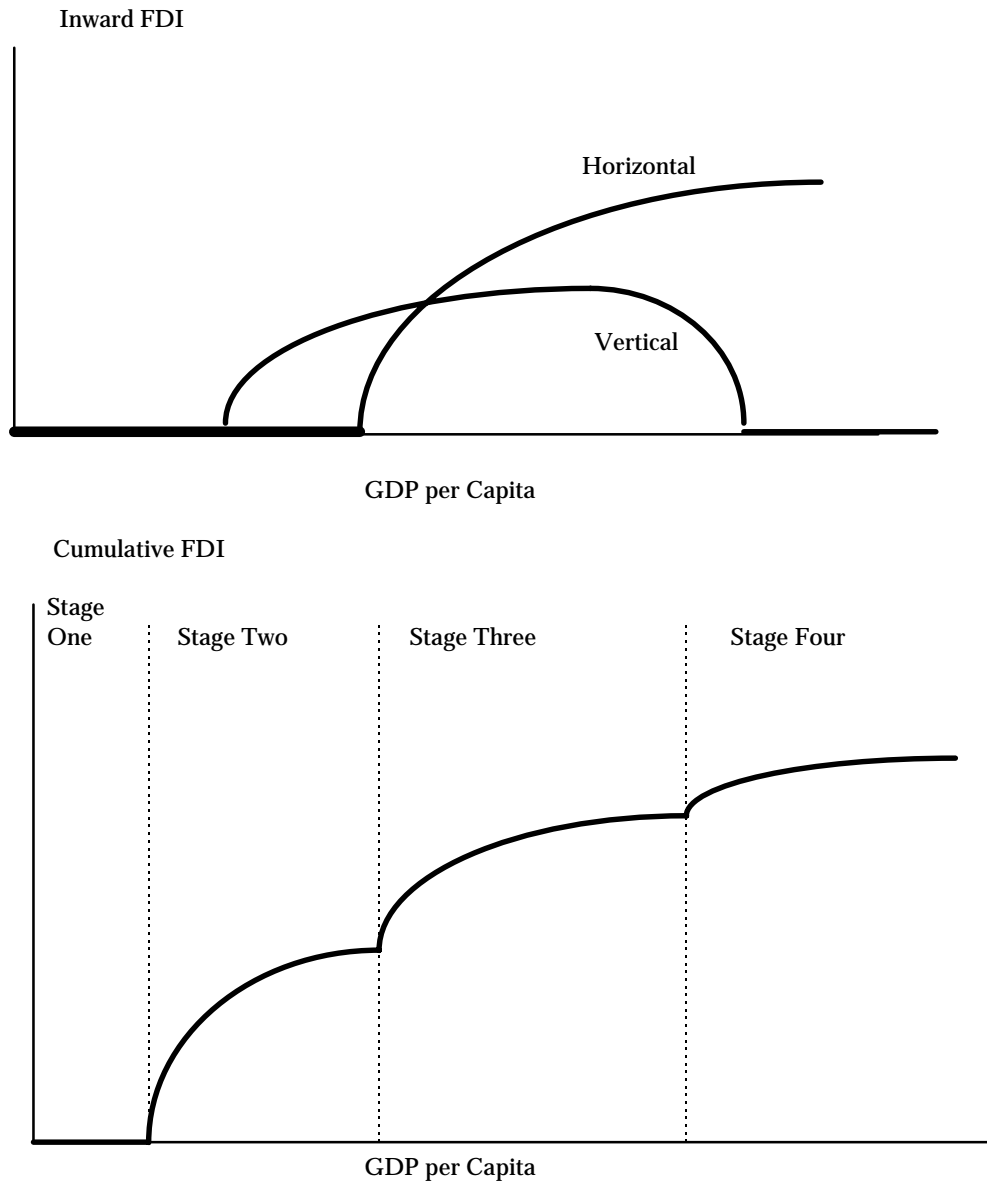Note: [a]Average over the seven countries listed.

TABLE 8. ELASTICITIES OF MODES OF SUPPLY WITH RESPECT TO
DOMESTIC CHARACTERISTICS AND POLICIES

Variable	Asset Stock	Affiliate Sales	Intrafirm Exports to Affiliate	Patent Apps.
Real GDP	0.25	0.30	0.13	0.19
Tariff Level	-0.02	-0.00[a]	-0.01	-0.01
Affiliate R&D	0.27	0.29	0.15	0.07
Distance	-0.25	-0.02	-0.03	0.02
Incentives	0.97	0.24	0.13	0.17
Disincentives	-0.25	-0.02	0.02	-0.01
Patent Strength in Developing Countries	0.45	0.05	-0.02	0.69

Source: Keith E. Maskus, *The International Regulation of Intellectual Property,* Band 134 WELTWIRTSCHAFTLICHES ARCHIVE [REV. OF WORLD ECON.] 186 (1998).

Note: [a]Coefficient is not significantly different from zero. Asset stock is total assets of foreign non-bank affiliates of U.S. parents in $ millions; Affiliate sales is total sales of foreign affiliates in $ millions; Intrafirm exports to affiliate is U.S. exports shipped to affiliates in $ millions; Patent applications is number filed in the host country; Real GDP in the host country is in $ billions; Tariff level is tariff revenues divided by total imports; Affiliate R&D is expenditure on R&D by foreign affiliates in $ millions; Distance is kilometers of capital city from Washington, DC; Incentives is the number of affiliates that received tax concessions in the host country divided by the number that received tax concessions in all the sample countries; Disincentives is number of affiliates required to employ a minimum amount of local personnel divided by the number of affiliates that are so constrained in all the sample countries; Patent strength is an endogeneity-corrected index of patent laws and enforcement.

FIGURE 1. INWARD VERTICAL AND HORIZONTAL FDI FLOWS AS AN
ECONOMY DEVELOPS

Inward FDI

Horizontal

Vertical

GDP per Capita

Cumulative FDI

Stage
One

Stage Two

Stage Three

Stage Four

GDP per Capita

Source: Kevin H. Zhang, Theory and Evidence Regarding Multinational Enterprises
and International Trade 59-64, 91-93 (1996) (unpublished Ph.D. dissertation, Uni-
versity of Colorado (Boulder)) (on file with Author).