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Chapter Author: Martin S. Feldstein

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2 The Effects of Outbound Foreign Direct Investment on the Domestic Capital Stock

Martin Feldstein

Foreign direct investment (FDI) plays an important role in the international transfer of both capital and technology and has a significant impact on the pattern of international trade. The most recent detailed government survey of U.S. direct investment abroad found that in 1989 the foreign affiliates of U.S. multinational corporations had assets of more than $1.2 trillion, approximately 25 percent of U.S. gross domestic product in that year.

Companies make direct investments abroad by acquiring existing business assets of foreign companies, by starting new businesses with "green field" investments in plant and equipment, and by increasing their investments in foreign businesses that they already own. These foreign investments can be either wholly owned by the parent company or owned jointly with foreign partners.[1] The heterogeneity of FDI reflects the diversity of motives for making such investments.[2] At one extreme, some FDI (like the purchase of commercial real estate) is not fundamentally different from portfolio investment and the motivation is the standard desire to diversify portfolio assets. A more traditional motivation for FDI is to take advantage of low-cost labor or proximity to raw materials. The primary reason is probably to maintain or increase foreign sales

Martin Feldstein is the George F. Baker Professor of Economics at Harvard University and president of the National Bureau of Economic Research.

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1. The minimum extent of the parent company's ownership share required to make an investment qualify as "direct" rather than portfolio investment depends on the particular definition of FDI. The common balance-of-payments definition of FDI is based on ownership of at least 10 percent of the equity in the foreign business. For some purposes, it is more sensible to concentrate on businesses where the parent has a majority ownership interest.

2. See Froot (1993) and Graham and Krugman (1991), and the references cited in those books, for a general discussion of FDI with particular reference to the United States.

and market share. Thus, manufacturing companies that make products for industrial customers invest abroad in order to have closer working relations with customers, especially when their products must be specifically designed or modified for their customers. Many service companies must invest abroad if they want to provide services to those local markets. And some manufacturers acquire foreign firms in order to gain entry into local markets.

Government policies significantly influence the pattern of FDI, sometimes intentionally and sometimes inadvertently. Some governments require local investment (to create industrial jobs or achieve technology transfers) as a condition of access to government procurement or licensing. Other governments use favorable tax and credit policies to attract foreign investment. In contrast, some governments (e.g., Japan) are notorious for the regulatory barriers that deter inbound FDI.

The effects of government policies on FDI are not always intended, but may be the inadvertent byproducts of policies designed to serve other purposes. Tariffs and other trade barriers intended to protect domestic producers induce inbound FDI. The taxation of multinational companies can encourage or impede both inbound and outbound FDI.

There has been a substantial public policy debate about the effects of inbound and outbound FDI on the domestic economy.[3] Much of the public concern is stated in terms of the effect of FDI on employment, with opponents of outbound FDI arguing that such FDI "takes production abroad" and reduces employment at home, while proponents of outbound FDI counter that such FDI creates markets for U.S. exports to affiliates and through affiliates to foreign buyers. Economists recognize that this is a misplaced concern because the American labor market works well in assuring that all who want jobs at wages that reflect their skills can find work within a relatively short period of time. As Graham and Krugman emphasize: "*The net impact of FDI on U.S. employment is approximately zero,* and the truth of this assertion has nothing to do with job gains and losses at the industry level" (Graham and Krugman 1991, 49). Studies that calculate the numbers of jobs "lost" because particular firms shift activity abroad (e.g., Bergsten et al. 1978; Hufbauer and Adler 1968) do not take into account the absorption of those American workers by other firms and industries.

A related and more plausible concern is often expressed in terms of the impact of FDI on the "quality" of jobs. The worry is that although the forces of supply and demand maintain total employment, the shift of investment to foreign countries causes a substitution in the United States of low-wage jobs for the higher-wage manufacturing jobs that have gone abroad. As a general proposition, this is again incorrect. In a well-functioning labor market like ours, wages reflect the skills of the workers and are therefore not affected by

3. See, e.g., the discussions in Bergsten, Horst, and Moran (1978), Graham and Krugman (1991), and Hufbauer and Adler (1968).

the entry or exit of individual firms. There are some ways, however, in which foreign investment could affect wages. Market imperfections that permit workers in some industries to be paid substantially more than individuals with similar skills in other industries (e.g., union power or the monopoly power of firms that share their monopoly profits with employees) do provide a mechanism by which the mix of firms can affect the distribution of wages. In addition, even without such market imperfections, FDI can affect the quality of jobs if it alters the marginal product of labor. This can happen if FDI changes the domestic capital stock. It can also happen if FDI increases or decreases the kinds of jobs that are more likely to involve substantial on-the-job training. Training reflects the mix of industries and may be more important in capital-intensive industries than in other industries.[4]

This leads naturally to two questions about the effect of FDI on the capital stocks of both the parent and host countries. First, what impact does an increase in the assets of foreign affiliates have on the parent country's capital stock? Second, what impact does an inflow of FDI have on the host country's capital stock? The answers to these questions may well depend on the form of the FDI and on the reason for the particular inflow or outflow of such investment.[5] Although the available data do not permit such a disaggregated analysis, it is possible to assess the extent to which countries that experience sustained high rates of inbound or outbound FDI have higher or lower levels of domestic investment than would otherwise be expected. The current study focuses on estimating the extent to which outbound FDI reduces domestic investment in the parent country.

Previous studies of this question have been microeconomic partial equilibrium analyses that have asked whether *firms* that invest more abroad reduce their investment at home.[6] Although these studies can shed interesting light on the behavior of multinational companies, they do not indicate the net effect on the economy as a whole when individual firms increase their outbound FDI. When firms increase their overseas investment, the funds that they might otherwise have used in the United States might instead finance greater domestic investment by others, leaving both the aggregate capital outflow and the level of domestic investment unchanged. Alternatively, the process of outbound FDI might increase the aggregate net capital outflow and therefore reduce total do-

4. For an extensive discussion of the impact of outbound FDI on employment in the United States, see Lipsey (chap. 1, this volume). Lipsey concludes that the effect of increased outbound FDI on the domestic employment by multinational companies is probably slightly positive (as outbound FDI increases exports) and that the mix of domestic jobs shifts toward more higher-paying technical and managerial positions.

5. Since FDI is an endogenous variable in the complex system of trade and capital flows, it would in principle be desirable to estimate a more fully articulated structural model in which one can assess the extent to which changes in exogenous variables that alter FDI influence domestic investment through this route. I return to this issue in section 2.4 below.

6. These studies include Blomström, Lipsey, and Kulchycky (1988), Lipsey and Weiss (1984), Severn (1972), and Stevens (1969).

mestic investment. Resolving the policy debate about the effect of FDI on domestic investment requires resolving this macroeconomic general equilibrium issue.

This paper presents information on the general equilibrium effect of FDI based on aggregate evidence about investment flows in the OECD countries. The analysis focuses on the effect of outbound FDI and implies that such investment does reduce domestic investment but that each dollar of assets in foreign affiliates reduces the domestic capital stock by substantially less than a dollar. The best summary of the evidence is that each dollar of assets in foreign affiliates reduces the domestic capital stock by between 20 and 40 cents.

Before looking at the basis for these conclusions, it is useful to begin by considering several alternative concepts of FDI and the relevant magnitude of each for the United States. This is the subject of section 2.1. Section 2.2 discusses alternative theories of how outbound FDI could affect the domestic capital stock. Sections 2.3 and 2.4 present investment equations that are estimated using the OECD data. The implications of this for the displacement question are discussed in the final section. The appendix presents the basic data used in sections 2.3 and 2.4.

2.1 Three Concepts of FDI

Several alternative concepts of the stock of FDI are possible. A very narrow definition measures the stock of FDI as the accumulated cross-border flow of equity and debt from the parent company to its foreign subsidiary. The parent company may, however, have control over a much larger volume of foreign assets, including those financed by retained earnings and by borrowing from foreign and other domestic creditors.

This section starts with the narrowest definition of outbound FDI and then presents a series of building blocks that can be used to construct broader measures of FDI. For each building block, there is an estimate of the value from the point of view of U.S. parents as of the end of 1989.

To avoid the special problems of comparing bank assets and liabilities with those of other types of businesses, this analysis is limited to nonbank affiliates of nonbank U.S. corporate parents. Similarly, in order to focus on foreign investments in which the U.S. parent has an unambiguous controlling interest, the analysis is limited to majority-owned nonbank affiliates of U.S. nonbank parents.[7]

These calculations are based on data from the 1989 benchmark survey of

7. The restrictions to nonbank firms and to those with majority ownership by the U.S. parent together reduce the measured stock of U.S.-owned FDI (according to the balance-of-payments measure) by approximately 18 percent. All U.S. FDI had a value (according to the balance-of-payments measure) in 1989 of $553 billion, while the corresponding figure for majority-owned nonbank affiliates was $452 billion. Both figures are estimates of current (1989 dollar) cost values.

U.S. investment abroad reported in the *Survey of Current Business* (U.S. Department of Commerce 1991). Although the benchmark survey data report the current dollar values of the debts of foreign affiliates,[8] the value of assets and therefore the value of equity is stated only as historic cost values. The value of original equity investments and of retained earnings must therefore be adjusted for past price changes to calculate the corresponding current cost values.

In the absence of the necessary detail on annual investment flows, I have done so by using the historic cost and current cost values for the total equity of all U.S. FDI (not just majority-owned nonbank affiliates of nonbank parents) that are published by the Department of Commerce. At year-end 1989, the total value of all U.S. FDI abroad[9] was $553 billion at current cost (1989 dollars) and $370 billion at historic cost (U.S. Department of Commerce 1992). Since the debt component of this balance-of-payments measure of the stock of FDI was $24 billion, the corresponding equity amounts were $529 billion at current cost and $346 billion at historic cost, a ratio of 1.53. Despite the obvious limitations of using a single ratio for both initial equity investments and subsequent retained earnings, this ratio will be used to adjust all historic cost equity values in the 1989 benchmark survey to the corresponding current cost estimates.

I turn now to an analysis of the different concepts of the FDI in the nonbank affiliates of nonbank U.S. parents. The narrowest definition of FDI is the *net external finance from the U.S. parent to the foreign affiliate.* This external finance at year-end 1989 consisted of $202 billion of initial equity investments of U.S. parents (at current cost)[10] and $25 billion of net debt provided by those same parents.[11]

1. Net External finance from U.S. parents	$227 billion
1a. Equity from U.S. parents	($202 billion)
1b. Net debt from U.S. parents	($25 billion)

A small amount of additional equity investment and credit is extended to these overseas affiliates by other U.S. investors and creditors. The equity invested in majority-owned businesses by American companies other than the parent company is very small, only a cumulative $1 billion. American creditors other than the parent firm provided credit of $22 billion.[12]

8. The foreign debt is translated into U.S. dollars at current exchange rates but is not adjusted for changes in value due to changes in interest rates since the debt was issued.

9. This is the "balance-of-payments" measure of FDI. It is the sum of the initial equity investments of U.S. parents, the subsequent retained earnings, and any net debt from U.S. parents to their foreign affiliates.

10. The historic cost number reported in the 1989 benchmark survey (U.S. Department of Commerce 1991, table III.C.1) is $132 billion. Multiplying this by the factor 1.53 produces the current cost estimate of $202 billion.

11. The gross debt from U.S. parents to their foreign affiliates was $84 billion. This was offset in large part by $59 billion of credit from affiliates to parents, leaving a net debt of affiliates to parents of $25 billion. The balance-of-payments measure of FDI includes only the net debt, and I follow that procedure in the current analysis.

12. The credit from the U.S. parent as well as from other U.S. sources includes trade credit as well as other forms of credit.

2. External finance from other U.S. sources	$23 billion
2a. Equity from other U.S. investors	($1 billion)
2b. Debt from other U.S. sources	($22 billion)

The external finance from U.S. sources is substantially augmented by equity and debt from foreign sources. Even among those affiliates that are majority owned by their U.S. parents, foreign sources invested equity of $92 billion at current cost[13] and foreign creditors provided $567 billion.[14]

3. External finance from foreign sources	$659 billion
3a. Equity from foreign sources	($92 billion)
3b. Debt from foreign sources	($567 billion)

The final source of capital in the foreign affiliates is the retained earnings that were reinvested after paying dividends to parents and others. The 1989 current cost estimate for the accumulated value of these retained earnings was $328 billion. Dividing this aggregate among the three classes of investors in proportion to their historic cost values of retained earnings implies:

4. Retained earnings	$328 billion
4a. Share of U.S. parents	($225 billion)
4b. Share of other U.S. investors	($1 billion)
4c. Share of foreign equity investors	($102 billion)

With these building blocks, it is possible to define three progressively broader concepts of outbound FDI. The first is the *net external finance from U.S. sources.* This is the sum of amounts 1 and 2 above, or $250 billion.

The second measure of U.S. FDI adds the value of the retained earnings of foreign affiliates attributable to U.S. investors (the sum of amounts 4a and 4b, or $226 billion) to the net external finance from U.S. parents and other U.S. sources. This *net finance from U.S. sources*[15] had a value of $476 billion.

The third natural definition is the value of the assets in the foreign affiliate, regardless of who finances those assets and of whether the finance is by debt or equity. This definition, the *value of assets of U.S. foreign affiliates,* is the sum of the four building blocks, or $1,237 billion.

The three concepts and the associated magnitudes are shown in table 2.1.

13. This current dollar figure is based on the historic cost value of $60 billion.

14. The 1989 benchmark survey reports that the total liabilities of the majority-owned nonbank affiliates of nonbank U.S. parents was $673 billion. This included current liability and long-term debt of $562 billion and "other liabilities" (including deferred taxes of the subsidiary) of $111 billion. Subtracting the $106 billion of gross debt provided by U.S. parents and other U.S. sources (i.e., the sum of $25 billion of net debt from parents, $59 billion of offsetting debt from affiliates to parents that is counted as part of the gross debt of the affiliates, and $22 billion of debt from other U.S. sources) leaves a balance of $567 billion of debt supplied by foreign sources.

15. This exceeds the official balance-of-payments definition of the stock of U.S. foreign investment by including the value of the equity and debt of U.S. investors and creditors who are not parents of the foreign affiliates.

Table 2.1 Alternative Measures of FDI

Concept of FDI	Value at Year-End 1989
1. Net external finance from U.S. sources (1 + 2)	$ 250 billion
2. Net finance from U.S. sources (1 + 2 + 4a + 4b)	$ 476 billion
3. Value of assets of U.S. foreign affiliates (1 + 2 + 3 + 4)	$1,237 billion

Note: All values are adjusted to current cost in 1989 dollars.

2.2 Displacement Effect of Outbound Direct Investment: Partial Equilibrium versus General Equilibrium Analysis

How does the decision of an American firm to invest abroad in a foreign subsidiary affect the total amount of investment in the United States? Despite the widespread interest in this question, there has been no formal analysis or empirical investigation of the general equilibrium effect of outbound FDI on domestic investment.

2.2.1 Behavior of Individual Firms

The common popular discussion of this issue treats it as a partial equilibrium question of where corporate production will occur. As noted above, opponents of outbound FDI argue that such investment reduces domestic production by substituting for exports, while defenders of outbound FDI argue that overseas subsidiaries increase the market for U.S. exports and therefore increase production in the United States. There are undoubtedly examples of both possibilities in actual practice. These countervailing effects may explain why the very careful study of individual multinational firms by Stevens and Lipsey (1992) failed to find any significant effects of overseas production on domestic exports and investment.[16]

An alternative partial equilibrium analysis would start with the corporate financial decisions and ask whether a firm that invests more abroad will invest less at home. In the simplest textbook version of the investment decision, the firm can borrow as much as it wants at a fixed interest rate and therefore invests until the marginal product of capital equals that rate of interest. In such an economy, borrowing to finance overseas investment does not alter the firm's funds available for domestic investment.

Actual corporate experience is very far from these textbook models. The following simplified version of corporate capital budgeting shows how a firm's decision to invest abroad could reduce its domestic investment. In this view,

16. Similar evidence that outbound FDI is not associated with export displacement is reported in Blomström et al. (1988) and in Lipsey and Weiss (1981, 1984).

the company starts with a fixed amount of after-tax profits and a dividend payout that its shareholders expect. There is some but very little room to vary dividends from the expected amount. The combination of the retained earnings (after this dividend payout) and the company's desired debt-to-capital ratio determines the amount that the company can borrow and therefore the firm's total funds available for capital investments.[17] Since this capital budget calculation is done for the multinational corporation as a whole rather than for individual subsidiaries, the result is a capital budget for the entire corporation. Any use of that capital abroad reduces the amount of capital available for domestic investment within the firm.[18]

However, as the analysis of section 2.1 indicated, much of the capital invested in U.S. affiliates overseas is raised abroad. It is clear that the share of foreign-source debt and equity in the U.S. foreign affiliates is far greater than the share of such foreign-source debt and equity in the financing of the domestic U.S. industry. This reflects the fact that most American firms are more likely to borrow abroad to finance overseas assets than to finance domestic assets. The reason for this is unclear. It may reflect a desire to hedge foreign currency profits with foreign currency debt, an ability to borrow more cheaply when collateral is available, or other aspects of the risk and return of financing behavior. This segmentation of borrowing may be a form of suboptimal behavior similar to the widely observed failure of portfolio managers to diversify investment.

Similarly, American firms are more likely to seek foreign joint-venture partners for overseas subsidiaries (in order to get market access or other benefits of having a local partner) than they are to seek such equity investors here in the United States. The foreign equity investor is also likely to regard such direct investment as a joint-venture partner within its own country as less risky than investing in the United States.

In short, even if outbound FDI substitutes for other investments within the firm's capital budget, more of the funds to finance that outbound FDI are likely to come from foreign sources than would be the case for domestic investment.

2.2.2 Macroeconomic General Equilibrium Effects

To assess the net impact of outbound FDI on total investment in the United States it is important to look beyond the partial equilibrium analysis of individual firms. The net impact of outbound FDI depends on the extent to which that

17. The company could of course modify this by new equity issues, share repurchases, and divestitures, but these should be seen as unusual events rather than as part of the annual capital budgeting process.

18. Stevens and Lipsey (1992) investigate the financial interdependence between foreign investment and domestic investment over time in a sample of U.S. multinational firms and find that overseas investment does reduce domestic investment through this channel. Their formal model lies between the two extremes described in the current text: firms do not have a fixed debt-to-capital ratio, but the cost of funds is a function of that ratio.

outbound FDI changes the aggregate net outflow of capital from the United States, including net portfolio investment as well as net direct investment.

In a world of perfect capital mobility in which the total pool of world savings moves to finance those investments with the highest risk-adjusted rates of return, an increase in U.S. direct investment abroad need not have any effect on the U.S. capital stock. Funds would automatically flow in to finance domestic U.S. investments that earn the required rate of return.

But although the integration of global capital markets appears to be increasing, we are still a long way from the textbook model of perfect capital-market integration. Gross international capital flows are large, but sustained net flows are relatively small. As Charles Horioka and I showed nearly 15 years ago (Feldstein and Horioka 1980), a nation's savings tend to be invested in the country where they originate.[19] The "saving retention coefficient" (the fraction of a marginal dollar of saving that is invested domestically) is estimated to be between 0.8 and 0.9 on average for the OECD countries. This is dramatically different from the world of perfect capital mobility in which a nation's rate of investment would not depend on its saving rate and therefore in which the saving retention coefficient would be zero.

Paradoxically, the extreme no-net-capital-flow case (a saving retention coefficient of 1.0 that is uninfluenced by the volume of outbound or inbound FDI) has the same implication in the current context as the perfect capital mobility case: an outflow of direct investment does not change the amount of net domestic investment. Any net outflow of FDI in this case would be offset by a reduction in outbound portfolio investment or an increase in inbound portfolio investment. The previous estimates of the Feldstein-Horioka–type investment-saving equations did not explicitly test whether the amount of domestic investment is influenced by the outbound or inbound FDI. That is the subject of the next two sections.

A more likely possibility is that the Feldstein-Horioka relation applies to portfolio investment rather than to direct investment. In the extreme case, an extra dollar of national saving would remain in domestic portfolio assets unless it is used by a multinational corporation to finance a cross-border direct investment. Such an outbound FDI would reduce the funds available for domestic investment by an equal amount, as the above corporate budget example suggests. If the portfolio investments were completely segmented into national markets in this way, the effect of the outbound FDI on domestically available funds would not be offset by any international flow of portfolio capital and the aggregate domestic investment would be reduced by the full amount of the direct investment outflow.

19. This fact has since been replicated many times. See Frankel (1991) and Mussa and Goldstein (1993) for discussions of this literature and comments on the reasons why savings remain at home even in a world capital market that appears to be quite closely linked and very active. See also Baxter and Crucini (1993) and Feldstein and Bacchetta (1991).

The evidence in the next two sections supports the idea that FDI transfers capital across borders with very little offsetting net portfolio investment. More specifically, the evidence indicates that each dollar of outbound FDI reduces domestic investment by approximately one dollar.

2.3 Estimates of the Effects of FDI on Domestic Investment

The estimates presented in this section are an extension of earlier work reported in a number of papers beginning with Feldstein and Horioka (1980).[20] The basic Feldstein-Horioka specification relates the ratio of gross domestic investment to GDP to the ratio of gross national saving to GDP. Since these ratios are calculated as decade averages, the analysis relates to sustained differences among countries rather than year-to-year changes. The specification assumes that the national differences in saving determine national differences in investment rather than the reverse. Since these specification issues have been discussed extensively in previous articles,[21] I will not comment on them here.

The innovation in the current study is to add data on inbound and outbound FDI to the previous bivariate specification. The simplest form of the resulting equation is

$$\text{GDI/GDP} = a + b\,(\text{GNS/GDP}) + c\,[(\text{FDI-out})/\text{GDP}] + d\,[(\text{FDI-in})/\text{GDP}] + u,$$

where GDI is gross domestic investment, GNS is gross national saving, GDP is gross domestic product, the two types of FDI are denoted FDI-out and FDI-in, and u is a stochastic disturbance. The individual variables in the numerator and denominator of each ratio are flows at annual rates denominated in current dollars in national currencies. The ratios are decade averages of annual ratios for each country. More general specifications with additional variables are discussed in section 2.4.

By definition, GDI includes only the investment done within the geographic boundaries of the home country. Investment by foreign affiliates of the home country's multinationals are excluded. Investment within the geographic boundaries of the home country that is done by the local affiliates of foreign multinationals is included in GDI. The GNS figures include the saving in the form of retained earnings of foreign affiliates of the home country's multinationals. The FDI values are based on the balance-of-payments definition and refer to all foreign affiliates, not just majority-owned or nonbank affiliates. These data are not ideal, but they are the best data available for this study.

20. See Frankel (1991) and Mussa and Goldstein (1993) for summaries of this literature.

21. See Feldstein (1983) and Feldstein and Bacchetta (1991) as well as the references cited in n. 20.

Table 2.2 Effects of National Saving and FDI on Domestic Investment

Equation	Period	RE[a]	N	Constant	GNS	FDI-Out	FDI-In	Adjusted R^2
(1)	1970s	–	15	0.04	0.87			0.85
				(0.02)	(0.10)			
(2)	1980s	–	18	0.07	0.74			0.67
				(0.03)	(0.12)			
(3)	Pooled	–	33	0.05	0.80			0.79
				(0.02)	(0.07)			
(4)	1970s	No	15	0.05	0.84	−1.73	0.80	0.87
				(0.03)	(0.10)	(0.90)	(1.11)	
(5)	1980s	No	18	0.08	0.74	−1.65	0.47	0.74
				(0.03)	(0.12)	(0.69)	(0.86)	
(6)	Pooled	No	33	0.07	0.77	−1.58	0.59	0.84
				(0.02)	(0.07)	(0.47)	(0.62)	
(7)	1970s	Yes	9	0.06	0.76	−1.42	2.18	0.90
				(0.03)	(0.12)	(0.46)	(0.63)	
(8)	1980s	Yes	10	0.10	0.59	−1.87	2.51	0.67
				(0.05)	(0.23)	(0.63)	(1.09)	
(9)	Pooled	Yes	19	0.08	0.66	−1.71	2.38	0.82
				(0.03)	(0.11)	(0.37)	(0.59)	

[a]Indicates whether the FDI variables include or exclude the retained earnings of the foreign affiliates.

Although the OECD produces consistent data on GDI, GNS, and GDP, there are no official OECD data on FDI. The data on FDI come from the International Monetary Fund.[22] The limited availability of data on FDI restricts the sample to 18 of the 24 OECD countries for the decade of the 1980s and 15 of those countries for the decade of the 1970s. This section presents separate results for both samples as well as for a pooled sample of 33 observations. For all of these countries it is possible to obtain estimates of FDI excluding retained earnings (RE). It is also possible to obtain the amount of retained earnings of these foreign affiliates for 9 of the countries during the decade of the 1970s and 10 of the countries during the decade of the 1980s. Estimates are also presented for these smaller samples.

The first three equations presented in table 2.2 are the standard investment-savings relation without FDI. The estimated savings retention coefficients for this sample of OECD countries are 0.87 (s.e. = 0.10) for the 1970s and 0.74 (s.e. = 0.12) for the 1980s, very similar to the estimates obtained with the larger samples of OECD countries in past research. The savings retention coefficient for the pooled data is 0.80 (s.e. = 0.07) and lies between the two individual decade estimates.

In equation (4) of table 2.2, the coefficient of the FDI-out variable is −1.73

22. These data are published in the Balance of Payments Yearbook. The current study uses updated unpublished data. The actual data are presented in the appendix to this paper.

(s.e. = 0.90) and the coefficient of the FDI-in variable is 0.80 (s.e. = 1.11). Adding these two FDI variables to the traditional saving-investment equation leaves the estimated savings retention coefficient virtually unchanged at 0.84 (s.e. = 0.10).

The coefficient of the FDI-out variable, which is of primary interest in the current analysis, is quite stable in the different time periods and specifications. It is always negative, implying that the aggregate level of domestic investment in a country declines when outbound FDI increases. Since this effect is conditional on given levels of national saving and inbound FDI, it implies that other international capital flows (inbound and outbound portfolio investment and borrowing) do not adjust to offset the direct effect of outbound FDI on domestic investment. The coefficient of outbound FDI is −1.73 (s.e. = 0.62) in the 1970s and −1.65 (s.e. = 0.69) in the 1980s when FDI is defined as a cross-border capital transfer (i.e., excluding retained earnings of the foreign affiliates). Adding the retained earnings of foreign affiliates (eq. [7]) leaves the coefficient for 1970 essentially unchanged (−1.42 with s.e. = 0.40) and increases the absolute size of the 1980 coefficient only slightly (−1.87 with s.e. = 0.63).

It would of course be desirable to distinguish the response of domestic investment to outbound cross-border FDI flows from the response of domestic investment to the retained earnings of the foreign affiliates. Unfortunately, there are too few observations to make such an estimate. Attempts to use the samples corresponding to equations (7)–(9) to look at the RE variable separately (in addition to the other variables already in those equations) results in almost no residual degrees of freedom and therefore leads to very unstable coefficient estimates with very large standard errors. It is not possible to determine statistically whether a one-dollar increase in GNS due to an increase in the RE of foreign affiliates has the same impact on GDI as a one-dollar rise in GNS due to domestic savings.[23] Similarly, when outbound FDI is defined to include the retained earnings of foreign affiliates (eqs. [7]–[9]), it is not clear whether the reaction to the cross-border FDI flow is the same as the reaction to FDI-out that is achieved without a cross-border flow by an increase in the retained earnings of the affiliate.

The reaction of domestic home-country investment to a dollar of dividends that is repatriated by the subsidiary to the parent company is ambiguous a priori as well. Although the direct effect of the dividend repatriation would be to add to the domestic capital stock, this could be offset to the extent that the dividend induces a reduction in inbound portfolio investment or an increase in outbound direct or portfolio investment. Since the econometric evidence cannot resolve this ambiguity, section 2.5 examines the implications of the two alternative extreme assumptions that subsidiary retained earnings reduce do-

23. Recall that gross national saving includes the retained earnings of foreign affiliates.

mestic (home-country) investment dollar for dollar and, alternatively, that they do not affect domestic investment at all.

2.4 Additional Variables and Simultaneity Problems

The interpretation of the coefficients in table 2.2 is clouded by the fact that the saving rate and the two FDI ratios are endogenous variables in the overall economic system. In particular, the levels of inbound and outbound FDI are likely to be correlated with variables that favor higher domestic rates of investment. A country that offers a "good environment" for domestic investment is also likely to attract more inbound FDI and may also experience less outbound FDI. This section shows that this problem of missing variables does indeed bias the coefficients shown in section 2.3, increasing the absolute size of both the FDI-out and FDI-in coefficients.

The results in this section are thus quite different from the earlier studies of potential bias in the estimated savings retention coefficient in the simpler Feldstein-Horioka specification. Since it is certainly possible that some of the same factors that cause a country to have a higher saving rate might also cause it to have a higher investment rate, Feldstein and Bacchetta (1991) also estimated the basic specification by an instrumental variable (IV) estimation procedure using demographic characteristics and social security variables as instruments for the national saving rate. Although the relatively small sample of fewer than two dozen countries limits the relevance of the consistency property of IV estimation, the similarity of the OLS and IV estimates provides some reassurance that the potential endogeneity of the savings rate is not a source of significant bias. Further support for the assumption that long-term intercountry differences in saving cause long-term differences in investment (rather than the reverse or a simultaneous equations relation) is obtained by dividing national saving into private saving and government saving and noting that both components of national saving have essentially the same effect on domestic investment in a generalized Feldstein-Horioka specification (Feldstein and Bacchetta 1991).

Although it would be desirable to reestimate the equations in table 2.2 using an IV approach, I have been unable to find any variables that would be satisfactory instruments. I decided therefore to pursue a different approach to reducing the possible bias in the estimated FDI coefficients by expanding the specification of the investment equation to include additional determinants of investment that might also be correlated with either or both of the FDI variables. Although some bias might remain even in this specification because not all possible variables are included, this method is preferable to using an IV estimation procedure with a very small sample and very inadequate instruments.

Table 2.3 summarizes the results of these more general specifications. The evidence confirms that outbound FDI does reduce domestic investment, but the

Table 2.3 **Impact of Additional Variables on the Estimated Effect of FDI on Domestic Investment**

Equation	Period	RE	N	GNS	FDI-Out	FDI-In	Other Variables	Adjusted R^2
(1)	Pooled	No	33	0.76	−1.17	0.16	E**, SIZE**, INF**, GRO	0.90
				(0.07)	(0.47)	(0.50)		
(2)	Pooled	No	33	0.79	−1.10	−0.04	E**, SIZE**, INF*, INT**	0.92
				(0.05)	(0.40)	(.44)		
(3)	1970s	No	15	0.85	−0.92	−0.03	E, SIZE*, INF*, GRO	0.89
				(0.17)	(0.91)	(1.21)		
(4)	1970s	No	15	0.87	−0.83	0.00	E, SIZE*, INF, INT	0.89
				(0.11)	(1.04)	(1.16)		
(5)	1980s	No	18	0.65	−0.80	−0.19	E**, SIZE**, INF**, GRO	0.91
				(0.09)	(0.55)	(0.57)		
(6)	1980s	No	18	0.65	−0.81	−0.20	E**, SIZE**, INF*, INT	0.91
				(0.10)	(0.54)	(0.54)		
(7)	Pooled	Yes	19	0.49	−1.59	1.41	E, SIZE**, INF, GRO	0.89
				(0.14)	(0.42)	(0.58)		
(8)	Pooled	Yes	19	0.62	−1.36	0.94	E*, SIZE**, INF, INT*	0.92
				(0.11)	(0.38)	(0.54)		
(9)	Pooled	Yes	19	0.55	−1.37	0.92	E*, SIZE**, INT**	0.93
				(0.11)	(0.31)	(0.49)		

Note: Each equation also contains a constant term. The FDI-in and FDI-out variables exclude retained earnings in eqs. (1)–(6) and include retained earnings in eqs. (7)–(9). See text for definitions of "other variables."

coefficients are now absolutely smaller, indicating that the previously omitted variables were common factors that affected FDI-out and GDI in similar ways.[24]

For example, equation (1) of table 2.3 (which is estimated for the pooled sample of 33 country-decade observations) includes four variables in addition to the saving rate and FDI variables: (1) a dummy variable indicating whether the country is in Europe (E), (2) the size of the country as measured by its average population during the decade (SIZE), (3) the average inflation rate during the decade (INF), and (4) the average growth rate of GDP during the decade (GRO). These variables are listed as "other variables" in the description of equation (1). Those other variables with a t-statistic between 1 and 2 are marked with an asterisk, while those with a t-statistic in excess of 2 are marked with two asterisks. Thus E, SIZE, and INF have t-statistics greater than 2, while GRO is not statistically significant. In this specification, the coefficient of FDI-out is −1.17 with a standard error of 0.47.

24. The coefficients of FDI-in change even more substantially and are now insignificant in every case, indicating that the inflow of FDI does not appear to alter the domestic investment rate. Presumably the capital inflow in the form of inbound FDI substitutes for inbound portfolio investment or induces other balancing transactions.

Equation (2) adds the average short-term interest rate (INT) and deletes the insignificant growth variable. This specification, which has the highest adjusted R^2 of all the variable combinations that I have examined, also suggests that the coefficient of FDI-out is approximately -1, i.e., that each dollar of FDI-out reduces GDI by about one dollar.

The next four equations in table 2.3 are for the individual decades. The absolute values of the coefficient of FDI-out are slightly smaller than 1 in each of these specifications. The large standard errors in these equations should be interpreted in the context of the smaller samples for individual decades (only 15 observations for the 1970s and 18 observations for the 1980s) which, together with the additional variables, leave as few as seven residual degrees of freedom. But taken together with the pooled data of equations (1) and (2) and the separate decade estimates for the simpler specifications in table 2.2, it seems most appropriate to conclude that each dollar of cross-border FDI-out reduces domestic investment by approximately one dollar.

The FDI variables reported in equations (1)–(6) of table 2.3 all measure FDI excluding retained earnings. Although eliminating the eight countries that do not provide information on retained earnings would leave too small a sample of observations for either decade alone, it is possible to use the pooled sample for 19 observations for the two decades. The results are shown in equations (7), (8), and (9). The first two of these repeat the two specifications of equations (1)–(6), while equation (9) is the specification with the highest adjusted R^2 when the FDI variables are defined to include retained earnings.

The coefficients are similar in all three specifications. The estimated effect of FDI-out is slightly larger in absolute size than in the pooled estimates of equations (1) and (2) but, given the small sample and large standard errors, is not significantly different from -1.0. The major difference from the other equations in table 2.3 is that the coefficient of the FDI-in variable rises to approximately 1.0 and becomes nearly twice its standard error. This implies that the retained earnings of foreign affiliates in a given host country, like other forms of domestic saving in that country, increase domestic investment in that host country.

More generally, the evidence in this section implies that outflows of FDI reduce domestic investment on a dollar-for-dollar basis and that this reduction is not offset by an international shift in portfolio investment. This is consistent with a view that the Feldstein-Horioka segmentation of capital markets applies to portfolio investment and that direct investment circumvents this barrier to capital mobility. Similarly, FDI induces U.S. firms to use much more foreign debt and equity finance in their majority-owned foreign affiliates than they would use for domestic investments. In that way, the financing of FDI also makes available the advantages of foreign portfolio financing in a way that would not occur without the direct investment.

2.5 Effect of Outbound FDI on Foreign Assets and the Domestic Capital Stock

By combining the parameter estimates of sections 2.3 and 2.4 with the evidence on the sources of capital of foreign affiliates of U.S. multinationals in section 2.2 it is possible to answer the fundamental question of how much the U.S. domestic capital stock declines per dollar of additional capital in the foreign affiliates of U.S. multinationals.

The answer to this question depends on how that foreign affiliate capital is financed. The parameter estimates of sections 2.3 and 2.4 imply that on average within the OECD each dollar of cross-border external finance reduces domestic investment by one dollar. The data analyzed in section 2.2 show that approximately 20 cents of each dollar of the existing U.S. foreign affiliate capital is financed by such a cross-border flow of capital from the United States. Of the remainder, 18 cents comes from the U.S. share of retained earnings of the foreign affiliate and 62 cents comes from foreign debt and equity sources.

Before considering the implication of this average financing mix, I will consider two simpler cases.

2.5.1 Pure Parent Finance

Consider first the simplest case in which the incremental foreign affiliate capital is financed exclusively by the U.S. parent with no foreign equity or debt. If the U.S. general equilibrium response to cross-border capital outflows is similar to the average OECD response, each dollar of parent-to-affiliate finance reduces the U.S. domestic capital stock by one dollar. In this extreme case, each dollar of increased capital in the foreign affiliate reduces the U.S. domestic capital stock by one dollar.

2.5.2 Leveraged Retained Earnings Finance

As a second and much more common case, consider the foreign affiliate that uses retained earnings to finance an incremental investment and that combines those foreign retained earnings with local debt. The sources of financing per unit of incremental capital in the subsidiary can be defined as:

s = the retained earnings of the subsidiary attributable to the U.S. parent and other U.S. equity investors;

s^* = the retained earnings of the subsidiary attributable to non-U.S. sources; and

b^* = the debt supplied by non-U.S. creditors.

By assumption, in this case $s + s^* + b^* = 1$.

The alternative to investing the retained earnings of the subsidiary would be to distribute them as dividends to the U.S. and foreign equity owners. The econometric analysis of sections 2.3 and 2.4 was not able to measure the aver-

age OECD response to changes in retained earnings or dividend repatriations. The effect on domestic capital formation in the home country of the subsidiary's choice between retaining earnings and repatriating those earnings as dividends cannot be settled by a priori analysis either. Consider therefore the alternative possibilities. If a dollar of repatriated dividends would add one dollar to the U.S. gross domestic investment, an additional dollar of foreign affiliate capital financed with leveraged retained earnings reduces the U.S. capital stock by $s < 1$ dollars. To the extent that the repatriation of retained earnings displaces other financial capital inflows or increases financial capital outflows, the depressing effect on the U.S. capital stock would be smaller than s.

The analysis of section 2.1 shows that the retained earnings attributable to U.S. investors (corresponding to s in the current calculation) were $226 billion in 1989, that the retained earnings attributable to foreign investors was $102 billion, and that the debt from foreign sources was $567 billion. If the relative magnitudes of these three financing sources are used to approximate the financing of the leveraged retained earnings investment, we obtain $s = 226/895 = 0.25$. With these assumptions, an additional dollar of foreign affiliate capital financed with leveraged retained earnings reduces the U.S. capital stock by 25 cents. This is an upper limit of the plausible range because it is based on the assumption that any retained earnings that are not invested by the foreign subsidiary would otherwise add dollar for dollar to the U.S. capital stock.

2.5.3 Average Financing

The observed aggregate financing mix described in section 2.1 reflects both new equity and debt transfers from parents to affiliates and the subsequent reinvestment of retained earnings. Both types of investments are leveraged with foreign debt. While individual investments will use different financing mixes, the overall financing mix may remain relatively unchanged if the mix of new investment and reinvestment continues to be about the same.[25]

To analyze this overall average financing case, the three sources of financing identified in the "leveraged retained earnings case" must be expanded to include:

e = the external equity capital provided by the U.S. parent and other U.S. investors;
e^* = the external equity capital provided by non-U.S. sources; and
b = the debt supplied by the U.S. parent and other U.S. creditors.

Now $e + e^* + b + b^* + s + s^* = 1$.

25. It would be desirable to compare the composition of financing of U.S. foreign affiliates in the 1989 benchmark survey with the financing composition in earlier studies.

The econometric results of section 2.3 and 2.4 imply that each dollar of cross-border equity and debt (e and b in the current notation) reduces domestic investment by one dollar. If we assume also that each dollar of foreign affiliate retained earnings that is not invested in the affiliate would otherwise be repatriated and would add dollar for dollar to domestic investment in the United States, an additional dollar of foreign affiliate capital financed with the observed average mix of financing sources would reduce the U.S. capital stock by $e + b + s < 1$ dollars. Once again this is an upper limit because the repatriation of subsidiary retained earnings may not increase domestic investment dollar for dollar.

The analysis of section 2.1 showed that, of the $1,237 billion of total assets, the external equity finance from U.S. sources was $203 billion, the debt from U.S. parents and other U.S. creditors was $47 billion, and the share of retained earnings attributable to U.S. parents and other investors was $226 billion. In this case, $e + b = 0.20$ and $e + b + s = 0.38$. If each dollar of retained earnings would otherwise be repatriated and add one dollar to domestic investment, each dollar of foreign affiliate investment financed by this average mix of sources reduces the U.S. capital stock by 0.38 dollars. At the other extreme, if the inflow of repatriated earnings would only displace some other portfolio inflow or induce a portfolio outflow, each dollar of foreign affiliate investment financed by this average mix of sources reduces the U.S. capital stock by only 0.20 dollars.

Although individual investments will use different financing mixes, this overall financing case is probably the best indication of how the financing of the foreign affiliate capital stock evolves. If so, it implies that each dollar of displaced domestic capital in the United States adds between $2.60 and $5.00 to the capital stock of U.S. foreign affiliates.

This relation between forgone domestic investment and the increase in the capital stock of U.S. foreign affiliates is important for assessing the impact of outbound FDI on the national income of the United States. The effect of outbound U.S. FDI on U.S. national income depends on the rate of return earned on such investments, the cost of the foreign capital, and the amount of taxes paid to the foreign government. Although U.S. firms that invest abroad presumably select the allocation of capital that maximizes the present value of the firms' after-tax profits, the existence of foreign taxes implies that their decisions will not in general maximize U.S. national income. The firm may be indifferent between paying taxes to the U.S. government and a foreign government, but only the former remains a part of U.S. national income. An evaluation of whether the outbound U.S. FDI increases or decreases U.S. national income requires balancing the tax losses to foreign governments against the advantage of the increased use of foreign-source capital that accompanies FDI. That analysis is the subject of a separate study (Feldstein 1994).

Appendix

Table 2A.1 **Decade Averages of Investment, Saving, and FDI Ratios: 1970–79**

	Ratios to GDP					
Country	GDI	GNS	Outbound FDI[a]	Inbound FDI[a]	Outbound RE	Inbound RE
Australia	0.250	0.238	0.001	0.007	0.001	0.006
Austria	0.286	0.278	0.001	0.005	n.a.	n.a.
Belgium/Luxembourg	0.227	0.232	0.007	0.015	n.a.	n.a.
Canada	0.240	0.224	0.008	0.007	n.a.	n.a.
Finland	0.285	0.265	0.002	0.002	n.a.	n.a.
France	0.255	0.259	0.003	0.004	0.000	0.000
Germany	0.234	0.244	0.005	0.003	0.001	0.001
Italy	0.258	0.260	0.002	0.003	n.a.	n.a.
Japan	0.345	0.353	0.003	0.000	n.a.	n.a.
Netherlands	0.234	0.246	0.018	0.010	0.006	0.002
New Zealand	0.260	0.217	0.001	0.008	0.001	0.008
Spain	0.266	0.251	0.001	0.006	n.a.	n.a
Sweden	0.216	0.209	0.006	0.001	0.000	0.000
United Kingdom	0.199	0.180	0.010	0.009	0.009	0.005
United States	0.194	0.197	0.003	0.001	0.005	0.001

Note: n.a. = not available.

[a]Excludes retained earnings (RE).

Table 2A.2 **Decade Averages of Investment, Saving, and FDI Ratios: 1980–90**

	Ratios to GDP					
Country	GDI	GNS	Outbound FDI[a]	Inbound FDI[a]	Outbound RE	Inbound RE
Australia	0.244	0.198	0.007	0.013	0.003	0.004
Austria	0.245	0.242	0.003	0.003	n.a.	n.a.
Belgium/Luxembourg	0.176	0.171	0.014	0.020	n.a.	n.a.
Canada	0.215	0.198	0.012	0.003	n.a.	n.a.
Denmark	0.181	0.152	0.006	0.003	n.a.	n.a.
Finland	0.258	0.237	0.012	0.002	0.000	0.001
France	0.209	0.204	0.010	0.006	0.000	0.000
Germany	0.206	0.227	0.009	0.003	0.001	0.000
Italy	0.225	0.216	0.004	0.003	n.a.	n.a.
Japan	0.300	0.321	0.007	0.000	n.a.	n.a.
Netherlands	0.197	0.225	0.027	0.013	0.009	0.005
New Zealand	0.242	0.182	0.005	0.010	0.005	0.006
Norway	0.259	0.267	0.011	0.006	n.a.	n.a.
Portugal	0.282	0.237	0.001	0.015	0.000	0.001
Spain	0.221	0.208	0.003	0.015	n.a.	n.a

(*continued*)

Table 2A.2 (continued)

Country	Ratios to GDP					
	GDI	GNS	Outbound FDI[a]	Inbound FDI[a]	Outbound RE	Inbound RE
Sweden	0.188	0.169	0.020	0.004	0.005	0.001
United Kingdom	0.176	0.166	0.015	0.012	0.012	0.006
United States	0.179	0.163	0.000	0.008	0.003	0.000

Note: n.a. = not available.

[a]Excludes retained earnings.

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Comment

Kenneth A. Froot

Over a decade ago, Feldstein posed a substantial puzzle to international economists. In his paper with Charles Horioka (Feldstein and Horioka 1980), he argued that an increase in the national savings rate resulted in a one-for-one increase in investment. Notwithstanding economists' views about the ease with which capital flows across borders, savings and investment behave as though there is no international capital mobility. This conclusion has been subjected to much further research, but with little change—by the measure of net asset flows, international capital mobility seems surprisingly low.

In the paper in this volume, Feldstein applies this line of research to foreign direct investment (FDI). If the Feldstein-Horioka view of the world is correct, then there is little room for net international capital flows—current accounts are effectively fixed. Thus, an increase in FDI outflows from (in this case) the United States should result in an increase in capital inflows, and result in no overall effect on domestic investment. Furthermore, domestic investment is insensitive to FDI flows under complete international capital mobility. As long as domestic opportunities are not correlated with FDI, then FDI flows should have no influence on the current account or level of domestic investment.

In contrast to the predictions of these theories, Feldstein finds that each dollar of FDI outflow (holding fixed gross national savings) results in a one-dollar reduction in domestic investment. This is a striking finding, as it seems to contradict both the Feldstein-Horioka and perfect-capital-markets views of the world. A similar, although considerably weaker, result seems to hold for U.S. inflows of FDI.

Kenneth A. Froot is professor of business administration at Harvard Business School and a research associate of the National Bureau of Economic Research.

In this comment, I want to do two things. First, I will argue that some, although probably not all, of the effect in the paper may be due to measurement issues in the data. This implies that a truly exogenous one-dollar increase in FDI results in a less-than-one-dollar decrease in domestic investment, but a decrease nonetheless. Second, I want to try to interpret this result in terms of the literature that links investment to corporate cash flow.

To see the measurement error issue, it is important to note that many capital transactions between a foreign affiliate and its U.S. parent can affect both FDI and domestic savings. For example, when an affiliate has retained earnings, those earnings are counted as domestic saving and as FDI outflows. Similarly, if for tax reasons a firm wants to repatriate a dividend from its foreign affiliate in a specific year, yet does not want to reduce the affiliate's cash resources, it would be recorded as both an increase in domestic savings and an FDI outflow. One might guess that these transactions have little influence on domestic savings, yet they will tend to bias the regression coefficient on FDI outflows toward that of domestic savings.

To see this, let us partition observed domestic savings into a component unrelated to these intracorporate transactions and the transactions themselves:

$$S_0 = S + \varepsilon, \tag{1}$$

where S_0 is observed gross national savings, ε is a measure of intracorporate transactions which is unrelated to domestic investment, and S is all other domestic savings. FDI outflows can be decomposed in the same way:

$$\mathrm{FDI}_0 = \mathrm{FDI} + \varepsilon. \tag{2}$$

Next, suppose that the *true* Feldstein-Horioka relationship between savings and investment is given by

$$I = \beta S + \mu, \tag{3}$$

where μ is a random error term. If we run the regression of investment on observed savings and FDI, we will find the coefficient on FDI_0 is biased toward $-\beta$, even if FDI flows have no effect on domestic investment. The larger the portion of FDI volatility contributed by ε, the closer to $-\beta$ will the estimated coefficient on FDI_0 be. A further implication of this setup is that when FDI_0 is omitted from the regression, the measurement error affects the estimated coefficient on S_0 more severely, causing it to be more severely biased below β.

The results in tables 2.2 and 2.3 provide some evidence to support this story. The coefficients on saving tend to be higher when FDI_0 is not included and lower when it is included. Furthermore, the coefficients on FDI_0 (for inflows as well as outflows) are larger (especially in table 2.3) when retained earnings are included in FDI flows. Since retained earnings are an important source of the ε-measurement error, this is what we would expect. This quick analysis suggests that it might be worth taking the time to clean the FDI data of intra-

corporate transactions. One could, for example, focus on FDI flows from mergers and acquisitions only to eliminate the potential for this type of bias.

Having said this, let us take seriously the hypothesis that FDI outflows do indeed negatively affect domestic investment. Thus, my second question becomes, How might we rationalize the Feldstein result? That is, why would FDI be expected to affect domestic investment, *given* domestic savings?

One explanation would rely on models of capital-market imperfections which arise from informational asymmetries or agency problems. Specifically, these models generate deadweight costs which make it more expensive for firms to tap external funds than to use internal funds. One prediction of these models is that investment spending by corporations is liquidity constrained, so that an increase in corporate liquidity—for example, corporate savings—results in an increase in investment even when holding investment opportunities fixed. This follows because the increase in internal funds lowers a firm's effective cost of capital, and therefore raises investment.[1]

In such a world, we might think of domestic saving as proxying for corporate and household liquidity. This would then help us understand the original Feldstein-Horioka results, which imply that increases in saving themselves generate increases in investment. Of course, to test this theory more precisely, one would want to include an additional variable in the original regression of investment on savings: a control for investment opportunities. For public corporations, such a control is available in the form of the companies' stock prices (relative to book values). However, for countries it is harder to think of an observable indicator of future investment opportunities.

In spite of the omission of a control for investment opportunities, this model can help us understand the results of Feldstein's paper as well. If the availability of internal funds to U.S. firms largely drives their total investment spending, then the sum of FDI outflows and domestic investment should be roughly constant. (This ignores the impacts on domestic investment of foreign firms' FDI inflows, but these can be thought of as exogenous and separate forces which are also driven by the availability of internal funds, i.e., foreign corporate savings.) This would imply that increases in FDI decrease one-for-one domestic investment.

Of course, this is an extreme version of the "cash-flow" hypothesis. In practice, companies do have access to external funds, even if they are somewhat more expensive. Thus, when an FDI opportunity comes along, it may not crowd out domestic investment one for one, because the firm borrows additional funds for the domestic investment from some combination of foreign and domestic households. Nevertheless, this suggests that a model of costly external funds can indeed generate results similar to those in the paper.

1. General references on this literature include Fazarri, Hubbard, and Petersen (1988), Froot and Stein (1991), and Hoshi, Kashyap, and Scharfstein (1991).

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