



BOARD OF GOVERNORS  
OF THE  
FEDERAL RESERVE SYSTEM  
WASHINGTON D.C. 20551

DIVISION OF INTERNATIONAL FINANCE

August 6, 1992

✓ To: Anne Kester, Study Director  
Panel on International Capital Transactions  
National Academy of Sciences  
National Research Council

From: Guy V.G. Stevens  
Senior Economist  
Division of International Finance  
Federal Reserve Board

Subject: Uses Made of Direct Investment Data

As we discussed, this memo will be a somewhat selective topical survey of studies using data on direct investment, particularly the data collected by the Bureau of Economic Analysis (BEA). It will be based primarily on a recent chapter written jointly with my colleague, Lois Stekler, "The Adequacy of Direct Investment Data" (in P Hooper and J. D. Richardson, eds., *International Economic Transactions*, NBER, 1991). Other studies that I have found very useful are: Richard Caves' *Multinational Enterprise and Economic Analysis* (1982), Gary Hufbauer's, "The Multinational Corporation and Direct Investment" (1975), and, my own "The Determinants of Investment" (1974).<sup>1</sup> At the end of this topical survey, I append a condensed version of the conclusions and a list of seven specific recommendations for BEA with which Lois Stekler and I concluded our chapter.

---

1. Full citations for the studies noted in the text may be found, below, in the list of references.

I. The Share of Direct Investment Enterprises in a Market or the Economy

This has become a "hot" area recently and the BEA data on the direct investment position, total assets, and sales have been the major source of information. See Eisner and Peiper (1988), Ulan and Dewald (1989), and Stekler and Stevens (1991). Some problems have been encountered when getting down to the industry level because of the pervasive problems associated with the current reporting of data at the enterprise, rather than the establishment level; thus, establishments of a given firm producing in a number of industries are often aggregated and reported under a single industry. This problem may soon be eased greatly for direct investment in the United States because of the work underway to link the BEA data with the establishment level data collected in the Census of Manufacturers. Problems still remain, and are particularly acute for direct investment abroad. (See recommendation 7 at the end of this memo.)

II. Direct Investment, Trade, and Competitiveness

Much work has been done in attempts to see if direct investment abroad and trade are basically substitutes or complements; overall, the evidence seems to point to the latter. The most careful and complete work has been done by Robert Lipsey with a number of coauthors, using primarily BEA data on trade and direct investment (often at the micro level): Lipsey and Weiss (1981, 1984), Bloomstrom, Lipsey, and Kulchycky (1988). See also, the excellent chapters in Bergsten, Horst and Moran (1978) (who used all sorts of data, including IRS, NSF and BEA data).

Related to the above is the increasingly important issue of how to measure the competitiveness on U.S. firms in a world where products

may be supplied to foreign and domestic markets by traded goods or production from foreign subsidiaries. Major contributions have been made by Lipsey and Kravis (1987) and Kester (1992).

### III. Forecasting Direct Investment Flows in Macroeconometric Models

Virtually every model of the United States must forecast at least the receipts and payments from direct investment that are included in the current account. Frequently, also, some equations are necessary for the flow of direct investment that hits the capital account. See Helkie and Stekler (1987) for one of the most detailed treatments. Such models typically use the aggregate data collected by BEA for the quarterly flows of receipts, payments, and capital. To attempt to explain these flows, it is necessary, although not particularly desirable, to use aggregate data on such things as foreign GNP, interest rates etc., rather than measuring directly the operations of the multinational firms in question. This is because only the balance of payments data are collected on a quarterly basis; all other data such as MNC sales and plant and equipment expenditure are collected annually, at best. I have long recommended that at least a limited set of operational data be collected with the quarterly BOP data: e.g., sales and plant and equipment expenditures.

### IV. Studies of the Determinants of MNC Behavior.

Over the years there has been a steady accretion of empirical knowledge on the determinants of various aspects of multinational firm behavior: e.g., plant and equipment expenditures, various financial flows, production functions, factor proportions. Some of these studies

have used the micro data collected by BEA; those that I know of are: Severn (1972) (fixed investment and finance), Stevens (1969) (fixed investment), Courtney and Leipziger (1975) (production functions), Lipsey, Kravis, and Roldan (1982) (factor proportions and production functions), and a number by Lipsey noted above under trade. Others that have used the BEA data at more aggregated levels are Ray (1989) (direct investment flows to the United States), Stevens (1972) (capital outflows, fixed investment, finance raised abroad), Froot and Stein (1989) (financial flows to the United States). See also the following studies that have used other sources of data to test interesting hypotheses: Corbo and Havrylyshyn (1982) (production functions); Lim (1977) (wage behavior of MNCs); Morley and Smith (1977) (technical choices of production methods); Reuber (1973) (economic development); Wells (1973) (production choices in developing countries).

One of the problems researchers have encountered when attempting to use the BEA data is the paucity of usable time series; when using BEA's data on MNC sales, asset changes, trade, and so on, researchers are forced either to use cross-section data or short time series. Unbroken annual time series exist for the operations of foreign investors in the United States since 1977 and for U.S. investors abroad only since 1982. Despite the fact that BEA started collecting data on an annual basis on the operations of foreign affiliates as early as 1957, there is a break in all series except plant and equipment expenditures between 1977 to 1982; this is a very sad story and, in my view, a tragic and costly blunder. As a result, researchers desiring time series have had to use other, inferior sources (e.g., Stevens and Lipsey (1992)), or have been obliged to merge the plant and equipment expenditure series with

aggregate sources of data (as is the case for a study I am doing at present on plant and equipment spending by U.S. affiliates in Argentina, Brazil and Mexico).

#### V. Direct Investment and Economic Welfare

In Stekler and Stevens (1991), we examined a large number of studies that either attempted to measure the overall impact of a direct investment on the host country or attempted to examine aspects of this impact. In the latter category are a number of studies comparing the behavior of direct investors to local or native firms, examining such questions as relative efficiency, wage rates and the like. Only a few of these studies used BEA data: Courtney and Leipziger (1975) (production functions of U.S. affiliates in the same industry in developed and less-developed countries); Lipsey, Kravis and Roldan (1982) (factor proportions and their relation to cost differentials).

In Stekler and Stevens (1991), pp. 32-37, I also examined in some detail whether the BEA data, particularly that collected in the periodic Censuses, could be used to carry out the necessary cost-benefit calculations to assess the overall impact of a foreign investment on the host and home countries. I concluded a qualified yes to this question. This conclusion was based largely on findings of Encarnation and Wells (1986), Graham and Krugman (1989), Little and Mirrlees (1974), Musgrave (1975), Roemer and Stern (1975), U.S. General Accounting Office (1988), and Vendrell-Alda (1978).

## VI. Other Important Topics

Recently, the interrelated issues of transfer pricing and the taxation of multinationals has re-emerged as an important area for research and public policy. My knowledge is fairly limited concerning the strengths and limitations of the data available for such studies; I refer interested readers to chapter 8 in Caves (1982), Hartman (1984), Grubert and Mutti (1991), Slemrod (1990), and Wheeler (1988).

## VII. Some Conclusions and Recommendations

The Bureau of Economic Analysis has for many years collected an impressive body of data on direct investment, designed to cast light on a wide variety of important issues. Among the conclusions of Stekler and Stevens (1991) regarding the accuracy of the BEA data is the finding that charges that BEA's measures omit as much as half of foreign direct investment in the United States are wildly implausible. There seems little reason to doubt that BEA surveys include most direct investment and that the basic balance-of-payments data on income and capital flows are in most cases accurate, in the sense that they accurately reflect the reporters' books.

On the other hand, the accuracy of answers supplied by the treasurer's offices of the reporters to survey questions requiring data that they would not normally collect for their own purposes is much more variable. Perhaps influenced by Washington's preoccupation with reducing the paperwork burden and OMB's abdication of its former responsibility for the assurance of data quality, firms today seem even less willing to go out of their way and devote resources to provide accurate data; in our

experience, this problem is not confined to the area of direct investment.

In the subject areas we have explored, we have inevitably identified some important questions that cannot be answered with the existing data. The answers to some of these questions are in principle unobtainable by BEA, since the requisite data lie outside the existing universe of direct investors. The prediction of greenfield investment by foreigners and the measurement of the impact of foreign affiliate production on imports may be two such questions.

However, we have also identified a number of ways in which we think the existing data system can be improved. Our specific recommendations include:

1. With respect to the definition of direct investment, it is our view that BEA should continue collecting data on the basis of the present 10 percent rule. However, the Bureau should provide data on key variables (e.g. assets, sales, etc.) based on a range of ownership cut-offs to call attention to the fact that currently published data using the 10 percent rule exaggerate the extent of foreign control of the U.S. economy. Some consideration should be given to efforts to distinguish affiliates with some foreign participation in management from those that are controlled by foreigners.

2. To facilitate comparisons and resolve inconsistencies, attention should be given to the harmonization of the definition of direct investment among different countries.

3. Given BEA's extremely tight resource constraints, the diversion of BEA resources to construct a market-based or replacement cost value for the direct investment position should not be given high

priority. Neither of these alternatives would provide a more accurate indicator of the future servicing burden implied by accumulating U.S. current account deficits.

4. A much higher priority should be given to the question of why income reported on foreign direct investment in the United States is so low and whether these low returns are likely to persist.

5. Since, in our view, the direct investment data have been under-utilized because of problems related to the confidentiality of the affiliate reports, we encourage BEA to reexamine its suppression rules for the published data and to pursue, even more actively, cooperative research projects with academic and government researchers.<sup>2</sup>

6. While recognizing that requiring data on the operations of the foreign parents of U.S. affiliates raises delicate questions of international law, we point out that, insofar as affiliate production and investment decisions are related to parent operations, the United States is missing completely an important class of direct investment data.<sup>3</sup> This is one of a number of areas where the provision of adequate data for any given country may depend on international cooperation.

7. A recurring problem in the analysis of direct investment is the lack of data at the establishment level. Given that the U.S. affiliates of foreign companies report at the establishment level in the U.S. Census of Manufacturers and that the foreign affiliates of U.S. companies report at the establishment level in similar surveys by many

---

2. We note the similar conclusion reached by Vukmanic, Czinkota and Ricks (1985), Lipsey (1985), and the recent study of Graham and Krugman (1989). It should also be noted that the statutory authority under which the direct investment data are now collected specifically envisages such cooperation with researchers.

3. See Stevens and Lipsey (1992) for evidence that they are.

foreign governments, establishment level data on production, investment, costs, prices, employment, and related data could be provided without substantially increasing reporting burden.<sup>4</sup> These data are necessary to improve our knowledge in the following areas: the disaggregated industry composition of direct investment in the United States and abroad; the separation of "greenfield" from other investments; and the accurate comparison of the behavior of foreign-owned and domestic firms with respect to, among other things, productivity and wage rates.

---

4. Fortunately, good progress is being made on this front with respect to direct investment in the United States. See Lipsey (1985) for a concurring view that much could be done to collect establishment level data for U.S. affiliates abroad and details on how this step could be taken with little extra cost or reporting burden.

References

Bergsten, C. Fred, Thomas Horst, and Theodore H. Moran. 1978. American Multinationals and American Interests. Washington, D.C.: The Brookings Institution.

Bloomstrom, Magnus, Robert E. Lipsey, and Ksenia Kulchycky. 1988. U.S. and Swedish Direct Investment and Exports. In Robert E. Baldwin, ed., Trade Policy Issues and Empirical Analysis, Chicago: University of Chicago Press.

Caves, Richard E. 1982. Multinational Enterprise and Economic Analysis. New York, N.Y.: Cambridge University Press.

Corbo, Vittorio, and Oli Havrylyshyn. 1982. "Production Technology Differences between Canadian-Owned and Foreign-Owned Firms Using Translog-Production Functions," NBER Working Paper No. 981, Cambridge: National Bureau of Economic Research, September.

Courtney, W.H., and D.M Leipzig. 1975. "Multinational Corporations in LDC's: The Choice of Technology," Oxford Bulletin of Economic Statistics, 37, November.

Eisner, Robert, and Paul J. Peiper. 1988. The World's Greatest Debtor Nation?. Paper Presented to Joint Session of North American Economics and Finance Association and American Economic Association. New York, N.Y.

Encarnation, Dennis J., and Louis T. Wells. 1986. "Evaluating Foreign Investment," in Theodore H. Moran, ed., Investing in Development: New Roles for Private Capital?. New Brunswick, USA: Transaction Books.

Froot, Kenneth A., and Jeremy C. Stein. 1989. Exchange Rates and Foreign Direct Investment: An Imperfect Capital Markets Approach. NBER Working Paper No. 2914. Cambridge, MA: National Bureau of Economic Research.

Graham, Edward M, and Paul R. Krugman. 1989. Foreign Direct Investment in the United States. Washington, D.C.: Institute for International Economics.

Grubert, Harry and John Mutti. 1991. "Financial Flows versus Capital Spending: Alternative Measures of U.S.-Canadian Investment and Trade in the Analysis of Taxes," in Peter Hooper and J. David Richardson, eds., International Economic Transactions. Chicago: U. of Chicago Press.

Hartman, David. 1984. "Tax Policy and Foreign Direct Investment in the United States," National Tax Journal 37, 475-88.

Helkie, William, and Lois Stekler. 1987. Modeling Investment Income and Other Services In The U.S. International Transactions Accounts. International Finance Discussion Paper, No. 319. Washington, D.C.: Board of Governors of the Federal Reserve System.

Hufbauer, G.C. 1975. "The Multinational Corporation and Direct Investment," in P.B. Kenen, ed., International Trade and Finance: Frontiers for Research, pp 253-319. Cambridge University Press.

Kester, Anne Y., ed., 1992. Behind the Numbers. Washington: National Academy Press.

Kindleberger, Charles P., and David B. Audretsch. 1983. The Multinational Corporation in the 1980s. Cambridge, MA.: The MIT Press.

Lall, S., and P Streeten. 1977. Foreign Investment, Transnationals and Developing Countries. London: Macmillan.

Lim, D. 1977. "Do Foreign Companies Pay Higher Wages than Their Local Counterparts in Malaysian Manufacturing," Journal of Development Economics. 4, March, 55-66.

Lipsey, Robert E. 1985. "Comment," in Asim Erdilek, ed., MNC's as Mutual Invaders: Intra-Industry Direct Foreign Investment. London, Sydney: Croom Helm.

Lipsey, Robert E., and Irving B. Kravis. 1987. "The Competitiveness and Comparative Advantage of U.S. Multinationals, 1957-1984," Banco Nazionale del Lavoro Quarterly Review. 161, June, 147-165.

Lipsey, Robert E., Irving B. Kravis, and Romualdo A. Roldan. 1982. "Do Multinational Firms Adapt Factor Proportions to Relative Factor Prices?,"

in Anne O. Krueger, ed., Trade and Employment in Developing Countries:2. Factor Supplies and Substitution, Chicago: U. of Chicago Press.

Lipsey, Robert E., and Merle Yahr Weiss. 1981. "Foreign Production and Exports in Manufacturing Industries". The Review of Economics and Statistics.

Lipsey, Robert E., and Merle Yahr Weiss. 1984. "Foreign Production and Exports of Individual Firms". The Review of Economics and Statistics, Vol 66.

Little, I. M. D., and James A. Mirrlees. 1974. Project Appraisal and Planning for Development. New York, N.Y.: Basic Books.

Morley, S. A., and G. W. Smith. 1977. "The Choice of Technology: Multinational Firms in Brazil," Economic Development and Cultural Change, 25, January, 239-64.

Morley, S. A., and G. W. Smith. 1977. "Limited Search and the Technology Choices of Multinational Firms in Brazil," Quarterly Journal of Economics, 91, May, 263-88.

Musgrave, Peggy B. 1975. Direct Investment Abroad and the Multinationals: Effects on the United States Economy. U.S. Congress, Senate. Subcommittee on Multinational Corporations of the Committee on Foreign Relations, 98th Congress, 1st Session. Washington, D.C.

Ray, Edward John. 1989. "The Determinants of Foreign Direct Investment in the United States: 1979-1985," in Robert Feenstra, ed., Trade Policies for International Competitiveness. Chicago: U. of Chicago Press.

Reuber, Grant L. 1973. Private Foreign Investment in Development. Oxford: Clarendon Press.

Roemer, Michael, and Joseph J. Stern. 1975. The Appraisal of Development Projects. New York, N.Y.: Praeger.

Slemrod, Joel. 1990. "Tax Effects on Foreign Direct Investment in the United States," in Assaf Razin and Joel Slemrod, eds., Taxation in the Global Economy, Chicago: University of Chicago Press.

Stekler, Lois and Guy V.G. Stevens. 1991. "The Adequacy of Direct Investment Data," in Peter Hooper and J. David Richardson, eds., International Economic Transactions. Chicago: U. of Chicago Press.

Stevens, Guy V.G. 1969. "Fixed Investment Expenditures of Foreign Manufacturing Affiliates of U.S. Firms: Theoretical Models and Empirical Evidence," Yale Economic Essays 9 (Spring), 137-198.

Stevens, Guy V.G. 1972. "Capital Mobility and the International Firm," in F. Machlup, W. Salant, and L. Tarshis, eds., The International Mobility and Movement of Capital, New York: NBER.

Stevens, Guy V. G. 1974. "The Determinants of Investment," Chapter 3, J.H. Dunning (ed.) Economic Analysis and the Multinational Enterprise, Chapter 3. London:George Allen & Unwin.

Stevens, Guy V.G., and Robert E. Lipsey. 1992. "Interactions Between Domestic and Foreign Investment," Journal of International Money and Finance, 11, 40-62.

Ulan, Michael, and William G. Dewald. 1989. The U.S. Net International Investment Position: the Numbers Are Misstated and Misunderstood. Washington, D.C.: State Department.

U.S. General Accounting Office. 1988. Foreign Investment: Growing Japanese Presence in the U.S. Auto Industry. Washington, D.C.

Vendrell-Alda, J. L. M. 1978. Comparing Foreign Subsidiaries and Domestic Firms: A Research Methodology Applied to Efficiency in Argentine Industry. New York, N.Y.: Garland.

Vukmanic, Frank G., Michael R. Czinkota and David A. Ricks. 1985. "National and International Data Problems and Solutions in the Empirical Analysis of Intra-Industry Direct Foreign Investment," in Asim Erdilek, ed., MNC's as Mutual Invaders: Intra-Industry Direct Foreign Investment. London, Sydney: Croom Helm.

Wells, L. T. 1973. "Economic Man and Engineering Man: Choice in a Low-Wage Country," Public Policy, 21, Summer, 319-42.

Wheeler, James E. 1988. An Academic Look at Transfer Pricing in a  
Global Economy. Tax Notes.