

**IMF COMMITTEE ON BALANCE OF PAYMENTS STATISTICS AND OECD WORKSHOP ON
INTERNATIONAL INVESTMENT STATISTICS**

DIRECT INVESTMENT TECHNICAL EXPERT GROUP (DITEG)

BACKGROUND PAPER FOR DITEG ISSUE #1

VALUING THE DIRECT INVESTMENT POSITION IN U.S. ECONOMIC ACCOUNTS

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Valuing the Direct Investment Position in U.S. Economic Accounts

Introduction

1. Under international standards, all of the components of the international investment position (IIP) should reflect current period prices, rather than historical cost or book values. Virtually all of the categories in the international investment position accounts except direct investment positions can be directly estimated in prices of the current period with reference to readily observable market prices. For example, the value of positions in portfolio investment securities, gold, loans, currencies, and bank deposits can be directly estimated based on face values or market prices of recent transactions. In contrast, direct investment positions typically involve illiquid ownership interests in companies that may possess many unique attributes – such as customer base, management, and ownership of intangible assets – whose value in the current period are difficult to determine, because there is no widely accepted standard for revaluing company financial statements at historical cost into prices of the current period.

2. The United States estimated direct investment positions only on a historical cost basis until 1991. In that year, the U.S. Bureau of Economic Analysis (BEA) replaced the historical cost measures in the IIP with two different measures of direct investment using current period prices.¹ The two different measures were presented in tables as co-equals, in order to highlight that different methods of valuing direct investment may be appropriate for different circumstances, and that depending on the valuation method used, the resulting estimates may differ substantially.

3. This article details the two methods used by the United States in revaluing historical cost financial statements to produce estimates of direct investment positions in prices of the current period.

¹ See “Valuation of the U.S. Net International Investment Position,” J. Steven Landefeld and Ann M. Lawson, in the May 1991 issue of the Survey of Current Business. This paper updates that article.

Summary

4. The international investment position is a measure of the value of accumulated stocks of U.S.-owned assets abroad and of foreign-owned assets in the United States as well as of the value of the difference between the two, which is the net international investment position of the United States. BEA presents two alternative official measures of the international investment position, one with direct investment recorded at current cost (the “current-cost method”), and the other with direct investment recorded at market value (the “market-value method”).²

5. The estimates prepared using the current-cost method are comparable with BEA’s current-cost estimates of total U.S. reproducible tangible wealth and with the Federal Reserve Board’s estimates of domestic net worth (the sum of tangible assets located in the United States, including plant and equipment, inventories, and land).³ The estimates prepared using the market value method are more consistent with BEA’s estimates of holdings of portfolio investment securities (the relationship between the book value and the current stock market price of portfolio investment securities is used in revaluing historical cost direct investment equity positions to current period prices).

6. More specifically, for U.S. direct investment abroad (USDIA) and foreign direct investment in the United States (FDIUS), the *current-cost method* revalues the U.S. and foreign parents’ share of their affiliates’ investment in plant and equipment using a perpetual inventory model to estimate the net stocks of plant and equipment at current costs, revalues direct investment in land using general price indexes, and revalues direct investment in inventories using estimates of their current replacement cost. The *market-*

² BEA also publishes estimates of direct investment on a historical-cost basis, which largely reflect prices of earlier periods, but does not include these estimates in the net international investment position. The estimates on a historical-cost basis provide country and industry detail that is not available for the current-cost and market-value measures.

³ BEA has produced estimates of the net stocks of domestic fixed reproducible assets on consistent current- and constant-cost bases since 1972. The Federal Reserve Board uses BEA’s current-cost estimates, along with an estimate of the market value of land, to estimate total tangible assets located in the United States, or domestic net worth, in its balance sheets for the U.S. economy.

value method revalues the owners' equity portion of the position for USDIA and FDIUS using indexes of stock market prices. Thus, the two methods can be viewed as revaluing, respectively, the asset side of a balance sheet and the liabilities and owners' equity side of a balance sheet (see the box, "Revaluation of Direct Investment in a Hypothetical Balance Sheet"). The market value differs from the current-cost value in that it is an estimate of firms' aggregate net worth, including not only the current value of tangible assets, but also the market value of intangible assets—such as patents, trademarks, management, and name recognition. The market value may also reflect changes in the general economic outlook or in the outlook for a particular industry—changes that may not be related to the prices of tangible assets.

7. BEA's estimates of the USDIA and FDIUS positions at current-cost and at market-value are shown in chart 1. The difference between the current-cost and market-value estimates reflects significantly different rates of change in recent years in stock prices and in the replacement costs of tangible assets.

Revaluation of Direct Investment in a Hypothetical Balance Sheet

The balance sheet in table A is for a hypothetical wholly owned foreign affiliate of a U.S. firm; in this balance sheet, all of the figures are recorded at historical cost. Table B shows the balance sheet after revaluation using the current-cost method, and table C shows the balance sheet after revaluation using the market-value method.

In table B, using the current-cost method revalues only tangible assets—inventories and property, plant, and equipment (PP&E)—on the left side of the balance sheet. Net PP&E is revalued from \$233,571 at historical cost to \$359,092 at current cost, and inventories are revalued from \$103,803 to \$117,318. Thus, the value of the firm's tangible assets is \$139,036 greater at current cost than at historical cost. Financial assets (current and noncurrent) do not need to be revalued, because the amounts carried on balance sheets for these assets are assumed to equal or approximate their current-period prices. On the right side of the balance sheet, owners' equity is revalued from \$387,102 to \$526,139 to reflect the adjustment in the value of the tangible assets on the left side.

In table C, using the market-value method revalues owners' equity, on the right side of the balance sheet, to reflect yearend stock market prices. Owners' equity is revalued from \$387,102 at historical cost to \$793,559 at market value. Liabilities, which are also on the right side of the balance sheet, do not need to be revalued, because they are assumed to be approximately at current-period prices. The counterentry on the left side of the balance sheet is assumed to be in goodwill, which is included under "other" noncurrent assets. Goodwill is the balancing item often used to reflect the difference between the acquisition price of a firm and the net value of the firm's assets less its liabilities.

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Revaluation of Direct Investment in a Hypothetical Balance Sheet-Continued

Table A.—Balance Sheet at Historical Cost

Assets		Liabilities and owners' equity	
Current:		Liabilities:	
Inventories	\$103,803	Current liabilities and long-term debt	\$504,956
Other	407,341	Other liabilities	107,942
Total	511,144	Total	612,898
Noncurrent:		Owners' equity:	
Property, plant, and equipment (PP&E)	420,720	Owners' equity	387,102
Less: Accumulated depreciation	-187,149		
Net PP&E	233,571	Total	387,102
Other	255,286		
Total	488,856		
Addendum: Net tangible assets	337,374		
Total assets	1,000,000	Total liabilities and owners' equity	1,000,000

Table B.—Balance Sheet Using Current-Cost Method

Assets		Liabilities and owners' equity	
Current:		Liabilities:	
Inventories	\$117,318	Current liabilities and long-term debt	\$504,956
Other	407,341	Other liabilities	107,942
Total	524,659	Total	612,898
Noncurrent:		Owners' equity:	
Property, plant, and equipment (PP&E)	646,816	Owners' equity	526,139
Less: Accumulated depreciation	-287,723		
Net PP&E	359,092	Total	526,139
Other	255,286		
Total	614,378		
Addendum: Net tangible assets	476,410		
Total assets	1,139,037	Total liabilities and owners' equity	1,139,037

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Revaluation of Direct Investment in a Hypothetical Balance Sheet-Continued

Table C.—Balance Sheet Using Market-Value Method

Assets		Liabilities and owners' equity	
Current:		Liabilities:	
Inventories	\$103,803	Current liabilities and long-term debt	\$504,956
Other	407,341	Other liabilities	107,942
Total	511,144	Total	612,898
Noncurrent:		Owners' equity:	
Property, plant, and equipment (PP&E)	420,720	Owners' equity	793,559
Less: Accumulated depreciation	-187,149		
Net PP&E	233,571	Total	793,559
Other	661,742		
Total	895,314		
Addendum: Net tangible assets	337,374		
Total assets	1,406,457	Total liabilities and owners' equity	1,406,457

Current-cost method

8. The current-cost method revalues U.S. and foreign parents' shares of affiliates' tangible assets—inventory stocks, land, and plant and equipment—using special adjustment factors for inventories (see below), general price indexes for land, and a perpetual inventory model for plant and equipment, which is the same model used to derive BEA's estimates of total U.S. fixed reproducible capital. The sum of the revalued inventory stocks, land, and plant and equipment produces a current-cost replacement value for all tangible assets.

9. Inventory stocks are revalued using ratios of current-cost to historical-cost inventory stocks for nonfarm corporate business from the U.S. national income and product accounts (NIPA's); these adjustments convert inventories from historical costs to current replacement costs. Land is revalued using U.S. and foreign gross domestic product price indexes.

10. *Perpetual inventory model.*—A perpetual inventory model is used to revalue the net stocks of plant and equipment for foreign affiliates of U.S. parents and for U.S. affiliates of foreign parents, by industry and geographic area.⁴ The model starts with plant and equipment gross investments in current and constant dollars and obtains the net plant and equipment capital stock for a given year by cumulating past plant and equipment gross investments and deducting the cumulated value of past plant and equipment depreciation. Depreciation is the decline in value due to wear and tear, obsolescence, accidental damage, and aging. Assets are assumed to have depreciation patterns that decline geometrically over time, which is the same assumption used for most assets in the NIPA's. For a given year, the annual depreciation charges on assets are obtained by multiplying the prior year's charge by one minus the annual depreciation rate.

11. The constant-cost estimates measure the net plant and equipment stocks in the prices of a base year, according to the following equation:

$$K_n = \sum (I_t - D_t) \left(\frac{P_b}{P_t} \right).$$

In this formula, K_n is the constant-cost net stock of plant and equipment in year n , expressed in the prices of base year b ; I_t is plant and equipment expenditures in year t ; D_t is the estimated annual depreciation in year n on the plant and equipment purchased in year t ; P_b is the price that would have been paid in the base year for the mix of plant and equipment purchased in year t ; and P_t is the price of the plant and equipment in period t . The net plant and equipment stock in a country or region is the summation of net plant and equipment stocks across all industries in the country or region.

12. Current-cost plant and equipment estimates are derived by multiplying constant-cost plant and equipment estimates by current-period price indexes. Thus, current-cost

⁴ For detailed information on the perpetual inventory model, see U.S. Department of Commerce, Bureau of Economic Analysis, *Fixed Reproducible Tangible Wealth in the United States, 1925-94* (Washington, DC: U.S. Government Printing office, August 1999): M-3 through M-10.

estimates measure the plant and equipment stocks in prices that would have been paid if the stocks had been purchased in the period to which the plant and equipment estimates refer.

13. *Property, plant and equipment (PP&E) expenditures.*—For USDIA and FDIUS, PP&E expenditures are derived from BEA's direct investment surveys of foreign and U.S. affiliates. For USDIA and FDIUS, it is assumed that the parents' share of PP&E expenditures equals the affiliates' PP&E expenditures multiplied by the parents' share of ownership in the affiliates.

14. Gross PP&E stocks at historical-cost (book) value are also available from BEA's direct investment surveys. Yearend changes in the gross stock of PP&E (also weighted by the parents' share of ownership) that are not explained by current PP&E expenditures or discards are the result of acquisitions or divestitures of affiliates and of benchmark revisions. Such changes are treated as transfers of used PP&E to or from affiliates.

15. Annual PP&E investments—PP&E expenditures adjusted for discards, acquisitions, divestitures, and benchmark revisions—are distributed into the components of PP&E using detailed information from BEA's benchmark surveys of FDIUS and USDIA. Additional adjustments are made to include expensed petroleum and natural gas exploration and development expenditures in PP&E investments and stocks. Although companies may expense certain petroleum and natural gas exploration and development expenditures for financial reporting, BEA treats these investments as capitalized for the purpose of developing current-cost estimates consistent with NIPA concepts.

16. For FDIUS, annual PP&E expenditures at historical cost by industry of U.S. affiliate are available from the 1974, 1980, 1987, 1992, and 1997 benchmark surveys and from the annual surveys of FDIUS for nonbenchmark years beginning with 1977. Estimates are made for 27 industry groups of affiliates. Gross PP&E stocks at historical cost by industry of affiliate are available for 1974 and for 1980 onward. Foreign parent ownership shares, by industry, are available from the 1974, 1980, 1987, 1992, and 1997 benchmark surveys

and for large affiliates from the annual surveys for nonbenchmark years beginning with 1981.

17. For USDIA, annual PP&E expenditures at historical cost by geographic area and industry of majority-owned foreign affiliates (MOFA's) are available from the 1957, 1966, 1977, 1982, 1989, 1994, and 1999 benchmark surveys, from the annual capital expenditure surveys of USDIA for nonbenchmark years from 1958-93, and from the annual surveys of USDIA for nonbenchmark years from 1995 onward.⁵ Gross PP&E stocks for MOFA's are available for 1966, 1977 and 1982 onward. Parent ownership shares, by geographic area and industry, are available from the 1966, 1977, 1982, 1989, 1994, and 1999 benchmark surveys and from the annual surveys for nonbenchmark years beginning with 1983.

18. For the estimates of PP&E expenditures and stocks for USDIA to be consistent with those for FDIUS, data on PP&E expenditures and stocks are needed for both MOFA's and minority-owned foreign affiliates (MINOFA'S).⁶ PP&E data for MINOFA's are not as complete as those for MOFA's. As a result, the relationships between net PP&E stocks for MOFA's and MINOFA's, by region and industry, as reported in the 1982, 1989, 1994, and 1999 benchmark surveys are used to proportionally adjust the MOFA's PP&E expenditures and stocks, by region and industry, to an estimated total for MOFA's and MINOFA's combined.

19. For USDIA, the revaluation adjustments were based on weighted averages of data from the following countries or groups of countries: Canada, France, Germany, Italy, Japan, the United Kingdom, all other countries in Europe, and a residual for all other countries in the world.⁷

⁵ MOFA's are foreign affiliates in which the U.S. parent(s) ownership share is over 50 percent.

⁶ MINOFA's are foreign affiliates in which the U.S. parent(s) ownership share is between 10 percent and 50 percent.

⁷ PP&E is revalued according to its location rather than to the location of the direct investment claim. This treatment differs from the usual historical-cost treatment so as to allow for the use of price indexes and currency exchange rates of the country in which the PP&E is located.

20. *Price indexes.*—For FDIUS, current and constant-cost values for plant and equipment are derived using the annual price indexes for U.S. investments in plant and equipment, by industry, from BEA’s capital stock estimates. Current- and constant-cost estimates of investment in land are derived using the implicit price deflator for U.S. gross domestic product.

21. For USDIA in Canada, France, Germany, Italy, Japan, and the United Kingdom, the current- and constant-cost values for plant and equipment are derived using the appropriate country price index, available from the Organisation for Economic Co-operation and Development (OECD), for nonresidential structures and for nonresidential equipment. Current and constant-cost estimates of investment in land are derived for each country using its price deflator for gross domestic product.

22. For USDIA in “other Europe,” country price indexes, available from the OECD, are used to develop weighted price indexes for structures, equipment, and gross domestic product. For USDIA in the rest of the world, U.S. price indexes are used because reliable weighted indexes for the developing countries are not available; furthermore, foreign affiliates in developing countries, particularly affiliates in the petroleum industry, are believed to acquire much of their equipment from the United States.

23. *Depreciation rates.*—The geometric depreciation rates for plant and equipment in specific industries are determined by dividing average declining-balance depreciation rates by average service lives for assets in specific industries. The average declining-balance depreciation rates used for FDIUS and USDIA are the rates used in BEA’s capital stock estimates.

24. The average service lives used for FDIUS plant and equipment are the same as those used in BEA’s capital stock estimates. The average service lives used for USDIA plant and equipment in Canada, France, Germany, Italy, Japan, and the United Kingdom are those used in the national economic accounts of those countries, as reported to the OECD.⁸ The

⁸ Derek Blades, “Service Lives Of Fixed Assets,” OECD Working Paper No. 4 (Paris,

service lives for plant and equipment in other European countries are based on service lives used in France, Germany, and Italy. The service lives used for plant and equipment in less developed countries are based on those for developed countries, but they have been lengthened because less developed countries are assumed to have slower technological obsolescence and lower labor costs (and maintenance costs) relative to capital acquisition costs.

Market-value method

25. The market-value method for estimating the value of the direct investment positions in current-period prices revalues the owners' equity portion of the positions using indexes of stock market prices. Owners' equity included in the positions is the cumulative total of equity capital flows, reinvested earnings, and valuation adjustments to equity. BEA's estimates revalue only the owners' equity portion of the position; the liabilities portion is assumed to be approximately valued at current-period prices. The market-value method is similar to that used by BEA to value portfolio investment in that both use stock price indexes to revalue equity interests in companies. The major difference is that portfolio investments are composed of frequently traded securities, whereas U.S. and foreign affiliates are often wholly owned subsidiaries, and their stock may not be publicly traded. The key assumption is that revaluation of direct investment using general stock price indexes may produce *on average* a reasonable estimate of the aggregate value of affiliates in a country.

26. The market-value method revalues the historical-cost value of owners' equity in foreign affiliates of U.S. parents using weighted average foreign stock prices. The method revalues owners' equity in U.S. affiliates of foreign parents using a broad-based U.S. stock price index. Owners' equity is revalued using the market-equity model.

27. *Market-equity model*—In the market-equity model, FDIUS is revalued at the aggregate level, and USDIA is revalued by a weighted average country/region estimate. The

revaluation formula for parents' equity in affiliates that maintain their financial records in U.S. dollars is

$$K_t = \frac{K_{t-1} \left(\frac{Peoy_t}{Peoy_{t-1}} \right) + I_t \left(\frac{Peoy_t}{Pavg_t} \right)}{1 + RE_t \left(\frac{Peoy_t}{Pavg_t} \right)}$$

where K_t is the equity investment in affiliates in year t , valued at yearend stock market prices; $Peoy_t$ is the yearend stock market price index and $Pavg_t$ is the annual average stock market price index, in year t ; I_t is the total equity capital flow in year t ; and RE_t is the yearend ratio of retained earnings per share as reflected in the stock price index for year t .

28. This formula revalues U.S. and foreign parents' equity in affiliates using end-of-year stock price indexes, while adjusting for changes in annual investment and correcting for the effect of retained earnings on stock market prices during the year. The stock market data are first converted into U.S. dollars, so exchange rate effects are reflected in the market indexes.

29. An additional adjustment is needed for foreign affiliates of U.S. parents that maintain their financial accounts in another national currency and later translate these accounts into U.S. dollars. Investments made during the year by these foreign affiliates must be revalued from the average exchange rate during the year to the yearend exchange rate.

30. *Equity investment flows.*—Data on equity capital flows are generally available from BEA's quarterly and benchmark surveys beginning with 1966. For both USDIA and FDIUS, the necessary earnings, dividends, equity capital flows, and equity positions are generally available beginning in 1966 for incorporated U.S. affiliates of foreign parents and incorporated foreign affiliates of U.S. parents.

31. For FDIUS, the 1966 market value of the foreign equity position in incorporated U.S. affiliates is estimated by multiplying the position by the ratio of market-to-book values in

1966 for the Standard and Poor's Index for 400 Industrial Companies.⁹ This method assumes that the relationship between market and book values of incorporated U.S. affiliates is similar to that of a typical large U.S. industrial corporation in 1966.

32. For USDIA, comparable market-to-book-value ratios for 1966 are unavailable for foreign stock markets. Therefore, the 1966 market value of U.S. parents' equity in incorporated foreign affiliates is estimated by dividing the value of dividends affiliates paid to U.S. parents by the market yield for the year.¹⁰

33. Time series data for unincorporated U.S. and foreign affiliates are more limited than data for incorporated affiliates. For FDIUS, distributed earnings, equity flows, and equity positions are available for unincorporated U.S. affiliates of foreign parents beginning with 1980. Because these data are not available for earlier years, the valuation of unincorporated affiliates begins with data for 1980. A starting position in current-cost values was created by multiplying the equity position in unincorporated U.S. affiliates by the estimated market-to-book-value ratio of incorporated U.S. affiliates in 1980. Equity capital flows from foreign parents to unincorporated U.S. affiliates account for only a small percentage of total equity capital flows to the United States from foreign parents.

34. For USDIA, complete data for unincorporated foreign affiliates are available beginning with 1982. An initial position for 1982 was estimated by using the market-to-book-value ratio for incorporated affiliates. Equity capital flows from U.S. parents to unincorporated foreign affiliates account for only a small percentage of total equity capital flows from U.S. parents.

⁹ The equity position of FDIUS in 1966 is not separately available. Therefore, an estimated equity position is derived by multiplying the total 1966 direct investment position by the ratio of equity to total direct investment in 1974, the first year equity is reported separately from debt.

¹⁰ An alternate methodology would be to calculate the market value of direct investment in 1966 by dividing earnings (instead of dividends) by the earnings/price ratio for publicly traded companies in that year. Direct investment dividends can be irregular, and so calculating the position by capitalizing earnings instead of dividends might avoid potential timing problems.

35. *Market indexes.*—For FDIUS, Standard and Poor’s composite stock market data are used to revalue foreign parents’ equity in U.S. affiliates. For USDIA, stock market data from Morgan Stanley Capital International are used to revalue U.S. parents’ equity in foreign affiliates. OECD stock market data are used for years in which the Morgan Stanley stock market data are incomplete or missing. Investments in countries where country-specific stock market data are not available are revalued using the Morgan Stanley World Index for stocks.

Chart 1.-Direct Investment Positions at Current-Cost and at Market-Value

