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MEASURING FOREIGN DIRECT INVESTMENT

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Measuring Foreign Direct Investment

Robert E. Lipsey[1]

<u>Introduction</u>

The measurement of foreign direct investment serves two broad purposes. One, which is the traditional one, views foreign direct investment as a financial flow, one of the ways in which source countries use surplus savings and, for the recipients, one of the ways in which their capital formation or the acquisition of other assets can be financed. The stocks of direct investment, often calculated by cumulating the flows over time, are for the source countries, one of the forms in which they hold assets abroad. For the recipient countries, they are a measure of foreigners' claims on their capital, the income on which, like the interest on foreign borrowing, is a burden on their current accounts. Markusen (2002) described the formal economics literature of the late 1970s, and could have similarly included the earlier literature, as dealing with direct investment and multinationals "…if they were treated at all…as just part of the theory of portfolio capital flows…Much data existed on direct investment stocks and flows, but very little existed on what the multinational firms actually produced and traded" (Pp. xi and xii).

The other purpose of the measurement of direct investment is to measure the activities of multinational firms, the determinants of these activities and their effects on the home countries and host countries involved. I think that, for most economists now, the role of direct investment in the flow of financial capital is a minor part of what FDI does. The major importance of FDI is as a vehicle for the transmission of ideas, technological knowledge, organizational knowledge, and business knowledge. This

transmission takes place through FDI operations, production, employment, capital investment, and R&D. We study FDI, in Markusen's terms, to answer questions about "…the relationship between trade and affiliate production, the effects of trade versus investment liberalization on factor prices, and the location of production." The models would provide testable hypotheses about "…how the pattern of affiliate production in the world economy should relate to country characteristics " (p. xiv). In this view, "…viewing multinationals and direct investment as part of capital theory was largely a mistake. The sourcing of finances for direct investments are often geographically disjoint from the actual parent country…" (p. xii). There is no summary measure that serves as a proxy for all of these aspects of multinational firms, but the flow and stock numbers do not represent any of them.

This interest in the effects of multinational firms' activities on their home country economies and on the economies of the countries that were the hosts to their affiliates' production, capital formation, and employment leads to a need for entirely different measures of multinational firms' activities. The studies of the impacts of multinational firms' effects on individual home and host countries summarized in Lipsey (2004) and other surveys mostly rely for their measures of multinationals' activities on data for production, sales, employment, R&D, and sometimes physical capital stock, or plant and equipment, of both parent firms and their foreign affiliates. That is particularly the case for studies based on microdata for individual plants and firms. However, these studies are limited by the fact that operations data are collected by relatively few countries on their own firms' foreign activities, and by more countries, but still a minority, on foreign firms' operations within their borders. For that reason, those who want to draw more

general conclusions about these issues are often led to fall back on the almost universally available stock and flow data, despite their deficiencies. It is therefore important in assessing this literature to know whether and how widely the stock and flow data diverge from the operations data.

Flows and Stocks of Foreign Direct Investment

The only measures of foreign direct investment that are available for almost every country in the world are the measures of outward and inward flows of FDI from the balance of payments and the related estimates of outward and inward stocks of FDI. These are published by UNCTAD in the World Investment Report and by the International Monetary Fund in the Balance of Payments Yearbooks. One of the last holdouts, Bermuda, began reporting according to the framework of IMF (1993) in 1996, although it continues to treat the "international exempt sector" as non-resident in its balance of payments and GDP accounts, where IMF (1993) calls for treatment of the sector as resident (Bermuda, Department of Statistics, 2006). Because the stock and flow data are so widely available, users are grateful for them, and they are probably used in more scholarly papers and news reports than any other measures.

The early calculations of stocks of U.S. direct investment abroad, such as Lewis (1938), measured them by the book values of holdings, distributed, as far as possible, "…according to the actual location of the properties represented…" (p. 577). Although that principle is carried over to the latest IMF definitions, it is not clear that it is effectively carried out in a world in which much production, or parts of production, are intangible. The latest IMF rules say that "An enterprise is said to have a center of economic interest and be a resident unit of a country…when the company is engaged in a

significant amount of production of goods and services there or when the enterprise owns land or buildings located there. The enterprise must maintain at least one production establishment in the country…" (IMF, 1993, p.22).

The ambiguities in the meaning of the published data on flows and stocks of FDI are highlighted by recent reported trends. After stressing the important role of Hong Kong as an outward direct investor, the largest among developing countries, UNCTAD (2004) reported that more than half of the outward stock was accounted for by four tax havens, the British Virgin Islands, Bermuda, Panama, and the Cayman Islands, all of them clearly not the ultimate destinations of these investments (p. 26). Luxembourg was reported to be the world's largest outward investor and the largest FDI recipient in 2002, accounting for 19 percent of world inflows and 24 percent of world outflows, although its share of EU GDP was only 0.2 percent (UNCTAD,2003, p. 69) "…because it offers favorable conditions for holding companies and for corporate HQ, such as certain tax exemptions…" (*ibid.*). Neither of these enormous purported flows represented real economic activity in the countries where it was reported.

FDI Stocks and Factor Inputs

The Bureau of Economic Analysis of the U.S. Department of Commerce, which produces both the direct investment flow and stock data and the data on the activity of U.S. firms and their foreign affiliates, has pointed to the rising share of U.S. direct investment abroad that is conducted through holding companies. Affiliates classified as holding companies accounted for more than a third of the U.S. outward investment stock in 2004, a large rise from their 9 percent share in 1982 (Koncz and Yorgason, 2005, p. 45). That means that the location of a third of the total U.S. outward stock is unknown in

these data. Not only the location, but the industry composition of that third is also unknown, except in the nominal sense that it passed through holding companies. For several important host countries, more than half of the U.S. outward investment stock was in holding companies. These include Luxembourg, Netherlands, Sweden, and Switzerland within Europe, and Argentina and United Kingdom Islands in the Caribbean (U.S. Bureau of Economic Analysis, 2005, p. 161).

The rise in the role of holding companies means that much of the flow of resources that the data are supposed to represent is concealed, with respect to the geographical destination and the industry of use. Even if that ambiguity were removed, it would be questionable whether the flows of direct investment represent any addition to the resources that the host country has for its use. Particularly when the flows are between parent firms and their wholly-owned affiliates, they may be simply a rearrangement of intangible assets for tax purposes, without any change in their function or control. To the extent that intangible assets do not have any tangible physical location, it is not obvious what is learned about flows of capital by observing changes in their nominal or legal location.

One test of the data on stocks of direct investment is how well they approximate the country or industry or country by industry distribution of production from direct investment enterprises. Unfortunately, there is no good measure of production, in the sense that it is immune to manipulation for tax purposes, but employment is the major input into production, it is relatively less subject to manipulation for tax purposes than other inputs, and its distribution should match that of the investment stock reasonably well. An earlier study of data for the United States outward position, based on 1989

stocks and employment, found that the distribution of outward stocks was fairly well correlated with that of employment, with a simple correlation coefficient of .89, implying that the investment stock explains about 80 percent of the distribution of employment. The degree of explanation was better in manufacturing than in other industries, for which only about two thirds of the distribution was explained by the stock. The country distribution of changes in the investment stock, on the other hand, explained much less of the change in the employment distribution between 1989 and 1996, about 20 percent for manufacturing and only 10 percent in other industries. For the country distribution of foreign investment in the United States, the story was similar: reasonably good degrees of explanation for the country distribution in 1999, better in manufacturing than in other industries, and a poor explanation of changes in the distribution from 1980 to 1990 (UNCTAD, 2001, Appendix D).

As mentioned above, the Bureau of Economic Analysis has recently emphasized the growing importance of holding companies in U.S. direct investment abroad, a trend that might be expected to reduce the connection between investment stock measures and production or factor input. No benchmark survey results have been published since 1999, so we may have missed recent developments, but the relation between investment stocks and inputs in 1994 and 1999 and changes from 1994 to 1999 were as follows:

U.S. Affiliate Employment and PP&E as Functions of U.S. Outward FDI Stock, Across Countries

Adjusted RSQs for 1994 and 1999

	1994	1999	1994-1999
Employment(All Industries)	.7243	.6991	.3096
Employment (Nonbank)	.7265	.5932	.2327
PP&E (Nonbank)	.7862	.7832	.433

Source: BEA Web site

The investment position was more closely related to the physical capital stock and changes in it than to the employment level and changes. The cross-country relationship with employment in all industries was reduced, but only slightly, between 1994 and 1999, but the changes in position did little to explain changes in employment.

Although the measures of PP&E are for only nonbank affiliates, they are probably a reasonable estimate of the country totals for all affiliates, since bank output is not much dependent on plant and equipment.   The cross-country relationship did not change greatly between 1994 and 1999, but only 40 per cent of the changes in the country distribution of PP&E were explained by changes in investment stock.

We cannot examine changes in industry composition in the same way as changes in country distribution because of the shift in industry classification systems from the US SIC to NAICS. However, the relationship between the investment position and each input can be estimated for each year separately. The data for 1994 show that the industry distribution of the investment stock is completely unrelated to the distribution of nonbank

employment and almost unrelated to the cross-country distribution of PP&E. In neither case is as much as 5 percent of the cross-industry variance explained. The 1999 industry classification is considerably more detailed, and there is a significant relationship, but only a little more than a third of the variance in employment and less than a quarter of that in PP&E are explained by the distribution of the investment stock.

For 1999, we can ask how well the outward investment stock explains the country by industry distribution of employment and physical capital. Less than 40 percent of the variance in the country by industry distribution of US affiliates' plant and equipment and that of employment is explained by the distribution of the outward investment stock.

Neither labor input nor physical capital input by itself represents the total input entering production, since industries differ greatly in their labor and capital intensities. As an alternative, when the data are available, we relate the stock of U.S outward FDI to a combination of the two, weighting labor input by two and capital input by one. The combination of the two factors is fairly closely related to the country distribution of the outward FDI stock in both 1994 and 1999 (Adj. RSQ = .78 and .79), but again, less than half of the change from 1994 to 1999 (44 percent) is explained by changes in the FDI stock.

In general, it appears that the U.S. outward investment stock in 1994 and 1999 was fairly well correlated across countries with the aggregate PP&E and aggregate employment of U.S. multinationals, but poorly correlated across industries. Changes in the stock of outward FDI were poorly correlated with changes in both employment and physical capital across countries. We cannot compare with changes in industry distribution in this period because of the change in classification system.

On the inward side, the country distribution of the inward investment stock is closely correlated with the source country distribution of employment and PP&E., with adjusted RSQs of over 95 percent. That might mean that little foreign direct investment in the United States is made through intermediate countries. Unfortunately, Luxembourg is missing from these calculations, but other tax havens are included.

The relation of the industry distribution of the inward investment stock to the industry distribution of employment and physical capital stock is much weaker. The industry distribution of the inward stock explains only about 40 percent of the distribution of PP&E and less than 20 percent of the distribution of employment.

It would be desirable to perform similar calculations for other countries' distributions of FDI production or input against country distributions of FDI stocks, but the data are very thin and often not comparable in coverage. A comparison for inward FDI in France, based on data in OECD (2001) and (2004), gives an adjusted RSQ of .85 for the relation of the country distribution of inward investment to that of employment in 1998. The distribution of investment explained less than 30 percent of the distribution of a very aggregated industry set of industry categories.

The European Union has held some discussions about the possibility of introducing a standard way of allocating corporate tax bases among countries for companies that operate in more than one country. The motivation for the proposals is different from the concerns of this paper, but the issues that arise are much the same. They involve the difference between the actual location of production and the location shown by company accounts, tax returns, and reports on the location of FDI. A recent study of German firms (Fuest, Hemmelgarn, and Ramb, 2006), using the Deutsche

Bundesbank's data on foreign direct investment and matched data for the domestic

operations of German firms, calculated the effects of imposing a system of formula

apportionment of profits across countries in place of the reported country location of

profits. The study concluded that under such a uniform system, "…countries with special

tax incentives for MNCs …would lose tax base ….because, under the current S.A.

(separate accounting) system, these countries attract a share of the EU wide tax base

which is higher than their share in real economic activity…" Some examples of the

change in each country's share of the EU tax base under formula allocation are as

follows:

	Share (%) of Tax Base Under	
	SA	FA
Germany	57.52	61.40
Great Britain	4.29	5.07
Ireland	.66	.42
Luxembourg	.68	.53
Netherlands	10.76	3.52
Sweden	2.35	1.29

Source: Fuest, Hemmelgarn, and Ramb (2006), Table 4.

Under the formula apportionment described in the paper, countries that had attracted FDI stocks, but not FDI production, by favorable tax treatment would lose large parts of their shares of EU-15 profits. Ireland would lose almost 40 percent, Netherlands, two thirds, and Sweden, 45 percent. High tax countries would gain share, 7 percent for Germany, and almost 20 percent for Great Britain.

Although this type of formula apportionment is crude, and does not escape all the effects of tax avoidance maneuvers, it does point out that German firms allocate their profits to minimize their tax bills, with the result that their accounts do not give a realistic picture of the location of their production. Since company accounts are the main basis for FDI data, the misrepresentation of location in those accounts leads to a similar distortion of the estimates of the location of FDI.

Tax Havens and the Measurement of FDI

Why are there these large differences between the location of FDI, as represented by data on FDI stocks and flows, and the location of FDI activity, as represented by data on employment and capital assets in FDI affiliates? One of the main reasons appears to be that firms operating internationally shift assets and sales nominally to low-tax countries to minimize taxes. I refer to these as nominal because they are bookkeeping transactions that have no counterpart in movements of production.

The nature of these transactions is obscured in most countries' accounts because they are mixed in with more genuine movements of production and hard to distinguish from them. However, certain small tax havens have so little real productive activity taking place within their borders that the tax-avoiding transactions can be observed clearly. These small tax havens may not account for most of the world's tax avoidance activity, but they can reveal the way in which it takes place and the kind of effect it has on FDI measurement.

There has been a substantial literature on the operations of tax havens, mostly involving their impact on home country tax revenue rather than their impact on measurement issues. Hines (2005) reviews some of this literature on the effect of low tax rates in attracting inward FDI, some of which involves production, but much of which involves only the shifting of income to reduce tax bill. The 30 tax haves he lists accounted in 1999 for 0.7 percent of the world's population, and 2.1 percent of world GDP , but for 4.8 percent of the net property, plant, and equipment and 3.7 percent of the employment of US firms' foreign affiliates. These shares probably represent the effect of low tax rates in attracting FDI production, and are not of concern with respect to

measurement. However, these same foreign affiliates accounted for 15.7 percent of the

gross foreign assets of US affiliates , 13.4 percent of sales, and "…a staggering 30

percent of total foreign income…" (*ibid., p. 78)*. "Much of the tax haven income consists

of financial flows from other foreign affiliates that parents own indirectly through their

tax haven affiliates. Clearly, American firms locate considerable financial assets in

foreign tax havens, and their reported profitability in tax havens greatly exceeds any

measure of their physical presence there (*ibid.).* Desai, Foley, and Hines (2003) explain

this contrast as "…the ability of multinational firms to adjust the reported location of

their taxable profits" (p. 68).

The ability of firms to shift the reported location of intangible assets, sales and

profits by paper transactions internal to the firm makes the location of the firm's

production ambiguous. That is particularly the case in banking and other financial

services where the product is intangible, but the problem exists in other industries where

the product is tangible, but has an intangible element, such as a patent or a trademark that

can be assigned by the firm to a low-tax location.

An example of the shifting of intangible assets was the allocation of intellectual

property by Microsoft to an Irish subsidiary that collects licensing fees from Microsoft

sales to many other countries (Wall Street Journal, November 7, 2005, p. 1). The

subsidiary had "…a thin roster of employees…" and the software had mostly been

developed outside Ireland, but the subsidiary "…controls more than $16 billion in

Microsoft assets" (*ibid.)*. The shifting is not confined to software. One news article

referred to "…patents on drugs, ownership of corporate logos, techniques for

manufacturing processes, and other intellectual assets…" and quoted a tax lawyer as

calling such moves routine "…international tax planning 101." He added that "… most of the assets that are going to be relocated as part of a global repositioning are intellectual assets… that is where most of the profit is. When you buy a pair of sneakers for $250, it's the swoosh symbol, not the rubber, you pay for." ("Key Company Assets Moving Offshore," New York Times, Nov. 22, 2002).

The allocation of assets within US multinationals is illustrated by Table 1, showing the ratios of total assets to measures of labor input, employment and payroll, of US-owned affiliates in the world as a whole, outside the United States, and in certain countries, particularly some of those known as tax havens. Affiliates in "Other Western Hemisphere," essentially islands in the Caribbean, own enormous assets relative to their labor input, measured by employment or labor compensation. The average assets per employee around the world was $700,000, but the ratios in the European countries shown here were all over $1.7 million and in affiliates in "Other Western Hemisphere" were $9 million per employee, higher in some of the individual countries in that group.

Differences in assets per employee could represent differences in industry composition, especially because depository institutions and other financial firms are particularly capital intensive. Tables 2 and 3 reveal that these country differences exist even within those industries. In the case of Depository Institutions, (Table 2), those in "Other Western Hemisphere" owned assets per employee more than ten times the world average. In the case of Finance, except depository institutions, and Insurance, (Table 3), assets per employee of affiliates in the European countries shown were twice to three times the world average, and in Bermuda and UK Islands in the Caribbean, were four to ten times the world average.

Table 1: Ratios of Total Assets to Employment and Compensations of Employees: US Affiliates in All Industries, 1999

	Ratios of Total Assets[3] to	
	Employment[3]	Compensation of Employees
All countries	696	21
Canada	360	11
Europe	941	22
Ireland	1,010~2,020	(D)
Netherlands	1,710	37
Switzerland	2,131	31
United Kingdom	1,784	38
Latin America and Other Western Hemisphere	556	34
Central & South America	253	16
Other Western Hemisphere	9,375	335
Bermuda	32,574~16,287	(D)
UK Islands, Caribbean[1]	28,157	462
Other, Western Hemisphere[2]	8,233~4,116	(D)
Middle East	1,078	25
Other Middle East[4]	3,967	100
Asia Pacific	563	20
China	112	17
Hong Kong	1,357	35
Singapore	1,204	37

1. "United Kingdom Islands, Caribbean" comprises of British Antilles, British Virgin Islands, Cayman Islands, Montserrat.
2. "Other, Western Hemisphere" refers to Anguilla, Antigua and Barbuda, Aruba, Bahamas, Cuba, Dominica, French Islands (Caribbean), Grenada, Haiti, Jamaica, Netherlands Antilles, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Trinidad and Tobago, United Kingdom Islands (Atlantic).
3. Thousands of dollars per employee.
4. "Other Middle East" refers to Bahrain, Iran, Jordan, Kuwait, Lebanon, Oman, Qatar, Syria and Yemen.
 (D): refers to the suppression of data.

Source:
US Department of Commerce, Bureau of Economic Analysis, www.bea.doc.gov , downloaded on Sept. 23rd, 2005.

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Table 2: Ratios of Total Assets to Employment & Compensation of Employees: US Affiliates in Depository Institutions, 1999

	Ratios of Total Assets[3] to	
	Employment[3]	Compensation of Employees
All countries	10,245	168
Canada	2,744	106
Europe	11,766	147
Ireland	3,570~8,922	(D)
Netherlands	(D)	(D)
Switzerland	6,970	55
United Kingdom	20,080	195
Latin America and Other Western Hemisphere	12,013	264
Central & South America	2,394	53
Other Western Hemisphere	117,367	2,347
Bermuda	0	0
UK Islands, Caribbean[1]	153,283	1,703
Other, Western Hemisphere[2]	(D)	(D)
Middle East	16,593	215
Other Middle East[4]	(D)	(D)
Asia Pacific	7,434	155
China	8,653	288
Hong Kong	6,402	130
Singapore	15,921	195

1. "United Kingdom Islands, Caribbean" comprises of British Antilles, British Virgin Islands, Cayman Islands, Montserrat.
2. "Other, Western Hemisphere" refers to Anguilla, Antigua and Barbuda, Aruba, Bahamas, Cuba, Dominica, French Islands (Caribbean), Grenada, Haiti, Jamaica, Netherlands Antilles, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Trinidad and Tobago, United Kingdom Islands (Atlantic).
3. Thousands of dollars per employee.
4. "Other Middle East" refers to Bahrain, Iran, Jordan, Kuwait, Lebanon, Oman, Qatar, Syria and Yemen.
 (D): refers to the suppression of data.

Source:
US Department of Commerce, Bureau of Economic Analysis, www.bea.doc.gov , downloaded on Sept. 23rd, 2005.

Table 3: Ratios of Total Assets to Employment & Compensation of Employees:
US Affiliates in Finance (except Depository Institutions) and Insurance, 1999

	Ratios of Total Assets[3] to	
	Employment[3]	Compensation of Employees
All countries	6,637	97
Canada	(D)	(D)
Europe	11,131	121
Ireland	15,089	268
Netherlands	(D)	(D)
Switzerland	22,222	175
United Kingdom	13,608	121
Latin America and Other Western Hemisphere	5,015	137
Central & South America	1,488	50
Other Western Hemisphere	(D)	378
Bermuda	27,725	398
UK Islands, Caribbean[1]	63,540	304
Other, Western Hemisphere[2]	(D)	(D)
Middle East	(D)	(D)
Asia Pacific	3,334	51
China	489~978	(D)
Hong Kong	4,342	30
Singapore	(D)	(D)

1. "United Kingdom Islands, Caribbean" comprises of British Antilles, British Virgin Islands, Cayman Islands, Montserrat.
2. "Other, Western Hemisphere" refers to Anguilla, Antigua and Barbuda, Aruba, Bahamas, Cuba, Dominica, French Islands (Caribbean), Grenada, Haiti, Jamaica, Netherlands Antilles, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Trinidad and Tobago, United Kingdom Islands (Atlantic).
3. Thousands of dollars per employee.
(D): refers to the suppression of data.

Source:
US Department of Commerce, Bureau of Economic Analysis, www.bea.doc.gov , downloaded on Sept. 23rd, 2005.

What kind of assets were involved in these shifts to low tax countries? They were not property, plant and equipment, as can be seen in Table 4. Worldwide, US affiliates' total assets were about six times PP&E, but they were ten to twenty times as large in Ireland, Netherlands, and Switzerland, and 15 times as large in Other Western Hemisphere. Most of the affiliate assets, especially in the low-tax countries, are intangible assets. Since it is hard to define the location of these assets, one could say that only statistical convention places the output from them in these affiliates' host countries.

One outcome of the placement of assets is shown in Table 5, which displays the "profit-type return" of nonblank majority-owned affiliates in various countries relative to the compensation of employees in 1999 and 2002. The "profit –type return" is defined by the BEA as measuring "…profits before income taxes…" excluding "… nonoperating items (such as special charges and capital gains and losses) and income from equity investments" (U.S. Bureau of Economic Analysis, 2004, p. M-19). The worldwide averages in both years were about .56 and .57, a little over half of labor compensation, but for Ireland they were 4 in 1999 and 5.7 in 2002, the latter ten times the world average. For countries in "Other Western Hemisphere" they were over 6 in both years, and for some of the individual island countries, they were over 10. In these countries, the affiliates managed to produce profits virtually without labor and without tangible capital.

<u>"Residence" and the Location of Production</u>

The keys to the disconnection between the location of multinationals' production and the apparent location of investment are the concept of residence in the balance of payments and the extent to which intangible assets, with no clearly definable physical location, have become important inputs into production.

Table 4: Ratio of Total Assets to Net Property, Plant and Equipment
by Nonbank Affiliates of Nonbank US Parents, 1999

	Ratio of Total Assets to Net Property, Plant and Equipment
All countries	5.65
Canada	4.22
Europe	7.44
Ireland	10.78
Netherlands	13.95
Switzerland	23.20
United Kingdom	8.59
Latin America and Other Western Hemisphere	4.66
Central & South America	3.11
Other Western Hemisphere	15.40
Barbados	(D)
Bermuda	27.57
United Kingdom Islands, Caribbean[1]	34.33
Other, Western Hemisphere[2]	4.04
Bermuda & Other, Western Hemisphere[2]	13.10
Middle East	2.19
Other Middle East[3]	1.49
Asia Pacific	4.56
China	2.90
Hong Kong	7.86
Singapore	7.02

1. "United Kingdom Islands, Caribbean" comprises of British Antilles, British Virgin Islands, Cayman Islands, Montserrat.
2. "Other, Western Hemisphere" refers to Anguilla, Antigua and Barbuda, Aruba, Bahamas, Cuba, Dominica, French Islands (Caribbean), Grenada, Haiti, Jamaica, Netherlands Antilles, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Trinidad and Tobago, United Kingdom Islands (Atlantic).
3. "Other Middle East" refers to Bahrain, Iran, Jordan, Kuwait, Lebanon, Oman, Qatar, Syria and Yemen.
 (D): refers to the suppression of data.

Source:
US Bureau of Economic Analysis (2004).

Table 5: Ratio of Profit-type Return to Compensation of Employees
by Majority-owned Nonbank Affiliates of US Nonbank Parents

	1999	2002
	Ratio of Profit-type Return to Compensation of Employees	Ratio of Profit-type Return to Compensation of Employees
All countries	**0.557**	**0.568**
Canada	**0.586**	**0.489**
Europe	**0.439**	**0.449**
Ireland	3.964	5.720
Netherlands	0.793	0.590
Switzerland	0.867	0.991
United Kingdom	0.333	0.238
Latin America and Other Western Hemisphere	**0.771**	**0.618**
Central & South America	0.466	0.273
Other Western Hemisphere	6.161	6.231
Barbados	30.884	51.781
Bermuda	13.007	12.889
United Kingdom Islands, Caribbean[1]	4.249	2.074
Other, Western Hemisphere[2]	1.655	3.706
Bermuda & Other, Western Hemisphere[2]	6.714	7.735
Barbados & Other, Western Hemisphere[2]	4.798	6.904
Middle East	**1.084**	**1.608**
Other Middle East[3]	5.887	8.629
Asia Pacific	**0.755**	**0.861**
China	0.670	1.216
Hong Kong	0.898	0.898
Singapore	1.420	1.493

1. "United Kingdom Islands, Caribbean" comprises of British Antilles, British Virgin Islands, Cayman Islands, Montserrat.
2. "Other, Western Hemisphere" refers to Anguilla, Antigua and Barbuda, Aruba, Bahamas, Cuba, Dominica, French Islands (Caribbean), Grenada, Haiti, Jamaica, Netherlands Antilles, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Trinidad and Tobago, United Kingdom Islands (Atlantic).
3. "Other Middle East" refers to Bahrain, Iran, Jordan, Kuwait, Lebanon, Oman, Qatar, Syria and Yemen.

Source:

1. US Bureau of Economic Analysis (2004).
2. US Department of Commerce, Bureau of Economic Analysis, www.bea.doc.gov , downloaded on Sept. 23rd, 2005.

The problems with the definition of residence are old ones for the calculation of the balance of payments. The Review Committee for Balance of Payments Statistics (1965) suggested that "balance of payments data are peculiarly elusive" because "The basic criterion for a balance of payments transaction is that it is between a domestic and a foreign 'resident'…The application of this set of concepts to concrete situations may involve subtle distinctions, and it is often difficult to determine residence even when all the facts are known" (pp. 16-17).

The residence of an enterprise requires (IMF, 1993, p. 22) "…a significant amount of production of goods and/or services there…" or ownership of land or buildings. The location of production of some goods is fairly easily defined and observed, but the location of the production of services is not, if the services are produced by intangible assets. The same is true to some extent of goods, if both tangible and intangible assets are used in production. Whether the intangible assets are financial assets, including shares in related affiliates in other countries, or patents or corporate logos or production techniques, their location is decided by the owners, and can be attributed to an affiliate in any country the parent firm finds desirable. The output from that asset appears to come from residents of that country. If the firm finds it convenient, it can shift the nominal location of that production, affecting exports and imports and national product, without any change in the labor or physical inputs to that production. Production that has taken place in a home country for home country consumption can be made to appear to take place abroad and be imported into the home country, without any change in the location of any real inputs. (For an example, see "Behind Big Wall Street Failure: An Unregulated Bermuda Unit," Wall Street Journal, July 3, 2006, p. A1.

"Refco Capital Markets was incorporated in Bermuda…it employed no one at all at its headquarters address in Bermuda. New York-based employees ran the unit").

While the consequences of shifts of assets and profits for tax revenues have been the subject of considerable discussion (see, for example, OECD, 1993), the consequences for economic measurement are rarely mentioned. Some of the consequences for measurement of trade in services are discussed in Lipsey (2006). The effects extend to the measurement of trade in goods, because goods trade often incorporates returns to the intangible assets owned by producing multinational firms, and the intangible assets can be moved freely. The effects extend also to the measurement of national product and, within countries, to measurements of regional output.

The ownership-based current account for the United States, explained in Landefeld, Whichard, and Lowe (1993), the latest version of which appears in US Bureau of Economic Analysis (2006), partly solves the problem by locating production according to the ownership of the productive resources or of the firm in which production takes place, rather than the geographical location of the resources. In this way, they net out the effects of transfers of assets and profits among units of the firm. However, these accounts are not intended as substitutes for the standard accounts but only as supplementary information, and they do not affect geography-based measures.

The measurement difficulty goes beyond tax-avoiding strategies to the underlying problem that as production comes to depend more and more on intangible, particularly intellectual, assets, the location of production loses much of its meaning, because these assets have no clear geographical location. They may be located within a firm, by ownership, but if the firm is multinational, that ownership has no definite geographical

implication. The tangible inputs to production can be associated with geographical

locations, but not the intangible inputs. One could suggest that intangible assets should

be attributed to the home or main location of a multinational firm (itself not always a

clear concept), but that would upset long traditions of both corporate and national

accounting. In the meantime, tax planning is eating away at the meaning of our standard

measurements.

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