International Trade and Payments Data:

An Introduction

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Macroeconomic Data: A User's Guide. The book, scheduled for publication in the
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including prices, employment, production, and money. The articles in the book are
designed to help the reader accurately interpret economic data and thereby
allow the numbers to be useful analytical tools.*

International trade and payments statistics are constantly discussed by journalists, businessmen, unions, politicians, and academicians. Nationalism has often made these data a source of emotion and politics. A primary goal of Adam Smith and other founders of modern economics, for example, was to subdue the ancient belief that a nation's economic strength could be measured solely by its volume of gold imports.

Terms like trade deficit, protection, quotas, and tariffs can raise red flags. The severity of the Great Depression has been blamed on the Smoot-Hawley tariff and retaliatory measures which greatly reduced world trade.[1] Some historians view tariffs passed by Northern states as a proximate cause of the American Civil War. In our own time, concerns about trade with Japan, Mexico, Europe, and other countries rank high on the U.S. political agenda. At the center of each controversy is the interpretation or misinterpretation of a set of trade data.

It is important to know that, by themselves, trade data have no meaning—they cannot speak for themselves. Depending on what question is being asked, the same trade deficit, for example, can be viewed correctly by different observers as good, bad, neutral, understated, overstated, or illusory. Imports are frequently a source of policy concern. Sometimes these concerns are well reasoned: one can rightfully be concerned about luxury good imports—

financed by debt to foreigners—which arise because of tax distortions. Sometimes these concerns are less well-reasoned, as in the case where debt-financed imports do not indicate economic weakness, but rather indicate investment in a growing economy.

International transactions are controversial, and they are crucial to the world economy. It is impossible to understand an economy without understanding its relationship with the world around it, and it is impossible to understand that relationship without a knowledge of international financial data. This article lists many weaknesses in international data and offers many reasons to be skeptical of analyses using them. These weaknesses are not presented to warn the user away from international data, but rather to suggest that the data be used with eyes open to their frailties. A simple reading of numbers often results in simplistic conclusions. Used with care and understanding, international financial data are indispensable. The purpose of this article is to give the reader a modicum of that understanding and to suggest further areas of exploration.

The article is organized as follows:

I. Basic Definitions
   Components of the Balance of Payments
   Trade: Bilateral vs. Total and
      Gross vs. Net
II. Defining and Measuring International
      Transactions
   Problems in Defining Aggregates
   Measurement Problems
III. Interpreting Trade Data
IV. Sources of Data and Other Information

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[1] Barry Eichengreen [*The Political Economy of the Smoot-Hawley Tariff*, NBER Working Paper Series #2001 (1986)] examines the literature on Smoot-Hawley and argues against the view that the tariff was central to the depth of the Depression.

I. BASIC DEFINITIONS

Components of the Balance of Payments

The balance of payments accounts—of which trade accounts are a part—are a compilation of international transactions. Included in a country's balance of payments are, in principle, all movement of resources across borders. Balance of payments accounts are related to the National Income and Product Accounts (NIPA),[2] the system by which we calculate Gross National Product (GNP) and other measures of national productivity. Net exports, plus domestically earned income, yield GNP, for example.

The types of transactions that appear in the NIPA do differ from the types that appear in the balance of payments accounts. Notably, trade in second-hand goods is excluded from the NIPA but not from the balance of payments. A used car sold by a Virginian to a North Carolinian does not appear in the NIPA (though the commission on the sale would be included). The NIPA measure economic transactions resulting in the addition of new final products to the economy. Domestic transactions in the NIPA are those which *create* things of economic value; the value of a car is added to the accounts at the time it is first sold. At the time of subsequent resale, the only addition of value to the economy (new final product) is the service provided by the car dealer and represented by his commission. Balance of payments accounts, in contrast, measure the *movement* of value across borders rather than the *creation* of value. Thus, if an American sells a used car to a Canadian, that sale will appear in the balance of payments.

Merchandise trade, goods and services trade, the current account, and the overall balance[3] are all aggregate measures of trade in resources, but their definitions and interpretations are very different. Table 1 shows some of the major accounts that comprise the balance of payments and shows how they are aggregated into the current account and the capital accounts which finance the current account.

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[2] For an introduction to these accounts, see Roy H. Webb, "The National Income and Product Accounts" in Roy H. Webb, ed., *Macroeconomic Data: A User's Guide*, Richmond: Federal Reserve Bank of Richmond, 1990. This article also appeared in the Richmond Fed's *Economic Review* (May/June 1986).

[3] For some purposes, the International Monetary Fund separates international monetary flows from other capital flows. These monetary flows are defined to consist mainly of movements of central bank reserves and related liabilities. The overall balance is the sum of the current and capital accounts minus these monetary flows.

There are other ways to divide up the balance of payments accounts. Sometimes the capital account is divided into short- and long-term capital. Sometimes the monetary portion of the capital account is itself divided into flows of gold, central bank reserves, Special Drawing Rights (SDRs), and other accounts. In general, the United States maintains its balance of payments accounts in accord with the International Monetary Fund's procedures.

Trade: Bilateral vs. Total and Gross vs. Net

In discussing international trade and payments, failure to distinguish among different definitions can cause confusion and misunderstanding. Particularly troublesome can be the distinctions between (1) bilateral vs. total accounts and (2) gross vs. net accounts. In most data sources, merchandise, service, and income trade accounts are compiled on both gross and net bases. In some data sources, unrequited transfers and capital accounts are available only on a net basis. While the discussion here uses the word "trade," the concepts are equally applicable to other payments accounts.

Bilateral trade refers to trade between two regions (a region can be an individual country or a group of countries). Total trade refers to a country's trade with the rest of the world combined. Gross exports or imports constitute the quantity of resources flowing *in one direction* between two regions, while net exports equal gross exports minus gross imports.

Gross Bilateral Exports and Imports: Table 2 shows the gross bilateral trade between three regions—the United States, Japan, and Other Countries (all countries except the U.S. and Japan).

In Table 2, rows 1, 2, and 3 give each country's gross imports, and columns a, b, and c give gross exports. For instance, the U.S. exported $45 billion worth of goods to Japan while importing $97 billion in goods from Japan.

Gross Total Exports and Imports: In Table 2, adding columns a, b, and c gives each region's total imports (column d), while adding rows 1, 2, and 3 gives each region's total exports (row 4). If there are no data or measurement errors, total world exports will always equal total world imports, since any goods leaving one country will enter some other country. As later sections will indicate, though, there are always measurement problems.

Total Net Exports: Total net exports are defined as the total gross exports minus total gross

Table 1

Balance of Payments Components
United States, 1989
(billions of dollars)

− 114.87	a	**Merchandise (goods):** manufactures, commodities, etc.
11.75	b	**Services:** insurance, shipping, tourism, education, etc.
7.84	c	**Income:** interest, profits, dividends
− 95.28	$d = a + b + c$	**Goods, Services & Income**
− 1.33	e	**Private Transfers:** private unrequited gifts, wage remittances, etc.
− 13.43	f	**Official Transfers:** unrequited government transfers (foreign aid payments to international organizations, etc.)
− 14.76	$g = e + f$	**Unrequited Transfers**
− 110.04	$h = d + g$	**Current Account Balance**
40.52	i	**Direct Investment:** asset (e.g., factory, firm) where purchaser gains substantial managerial control
44.79	j	**Portfolio Investment:** asset purchase where little managerial control is gained (e.g., bonds)
18.96	k	**Other Capital:** investments not classified as direct or portfolio
22.56	l	**Errors & Omissions:** balancing item to reconcile the overall balance and the sum of current and capital accounts
− 16.79	m	**Reserve and Other Monetary Flows***
110.04	$n = i + j + k + l + m$	**Capital Account Balance**

* Reserve and other monetary flows appear in IMF statistics as the Overall Balance. In published statistics, the sign is reversed—in this case, the Overall Balance would appear as + 16.79 instead of − 16.79. An explanation is that the sign here indicates an "import" of money; 16.79 in net monetary reserves are flowing into the United States. We do not normally think, however, of importing or exporting money. We think of importing and exporting current items and capital, using money as the payment medium. Thus, by convention, the Overall Balance is listed as + 16.79 to indicate that the U.S. was a net *exporter* of total current items and capital.

Source: *International Financial Statistics*, July 1991. This table is described in the adjacent text. Note that the figure for net exports (− 114.87) appears inconsistent with the net exports in Table 2 (− 130). The principal reason for this discrepancy is that *Directions of Trade Statistics* values imports on a c.i.f. basis, while *International Financial Statistics* values imports on an f.o.b. basis. (See discussion of f.o.b. and c.i.f. below.)

imports. Table 2, row 6 shows total net exports for each region. If a country's net exports are positive, then that country is exporting more than it is importing. Negative net exports means that the country is importing more than it is exporting. Assuming no measurement errors, the sum of all regions' net exports will equal zero.

Bilateral Net Exports: Finally, bilateral net exports can be calculated from the data in Table 2. For example, Japan's net exports to the United States would equal $52 billion ($97 billion − $45 billion), and U.S. net exports to Japan would equal − $52 billion.

II. DEFINING AND MEASURING INTERNATIONAL TRANSACTIONS

Table 1 defines a number of international accounts which together comprise the balance of payments. At first glance, the divisions between different

classes of cross-border transactions seem self-evident. Exporting a piece of fruit is merchandise trade. Buying legal advice from an overseas firm is a service import. Investing in foreign bonds is portfolio investment. The lines, though, are not as clear as these examples would suggest.

We can define two broad classes of problems in compiling statistics. First, even with complete information on each and every transaction, simply defining the lines between different aggregates would be a chore. Second, complete information on every transaction does not exist, so there are errors, sometimes large, in measurement. In the text that follows, a set of hypothetical transactions are aggregated into balance of payments statistics, as shown in Table 3.

For example, in the first row of the top portion of Table 3, an exporter in the U.S. sends wheat to a purchaser in some other country and, in exchange,

Table 2

Gross Bilateral & Total Trade Accounts
(billions of U.S. dollars)

	Importer	Exporter US a	Exporter JA b	Exporter OC c	Gross Total Imports d
1	United States	—	97	397	494
2	Japan	45	—	165	210
3	Other Countries	319	178	—	497
4	Gross Total Exports	364	275	562	1,201
5	Gross Total Imports	494	210	497	1,201
6	Gross Net Total Exports	−130	65	65	0

Mathematical Relationships

column d = column a + column b + column c

row 4 = row 1 + row 2 + row 3

row 5 = column d

row 6 = row 4 − row 5

Note: 1989 data adapted from the IMF's *Directions of Trade Statistics Yearbook*. This table is described in the adjacent text and is used to illuminate the mathematical relationships between the gross accounts. In order to make exports equal imports (for illustrative purposes), the numbers here ignore measurement errors present in the actual data.

the importer issues to the exporter a liability whose value is equal to that of the wheat. Importantly, the rows represent transactions between disparate individuals, firms, and governments, with the paper trails (if any) widely dispersed. In the bottom portion of Table 3, the sale of wheat shows up in U.S. merchandise exports and the corresponding trade credit shows up in other capital.

It is expensive to collect and sort data, so resources should be spent on the most useful information. Collecting enough information to sort merchandise trade by color, for instance, would cost a great deal and would not seem a sensible use of resources—it is difficult to think of anyone who would find this information useful. Thus this information is not collected. There are potentially useful distinctions which are not collected, though, because the usefulness is still not viewed as worth the costs. In deciding what data will be collected, it must also be remembered that the mere act of collecting and classifying data implies that the classification is economically meaningful. It is easy, for instance, to take for granted that the distinction between current and capital transactions is clear and economically significant; for some purposes, that is an overstatement.

Table 3

Aggregating Balance of Payments Transactions
(see adjacent text)

Resources Transmitted From

U.S. to Rest of World	Rest of the World to U.S.
[a] wheat	[b] trade credit
[c] tourist's hotel room	[d] cash
[e] wages remitted	[f] private transfer
[g] bank deposits	[h] bonds issued by factory
[i] automobiles	[j] tin
[k] stock issued by factory	[l] gold ingots
[m] cash	[n] property rental
[o] steel ingots	[p] automobiles
[q] illegal drugs	[r] cash

U.S. Balance of Payments Accounts
derived from transactions [a] through [r] above

Merchandise (goods)	$a + i + o + q - j - p$
Services	c
Income	$-n$
Private Transfers	$-f$
Direct Investment	k
Portfolio Investment	$-h$
Other Capital	$-b$
Reserve Flows	$(e + g + m) - (d + l + r)$

Goods and Services	$(a + i + o + q - j - p) + c$
Goods, Services & Income	$(a + i + o + q - j - p) + c - n$
Current Account Balance	$(a + i + o + q - j - p) + c - n - f$
Capital Account Balance	$k - b - h + (e + g + m) - (d + l + r)$
Overall Balance	$(d + l + r) - (e + g + m) =$
	$(a + i + o + q - j - p) + c - n - f + (k - b - h)$

The top portion of this table lists hypothetical individual transactions, each consisting of two movements of resources of equal value. The bottom portion shows the resulting balance of payments accounts. In the adjacent text, this table is used to illustrate measurement and classification problems. As explained in Table 1, the sign is reversed for the Overall Balance.

A current account deficit is viewed by some as collective profligacy,[4] while a current account surplus is taken to mean saving for a rainy day (Section III explains why this view may be erroneous). On the basis of such views, governments sometimes enact policies, such as trade or capital controls, to influence

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[4] For an article taking this view, see Benjamin M. Friedman, "Implications of the U.S. Net Capital Inflow," in R.W. Hafer, ed., *How Open Is the U.S. Economy?*, Lexington, Massachusetts: Lexington Books, 1986.

the current and capital accounts. A current account deficit, though, may be illusory—resulting less from economic realities than from the means of defining and measuring current and capital transactions.

Problems in Defining Aggregates

This section gives some conceptual problems encountered in classifying international transactions. In the paragraphs below, the transactions found in the top portion of Table 3 are aggregated into the balance of payments accounts in the lower portion of the table.

Consumption vs. Investment: Distinguishing between consumption and investment purchases is difficult in international trade, as it is in all national income accounting. Consider automobiles and tin in [i] and [j]. Both are treated here as merchandise trade (current account transactions), thus implying that they are consumption goods. Autos, however, are *consumer or producer durables*, meaning they are part capital good, yielding services over time. A company which imports an automobile for business use over the next five years is investing as surely as is the purchaser of the factory stock in [k]. Similarly, tin is a storable commodity and can be purchased either to use next week (consumption) or to store for the next ten years (investment). Classifying durable goods as current account items can thus imply a lower rate of investment than is true in an economically meaningful sense, since the capital portion of the good never shows up in the capital account.

Merchandise vs. Money—Gold and Silver: The gold ingots sold to the U.S. in Table 3 [l] appear in the capital accounts as reserve flows, implying that gold is money. Gold, though, can also be a form of nonmonetary capital or a merchandise good (say, for a jeweler). The United Nations classification system distinguishes between monetary and nonmonetary gold. It assumes that gold received by a central bank is money, and gold received by anyone else—even commercial banks—is not money. While this is an imperfect way to divide the data, the U.N. system views this as closer to the truth than classifying all gold as money or all as merchandise. This convention also implies that a more accurate classification system is viewed as not worth the expense.

In Table 3, the fact that gold appears as a monetary flow indicates that it was received by the central bank of the U.S.—the Federal Reserve. Had the gold been received by a commercial bank, the U.S. accounts would have shown higher merchandise imports and lower monetary receipts, even if everyone involved had considered the gold to be money. (It should be noted that since 1973, gold has for the most part ceased being a means of international settlement.)

Defining Countries: International data are critically dependent on where national boundaries are drawn. Changes in the amount of trade over time will be affected by changes in boundaries. For instance, the trade statistics for the Federal Republic of Germany might be expected to drop because of that country's recent reunification. The reason is that transactions between West Germany and East Germany used to count as international trade, but are now counted as domestic transactions. Similarly, the independence of the Baltic States should increase measured international trade; transactions between the Baltics and other Soviet republics were previously considered domestic transactions, but now enter world trade statistics. The changes, though, do not necessarily represent any changes in any individual's economic activity or well-being.

Customs unions can cause world trade to be understated. These organizations are collections of countries which have eliminated or limited their trade barriers with each other—the European Community is an example. Sometimes, customs unions will cease collecting statistics on trade between member countries and only report trade between the union and countries outside the union. When this happens, measured international trade drops because the customs union hides the intra-union trade. Note that Table 1 understates the amount of world trade by hiding all trade between "Other Countries."

Goods Destined for Embassies or Military Bases: The wheat shipped in transaction [a] is a merchandise export because the shipment of grain reduces the material resources found in the U.S. If, however, the grain were sent to a U.S. embassy abroad, then this line would not appear in the trade statistics. Thus, a shipment to an American in a hotel in Paris would appear as an export, while a shipment to an American at the U.S. embassy down the street is treated as a domestic sale. In principle, shipments of military resources across borders should be included in balance of payments statistics, but they are sometimes omitted for security reasons.

Ships and Aircraft: In transaction [j], tin, a material resource, is transported to the United States in the hold of a ship, which is also a material resource. The movement of the ship itself is not counted as

an export to the U.S. because the ship will only reside temporarily in the U.S., and we do not wish temporary resource movements to be counted as trade. Ships and airplanes move frequently between countries in this manner, but sometimes they do move permanently from one country to another, or they change their national ownership or flag of registration. By convention, the sale of a new ship or airplane across national boundaries is counted as merchandise trade. The sale of old vessels is omitted from some trade data (e.g., United Nations data), even though such a sale might constitute a real (and enormous) movement of resources. This is because the ownership of ships and airplanes is highly complex, and it is difficult to define and measure international trade of such vessels. IMF statistics include such sales, though there are serious measurement problems involved.

Pass-Through Trade: Suppose that in transaction [p], a U.S. importer buys cars from Germany and then plans to sell them next week to a buyer in Mexico. Then, [p] would generally not be considered an import, but rather would be counted as a temporary import destined for re-export and dropped from U.S. trade figures. If this were not so, then the automobile transaction would be counted twice, thus overstating the volume of world trade. Some de facto temporary imports are counted as if they were permanent due to the form of their legal documentation.

Tourist Effects: Suppose the tourist in transaction [c] takes his car on his trip. If he goes for a week and then brings the car back, then the car will not appear in the trade statistics because this relocation is, again, regarded as temporary. If the car were to remain abroad for ten years, that would constitute a merchandise export, offset by a private transfer. A line between permanent and temporary must be drawn, usually at one year, but that line is arbitrary.

Ownership vs. Location: In general, concerns about imports revolve around the question "Are we buying too much from foreigners?" The way international trade is measured makes it difficult to even know how much a country buys from foreigners. Until recent decades, capital mobility was quite limited by today's standards. By and large, factories in Germany were owned by Germans, firms in the U.S. were owned by Americans, and so forth. Today, capital is highly fluid, but our trade statistics can obscure that fact. Suppose Acme-USA buys equipment from American-owned Apex-Germany or from Acme's wholly-owned subsidiary Acme-Germany.

The trade accounts treat these transactions as imports, even though no foreigners are involved. Similarly, if Acme-Germany sells widgets to a German distributor, this is treated (in the merchandise trade accounts) as a wholly German transaction, despite the fact that Germans are buying goods from Americans.

It should be noted that this last transaction would not be a problem in the current account, as opposed to the merchandise trade account. Acme-Germany's profit on the sale to a German distributor would either be paid to the American parent company as a dividend or would be kept on Acme-Germany's books as retained earnings. Either way, the income would show up as a credit item in the income account of America's balance of payments.

Our accounting conventions record trade on the basis of place of origin, rather than nationality of ownership. In the past, the two were usually the same, so the distinction made little difference. Nowadays, the country of production is a poor guide to nationality of ownership. An alternative accounting system would define trade by *ownership* rather than by *location*. Under such a system, a shipment to an American factory overseas would be treated as a domestic transaction, just as shipments to embassies are already treated. According to *The Economist* ("Tricks of the trade," 3/31/91, p. 61), this change in accounting procedures would change America's 1986 merchandise trade balance from a $144 billion deficit into a $57 billion surplus. If the question being asked is how much American firms are selling to foreigners, then trade ought to be defined by ownership. If, alternatively, the question is where jobs will be found, then perhaps trade ought to be defined by location, since Acme-Germany is likely to be staffed by German workers instead of American workers.

Measurement Problems

Even if all conceptual problems in defining trade data could be resolved, measuring the data would still be difficult. Unlike the hypothetical example in Table 3, there is in actuality no complete record of individual transactions. Much information is confidential or simply not recorded, so aggregate estimates must be made; there are statistical sampling problems; some data are intentionally distorted by those involved; price, quantity, and exchange rate data often come from different sources, and reconciling them is a challenge. In other words, trade data are developed by splicing together bits and pieces of inaccurate, incomplete, inconsistent information. Any

such aggregation requires judgment and any such judgment will, at times, cause problems. Again using Table 3, some problems can be illustrated.

Timing of Prices, Exchange Rates, and Quantities: A major problem in measuring the value of trade is that our information on quantities and prices often comes from separate sources. In blending these different data sources, timing is often critically important. Suppose we are estimating the dollar value of tin purchases represented in Table 3, transaction [j]. Estimating this figure may require that the numbers and calculations in Table 4 be used. Here, a foreign exporter sells tin to the U.S. for a foreign currency (here called francs), and we wish to know the dollar value of those sales.

Exchange rate data are readily available on a daily or even more frequent basis, and the same is true for prices of many goods—especially commodities. Information on physical quantities of goods sold, though, is often reported only for longer periods of time. In Table 4, it is assumed that quantity information is available on a quarterly basis, while price and exchange rate information are available on a monthly basis. As is explained in the table, the result is that the hypothetical country's export earnings are greatly overestimated.

This sort of indexation problem is less severe for merchandise trade in a country like the U.S., where statistical collection procedures have been developed and refined over time. Trade data are mostly gathered from customs forms which list both quantity and price information. Such indexation problems, though, become much more severe in services and capital accounts, where data collection relies on surveys and, to a large extent, voluntary compliance. The sort of problem shown in Table 4 is also more common in poorer countries, where data collection is less complete, where the collection process is poorly financed, and where documentation is less reliable.

Other Timing Differences: In Table 3, item [o] is the sale of steel ingots. This sale, though, could show up in a number of different time periods, depending on the methods of accounting and data collection. The movement of ingots could end up being counted when the sale was made, when the steel was loaded onto a ship in the U.S., when the steel was unloaded overseas, when the steel reached the buyer, when the customs documents reached the data collection agency, when the data collection agency sifted through its in-box, and so forth. A change in procedures, for example, could result in items [o] and [p]—which are the two sides of the same transaction—showing up in different years, thus distorting the merchandise trade balance and capital account. Timing problems may wash out in the long run, but for some purposes, the data may remain permanently distorted.

Index Number Problems: Aggregating data lets us make more important observations. Trade data begins as millions of individual bits of data on narrow ranges of transactions, and the usefulness of

Table 4

Estimating Quarterly Tin Exports

	Jan	Feb	Mar	3 Months	Estimates
Tin Price (in francs)	10	10	4	8 (average)	
Quantities	0	0	10	10 (total)	
Value (in francs)	0	0	40 = 4x10	40 (total)	80 = 8x10
Exchange Rate (francs/$)	1	1	4	2 (average)	
Value (in dollars)	0	0	10 = 40/4	10 (total)	40 = 8x10/2

In this table, a hypothetical country exports tin, priced in francs, and paid for in dollars. Price information is available on a monthly basis, but quantity information is only available on a quarterly basis. In this three-month period, total trade is actually 40 francs, or 10 dollars. However, the data only say that 10 units of the tin were sold, and it is not specified whether the tin was sold in January, February, or March. In this situation, total value of sales could be estimated by multiplying the average quarterly price (8 francs) by the total units sold (10 units). Using this method, total sales appear to be 80 francs—twice the actual amount.

When the world moved to floating exchange rates in the early 1970s, a further complication was added. Here, the exchange rate moved from 1 franc per dollar to 4 francs per dollar. To estimate the dollar value of tin sold, divide the estimated total franc value (80 francs) by the period average exchange rate (2 dollars per franc), yielding estimated total dollars sales of 40 dollars—four times the actual amount.

these individual data is limited. Data on aggregate merchandise trade is more important than data on trade in swiss cheese or vacation packages (unless you deal in swiss cheese or vacation packages). Aggregating data, though, introduces judgment and ambiguity into measurement.

In the case of a single good—say, a standard gold coin—one can unambiguously separate changes in price from changes in quantity. Suppose in one year, 10 coins are sold at $100 apiece ($1,000 in total), and in the second year, 15 are sold at $80 apiece ($1,200 in total). Several unambiguous observations can be made: The trade value went up by $200; the trade volume went up by 5 coins; and the trade price went down by $20.

Suppose, though, that data on two goods—say, melons and grapes—are being aggregated, with the intention of calculating the change in trade volume and trade price. First of all, measuring change in aggregate volume requires that statistical weights be applied to the separate volumes of melons and grapes. Individual fruits could serve as the unit; then, a decrease of one melon and an increase of two grapes would be considered an increase in fruit trade. For most purposes, this choice of weights seems unsatisfactory. Statistical weights could be based on physical weight or on physical volume so that the one-melon decrease would outweigh the two-grape increase; these weights might also yield unsatisfactory results, though.

Usually statistical weights are based on the *values* of the goods in some base year; to measure changes in aggregate trade volume, ask how the aggregate value of goods would change if the prices of all goods remained the same but quantities changed. Similarly, changes in price per unit of aggregate trade is measured by asking how much aggregate value would change if quantities purchased of each good remained the same but prices changed. The problem is that by choosing different base years, the same data can indicate falling or rising volumes and prices— there is no means of aggregating dissimilar data that precisely answers every possible question.[5]

Accounting Methods and Valuation: The value of cross-border flows is generally assumed to

[5] See Roy H. Webb, *Macroeconomic Data: A User's Guide*, Federal Reserve Bank of Richmond, 1990, p. 5 (Introduction) for a discussion of indexing problems. Fuller explanations of indexation problems can be found in any elementary textbook under Laspeyres Index or Paasche Index or a variety of other indexes.

be the price paid when the title to the resource changes. Some items, though, have no readily verifiable market price—services and capital are especially vulnerable to these problems. In highly developed market economies, merchandise trade data are of good quality, and price and quantity data come from the same source. In other countries, though, records may be less complete or consistent. Some data will report the value of an item—say, stock in a factory—according to its historical price—the price originally paid for it. Another method would value the factory according to its current replacement cost. Often, these valuation methods will differ greatly from the market value—the price that would actually be paid in a current transaction for that item. Such valuation problems become especially acute in the case of barter (counter-trade), such as in Table 3, items [o] and [p], where no monetary price is expressed on either side of the transaction.

Trade barriers (e.g., quotas and tariffs) can make the value of trade ambiguous. Suppose an importer pays $1,000 for an item, but the exporter only receives $500, with the rest going to tariffs. The value of merchandise trade might appear in one account at one price and in another account at the other price. This is because the inclusion or exclusion of taxes from the recorded price is in some cases a matter of discretion. In principle, the accounting treatment of taxes should be consistent in all countries. In practice, however, different countries apply different rules so that equivalent transactions will appear differently in the statistics.

Lightly Monitored Borders: Cross-border trade is not uniformly monitored. Some countries have free-trade zones whose attraction to business is that international trade through the zone is monitored lightly or not at all. Some countries are lax in monitoring cross-border trade in certain geographic areas or in specific industries. For example, customs officials may choose not to monitor livestock movements across inland borders, either because monitoring would be too expensive or because de facto immunity from customs laws may be a political favor to those involved in the trade.

Services: Sale of services across borders is particularly difficult to estimate, since there are no customs agents monitoring them. Tracking, say, banking and legal services between countries demands cooperation by those involved. Much information is derived from surveys, which are subject to a variety of statistical problems such as sampling error.

False Invoicing in Response to Taxes: Taxes and customs on international transactions provide an incentive to overstate or understate various transactions. Referring again to Table 3, suppose that the United States were to place a high tax on the purchase of foreign bonds [h] while not taxing the rental of foreign property [n]. In response, a U.S. entity might purchase bonds and rent property from the same overseas entity, and then understate the sale price of the bonds and overstate the cost of the property rental. The effect would be to overstate the current account and understate the capital account.

Illegal Trade: Individuals do not routinely report illegal activities to their governments, so the sale of illegal drugs [q] will not likely show up as a merchandise import or as part of current account debit items. The likely result is that the illegal drugs will be mistakenly included in "Other Capital" or in "Errors and Omissions," the balancing item used to reconcile discrepancies between the accounts.[6]

Foreign Exchange Black Market: In Table 4, the dollar value of purchases was miscalculated because the quarterly average exchange rate was not equal to the actual exchange rate used in the transaction. Similarly, the dollar value of a transaction can be misjudged when foreign currency is purchased not at the official (or legal) exchange rate, but rather at an illegal black market rate.

Inconsistent and Inadequate Accounting: In Table 1, U.S. exports to Japan were said to total around $45 billion, based on U.S. estimates. In the same data source, Japan reported importing over $48 billion from the U.S. in 1989. Such discrepancies in reporting are the norm. Sometimes the discrepancies can be huge relative to total trade. When such conflicts arise, the user of data is forced to rely on judgment in deciding which numbers to use. Finally, measurement of trade between countries can be difficult because different countries use different accounting systems. Some are lax in accounting. Some lack the resources to measure trade adequately. Some, for political or other reasons, do not wish to measure trade accurately.

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[6] A great deal of unrecorded transactions can be explained not by smuggling of goods, but rather by illegal or unseen capital flows. According to the *Wall Street Journal* ("U.S. Statistics on '90 Capital Inflow Are Off to the Tune of $73 Billion," 5/24/91, p. A2), unrecorded capital inflows into the U.S. appear to be the largest factor in the statistical discrepancies in the balance of payments accounts.

Other Definitional Ambiguities

Below are some additional ambiguities found in trade definitions. Comparisons can be severely distorted if inconsistently formulated data are used together.

F.O.B. vs. C.I.F.: Merchandise imports and exports are defined either f.o.b. (free on board) or c.i.f. (cost, insurance, and freight) terms. Trade on f.o.b. basis equals the value of the goods only. Trade on c.i.f. basis includes the value of the goods plus the cost of transporting the goods from the country of export to the country of import. Exports are almost always measured f.o.b. Imports are usually measured c.i.f., but some countries measure them f.o.b. In the latter case, the shipping costs appear as service trade instead of goods trade.

Services vs. Services & Income: Some data sources group services and income together as services or "invisibles" (merchandise goods being "visibles"). The International Monetary Fund and the U.S. Department of Commerce have recently adopted the convention of separating services and income.

Current Account and Official Transfers: Some sources consider official transfers to be part of the capital account rather than part of the current account.

Terms of Trade: A country's terms of trade is the ratio of a price index of the country's exports to a price index of its imports. The measured terms of trade, though, can differ greatly, depending on which goods are included in the measure, on the means of aggregating the prices of those goods, and on the base year chosen. (See the discussion above of index number problems.)

III. INTERPRETING TRADE DATA

The above sections have suggested that an observer must use great care in interpreting trade data, which are highly susceptible to problems of definition, measurement, and aggregation. They do not give us a perfect picture of resource movements, and the economic significance of resource movements themselves can be highly subjective. Following are a few examples of how data are frequently interpreted and problems with those interpretations.

Total Merchandise Trade: Properly measured, a U.S. merchandise trade deficit means that

in terms of value, more goods are leaving the U.S. than are arriving. For a shipping company planning its routing, that may be a meaningful piece of information. For public policymakers, however, a deficit may be less significant than is often assumed. Deficits on merchandise trade are often presented as boding ill for a national economy.[7] To be sure, a trade deficit might well be a sign of faltering commodity or manufactured goods sector. Alternatively, the deficit may just as easily indicate that a large share of the country's individuals have found it more advantageous to produce services than goods. The mercantilist idea that a merchandise trade deficit is bad per se is akin to the argument that it is inherently better for an individual to work in farming or manufacturing than in banking, sales, or engineering.

Bilateral Merchandise Trade: The same arguments described above for total merchandise trade hold here, but with an added caveat. Even if one has reason to believe that a total trade deficit is bad, there is no reason to believe that bilateral trade accounts should be balanced. It is possible for Country A to run a $100 million deficit with Country B, Country B to run a $100 million deficit with Country C, and Country C to run a $100 million deficit with Country A. All three countries have balanced total trade, despite their bilateral deficits and surpluses.

For a better understanding of the patterns of world trade, the reader can look in any macroeconomics or international trade textbook for explanations of the economic principles of comparative advantage and gains from specialization. These principles are generally thought to explain much of the flow of goods.

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[7] Benjamin Friedman, op. cit., for instance, describes growing U.S. merchandise trade and current account deficits as "deterioration" (p. 138) and describes the international imbalance as "the outstanding failing of U.S. macroeconomic performance in the 1980s" (p. 137).

In contrast, *The Economist* ("For whom the gloom tolls," 8/31/91, p. 16) warns that

commentators should . . . mind their tongues when it comes to trade. America's trade balance is said to "improve" as its deficit shrinks, Germany's to "deteriorate" as its surplus disappears. Yet a trade surplus is a misleading measure of a country's economic strength, or a deficit of its weakness. Barring further information, it is neutral . . . . The idea that surpluses are good and deficits bad comes from the nasty mercantilist view that exports are good and imports are bad: yet the only reason to export is to enable your consumers to buy luvverly imports.

Current Account: A current account deficit equals the domestic investment minus domestic savings. This allows a country to spend more today than it is earning today by borrowing from abroad. For this reason, overseas borrowing is often taken to mean "living beyond one's means." There are many reasons, though, that a country might reasonably run a current account deficit. A current account deficit may mean that, collectively, the country is borrowing abroad to finance productive investment, with presumed gains for the country and its trading partners in the end. This is analogous to starting a business with borrowed capital, and paying back the loan in later years to the advantage of both the businessman and the bank. It often makes sense for a developing country to borrow in this way, though the borrowing must finance productive investments and not, say, luxury consumption goods. Some would argue that the U.S. was justified in running large current account deficits during the 1980s; the *Economic Report of the President* (1989, p. 106) said the following:

Trade and current account deficits represent important channels through which an economy can acquire the resources needed to take advantage of profitable investment opportunities. They can also represent consumption out of previous saving. Trade deficits can arise when an economy's households and firms react to distorted incentives to consume today by borrowing from abroad at the expense of future generations. Whether the trade deficits of the 1980s signal promise or trouble for the current and future well-being of the United States is an important and difficult question.

Valuation of Overseas Investments: Thus far, this article has discussed *flows* of resources between countries—the balance of payments. In all of the above examples, some good or service or claim on future income has been shifted from an entity in one country to an entity in another. This section introduces *stock* adjustments—changes in one country's claims (net overseas investment position) on another that arise not because any resource or claim has moved across borders, but rather because the *price* of some cross-border obligation has changed.

Purchase of overseas assets by domestic residents (a capital account debit item) minus the purchase of domestic assets by foreign residents (a capital account credit item) is often assumed to be a measure of changes in a country's overseas investments. This, however, is a poor measure of a country's overseas wealth. Looking only at transactions ignores the

changes in values of investments. An individual would not properly evaluate his personal wealth by adding together what he has paid over the years for stocks and bonds. Rather, he ought to sum up the current market value of those investments. Ideally, a country ought to value its overseas investment position according to the current market values of those investments. Practically, though, such valuation is often difficult.

If the value of an American-owned company in Spain doubles, the American owner's claim on Spanish resources doubles, though no change of title has occurred. An American who owns bonds of a failed Australian company has lost his future claims on Australian resources, even though the American still holds a piece of paper promising future payment. In other words, the balance of payments is like a corporate income statement, while the net investment position is like a corporate balance sheet.

Treatment of capital gains in the balance of payments and net investment accounts deserves mention. First is the treatment of unrealized gains resulting from exchange rate changes. For example, suppose an American buys a German bond worth 1,000 marks, and the mark then strengthens against the dollar (so a mark buys more dollars than before). Now, the American has a paper gain, since the 1,000-mark bond is worth more in dollars, but until the bond is sold, it is only a paper (or unrealized) gain—the German bond issuer has not *paid* anything to the American bondholder. Previously, such unrealized gains were counted in the balance of payments as income. Now, however, unrealized gains are excluded from the balance of payments and only appear as valuation changes in the investment accounts.

On the other hand, the treatment is different for retained earnings of foreign subsidiaries. If a French subsidiary earns a profit and pays its American parent a dividend, that clearly appears as an income credit item in the balance of payments. If the subsidiary earns the profits and then retains those earnings (i.e., pays no dividend to the parent), convention still treats that as an income credit.

The statement that the United States has become the "world's largest debtor" has gained frequency.[8] This assertion may, in fact, be attributable to a systematic undervaluation of U.S. assets abroad and

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[8] Benjamin Friedman, op. cit. argues this case.

overvaluation (or smaller undervaluation) of foreign assets in the U.S., particularly with regards to direct investment. An account of the U.S. Commerce Department's attempt to remedy these valuation problems can be found in *Survey of Current Business* (May 1991, p. 40). Another piece of evidence indicates that the value of U.S. investment abroad continues to exceed the value of foreign investment in the U.S.: according to *International Financial Statistics* (August 1991, p. 554), U.S. income on foreign assets has exceeded foreign income on U.S. assets in every year over the period 1984-90 (all the years covered in that issue).

IV. SOURCES OF DATA AND OTHER INFORMATION

Numerous organizations provide data on international transactions. Below are some of the major providers of data and analytical publications on international trade and finance. Included are the names of some specific publications, with subject matter in parentheses. Many of these agencies also sell data in electronic form.

International Monetary Fund: Publications include *International Financial Statistics* (all aspects of international and domestic finance) plus yearbooks and topical supplements, *Balance of Payments Statistics, Direction of Trade Statistics* (distribution by partner countries and by areas of countries' exports and imports). The *Balance of Payments Manual* explains in great detail the methodologies for measuring and interpreting international transactions. In addition, the IMF publishes numerous studies and documents on special topics. Articles in *Finance and Development* include information on developing country data.

World Bank (International Bank for Reconstruction and Development): The World Bank publishes *World Debt Tables* (external debt of developing countries, aggregate net resource flows and net transfers) and many topical reports.

Organization for Economic Cooperation and Development: OECD provides numerous printed, microfiche, and electronic data publications. Among these are *Monthly Statistics of Foreign Trade, Foreign Trade by Commodities, Financial Market Trends, OECD Financial Statistics, Main Science and Technology Indicators* (trade in technology), and *Quarterly Oil Statistics and Energy Balances*.

United Nations: U.N. publications include the *International Trade Statistics Yearbook, Statistical Yearbook for Asia and the Pacific, Statistical Yearbook for Latin America and the Caribbean, Agriculture, External Trade and International Cooperation, Foreign Trade Statistics of Asia and the Pacific, Handbook of International Trade and Development Statistics,* and the *UNCTAD Commodity Yearbook.*

Central Banks: For the United States, the *Federal Reserve Bulletin* includes data on U.S. international transactions, U.S. foreign trade, and assets and liabilities of Americans to foreigners and foreigners to Americans. Central bank publications in other countries provide similar data.

National Fiscal Agencies: The U.S. *Treasury Bulletin* includes data on international financial holdings, capital movements, and foreign currency. Other countries' treasuries or finance ministries release similar data.

National Economic and Foreign Trade Agencies: The U.S. Department of Commerce monitors U.S. foreign trade. The Department's Bureau of Economic Analysis publishes the *Survey of Current Business,* which includes data on U.S. international trade and finance. Other countries' foreign trade ministries publish similar documents. The Bureau has recently published a book—*The Balance of Payments of the United States: Concepts, Data Sources, and Estimating Procedures*—detailing the Bureau's methodology.

Textbooks: For a better understanding of international trade data, textbooks can be indispensable. One such book is Leland B. Yeager's *International Monetary Relations: Theory, History, and Policy* (Harper & Row).