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Foreign Affiliate Sales and the Measurement of Trade in Both Goods and Services [*]

Abstract: There is an incompatibility between measures of trade in goods and services. Measures of goods trade reflecting GATT are restricted to trade that crosses borders. Service trade, however, under GATS includes both cross border delivery and foreign affiliate sales within borders. We propose that for comparability the trade component of foreign affiliate sales in goods should be included in goods trade or affiliate sales should be removed from service trade data. We make modifications to reported goods and services trade for specific countries by using data on affiliate sales to produce more consistently measured cross country estimates of trade flows.

Keywords: Trade Statistics; Foreign Affiliate Sales; Commercial Presence; Cross Border Trade

JEL Classification: F10; C10; F23

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1. Introduction

This paper discusses how we measure trade flows between countries in the modern global economy and how much difference alternative treatments imply for our perceptions of the degree that global economies are integrated. It focuses on the treatment of foreign affiliate sales, putting on one side the related issue of whether we should focus on trade in goods or value added discussed extensively in recent literature (Hummels *et al*, 2001; Koopman *et al*, 2008; Johnson and Noguera, 2009). Given we wish to measure trade in goods and services, how large are they and with what degree of imbalance.

Our main point is that as integration of global economy deepens and more cross border multinational activity occurs, traditional cross-border trade statistics do not fully capture all of the forms of trade involved. In the services area, this is acknowledged to be the case for commercial presence service activities (for example, banking services provided by, say, a U.S. owned bank in country X to intermediate between residents of country X), but is also the case with goods related activities (GM may produce and sell autos in China using Chinese steel and rubber, but production of autos in China also use US branding and organization).

The aim of this paper is to explore both the statistical importance of FAS in both trade in services and goods and how our perceptions of the role of trade in the world economy may be altered by different treatments of FAS. If the argument is accepted that FAS should either be partially included in goods trade to achieve consistency across the separate sets of goods and services trade data or alternatively removed from services trade data, then adjustments to available data are needed. Some countries' services trade data (most notably U.S., Japan, and Germany) already include both deliveries of services across borders and sales by foreign affiliates from commercial presence. And data on FAS in goods is available from information on foreign affiliate activity from the OECD database. For consistent accounting and comparison of goods and service trade, either commercial presence should be accounted in goods trade data or services data should have it removed.

Earlier literature has noted the potential importance of foreign affiliate sales in goods. This includes Zeile (1993), GAO (2005), Hausmann and Sturzenegger (2006). However, outside of these papers, we find no other discussion of this issue, and none which explores, as here, the use of data on commercial presence for trade in goods in ways which mirror that in services.

We use data for USA, Japan, Germany, Finland and Czech Republic only to produce initial estimates of more consistent goods and services trade data. For these countries, the underlying information needed is available for their cross-border trade in both services and FAS, while for others it is not. We focus on the size of country total trade in goods and services, the growth rate

of trade, trade imbalances and the relative size of trade in goods and services.

We explore the implications for each of the use of different consistent statistical measures using both the present mixed GATT and GATS basis, as well as consistently including or excluding FAS in both goods and services trade. We find that perceptions of the importance of trade in the dimensions above using three different measures change sharply. If we either add or remove foreign affiliate sales to traditional cross-border trade in both goods and services, perceptions of the trade situation change substantially for each country.

We get some conclusions from our calculation. For the total trade in goods and services by country, results change substantially with different statistical bases. In the US example, total trade inclusive of FAS (take sales as FAS) is nearly 3 times that on a FAS exclusive value. For the annual growth rates of total trade in goods and services, statistics with FAS are nearly all higher than a GATT/GATS basis calculation. In the US, the average trade growth rate from 2004 to 2007 under different bases varies between 11.7% and 12.9%; higher than economic growth. For the relative size of trade in goods and services, they change a lot under different bases. In the US example, if we take sales as FAS, the average relative size on a FAS inclusive basis is 1.43; but this is 3.68 using a FAS exclusive basis; and 0.66 for a GATT and GATS basis. For the trade imbalances, results change completely for some countries. In the US example, the average FAS exclusive balance is a deficit of $-698 billion, but the average FAS inclusive balance is a surplus of $477 billion, and the average GATT and GATS basis balance is a smaller deficit of $-356 billion.

2. Foreign Affiliate Sales and Trade Statistics

Traditionally, trade in goods is recorded as the physical movement of goods across borders and import and export data on trade in goods are obtained from customs clearance data. For services, this treatment does not capture all modes of service delivery covered by the WTO General Agreement on Trade in Services (GATS) since data on GATS mode 3(commercial presence) is missing under such an approach. At present, for several countries commercial presence trade in services via foreign affiliate sales data may or may not be included. Importantly, it is included for such large economies as the US and Germany. The result is the use of different bases both across goods and services and across countries for the two sets of trade data.

It is the growth in both types of trade and the potentially distorted perceptions that makes this issue important. For many advanced economies, services contribute more than 70% of GDP and employment (OECD, 2005b). Many developing countries are now embarked on a path of industrialization with a growing role for services. This has been accompanied by discussion of new trade liberalization in services and in 1994 the initiation of GATS in the WTO. International trade has grown faster than global GDP in recent decades. With this growth, service's contribution to the global economy has also grown.

We will assume for the present discussion the measurement objective is to accurately assess trade

as sales of goods or services by citizen (or residents) of one country to another. The primary issues we raise the coming of goods and services produced in different countries into final sale transactions which value across international borders do not capture. Foreign affiliate sales (FAS) in manufacturing sectors grow fast and become more and more prevalent in the past decades. We take the Apple Iphone for an example. Iphone is designed in the US, CPU is usually produced by Sumsung Corporation in Korea, camera is usually produced by Sony Corporation in Japan, screen is often produced in Japan or Korea, and ultimately iphone will be assembled in China and sale to the world. We give another example of NIKE shoes manufacturing in China, the design and brand are originated from NIKE corporation in the US, some of manufacturing materials may get from Vietnam or Malaysia, and the manufacturing process is finished in China and then sale to the world.

Existing measures of trade in both goods and services are a reflection of the international agreements entered into separately for goods and services. For goods trade it is the GATT (GATT 1994 in WTO) and customs clearance at the border provide the basis for measurement. Measures on service trade, however, are based on classifications used in GATS and these involve four modes of service delivery, i.e., cross-border supply, consumption abroad, commercial presence and presence of natural persons. Table 1 reports the statistical coverage for the four GATS modes of services trade. GATS treatment of services thus captures more trade related activities for services than is true of GATT based measures of trade in goods. Data on the growth rates of goods and services trade using current conventional measures are shown in Figures 1-3.

[Figures 1-3 around Here]

Statistics based on modes of service delivery pose special challenges for data collection and statistical methodology (Lipsey, 2006), and by extension, the comparability of trade in goods and trade in services which we emphasize here. Services are often regarded as different from goods and largely non-tradable and having the characteristics of intangibility, non-storability, proximity and simultaneity of production and consumption. But for core services (banking, insurance, transportation, retailing, wholesaling), their intermediation role across time, space, and risk is key.

[Table 1 around Here]

An inter-agency task force headed by the UN statistics division with participation for international organizations including OECD, IMF, UNCTAD, WTO and Eurostat was formed in 2002 to meet the need for a more accurate picture of the size of trade in services and published the "Manual of Statistics of International Trade in Service" (UN, 2002 and 2010; Arkell, 2002). This manual recommends that data on trade in services should include both "detailed presentation of trade in services data on balance of payments basis", and "the compilation of statistics covering the overall activities of overseas affiliates and others". The former lead to the adoption of separate EBOPS (Extended Balance of Payments in Service) data for trade in services, and the latter to the separate compilation of foreign affiliate trade statistics (FATS). The idea was that EBOPS and FATS data could then cover almost all service delivery through the four GATS modes.

Foreign affiliate trade statistics (FATS) (also known as transnational corporation (TNC) data) cover the service operations of foreign direct investment-based enterprises. FATS data include sales, expenditures, profits, value-added, exports and imports, employment and inter and intra firm trade. Also, FATS is divided into an inward and outward component. Inward FATS reflect the operations of foreign-owned firms (in the FDI sense, of a minimum of 10% of book value) in the local economy or country. Outward FATS reflect the operations of firms abroad which are owned by a firm in the home-country (owned in the FDI sense, of involving a minimum of 10% of book value). So far, UNCTAD, OECD, EUROSTAT collect and publish FATS data. Progressively more countries are publishing this data, including the US, Canada, Japan, France, Germany, UK, Italy, and Finland.

FATS data provide a basis for measuring commercial presence and hence total trade in services. The justification of including FAS in service trade is based partly on service features, but also because FDI is considered to be a channel for the delivery of services (OECD, 2001 and 2005a; Eurostat, 2007). The argument is that the development of modern technology, especially information and telecommunication technology, has weakened the claimed distinguishing features of services since more and more services are becoming tradable. Also, deregulation of cross border investment and the search for more efficient use of global resources has spurred the growth of sales of goods through relocated production. Foreign investment has thus become an alternative to cross-border trade in the delivery of goods to consumers, especially for large developed countries such as U.S. and Japan (GAO, 2005).

Thus, in order to accurately assess the significance of trade in both goods and services in the modern global economy one must seemingly inevitably include some treatment of foreign affiliate trade in both portions of the trade data. Present WTO GATT and GATS based procedures only produce FAS data in services, which creates a statistical inconsistency when included in services data. Ideally, trade in both goods and services should be collected either on a conventional BOP basis or on a combined BOP and FATS basis. The presently available combination of BOP goods and FATS services trade according to GATS seems potentially misleading for comparative purposes insofar as trade in goods is under reported.

3. A Methodology for Calculating Both Cross-Border and FAS Measures of Trade in Both Goods and Services

To obtain data on FAS in goods trade, the natural approach is to mimic procedures used for services trade data. But even data on trade in services using EBOPS and FATS encounter consistency problems. First, BOP data is based on a residency basis, while FATS data is based on the location of direct investment. This difference can cause miscalculation of trade in certain cases and can lead to mismeasurement in overall service trade if EBOPS and FATS are simply combined (Eurostat, 2007). Second, data on cross-border service flows are classified by type of service,

treating both sales and purchases alike, whereas data on sales of services through affiliates are classified on the basis of primary industry of affiliates, measuring only affiliates' sales, but without their purchases. Since it is difficult to collect data on specific types of services sold by affiliates (thus far, these data have not been collected by any country), this can make service-by-service comparisons between EBOPS and FATS difficult (Arkell, 2002). Furthermore, the recording of sales without purchases through affiliates does not provide a complete picture of service activities and their economic impacts (Bensidoun and Deniz, 2008).

Similar issues arise with trade in goods if one attempts to add foreign FAS to current cross-border trade data. Sales in a foreign market might come partially from domestic sourcing as well as from imports by companies. Additionally, a foreign affiliate can be partly owned by foreign shareholders. Thus if we add all foreign affiliate sales to cross-border trade data, this will exaggerate the FAS component of trade, but to exclude it totally also seems inappropriate.

To partially account for these problems, we add only a fraction of FAS data using alternative weights based on FAS, affiliates' value added values, and affiliates' profits to range of the possible FAS effect on goods trade. If value added and profits are close to sales minus purchases we can use these to partially eliminate the affiliates' import and joint stock problems. Applying a weight to FAS also aims to avoid exaggerating the FAS effect on good trade statistics. We first use a 0.5 weight in calculating FAS in trade in goods and subsequently modify this.

To combine goods data with data on services, we obtain FATS data from OECD statistics, EU statistics, a pilot survey item of Eurostat, the UNCTAD FDI/FATS database, and the US BEA database. Cross-border EBOPS data can be easily obtained from the UN or WTO database.

In the calculations of goods trade including FAS we report later, we use specific countries' industrial division foreign affiliate activities data from an OECD database (OECD, 2010), since OECD's inward and outward foreign affiliate activity data are reported by industry sector division on a UN international standard industrial classification basis (ISIC Rev.3). This allows us to use data for both the goods and services parts of this data according to an ISIC classification.

The procedure we use is to first collect specific countries' industrial data of foreign affiliate sales, value added and profit from the OECD database. Then, according to ISIC codes, we add all of the goods trade related industries data together as FAS of goods, and then add all of the services trade related industries data together as FAS of services. Table 2 lists the detailed classification division we use in doing this. OECD foreign affiliate activities data use specific national currencies as their reporting units, so we use average yearly exchange rates to convert all this data to US dollars.

[Table 2 around Here]

We take one country's outward foreign affiliate activities as its foreign affiliate exports, and inward foreign affiliate activities as its foreign affiliate imports. We use four different activities to represent alternative measures of exports and imports in value terms in different calculations. These are sales (equal to turnover in the database), value added, profits (equal to gross operating

surplus in the database), and sales with a 0.5 weight. Generally, the value of sales does not accurately measure FAS. As we mention above, all production of GM Chinese autos in China are not of US origin, and if we use the whole sales value as US FAS it exaggerates. To take account of this, we also use value added, profits and sales as proxies for FAS. Value added eliminates intermediate costs, and so reduces host countries' cost contributions to FAS. Profit represents the net income of multinational enterprises after all costs of production, and it shows multinational firms' returns which may be related to FAS.

The initial FAS weight we use to represent host country contributions to such sales is 0.5 of total sales. We also make calculations using full FAS on the grounds that for some countries component imports from third countries are involved, which in turn are produced by affiliates of host country counterparts. Foreign affiliate exports of goods are thus alternatively taken as equal to 0.5 times total outward affiliate sales, full total outward affiliate sales, value added or profits of outward FDI activities in goods industry (ISIC, Rev.3 industry 01-45). Imports equal similar inward activities for goods industries. Table 3 summaries these treatments we use in alternative calculations.

[Table 3 around Here]

After obtaining cross-border and FAS goods and services trade data, we then focus on how four perceptions of the role of trade in individual national economies are affected. These are the size of total goods and services trade, the trade growth rate, trade imbalances and the relative size of trade in goods and services. We contrast the perceptions of each of these for the individual countries we have data for using three different statistical bases; the current mixed GATT and GATS basis, a FAS inclusive basis and a FAS exclusive basis. The GATT and GATS basis denotes the calculations of goods trade under GATT rules and services trade under GATS rules that appear in WTO reports. The FAS inclusive basis denotes both goods and services trade including FAS. The FAS exclusive basis denotes both goods and services trade without FAS data.

4. Some Specific Results of Important Trade Topics with FAS

We use data for five countries (USA, Japan, Germany, Finland and Czech Republic) as individual country cases to calculate total goods and services trade, trade growth rates, trade imbalances and the relative size of trade in goods and services using different bases. The choice of these countries reflects data availability. Tables 4 to 11 report results in detail. We use Figures 4 to 5 to show the whole trade pictures using different trade statistical bases for the US and Japan.

[Tables 4–11 around Here]

[Figures 4-5 around Here]

Several striking features emerge from these tables. First, total trade in goods and services by country changes substantially if we use different statistical bases. For the US, if we take sales as FAS, total trade inclusive of FAS is nearly 3 times that on a FAS exclusive value. If we use value

added and profit as FAS, FAS inclusive total trade is nearly 1.5 times that on a FAS exclusive basis. This is reflective of the feature that the US has substantial multinational activity abroad which can substitute for exports.

Japan, Germany, Finland and Czech Republic also have large numbers for FAS and thus experience similar effects on measures of their trade. Their FAS inclusive value of total trade is more than 2 times of FAS exclusive trade if we use sales as FAS. Japan has large multinational enterprises in key industries such as auto and electronics. Germany also has many multinational enterprises operating abroad. Finland's FAS reflects foreign investment by metal, forest and electronic industries of which NOKIA is a key element. The Czech Republic has been a recipient of large inflows of foreign investment following its entry into EU, which has greatly increased its inward FAS. These calculations thus suggest that FAS in goods are potentially a large part of total trade, and trade itself globally may be much larger than currently thought.

Second, using these measures annual growth rates of total trade in goods and services in different countries under different statistical bases may all be higher than a GATT/GATS basis would suggest. In the US, the average trade growth rate from 2004 to 2007 under different bases varies between 11.7% and 12.9%; higher than economic growth. Japan's average trade growth rate varies between 10.8% and 12.1% under different bases. Germany, Finland and Czech Republic have comparatively higher average growth rates, separately about 14.3%, 17.4% and 24.7%. Finland and Czech Republic have especially more rapid trade growth rate because of their small size and export-oriented economic development strategy. These features all reflect more rapid FAS growth than is the case for conventionally measured cross border trade in goods.

Third, the relative size of trade in goods and services changes a lot under different bases for each of the countries we consider. For the US, if we take sales as FAS, the average relative size on a FAS inclusive basis is 1.43; but this is 3.68 using a FAS exclusive basis; and 0.66 for a GATT and GATS basis. These large differences change if we use value added or profits as FAS, but do not change as much as the size of trade. In Japan, Germany and Czech Republic, a FAS basis is larger than cross-border trade, and the relative size of trade in goods and services is sharply different under different statistical bases. Big changes also occur for Finland. Thus if we measure goods and services trade on a GATT and GATS basis as at present, we may miss much of the trade involved.

Lastly, imbalances in trade are different under the different bases. For the US, the size changes when we use sales as FAS. The average FAS exclusive balance is a deficit of $-698 billion, but the average FAS inclusive balance is a surplus of $477 billion, and the average GATT and GATS basis balance is a smaller deficit of $-356 billion. If we use value added and profits as FAS, the total FAS value decreases. All of the measures under different bases become trade deficits but the amounts are different also. Although the US has a large trade deficit in cross-border trade, its FAS moves trade measures into a surplus and sharply reduces the total imbalance.

These features of the recalculated goods and services trade data all reflect the deepening international division of labor which has prompted US and other OECD firms to invest and operate abroad in recent years. The Japanese, German and Finnish average trade balance from

2003 to 2007 increases respectively by more than 20 times, 4.8 times and 11.9 times when we add FAS to cross-border trade since these three countries have large foreign direct investments and large foreign affiliate sales. The Czech Republic is a special case since its average trade balance is a surplus of $2.2 billion on a FAS exclusive basis, but after adding FAS the trade situation changes to a deficit of -$150.6 billion if we use sales as FAS. The reason is the substantial inflow of foreign investment into the Czech Republic from 2000 following its accession to the EU.

5. Implications and Concluding Remarks

As both integration of world economy and trade liberalization proceed, multinational firms organize more of their production, sales and services abroad. As a result, foreign affiliate activities become a progressively more important part of the international economy. Trade data collected on a current account basis takes a residency-based view of trade, that is, it measures the physical flow of goods and services across a nation's borders, regardless of the nationality or the ownership of parties on either side of the transaction. In the 1940s when GATT based measurements of trade were formalized and national trade and balance of payments accounting methodologies were created, few companies had operations outside the home country. Imports were goods produced by foreign companies, exports by domestic ones.

To fully capture commercial presence and more accurately calculate trade flows, international organizations and countries have begun to collect and publish foreign affiliate activities sales data. Such data opens the way to calculate commercial presence trade data. Here we argue that trade in goods as well as services should include a FAS part, and, if only trade in services has an added FAS part as at present, we cannot compare goods and services trade because of the statistical inconsistency.

It is finally worth noting that global trade imbalances are an important area of global debate impacted by this statistical issue, in turn affecting potential contemporary G20 dialogue and cooperation. Many of the G20 countries including US, China, Japan seek to reduce trade imbalances, but if we take account of the FAS, the imbalance situation changes sharply. Presently measured global imbalances in cross-border trade may thus misrepresent the real situation and raises the issue of whether global G20 efforts are only stabilizing inaccurate statistics, not the real global economy. According to our calculations, the US may actually have a trade surplus or a small deficit and Japan, Germany and Finland may have much larger trade surpluses than at present. It may thus be useful for G20 countries to be aware of these measurement issues.

As economic integration further accelerates in the years ahead, trade statistical methods will need more to change accordingly. Traditional cross-border trade has gradually been substituted by foreign direct investment over the last few decades, because of production segmentation and further international division of labor following increased multinational firms production and operations abroad. Additionally, they now have separate parts of their production abroad firms though outsourcing. We suggest here that statistical recording of international trade now also

needs to respond, and we are able to make some initial calculations to reflect this. They in turn affect (and in some cases sharply) our perceptions on the size, role, and speed of change of trade.

Table 1 The Four Modes of GATS Trade in Services and Their Statistical Coverage (including FATS)

MODE	STATISTICAL COVERAGE
1. Cross-border Supply	<u>BOP</u>: transport (for the most part) (205), communications services (245), insurance services (253), financial services (260), royalties & license fees (266), part of computer and information service (262), other business services (268) and personal, cultural & recreation services (287).
2. Consumption Abroad	<u>BOP</u>: travel and tourism (236), repairs in foreign ports, part of transport (852).
3. Commercial Presence	<u>BOP</u>: Part of construction services (249). <u>FATS</u>: services classified by ISIC industry branch.
4. Presence of Natural persons	<u>BOP</u>: part of computer and information services (262), other business services (268), personal, cultural & recreation services (287), and construction services (249), compensation of employees (310). <u>FATS</u>: expatriate employment in foreign affiliates. <u>Other sources</u>: statistics on migration, employment, etc.

Source: Manual on Statistics of International Trade in Services, 2002, P.24

Table 2 The International Standard Industrial Classification (ISIC Rev.3) Codes Used in Our Data Analysis

Classification	Industries	ISIC Rev.3
Goods	Agriculture, Hunting, Forestry, and Fishing	01+02+05
	Mining and Quarrying	10-14
	Total Manufacturing	15-37
	Electricity, Gas and Water Supply	40-41
	Construction	45
	Total Goods	01-45
Service	Wholesale and Retail Trade, Repair of Motor Vehicles and Personal Goods	50+51+52
	Hotels and Restaurants	55
	Transport, Storage and Communications	60-64
	Financial Intermediation	65+66+67
	Real Estate Renting and Business Activities	70-74
	Other Community and Personal Services	75+80+85+90-99
	Total Services	50-99
Total	Grand Total	01-99

Sources: UN statistics website (http://unstats.un.org/unsd/cr/registry/regcst.asp?Cl=2) and Bensidoun and Deniz (2008), p36.

Table 3 Methods Used in the Calculation of Foreign Affiliate Sales

NAME	SORT	Data Source (OECD)	Calculation Methodology
Affiliate Sales in Goods	Outward (Export)	Outward activity of multinationals by industry sector-ISIC Rev3	Sum (turnover/value added/gross operating surplus of goods industry, ISIC3 01-45)
	Inward (Import)	Inward activity of multinationals by industry sector-ISIC Rev3	Sum (turnover/value added/gross operating surplus of goods industry, ISIC3 01-45)
Affiliate Sales in Services	Outward (Export)	Outward activity of multinationals by industry sector-ISIC Rev3	Sum (turnover/value added/gross operating surplus of goods industry, ISIC3 50-99)
	Inward (Import)	Inward activity of multinationals by industry sector-ISIC Rev3	Sum (turnover/value added/gross operating surplus of goods industry, ISIC3 50-99)

Source: Compiled by Authors

Table 4 Yearly Total Trade in Goods and Services Averaged Over The Period 2003-2007

Unit: Billions US Dollar

Country	Basis for Calculation	Sales Using FAS	Sales Using FAS with 0.5 Weight	Value Added as FAS	Profit as FAS
US	GATT and GATS Basis	6615.46	4975.20	3651.40	3568.27
	FAS Inclusive	9708.36	6521.65	4070.56	3659.61
	FAS Exclusive	3334.94	3334.94	3334.94	3334.94
Japan	GATT and GATS Basis	2172.68	1760.40	1610.16	1374.07
	FAS Inclusive	2977.19	2162.66	1865.03	1423.14
	FAS Exclusive	1348.12	1348.12	1348.12	1348.12
Germany	GATT and GATS Basis	3463.17	2753.13	—	—
	FAS Inclusive	4781.56	3412.33	—	—
	FAS Exclusive	2043.09	2043.10	2043.10	2043.10
Finland	GATT and GATS Basis	239.52	200.48	—	—
	FAS Inclusive	398.68	280.06	—	—
	FAS Exclusive	164.07	164.07	164.07	164.07
Czech Republic	GATS Basis	264.95	226.03	203.25	—
	Including FAS	351.15	269.13	221.47	—
	Excluding FAS	187.12	187.12	187.12	187.12

Notes: A GATT and GATS basis means trade in services includes cross border trade and FAS, but trade in goods only includes cross border trade; FAS inclusive means both trade in goods and trade in services include FAS and cross border trade; FAS exclusive means both trade in goods and trade in services only includes cross border trade. "—" denote lack of data.

Sources: Cross-border goods trade data come from UN database; Cross-border service trade data come from OECD database; Affiliate sales data collected and calculated from OECD database; Exchange rates come from foreign exchange average converter (http://www.oanda.com).

Table 5 Annual Growth Rate of Country Trade in Goods and Services Averaged over The Period 2004-2007

Unit: %

Country	Basis for Calculation	Sales Using FAS	Sales Using FAS with 0.5 Weight	Value Added as FAS	Profit as FAS
US	GATT and GATS Basis	12.42	12.24	11.88	12.63
	FAS Inclusive	12.34	12.22	11.71	12.90
	FAS Exclusive	11.89	11.89	11.89	11.89
Japan	GATT and GATS Basis	12.18	11.99	12.13	11.75
	FAS Inclusive	10.88	11.14	11.87	11.59
	FAS Exclusive	11.72	11.72	11.72	11.72
Germany	GATT and GATS Basis	15.32	14.73	—	—
	FAS Inclusive	14.99	14.61	—	—
	FAS Exclusive	13.77	13.77	13.77	13.77
Finland	GATT and GATS Basis	26.84	21.04	—	—
	FAS Inclusive	13.51	13.41	—	—
	FAS Exclusive	16.16	16.16	16.16	16.16
Czech Republic	GATS Basis	24.15	24.16	24.90	—
	Including FAS	26.46	25.66	25.25	—

	Excluding FAS	24.20	24.20	24.20	24.20

Notes and Sources: The same as Table 4.

Table 6 Annual Relative Size of Country Trade in Goods / Services Averaged Over The Period 2003-2007

Unit: Ratio

Country	Basis for Calculation	Sales Using FAS	Sales Using FAS with 0.5 Weight	Value Added as FAS	Profit as FAS
US	GATT and GATS Basis	0.66	1.12	1.95	2.25
	FAS Inclusive	1.43	1.78	2.58	2.40
	FAS Exclusive	3.68	3.68	3.68	3.68
Japan	GATT and GATS Basis	1.04	1.71	2.22	4.19
	FAS Inclusive	1.81	2.33	2.73	4.37
	FAS Exclusive	4.64	4.64	4.64	4.64
Germany	GATT and GATS Basis	0.95	1.59	—	—
	FAS Inclusive	1.70	2.21	—	—
	FAS Exclusive	4.71	4.72	4.71	4.71
Finland	GATT and GATS Basis	1.22	1.83	—	—
	FAS Inclusive	2.80	3.01	—	—
	FAS Exclusive	3.81	3.81	3.81	3.81
Czech Republic	GATS Basis	1.63	2.66	4.28	—
	Including FAS	2.47	3.34	4.75	—
	Excluding FAS	7.23	7.23	7.23	7.23

Notes and Sources: The same as Table 4.

Table 7 Annual Imbalance of Trade Averaged Over The Period 2003-2007

Unit: Billions US Dollar

Country	Basis for Calculation	Sales Using FAS	Sales Using FAS with 0.5 Weight	Value Added as FAS	Profit as FAS
US	GATT and GATS Basis	-355.82	-526.86	-663.09	-517.29
	FAS Inclusive	476.53	-110.69	-524.27	-461.32
	FAS Exclusive	-697.90	-697.90	-697.90	-697.90
Japan	GATT and GATS Basis	696.47	379.23	291.68	76.69
	FAS Inclusive	1241.58	651.79	500.35	102.13
	FAS Exclusive	61.99	61.99	61.99	61.99
Germany	GATT and GATS Basis	583.68	360.33	—	—
	FAS Inclusive	742.99	439.99	—	—
	FAS Exclusive	153.77	153.77	153.77	153.77
Finland	GATT and GATS Basis	-2.59	2.61	—	—
	FAS Inclusive	101.89	54.85	—	—
	FAS Exclusive	8.55	8.55	8.55	8.55
Czech Republic	GATS Basis	-68.16	-32.96	-13.12	—
	Including FAS	-150.56	-74.16	-30.81	—
	Excluding FAS	2.23	2.23	2.23	2.23

Notes and Sources: The same as Table 4.

Table 8: The Relative Size of Trade in Goods and Services by Country over The Period 2003-2007 (Unit: Ratio)

Country	Basis for Calculation		2003	2004	2005	2006	2007		2003	2004	2005	2006	2007
US	GATT and GATS Basis	Using Sales as FAS	0.65	0.67	0.67	0.68	0.63	Using Sales as FAS with 0.5 Weight	1.10	1.13	1.14	1.14	1.07
	FAS Inclusive		1.42	1.45	1.47	1.45	1.38		1.76	1.79	1.81	1.80	1.71
	FAS Exclusive		3.66	3.63	3.75	3.76	3.62		3.66	3.63	3.75	3.76	3.62
Japan	GATT and GATS Basis		1.08	1.01	0.99	1.07	1.07		1.75	1.64	1.63	1.76	1.75
	FAS Inclusive		1.96	1.74	1.71	1.81	1.82		2.46	2.23	2.22	2.36	2.36
	FAS Exclusive		4.59	4.45	4.54	4.85	4.79		4.59	4.45	4.54	4.85	4.79
Germany	GATT and GATS Basis		0.99	1.01	0.89	0.93	—		1.62	1.66	1.51	1.56	—
	FAS Inclusive		1.76	1.77	1.62	1.66	—		2.26	2.29	2.11	2.17	—
	FAS Exclusive		4.56	4.74	4.68	4.87	—		4.56	4.74	4.68	4.87	—
Finland	GATT and GATS Basis		—	1.39	1.36	0.91	—		—	2.03	1.97	1.48	—
	FAS Inclusive		—	3.31	3.27	1.80	—		—	3.44	3.36	2.22	—
	FAS Exclusive		4.06	3.80	3.58	4.06	3.81		4.06	3.80	3.58	4.06	3.81
Czech Republic	GATT and GATS Basis		1.55	1.68	1.56	1.75	1.63		2.52	2.75	2.55	2.82	2.69
	FAS Inclusive		2.26	2.48	2.31	2.66	2.61		3.09	3.39	3.17	3.56	3.50
	FAS Exclusive		6.66	7.48	7.02	7.31	7.67		6.66	7.48	7.02	7.31	7.67
US	GATT and GATS Basis	Using Value Added as FAS	1.92	1.94	1.98	1.99	1.91	Using Profits as FAS	2.50	2.29	2.17	2.18	2.12
	FAS Inclusive		2.56	2.57	2.62	2.62	2.51		2.63	2.43	2.33	2.35	2.28
	FAS Exclusive		3.66	3.63	3.75	3.76	3.62		3.66	3.63	3.75	3.76	3.62
Japan	GATT and GATS Basis		2.25	2.24	2.24	2.18	2.19		4.19	3.99	4.07	4.35	4.34
	FAS Inclusive		2.79	2.78	2.74	2.65	2.69		4.37	4.18	4.27	4.55	4.49
	FAS Exclusive		4.59	4.45	4.54	4.85	4.79		4.59	4.45	4.54	4.85	4.79

Notes and Sources: The same as Table 4.

Table 9: Total Trade in Goods and Services by Country over The Period 2003-2007 (Unit: Billions US Dollar)

Country	Basis for Calculation		2003	2004	2005	2006	2007		2003	2004	2005	2006	2007
US	GATT and GATS Basis	Using Sales as FAS	5152.78	5849.06	6541.33	7305.21	8228.93	Using Sales as FAS with 0.5 Weight	3867.65	4416.96	4938.89	5516.04	6136.46
	FAS Inclusive		7570.44	8590.31	9632.89	10691.01	12057.15		5076.48	5787.58	6484.67	7208.94	8050.57
	FAS Exclusive		2582.53	2984.85	3336.45	3726.87	4043.98		2582.53	2984.85	3336.45	3726.87	4043.98
Japan	GATT and GATS Basis		1642.66	2037.95	2232.71	2367.83	2582.26		1341.89	1643.77	1794.05	1923.25	2099.04
	FAS Inclusive		2334.34	2784.42	3042.75	3210.19	3514.26		1687.73	2017.01	2199.06	2344.43	2565.05
	FAS Exclusive		1041.12	1249.59	1355.38	1478.68	1615.83		1041.12	1249.59	1355.38	1478.68	1615.83
Germany	GATT and GATS Basis		2730.49	3244.37	3693.38	4184.44	—		2191.94	2606.55	2907.62	3306.43	—
	FAS Inclusive		3791.43	4485.16	5088.30	5761.36	—		2722.41	3226.94	3605.08	4094.88	—
	FAS Exclusive		1653.39	1968.72	2121.86	2428.41	—		1653.40	1968.72	2121.86	2428.41	—
Finland	GATT and GATS Basis		—	194.499	215.971	308.08	—		—	168.59	187.48	245.37	—
	FAS Inclusive		—	351.569	391.619	452.84	—		—	247.13	275.29	317.75	—
	FAS Exclusive		119.27	142.681	158.978	182.67	216.77		119.27	142.68	158.98	182.67	216.77
Czech Republic	GATT and GATS Basis		165.05	221.47	254.04	295.84	388.35		140.27	189.51	215.35	254.85	330.19
	FAS Inclusive		210.91	287.31	329.53	394.57	533.42		163.21	222.42	253.09	304.22	402.73
	FAS Exclusive		115.49	157.54	176.66	213.86	272.03		115.49	157.54	176.66	213.86	272.03
US	GATT and GATS Basis	Using Value Added as FAS	2710.15	3174.05	3591.05	4011.78	4354.32	Using Profits as FAS	2833.02	3266.15	3648.67	4074.40	4434.74
	FAS Inclusive		2760.58	3245.99	3684.44	4128.79	4478.25		3168.95	3649.72	4066.98	4535.63	4931.55
	FAS Exclusive		2582.53	2984.85	3336.45	3726.87	4043.98		2582.53	2984.85	3336.45	3726.87	4043.98
Japan	GATT and GATS Basis		1058.93	1275.31	1384.02	1507.39	1644.72		1235.26	1474.71	1606.52	1787.46	1946.86

		2003	2004	2005	2006	2007		2003	2004	2005	2006	2007
FAS Inclusive		1096.50	1320.52	1440.79	1564.13	1693.79		1445.32	1716.57	1853.17	2052.61	2257.50
FAS Exclusive		1041.12	1249.59	1355.38	1478.68	1615.83		1041.12	1249.59	1355.38	1478.68	1615.83

Notes and Sources: The same as Table 4.

Table 10: Trade Imbalance of Trade by Country over The Period 2003-2007 (Unit: Billions US Dollar)

Country	Basis for Calculation		2003	2004	2005	2006	2007		2003	2004	2005	2006	2007
US	GATT and GATS Basis	Using Value Added / Using Sales as FAS	-334.87	-379.95	-339.59	-374.69	-349.99	Using Sales as FAS with 0.5 Weight / Using Profits as FAS	-429.59	-514.45	-547.82	-590.91	-551.54
	FAS Inclusive		218.24	370.64	521.25	566.74	705.75		-153.03	-139.16	-117.39	-120.19	-23.67
	FAS Exclusive		-524.30	-648.96	-756.04	-807.12	-753.09		-524.30	-648.96	-756.04	-807.12	-753.09
Japan	GATT and GATS Basis		616.99	667.31	701.22	714.51	782.34		337.32	372.09	378.16	381.98	426.61
	FAS Inclusive		975.26	1178.99	1266.05	1323.90	1463.70		516.46	627.94	660.58	686.67	767.29
	FAS Exclusive		57.65	76.88	55.11	49.45	70.88		57.65	76.88	55.11	49.45	70.88
Germany	GATT and GATS Basis		428.52	536.90	664.95	704.37	—		262.35	339.96	405.81	433.22	—
	FAS Inclusive		549.32	675.50	834.29	912.85	—		322.75	409.26	490.48	537.46	—
	FAS Exclusive		96.17	143.02	146.67	162.07	220.94		96.17	143.02	146.67	162.07	220.94
Finland	GATT and GATS Basis		—	-14.74	-26.04	32.99	—		—	-2.03	-10.02	19.86	—
	FAS Inclusive		—	96.78	95.59	113.33	—		—	53.73	50.79	60.03	—
	FAS Exclusive		9.98	10.69	6.01	6.73	9.34		9.98	10.69	6.01	6.73	9.34
Czech Republic	GATT and GATS Basis		-47.90	-57.11	-64.39	-66.63	-104.75		-25.23	-28.72	-30.63	-31.42	-48.82
	FAS Inclusive		-92.34	-120.33	-136.11	-162.14	-241.87		-47.45	-60.33	-66.49	-79.18	-117.38
	FAS Exclusive		-2.56	-0.34	3.14	3.79	7.12		-2.56	-0.34	3.14	3.79	7.12
US	GATT and GATS Basis		-504.76	-625.55	-715.57	-765.49	-704.05		-420.13	-501.21	-559.96	-603.32	-501.81
	FAS Inclusive		-412.94	-495.57	-575.08	-614.68	-523.08		-376.67	-459.34	-506.77	-541.70	-422.12

	FAS Exclusive		-524.30	-648.96	-756.04	-807.12	-753.09	-524.30	-648.96	-756.04	-807.12	-753.09
Japan	GATT and GATS Basis		221.88	275.66	277.79	323.83	359.26	67.83	90.45	69.24	67.01	88.88
	FAS Inclusive		389.18	468.81	472.85	544.61	626.32	81.89	111.57	98.52	102.73	115.95
	FAS Exclusive		57.65	76.88	55.11	49.45	70.88	57.65	76.88	55.11	49.45	70.88

Notes and Sources: The same as Table 4.

Table 11: Annual Growth Rate of Trade in Goods and Services by Country over The Period 2003-2007 (Unit: %)

Country	Basis for Calculation		2004	2005	2006	2007		2004	2005	2006	2007
US	GATT and GATS Basis		13.51	11.84	11.68	12.64		14.20	11.82	11.69	11.25
	FAS Inclusive		13.47	12.14	10.98	12.78		14.01	12.04	11.17	11.67
	FAS Exclusive		15.58	11.78	11.70	8.51		15.58	11.78	11.70	8.51
Japan	GATT and GATS Basis		24.06	9.56	6.05	9.06		22.50	9.14	7.20	9.14
	FAS Inclusive		19.28	9.28	5.50	9.47		19.51	9.03	6.61	9.41
	FAS Exclusive	Using Sales as FAS	20.02	8.47	9.10	9.28	Using Sales as FAS with 0.5 Weight	20.02	8.47	9.09	9.28
Germany	GATT and GATS Basis		18.82	13.84	13.29	—		18.92	11.55	13.72	—
	FAS Inclusive		18.29	13.45	13.23	—		18.53	11.72	13.59	—
	FAS Exclusive		19.07	7.78	14.45	—		19.07	7.78	14.45	—
Finland	GATT and GATS Basis		—	11.04	42.65	—		—	11.20	30.88	—
	FAS Inclusive		—	11.39	15.63	—		—	11.40	15.42	—
	FAS Exclusive		19.63	11.42	14.90	18.67		19.63	11.42	14.90	18.67
Czech Republic	GATT and GATS Basis		34.19	14.71	16.45	31.27		35.10	13.64	18.34	29.56
	FAS Inclusive		36.22	14.69	19.74	35.19		36.28	13.79	20.20	32.38
	FAS Exclusive		36.39	12.14	21.06	27.20		36.39	12.14	21.06	27.20

		Using Value Added as FAS					Using Profits as FAS				
US	GATT and GATS Basis		15.29	11.7115	11.67	8.84		17.12	13.14	11.72	8.54
	FAS Inclusive		15.17	11.4328	11.52	8.73		17.58	13.51	12.06	8.46
	FAS Exclusive		15.58	11.7794	11.70	8.51		15.58	11.78	11.70	8.51
Japan	GATT and GATS Basis		19.39	8.94	11.2632	8.92		20.43	8.52	8.91	9.11
	FAS Inclusive		18.77	7.96	10.7616	9.98		20.43	9.11	8.56	8.29
	FAS Exclusive		20.02	8.47	9.0969	9.28		20.02	8.47	9.09	9.28

Notes and Sources: The same as Table 4.
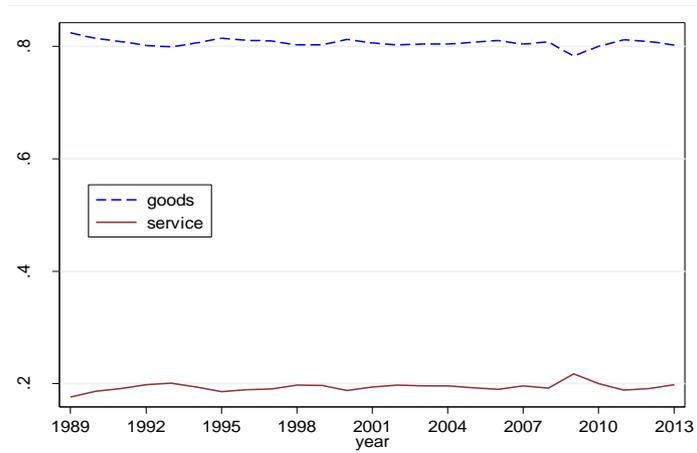
Figure 1 Share of Goods Trade and Service Trade in Total World Trade (1989-2013)
Source: WTO World Trade Report, 1990-2014
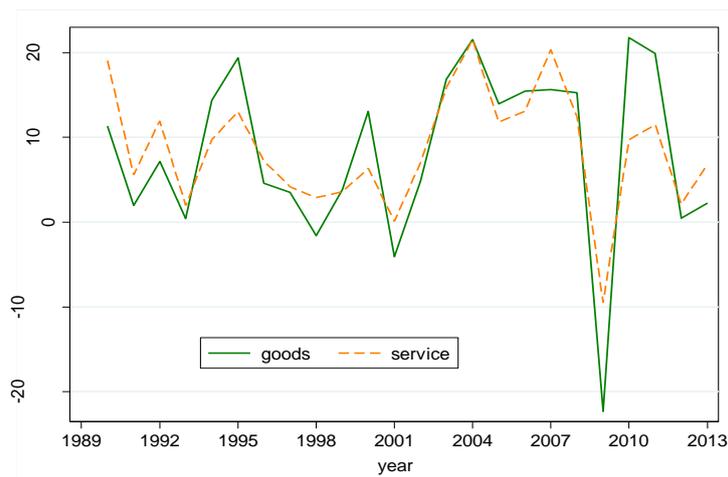
Figure 2 Growth Rates of World Goods and Services Trade (1990-2013)
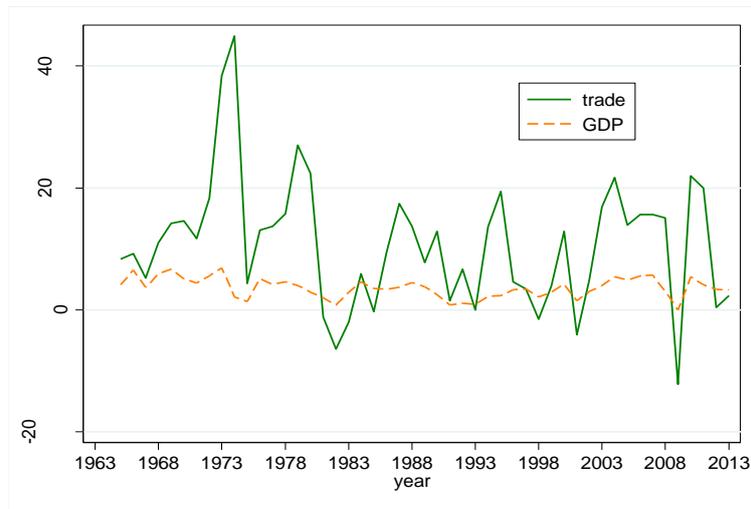Source: WTO World Trade Report, 1990-2014

Figure 3 Trade and GDP Global Growth Rate (1965-2013)
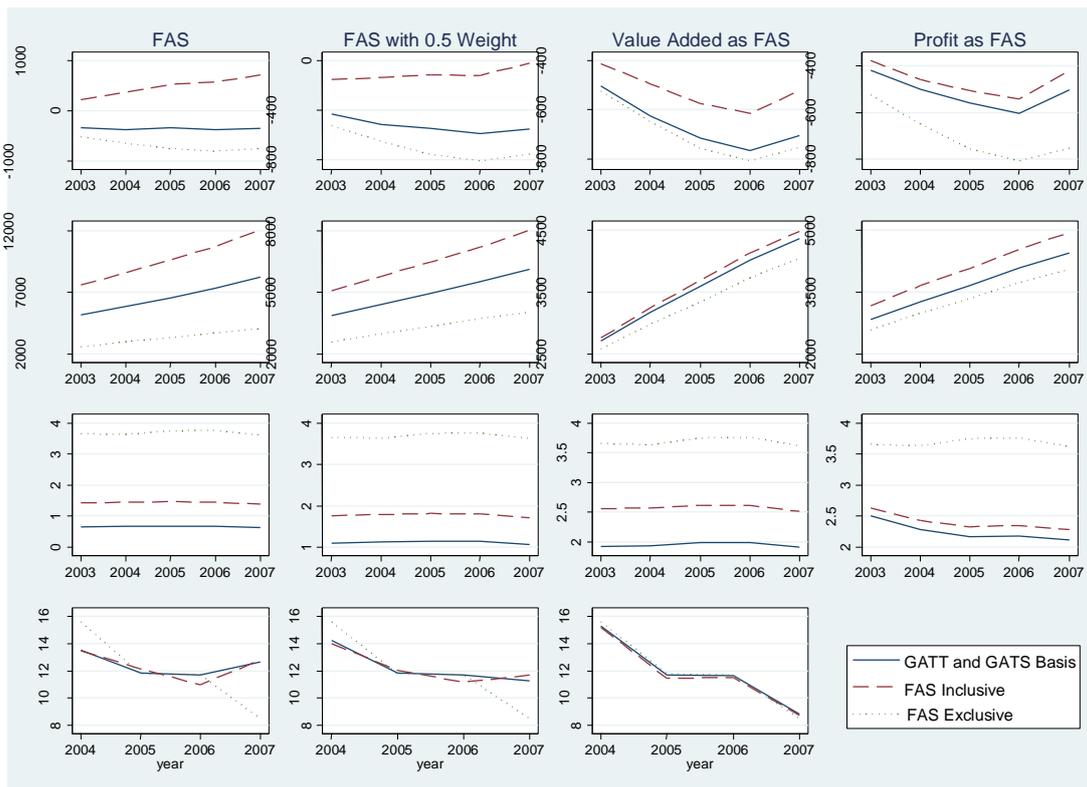
Source: WTO World Trade Report, 2014

Figure 4 US Trade Situations under Different Statistical Bases

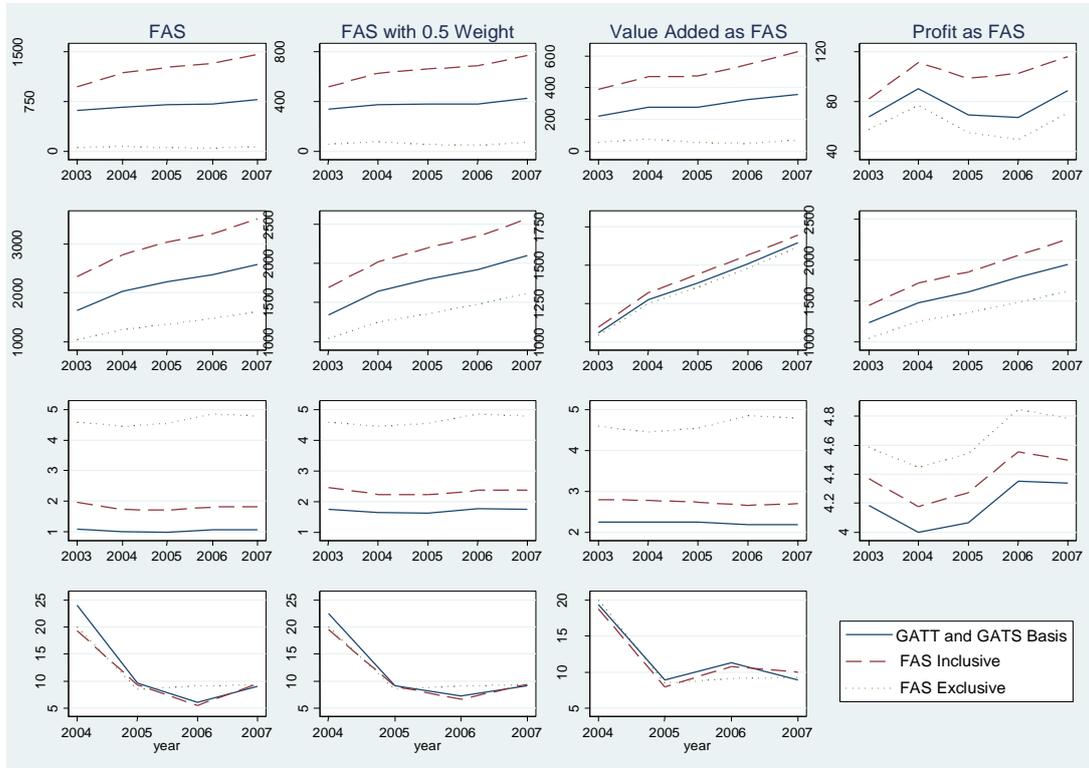Unit: Billion US$, Ratio and %

Sources: The same as Table 4

Figure 5 Japan Trade Situations under Different Statistical Bases
Unit: Billion US$, Ratio and %
Sources: The same as Table 4

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