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## **Benchmarking U.S. Services Exports to Brazil**

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# Benchmarking U.S. Services Exports to Brazil

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## *Abstract*

In this paper, we present an outcomes-based assessment of the performance of U.S. exporters of services to the Brazilian market in 2010, the most recent year for which data are available. We develop a set of benchmark export values based on the value of U.S. exports of the same category of services to other destination countries that are economically similar to Brazil. This benchmarking analysis indicates that annual U.S. exports of telecommunications services to Brazil in 2010 were more than \$100 million above their benchmark value, while annual U.S. exports of some business, professional, and technical services fell short of their benchmark value by more than \$100 million in that year.

*Key Words:* International Trade, Services, Telecommunications, Brazil, United States

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# Benchmarking U.S. Services Exports to Brazil

## 1. Introduction

According to the Bureau of Economic Analysis (BEA) of the U.S. Department of Commerce, U.S. exports of private services to Brazil totaled \$7.5 billion in 2006.<sup>2</sup> They accounted for 1.9 percent of total U.S. services exports in that year. By 2010, they had more than doubled, to \$16.5 billion, and accounted for 3.1 percent of total U.S. services exports.

There are several questions that we can ask to better understand the expansion of U.S. services exports to Brazil. Does this growth exceed or fall short of what we would expect? Is it in line with the growth of the Brazilian economy over this period? Are the export values similar to those of U.S. exports of private services to countries that are comparable in size, distance from the United States, level of economic development, level of barriers to imports from the United States, and language?

To address these questions, we apply the tools of performance benchmarking to the data on U.S. exports of private services to each of its major trading partners. We compare the U.S. exports of private services to Brazil to averages for such exports to groups of comparable countries that serve as benchmarks. In some categories of services, exports to Brazil are in line with those to the comparables. However, exports in other service categories are far in excess of exports to the comparables, while exports in still others fall short.

In the next section, we explain the principles of performance benchmarking and discuss its broad application to a range of economic issues. Then we report our benchmarking analysis. The first step in this analysis is to group countries by economic characteristics that are known to affect international trade flows. The economics literature on gravity models of international trade demonstrates that the following

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<sup>2</sup> All of the statistics on U.S. private services exports in this paper are from BEA's cross-border trade in services database, described in Koncz-Bruner and Flatness, "U.S. International Services," 2011.

factors are good predictors of the value of trade flows between pairs of countries: the size of each country, the distance between the countries, the level of economic development of each country, whether they share the same language, and whether they are economically integrated by preferential trade agreements.<sup>3</sup> We use these economic factors to filter a set of 33 countries that import services from the United States and to define groups of countries that are, in different ways, most comparable to Brazil.

Applying each of the economic filters in turn to the set of 33 countries, we calculate benchmark shares. Before making these international comparisons, we normalize the value of U.S. exports to each country by the size of that country's aggregate expenditures—i.e., we divide the value of U.S. exports of private services to each country by that country's gross domestic product (GDP) in the same year.<sup>4</sup> We calculate benchmark shares for six groups of comparable countries. The six groups are all countries other than Brazil, other middle-income countries, other countries with a primary language other than English, other countries that do not have bilateral free trade agreements with the United States, other countries that are not adjacent to the United States, and other countries that share all of these similarities with Brazil. We consider all of these alternatives in order to illustrate which of these economic factors are relevant when constructing an economically relevant benchmark for U.S. private services exports to Brazil. The tradeoff when constructing a benchmark is that we would like to limit the group of countries to those that are economically similar to Brazil, but we also want to average the services trade values for 2010 over a number of countries so that the benchmark values are less likely to be dominated by the idiosyncratic values of a few outliers.

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<sup>3</sup> Kimura and Lee, "The Gravity Equation in International Trade in Services," 2006, is an excellent example of a study that applies the gravity model to international trade in services. Prominent examples of gravity models of trade in goods include Frankel, *Regional Trading Blocs*, 1997; Anderson and van Wincoop, "Gravity with Gravitas," 2003; Santos Silva and Tenreyro, "The Log of Gravity," 2006; and Baier and Bergstrand, "Bonus Vetus OLS," 2009.

<sup>4</sup> We do not use the GDP of the country of origin in the analysis, despite its significance in gravity models of international trade flows, because all of the trade flows that we consider are from the same country of origin, the United States.

The benchmarking analysis tells us which categories of services exports stand out. We calculate the differences in the actual dollar value of exports relative to the value implied by the benchmark. These calculations indicate that the actual values often varied from benchmark values, sometimes significantly. For example, annual U.S. exports of telecommunication services to Brazil were more than \$100 million above their benchmark value in 2010, while annual U.S. exports of some business, professional, and technical services fell short of the benchmark value by more than \$100 million in that year.

The categories of services with unusual trade flows are candidates for more detailed investigation. The next step is to focus on these outliers and to try to determine the underlying causes of the unusual trade flows, to determine whether unusually favorable outcomes can be replicated and whether poor outcomes can be avoided. For most services categories, this next step is beyond the scope of this paper. However, we can make some headway with telecommunication services, the largest positive outlier in the benchmarking analysis. We provide some analysis of these export successes.

## **2. What is Performance Benchmarking?**

Performance benchmarking is an outcomes-based assessment of economic performance. It involves comparing a specific economic outcome to the average over a set of comparables. In this paper, we benchmark *within* each category of services. We compare the value of a particular category of U.S. exports to Brazil to the value of that category's U.S. exports to economically similar destination markets. The principles of benchmarking have been applied in many different contexts to assess the economic performance of countries, industries, firms, and even individual managers.<sup>5</sup>

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<sup>5</sup> Chan, Dimmock, and Lakonishok, "Benchmarking Money Manager Performance," 2009; Feeny and Rogers, "Innovation and Performance: Benchmarking Australian Firms," 2003; Gauri, Pauler, and Trivedi, "Benchmarking Performance in Retail Chains," 2009; and Jetmarova, "Benchmarking: Methods of Raising Company Efficiency," 2011, are recent examples of benchmarking analysis applied to this diverse set of economic issues.

There are two general advantages of benchmarking that account for the widespread use of the approach. First, performance benchmarking goes directly to the bottom line: it assesses whether the specific economic outcome is higher or lower than we would expect, based on the most relevant group of comparables. Second, it is more practical to measure performance based on outcomes, rather than inputs or efforts that contribute to performance, when the latter are difficult or even impossible to observe directly.

### **3. BEA Data on U.S. Exports of Services**

Our measures of U.S. exports of private services by country and category are from the database on cross-border trade in services compiled from responses to BEA surveys. Responding companies reported the dollar value of their sales of selected services and intangible assets to foreign entities in each destination country.

For the statistical analysis in this study, we focus on U.S. exports of private services to the 33 destination countries that are separately identified in the BEA data.<sup>6</sup> Table 1 provides a list of the 33 countries, which includes Brazil, along with the total dollar value of U.S. exports of private services to each country in 2010, the ratio of these exports to the dollar value of the country's GDP in 2010, and the level of economic development of the country, based on the country's classification in the World Bank's World Development Indicators. BEA started publishing significantly more disaggregated services trade data in 2006, and therefore our analysis focuses on the five-year period from 2006 to 2010.

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<sup>6</sup> BEA reports Belgium and Luxembourg together, as if they were one country. BEA also reports Hong Kong as if it were a separate country and reports Taiwan separately.

We examine the 13 categories of services listed in table 2.<sup>7</sup> The table reports the dollar value of U.S. private services exports to the world and to Brazil in 2006 and 2010. It also reports the value of U.S. exports to Brazil as a share of total U.S. exports in each services category in these two years.

Exports of telecommunications services to Brazil stand out as a share of U.S. total exports of the category. U.S. exports to Brazil and to the world grew substantially over the five-year period in all of the categories except for the residual category called “all other private services.”<sup>8</sup> The three categories of U.S. services exports to Brazil with the highest value in 2010 were travel services (not including airfare), royalties and license fees, and telecommunications services.<sup>9</sup>

#### **4. Comparable Countries and Benchmark Shares**

We consider several single-factor benchmarks for the U.S. services exports to Brazil. The first comparable is the ratio of U.S. exports to a given country in 2010 (within each category of services) to the country’s GDP in 2010, averaged over 32 countries (i.e., all the countries listed in table 1 other than Brazil). The purpose of averaging over the 32 countries is to offset economic factors that are unique or idiosyncratic to each country. This is the simplest benchmarking comparison, because it includes all the countries for which we have data on U.S. exports of private services without considering whether they are economically similar to Brazil. The 32 countries include high-income countries as well as other middle-income countries. This comparable serves as a starting point for our discussion. Table 3 reports the

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<sup>7</sup> BEA reports more detailed subcategories, but for many countries the values for these sub-categories are not publically disclosed.

<sup>8</sup> This category includes the following subcategories: operational leasing; advertising; construction, architectural and engineering services; industrial engineering; installation, maintenance, and repair of equipment; legal services; medical services; mining services; sports and performing arts; trade-related services; and other.

<sup>9</sup> The exports of travel services are the U.S. receipts for services sold to Brazilian residents while they are visiting the United States. Similarly, exports of education services are the receipts for services delivered to Brazilians in the United States.

benchmark shares for this and the other comparables we will discuss, alongside the actual shares of exports to Brazil.

The second comparable focuses on 12 countries that are similar to Brazil in terms of their level of economic development. This benchmark, a subset of the 32 countries in the first benchmark, is a simple average over the other middle-income countries. It is more realistic to compare Brazil to countries with a similar level of economic development. We can see from the difference between the first and second columns of benchmark shares that this is an important distinction. The average shares of the 12 other middle-income countries are lower in most but not all of the categories of services.

The third comparable focuses on 23 countries that are similar to Brazil in that they do not speak English as their primary language. The benchmark share is a simple average over the other countries in which English is not the primary language, without a distinction for the country's level of economic development. Language can be a significant barrier to trade in services. The benchmark shares in the third set are the same as or lower than the first set for all but one category of services (all other private services).

The fourth comparable focuses on 26 countries that are similar to Brazil in terms of barriers to trade with the United States. The benchmark share is a simple average over the other countries that do not have a bilateral free trade agreement with the United States. The fourth set of benchmark shares are the same as or lower than the first set for all but one category of services (management, consulting, and public relations).

Finally, the fifth comparable focuses on the 30 countries that are not adjacent to the United States. Specifically, the benchmark share is a simple average of these 30 countries. The fifth set of benchmark shares are the same as or smaller than the first set for all of the categories of services.

In sum, the benchmark shares vary depending on the economic factor used to filter the countries. Since all four factors (economic development, language, trade barriers, and distance) move the

benchmark shares relative to the simplest 32-country set of benchmark shares, we conclude that they are all relevant in defining a set of economically comparable countries. In the next section, we combine the four factors by constructing a set of multifactor benchmark shares.

## **5. The Dollar Value of the Differences from the Benchmarks**

We report the multifactor benchmark shares in table 4. They include the seven countries that, like Brazil, are middle-income countries, do not have a bilateral free trade agreement with the United States, do not speak English as their primary language, and are not adjacent to the United States. The seven countries are Argentina, China, Hong Kong, Indonesia, Malaysia, Thailand, and Venezuela. We view the multifactor benchmark shares as the best among the six alternatives in tables 3 and 4, since they take into account all of the gravity factors.

Next, we calculated the difference between the recorded actual value of U.S. private services export revenues to Brazil, in millions of dollars, and the value corresponding to the multifactor benchmark shares.<sup>10</sup> This provides a dollar estimate of the difference from the benchmark values within each category of services.

The category of services that exceeds the multifactor benchmark shares overall by the largest amount—in other words, that has the largest “export excess”—is telecommunications services. The estimated export excess in this category is \$111 million in 2010. If we calculate the difference between recorded actual exports and benchmark exports in 2010 for each single country in the group of multifactor comparables, rather than for the group as a whole, then the difference ranges from a \$220 million export excess to a \$118 million export shortfall. There are also estimated export excesses for the group as a whole in the royalties and license fees, travel, and passenger fares categories.

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<sup>10</sup> The latter is the product of the multifactor benchmark share and Brazil’s GDP in 2010.

The category of services with the largest export shortfall is other business, professional, and technical services. We estimated the export shortfall in this category at \$126 million in 2010. Again, if the difference between observed exports and benchmark exports in 2010 is calculated for each single country in the group of multifactor comparables, then the difference ranges from a \$313 million export shortfall to a \$44 million export excess. There are also estimated export shortfalls in the financial services, other transportation services, education, management, consulting and public relations, computer and information services, and insurance categories.

As a final check on the robustness of our benchmarking estimates, we recalculated the multifactor shares using all of the data for 2006 through 2010, rather than limiting the averages to the shares of the comparables in 2010. Table 5 presents a side-by-side comparison of the two sets of multifactor benchmark shares. Since the benchmark shares are not significantly different, the calculated dollar value of the difference will be similar. We conclude that our estimates are robust over the longer time series.

## **6. The Next Step**

As we have explained above, the benchmarking analysis provides a simple way to compare outcomes across destination countries and to identify outliers. Its main limitation is that it does not distinguish among alternative explanations of the outliers. U.S. exports in particular categories of services could be greater than expected because they face fewer barriers in Brazil. They could be greater because there are few local competitors. They could indicate that the Brazilian market is even larger than the country's aggregate expenditure levels would suggest. The aggregate trade statistics cannot tell us which of these factors is most important. The next step, therefore, would be to investigate these alternatives for each country and category. For the most part, this next step is beyond the scope of this paper.

However, we can make some headway with telecommunication services, the greatest positive outlier in the benchmarking analysis. In 2010, U.S. cross-border exports of telecommunication services to

Brazil totaled approximately \$2.2 billion, up 40 percent from 2009. This increase is almost exactly in line with the compound annual growth rate of 41 percent recorded during 2006–10.<sup>11</sup> Even accounting for the growth of the overall Brazilian economy, U.S. exports of telecommunication services stand out. To explain these unusual export volumes, it would be helpful to examine firm-level data on the cross-border transactions, but these data are not publicly available.<sup>12</sup> Nevertheless, there is some indication that the strong growth in exports to Brazil over the past few years has stemmed from an increase in receipts from the provision of enterprise services by U.S. telecommunication companies.<sup>13</sup> Enterprise services are defined as telecommunication services offered to business customers (as opposed to individual consumers), with commonly offered services including international telephone and Internet access services as well as a suite of services associated with the design, operation, and management of corporate data networks. The particularly strong growth in demand for such services over the past five years has likely been due to surging levels of international trade conducted by Brazilian companies. U.S. telecommunication services providers, including AT&T, Verizon, and Level 3, are leaders in furnishing enterprise services worldwide, and are therefore well positioned to expand along with the emerging Brazilian economy. They offer a wide variety of telecommunication services to both foreign and domestic businesses via multiple network points-of-presence in Brazil.

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<sup>11</sup> Koncz-Bruner and Flatness, “U.S. International Services,” 2011, 42.

<sup>12</sup> BEA official, email message to USITC staff, August 13, 2012.

<sup>13</sup> For example, Koncz-Bruner and Flatness, “U.S. International Services,” 2011, report that affiliated transactions now account for more than half of U.S. global telecommunication companies’ exports.

## **7. Conclusions**

U.S. exports of services to Brazil more than doubled between 2006 and 2010, though the pattern of expansion varied greatly across categories of services. U.S. exports of telecommunication services to Brazil expanded more than exports of the same category of services to comparable countries, while exports of business, professional, and technical services expanded much less.

We find benchmarking analysis, the approach used in this article, to be a promising addition to the economist's toolkit. The methodology is quick to implement as a preliminary assessment of outliers, and it is straightforward to explain. It provides a useful method for identifying outlier categories of services for further examination.

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**Table 1: U.S. exports of private services by country in 2010**

Destination country	U.S. exports of private services, 2010 (million \$)	U.S. exports as a share of destination country's GDP (percent)	Level of economic development
Argentina	4,576	1.24	Middle income
Australia	13,168	1.04	High income
Belgium-Luxembourg	7,618	1.46	High income
Brazil	16,515	0.79	Middle income
Canada	50,521	3.20	High income
Chile	2,324	1.14	Middle income
China	21,135	0.37	Middle income
France	15,843	0.62	High income
Germany	24,118	0.74	High income
Hong Kong	5,507	2.45	Middle income
India	10,319	0.60	Middle income
Indonesia	1,596	0.23	Middle income
Ireland	24,840	12.02	High income
Israel	3,489	1.60	High income
Italy	8,349	0.41	High income
Japan	44,750	0.82	High income
Korea, Republic of	15,105	1.49	High income
Malaysia	2,096	0.88	Middle income
Mexico	24,110	2.34	Middle income
Netherlands	12,874	1.65	High income
New Zealand	1,643	1.16	High income
Norway	2,726	0.66	High income
Philippines	2,003	1.00	Middle income
Saudi Arabia	4,521	1.04	High income
Singapore	9,709	4.36	High income
South Africa	2,476	0.68	Middle income
Spain	6,457	0.46	High income
Sweden	5,459	1.19	High income
Switzerland	20,313	3.85	High income
Taiwan	9,292	2.18	High income
Thailand	1,931	0.61	Middle income
United Kingdom	48,535	2.15	High income
Venezuela	5,013	1.28	Middle income

Sources: Export data from BEA, GDP data from UN National Accounts, level of economic development based on World Bank classifications.

**Table 2: U.S. exports of private services to Brazil and the world (million \$)**

	To world in 2006	To world in 2010	To Brazil in 2006	To Brazil in 2010
Travel	86,187	103,505	1,947 (2.3%)*	4,236 (4.1%)
Passenger fares	21,638	30,931	707 (3.3%)	1,683 (5.4%)
Other transportation services	35,824	39,936	683 (1.9%)	998 (2.5%)
Royalties and license fees	83,549	105,583	1,514 (1.8%)	3,123 (3.0%)
Education	14,647	21,291	180 (1.2%)	257 (1.2%)
Financial services	47,882	66,387	698 (1.5%)	1,544 (2.3%)
Insurance	9,445	14,605	65 (0.7%)	265 (1.8%)
Telecommunications	2,105	11,095	550 (26.1%)	2,159 (19.5%)
Computer and information services	10,079	13,766	290 (2.9%)	251 (1.8%)
Management, consulting, and public relations	21,421	30,858	97 (0.5%)	249 (0.8%)
Research, development, and testing	12,810	20,954	20 (0.2%)	47 (0.2%)
Other business, professional, technical	42,135	60,718	743 (1.8%)	1,658 (2.7%)
All other private services	11,274	10,646	45 (0.4%)	45 (0.4%)

*Note:* Brazil's share of U.S. total exports is reported in parentheses.

**Table 3: U.S. services exports as a percent of destination country's GDP, by category for 2010**

Category of services	Brazil	Benchmark shares				
		Other 32 countries	Other middle-income countries	Other non-English-speaking countries	Others without U.S. FTA	Others outside North America
Travel	0.20	0.25* (0.03, 1.06)	0.22 (0.03, 0.59)	0.21 (0.03, 0.59)	0.20 (0.03, 0.50)	0.22 (0.03, 0.52)
Passenger fares	0.08	0.07 (0.00, 0.27)	0.08 (0.00, 0.25)	0.06 (0.00, 0.25)	0.05 (0.00, 0.19)	0.06 (0.00, 0.19)
Other transportation services	0.05	0.13 (0.01, 0.65)	0.12 (0.01, 0.65)	0.13 (0.01, 0.65)	0.11 (0.01, 0.65)	0.12 (0.01, 0.65)
Royalties and license fees	0.15	0.49 (0.03, 6.22)	0.13 (0.03, 0.26)	0.27 (0.03, 1.57)	0.49 (0.03, 6.22)	0.48 (0.03, 0.22)
Education	0.01	0.05 (0.01, 0.22)	0.06 (0.01, 0.19)	0.05 (0.01, 0.22)	0.05 (0.01, 0.22)	0.05 (0.01, 0.22)
Financial services	0.07	0.16 (0.03, 0.52)	0.11 (0.03, 0.50)	0.13 (0.04, 0.50)	0.15 (0.03, 0.52)	0.15 (0.03, 0.21)
Insurance	0.01	0.04 (0.00, 0.21)	0.02 (0.00, 0.07)	0.03 (0.00, 0.10)	0.03 (0.00, 0.21)	0.03 (0.00, 0.16)
Telecommunications	0.10	0.03 (0.00, 0.16)	0.05 (0.00, 0.16)	0.03 (0.00, 0.16)	0.03 (0.00, 0.16)	0.03 (0.00, 0.16)
Computer and information services	0.01	0.04 (0.00, 0.14)	0.03 (0.00, 0.10)	0.03 (0.00, 0.14)	0.04 (0.00, 0.14)	0.04 (0.00, 0.14)
Management, etc.	0.01	0.13 (0.01, 1.53)	0.04 (0.01, 0.21)	0.08 (0.01, 0.50)	0.14 (0.01, 1.52)	0.13 (0.01, 1.53)
Research, etc.	0.00	0.11 (0.00, 1.60)	0.01 (0.00, 0.04)	0.06 (0.00, 0.61)	0.11 (0.00, 1.60)	0.11 (0.00, 1.60)
Other business, professional, etc.	0.08	0.20 (0.04, 1.01)	0.15 (0.04, 0.29)	0.15 (0.04, 0.29)	0.17 (0.04, 1.01)	0.19 (0.04, 1.01)
All other private services	0.00	0.02 (0.00, 0.51)	0.05 (0.00, 0.51)	0.03 (0.00, 0.51)	0.01 (0.00, 0.04)	0.01 (0.00, 0.04)

*Note:* The table reports the group mean of the ratio in percentage points and the range of values in parentheses.

**Table 4: Multifactor benchmark share and estimate of the dollar value of the deviation from the benchmark, by category for 2010**

	Brazil	Multifactor benchmark share	Dollar value of the deviation from the benchmark (million \$)
Travel	0.20	0.18* (0.03, 0.44)	85 (-1022, 737)
Passenger fares	0.08	0.06 (0.00, 0.19)	30 (-181, 136)
Other transportation services	0.05	0.13 (0.01, 0.65)	-86 (-601, 35)
Royalties and license fees	0.15	0.12 (0.03, 0.26)	92 (-353, 380)
Education	0.01	0.06 (0.02, 0.11)	-12 (-26, -2)
Financial services	0.07	0.13 (0.04, 0.50)	-90 (-654, 60)
Insurance	0.01	0.01 (0.00, 0.03)	-1 (-6, 3)
Telecommunications	0.10	0.05 (0.00, 0.16)	111 (-118, 220)
Computer and information services	0.01	0.03 (0.00, 0.10)	-4 (-22, 2)
Management, consulting, and public relations	0.01	0.05 (0.01, 0.21)	-10 (-50, 0)
Research, development, and testing	0.00	0.01 (0.00, 0.04)	0 (-2, 0)
Other business, professional, technical	0.08	0.16 (0.05, 0.27)	-126 (-313, 44)
All other private services	0.00	0.00 (0.00,0.01)	0 (0, 0)

*Note:* The table reports the group mean of the ratio in percentage points and the range of country-specific values in parentheses.

**Table 5: Side-by-side comparison of multifactor benchmark shares for different time periods**

	Multifactor benchmark share for 2010 only	Multifactor benchmark share for 2006 to 2010
Travel	0.18	0.20
Passenger fares	0.06	0.07
Other transportation services	0.13	0.13
Royalties and license fees	0.12	0.13
Education	0.06	0.06
Financial services	0.13	0.14
Insurance	0.01	0.02
Telecommunications	0.05	0.05
Computer and information services	0.03	0.03
Management, consulting, and public relations	0.05	0.06
Research, development, and testing	0.01	0.01
Other business, professional, technical	0.16	0.15
All other private services	0.00	0.00

*Note:* The table reports the group mean of the ratio in percentage points.