INTERNATIONAL TRADE ADMINISTRATION

Manufacturing and Services Economics Brief

U.S. International Business Travel:

Its Impact on U.S. Merchandise Exports

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Executive Summary

Achieving the National Export Initiative goal of doubling U.S. exports within five years will require market strategies that increase the competiveness of U.S. industries. Outbound U.S. international business travel is likely to have a key role. It helps U.S. industries establish their presence and brand appeal abroad. It brings them face-to-face with qualified potential buyers, agents, distributors, and other business partners and provides them with first-hand knowledge of overseas markets. U.S. international business travel, in turn, is facilitated by government-sponsored trade missions and private industry efforts. In this economics brief, we quantify the economic benefits of U.S. international business travel in terms of the dollar value of U.S. merchandise exports that it generates.

We find that:

- U.S. outbound international business travel has a significant, positive effect on the U.S. merchandise exports;
- The impact of outbound international business travel on trade is generally higher for countries that are likely more dissimilar to the United States in terms of culture, language and other factors that influence U.S. brand knowledge;
- Each additional international business trip increases U.S. merchandise exports to the visited country by $36,693 per year, on average.
- For the National Export Initiative priority countries of Brazil, China and India, U.S. merchandise exports will increase by an average of $53,338, $66,587, and $26,176, respectively, for each additional outbound international business trip.

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Introduction

Ninety-five percent of the world's consumers reside outside of the United States.[1] This fact suggests vast opportunities for U.S. firms to expand into foreign markets. To be a successful exporter, a firm needs to make its goods and services visible in foreign markets and to establish international distribution channels. U.S. international business travelers facilitate trade in manufactured goods through face-to-face interactions. They negotiate sales, promote brands, and establish joint ventures. The resulting expansion of a country's exports can generate significant benefits for the U.S. economy. Although the expenditures of outbound U.S. international business travelers are counted as U.S. services imports, these marketing efforts are likely to facilitate a significant expansion of U.S. exports of goods and services.

In this economics brief, we specifically ask: *How large is the increase in U.S. merchandise exports generated by outbound U.S. international business travel?* We answer this question using an econometric model of the relationship between outbound U.S. international business travel and U.S. merchandise exports. We derive our econometric specification by incorporating international business travel into a model of international trade.[2] In this model, the number of international business travelers to each country is a choice of each firm, with costs and benefits. We assume that firms undertake marketing in order to reach an expanded set of consumers in foreign markets. Insufficient knowledge about U.S. brands may limit demand for U.S. merchandise exports. In response, firms increase international business travel. Thus, in our model U.S. merchandise exports and U.S. international business travel are jointly determined.

The results of our model establish a positive relationship between U.S. outbound international business travel and merchandise trade without observing whether each business trip directly contributed directly to additional sales. We find that the effect of business travel on merchandise trade is higher for countries that are likely more dissimilar to the United States in terms of language and culture.

[1]Report to the President on the National Export Initiative, U.S. Department of Commerce (2010).
[2]Theoretical model of international business travel and trade available from the authors upon request.

Data on International Travel and Trade

The data on business and leisure travel are from the outbound U.S. travel and tourism statistics published by the Office of Travel and Tourism (OTTI) of the U.S. Department of Commerce. This publication provides a summary of responses to OTTI's annual Survey of International Air Travelers (SIAT). OTTI reports the fraction of business and leisure travelers to thirty-six regions (defined as either a single country or a set of countries). To construct the numbers of business and leisure travelers, we multiply the shares of business and leisure travelers for each region and year by the total numbers of travelers by type and year. The resulting panel dataset contains 294 region-year observations.

From these thirty-six regions, we focus on the twenty-one regions listed in Table 1, which all have complete data for the period from 1996 to 2009. Canada and Mexico are not included in our analysis. The SIAT only includes international air travelers from the United States. Since Canada and Mexico can be easily reached by land, the volume of business travel to these two countries is undercounted by the air travel survey.

Table 1 - List of Regions Included in the Analysis

Africa	Hong Kong	South Korea
Australia	India	Spain
Caribbean	Ireland	Switzerland
Central America	Italy	Taiwan
China	Japan	United Kingdom
Eastern Europe	Middle East	
France	Netherlands	
Germany	South America	

We examine bilateral export volumes between the United States and the twenty-one regions for the period from 1996 to 2009. We aggregate the FAS value of U.S. merchandise exports to the six multi-country regions (Africa, Caribbean, Central America, Eastern Europe, Middle East and South America) by adding the corresponding value of exports to the countries in these regions. The total FAS value of U.S. merchandise exports in 2009 was $651 billon. After aggregating and matching the data to the international travel counts, the total FAS value of U.S.

merchandise exports from our set of twenty-one regions is $554 billion in 2009, which is 85 percent of the global total.

Table 2 reports the share of U.S. business travelers, leisure travelers, and merchandise exports by region in 2009. The regions that account for the largest shares of U.S. merchandise exports – China, Japan, the Middle East, South America, and the United Kingdom – also account for some of the largest shares of business travelers.

Table 2 - 2009 Share of U.S. Business Travelers, Leisure Travelers, and Exports by Region

Region	Share of Total		
	Business Travelers	Leisure Travelers	U.S. Exports
Africa	5%	3%	4%
Australia	2%	2%	3%
Caribbean	8%	19%	3%
Central America	4%	6%	3%
China	6%	4%	10%
Eastern Europe	4%	4%	1%
France	5%	6%	4%
Germany	7%	5%	6%
Hong Kong	4%	2%	2%
India	4%	4%	2%
Ireland	2%	2%	1%
Italy	4%	6%	2%
Japan	9%	4%	7%
Korea	4%	6%	4%
Middle East	7%	2%	7%
Netherlands	3%	8%	4%
South America	7%	2%	9%
Spain	2%	4%	1%
Switzerland	3%	2%	2%
Taiwan	3%	2%	3%
United Kingdom	10%	8%	6%

Source: Authors calculations

We construct measures of shipping costs and aggregate demand in each region to control for determinants of the volume of international merchandise trade in conventional gravity models. We measure the size of the market in each region as the GDP of the country or the

combined GDPs of the group of countries. The GDP data are from United Nations national accounts. We use the ratio of the CIF value of U.S. imports from the region to the customs value of these imports as a proxy for the cost of shipping the goods from the United States to the region in each year. The CIF ratio reflects the international distance and transport and insurance costs per unit of distance. The ratios in the sample range from 1.009 to 1.077.

The Effect of Outbound Business Travel on U.S. Exports

We use the panel dataset to estimate the effect of business travel on U.S. merchandise exports. To control for a variety of country characteristics, including barriers to merchandise trade, our econometric specification controls for country fixed effects. Since the United States is the source country for all of the trade flows in the dataset, the year fixed effects in the specification control for the size of the U.S. production base and production costs. We apply ordinary least squares (OLS) to obtain the baseline estimates. We report these estimates in Table 3. The OLS estimate implies that a 10 percent increase in the number of business travelers, holding constant the other explanatory variables, increases U.S. merchandise exports by approximately 2.84 percent.

Table 3 - OLS Econometric Model of Exports*

Variables	Coefficients
Gross Domestic Product	0.579 (0.064)
Trade Cost	-4.875 (1.914)
Business Travelers	0.284 (0.042)
Year Fixed Effects Region Fixed Effects	Included Included
R-Squared Number of Observations	0.97 294

*All variables in logs (standard error in parentheses). The dependant variable is U.S. exports to the region in the year.
Source: Author's calculations

However, our theoretical model indicates that the OLS estimates will be biased, since U.S. international business travel is jointly determined with U.S. merchandise exports. To

correct this bias, we use the number of leisure travelers to the region as an instrument for the number of U.S. business travelers to the region. We present the instrumental variables (IV) estimates in two stages. In the first-stage, we confirm that the number of international leisure travelers to a region is correlated with the number of U.S. business travelers to the region. This is the first requirement of a valid instrumental variable and Table 4 reports the results of the first-stage estimation. The results of the second-stage estimation are reported in Table 5. We find that the estimated coefficient on the number of international business travelers increases to 0.46. This elasticity implies that a 10 percent increase in the number of business travelers increases the value of U.S. merchandise exports by approximately 4.6 percent.[3]

Table 4 - First-Stage Model of the Number of Business Travelers*

Variables	Coefficients
Gross Domestic Product	0.276 (0.082)
Trade Cost	4.385 (2.610)
Leisure Travelers	0.515 (0.063)
Year Fixed Effects Region Fixed Effects	Included Included
R-Squared Number of Observations	0.871 294

*All variables in logs (standard error in parentheses). The dependant variable is the number of business travelers. The instrumental variable is the number of leisure travelers to the region in the year.
Source: Author's calculations

As a sensitivity analysis, we re-estimated our model in Table 5 omitting China and then South America from the estimation sample. The purpose of this analysis was to test whether the estimated elasticity is sensitive to the inclusion of these two large destination regions, which could be outliers that drive the elasticity estimate. We find that the estimated elasticity is 0.436 when China is excluded and 0.435 when South American is excluded. In both cases, these elasticities are close to the elasticity reported in Table 5. The results indicate that the elasticity estimate is not sensitive to the set of countries included in the estimation sample.

[3] We performed a Hausman test of whether OLS or IV is an appropriate estimator for our econometric specification. We reject the null hypothesis of the Hausman test (that the OLS estimator is consistent) in favor of the IV estimates.

Table 5 - Second-Stage Model of U.S. Merchandise Exports*

Variables	Coefficients
Gross Domestic Product	0.518 (0.069)
Trade Cost	-5.552 (1.878)
Business Travelers	0.460 (0.087)
Year Fixed Effects Region Fixed Effects	Included Included
R-Squared Number of Observations	0.968 294

*All variables in logs (standard error in parentheses). The dependant variables are the U.S. exports to the region in the year and the number of business travelers. The instrumental variable is the number of leisure travelers to the region in the year.
Source: Author's calculations

We performed a second sensitivity analysis to provide further support for the validity of the instrumental variable. The second requirement of a valid instrumental variable is that it should not be correlated with the error term in the export equation. This issue is addressed in part by including the shipping cost measure in our econometric specification. The number of leisure travelers could be correlated with the cost of shipping merchandise. By controlling for the cost of shipping goods, we ensure that the error term does not include shipping costs and is not likely to be correlated with the number of leisure travelers to the region. We also considered using lagged correlation as a way to further reduce the likelihood of estimation bias. Specifically, we model exports in each year as a function of the number of business travelers in the prior year. In this case, the instrumental variable is the number of leisure travelers in the prior year. This should further reduce or eliminate correlation between the number of business travelers and the error term of the export equation. Table 6 reports this analysis. The elasticity estimate for this alternative specification is 0.447, which is still close to the estimate in Table 5.

Table 6 - Alternative IV Model With Lagged Effect on Business Travel*

Variables	Coefficients
Gross Domestic Product	0.491 (0.075)
Trade Cost	-4.363 (2.033)
Business Travelers	0.447 (0.102)
Year Fixed Effects Region Fixed Effects	Included Included
R-Squared Number of Observations	0.964 294

* All variables in logs (standard error in parentheses). Dependant variable is U.S. exports to the region in the year; instrumental variable is the number of leisure travelers to the region in the prior year.
Source: Author's calculations

As a third sensitivity analysis, we re-estimated the model without the shipping cost measure. Although the shipping cost measure has a significant negative effect on U.S. merchandise exports in the unrestricted model in Table 3, its omission from the specification does not have a significant effect on the estimated elasticity with respect to the number of international business travelers. Table 7 reports the additional econometric estimates.

Value of a Business Traveler in U.S. Exports

Finally, we estimate the dollar value of the impact of outbound U.S. international business travelers on U.S. merchandise exports. Specifically, we calculate the marginal change in the value of the exports with respect to each additional U.S. business traveler, based on estimated elasticity of U.S. exports with respect to international business travel, the values of exports and the number of travelers reported for 2009.

Table 7 - Instrumental Variables Model of Exports Without Trade Cost*

Variables	Coefficients
Gross Domestic Product	0.554 (0.067)
Trade Cost	Not Included
Business Travelers	0.466 (0.089)
Year Fixed Effects Region Fixed Effects	Included Included
R-Squared Number of Observations	0.966 294

* All variables in logs (standard error in parentheses). Dependant variable is U.S. exports to the region in the year; instrumental variable is the number of leisure travelers to the region in the prior year.
Source: Author's calculations

We find that a U.S. business traveler generates $36,693 in additional U.S. exports on average across the countries. We note, for example, the values for China and the Netherlands ($66,587 and $69,590) are far above the average; and the value for the United Kingdom ($27,321) is below the average. Table 8 reports the results for each of the twenty-one regions.

The estimates can be further refined using a measure of the intensity of each international business trip, like the number the nights spent in the country. In our main estimation, the region and year fixed effects account for systematic differences in travel intensity between regions and between years. However, the estimated dollar values in Table 8 do not account for travel intensity. They represent the marginal contribution of each business trip, not the marginal contribution of each travel day. To approximate the latter, we divide the dollar-value estimates in Table 8 by 18.4, the average number of nights of U.S. overseas business trips in 2009.

Table 8 - Marginal Returns to Business Travel in 2009

Region	Returns per Trip (US$)	Returns per Travel Day (US$)
Africa	$33,467	$1,819
Australia	$65,288	$3,548
Caribbean	$13,353	$736
Central America	$38,414	$2,088
China	$66,587	$3,619
Eastern Europe	$10,088	$548
France	$29,067	$1,580
Germany	$35,991	$1,956
Hong Kong	$27,232	$1,480
India	$26,176	$1,423
Ireland	$24,941	$1,355
Italy	$20,045	$1,089
Japan	$33,692	$1,831
Korea	$48,444	$2,633
Middle East	$40,991	$2,228
Netherlands	$69,596	$3,782
South America	$53,338	$2,899
Spain	$29,997	$1,630
Switzerland	$36,656	$1,992
Taiwan	$39,871	$2,166
United Kingdom	$27,321	$1,485
Average	**$36,693**	**$1,994**

Source: Author's calculations

Concluding Remarks

The results of our model establish a positive relationship between U.S. outbound international business travel and merchandise trade without observing whether each business trip directly contributed directly to additional sales. By calculating marginal dollar value of a business trip to a set of countries and regions, we find that the effect of business travel on merchandise trade is higher for countries that are likely more dissimilar to the United States in terms of language and culture. This dissimilarly may contribute to lower brand knowledge of U.S. products. Accordingly, our results may provide a guide of how to allocate scarce business travel resources. This analysis may be particularly useful for small and medium size businesses

that are looking to enter export markets without direct access to global distribution and marketing networks.

We estimate that each additional international business trip will increase U.S. merchandise exports to the visited country by $36,693 per year, on average. For the NEI priority countries of Brazil (as proxied by South America), China and India, U.S. merchandise exports will increase by $53,338, $66,587, and $26,176, respectively, on average. The impact of outbound business travel on trade varies considerably across the twenty-one destination regions that we analyze.

Based on these estimates, we conclude that trade missions and private industry efforts that provide first-hand knowledge of overseas markets and bring U.S. companies face-to-face with qualified potential buyers, agents, distributors, and other business partners can provide a significant boost to U.S. exports of goods, and probably also to U.S. exports of services, by facilitating outbound international business travel.

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Technical Appendix

Econometric Specification

From the theoretical model, we determine the coefficients in the following system of log-linear equations, with lower-case variables indicating the natural logs of the variables:

$$b_{jt} = \theta_{BY}\, y_{jt} + \theta_{BF}\, f_{jt} + \theta_{BG}\, g_{jt} + \theta_{BM}\, m_t + \theta_{BS}\, s_{jt} + \theta_{BZ}\, z_{jt} + \theta_{BV}\, v_{jt} \quad (1)$$

$$x_{jt} = \theta_{XB}\, b_{jt} + \theta_{XY}\, y_{jt} + \theta_{XF}\, f_{jt} + \theta_{XG}\, g_{jt} + n_t + \theta_{XM}\, m_t + \theta_{XS}\, s_{jt} + \theta_{XZ}\, z_{jt} \quad (2)$$

For example, the coefficient θ_{XB} is the elasticity of the value of U.S. exports with respect to the number of business travelers to country *j* in year *t*. The system of log-linear equations in (8) and (9) jointly determines the number of business travelers to country *j* and the value of U.S. exports to the country. The number of business travelers is increasing in income, brand awareness and the proximity and size of country *j*, and it is decreasing in the cost of the international travel. Similarly, the value of U.S. exports is increasing in the volume of business travel and country size and is decreasing in the cost of international shipping.

The key empirical implication of the log-linear system of equations in (1) and (2) is that business travel is not an independent determinant of export volume to country *j*, because exports and the number of business travelers are both determined by the unobservable export demand factors, represented in these equations by the variables f_{jt} and g_{jt}. This joint endogeneity needs to be addressed in the econometric analysis.

In our econometric estimation, we use the specification in (3) to estimate the parameters in (2).

$$x_{jt} = \gamma_0 + \gamma_1\, b_{jt} + \gamma_2\, y_{jt} + \gamma_3\, s_{jt} + \delta_j + \mu_t + u_{jt} \quad (3)$$

The variables δ_j and μ_t represent country and time fixed effects. The error term of the econometric model, u_{jt}, includes $\theta_{XF}\, f_{jt}$ and $\theta_{XG}\, g_{jt}$. OLS estimation of this elasticity based on equation (10), with unobservable f_{jt} and g_{jt} in the error term, will generate a biased estimate of γ_1 as long as θ_{BF} and θ_{BG} are not equal to zero.

To obtain an unbiased estimate of γ_1, we use an instrumental variable. The instrumental variable should be correlated with the number of international business travelers but should not depend on any other factors that affect the demand for exports, including the variables represented by f_{jt} and g_{jt}. We propose that the annual count of leisure travelers from the United States to country j satisfies these requirements. We expect that the number of leisure travelers is affected by the cost of traveling to the country as well as many other factors that we do not directly observe, including the quality of historical and cultural attractions that are unrelated to commercial opportunities to export to country j. We use the variable l_{jt} to represent the count of leisure travelers. We expect that l_{jt} is positively correlated with v_{jt}, since both types of international travelers reflect the cost of travel from the United States to the country j, but is not correlated with f_{jt} or g_{jt}.

In the first stage of the estimation, we regress the number of business travelers on the number of leisure travelers, using the specification in (4).

$$b_{jt} = \beta_0 + \beta_1 l_{jt} + \beta_2 y_{jt} + \beta_3 s_{jt} + \xi_j + \zeta_t + e_{jt} \quad (4)$$

The variables ξ_j and ζ_t represent country and year fixed effects in the first-stage specification. Then we substitute the predicted values of b_{jt} into (3). This two-stage procedure is equivalent to instrumental variable (IV) regression where the number of business travelers is instrumented with the number of leisure travelers.

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