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COWLES FOUNDATION DISCUSSION PAPER NO. 93

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Demand for Tourists' Goods and Services in a World Market

Harold W. Guthrie

July 26, 1960

Demand for Tourists' Goods and Services in a World Market*

Harold W. Guthrie

In many countries a balance of payments crisis is almost certain to lead to a suggestion that efforts be made to increase revenues from foreign tourists. The recommendations for attracting tourists can range from relatively inexpensive easing of visa requirements to large capital expenditures for luxury hotels, transportation equipment, etc. Each recommendation relates, implicitly or explicitly, an assumption about the dominant motivations for traveling abroad and an estimated gain in foreign exchange.

The motivations for foreign travel are extremely diverse. Given particular reasons for traveling, the tourist may choose from a wide variety of places which satisfy, more or less well, his demand. Also, he may visit a single country or many countries in a single journey. The following examples illustrate the heterogeneous nature of the world market for tourist services:

- A British student of classical literature spends three months in Athens and Rome.
- A Japanese business man stays a week in Malaya to negotiate a contract for materials.
- An American couple, the husband recently retired, go on a six-month cruise around the world, visiting 26 different countries.

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* This paper is an extensive revision of a preliminary analysis prepared at Gadjah Mada University, Jogjakarta, Indonesia, during my appointment in the University of Wisconsin Indonesia Project. I am grateful to the University of Wisconsin and the Ford Foundation for support in the early stages of investigation. The results of the preliminary research, "An Economic Analysis of Revenues from Tourism," will be published in Ekonomi dan Keuangan in Indonesia.

The preparation of the revision presented here has been supported by the Cowles Foundation for Research in Economics at Yale University. The analysis has been improved by helpful suggestions offered by Lawrence Krause and other colleagues at the Cowles Foundation. Mrs. Wilma Heston assisted in making computations.

- A Pakistani makes his pilgrimage to Mecca.
- An American family living in Detroit spends one day at an exposition in Windsor, Ontario, a one-half hour journey from their home.
- A group of German students on a camping trip go to Austria and Italy for the summer.
- A Canadian spends the month of February in Cuba enjoying the warm weather and the gambling facilities.
- An American who emigrated from Denmark as a young man returns to Denmark to visit his parents and stops over several days in Paris en route.
- A Dutch skiing enthusiast goes to Switzerland for three days.

These few examples suggest the great variation in motives for travelling, length of journey, number of countries visited, and duration of visit. A market as complex as this one cannot be easily explained by a single strategic variable. Reliable forecasts and recommendations applicable to many countries would require an elaborate cross-section analysis of travelers in order to identify and evaluate the determinants of demand.

This study uses a cross-section of aggregate revenues from tourists received in 58 countries over a four year period. The results describe some of the economic characteristics of the world market. It is found that a country's revenue from tourists is affected by:

1. The location of a tourist-receiving country relative to tourist-originating countries.
2. The level of average income in neighboring countries.
3. The amount of emigration from the tourist-receiving country.

The conclusions with respect to the effect of varying price levels and volume of trade are somewhat ambiguous, and the analysis of these variables will be described below.

1. The Flow of Tourist Expenditures

The data used for statistical analysis are those reported in the Balance of Payments for 58 countries by the International Monetary Fund. Each country estimates its entries in the Foreign Travel account, a credit entry for receipts from all foreign visitors, a debit entry for expenditures by its residents in all other countries. It is important to note that these data do not allow tracing a pattern of the flow of tourist expenditures, country-to-country, for all countries.

Receipts from foreign travelers by the 58 countries amounted to about US $3.5 billion in 1956, and the distribution of receipts among countries is far from equal. Nine countries received amounts greater than US $100 million and these nine countries account for 84 per cent of the total for the 58 countries. The nine major countries and the amounts received are:

United States	US $705.0 million
Mexico	509.2
Germany (Federal Republic)	369.8
United Kingdom	336.0
Canada	342.0
Italy	256.9
Switzerland	250.0
France	152.6
Austria	116.1

The major countries from which tourists originate can be identified from the debit entries in the Balances of Payments. Seven countries made expenditures abroad in 1956 of more than US $100 million for foreign travel:

United States	US $1,275.0 million
Canada	506.0
United Kingdom	344.4
Germany (Federal Republic)	256.9
France	218.7
Mexico	213.8
Switzerland	102.0

These seven countries account for 79 per cent of the total expenditures by all 58 countries.

The economic impact of tourism on the individual countries can be measured by examining the net balance between receipts and expenditures. The following list indicates the three highest net gains and the three highest net losses from foreign travel in 1956:

Net gains:	
Mexico	US $295.4 million
Italy	215.2
Switzerland	148.0
Net losses:	
United States	- 570.0
Canada	- 164.0
France	- 66.2

Another measure of the economic impact of foreign travel on individual countries is the ratio of receipts from visitors to total receipts from ex-

port of goods and services. The three highest ratios for 1956 are:

Mexico	36%
Panama	20
Ireland	18

In 12 countries receipts from foreign visitors are less than one half of one per cent of total receipts from the sale of goods and services abroad.

Inspection of these basic data shows that except for Italy, the major tourist-receiving countries are also the major tourist-originating countries. Of these, the United States, Canada, and France show large negative balances while Mexico, Italy, and Switzerland have the largest net gains from tourism. Mexico is unique in its role in world tourism. It ranks among the top countries in receipts, expenditures and net gain, and receipts from tourists amount to more than one-third of its total exports of goods and services. Table 1 shows these data for all 58 countries included in this study.

Balance of Payments Entries on Foreign Travel Account for Specified Countries, 1956
(millions of U.S. dollars)

Country	Foreign Travel Credits	Foreign Travel Debits	Net Balance	Foreign Travel Credit as Percentage of Total Credits
Australia	$ 13.4	$ 50.0	$- 36.6	1%
Austria	116.1	23.5	92.6	11
Belgium-Luxemburg	75.7	55.8	19.9	2
Bolivia	0.3	1.0	- 0.7	*
Brazil	9.0	43.0	- 34.0	1
Burma	0.2	3.1	- 2.9	*
Canada	342.0	506.0	-164.0	7
Ceylon	1.9	7.7	- 5.8	*
Chile	5.5	11.1	- 5.6	1
China (Taiwan)	0.1	1.0	- 0.9	*
Colombia	9.0	21.6	- 12.6	1
Costa Rica	4.2	3.6	0.6	5
Cuba	38.1	33.8	4.3	5
Denmark	57.2	50.0	7.2	4
Dominican Republic	7.3	5.0	2.3	5
Ecuador	2.5	3.1	- 0.6	2
Egypt	5.5	23.0	- 17.5	1
El Salvador	3.1	10.8	- 7.7	2
Ethiopia	0.3	3.5	- 3.2	*
France	152.5	218.7	- 66.2	2
Germany (Federal Republic)	369.8	256.9	112.9	4
Greece	31.2	12.7	18.5	9
Haiti	7.4	3.5	3.9	12
Honduras	1.2	1.5	- 0.3	2
Iceland	0.1	2.2	- 2.1	*
India	32.3	28.6	3.7	2
Indonesia	1.0	11.0	- 10.0	*
Iran	1.9	13.4	- 11.5	*
Iraq	26.8	24.3	2.5	5
Ireland	98.6	35.3	63.3	18
Israel	6.4	2.1	4.3	4
Italy	256.9	41.7	215.2	8
Japan	16.5	12.3	4.2	*
Jordan	5.5	3.5	2.0	15
Korea (South)	0.1	3.0	- 2.9	*
Liberia	1.3	.6	0.7	3
Libya 1/	2.5	4.7	- 2.2	6
Mexico	509.2	213.8	295.4	36
Netherlands	61.6	75.0	- 13.4	2
New Zealand	8.1	19.0	- 10.9	1

1/ Data for 1956 were not available and data for 1955 were substituted.

Continued

Table 1 (Continued)

Country	Foreign Travel Credits	Foreign Travel Debits	Net Balance	Foreign Travel Credit as Percentage of Total Credits[2/]
Nicaragua	$ 0.9	$ 5.1	$ - 4.2	1
Norway	35.0	43.4	- 8.4	2
Pakistan	1.0	16.2	- 15.2	*
Panama	28.8	3.8	25.0	20
Peru	9.1	12.3	- 3.2	3
Philippines	1.5	13.5	- 12.0	*
Portugal	20.6	10.6	10.0	4
Puerto Rico	26.2	23.9	2.3	4
Spain	94.8	3.3	91.5	15
Sweden	75.4	71.5	3.9	3
Switzerland	250.0	102.0	148.0	11
Syria	19.6	19.6	0.0	9
Thailand	2.6	10.1	- 7.5	1
Turkey	2.8	11.3	- 8.5	1
United Kingdom	336.0	344.4	- 8.4	3
United States	705.0	1275.0	-570.0	3
Uruguay	5.8	4.1	1.7	2
Yugoslavia	7.2	3.6	3.6	2
Total	3,904.6	3,814.1	90.5	

2/ Total credits include all goods and services in export account.

*/ Less than half of one per cent.

2. The Effect of Location on Demand for Tourists' Services

Given the wide variation among countries' revenues from tourists the question to be answered is: What are the characteristics which differentiate countries systematically with respect to variations in revenue? Everyone is aware of certain unique characteristics of many countries which may attract visitors, e.g., the scenic beauty of Switzerland, the exotic image of India and other Eastern countries, the many opportunities for cultural development and entertainment in Paris and Rome, etc. While these characteristics are

undoubtedly very important in understanding the allocation of tourists' expenditures among countries, there is no scale of measurement which will relate these essentially qualitative characteristics to each other between countries. Qualitative differences between countries are therefore reserved for later discussion.

Some of the more obvious differences between countries which can be quantified are certain characteristics of location. The theory of location has received increasing attention in recent years, and some of its propositions are applicable to an empirical analysis of the tourist problem. The physical distance between the demand and supply sides of the market, when translated to costs, must certainly be taken into account. Two alternative models of the effect of transportation cost have been considered and tested. Each of the models hypothesizes that revenues from tourists are inversely related to cost of transportation.

A second important aspect of location involves adjacent countries. It is reasonable to expect that there will be more "border travel" from the United States to Mexico than from Spain to Portugal, primarily because of the difference in income between the United States and Spain. Abstracting from any differences in distance involved in "border-travel" between places in adjoining countries, the models hypothesize that revenues from tourists are positively related to the income level of adjoining countries. The measurement of income is crude but relatively simple. The measurement of transportation costs is more complex and requires more detailed description. The two location models posit different concepts of cost and imply different travel routes from tourist-originating countries to tourist-receiving countries.

Each of the 58 countries (now denoted by an index k) is a tourist-receiving country. Although tourists in fact originate from all 58 countries,

five of them are designated as tourist-originating countries to simplify the analysis. The five tourist-originating countries (now denoted by an index i) and the expenditures made by the residents of these countries in other countries are shown in Table 2.

Table 2

Expenditures Made by Tourist-Originating Countries, 1956

Country	Tourist Expenditures	Percent of Total (w_i)
United States	US $1,275.0 million	49%
Canada	506.0	20
United Kingdom	344.4	13
Germany	256.9	10
France	218.7	8
Total	US $2,601.0 million	100

The total tourist expenditures made by residents of countries i are about 68% of expenditures by residents of all 58 countries. The weights (w_i) are used to calculate average cost of travel from countries i to countries k .

It is obvious, however, that tourists do not always visit a single country and then return to their homes. There are many possible configurations of multi-country visits each involving some combination of country-to-country transport costs. In order to abstract from the complexity of these many configurations a relatively simple model of marginal costs incurred in visiting a second country within a given region is to be tested.

Three regions are defined for the world and in Table 3 the major tourist-receiving countries (now denoted by an index j) are listed for each region. The countries j are considered to be stop-over points in their respective

regions en route from countries i to countries k. The weights v_j are used to calculate an average cost of travel from countries j to countries k, a measure of intra-regional or marginal cost. The inter-regional or fixed cost is measured by a weighted average of cost of travel from countries i to countries j using w_i as weights.* Figure 1 illustrates the three concepts of costs of travel.

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* Some intra-regional costs are included in the calculation of weighted fixed cost, which is therefore not a pure measure of inter-regional costs.

Table 3

Major Tourist-Receiving Countries in Three Regions, 1956

Region and Country	Tourist Revenue	Percent of Total (v_j)
Western Hemisphere		
United States	US $705.0 million	45%
Mexico	509.2	33
Canada	342.0	22
Total	US $1556.2 million	100%
Europe, Africa, Middle East		
Germany	369.8	38%
United Kingdon	336.0	35
Italy	256.9	27
Total	US $962.7 million	100%
Asia, Oceania		
India	32.3	52%
Japan	16.5	26
Australia	13.4	22
Total	US $ 62.2 million	100%

Again, abstracting from the many available means of travelling between countries, one-way minimum available air fare is used to measure travel costs. The major international airport in each country was used as the point of departure or destination for all tourist travel, with one exception. Chicago was substituted for New York to get a better approximation of a geographic-population center for the United States. The air fares were obtained from air travel guides published for use in the tourist industry [1].*

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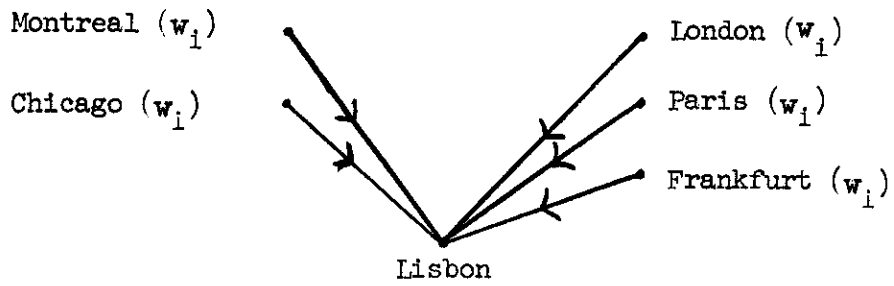
* I am grateful to Mr. Guy R. Mitchell, Director of Research, Pan American Airways System, for making these and other materials available to me.

Figure 1

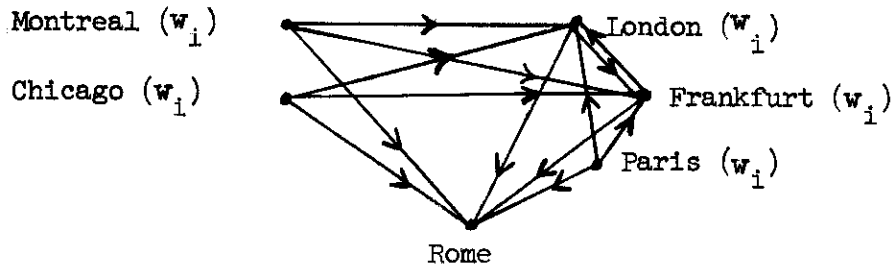
Direct Travel Model, Country k = Portugal



Lines represent one-way air fares (C) between points

$$\bar{C}_k = \frac{\Sigma\, w_i C}{\Sigma\, w_i}$$

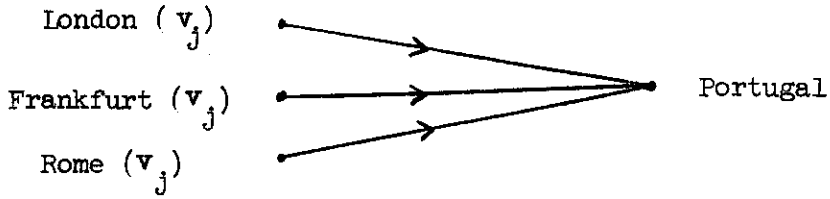
Intermediate Point Model, Country k = Portugal
Fixed Cost for the Region



Lines represent one-way air fares (C) between points

$$\overline{FC}_j = \frac{\Sigma w_i C}{\Sigma w_i}$$

Intermediate Point Model, Country k = Portugal
Marginal Cost



Lines represent one-way air fares (C) between points

$$\overline{MC}_k = \frac{\Sigma\, v_j C}{\Sigma\, v_j}$$

The three concepts of cost differentiate the models used to evaluate the effects of location on revenues from tourists. The two models are described by equations (1) and (2).

Direct Travel Model

$$(1)\quad R_{kt} = X_o^{b_o}\ \bar{C}_{kt}^{b_1}\ Y_k^{*b_6}\ X_7^{b_7}\ X_8^{b_8}\ X_9^{b_9}\ u_{kt}$$

where k = index of tourist-receiving country,

$(k = 1,2,3,\ldots,58)$

t = index of year observed,

$(t = 1953, 1954, 1955, 1956)$

R = Revenue from tourists in hundred thousand US dollars,

$X_o = 10$,

$\bar{C}_{kt}$ = Weighted average cost of travel to country k in year t .

Y^* : Among the countries which adjoin country k there is one which has the highest per capita national income. Y^* is that highest per capita income measured in units of US \$50. *

$X_7 = 10$ for 1953; 1 for other years,

$X_8 = 10$ for 1954; 1 for other years,

$X_9 = 10$ for 1955; 1 for other years,

u = random disturbance.

---

* There are some countries which have no adjacent countries, and it was necessary to seek a sensible compromise for consistent measurement. For the following countries some ambiguity existed, and the countries selected as adjacent countries are indicated:

Country k	Selected "Adjacent" Country
Australia	New Zealand
Ceylon	India
China (Taiwan)	Philippine Republic
Cuba	United States
Dominican Republic	Puerto Rico
Haiti	Dominican Republic
Iceland	Denmark
Indonesia	Australia
Japan	Korea
Korea	Japan
New Zealand	Australia
Philippine Republic	China
Puerto Rico	Dominican Republic

Equation (1) becomes linear in its logarithm; for example, in 1956:

$$\log (1) \quad \log R_{kt} = b_o + b_1 (\log \bar{C}_{kt}) + b_6 (\log Y^*_k) + \log u$$

Equations for other years are similar except that b_o is increased by b_7, b_8, or b_9. Differences in these constants will therefore reflect differences in positioning of the fitted hyperbola functions between years. The results of fitting the equation (1), with standard errors of regression coefficients shown in parentheses, are:

$$R_{kt} = 10^{4.24} \; \bar{C}_{kt}^{-1.25} \; Y_k^{*1.09} \; X_7^{-.20} \; X_8^{-.13} \; X_9^{.01} \; u_{kt}$$

$$(.81) \qquad (.29) \qquad (.13) \quad (.14) \quad (.14) \quad (.14)$$

$$R^2 = .46 \qquad n = 218$$

At a significance level of 5% the null hypothesis that the samples for the four years were drawn from the same universe is accepted; the exponents of X_7, X_8, and X_9 are not significantly different from zero. The relationship between revenues and the independent variables is therefore not affected by correlation of the observations over time.

Both average cost of travel (calculated for direct travel) and the income of an adjoining country have significant explanatory effects on revenues received.

Intermediate Point Model

$$(2) \; R_{kt} = X_o^{b_o} \; \overline{FC}_{jt}^{b_2} \; (X_3\overline{MC}_{kt})^{b_3} \; (X_4\overline{MC}_{kt})^{b_4} \; (X_5\overline{MC}_{kt})^{b_5} \; Y_k^{*b_6} \; X_7^{b_7} \; X_8^{b_8} \; X_9^{b_9} \; u_{kt}$$

where: k, t, X_o, Y^*_k, X_7, X_8, X_9, and u are all defined as in (1)

j = index of the three major tourist-receiving countries in each of three regions.

$\overline{FC}_{jt}$ = Weighted average fixed cost of travel from countries i to countries j. In a given year there are three values of $\overline{FC}$, one for each region.

$\overline{MC}_{kt}$ = Weighted average marginal cost of travel from countries j to countries k .

X_3 = 1 for countries in the Europe region; $1/\overline{MC}_{kt}$ for all other countries.

X_4 = 1 for countries in the Western Hemisphere; $1/\overline{MC}_{kt}$ for all other countries.

X_5 = 1 for countries in the Asia-Oceania region; $1/\overline{MC}_{kt}$ for all other countries.

Equation (2) becomes linear in its logarithm. For example, the logarithm form of (2) for countries in the Europe region in 1955 is:

$$\log R_{kt} = b_o(\log 10) + b_2(\log \overline{FC}_{jt}) + b_3(\log 1 + \log \overline{MC}_{kt}) + b_4(\log 1 - \log \overline{MC}_{kt} + \log \overline{MC}_{kt}) + b_5(\log 1 - \log \overline{MC}_{kt} + \log \overline{MC}_{kt}) + b_6(\log Y_k^*) + b_7(\log 1) + b_8(\log 1) + b_9(\log 10) + \log u_{kt}$$

which reduces to:

$$\log R_{kt} = b_o + b_2(\log \overline{FC}_{jt}) + b_3(\log \overline{MC}_{kt}) + b_6(\log Y^*) + b_9 + \log u_{kt} .$$

The complex, dummy-variable design for the marginal cost terms was intended to detect differences in the marginal cost function between regions. It appeared that the much larger fixed cost component for traveling to Asia-Oceania, compared to the other regions, might cause the marginal cost effect in Asia-Oceania to differ from the marginal cost effects in the other regions. The results do not support this hypothesis. The estimates resulting from equation (2) are:

$$R_{kt} = 10^{9.77}\ \overline{FC}_{jt}^{-2.47}\ \overbrace{\overline{MC}_{kt}^{-.82}}^{\text{Europe}}\ \overbrace{\overline{MC}_{kt}^{-1.06}}^{\substack{\text{Western}\\ \text{Hemisphere}}}\ \overbrace{\overline{MC}_{kt}^{-1.05}}^{\substack{\text{Asia}\\ \text{-Oceania}}}$$

$$(6.97) \qquad (2.73) \qquad (.34) \qquad (.22) \qquad (.19)$$

$$Y_k^{*.91}\ X_7^{.16}\ X_8^{.11}\ X_9^{.02}\ u_{kt}$$

$$(.13) \quad (.13) \quad (.13) \quad (.13)$$

$$R^2 = .51 \qquad n = 218$$

As in the direct cost model, there is no significant shift in the fitted functions between years.

The results reveal a serious defect in the intermediate point model. There are strong a priori grounds for expecting fixed costs to be a greater barrier to increased foreign travel than marginal costs -- in a total bill for travel the inter-regional component would usually be much greater than the intra-regional component. But the results show that the fixed cost effect is not significant while the marginal cost effect is significant in each of the three regions. One possible explanation for this apparent anomaly is suggested by the following:

	Mean R_{kt}	Mean $\overline{FC}_{kt}$	Mean $\overline{MC}_{kt}$
Europe	661	344	117
Western Hemisphere	782	346	206
Asia-Oceania	51	646	327

The mean values indicate a negative correlation between revenue and fixed costs. They also show correlation between fixed costs and marginal costs. The collinearity (in the logarithms) of the explanatory variables casts doubts on the estimates from equation (2), particularly the estimated effect of fixed costs. Since the marginal cost is relevant only to intra-regional travel, casting the fixed cost term out would leave a rather sterile model.

Because of this defect in the indirect travel model, it is necessary to reject it in favor of the less realistic direct travel model.

The direct travel model, recalculated to remove the non-significant trend terms, results in the following estimates:

$$(1') \quad R_{kt} = 10^{4.22} \bar{C}_{kt}^{-1.27} Y_k^{*1.08} u_{kt}$$

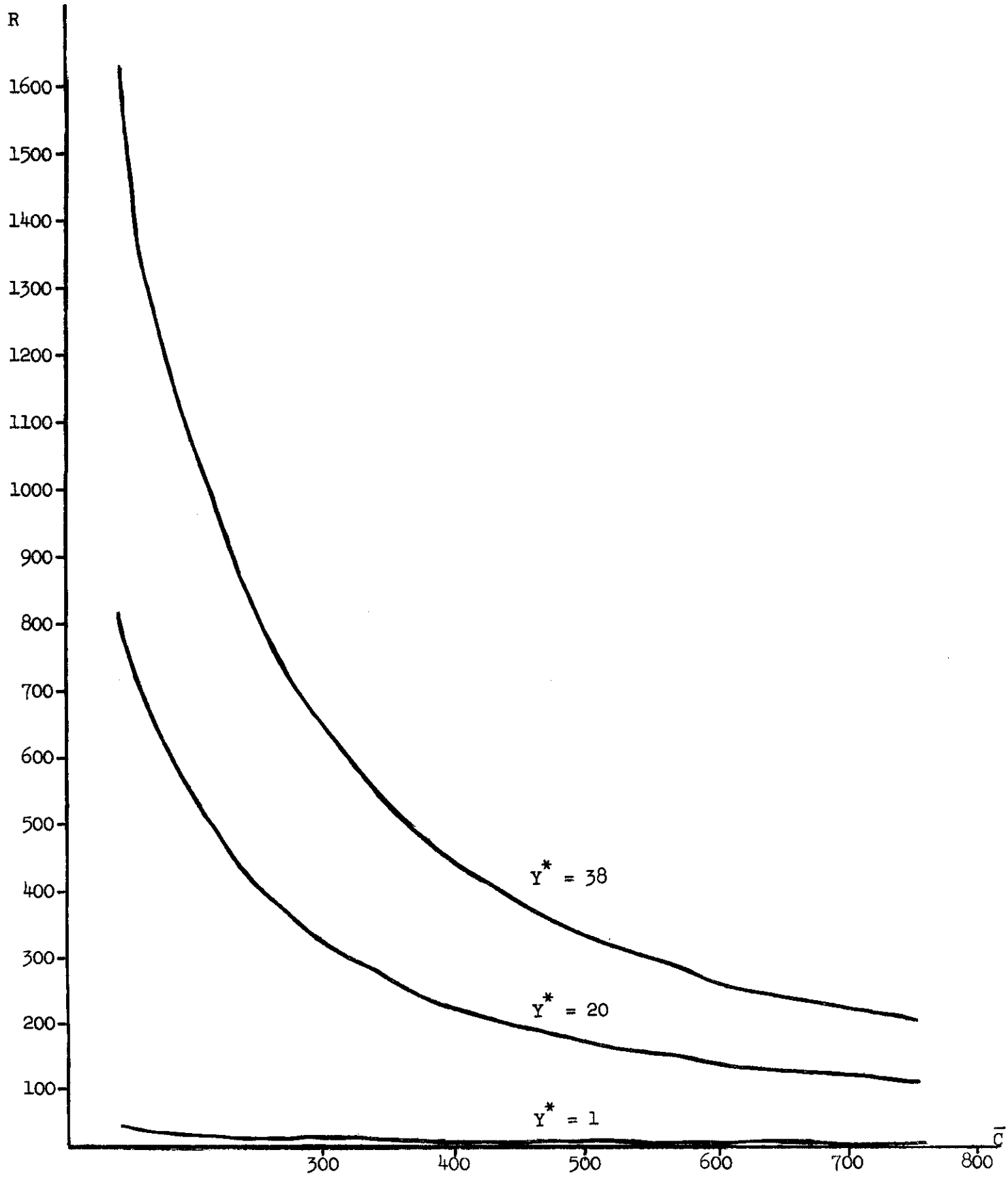
$$(.81) \qquad (.29) \quad (.13)$$

$$R^2 = .45 \qquad n = 218$$

This equation is plotted in Figure 2 for three different assumed values of Y^*. The lower curve describes the cost effect for countries which adjoin other countries in which per capita income is about US $50. The middle curve describes the cost effect for countries which adjoin other countries in which per capita income is about US $1,000, e.g., Sweden and Switzerland. The upper curve describes the cost effect for countries which adjoin countries in which per capita income is about US $1900, e.g., the United States.

Figure 2

The Effect of Location on Revenues from Tourists



3. The Effect of Foreign Trade on Demand for Tourists' Services

"Tourist" is a misnomer for many people who travel abroad for business purposes, and the term is intended to include these people as well as pleasure-seeking travelers. No available data show what proportion of aggregate tourists' expenditures are made by business travelers. In this analysis a very simple hypothesis about business travel is posed and tested. The results are suggestive rather than conclusive.

The measurement of the effect of business travel from available data cannot be precise because of the many different occasions for business travel. Observation indicates that business representatives travel in order to buy and sell products, make financial investment decisions, plan capital expenditures, assist in constructing foreign plants, attend conventions, etc. There are no data which measure all of these activities. Data measuring foreign trade for many countries are readily available for testing the hypothesis that buyers and/or sellers travel abroad for business purposes, i.e. revenues from tourists will be positively related to exports and imports.

Many of the products traded in the world market are basic commodities for which quality differences are defined by standard grading procedures. The channels through which these products are traded are frequently well established. It seems less likely that trade in these products, compared to processed goods, would give rise to frequent foreign travel. Both imports and exports are therefore measured as annual aggregates under selected sections in the Standard International Trade Classification reported by the United Nations [10]. The selected sections and their titles are:

5. Chemicals
6. Manufactured goods classified by material
7. Machinery and transport equipment
8. Miscellaneous manufactured articles

Revenue is measured by u, the random disturbance term from equation (1'). Thus all location effects actually accounted for by equation (1') are removed and the residual measures: (a) location effects not accounted for by equation (1'); (b) the effect of other variables to which revenues might be systematically related; (c) the effect on revenues of unique qualitative characteristics of the various countries. We still consider (c) to be part of a random disturbance in the regression on imports and exports. Instead of continuing to use u to represent the residual from (1'), this measure will now be denoted by R_o/R_c, the ratio (expressed in percentage terms) of the observed value of revenue received from tourists to the calculated value from equation (1').

Equations (3) and (3') describe the regression model and the estimates obtained from it.

$$(3)\quad \frac{R_o}{R_c}kt = b_o + b_1 I_{kt} + b_2 X_{kt} + v_{kt}$$

where R_o/R_c = u from equation (1') multiplied by 100,

I = imports in selected sections of SITC code described above, measured in millions of U.S. dollars,

X = exports in selected sections of SITC code described above, measured in millions of U.S. dollars,

v = random disturbance.

$$(3')\quad \frac{R_o}{R_c}kt = 208.32 - .11\, I_{kt} + .14\, X_{kt} + v_t$$

$$\qquad\qquad (26.7) \qquad (.04) \qquad (.02)$$

$$R^2 = .47 \qquad n = 142$$

The effect on revenues of increasing exports of processed goods is significant and positive, as expected. The effect on revenues of increasing imports is significant and negative, contrary to the hypothesis. The latter result suggests that sellers of processed goods do not travel abroad in the course of their business, a highly dubious finding.

Further inspection of the data shows that $\frac{R_o}{R_c}_{kt}$ is related positively to imports alone and that exports and imports are related positively. Thus the negative coefficient for imports in (3') is a quirk of multicollinearity.

The combination of exports and imports in a sum which measures the volume of activity in trading processed goods is an attractive alternative to treating each variable separately. The results obtained by using the sum are inferior, however, to those obtained by using exports alone to explain $\frac{R_o}{R_c}_{kt}$. Equations (4') and (5') contrast these two hypotheses.

$$(4') \quad \frac{R_o}{R_c}_{kt} = 153.31 + .07\ (I + X)_{kt} + v_{kt}$$

$$(25.16)\ (.01)$$

$$R^2 = .39 \qquad n = 142$$

$$(5') \quad \frac{R_o}{R_c}_{kt} = 170.73 + .10\ X_{kt} + v_{kt}$$

$$(23.08)\ (.01)$$

$$R^2 = .44 \qquad n = 142$$

Equation (5') is selected for further analysis in the concluding section because it is superior to (4') in explanatory power and superior to (3') in economic meaning.

The interpretation of equation (5') is further complicated by another collinear relationship. In the preliminary analysis of revenues from tourists cited on page one, it was found that revenues are positively related to per capita national income. The rationale for this relationship is that tourists

prefer to visit countries which offer what might be called "amenities." They want their host country to offer good health conditions, good internal transportation facilities, comfortable accommodations, the bright lights of a large cosmopolitan city, etc. Per capita national income was used as a single proxy for all amenities. The relationship between tourist revenues and per capita income was significant, but the procedures used were slightly different from those used in the present analysis.* The R^2 for a relationship between $\frac{R_o}{R_c} k$ and

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* The methods used in the earlier investigation can be documented as follows:

(a) $\hat{P}_{kt} = b_o \bar{C}_{kt}^{b_1}$

(b) $w_{kt} = R_{kt} - \hat{R}_{kt}$

(c) $w_{kt} = b_o + b_1 Y_k$

---

per capita national income for 1953 is only 4% and the relationship is not significant.

There is, however, a significant relationship between trade in processed goods and per capita income. For 1953:

$$(6') \quad (I + X)_k = -1064.96 + 5.25\ Y_k + Z_k$$
$$(728.79)\ (1.02)$$
$$R^2 = .52 \qquad n = 27$$

where Y = per capita national income in U.S. dollars.

$$(7') \quad X_k = -\ 870.16 + 3.61\ Y_k + Z_k$$
$$(602.28)\ (.84)$$
$$R^2 = .42 \qquad n = 27$$

The collinearity of tourist revenue with trade activity and trade activity with "amenities" complicates the interpretation of equation (5'). There are at least two (and perhaps many more) behavioral hypotheses implied in the estimate of the degree of association stated in equation (5'). These tests result in rejection of the hypothesis that trade in processed goods does not affect tourist revenues. Although the hypothesis that "amentities" do not affect tourist revenues must be accepted according to the test, the intuitive appeal of the hypothesis, the collinearity of trade activity with income, and the contrary result obtained in an earlier study -- all of these factors point toward regarding this hypothesis as an open question.

4. The Effect of Emigration on Demand for Tourists' Services

Communication between friends and relatives about job opportunities has proved to be important in determining migration within the United States. Phillip Nelson [7] emphasizes the dual role played by friends and relatives of potential migrants; they provide not only information but the prospect of a warm welcome to the migrant in a strange area.

A similar relationship can be expected to exist in foreign travel. If a large number of people have emigrated from say, Italy, two kinds of results might be expected. The migrant and his descendants may be attracted to Italy more than to any other foreign country, a direct effect of the national heritage of emigrants. The emigrant also communicates knowledge of his home country to other people. For example, many characteristcis of Italy may be known to all residents of the U.S. simply because of a relatively high rate of immigration from Italy. It is conceivable that this knowledge could induce the traveler to include Italy in his travel program. The direct and indirect effects are both included in the

hypothesis: Revenues from tourists increase proportionally with past emigration. A curve of increasing slope is expected because of the multiplicative character of family growth from immigrants and of communication.

Unfortunately data on emigration with world-wide coverage are available only for the very recent past while the hypothesis to be tested implies a fairly long time-period. Data on immigration for the United States are therefore substituted for emigration data for all other countries. Even the U.S. data on immigration [11] are incomplete and the hypothesis can be tested only for European countries, Canada, and Mexico. The regression is in the form

$$(8) \qquad u_{kt} = X_o^{b_o} M_k^{b_1} Z_{kt}$$

where u_{kt} = the residual from equation (1') for year t

$X_o = 10$

M_k = immigration from country k to the United States, cumulated from 1850 to 1950, measured in hundreds of thousands

Z_{kt} = random residual for year t .

The results of fitting the data to equation (8) are:

$$(8') \qquad u_{kt} = 10^{2.11} M_k^{.31} Z_{kt}$$

$$(.10) \quad (.07)$$

$$R^2 = .23 \qquad n = 74$$

The coefficient of M is significantly larger than zero and significantly less than one. Thus there is a positive relationship between u_{kt} and M_k, but the data do not support the hypothesized form of the relationship. The estimates in equation (8') indicate a decreasing slope, contrary to the increasing slope implied by the hypothesis.

It can be argued that the increasing-slope function should be tested for the observed values of revenues from tourists rather than for the residuals from the location function. Indeed, a scatter diagram for the observed values of revenue plotted against U.S. immigration data suggests that this test would yield the expected relationship. For purposes of the present analysis, however, I have elected to consider the location function as a basic description of the state of the world. The search for other possible systematic explanations of variations in revenues from tourists takes as given the locations of countries relative to each other and the effect of their locations on revenues.

5. The Effect of Cost of Living on Demand for Tourists' Services

The use of revenue received, rather than the quantity of real goods and services consumed, as a measure of demand complicates an analysis of the effect of price on demand. The theoretical problems are not serious. Elasticities of demand functions in terms of real quantities can be inferred from revenue elasticities [2]. There is also a problem of identification, but it is possible to find exogenous variables which will identify the demand function. The results of an empirical test of the price effect are not statistically significant, however, and they offer little support to the use of price changes as an instrument of policy.

The theoretical context of the problem is open to a variety of assumptions; the following model seems plausible and simple. Assume, first, that there is a unique demand function for the goods and services available to tourists in each country. The elasticity of demand will be determined by the qualitative characteristics of each country relative to others, e.g., scenery, climate, cultural attractiveness, etc. Assume, second, that prices will be measured in terms of the cost of hotel accommodations. Assume, third, that hotel prices are

controlled in each country. Assume, fourth, that a constant proportion of total hotel capacity is actually used in each country. Under these assumptions the observed values of revenue would be generated by a scatter of demand and supply functions similar to those shown in Figure 3. The points of intersection of the

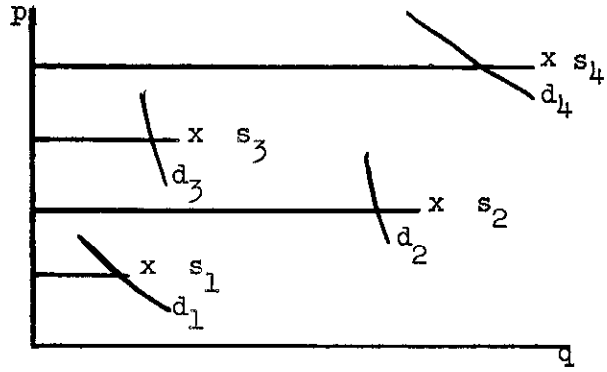

Figure 3

demand and supply schedules define rectangles of expenditures. A regression of expenditures on price is not clearly identified. In this model, at least, the expenditures function would describe the supply-capacity relationship as well as the demand relationship between expenditures and price.

In order to identify the demand function more clearly the regression equation includes the emigration variable described in the preceding section. There is little reason to expect a supply function to be affected by emigration. An index of the cost of living for tourists in various countries cannot be measured precisely. The approximation adopted is the cost for one person of a room and meals for one day in a middle-class hotel in the major city of each country. The data used for this calculation standardize the classification of hotels so that the real value of goods and services consumed is roughly constant in all countries. Unfortunately, the variations in hotel accommodations in various countries make it impossible to hold the real values constant for all countries,

and the test is therefore restricted to European countries.*

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* I am most grateful to Mr. John Houser, Vice President, The American Express Company, for granting access to confidential materials for research purposes. The American Express Company maintains a hotel rating system with reasonably precise definition of standards for each classification and reporting of charges by the hotels. The cost of living is based on these reported charges for all (or a sample of at least 10) hotels of a given class in each city observed.

The equation used to test for the effect of cost of living for tourists on revenues is:

$$(9) \quad u^*_k = X_o^{b_o} M_k^{b_2} L_k^{b_3} Z_k$$

where X_o, M_k, Z_k are defined as in (8)

u^*_k = geometric mean of annual residuals from equation (1')

L_k = cost of hotel lodging and meals for one day for one person in U.S. dollars, 1955.

The results of the test are:

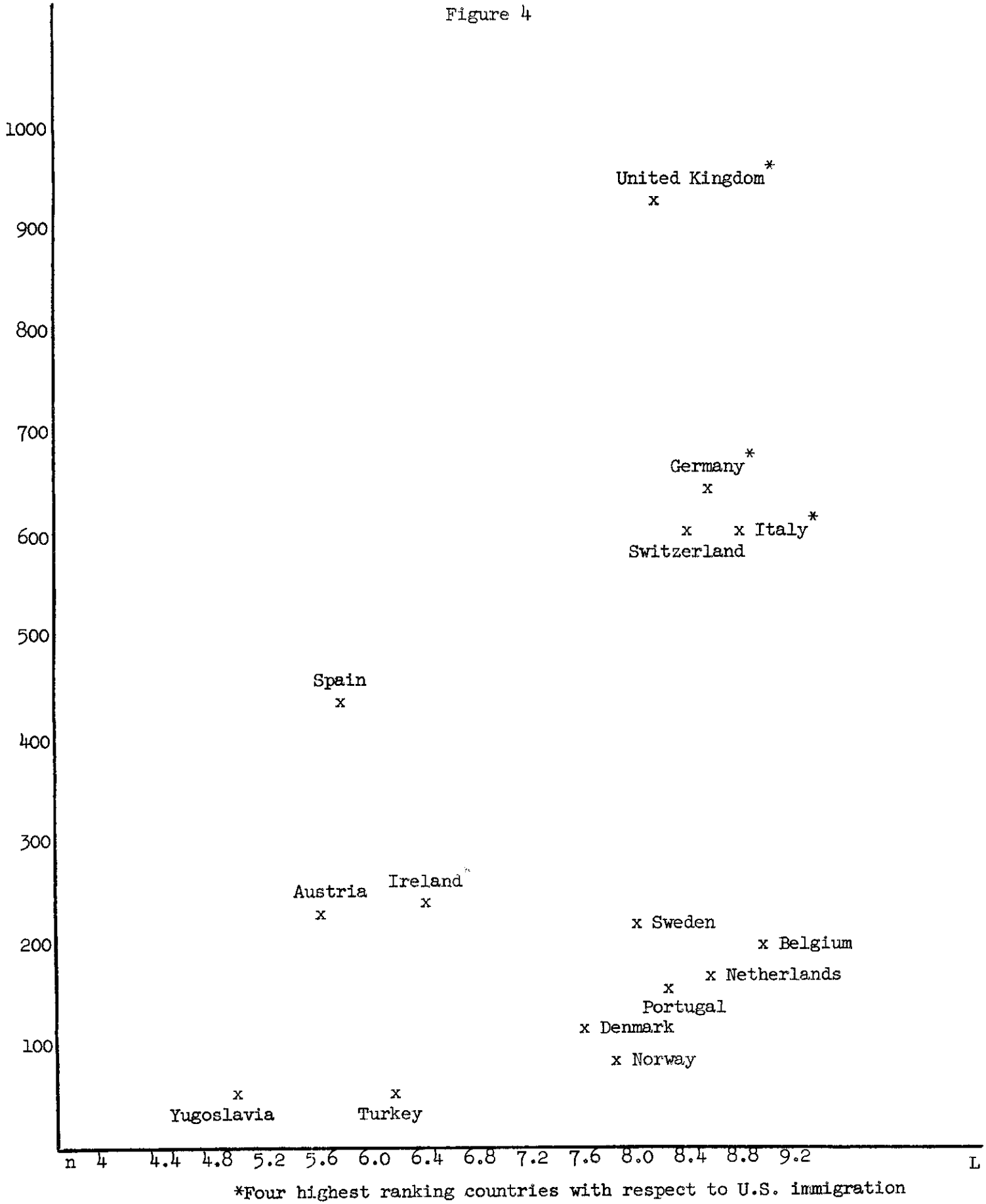
$$(8) \quad u^*_k = 10^{1.83} M_k^{.51} L_k^{.04}$$

$$(.97) \quad (.16) \quad (1.13)$$

$$R^2 = .45 \qquad n = 16$$

This test shows no statistically significant relationship between revenues from tourists and cost of living, after removal of location effects. The scatter diagram, Figure 4, provides a speculative hint that the revenue elasticity is positive and greater than one. It also shows that there is a strong collinear influence resulting from a coincidence of high values of revenue, price (L), and immigration for the United Kingdom, Germany, and Italy. This collinearity may explain, in part, the failure of the test.

Figure 4



*Four highest ranking countries with respect to U.S. immigration

If we now consider the implications of a revenue function with price elasticity greater than +1, other possible inferences about a price effect may be drawn. Assuming constant elasticities:

let η = the price elasticity of quantity demanded; i.e., $q = p^{\eta}$

ϵ = the price elasticity of revenue; i.e., $R = p^{\epsilon}$

Then, since $R = pq$

$$p^{\epsilon} = p \cdot p^{\eta} = p^{\eta+1}$$

$$\epsilon = \eta + 1$$

If $\epsilon > 1$, $\eta > 0$.

A positively sloped demand function is certainly contrary to usual a priori judgments, and, yet, this result is not necessarily ridiculous for the tourist market. It simply indicates the obvious, that countries are not homogeneous with respect to the services they offer. Tourists are willing to pay higher prices than those offered elsewhere in order to visit the countries which rank high in subjective preference.*

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* Note that the empirical evidence does not support this conclusion.

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6. Summary and Conclusions

The allocations of expenditures for tourists goods and services by all travelers among all countries of the world cannot be explained by a simple causal relationship. The policy-maker who recommends actions and expenditures intended to induce an increase in revenue from tourists, therefore, faces a difficult task. This analysis has shown that there are unchangeable characteristics of countries which have a substantial effect on their expected revenues. In this section it will be shown that after these basic differences in location, export activity, and emigration have been taken into account, indexes of qualitative differences between countries can be calculated.

Almost half of the relative variation in tourist revenues between countries can be attributed to the advantages or disadvantages of location. It is advantageous to have a neighboring country with high income because residents of the neighboring country may be active "border-travelers." It is also advantageous to be relatively close to the major tourist-originating countries: United States, Canada, United Kingdom, Germany, and France. The measure of closeness used is cost of transportation, the economic cost of reaching the point of consumption. It is possible that travel-time is also an effective constraint and the increasing use of jet aircraft could reduce the relative disadvantage of being far away from the major tourist-originating countries.

After allowing for the effect of location on revenue, tourist revenues are positively related to the volume of exports. The behavioral significance of this relationship is not clear. It may reflect the volume of travel for business purposes, or the traveler's preference for amenities, or other influences not yet investigated. The "export effect" must be regarded, then, as a question rather than an answer. There are no obviously correct and effective policy implications in the relationship between tourist revenues and exports.

A third explanatory influence is emigration, like location and exports, not subject to manipulation for policy purposes. One implication of the emigration effect is that the volume of available information about a given country affects its revenue from tourists. A direct test of the effectiveness of available information could be made by measuring the volume of advertising about given countries. The results of this test could measure the validity of the hypothesis about information and might reveal a useful policy instrument. Investigation of this relationship has not been undertaken in the present analysis because of the complexity of measuring the volume of advertising.

According to the limited available data on differences in prices between countries, a reduction of prices of goods and services to tourists does not tend to increase total revenue.

The equations used to discover the influence of location, export activity, and emigration on revenue from tourists summarize a quantitative relationship between revenue and measures of these variables between countries. There are undoubtedly other relationships, not yet investigated, which could be described in quantitative terms. Also, there are important differences between countries which cannot be easily quantified, e.g., scenery, cultural characteristics, etc. The influence of these still undiscovered factors, quantitative and qualitative, is indicated by the departure of observed revenue from estimates of revenue based on location, exports, and emigration. An index of deviations from these estimates can therefore be interpreted as a measure of subjective preference by tourists for the particular set of qualitative characteristics offered by various countries. It is derived by equalizing countries with respect to known quantitative determinants of tourist revenues. The index is an imperfect measure of preference because of remaining differences between countries which could be described quantitatively and because of random variations.

Each of the equations was based on data for all countries for which data were available. The indexes, therefore, measure preferences for given countries relative to other countries. Since countries within a region may be regarded as competing with each other, however, Tables 4-6 show the indexes within regions. Table 4 shows the effect of location alone, Table 5 shows the combined effect of location and exports, and Table 6 shows the index of revenue received compared to the sum of estimates based on all three variables: location, exports and emigration. In Table 7 the indexes show the individual effects of all three variables.

Table 4

Countries Ranked by an Index of Tourist Revenues Relative to Location

Country	Average Revenue[1]	Estimated Revenue[2]	Location Index[3]		
			Asia	Europe	Western Hemisphere
India	168	5	3278		
Japan	130	10	1291		
United States	6,298	602			1047
United Kingdom	2,898	304		952	
Germany	2,422	347		697	
Switzerland	1,732	262		662	
Iraq	234	38		615	
Italy	1,930	333		580	
Greece	271	55		493	
Spain	1,163	257		452	
France	1,620	388		417	
Panama	277	74			375
Mexico	4,004	1,103			363
Peru	89	28			320
Ceylon	15	5	312		
Ireland	874	352		248	
Austria	846	344		246	
Puerto Rico	224	93			241
Sweden	532	242		220	
Canada	3,235	1,548			209
Belgium	577	286		202	
Netherlands	547	330		166	
Portugal	163	99		165	
Pakistan	9	6	159		
Liberia	11	7		152	
Syria	116	78		149	
Iran	9	6		147	
Israel	59	46		128	
Denmark	474	373		127	
Uruguay	60	49			122
Australia	120	107	112		
Ethiopia	6	5		112	
Ecuador	25	23			110
Libya	25	25		100	
Chile	46	48			96
Thailand	26	30	86		
Norway	290	362		80	
Jordan	58	74		78	
Philippines	11	14	78		
Brazil	62	89			70
Colombia	116	168			69
Turkey	27	40		68	
Yugoslavia	61	92		66	
Haiti	44	70			63

Table 4 (Cont'd.)

Country	Average Revenue	Estimated Revenue	Location Index		
			Asia	Europe	Western Hemisphere
New Zealand	60	111	54		
Burma	2	5	42		
Costa Rica	30	86			35
El Salvador	22	73			30
Cuba	274	1,191			23
Dominican Republic	38	181			21
Honduras	12	80			15
Indonesia	10	91	11		
Korea	2	25	8		
Nicaragua	4	50			8
China	1	14	7		
Bolivia	3	60			5
Paraguay	2	40			5
Iceland	1	426		*	

1/ Average receipts, 1953-56, in hundred thousand U.S. dollars.

2/ Average of estimates from equation (1'), 1953-56, in hundred thousand U.S. dollars. See Appendix for derivation of estimates (R_L) .

3/ Ratio of average revenue to estimated revenue, in per cent; rounding errors cause slight inconsistencies. See Appendix for derivation of location index (I_L) . Australia and New Zealand are included under Asia. Countries in Africa and the Middle East are listed under Europe.

* Less than one-half of one per cent.

Table 5

Countries Ranked by an Index of Tourist Revenues Relative to Location and Exports

Country	Estimated Revenue[1]	Location-Export Index[2]		
		Asia	Europe	Western Hemisphere
Iraq	54		433	
Japan	43	300		
Greece	150		181	
Switzerland	1,020		170	
Spain	700		166	
Italy	1,261		153	
Ceylon	10	146		
Panama	200			138
Mexico	3,088			130
United Kingdom	2,794		104	
Germany	2,644		92	
Ireland	966		91	
Austria	1,090		78	
United States	8,103			78
France	2,148		75	
Sweden	868		61	
Portugal	278		59	
Liberia	20		56	
Canada	7,337			44
Denmark	1,105		43	
Belgium	1,374		42	
Netherlands	1,292		42	
Australia	311	39		
Libya	68		37	
Thailand	82	32		
Norway	1,098		26	
Brazil	252			25
Colombia	456			25
Turkey	108		25	
Yugoslavia	254		24	
New Zealand	302	20		
Burma	13	16		
Costa Rica	232			13
El Salvador	199			11
Dominican Republic	469			8
Honduras	217			6
Indonesia	247	4		
Korea	68	3		
Nicaragua	132			3
Paraguay	110			2
Iceland	1,149		*	

1/ Sum of revenue estimated from location (R_L) and revenue estimated from exports ($R_{X,L}$). See Appendix for derivation of estimates.

2/ Ratio of average revenue (Table 4) to estimated revenue, in per cent; rounding errors cause slight inconsistencies. See Appendix for derivation of location-export index (I_{L+X}). Australia and New Zealand are included under Asia. Countries in Africa and the Middle-East are listed under Europe.

* Less than one-half of one per cent.

Table 6

Countries Ranked by an Index of Tourist Revenues
Relative to Location, Exports, and Emigration

Country	Estimated Revenue[1]	Location-Export-Emigration Index[2]	
		Europe	Western Hemisphere
Switzerland	1,539	113	
Greece	260	104	
Spain	1,121	104	
United Kingdom	4,007	72	
Italy	2,723	71	
Mexico	5,968		67
Germany	4,399	55	
France	3,038	53	
Austria	2,299	37	
Portugal	459	36	
Ireland	2,473	35	
Sweden	1,568	34	
Belgium	1,847	31	
Netherlands	1,893	29	
Denmark	1,792	26	
Canada	13,219		24
Yugoslavia	376	16	
Norway	2,005	14	
Turkey	188	14	

1/ Sum of revenue estimated from location (R_L), exports ($R_{X,\ L}$), and emigration ($R_{M,\ L}$). See Appendix for derivation of estimates.

2/ Ratio of average revenue (Table 4) to estimated revenue, in per cent; rounding errors cause slight inconsistencies. See Appendix for derivation of location-export-emigration index (I_{L+X+M}).

Table 7

Indexes of Tourist Revenues Relative to Location, Exports, and Emigration

	Indexes[1/]		
Asia-Oceania	Location (I_L)	Exports ($I_{X,L}$)	Emigration ($I_{M,L}$)
Australia	112	59	-
Burma	42	25	-
Ceylon	312	274	-
China	7	-	-
India	3278	-	-
Indonesia	11	6	-
Japan	1291	391	-
Korea	8	5	-
New Zealand	54	31	-
Pakistan	159	-	-
Philippines	78	-	-
Thailand	86	51	-
Europe, Africa, Middle-East			
Austria	246	113	70
Belgium	202	53	122
Denmark	127	65	69
Ethiopia	112	-	-
France	417	92	182
Germany	697	105	138
Greece	493	287	246
Iceland	*	*	-
Iran	147	-	-
Iraq	615	1464	-
Ireland	248	143	58
Israel	128	-	-
Italy	580	208	132
Jordan	78	-	-
Liberia	152	89	-
Libya	100	59	-
Netherlands	166	57	91
Norway	80	39	32
Portugal	165	91	90
Spain	452	263	276
Sweden	220	85	76
Switzerland	662	228	334
Syria	149	-	-
Turkey	68	39	34
United Kingdom	952	116	239
Yugoslavia	66	38	50

Table 7 (Cont'd.)

Western Hemisphere	Indexes		
	Location (I_L)	Exports ($I_{X,L}$)	Emigration ($I_{M,L}$)
Bolivia	5	-	-
Brazil	70	38	-
Canada	209	56	55
Chile	96	-	-
Colombia	69	40	-
Costa Rica	35	20	-
Cuba	23	-	-
Dominican Republic	21	13	-
Ecuador	110	-	-
El Salvador	30	18	-
Haiti	63	-	-
Honduras	15	9	-
Mexico	363	192	144
Nicaragua	8	5	-
Panama	375	219	-
Paraguay	5	3	-
Peru	320	-	-
Puerto Rico	241	-	-
United States	1047	84	-
Uruguay	122	-	-

1/ See Appendix for derivation of indexes.

* Less than one-half of one per cent.

The results show that the major tourist-receiving countries of the world (U.S., Mexico, Canada, U.K., Germany, France, Italy, and Switzerland) receive more revenue from tourists than the amount that can be explained by relatively favorable location. India and Japan, with relatively unfavorable location characteristics, rank higher in preference than the major tourist-receiving countries.

After accounting for the advantage implied by exports, the most preferred countries are, in order: Iraq, Japan, Greece, Switzerland, Spain, Italy, and Ceylon. Many of the major tourist-receiving countries drop to lower preference rankings because they do not realize fully the advantages implied by a high volume of exports.

Unfortunately, the effect of emigration could be measured for only 19 countries. After considering all three effects -- location, exports, and emigration -- three countries rank higher than 100 on the preference scale. Switzerland, Greece, and Spain apparently are unusually attractive to tourists because of qualitative characteristics.

There is little aid and comfort to be found in the results for those countries which rank low in preference. The data describe the position of each country relative to all other countries with respect to their intrinsic attractiveness to tourists. Prescription of policy to increase their revenues could be decided upon only after further research and understanding of individual countries.

APPENDIX

Derivation of Estimates of Revenue and Indexes of Revenue Received

R^o_{kt} , the revenue received in country k in year t , is explainable, in part, by association with location, exports and emigration. The estimate derived from the equation describing the association between R^o_{kt} and location is R^L_{kt} . The remaining estimates, derived from the effects of exports and emigration, will be measured after correcting for R^L_{kt} . In the derivations below the subscripts k and t will be omitted and the following notation will be used:

R_o = observed value of revenue.

R_L = revenue estimated by location.

$R_{X,L}$ = revenue estimated by exports after correcting for R_L .

$R_{M,L}$ = revenue estimated by emigration after correcting for R_L .

Location

$$(1') \quad R_o = 10^{4.22}\,\bar{C}^{-1.27}\,Y^{*1.08}\,u$$

$$= R_L\,u$$

$$R_L = \frac{R_o}{u}$$

$$\bar{R}_L = \frac{\bar{R}_o}{\bar{u}}$$

$$I_L = \bar{R}_o/\bar{R}_L = \bar{u}$$ Index of Revenue Relative to Location

Exports

(5') $100 \frac{R_o}{R_L} = 170.73 + .10 + v$

R_o has been expressed in "location units"

$(170.73 + .10X)$ = number of location units associated with exports

v = number of location units not explained by exports

$$100 \frac{R_o}{R_L} - \frac{R_L(170.73 + .10X)}{R_L} = v$$

$R_L(170.73 + .10X) = R_{X,L}$ an estimate of revenue associated with exports after equalizing countries with respect to location, 170.73 being understood as a percentage.

$I_{X,L} = \frac{\overline{R}_o}{\overline{R}_{X,L}}$ Index of Revenue Relative to Exports

$I_{L+X} = \frac{\overline{R}_o}{\overline{R}_L + \overline{R}_{X,L}}$ Index of Revenue Relative to Location and Exports

Emigration

(8') $100 \frac{R_o}{R_L} = 10^{2.14} M^{.29} Z$

R_o has been expressed in location units

$(10^{2.14} M^{.29})$ = number of location units associated with emigration

Z = proportion of location units not explained by emigration

$100 R_o = R_L (10^{2.14} M^{.29}) Z$

$R_L (10^{2.14} M^{.29}) = R_{M,L}$ an estimate of revenue associated with emigration after equalizing countries with respect to location, $10^{2.14}$ being understood as a percentage.

$$I_{M,L} = \frac{\bar{R}_o}{\bar{R}_{M,L}}$$ Index of Revenue Relative to Emigration

$$I_{L+M} = \frac{\bar{R}_o}{\bar{R}_L + \bar{R}_{M,L}}$$ Index of Revenue Relative to Location and Emigration

$$I_{L+X+M} = \frac{\bar{R}_o}{\bar{R}_L + \bar{R}_{X,L} + \bar{R}_{M,L}}$$ Index of Revenue Relative to Location, Exports, and Emigration

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