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MODELO ECONOMETRICO DEL TURISMO RECEPTIVO EN MEXICO

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CONTENTS

INTRODUCTION

The economic development achieved by some countries has had an outstanding impact on the behavior of modern society. Within this context, Tourism has been turning into a more and more significant social activity. In a parallel way, many people have adopted it as an instrument and agent of economic growth, becoming a contributory element for improving the levels in the quality of life.

Tourism does not imply by any means a simple escapist entertainment formula, a turning point phenomenon or an absent-minded evasion with a limited influence on economic systems. Two simple figures for 1990 provide just a small sample of the increasing importance Tourism has acquired: during 1990, international tourist demand amounted to 425 millions of travelers with a total expenditure of 230 thousand millions of dollars. At any rate, social and economic contribution of Tourism to modern societies is undeniable and very high, situation that obliges to design, in a scientific and documentary fashion, a wide framework of study which allows to put out realistic conclusions in order to mitigate the confusion about the definitely framework of tourist activity. It is apparent, taking into account the influential factors and the effects that it produces, that Tourism is deeply submerged in the economic sphere, though it is essential not to leave aside its cultural and social projection. The latter justifies the concern for intensifying the study of the phenomenon and generating, on one hand, more expedient, reliable and accurate information with regard to the activity, and filling in the deep gaps detected in the methodological inventories and statistics, on the other.

Statistical data, capable to explain reality and the analytical methods and models that enable to project the information toward future, make rational decisions and take the steps required by the market, offer the basic elements to build up an economic foundation that make it possible the equilibrium between theory and practice.

Although Tourism has firmly rooted signs in a subjective scope -the enjoyment of the activity belongs to a set of experiences with outstanding shades of intangible order- owing to its own nature and characteristics, needs to be investigated from a mathematical point of view, along with the analysis of the elements that identify it and integrate it. Therefore, the effects of tourist activity require the application of a mathematical treatment in order to take out the real importance of its influence from such repercussions.

The need of a quantitative analysis of the activity is preferably justified by the convenience to know in detail the situation in a precise moment, the reasons of that situation , the problems on hand and the usefulness of having alternatives for political decisions endorsed by experimental studies. On the other hand, it is understandable that it is essential to be in the position to produce forecasts and projections, estimate structural relationships of the activity, build estimation models to assume possible performances and estimate profitability models in the microeconomics sphere.

Then, it comes out necessary to make use of experimented and contrasted methodological processes that, when applied, play the role of consolidation and configuration instruments of tourist knowledge, under a sectored approach of Econometrics leading to a system of calculation and study feasible to be used continuously and efficiently.

Nevertheless, it is vital to bear in mind that trying to forecast the future is really not a pure science by any means. Forecasting is really some kind of blend of art and science. And, for this purpose, some kind of organizing principle is required. For economists, it might be data about potential GNP versus actual GNP and those sorts of things. For futurists, it might imply other large trends to monitor. But for those interested in Tourism, it is definitely the inclusion of social values. This is a key factor that sets up a big constraint when studying the outcome of tourist phenomena.

Given the aforementioned general considerations, the restrictions imposed mainly by the availability of data, the possibility to model some of the "non objective" elements involving Tourism and the characteristics of the present project, the scope of the model we are about to detail is reduced, in this primary version, to the estimation of the flows of tourists between Mexico and the United States of America by air, with the latter as the region of origin and the former as the region of destination, paying attention not only to the number of travelers, but also to their total expenditure, having a sample period going from 1970 through 1990 and considering the analysis of annual series.

The selection of this segment of the Mexican ingoing tourism market was based, among other things that will be detailed later, on the following relevant facts:

1. The most important tourism market for Mexico has been that of the
United States of America. On an average, from 1970 to 1990, the 85.7% of
ingoing leisure travelers to Mexico has come from the neighbor country. The
importance given to this market has been emphasized over and over through the
years not only by the Mexican government but also by Mexican tourist
principals , who have all shown their interest to make use of specialized tools
with the aim of having adequate support for decision-making and satisfying better
the needs of the tourist consumers coming from abroad.

2. Since the invention of the airplane in the early years of the century, traveling by
air has been the most significant means of transportation for long distances and
its development has been linked with a great amount of technological advances of
the modern world. Furthermore, air transportation happens to be one of the
priorities for the territorial communication in Mexico, in which both the
development of the country and Tourism are confined.

The findings of the present investigation regarding Mexican incoming tourist demand and the resulting final product, expressed in the way of an econometric model, are grouped, for a better understanding, in the following sequence:

The first section highlights some of the conclusions reached by several authors devoted to analyze various aspects of tourist demand. These assertions, as well as being part of the bibliographic revision task, played the role of being some sort of general guidelines and additional supporting material for the investigation.

In the second part, a brief review of the historical events affecting Tourism in Mexico is depicted, with the purpose of having a summarized idea of the performance of the sector during the last two decades. In addition, three useful diagrams are presented so to have a general understanding of the insertion of Tourism into the economic context.

In accordance with the General Theory of Systems, "...Tourism constitutes an open system, of five elements, interpolating in a wide environment. These elements are: one dynamic, the tourist; three geographical, the generating region, the route of transit and the destination region; and an economic element, the tourist industry."[1]

The five components mentioned above are ordered in connection, both functional and spatial, and in interaction with the physical, economic, social, cultural, political and technological factors that shape the environment in which the tourist activity is developed.

Therefore, having this in mind and putting it into the context of the econometric project we are dealing with, the next part of the research is devoted to provide a general explanation of the generating region where the tourism flows start, focusing on two main purposes. On the one hand, to review the major trends shaping the general consumers' environment -paying particular attention to the future trends- and, on the other, establishing their connection with the tourism sphere.

The following section includes a global outlook at the profile of the warm-weather traveler, and, particularly, of the ingoing the ingoing tourism to Mexico from the United States of America, so as to take into account the specific characteristics of the travelers that the destination region is receiving, as part of the Tourist System.

The third part contains the specification of the model, the description of the data used as input information, the explanation of the variables involved, the estimated equations with their respective results and graphs, and some hints provided by the previous attempts made before reaching the final specification.

The simulation phase is the objective of the next section, where the final results of putting all the equations together are shown.

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[1] Leiper, Neil, "Toward a cohesive curriculum in tourism; the case for a Distinct Discipline", *Annals of Tourism Research*, vol. VIII, num. 1, 1981, p. 74.

I. BIBLIOGRAPHIC ANALYSIS

Several econometric studies of demand have been reported in the tourism literature, some of them center the attention in forecasting purposes and some others on the values estimated for parameters.

From a demand point of view, David L. Edgell (1) in his article International Tourism Policy states that in all aspects the demand for tourism is similar to the demand for most other products and services, the basic determinants are: price of the commodity, price of the competing and complementary commodities, level of personal disposable income , and tastes, habits and preferences of potential consumers.

Edgell also points out the factors which influence international tourism. Some of the most important are : supply of facilities, disposable income levels, explicit or implicit barriers to travel, currency devaluation, promotion abroad, level of international airfares.

Some other articles are referred to specific effects that one variable has on the tourism activity between two countries. D. Chadee and Z. Mieczkowski (2) tried to measure the effect of the Canadian dollar depreciation versus the US dollar on the Canadian tourist industry. What they showed is that the exchange rate had a modest impact in attracting US visitors to Canada.

The frame within these authors do their analysis is one of international trade theory, the logic of such theory is that a depreciation of the Canadian dollar implies an increase in the purchasing power of the US dollar. The immediate effect is an increase in the number of US visitors. But as the demand for tourism services grows, pressure on the market drives prices upwards. So that, the magnitude of the changes in the total revenue following the depreciation depends on the elasticity of supply and demand.

If they assume that both excess functions are elastic , a currency devaluation will likely result in a larger number of US visitors and an increased revenue for the Canadian tourist sector.

For Chadee and Mieczkowski the major determinants of the demand of tourism are: price of tourist products, prices of substitutes, income of tourists, tastes of travelers, and exchange rate.

Stephen F. Witt and Christine A. Martin (3) developed a set of econometric models for forecasting international tourism demand. According to Witt and Martin, economic theory does not give a clear indication of which factors are likely to be operative for a particular origin-destination holiday visit data set and therefore experimentation is necessary in order to obtain an appropriate model. The explanatory variables in Witt and Martin models are basically the same used by Chadee and Mieczkowski, real personal disposable income, cost of travel, destination level of prices and

4

exchange rate.

In his article Tourism Demand, Economic Theory and Econometrics: An Integrated Approach, (4) Egon Smeral uses econometric methods to estimate how tourism demand reacts to increased economic growth.

According to the author the income elasticity is higher than one, and states that such high elasticity is the main reason travel depends strongly in the consumption climate and on economic expectations regarding real income and the labor market situation are important.

Smeral says that economic growth influences tourism demand through mechanisms caused by the interdependence of certain elements of the socioeconomic system we live in, particularly: real disposable income development, increase in urbanization and industrialization, demographics such as the income and age structures and educational background of a society, and the level of relative prices of tourism goods.

II. HISTORICAL SUMMARY

The development of transportation, travel and tourism in Mexico can be divided into the following stages:

0. Stage of birth	1920-1940	
1. First period of modern tourism	1945-1958	(development phase)
2. Second period	1959-1969	(technical
3. Third period :	1970-1982	implementation
		phase)
4. Fourth period	1983- at present	

During the third period of modern tourism in Mexico (1970-1982), the economic problems derived from the development model selected by the government became more acute. The inability to develop an industrial plant -overprotected by economic policies- that were competitive in the international market and where the terms of interchange were increasingly deteriorating, stressed even more the social-economic problems of the country.

A new phase arose with the characteristic of attempting to improve the foreign sector of Mexican economy and where tourism played a first-order role. Such part was based on the development of the so-called "tourist macro projects", that joined the traditional tourist centers such as Acapulco, Puerto Vallarta, Cozumel or Mazatlan, which would represent the legacy and culmination of the international policy sustained in the previous decade.

Tourism was conceived with all its economic benefits: operation of renewable resources, fast-growing activity, important line for export trade, low import content, intensive in labor force, contributor to a more balanced regional development, generator of a fair income distribution and multiple private investment opportunities, less technological-dependent. Besides, during president Luis Echeverria Alvarez' administration, attempts were made to incorporate Mexican peasants into the tourist activity to enlarge their economic possibilities, however such policy was not successful.

Under the assumption that foreign investment in Tourism was necessary to guarantee the flows of incoming travelers, some legal actions were implemented in those areas preserved by the 27th article of Mexican Constitution. Thereupon, investment trusts appeared. During the first five years of the period, government created legal procedures to allow a great scale financial support to take place in the sector, though basically oriented to the real-estate line (hotels). Thus, in 1974 authorities created FONATUR ("National Fund for the Promotion of Tourism"), which would become one of the most effective promotional instruments for hotel expansion in Mexico. On December 29 1974, the Department of Tourism was risen to the rank of State Office. This event emphasized the importance granted to Tourism during this administration.

All these actions were made in a moment when international economy problems sharpened as a result of the oil crisis. Soon after, these conflicts would coincide with the Mexican international position of considering Zionism as a form of racism. In response, the powerful Jewish community in the United States of America undertook a boycott against Mexico. This situation would unmistakably prove the fragility of Mexican tourist sector and the basic mechanisms of the entities responsible for its fomentation and control.

As a consequence of such converging events, Mexico suffered a substantial decrease in the flows of visitors from abroad and Mexican tourist activity plunged into an unparalleled crisis. National and international political context of confrontation caused the critical status of the situation. This framework was reflected in the conception of president Jose Lopez Portillo with regard to Tourism.

During the second half of the decade some other alternatives were sought to secure the foreign exchange provisions required for the development of the country (basically oil).

Despite the fact that tourist activity passed through a deep crisis, Tourism was not left aside from Mexican economic policy. On the contrary, the government tried to take advantage of the tourist plant already installed, looking to achieve the consolidation of the sector by expanding the supply (97 thousand new rooms were built). Nevertheless, authorities attempted for Tourism to have a rapid contribution to the earnings of foreign currency, in virtue of the fact that, together with agriculture, was the only possible option -according with the government conception. In this way, Tourism would help to get the economic recovery, while the oil sector were not in the position of increasing its levels of output and the amount of exports, replacing Tourism in the previously assigned role of "securer" of foreign exchange.

Paradoxically, the excessive emphasis put on oil led Mexican economy toward a speeding-up inflationary process, which combined with the over-valuation of Mexican peso, undermined the competitive position of national tourist centers, both at home and abroad. Under the auspices of this situation, outgoing tourism would show a higher dynamics than that of domestic tourism.

Within this context, during the second half of the decade the national tourist policy started a new change, being reoriented now toward the national market which at that moment had had a relative weight on the attitude of tourist principals. Such reorientation was an attempt to compensate the unfavorable turning point of tourism sector in receiving ingoing tourism flows that, in addition, showed their fragility and hypersensitivity before the events of domestic politics and national diplomacy. On the other hand, authorities intended to make use of the dynamic growth of domestic tourism, whose preferences were focused on the foreign leisure centers, diminishing in its turn the economic benefits of incoming tourism. For the early years of the 1980s such trend kept on having effect and contributed so to the Mexican peso devaluation in 1982.

During the decade, the construction of the important ground infrastructure was reactivated - mainly during the administration of president Luis Echeverria Alvarez- and air transportation infrastructure continued to be strengthened and enlarged. It became evident, once again, the relevance of this means in the policy of power and in moving the flows of travelers toward the country. When the signing of the Bilateral Air Agreement with the United States Of America took

place, new problems rose, preventing real benefits and equilibrium for Mexico.

Mexican tourist policy, expressed in the tourism development plans (1980) and the two federal laws promulgated during this period (one in 1974, the other in 1980), was basically centered in the promotion and development of the physical and territorial plant (installations and declaration of several zones of interest for tourism development, respectively), but tended to exclude the other elements that made it possible, especially transportation.

Starting from the second part of the decade, those organizations devoted to promote internal demand increased in number, within the new political context involving the reorientation of national tourist supply inward.

MEXICAN TOURISM SECTOR IN THE PERIOD 1982-1988

During the period 1982-1988, the National System of Democratic Planning gave shape to the National Plan of Development (1983-1988) and the National Tourism Program (1984-1988). It was within this frame that tourist activity received impulse.

In addition to the efforts made to promote tourism activity, in March of 1986 the "Program of Immediate Action to Promote Tourism" was started in order to reduce the negative effects of both, the earthquakes of 1985 and the oil crisis.

For the creation of the Plans and Programs mentioned above the following objectives for the tourism sector were considered:

- To consolidate the strategic role of tourism for the development of the
     country
- To turn this activity into a creative experience to reproduce our culture and
     values

At the same time, the sector strategy contemplated the following lines:

- To use the capacity of installation intensively and efficiently
- To maintain the supply competitively
- To achieve the optimal allocation of financial resources
- To give impulse to regional development, and...
- To diversify internal and external markets

At the end of 1988 there were 18,140 commercial establishments registered, of a broad range, to satisfy the demand for tourism services. They were classified as follows:

- Accommodation installations
- Restaurants
- Travel agencies
- Tourists guides
- Car rental agencies
- Operators of Marinas

The integration of these very diversified services located in the whole country was a main objective of the Tourist policy.

Another very important task that was tried to be achieved when President De la Madrid started his administration period was the consolidation of an integrated system of fares and prices in order to provide the consumers and the suppliers a reasonable acknowledgment of the conditions they were getting involved in when a tourist transaction occurs. Among other things, this integrated system tried to:

- Increase the quality and competitively of the services.
- Promote new investments.
- Create new jobs.
- Optimize foreign currency receipts.
- Favor the growth of tourists flows.

With the aim to generate a confidence climate for tourists, the National Tourism Office promoted the creation of an organism to protect the visitors. In this organism the Government Office, the Exterior Relations Office, and the Communications and Transportation Office were represented.

During the last ten years, Mexico has searched for facilitating and encouraging travel to our country. As an example can be mentioned the authorization and facilitation for "charter flights".

In this period several restrictions were eliminated about the number and frequencies of tourists and flights, respectively, that European airlines could carry.

Additionally, on November 21,1989 the "Mexico-USA Tourism Agreement" was signed. An outstanding characteristic of the agreement is that each party, on a reciprocal basis, will accredit tourism promotion personnel of the other party as members of a diplomatic mission or consular post.

Another bottleneck for the activity was the tourism oriented to water activities (called "Marinas"). To solve this problem a change in legislation was promoted to allow tourists to take their boats to the country, being able to stay for a five-year period.

As a result of the above mentioned changes, a new branch of tourism services emerged in Mexico, supported in a Commission of Advisory of Operators of "Marinas Turisticas", integrated by the National Tourism Office, the Communications and Transportation Office, the Urban Development and Ecology Office, the Treasury and Public Credit Office and private sector representatives. It can be said that there have been good results if we consider that in 1982 Mexico received 500 thousand tourists in this particular market, increasing dramatically this figure in 1987 when 1500

thousand tourists were registered, mainly in the Caribbean region, Baja California and the so-called Mexican Pacific Rim.

It is important to mention that one of the most important functions started during the last decade was the design of an integrated tourist information system to help for a better understanding of the behavior and development of the activity.

For the impulse of tourism, there were other important actions at an international cooperation level, such as:

- The participation in the World Tourism Organization (WTO), and in the
   Organization of American States (OAS).
- Technical assistance to Latin-American countries.
- Information interchange and participation in Seminars related to the field,
   mainly with USA, France, and Spain.

In relation to the promotion of tourism, the goals attempted to be achieved were the consolidation and diversification of ingoing tourists flows. The markets were classified in the following way: United States of America, Canada, Europe, Latin-America, Asia and the rest of the world. The assumption observed for this classification is that tourism flows in the world are performed within small regions, generally between relatively small distances.

The strategy followed to promote the Mexican tourist resources consisted of the grouping of six concepts which were:

- Beaches
- Gastronomy
- Urban Centers, both Colonial and Modern
- Archaeological Places
- Popular Traditions and
- Folklore Attractions

In a parallel way, the advantages of an excellent weather were pointed out.

In relation to the events that generated the best results in terms of commercialization were:

- The "Tianguis Turistico". This event constitutes the axis of the promotional efforts of Mexico. (Approximately 30% of the annual operations are performed in such event, as stated by participants) .
- It was implemented an scheme called "Tourist Promotion Caravans" which consisted of visiting the most important tour operators and travel agents in USA, Europe and Latin-America.
- It was started a program of annual seminars about Conventions market and Incentive Trips, in order to encourage the demand.
- The activities of the Tourism Office were redefined and oriented towards a major promotion of Mexican tourist attractions.

Besides this effort at an international level, it was tried to spread the promotional activity to reach the social strata of medium and low income in the national market.

Through specific publicity campaigns such as "Mexico gives you the choice" and "Mexico, an Adventure within your reach", an improvement in the traveling habits of Mexicans and a better distribution of tourist flows was achieved, thanks to the diffusion of different places different from the traditionally known.

Another important program promoted in the last decade was concerned with investment and financing. The Inter American Development Bank (BID), and the World Bank provided funds for that purpose. Domestic credit conditions were facilitated and expedited, and furthermore, it was implemented a new scheme of financing in foreign currency to cover exchange rate risks, ad equating the rate of interest to the market conditions.
It is important to mention that public sector had followed a decentralization policy not only in most of the economic sectors but in tourism sector also, in 1982 there were 45 entities conforming the public sector presence in tourism activity, at the end of 1988 they were only 11.

In 1987 the number of tourists visiting Mexico reached a total up to 363 million with a total expenditure of 150 thousand million dollars. This flow of tourists and its resulting monetary flow has a higher international competence attached. According to this, stronger efforts should be made to maintain and increase Mexico's share of international tourism.

For the period 1983 to 1988 the average rate of growth of 9% in the number of tourists and 10.2% in their expenditure, were higher than the world's average rate of growth which were of 4.3%, and 9.2%, respectively.

Thanks to these facts, Mexico is ranked 14th in the row of tourists arrivals, 10th in revenues from tourism and 8th in terms of the quality of hotels and accommodations supply.

III. SPECIFICATION OF THE TOURISM SECTOR MODEL

The analysis of tourism sector is normally related to the determination of demand for tourism services that one region or a whole country can provide. In this work an attempt is made to measure the demand for Mexican tourist services. The structure of the model is supported on the estimation of two main aspects of the activity: the number of tourists going to Mexico from USA by air and their expenditure. Based on those estimations it is intended to estimate the total number of tourists arriving in Mexico by air from all over the world, the total flows of ingoing tourism both by air and land, together with the total receipts of the country derived from such activity.

There are two basic purposes to build a model of tourism sector, one is related to the capacity of predicting or forecasting. On the other hand, more attention is paid to the estimated values for the parameters, concretely, the elasticity's. For this model we will try to pay attention to both aspects.

In the first step of the model we try to measure the size of the potential demand for Mexican tourism services, rather than just measure the effective demand performed, in such a way that an image can be created about how big is the market that can be exploited and at a certain point, it could be determined if there is a decrease or an increase in the share of that market.

According to this, in the first equation we try to estimate the total number of tourists going from USA abroad by air (NTEUAVEVA), understanding that the main factors concerned with a decision of this kind, has to do basically with the economic conditions of the USA tourists.

EQUATIONS: DEMAND

The total number of tourists traveling from USA to the rest of the world by air (NTEUAVEVA) is explained as a function of this very variable lagged one period, and the level of personal disposable income in the USA.

DEPARTURE FROM THE REGION OF ORIGIN

(1) $\ln$ NTEUAVEVA $= \beta_0 + \beta_1 \ln$ NTEUAVEVA.1
$+ \beta_2 \ln$ IPDPCD87$

Where:

NTEUAVEVA.- Total Number of tourists from USA to other countries traveling by air.
Type of variable: ENDOGENOUS
Determination: Direct localization of the series
Source: Statistical Abstract of the USA.

IPDPCD87$.- Real personal disposable income per capita in USA (measured in dollars of 1987).
Type of variable: EXOGENOUS
Determination: Direct localization of the series
Source: Economic Report of the President

And β_i ; $i = 0,..., 2$ are parameters to estimate.

The expected signs of the parameter for the IPDPCD87$ is positive, that is, an increase in the number of US travelers is expected as the real disposable income raises.

ARRIVAL AT THE REGION OF DESTINATION

Once the total number of USA travelers is determined, and since the USA is our main customer we can figure out how big the demand for Mexican tourism services would be and then estimate the arrival equation to the destination of interest, Mexico.

Since the driving variable affecting the decision to travel is thought to be the personal disposable income, this variable enters again in the equation of arrival.

Besides the consideration of income, three other variables were used so as to incorporate other important aspects of tourist activity.

One of them deals with the cost of living tourism in Mexico in relation with the consumer price index of several countries that due to their physical characteristics and geographical ubication could be considered as substitute destinations.

The other is the attempt to include a variable feasible to catch the complexity of the so-called concept "attractiveness index", a difficult concept that depicts, from a theoretical point of view, how high or low a tourist feels attracted to visit one country or other, considering a wide variety of aspects. The third aspect has to do with the facilitation's in traveling to Mexico, the EXCAP variable intends to measure the excess of capacity for the international air operations that Mexican airports can handle. It is assumed that the narrower the gap between the potential number of operations and the actually performed the higher the incentive to rise the air fares.

It is important to notice that two dummy variables were introduced in the equation one for 1983 and another for 1987, years that followed a large currency devaluation.

$$(2) \quad \ln TRPEUAVA = \beta_0 + \beta_1 \ln IPDPCD87\$ + \beta_2 \ln RPMEXSUS + \beta_3 \ln IATRAC2 + \beta_4 \ln EXCAP + \beta_5 DUMMY83 + \beta_6 DUMMY87$$

Where:

TRPEUAVA.- Total number of tourists arriving in Mexico from USA by air.
Type of variable: ENDOGENOUS
Determination: Direct localization of the series
Source: Estadísticas Básicas de la Actividad Turística, Banamex/Sectur

IPDPCD87\$.- Real personal disposable income per capita in USA (measured in dollars of 1987).
Type of variable: EXOGENOUS
Determination: Direct localization of the series
Source: Economic Report of the President.

RPMEXSUS.- Ratio between consumer price index in Mexico and a weighted average of consumer price index in several countries considered as potential competitive destinations.
Type of variable: EXOGENOUS
Determination: It was determined as follows:

RPMEXSUS= (ICVTMEX2)/ (IPCSUS80TC/ TCNMEPUSD)

Where:

ICVTMEX2. Is the cost living of tourism in Mexico and is an average of the consumer price index for the rows of air fare transportation, accommodation,food and beverages and night clubs. It is expressed in Mexican pesos.

IPCSUS80TC. Is a weighted average of the consumer price indexes for several countries or tourist destinations, such as Hawaii, Bahamas, Bermuda, Puerto Rico and Jamaica expressed in US dollars. The weights were assigned according with the relative share observed for those destinations in the total flow of US tourists, and then expressed in Mexican pesos by dividing by the nominal exchange rate between Mexican peso and US dollar.

IATRAC2.- Proxy variable that tries to reflect the attractiveness that Mexico has for USA tourists.
Type of variable: EXOGENOUS
Determination: This variable was the result to compare the total number of tourists traveling from USA to Mexico by air in the previous year (TRPEUAVA.1), over the total number of tourism flows departing from USA by air toward the rest of the world in the preceding year (NTEUAVEVA.1). Since the quantification of this variable implies to face strong difficulties, because it should pick up aspects such as: exchange rate between the currencies involved, level of Mexican tourist prices, quality of national tourist supply, and so forth, an attempt was made to take into account some of these elements separately, as it will be seen below.

EXCAP.- Ratio between the potential number of international air operations (landings, take-off, and movement of aircraft's) in Mexican airports, and the number of operations actually performed.
Type of variable: EXOGENOUS
Source: Airports and Auxiliary Services (ASA). Secretary of Communications and Transportation.

DUMMY83.- This dummy variable tries to capture the Mexican peso devaluation of 1982. We consider that since such devaluation took place in late 1982and due to the lagged effect or reaction to this fact, the main effect appeared in 1983.

DUMMY87.- This dummy variable, like the previous one, is intended to capture athe effect of a devaluation.

And ßi for i= 0,..6 are parameters to estimate.

Up to this point we have just considered the tourists coming from the USA by air but there are tourists arriving in Mexico from Europe,Asia and other regions by air and there are also tourists from USA arriving by other means and not only by air. According to this, we first intended an explanation of the total number of tourists arriving in Mexico by air from the whole world (TRTVA) and then we tried to estimate the total number of tourists arriving in Mexico from the whole world and by all means (TRT). In both cases we used as a main explanatory variable the total number of tourists from USA by air (TRPEUAVA), the equations to estimate TRTVA and TRT were specified as follows:

(3)   ln TRTVA = ß$_0$ + ß$_1$ ln TRPEUAVA

Where:

TRTVA.- Is the total number of tourists arriving to Mexico from everywhere by air.
Type of variable: ENDOGENOUS EXPLANATORY
Determination: Direct localization of the series
Source: Basic Statistics of the Tourism Sector Banamex/Sectu

TRPEUAVA.- Total number of tourists arriving at Mexico from USA by air.
Type of variable: ENDOGENOUS EXPLANATORY
Determination: Direct localization of the series
Source: Basic Statistics of the Tourism Sector Banamex/Sectur

And ß$_i$ for i= 0, 1 are parameters to estimate.

(4) ln TRPOEUA = ß$_0$ + ß$_1$ ln TRPOEUA.1 + ß$_2$ ln IPDPCD87\$ +
ß$_3$ ln TCREAL78.1 + ß$_4$ ln EXCAP + ß$_5$ ln DUMMY83

Where:

TRPOEUA.- Is the total number of tourists arriving in Mexico from USA by both air and land.
Type of variable: ENDOGENOUS
Determination: Direct localization of the series
Source: Basic Statistics of the Tourism Sector Banamex/Sectur

IPDPCD87\$.- Real personal disposable income per capita in USA (measured in dollars of 1987).
Type of variable: EXOGENOUS
Determination: Direct localization of the series
Source: Economic Report of the President.

TCREAL78.1 .- Real exchange rate between Mexico and the USA, Mexican pesos per one US dollar, lagged one period.
Type of variable: EXPLANATORY.

16

Determination: It is calculated as follows:

$$TCREAL78 = (IPCEUA78/INPCMEX78)*TCNMEPUSD$$

Where:
IPCEUA78 is the consumer price index in the United States, basis 1978.
INPCMEX78 is the consumer price index for Mexico, basis 1978, and
TCNMEPUSD is the nominal exchange rate between the Mexican
peso and the US dollar.
Source: International Financial Statistics, IMF, and Bank of Mexico.

EXCAP.- Ratio between the potential number of international air operations (landings, take-off, and movement of aircraft's) in Mexican airports, and the number of operations actually performed.
Type of variable: EXOGENOUS
Source: Airports and Auxiliary Services (ASA). Secretary of Communications and Transportation.

DUMMY83.- This dummy variable tries to capture the Mexican peso devaluation of 1982. We consider that since such devaluation took place in late 1982and due to the lagged effect or *reaction* to this fact, the main effect appeared in 1983.

And β_i for i=0,..5 are parameters to estimate.

(5) $\ln TRT = \beta_0 + \beta_1 \ln TRPOEUA + \beta_2 IPDPCD87\$$

Where:

TRT is the total number of tourists arriving in Mexico from the whole world by all means (air, sea, land).
Type of variable: ENDOGENOUS
Determination: Direct localization of the series
Source: Basic Statistics of the Tourism Sector Banamex/Sectur

TRPOEUA.- Is the total number of tourists arriving in Mexico from USA by both air and land.
Type of variable: ENDOGENOUS
Determination: Direct localization of the series
Source: Basic Statistics of the Tourism Sector Banamex/Sectur

IPDPCD87$.- Real personal disposable income per capita in USA (measured in dollars of 1987).
Type of variable: EXOGENOUS
Determination: Direct localization of the series
Source: Economic Report of the President

And $ß_i$ for i=0,..2 are parameters to estimate.

EQUATIONS: EXPENDITURE

Estimation of the total expenditure:

Once the number of tourists arriving in Mexico is determined, we tried to estimate their total expenditure using as an input variable the total number of tourists arriving in Mexico from USA (TRPEUAVA) among other variables.

It is important to point out that initially we tried to determine the average expenditure but we found several troubles since the variables on the left and on the right-hand side were divided by the same variable TRPEUAVA, causing statistical problems.

The total expenditure of the tourists from USA was first converted to Mexican pesos by multiplying it by the nominal exchange rate (TCNMEPUSD) and was then deflated by the cost index of tourism services (ICVTMEX78). The convertion was made in the understanding that expenditure is performed in the region of destination currency. In that way we got the dependent variable to be explained, the total expenditure in Mexican pesos in real terms (TRGTEUAVAMEPR$).

On the right-hand side of the equation as explanatory variables we considered firstly, the total number of tourist coming to Mexico from USA, which was determined in the previous equation. Secondly, the real disposable income converted into Mexican pesos in real terms, it was deflated by the same cost index of tourism services (ICVTMEX78).

The real exchange rate between Mexican peso and US dollar was also introduced as an explanatory variable.

As in the previous equation the mathematical approach of the equation is a double logarithmic form:

(6) $\ln \text{TRGTEUAVAMEPR\$} = ß_0 + ß_1 \text{TRCAL} + ß_2 \ln \text{INGREALMEP\$I} + ß_3 \ln \text{TCREAL78}$

Where:

TRGTEUAVAMEPR$.- Is the total expenditure of the tourists from USA in Mexico, measured in real Mexican pesos.
Type of variable: ENDOGENOUS
Determination: It is calculated as follows:

TRGTEUAVAMEPR$= (TRGTEUAVA$ * TCNMEPUSD)/ICVTMEX78

Where:
TRGTEUAVA$ is the total expenditure of tourists from the USA in Mexico.
TCNMEPUSD is the National exchange rate between Mexican peso and US dollar, measured in Mexican pesos per one dollar.
ICVTMEX78 is the index of tourist services cost obtained as the average of the price index for the rows of Accommodations, Beverages and Food and Night Clubs.
Source: Basic Statistics of the Tourism Sector Banamex/Sectur

TRCAL.- This is a variable that results of the weight of the total number of tourists who arrive in Mexico from USA by air, multiplied by a factor which indicates the quality of tourists that are arriving.
Type of variable: EXOGENOUS
Determination: It is calculated as follows:
TRCAL= TRPEUAVA*1-(TRVFM/TRTVA)

Where:
TRPEUAVA.- Is the total number of tourists arriving from USA by air.
TRVFM.- Is the number of tourists arriving in Mexico by charter flights, and
TRTVA.- Is the total number of tourists arriving in Mexico by air from everywhere.

INGREALMEP$1.- Is the real disposable income in the USA in Mexican pesos.
Type of variable: EXPLANATORY.
Determination: This variable was obtained as follows:
INGREALMEP$1= (IPDPCDC$ * TCNMEPUSD)/ICVTMEX78

Where:
IPDPCDC$ is the personal disposable income in current dollars for the USA.
TCNMEPUSD is the National exchange rate between Mexican peso and US dollar, measured in Mexican pesos per one dollar.
ICVTMEX78 is the index of tourist services cost obtained as the average of the price index for the rows of Accommodations, Beverages and Food and Night Clubs.
Source: International Financial Statistics, IMF.; Bank of Mexico.

TCREAL78 .- Real exchange rate between Mexico and the USA, Mexican pesos per one US dollar.
Type of variable: EXPLANATORY.
Determination: It is calculated as follows:

$$TCREAL78= (IPCEUA78/INPCMEX78)*TCNMEPUSD$$

Where:
IPCEUA78 is the consumer price index in the United States, basis 1978.
INPCMEX78 is the consumer price index for Mexico, basis 1978, and
TCNMEPUSD is the nominal exchange rate between the Mexican peso and the US dollar.
Source: International Financial Statistics, IMF. and Bank of Mexico.

And β_i for i=0,..3 are parameters to estimate.

From the last equation in which total expenditure of tourists from USA is estimated, it is possible to derive two identities to estimate both the average and daily average expenditure of tourists from USA, using the following identities:

(7)   **TRGMEUAVAMEPR\$ = TRGTEUAVAMEPR\$/TRPEUAVA**

(8)   **TRGMDEUAVAMEPR\$ = TRGMEUAVAMEPR\$/TRPMVA**

Where:

TRGMEUAVAMEPR\$ is the average expenditure of tourists from the USA obtained as the ratio between the total expenditure of tourists from USA (TRGTEUAVAMEPR\$) over the total number of tourists from the USA arriving in Mexico (TRPEUAVA).

TRGMDEUAVAMEPR\$ is the daily average expenditure of tourists from the USA obtained as the ratio between the average expenditure of tourists from USA (TRGMEUAVAMEPR\$) over the average staying of those tourists in days (TRPMVA).

Since the total expenditure is expressed in real Mexican pesos, the average and daily average expenditure are derived in the same measurement.

(9)   **ln TRGTVAMEPR\$ = β_0 + β_1 ln TRCALVA + β_2 ln INGREALMEP\$**
          + $\beta_3$ln TCREAL78+β_4 DUMMY75 + β_5 DUMMY87

Where:

TRGTVAMEPR$.- Is the total expenditure of the tourists from the whole world arriving in Mexico by air, measured in real Mexican pesos.
Type of variable: ENDOGENOUS
Determination: It is calculated as follows:

TRGTVAMEPR$= (TRGTVA$ * TCNMEPUSD)/ICVTMEX78
Where:
TRGTVA$ is the total expenditure of tourists from the whole world arriving by air in Mexico.
TCNMEPUSD is the National exchange rate between Mexican peso and US dollar, measured in Mexican pesos per one dollar.
ICVTMEX78 is the index of tourist services cost obtained as the average of the price index for the rows of Accommodations, Beverages and Food and Night Clubs.
Source: Basic Statistics of the Tourism Sector Banamex/Sectur

TRCALVA.- This is a variable that results of the weight of the total number of tourists who arrive in Mexico from the whole world by air, multiplied by a factor which indicates the quality of tourists that are arriving.
Type of variable: EXOGENOUS
Determination: It is calculated as follows:

TRCALVA= TRTVA*1-(TRVFM/TRTVA)

Where:

TRTVA.- Is the total number of tourists arriving from everywhere by air.
TRVFM.- Is the number of tourists arriving in Mexico by charter flights, and
TRTVA.- Is the total number of tourists arriving in Mexico by air from everywhere.

INGREALMEP$.- Is the real disposable income in the USA in Mexican pesos.
Type of variable: EXOGENOUS.
Determination: This variable was obtained as follows:

INGREALMEP$1= (IPDPCDC$ * TCNMEPUSD)/ICVTMEX78

Where:
IPDPCDC$ is the personal disposable income in current dollars for the USA.
TCNMEPUSD is the National exchange rate between Mexican peso and US dollar, measured in Mexican pesos per one dollar.
ICVTMEX78 is the index of tourist services cost obtained as the average of the price index for the rows of Accommodations, Beverages and Food and Night Clubs.

Source: International Financial Statistics, IMF.; Bank of Mexico.

TCREAL78 .- Real exchange rate between Mexico and the USA, Mexican pesos per one US dollar.
Type of variable: EXPLANATORY.
Determination: It is calculated as follows:

$$TCREAL78= (IPCEUA78/INPCMEX78)*TCNMEPUSD$$

Where:
IPCEUA78 is the consumer price index in the United States, basis 1978.
INPCMEX78 is the consumer price index for Mexico, basis 1978, and
TCNMEPUSD is the nominal exchange rate between the Mexican peso and the US dollar.
Source: International Financial Statistics, IMF. and Bank of Mexico.

Once the total expenditure of tourists arriving by air and total expenditure of tourists, in real Mexican pesos are determined, four identities are introduced to obtain the average and daily average in both cases.

And β_i for i=0,..5 are parameters to estimate.

(10)   TRGTMEPR\$= (TRGTVAMEPR\$ / TRTVA)

Where:
TRGMVAMEPR\$ is the average expenditure of tourists arriving by air to Mexico, in real Mexican pesos.
TRGTVAMEPR\$ is the total expenditure of tourists arriving by air to Mexico, in real Mexican pesos.
TRTVA is the total number of tourists arriving by air to Mexico.

(11)   TRGMDVAMEPR\$= (TRGMVAMEPR\$ / TRPMVA)

Where:

TRGMDVAMEPR\$ is the daily average expenditure of tourists arriving by air to Mexico, in real Mexican pesos.
TRGMVAMEPR\$ is the average expenditure of tourists arriving by air to Mexico, in real Mexican pesos.
TRPMVA is the average staying of tourists who arrived by air to Mexico.

(12)   TRGMMEPR\$= (TRGTMEPR\$ / TRT)

Where:

TRGMMEPR$ is the average expenditure of tourists arriving to Mexico, in real Mexican pesos.
TRGTMEPR$ is the total expenditure of tourists arriving to Mexico, in real Mexican pesos.
TRT is the total number of tourists arriving to Mexico.

(13) $\qquad$ **TRGMDMEPR$= (TRGMMEPR$ / TRPMT)**

Where:

TRGMDVAMEPR$ is the daily average expenditure of tourists arriving to Mexico, in real Mexican pesos.
TRGMMEPR$ is the average expenditure of tourists arriving to Mexico, in real Mexican pesos.
TRPMT is the average staying of tourists who arrived to Mexico.

A very important variable in the model is the cost index of tourist services in Mexico (ICVTMEX78) that's why an equation is incorporated tin the model to try to predict the variations in such index using the National Consumer Price Index as explanatory variable, this equation was specified as follows:

(14) $\qquad$ **ICVTMEX78VP= $\beta_0 + \beta_1$ INPCMEX78VP**

Where:

ICVTMEX78VP is the percent change of the ICVTMEX78.
INPCMEX78VP is the percent change of the INPCMEX78

According to this specification the changes in the cost of tourist services are explained by the changes of the National Consumer Price Index and are then incorporated to the model through the identity:

(15) $\qquad$ **ICVTMEX78= ICVTMEX78.1 * (1+(ICVTMEX78VP/100))**

Since the model is estimating the expenditure in real Mexican pesos, 22 additional identities are incorporated to the model to convert again the real Mexican pesos to both, nominal Mexican pesos and nominal US dollars.

(16) $\qquad$ **TRGTEUAVAMEPN$= (TRGTEUAVA$ * TCNMEPUSD)**

Where:

TRGTEUAVAMEPN$ is the total expenditure of tourists from the USA who arrived by air to Mexico, in nominal pesos.
TRGTEUAVA$ is the total expenditure of the tourists from USA who arrived by air to Mexico, in US dollars.
TCNMEPUSD is the nominal exchange rate between Mexico and the USA, Mexican pesos per US dollars.

(17)   **TRGTEUAVAUSDN$= (TRGTEUAVA$ / TCNMEPUSD)**

Where:

TRGTEUAVAUSDN$ is the total expenditure of tourists from the USA who arrived by air to Mexico, in US nominal dollars.
TRGTEUAVA$ is the total expenditure of the tourists from USA who arrived by air to Mexico, in US dollars.
TCNMEPUSD is the nominal exchange rate between Mexico and the USA, Mexican pesos per US dollars.

(18)   **TRGMEUAVAMEPN$= (TRGMEUAVA$ * TCNMEPUSD)**

Where:

TRGMEUAVAMEPN$ is the average expenditure of tourists from the USA who arrived by air to Mexico, in nominal pesos.
TRGMEUAVA$ is the average expenditure of the tourists from USA who arrived by air to Mexico, in US dollars.
TCNMEPUSD is the nominal exchange rate between Mexico and the USA, Mexican pesos per US dollars.

(19)   **TRGMEUAVAUSDN$= (TRGMEUAVA$ / TCNMEPUSD)**

Where:

TRGMEUAVAUSDN$ is the average expenditure of tourists from the USA who arrived by air to Mexico, in US nominal dollars.
TRGMEUAVA$ is the average expenditure of the tourists from USA who arrived by air to Mexico, in US dollars.
TCNMEPUSD is the nominal exchange rate between Mexico and the USA, Mexican pesos per US dollars.

(20)   TRGMDEUAVAMEPN$= (TRGMDEUAVA$ * TCNMEPUSD)

Where:

TRGMDEUAVAMEPN$ is the daily average expenditure of tourists from the USA who arrived by air to Mexico, in nominal pesos.
TRGMDEUAVA$ is the average expenditure of the tourists from USA who arrived by air to Mexico, in US dollars.
TCNMEPUSD is the nominal exchange rate between Mexico and the USA, Mexican pesos per US dollars.

(21)   TRGMDEUAVAUSDN$= (TRGMDEUAVA$ / TCNMEPUSD)

Where:

TRGMDEUAVAUSDN$ is the daily average expenditure of tourists from the USA who arrived by air to Mexico, in US nominal   dollars.
TRGMDEUAVA$ is the average expenditure of the tourists from USA who arrived by air to Mexico, in US dollars.

TCNMEPUSD is the nominal exchange rate between Mexico and the USA, Mexican pesos per US dollars.

In an analogous way several identities were specified to determine the total expenditure of the tourists by air from the whole world and the expenditure of the tourists from the whole world and by all means to express them in nominal Mexican pesos and nominal US dollars.

(22)   TRGTVAMEPN$= (TRGTVA$ * TCNMEPUSD)

Where:

TRGTVAMEPN$ is the total expenditure of tourists who arrived by air to Mexico, in nominal pesos.
TRGTVA$ is the total expenditure of the tourists who arrived by air to Mexico, in US dollars.
TCNMEPUSD is the nominal exchange rate between Mexico and the USA, Mexican pesos per US dollars.

(23)   TRGTVAUSDN$= (TRGTVA$ / TCNMEPUSD)
Where:
TRGTVAUSDN$ is the total expenditure of tourists who arrived by air to Mexico, in US nominal dollars.

TRGTVA$ is the total expenditure of the tourists who arrived by air to Mexico, in US dollars.
TCNMEPUSD is the nominal exchange rate between Mexico and the USA, Mexican pesos per US dollars.

(24)   **TRGMVAMEPN$= (TRGMVA$ * TCNMEPUSD)**

Where:

TRGMVAMEPN$ is the average expenditure of tourists who arrived by air to Mexico, in nominal pesos.
TRGMVA$ is the average expenditure of the tourists who arrived by air to Mexico, in US dollars.
TCNMEPUSD is the nominal exchange rate between Mexico and the USA, Mexican pesos per US dollars.

(25)   **TRGMVAUSDN$= (TRGMVA$ / TCNMEPUSD)**

Where:

TRGMVAUSDN$ is the average expenditure of tourists who arrived by air to Mexico, in US nominal dollars.
TRGMVA$ is the average expenditure of the tourists who arrived by air to Mexico, in US dollars.

TCNMEPUSD is the nominal exchange rate between Mexico and the USA, Mexican pesos per US dollars.

(26)   **TRGMDVAMEPN$= (TRGMDVA$ * TCNMEPUSD)**

Where:

TRGMDVAMEPN$ is the daily average expenditure of tourists who arrived by air to Mexico, in nominal pesos.
TRGMDVA$ is the average expenditure of the tourists who arrived by air to Mexico, in US dollars.
TCNMEPUSD is the nominal exchange rate between Mexico and the USA, Mexican pesos per US dollars.

(27)   **TRGMDVAUSDN$= (TRGMDVA$ / TCNMEPUSD)**

Where:

TRGMDVAUSDN$ is the daily average expenditure of tourists who arrived by air to Mexico, in US nominal dollars.

TRGMDVA$ is the average expenditure of the tourists who arrived by air to Mexico, in US dollars.

TCNMEPUSD is the nominal exchange rate between Mexico and the USA, Mexican pesos per US dollars.

(28)   TRGTMEPN$= (TRGTVA$ * TCNMEPUSD)

Where:

TRGTMEPN$ is the total expenditure of tourists who arrived to Mexico, in nominal pesos.
TRGT$ is the total expenditure of the tourists who arrived to Mexico, in US dollars.
TCNMEPUSD is the nominal exchange rate between Mexico and the USA, Mexican pesos per US dollars.

(29)   TRGTUSDN$= (TRGT$ / TCNMEPUSD)

Where:

TRGTUSDN$ is the total expenditure of tourists who arrived to Mexico, in US nominal dollars.
TRGT$ is the total expenditure of the tourists who arrived to Mexico, in US dollars.
TCNMEPUSD is the nominal exchange rate between Mexico and the USA, Mexican pesos per US dollars.

(30)   TRGMMEPN$= (TRGM$ * TCNMEPUSD)

Where:

TRGMMEPN$ is the average expenditure of tourists who arrived to Mexico, in nominal pesos.
TRGM$ is the average expenditure of the tourists who arrived to Mexico, in US dollars.
TCNMEPUSD is the nominal exchange rate between Mexico and the USA, Mexican pesos per US dollars.

(31)   TRGMUSDN$= (TRGM$ / TCNMEPUSD)

Where:

TRGMUSDN$ is the average expenditure of tourists who arrived to Mexico, in US nominal dollars.

TRGM$ is the average expenditure of the tourists who arrived to Mexico, in US dollars.

TCNMEPUSD is the nominal exchange rate between Mexico and the USA, Mexican pesos per US dollars.

(32)   TRGMDMEPN$= (TRGMD$ * TCNMEPUSD)

Where:

TRGMDMEPN$ is the daily average expenditure of tourists who arrived to Mexico, in nominal pesos.

TRGMDVA$ is the average expenditure of the tourists who arrived to Mexico, in US dollars.

TCNMEPUSD is the nominal exchange rate between Mexico and the USA, Mexican pesos per US dollars.

(33)   TRGMDUSDN$= (TRGMD$ / TCNMEPUSD)

Where:

TRGMDUSDN$ is the daily average expenditure of tourists who arrived to Mexico, in US nominal dollars.

TRGMD$ is the average expenditure of the tourists who arrived to Mexico, in US dollars.

TCNMEPUSD is the nominal exchange rate between Mexico and the USA, Mexican pesos per US dollars.

NDOGENOUS VARIABLE	EXPLAN VAR	R2	ADJ R2	.W. (1	D.W. (2	F	T STAT	COEFF	SUM SQ	STD ERR	LHS MEAN	AR 0 AR 1	H
EPARTURE EQUATION													
NTEUAVEVA `OG	NTEUAVEVA.1	0.9866	0.985	1.359	1.9975	591.047	4.78004	0.54073	0.0289	0.0425	9.7672		1.594
	IPDPCD87$						3.88527	1.57039					
	CONSTANT						3.72204	-10.232					
ARRIVAL EQUATIONS													
RPEUAVA LOG/COCHR	IPDPCD87$	0.9904	0.9842	2.0301	2.4864	161.306	13.5844	4.89257	0.0296	0.0518	7.5408	-0.4791	
	RPMEXSUS						2.27271	-0.0162				-1.7272	
	IATRAC2						1.83275	0.31766					
	EXCAP						6.88322	0.61651					
	DUMMY83						7.86425	0.44121					
	DUMMY87						3.21224	0.19009					
	CONSTANT						10.3966	-37.592					
RTVA LOG/COCHR	TRPEUAVA		0.997	0.9966	1.9516	1.983	2787.92	35.6434	0.91369	0.0102	0.0244	7.7155	0.42408	
	CONSTANT						4.44543	0.87078				-2.7534	
RPOEUA OG	TRPOEUAVA.1		0.979	0.9709	2.0473	1.8142	121.198	2.32293	0.33135	0.0204	0.0396	8.1259		-0.728
	IPDPCD87$						3.74002	1.5446					
	TCREAL78.1						4.31939	0.29696					
	EXCAP						4.09697	0.47599					
	DUMMY83						4.36703	0.18887					
	CONSTANT						3.60339	-9.9342					
`RT OG/COCHR	TRPOEUA	0.9972	0.9967	1.8446	1.9309	1905.82	22.1595	0.947	0.0035	0.0148	8.3031	0.68034	
	IPDPCD87$						0.4206	0.06411				-5.9374	
	CONSTANT						0.00714	-0.0089					
XPENDITURE EQUATIONS													
IRGTEUAVAMEPR$ LOG	TRCAL	0.9892	0.9873	2.1968	2.7846	520.814	25.0812	0.63899	0.0301	0.0421	4.8592		
	INGREALMEP$						7.12108	1.06172					
	TCREAL78						4.66623	-0.6317					
	CONSTANT						8.40911	-5.5482					
TRGTVAMEPR$ OG/COCHR	TRCALVA	0.9881	0.986	1.9312	2.4048	472.146	22.0128	0.6042	0.0314	0.043	5.1458		
	INGREALMEP$						9.07725	1.42159					
	TCREAL78						6.7178	-0.9376					
	CONSTANT						14.6125	-9.5752					
RGTMEPR$ OG	TRT	0.9808	0.9744	2.0031	2.4365	152.946	13.9361	0.54367	0.0229	0.0391	5.4533		
	INGREALMDO$						8.13025	0.89034					
	TCREAL78						5.39466	-0.5341					
	DUMMY75						2.9371	-0.1267					
	DUMMY87						2.02322	0.09225					
	CONSTANT						7.54515	-2.8268					
CVTMEX78VP	INPCMEX78VP	0.9901	0.9896	1.5042	1.643	1898.56	43.5724	1.06198	328.05	4.1552	42.9169		
	CONSTANT						0.60302	-0.8157					

V. RESULTS OF THE ESTIMATION

The equations of the model were estimated by ordinary least squares and in those cases where the Durbin-Watson statistic indicates the presence of auto correlation, the parameter estimates are inefficient and the usual hypothesis-testing procedures are no longer valid. Therefore, those equations were estimated again using the Cochrane-Orcutt iterative procedure to try to reduce the likelihood of auto correlation.

In all the equations the expected signs are correct and we are going to comment the most important results, in chapter 2 are defined the variables and the methodology to build them up.

The first equation tries to explain the total number of tourists going from USA overseas, as a function of the per capita personal disposable income in real terms and the same number of tourists lagged one period. As we can see, the income elasticity is 1.57 that is not too high but shows that traveling could be considered a superior good.

Equation 2 explains the total number of tourists from USA arriving to Mexico by air (TRPEUAVA) as a function of the per capita personal disposable income in USA (IPDPCD87$), a relationship between a tourism price index and a weighted average price index of competitive destinations (RPMEXSUS); an attractiveness index (IATRAC), a proxy variable for air services tariffs (EXCAP); and two dummy variables for 1983 and 1987 years of Mexican peso devaluation. As is usual in demand analysis, income and the price of substitutes (in relation with own prices) are included as explanatory variables.

From the results it is important to notice that for this equation the income elasticity is much higher than income elasticity in equation 1, this fact reflects that for the tourists who decide to come to Mexico the changes in income are much more important. So that, the impact of a recession in the USA impacts heavily on the number of tourists who come to Mexico and not that much on the number of tourists who go to the rest of the world.

About the price relationship (RPMSUS) it is worth to notice that the coefficient is very low, this could indicate that the tourists have well defined where to go regardless the variation of prices in their alternative destination.

Considering that tourists from USA represents around 80% average in the period of study (1970-1990), the total number of tourists arriving in Mexico by air, from both USA and rest of the world, was estimated as a function of TRPEUAVA.

The total number of tourists from USA by air and land (TRPOEUA) estimation shows that the exchange rate is significant but the low coefficient indicates that its impact is not significant.

In this equation we can realize that income elasticity falls again to the level it showed in equation 1, the conclusion of this fact could be that the tourists who travel by land are not high sensitive to variations in income as air travelers are.

Equation 7 explains the total expenditure of USA tourists in Mexico (TRGTEUAVAMEPR$) but now, since the expenditure takes place in Mexico, the variable is measured in real Mexican pesos. Once more the income (INGREALMEP) elasticity is higher than the exchange rate (TCREAL78) elasticity, the former has a 1.06 coefficient while the latter has a .48 coefficient. It is important that the specification of the equations has a double logarithm form, so that the coefficient of the exchange rate is not -63 because the variable INGREALMEP$ already has an exchange rate factor multiplying it. According to this, the coefficient for TCREAL78 would be 1.4 plus -.63 which equals .48 with positive sign as we would expect.

VI. RESULTS OF SIMULATION

A useful simulation statistic related to the root mean square simulation error and applied to the evaluation of historical simulations or ex-post forecasts is the Theil s inequality coefficient which can be decomposed in the following way: $U = Um + Us + Uc$.

Where Um is the bias, Us is the variance and Uc is the covariance proportions respectively.

Um is the systematic error and is desirable to be close to zero since it measures the extent to which the average values of simulated and actual values deviate from each other. In the simulation of the model almost all series had an Um close to zero. (See the Summary of Simulation Statistics).

The variance proportion Us indicates the ability of the model to replicate the degree of variability in the variable of interest. A large Us would mean that the actual series has fluctuated considerably while the simulated shows little fluctuation, or vice versa. For most series of the model the variance proportion is low.

Finally, the covariance proportion measures the unsystematic error, it is desirable, as most of the series in the model, that Uc be close to 1.

VII. CONCLUSIONS

The model presented above is just an estimate of reality, but shows how econometric models can be useful to find some basic explanations for the behavior of tourism demand . Appraisal of an econometric model normally considers criteria such as correct coefficient signs, goodness of fit, statistical significance of the coefficients, etc.

Even more, it is often implied that information yielded by this criteria should provide some guidance with regard to forecasting ability.

According to the results of the simulation, the model reproduces the general trends for most variables, in spite of the several statistical problems arose in the estimation.

It is clear that the main explanatory variable of the model is the personal disposable income of USA residents, it determines the number of tourists arriving in Mexico from USA and the quantity of money they spend in Mexico.

Another important conclusion is that other variables such as exchange rate or price trends in Mexico and in alternative countries have a lower impact in the endogenous variables.

According to this, it can be said that the policy variables that the Mexican government can handle in order to encourage the demand side of the tourism activity have a limited effect and
that the number of tourists and its expenditure e depends more upon the income level of our most important consumers of tourism services.

We would like to point out that this is a first attempt to model one aspect of tourism activity (receptive tourism) and that improvement of the results may be effected by further refinements of the model presented.

Some other aspects may be added to the model, such as outgoing tourism or the supply side of the activity, the result would be a much more complete model which allows us appreciate the complexity of that interesting economic phenomena.

VIII   APPENDIX

```
=>  SHOW (RESIDUAL);
 NTEUAVEVA
! Ordinary Least Squares
 ANNUAL data for   19 periods from 1971 to 1989
_ Date: 22 MAY 1992


  log(nteuaveva)

    =    0.54073 * log(nteuaveva)[-1] + 1.57039 * log(ipdpcd87$)
         (4.78004)                          (3.88527)

       - 10.2320
         (3.72204)


  Sum Sq      0.0289    Std Err     0.0425   LHS Mean   9.7672
  R Sq        0.9866    R Bar Sq    0.9850   F  2, 16   591.047
  D.W.( 1)    1.3590    D.W.( 2)    1.9975
  H           1.5942


  NTEUAVEVA=EXP(??)
```

<div align="center">Regression Summary</div>

ANNUAL Data for   19 periods from 1971 to 1989

Variable	Total coeff	T-statistic	Mean	Elasticity
LOG(NTEUAVEVA)	0.5407E+00	4.7800E+00	9.6988E+00	0.5362E+00
LOG(IPDPCD87$)	1.5704E+00	3.8853E+00	9.3955E+00	1.5106E+00
Constant	-1.0232E+01	3.7220E+00		

```
  Sum Sq      0.2893E-01   Std Err     0.4252E-01   LHS Mean    9.7672E+00
  R Sq        0.98665      R Bar Sq    0.98498       F  2, 16    5.9105E+02
  D.W.( 1)    1.35900      D.W.( 2)    1.99751
  Res Mean   -0.4503E-09   %RMSE       1.1556E+01
```

	Actual	Predicted	Residual
1971	9.141	9.141	-0.001
1972	9.285	9.238	0.046
1973	9.419	9.404	0.015
1974	9.453	9.450	0.002
1975	9.397	9.479	-0.082
1976	9.474	9.490	-0.016
1977	9.533	9.561	-0.029
1978	9.668	9.653	0.015
1979	9.805	9.751	0.054
1980	9.866	9.821	0.045
1981	9.899	9.873	0.026
1982	9.869	9.890	-0.021
1983	9.890	9.900	-0.010
1984	9.981	9.995	-0.014
1985	10.021	10.072	-0.051
1986	10.051	10.128	-0.077
1987	10.191	10.143	0.048
1988	10.289	10.259	0.031
1989	10.347	10.327	0.019

INGOING TOURISM FROM USA TO MEXICO BY AIR
(Actual and Predicted Values)

—LOG(TRPEUAVA)   --TRPEUAVA.PREDICT
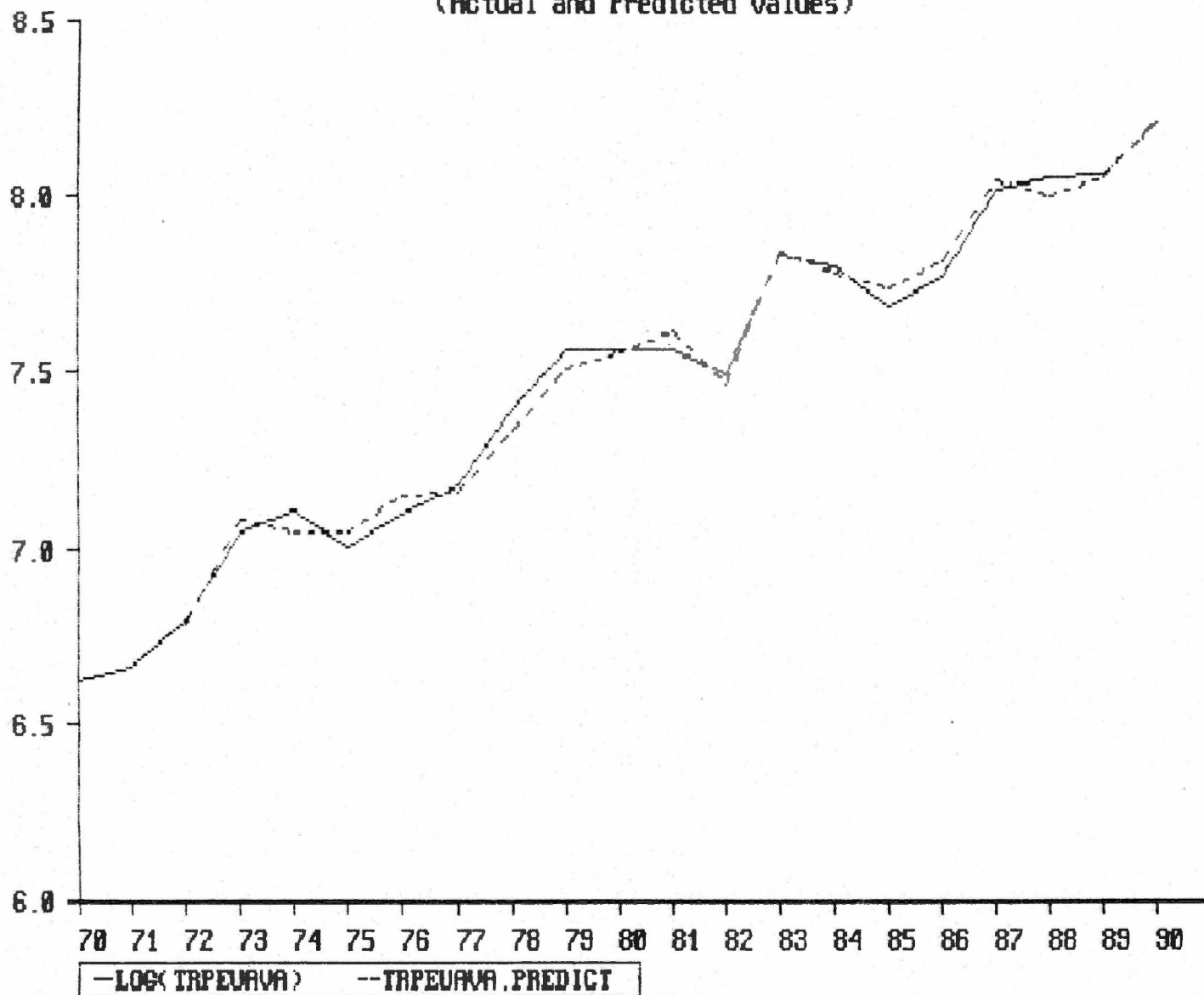
```
=)  SHOW (RESIDUAL);
 TRTVA
 Cochrane-Orcutt
 ANNUAL data for   20 periods from 1971 to 1990
 Date: 22 MAY 1992


 log(trtva)

   =     0.91369 * log(trpeuava) + 0.87078
         (35.6434)                   (4.44543)


 Sum Sq       0.0102   Std Err     0.0244   LHS Mean   7.7155
 R Sq         0.9970   R Bar Sq    0.9966   F  2, 17  2787.92
 D.W.( 1)     1.9516   D.W.( 2)    1.9830


 AR_0 =  + 0.42408 * AR_1
          (2.75336)


 TRTVA=EXP(??)
```

Regression Summary

ANNUAL Data for   20 periods from 1971 to 1990

Variable	Total coeff	T-statistic	Mean	Elasticity
LOG(TRPEUAVA)	0.9137E+00	3.5643E+01	7.4973E+00	0.8878E+00
Constant	0.8708E+00	4.4454E+00		
RHO 1	0.4241E+00	2.7534E+00		

```
 Sum Sq     0.1015E-01    Std Err    0.2444E-01   LHS Mean   7.7155E+00
 R Sq       0.99696       R Bar Sq   0.99660      F  2, 17   2.7879E+03
 D.W.( 1)   1.95157       D.W.( 2)   1.98297
 Res Mean  -0.3580E-08    %RMSE      5.5132E+00
```

	Actual	Predicted	Residual
1971	6.894	6.901	-0.007
1972	7.072	7.048	0.023
1973 :	7.267	7.308	-0.041
1974 :	7.343	7.352	-0.009
1975 :	7.267	7.261	0.006
1976 :	7.334	7.354	-0.021
1977 :	7.452	7.420	0.032
1978 :	7.682	7.637	0.045
1979 :	7.822	7.808	0.014
1980 :	7.812	7.799	0.013
1981	7.756	7.792	-0.037
1982	7.683	7.709	-0.026
1983	8.004	8.010	-0.006
1984	8.007	7.990	0.017
1985	7.899	7.900	-0.001
1986	7.990	7.977	0.012
1987	8.198	8.200	-0.002
1988	8.207	8.234	-0.027
1989	8.254	8.228	0.026
1990	8.369	8.380	-0.011

Covariance Matrix

```
1          0.001
2         -0.005        0.038
3         -0.002        0.018        0.024

              1             2             3
```

Correlogram(X) and Partial correlogram(*) for residuals

```
  |
  |
  |
  |
  |
  |
  |                                    X         X         X
  |*--------*--------------------------*------------------------
  |*        *                 *        *                X
  |                  *                  *        *
  |                                              *
  |            *
  |
  |
  |
```
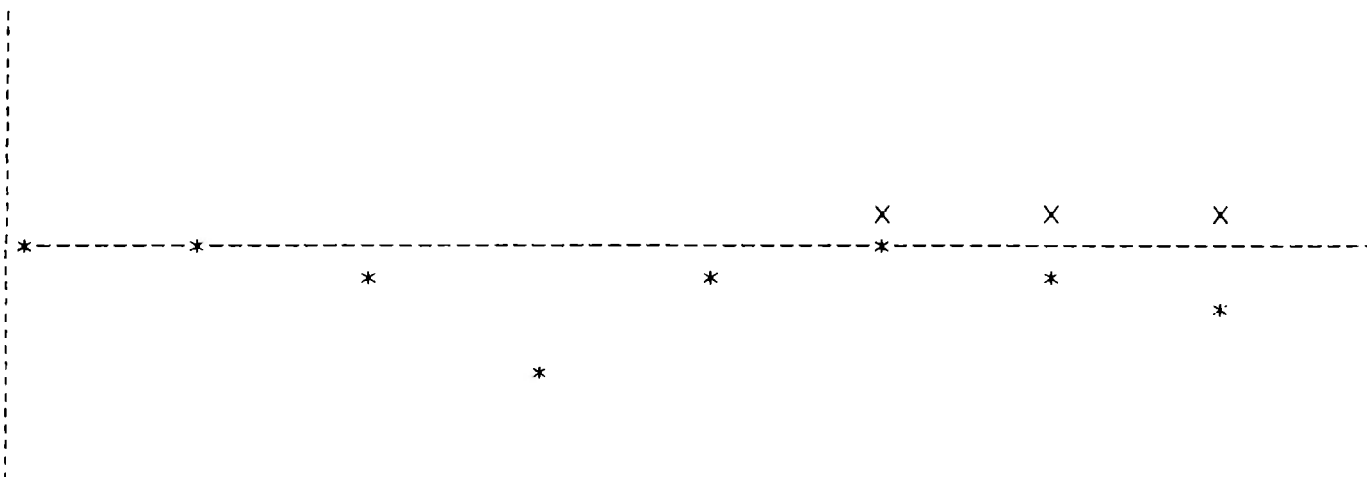
Modified Box-Pierce statistics Q(1) =   0.01 Q(2) =   0.09

```
Lag    X         *      Lag    X         *      Lag    X         *
 1   0.016     0.016      2  -0.060    -0.060      3  -0.122    -0.121
 4  -0.538    -0.548      5  -0.090    -0.189      6   0.156     0.052
 7   0.075    -0.085      8   0.102    -0.321
```

INGOING TOURISM TO MEXICO BY AIR
(Actual and Predicted Values)

—LOG(TRIVA)   --TRIVA.PREDICT
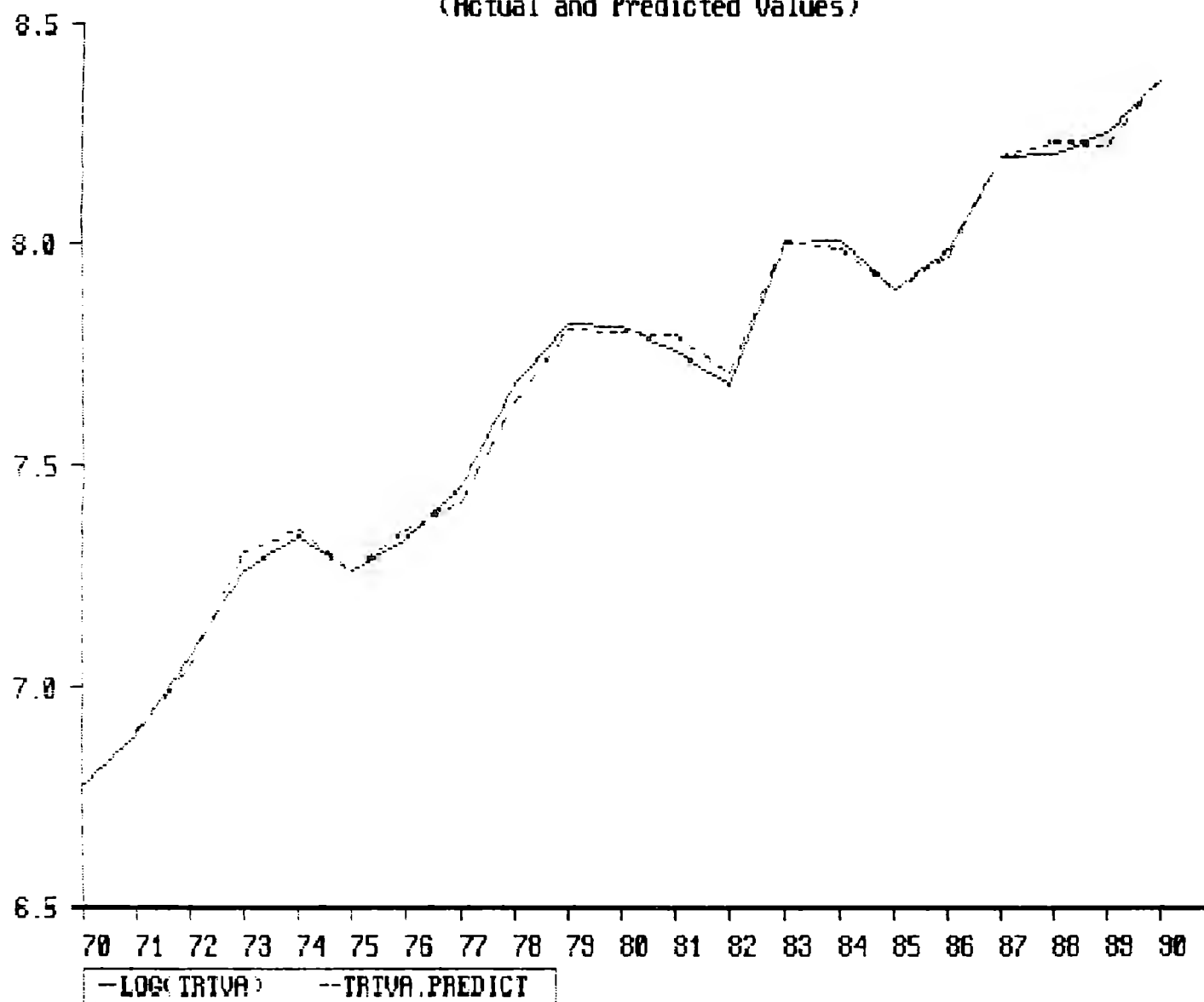
```
=>   SHOW <RESIDUAL>;
 TRPOEUA
 Ordinary Least Squares
 ANNUAL data for   19 periods from 1971 to 1989
 Date: 22 MAY 1992

 log(trpoeua)

    =     0.33135 * log(trpoeua)[-1] + 1.54460 * log(ipdpcd87$)
        (2.32293)                      (3.74002)

      + 0.29696 * log(tcreal78.1) + 0.47599 * log(excap)
        (4.31939)                   (4.09697)

      + 0.18887 * dummy83 -  9.9342
        (4.36703)            (3.60339)

 Sum Sq      0.0204    Std Err     0.0396    LHS Mean   8.1259
 R Sq        0.9790    R Bar Sq    0.9709    F  5, 13   121.198
 D.W.( 1)    2.0473    D.W.( 2)    1.8142
 H          -0.7285

 TRPOEUA=EXP(??)
```

Regression Summary

ANNUAL Data for   19 periods from 1971 to 1989

Variable	Total coeff	T-statistic	Mean	Elasticity
LOG(TRPOEUA)	0.3314E+00	2.3229E+00	8.0764E+00	0.3293E+00
LOG(IPDPCD87$)	1.5446E+00	3.7400E+00	9.3955E+00	1.7859E+00
LOG(TCREAL78.1)	0.2970E+00	4.3194E+00	3.1702E+00	0.1159E+00
LOG(EXCAP)	0.4760E+00	4.0970E+00	-0.1677E+00	-0.9821E-02
DUMMY83	0.1889E+00	4.3670E+00	0.5263E-01	0.1223E-02
Constant	-9.9342E+00	3.6034E+00		

```
 Sum Sq    0.2042E-01    Std Err     0.3963E-01    LHS Mean    8.1259E+00
 R Sq      0.97900       R Bar Sq    0.97092       F   5, 13   1.2120E+02
 D.W.( 1)  2.04733       D.W.( 2)    1.81421
 Res Mean  -0.2972E-09   %RMSE       1.4492E+01
```

		Actual	Predicted	Residual
1971	:	7.745	7.777	-0.032
1972	:	7.857	7.809	0.049
1973	:	7.948	7.969	-0.021
1974	:	7.976	7.937	0.039
1975	:	7.932	7.944	-0.012
1976	:	7.891	7.888	0.003
1977	:	7.914	7.902	0.012
1978	:	8.030	8.030	0.001
1979	:	8.140	8.131	0.010
1980	:	8.144	8.183	-0.039
1981	:	8.146	8.180	-0.035
1982	:	8.084	8.047	0.036
1983	:	8.317	8.317	0.000
1984	:	8.278	8.309	-0.031
1985	:	8.172	8.251	-0.078
1986	:	8.267	8.250	0.017
1987	:	8.438	8.413	0.025
1988		8.520	8.517	0.004
1989		8.591	8.540	0.052

Covariance Matrix

1	0.020				
2	-0.055	0.171			
3	0.002	-0.009	0.005		
4	-0.008	0.031	0.001	0.013	
5	-0.000	0.002	-0.000	0.001	0.002
6	0.342	-1.127	0.059	-0.222	-0.017
	7.600				

	1	2	3	4	5
	6				

Correlogram(X) and Partial correlogram(*) for residuals
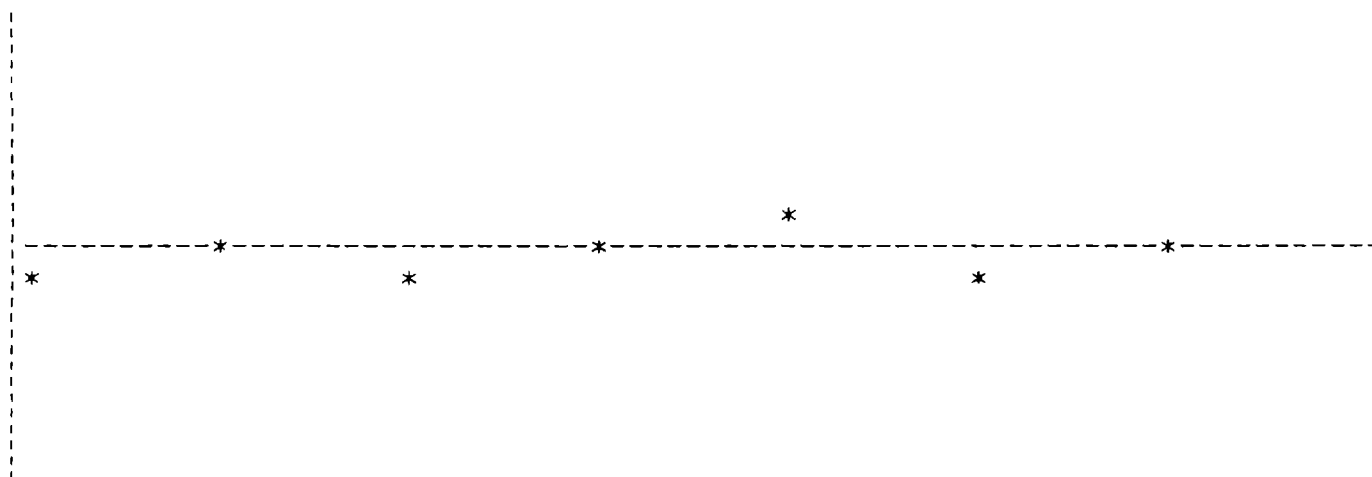
Modified Box-Pierce statistics Q(1) =   0.29 Q(2) =   0.36

Lag	X	*	Lag	X	*	Lag	X	*
1	-0.114	-0.114	2	-0.055	-0.069	3	-0.169	-0.187
4	0.001	-0.050	5	0.152	0.126	6	-0.182	-0.192
7	-0.000	-0.037						

·

INBOUND TOURISM FROM USA TO MEXICO BY AIR AND LAND
(Actual and Predicted Values)

—LOG(TRPOEUA)   --TRPOEUA.PREDICT
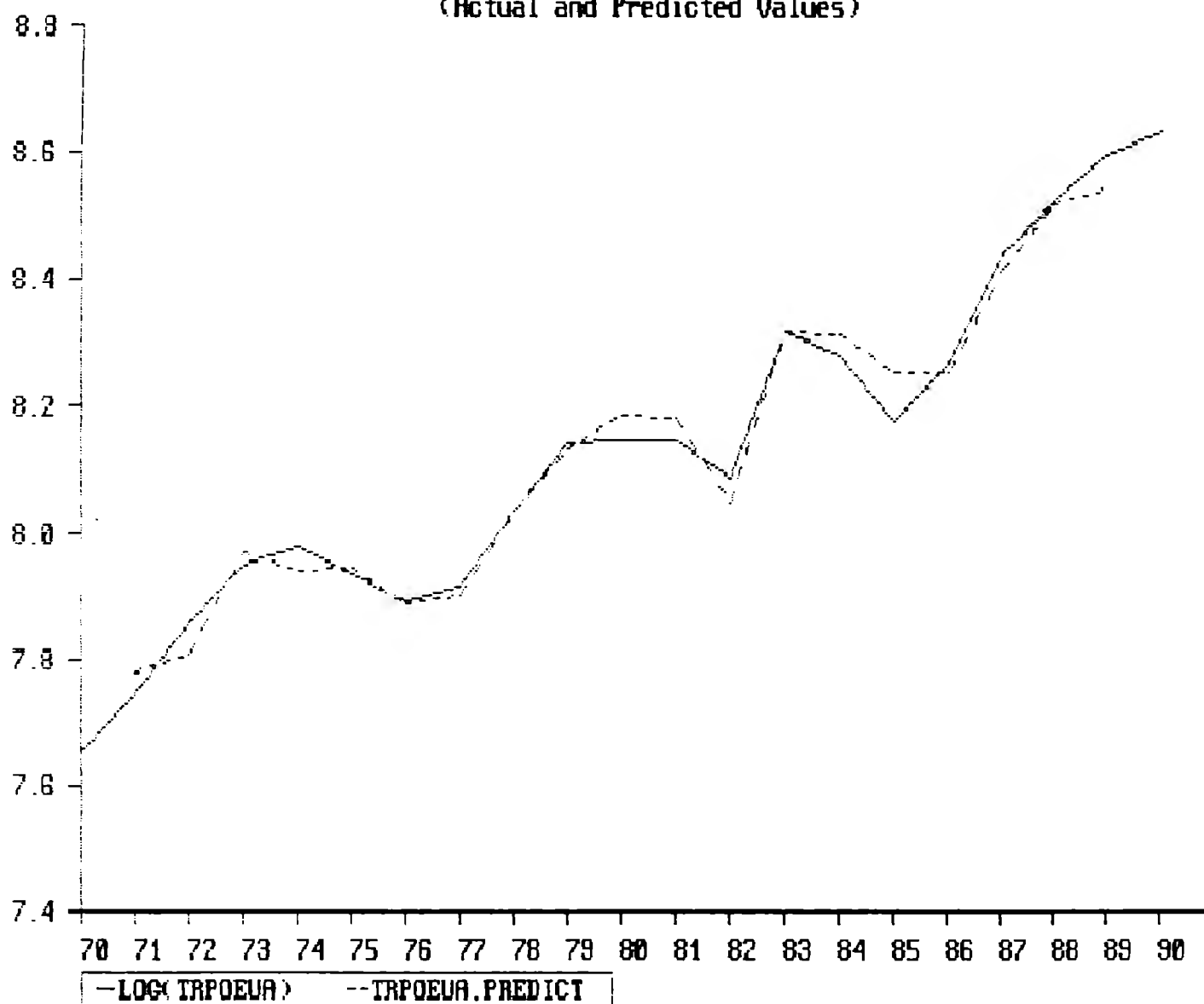
```
=>   SHOW  (RESIDUAL);
 TRT
 Cochrane-Orcutt
 ANNUAL data for    20 periods from 1971 to 1990
 Date: 22 MAY 1992


 log(trt)

    =     0.94700 * log(trpoeua) + 0.06411 * log(ipdpcd87$) - 0.00891
       (22.1595)                    (0.42060)                   (0.00714)


 Sum Sq      0.0035   Std Err     0.0148   LHS Mean    8.3031
 R Sq        0.9972   R Bar Sq    0.9967   F   3, 16  1905.82
 D.W.( 1)    1.8446   D.W.( 2)    1.9309


 AR_0 =  + 0.68034 * AR_1
          (5.93742)


 TRT=EXP(??)
```

Regression Summary

ANNUAL Data for   20 periods from 1971 to 1990

Variable	Total coeff	T-statistic	Mean	Elasticity
LOG(TRPOEUA)	0.9470E+00	2.2160E+01	8.1511E+00	0.9297E+00
LOG(IPDPCD87$)	0.6411E-01	0.4206E+00	9.4037E+00	0.7261E-01
Constant	-0.8907E-02	0.7144E-02		
RHO 1	0.6803E+00	5.9374E+00		

```
 Sum Sq      0.3512E-02   Std Err     0.1482E-01   LHS Mean   8.3031E+00
 R Sq        0.99721      R Bar Sq    0.99669      F   3, 16  1.9058E+03
 D.W.( 1)    1.84456      D.W.( 2)    1.93091
 Res Mean    0.0000E+00   %RMSE       5.2826E+00
```

	Actual	Predicted	Residual
1971	7.828	7.844	-0.016
1972	7.978	7.964	0.013
1973 :	8.079	8.082	-0.003
1974 :	8.120	8.116	0.004
1975 :	8.077	8.086	-0.009
1976 :	8.041	8.046	-0.004
1977 :	8.085	8.071	0.014
1978 :	8.231	8.198	0.033
1979 :	8.327	8.325	0.002
1980 :	8.329	8.323	0.007
1981 :	8.304	8.324	-0.021
1982 :	8.234	8.246	-0.012
1983 :	8.466	8.461	0.005
1984 :	8.446	8.434	0.012
1985 :	8.345	8.344	0.000
1986 :	8.439	8.434	0.005
1987 :	8.595	8.598	-0.003
1988 :	8.647	8.674	-0.027
1989	8.730	8.723	0.007
1990	8.763	8.770	-0.007

Covariance Matrix

```
1          0.002
2         -0.004       0.023
3          0.024      -0.185       1.555
4          0.000      -0.008       0.074         0.013

               1           2           3             4
```

Correlogram(X) and Partial correlogram(*) for residuals
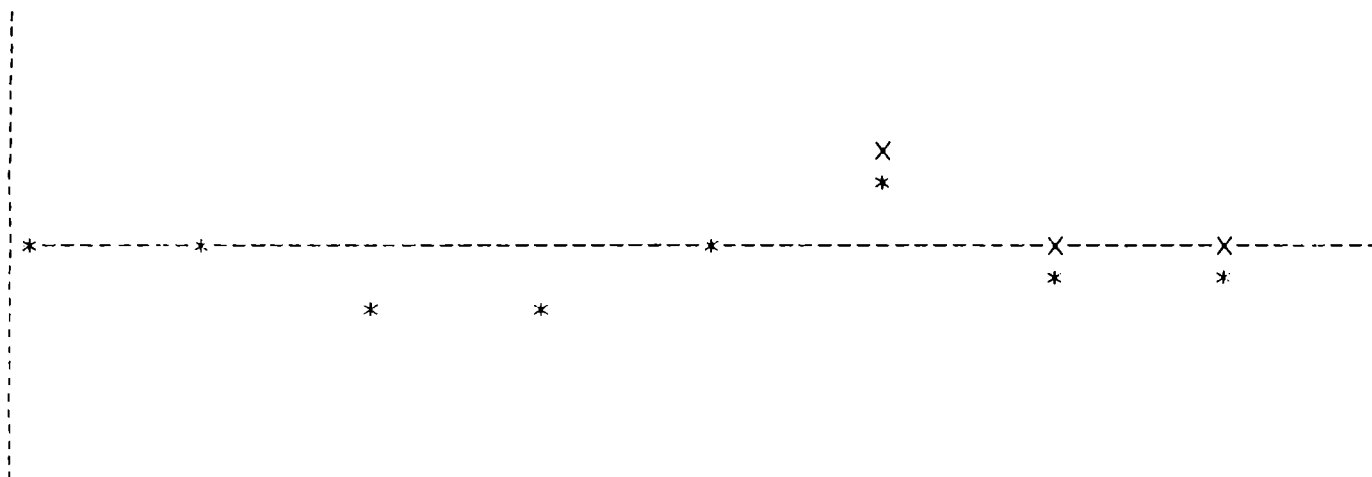
Modified Box-Pierce statistics   Q(1) =   0.02 Q(2) =   0.07

```
Lag     X          *       Lag      X          *       Lag      X          *
 1    0.033      0.033      2    -0.044     -0.045      3     -0.341     -0.339
 4   -0.258     -0.274      5     0.024     -0.019      6      0.370      0.286
 7    0.020     -0.151      8    -0.030     -0.124
```

TOTAL INGOING TOURISM TO MEXICO
(Actual and Predicted Values)

—LOG(TRT)   --TRT.PREDICT
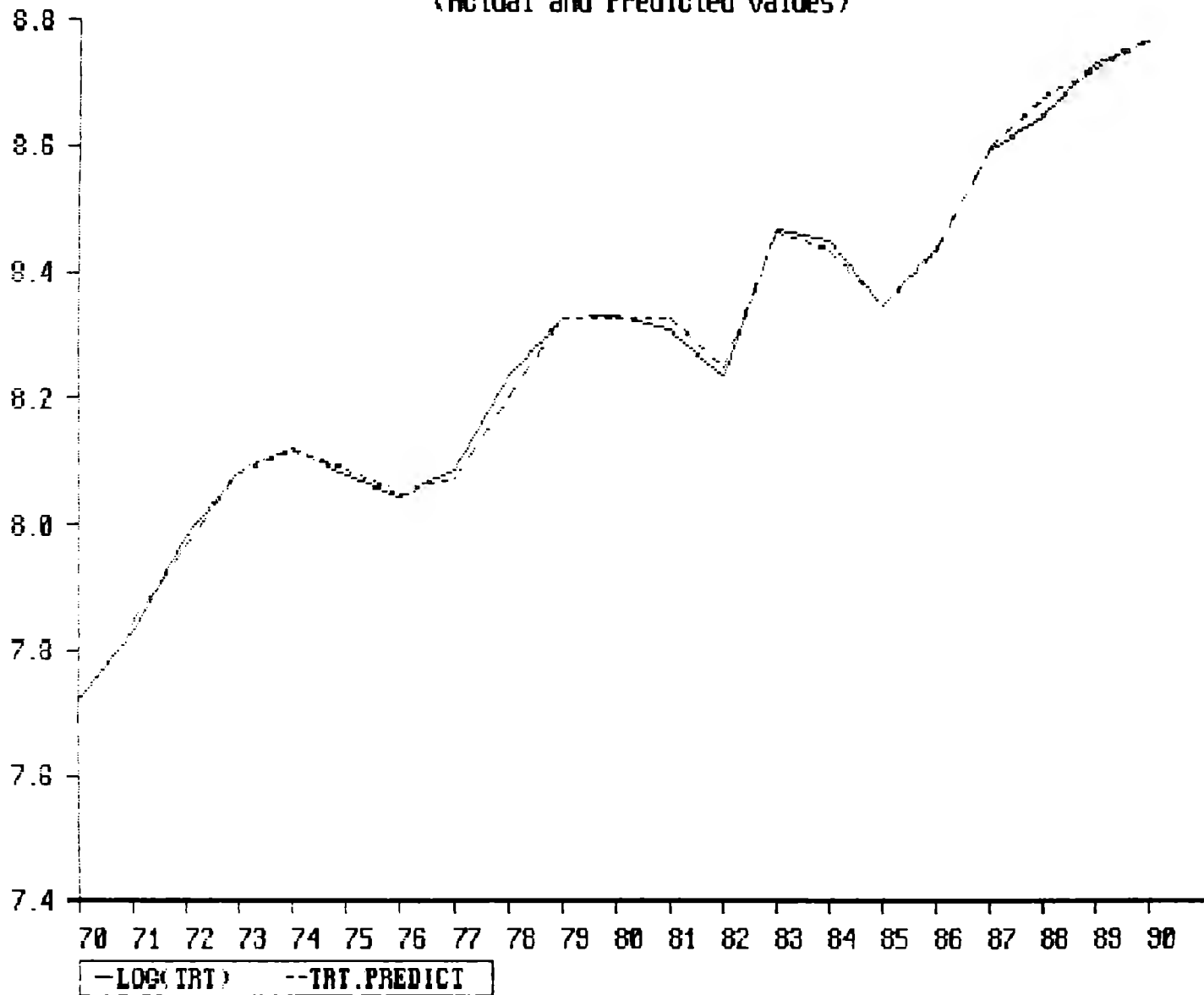
```
=>   SHOW <RESIDUAL>;
 TRGTEUAVAMEPR$
 Ordinary Least Squares
 ANNUAL data for    21 periods from 1970 to 1990
 Date: 22 MAY 1992


 log(trgteuavamepr$)

    =     0.63899 * log(trcal) + 1.06172 * log(ingrealmep$)
         (25.0812)                  (7.12108)


      - 0.63172 * log(tcreal78) - 5.54821
        (4.66623)                  (8.40911)


 Sum Sq       0.0301    Std Err    0.0421    LHS Mean    4.8592
 R Sq         0.9892    R Bar Sq   0.9873    F  3, 17    520.814
 D.W.( 1)     2.1968    D.W.( 2)   2.7846


 TRGTEUAVAMEPR$=EXP(??)
```

Regression Summary

ANNUAL Data for   21 periods from 1970 to 1990

Variable	Total coeff	T-statistic	Mean	Elasticity
LOG(TRCAL)	0.6390E+00	2.5081E+01	7.2990E+00	0.9598E+00
LOG(INGREALMEP$)	1.0617E+00	7.1211E+00	7.2998E+00	1.5950E+00
LOG(TCREAL78)	-0.6317E+00	4.6662E+00	3.1769E+00	-0.4130E+00
Constant	-5.5482E+00	8.4091E+00		

```
 Sum Sq     0.3009E-01    Std Err    0.4207E-01    LHS Mean   4.8592E+00
 R Sq       0.98924       R Bar Sq   0.98734       F   3, 17  5.2081E+02
 D.W.( 1)   2.19676       D.W.( 2)   2.78464
 Res Mean   0.1136E-09    %RMSE      1.0375E+01
```

	Actual	Predicted	Residual
1970 :	4.230	4.198	0.032
1971 :	4.189	4.228	-0.039
1972 :	4.347	4.362	-0.014
1973 :	4.631	4.577	0.054
1974 :	4.605	4.561	0.045
1975 :	4.389	4.411	-0.022
1976 :	4.548	4.549	-0.001
1977 :	4.762	4.774	-0.013
1978 :	4.858	4.907	-0.050
1979 :	5.058	5.020	0.038
1980 :	4.944	4.920	0.024
1981 :	4.801	4.856	-0.055
1982 :	4.918	4.881	0.037
1983 :	5.164	5.141	0.023
1984 :	5.130	5.098	0.032
1985 :	4.962	5.035	-0.073
1986 :	5.184	5.244	-0.060
1987 :	5.416	5.370	0.046
1988 :	5.276	5.292	-0.015
1989 :	5.253	5.251	0.002

47

	Actual	Predicted	Residual
1990 :	5.379	5.369	0.010

Covariance Matrix

1	0.001			
2	-0.001	0.022		
3	0.000	-0.018	0.018	
4	0.004	-0.095	0.071	0.435
	1	2	3	4

Correlogram(X) and Partial correlogram(*) for residuals
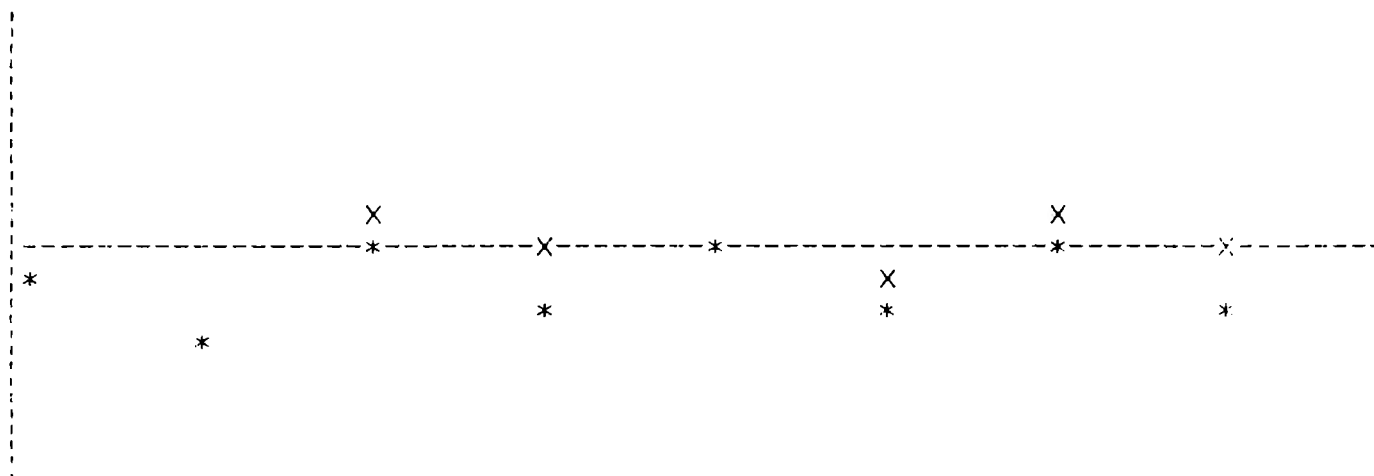
Modified Box-Pierce statistics Q(1) = 0.33 Q(2) = 5.18

Lag	X	*	Lag	X	*	Lag	X	*
1	-0.117	-0.117	2	-0.437	-0.457	3	0.073	-0.071
4	0.023	-0.226	5	-0.003	-0.046	6	-0.112	-0.269
7	0.074	-0.002	8	0.008	-0.216			

TOTAL EXPENDITURE OF TOURISTS FROM USA TO MEXICO BY AIR IN REAL MEP
(Actual and Predicted Values)

—LOG(TRGTEUAVAMEPR$)   --TRGTEUAVAMEPR$.PREDICT
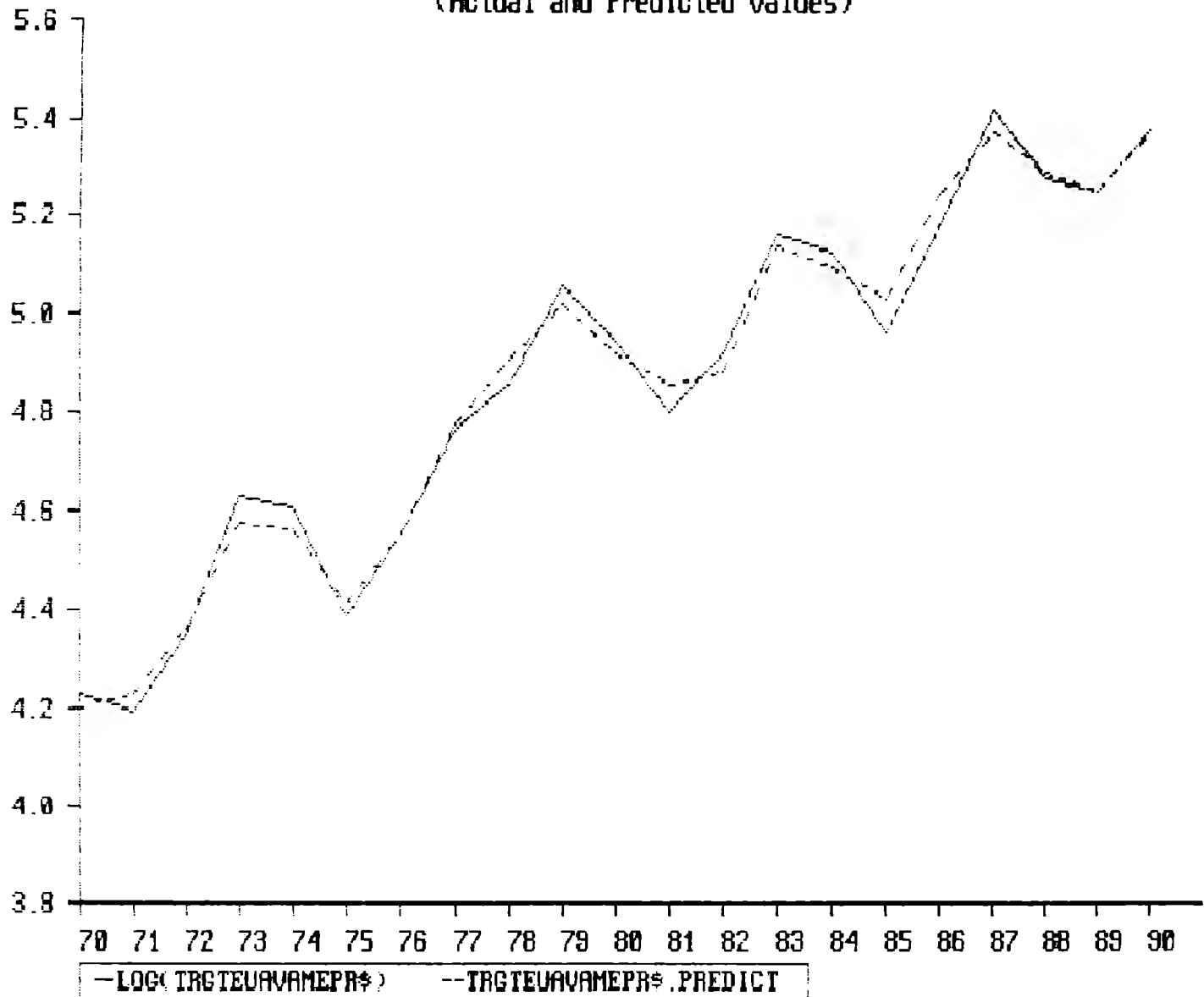
```
=>   SHOW (RESIDUAL);
 TRGTVAMEPR$
 Ordinary Least Squares
 ANNUAL data for   21 periods from 1970 to 1990
 Date: 22 MAY 1992

 log(trgtvamepr$)

    =    0.60420 * log(trcalva) - 0.93757 * log(tcreal78)
         (22.0128)                    (6.71780)

       + 1.42159 * log(ingrealmep$) -  9.5752
         (9.07725)                    (14.6125)

 Sum Sq      0.0314   Std Err     0.0430   LHS Mean   5.1458
 R Sq        0.9881   R Bar Sq    0.9860   F  3, 17   472.146
 D.W.( 1)    1.9312   D.W.( 2)    2.4048

 TRGTVAMEPR$=EXP(??)
```

Regression Summary

Variable	Total coeff	T-statistic	Mean	Elasticity
LOG(TRCALVA)	0.6042E+00	2.2013E+01	1.2119E+01	1.4230E+00
LOG(TCREAL78)	-0.9376E+00	6.7178E+00	3.1769E+00	-0.5786E+00
LOG(INGREALMEP$)	1.4216E+00	9.0772E+00	7.2998E+00	2.0167E+00
Constant	-9.5752E+00	1.4613E+01		

```
 Sum Sq     0.3139E-01   Std Err    0.4297E-01   LHS Mean   5.1458E+00
 R Sq       0.98814      R Bar Sq   0.98605      F  3, 17   4.7215E+02
 D.W.( 1)   1.93117      D.W.( 2)   2.40483
 Res Mean   0.1109E-09   %RMSE      1.0890E+01
```

	Actual	Predicted	Residual
1970 :	4.424	4.420	0.004
1971 :	4.483	4.501	-0.018
1972 :	4.694	4.682	0.012
1973 :	4.903	4.886	0.018
1974 :	4.898	4.875	0.023
1975 :	4.714	4.730	-0.016
1976 :	4.842	4.869	-0.027
1977 :	5.114	5.144	-0.030
1978 :	5.270	5.286	-0.015
1979 :	5.406	5.365	0.040
1980 :	5.299	5.228	0.062
1981 :	5.071	5.106	-0.034
1982 :	5.206	5.142	0.064
1983 :	5.417	5.374	0.043
1984 :	5.386	5.355	0.031
1985 :	5.212	5.301	-0.088
1986 :	5.502	5.542	-0.040
1987	5.674	5.630	0.044
1988	5.470	5.523	-0.052
1989	5.481	5.501	-0.021

	Actual	Predicted	Residual
1990 :	5.605	5.604	0.000

Covariance Matrix

1	0.001			
2	0.001	0.019		
3	-0.002	-0.020	0.025	
4	0.002	0.074	-0.095	0.429
	1	2	3	4

Correlogram(X) and Partial correlogram(*) for residuals

```
     |
     |
     |
     |
     |
     |
     |
     |
     |
.    |                             X
     |*---------------*----------------*-------------------------*---------X--------
     |                                         *                          *
     |        *
     |                                                 *
     |
     |
     |
```
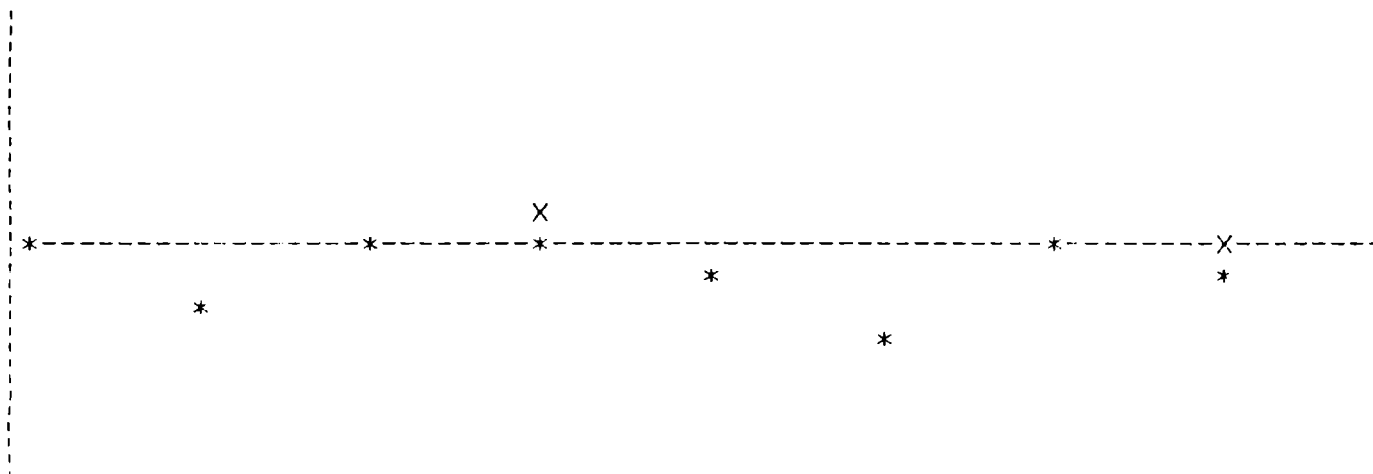
Modified Box-Pierce statistics Q(1) =   0.03 Q(8) =   1.20

Lag	X	*	Lag	X	*	Lag	X	*
1	0.034	0.034	2	-0.214	-0.216	3	-0.008	0.009
4	0.097	0.054	5	-0.155	-0.169	6	-0.391	-0.374
7	0.024	-0.031	8	0.059	-0.123			

TOTAL EXPENDITURE OF INGOING TOURISM TO MEXICO BY AIR IN REAL MEP
(Actual and Predicted Values)

Legend: —LOG(TRGTVAMEPR$)   --TRGTVAMEPR$.PREDICT
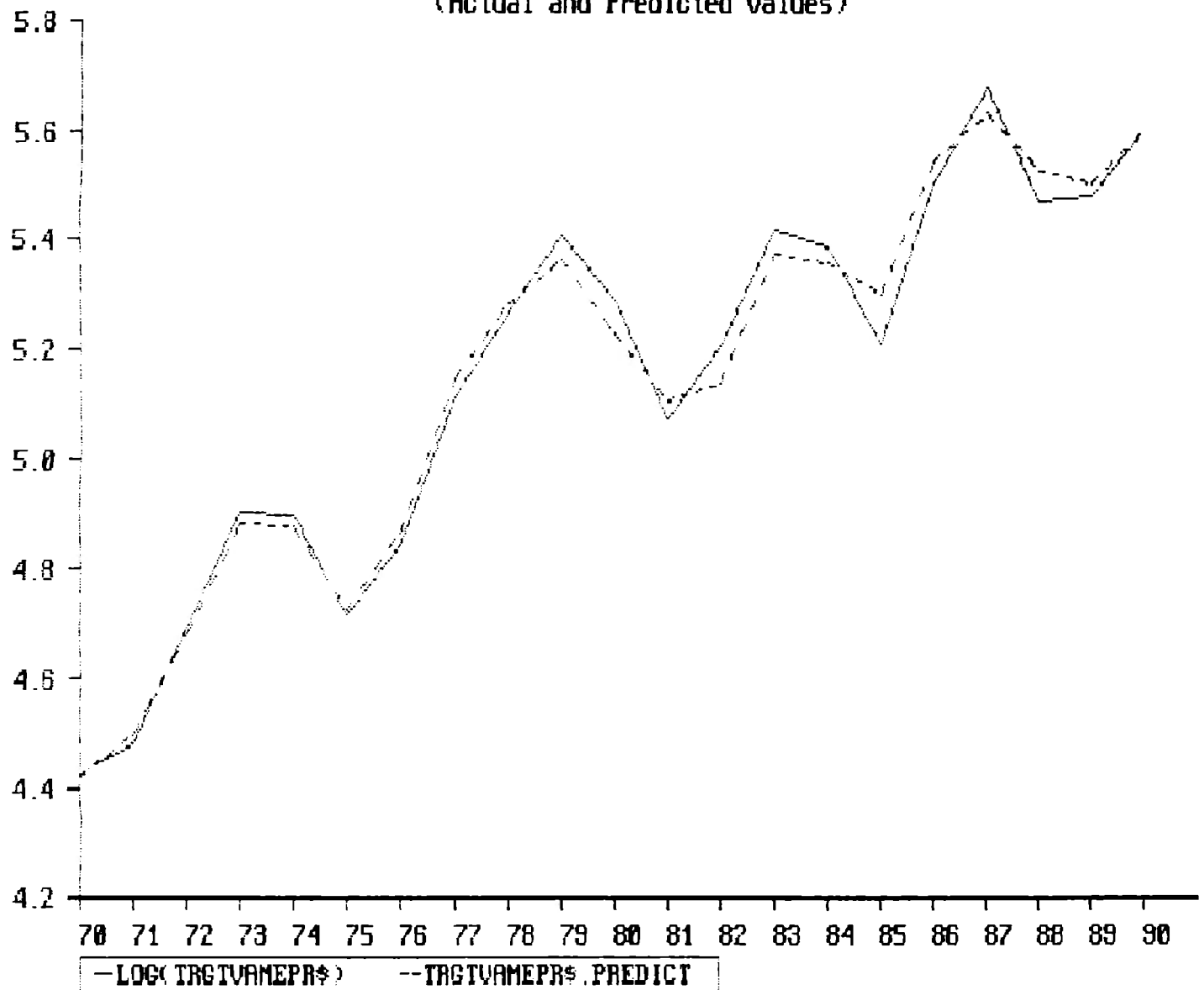
```
=>  SHOW <RESIDUAL>;
 TRGTMEPR$
 Ordinary Least Squares
 ANNUAL data for   21 periods from 1970 to 1990
 Date:  1 JUN 1992

 log( trgtmepr$ )

    =     0.54367 * log( trt ) + 0.89034 * log( ingrealmdo$ )
         (12.9361 )             (8.13025 )

       - 0.53406 * log( tcreal78 ) - 0.12672 * dummy75
         (5.39466 )                 (2.93710 )

       + 0.09225 * dummy87 - 2.82684
         (2.02322 )             (7.54515 )

 Sum Sq      0.0229    Std Err    0.0391    LHS Mean    5.4533
 R Sq        0.9808    R Bar Sq   0.9744    F  5, 15    152.946
 D.W.( 1 )   2.0031    D.W.( 2 )  2.4365

 TRGTMEPR$=EXP( ?? )
```

Regression Summary

ANNUAL Data for   21 periods from 1970 to 1990

Variable	Total coeff	T-statistic	Mean	Elasticity
LOG(TRT)	0.5437E+00	1.2936E+01	8.2753E+00	0.8250E+00
LOG(INGREALMDO$)	0.8903E+00	8.1303E+00	6.1543E+00	1.0048E+00
LOG(TCREAL78)	-0.5341E+00	5.3947E+00	3.1769E+00	-0.3111E+00
DUMMY75	-0.1267E+00	2.9371E+00	0.4762E-01	-0.1107E-02
DUMMY87	0.9225E-01	2.0232E+00	0.4762E-01	0.8055E-03
Constant	-2.8268E+00	7.5451E+00		

```
 Sum Sq     0.2292E-01    Std Err    0.3909E-01    LHS Mean   5.4533E+00
 R Sq       0.98076       R Bar Sq   0.97435       F  5, 15   1.5295E+02
 D.W.( 1 )  2.00306       D.W.( 2 )  2.43647
 Res Mean   -0.8870E-10   %RMSE      1.3870E+01
```

		Actual	Predicted	Residual
1970	:	4.988	4.972	0.016
1971	:	5.027	5.047	-0.020
1972	:	5.201	5.189	0.011
1973	:	5.382	5.329	0.053
1974	:	5.360	5.329	0.031
1975	:	5.129	5.129	-0.000
1976	:	5.241	5.308	-0.067
1977	:	5.439	5.460	-0.021
1978	:	5.544	5.565	-0.021
1979	:	5.630	5.595	0.035
1980	:	5.525	5.491	0.034
1981	:	5.323	5.362	-0.039
1982	:	5.431	5.425	0.006
1983	:	5.570	5.552	0.018
1984	:	5.565	5.509	0.056
1985	:	5.393	5.455	-0.062
1986	:	5.694	5.685	0.009
1987	:	5.861	5.861	-0.000
1988	:	5.693	5.732	-0.040
1989	:	5.730	5.739	-0.009

		Actual	Predicted	Residual
1990	:	5.794	5.785	0.009

Covariance Matrix

	1	2	3	4	5
1	0.002				
2	-0.002	0.012			
3	0.001	-0.008	0.010		
4	-0.000	0.000	0.001	0.002	
5	0.000	-0.001	-0.001	-0.000	0.002
6	-0.002	-0.028	0.015	-0.004	0.006
	0.140				
	1	2	3	4	5
	6				

Correlogram(X) and Partial correlogram(*) for residuals
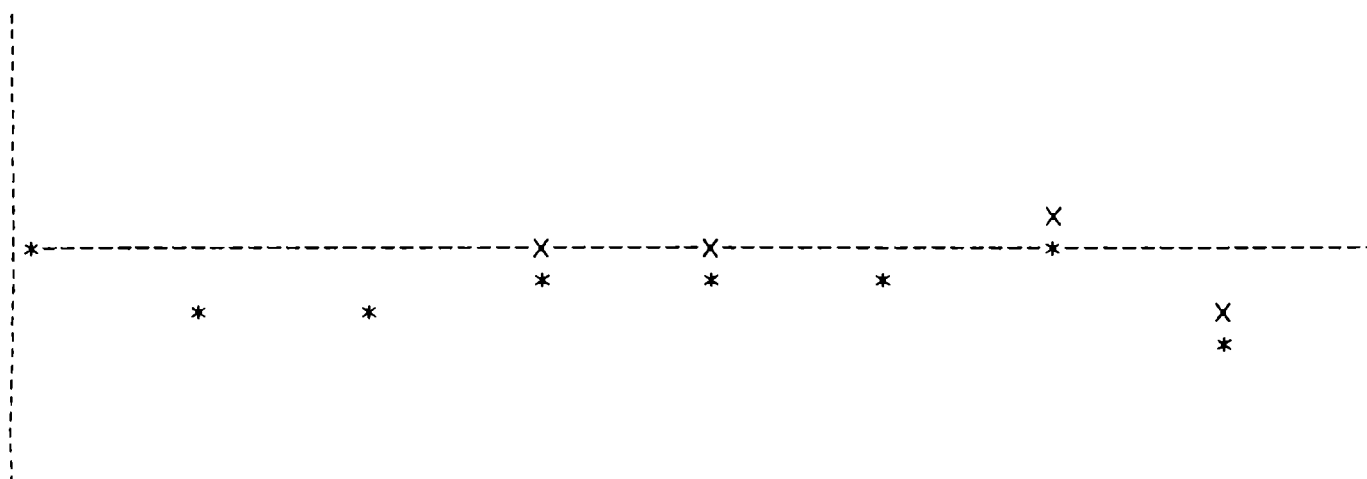
Modified Box-Pierce statistics Q(1) =   0.00 Q(2) =   1.42

Lag	X	*	Lag	X	*	Lag	X	*
1	-0.009	-0.009	2	-0.236	-0.236	3	-0.235	-0.254
4	-0.011	-0.097	5	0.040	-0.098	6	-0.076	-0.195
7	0.085	0.020	8	-0.268	-0.409			

TOTAL EXPENDITURE OF INGOING TOURISM TO MEXICO IN REAL MEP
(Actual and Predicted Values)

—LOG(TRGTMEPR$)   --TRGTMEPR$.PREDICT
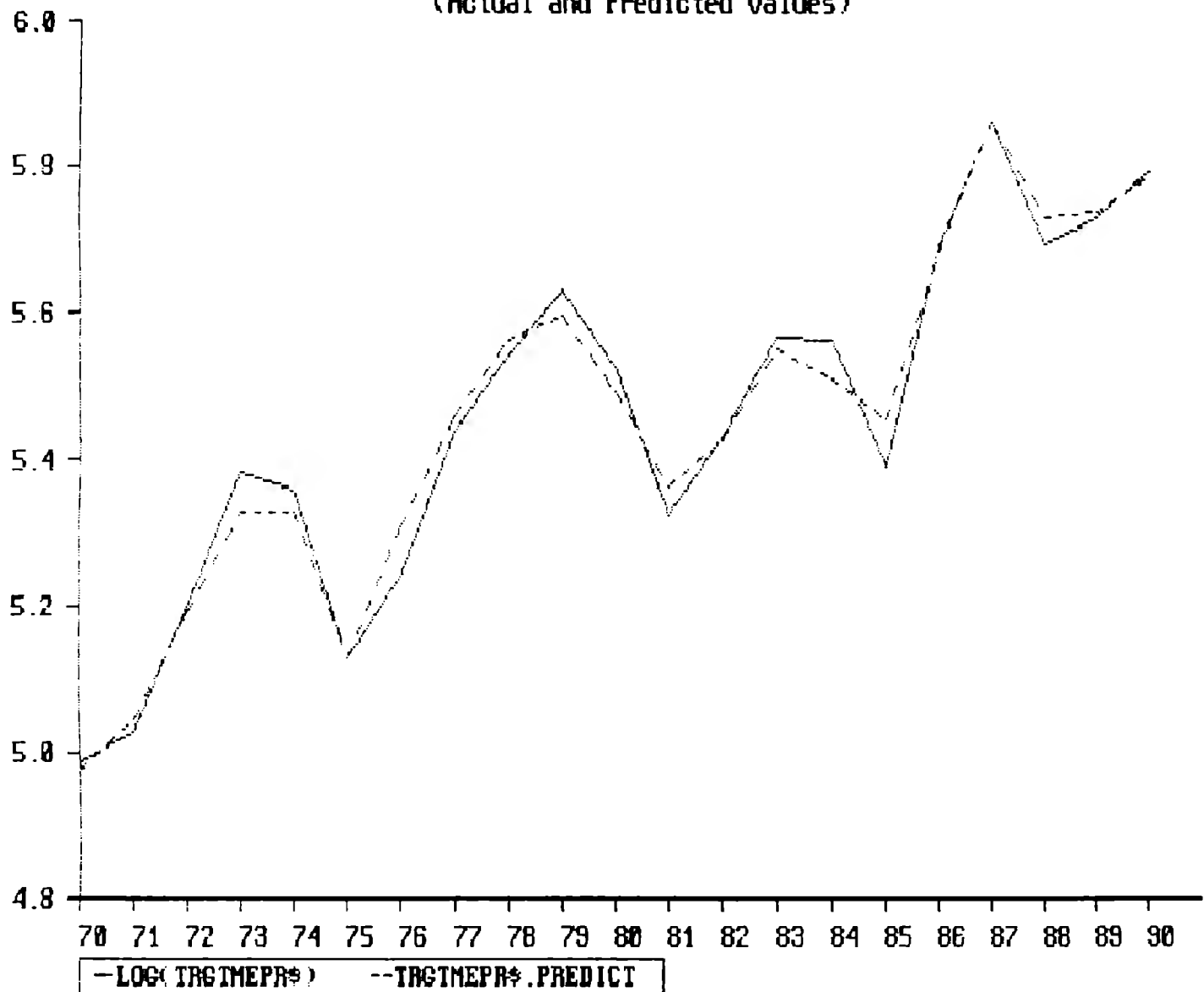
```
=>   SHOW (RESIDUAL);
 ICVTMEX78VP
 Ordinary Least Squares
 ANNUAL data for   21 periods from 1970 to 1990
 Date: 25 MAY 1992

 icvtmex78vp

   =     1.06198 * inpcmex78vp - 0.81565
        (43.5724)                (0.60302)

 Sum Sq      328.051   Std Err     4.1552   LHS Mean  42.9169
 R Sq          0.9901   R Bar Sq    0.9896   F  1, 19  1898.56
 D.W.( 1)     1.5042   D.W.( 2)    1.6430
```

Regression Summary

ANNUAL Data for   21 periods from 1970 to 1990

Variable	Total coeff	T-statistic	Mean	Elasticity
INPCMEX78VP	1.0620E+00	4.3572E+01	4.1180E+01	1.0190E+00
Constant	-0.8156E+00	0.6030E+00		

```
 Sum Sq      3.2805E+02   Std Err   4.1552E+00   LHS Mean   4.2917E+01
 R Sq        0.99009      R Bar Sq  0.98957      F  1, 19   1.8986E+03
 D.W.( 1)    1.50423      D.W.( 2)  1.64298
 Res Mean    0.8338E-08   %RMSE     9.9541E+00
```

	Actual	Predicted	Residual
1970 :	8.056	4.502	3.554
1971 :	6.880	4.919	1.961
1972 :	2.557	4.625	-2.068
1973 :	7.395	12.028	-4.633
1974 :	18.815	24.409	-5.593
1975 :	19.744	15.076	4.668
1976 :	15.082	16.013	-0.931
1977 :	24.743	30.053	-5.310
1978 :	17.601	17.675	-0.074
1979 :	18.100	18.493	-0.393
1980 :	32.543	27.226	5.317
1981 :	34.327	28.816	5.511
1982 :	65.076	61.771	3.305
1983 :	114.242	107.243	6.999
1984 :	68.739	68.787	-0.048
1985 :	60.416	60.511	-0.095
1986 :	83.293	90.763	-7.470
1987 :	139.919	139.183	0.736
1988 .	118.043	120.422	-2.379
1989 :	21.928	20.432	1.496

	Actual	Predicted	Residual
1990	23.756	28.308	-4.552

Covariance Matrix

```
1            0.001
2           -0.024        .830
             1             2
```

Correlogram(X) and Partial correlogram(*) for residuals

```
 |
 |
 |
 |
 |
 |
 |
'* |      *
 |-----------------------------*---------*------------------------------*---------
 |              X                       X                       *              X
 |              *                                      *        X
 |
 |
 |
 |
```
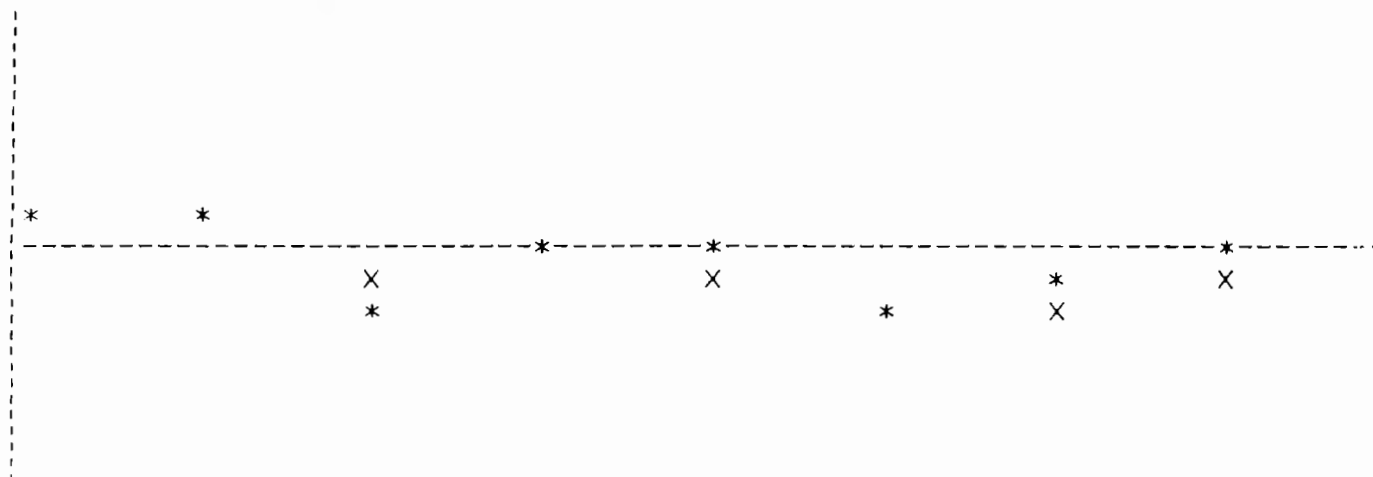
Modified Box-Pierce statistics Q(1) = 0.94 Q(2) = 1.29

Lag	X	*	Lag	X	*	Lag	X	*
1	0.197	0.197	2	0.118	0.083	3	-0.192	-0.241
4	-0.028	0.048	5	-0.078	-0.032	6	-0.271	-0.333
7	-0.298	-0.205	8	-0.128	0.018			

TOURISM COST OF LIVING INDEX IN MEXICO - PERCENT CHANGES
(Actual and Predicted Values)

— ICVTMEX78VP   --ICVTMEX78VP.PREDICT

SUMMARY OF SIMULATION STATISTICS
(SIMULATION PERIOD: 1970 -1990)

	RMSE	RMSPE	U	UM	US	UC
NTEUAVEVA ·	3074.08	3.92%	0.0774	0.0005	0.0014	0.9981
TRPEUAVA	316.97	4.17%	0.0759	0	0	1
TRTVA	487.34	5.37%	0.09583	1.9042	0.0012	-0.905
TRPOEUA	541.03	3.16%	0.07446	1.3983	0.0018	-0.4
TRT	655.85	4.02%	0.07739	·1.1716	0.0025	-0.174
TRGTEUAVAMEPR$	24.81	3.75%	0.08548	1.7371	0.0009	-0.738
TRGTVAMEPR$	36.17	3.88%	0.09456	1.1376	0.0001	-0.138
TRGTMEPR$	44.46	4.47%	0.09016	0.5117	0.0031	0.4852
TRGMEUAVAMEPR$	16.36	4.52%	0.10773	0.122	0.0014	0.8766
TRGMVAMEPR$	22.24	5.72%	0.1365	0.0662	1E-05	0.9337
TRGMMEPR$	9.15	3.27%	0.07616	0.0634	0.0005	0.9361
TRGMDEUAVAMEPR$	1.69	4.52%	0.10542	0.0282	0.0023	0.9695
TRGMDVAMEPR$	2.33	5.72%	0.1353	0.0135	0.0104	0.976
TRGMDMEPR$	0.86	3.25%	0.0748	0.0006	0.0003	0.9991
ICVTMEX78VP	17.20	26.10%	0.1472	2.2224	3.2804	-4.503
ICVTMEX78	423.42	5.39%	0.02216	97.951	390.17	-487.1

=> M_COMPARE A MOD NTEUAVEVA;

	NTEUAVEVA.A	NTEUAVEVA.MOD	Difference	% Difference
1970	8495.000	8495.000	0.000	0.000
1971	9328.000	9333.328	5.328	0.057
1972	10771.000	10286.693	-484.307	-4.496
1973	12315.000	11837.428	-477.572	-3.878
1974	12742.000	12443.173	-298.827	-2.345
1975	12053.000	12920.924	867.924	7.201
1976	13017.000	13733.962	716.962	5.508
1977	13804.000	14623.268	819.268	5.935
1978	15800.000	16065.021	265.021	1.677
1979	18128.000	17325.959	-802.041	-4.424
1980	19256.000	17968.547	-1287.453	-6.686
1981	19911.000	18689.180	-1221.820	-6.136
1982	19322.000	19066.154	-255.846	-1.324
1983	19724.000	19781.432	57.432	0.291
1984	21606.000	21951.455	345.455	1.599
1985	22487.000	23866.605	1379.605	6.135

	NTEUAVEVA.A	NTEUAVEVA.MOD	Difference	% Difference
1986	23175.000	23993.885	818.885	3.533
1987	26664.000	27145.748	481.748	1.807
1988	29421.000	29698.510	277.510	0.943
1989	31154.000	31309.564	155.564	0.499
1990	31300.000	31386.191	86.191	0.275

=> M_COMPARE A MOD TRPEUAVA;

	TRPEUAVA.A	TRPEUAVA.MOD	Difference	% Difference
1970	755.479	755.479	0.000	0.000
1971	788.632	811.326	22.694	2.878
1972	892.773	874.986	-17.787	-1.992
1973	1150.905	1206.122	55.217	4.798
1974	1228.255	1125.525	-102.730	-8.364
1975	1103.995	1204.687	100.692	9.121
1976	1210.510	1227.206	16.696	1.379
1977	1311.584	1278.831	-32.753	-2.497
1978	1628.000	1558.666	-69.334	-4.259
1979	1935.335	1867.465	-67.870	-3.507
1980	1931.236	1949.851	18.615	0.964
1981	1924.551	2025.058	100.507	5.222
1982	1800.931	1713.068	-87.863	-4.879
1983	2516.000	2602.777	86.777	3.449
1984	2445.909	2357.071	-88.838	-3.632
1985	2185.763	2331.121	145.358	6.650

	TRPEUAVA.A	TRPEUAVA.MOD	Difference	% Difference
1986	2384.400	2362.513	-21.886	-0.918
1987	3027.545	3083.387	55.842	1.844
1988	3154.952	3081.387	-73.565	-2.332
1989	3178.403	3146.389	-32.014	-1.007
1990	3684.000	3594.952	-89.048	-2.417

=>   M_COMPARE A MOD TRTVA;

	TRTVA.A	TRTVA.MOD	Difference	% Difference
1970	875.000	875.000	0.000	0.000
1971	986.000	1087.094	101.094	10.253
1972	1178.000	1164.774	-13.226	-1.123
1973	1432.000	1561.710	129.710	9.058
1974	1545.000	1466.078	-78.922	-5.108
1975	1432.000	1560.013	128.013	8.939
1976	1531.000	1586.636	55.636	3.634
1977	1723.000	1647.510	-75.490	-4.381
1978	2168.000	1974.015	-193.985	-8.948
1979	2495.000	2328.490	-166.510	-6.674
1980	2470.000	2422.171	-47.829	-1.936
1981	2335.000	2507.393	172.393	7.383
1982	2172.000	2151.946	-20.054	-0.923
1983	2992.000	3153.652	161.652	5..403
1984	3002.000	2880.489	-121.511	-4.048
1985	2694.000	2851.501	157.501	5.846

	TRTVA.A	TRTVA.MOD	Difference	% Difference
1986	2950.000	2886.567	-63.433	-2.150
1987	3635.000	3681.740	46.740	1.286
1988	3667.000	3679.556	12.556	0.342
1989	3844.000	3750.412	-93.588	-2.435
1990	4313.000	4236.081	-76.919	-1.783

=> M_COMPARE A MOD TRPOEUA;

	TRPOEUA.A	TRPOEUA.MOD	Difference	% Difference
1970	2102.000	2102.000	0.000	0.000
1971	2310.000	2384.250	74.250	3.214
1972	2584.000	2487.545	-96.455	-3.733
1973	2830.000	2853.095	23.095	0.816
1974	2911.000	2807.223	-103.777	-3.565
1975	2786.000	2786.227	0.227	0.008
1976	2672.000	2663.870	-8.130	-0.304
1977	2736.000	2699.834	-36.166	-1.322
1978	3073.000	3057.446	-15.554	-0.506
1979	3430.000	3390.966	-39.034	-1.138
1980	3443.000	3564.774	121.774	3.537
1981	3448.000	3610.787	162.787	4.721
1982	3241.000	3173.758	-67.242	-2.075
1983	4093.000	4064.675	-28.325	-0.692
1984	3935.000	4049.423	114.423	2.908
1985	3541.000	3866.390	325.390	9.189

	TRPOEUA.A	TRPOEUA.MOD	Difference	% Difference
1986	3895.000	3941.625	46.625	1.197
1987	4620.000	4524.348	-95.652	-2.070
1988	5016.000	4963.463	-52.537	-1.047
1989	5385.000	5095.620	-289.380	-5.374
1990	5598.000	5584.810	-13.190	-0.236

=> M_COMPARE A MOD TRT;

	TRT.A	TRT.MOD	Difference	% Difference
1970	2250.000	2250.000	0.000	0.000
1971	2509.000	2826.526	317.526	12.655
1972	2915.000	2947.936	32.936	1.130
1973	3226.000	3368.719	142.719	4.424
1974	3362.000	3313.883	-48.117	-1.431
1975	3218.000	3291.844	73.844	2.295
1976	3107.000	3160.022	53.022	1.707
1977	3247.000	3204.299	-42.701	-1.315
1978	3754.000	3613.742	-140.258	-3.736
1979	4134.000	3990.039	-143.961	-3.482
1980	4144.000	4182.698	38.698	0.934
1981	4038.000	4237.204	199.204	4.933
1982	3767.000	3749.707	-17.293	-0.459
1983	4749.000	4744.782	-4.218	-0.089
1984	4655.000	4744.199	89.199	1.916
1985	4207.000	4545.951	338.951	8.057

	TRT.A	TRT.MOD	Difference	% Difference
1986	4625.000	4636.196	11.196	0.242
1987	5407.000	5282.683	-124.317	-2.299
1988	5692.000	5776.330	84.330	1.482
1989	6186.000	5925.681	-260.319	-4.208
1990	6393.000	6466.728	73.728	1.153

=>   M_COMPARE A MOD TRGTEUAVAMEPR$;

	TRGTEUAVAMEPR$.A	TRGTEUAVAMEPR$.MOD	Difference	% Difference
1970	68.737	68.737	0.000	0.000
1971	65.976	68.610	2.634	3.993
1972	77.275	78.384	1.109	1.435
1973	102.583	97.227	-5.356	-5.221
1974	100.027	95.650	-4.377	-4.375
1975	80.553	82.329	1.776	2.205
1976	94.455	94.536	0.081	0.085
1977	116.959	118.439	1.480	1.266
1978	128.707	135.295	6.588	5.119
1979	157.320	151.442	-5.878	-3.736
1980	140.261	137.001	-3.260	-2.324
1981	121.608	128.458	6.851	5.633
1982	136.689	131.756	-4.933	-3.609
1983	174.904	170.914	-3.990	-2.281
1984	168.952	163.641	-5.312	-3.144

	TRGTEUAVAMEPR$.A	TRGTEUAVAMEPR$.MOD	Difference	% Difference
1985	142.822	153.701	10.879	7.617
1986	178.479	189.462	10.983	6.154
1987	225.038	214.964	-10.075	-4.477
1988	195.612	198.654	3.042	1.555
1989	191.108	190.678	-0.430	-0.225
1990	216.772	214.664	-2.108	-0.972

=> M_COMPARE A MOD TRGTVAMEPR$;

	TRGTVAMEPR$.A	TRGTVAMEPR$.MOD	Difference	% Difference
1970	83.412	83.412	0.000	0.000
1971	88.492	90.068	1.576	1.780
1972	109.308	107.989	-1.319	-1.206
1973	134.748	132.385	-2.363	-1.754
1974	134.080	130.998	-3.082	-2.299
1975	111.466	113.286	1.820	1.633
1976	126.739	130.167	3.428	2.704
1977	166.324	171.359	5.035	3.027
1978	194.507	197.509	3.002	1.543
1979	222.652	213.889	-8.763	-3.936
1980	198.169	186.339	-11.830	-5.969
1981	159.409	164.990	5.581	3.501
1982	ʼ 182.394	171.012	-11.382	-6.240
1983	225.137	215.718	-9.419	-4.184
1984	218.308	211.674	-6.635	-3.039

	TRGTVAMEPR$.A	TRGTVAMEPR$.MOD	Difference	% Difference
1985	183.539	200.450	16.910	9.213
1986	245.168	255.151	9.983	4.072
1987	291.241	278.760	-12.481	-4.286
1988	237.567	250.337	12.771	5.376
1989	240.024	245.042	5.018	2.091
1990	271.742	271.618	-0.124	-0.046

=> M_COMPARE A MOD TRGTMEPR$;

	TRGTMEPR$.A	TRGTMEPR$.MOD	Difference	% Difference
1970	146.678	146.678	0.000	0.000
1971	152.447	165.945	13.498	8.854
1972	181.406	180.455	-0.951	-0.524
1973	217.434	211.066	-6.368	-2.928
1974	212.770	204.682	-8.088	-3.801
1975	168.845	170.940	2.096	1.241
1976	188.776	203.732	14.956	7.922
1977	230.297	233.405	3.109	1.350
1978	255.588	255.688	0.100	0.039
1979	278.639	264.049	-14.590	-5.236
1980	250.894	243.801	-7.093	-2.827
1981	205.026	218.804	13.778	6.720
1982	228.484	226.470	-2.014	-0.882
1983	262.364	257.542	-4.822	-1.838
1984	261.128	249.395	-11.733	-4.493
1985	219.907	243.965	24.058	10.940

	TRGTMEPR$.A	TRGTMEPR$.MOD	Difference	% Difference
1986	296.943	294.778	-2.165	-0.729
1987	351.163	346.750	-4.413	-1.257
1988	296.644	311.108	14.465	4.876
1989	307.939	303.511	-4.428	-1.438
1990	328.161	327.312	-0.850	-0.259

=>   M_COMPARE A MOD TRGMEUAVAMEPR$;

	TRGMEUAVAMEPR $.A	TRGMEUAVAMEPR $.MOD	Difference	% Difference
1970	90.984	90.984	0.000	0.000
1971	83.659	84.566	0.907	1.084
1972	86.556	89.583	3.027	3.497
1973	89.133	80.611	-8.521	-9.560
1974	81.438	84.983	3.545	4.353
1975	72.965	68.341	-4.624	-6.338
1976	78.029	77.034	-0.996	-1.276
1977	89.174	92.615	3.441	3.859
1978	79.058	86.802	7.743	9.795
1979	81.288	81.095	-0.193	-0.238
1980	72.628	70.262	-2.365	-3.257
1981	63.187	63.434	0.247	0.391
1982	75.899	76.912	1.013	1.335
1983	69.517	65.666	-3.851	-5.539
1984	69.075	69.425	0.350	0.507

	TRGMEUAVAMEPR $.A	TRGMEUAVAMEPR $.MOD	Difference	% Difference
1985	65.342	65.934	0.592	0.906
1986	74.853	80.195	5.342	7.137
1987	74.330	69.717	-4.614	-6.207
1988	62.002	64.469	2.467	3.979
1989	60.127	60.602	0.475	0.790
1990	58.842	59.713	0.871	1.480

```
=>  M_COMPARE A MOD TRGMVAMEPR$;
```

	TRGMVAMEPR$.A	TRGMVAMEPR$.M OD	Difference	% Difference
1970	95.328	95.328	0.000	0.000
1971	89.749	82.852	-6.897	-7.685
1972	92.791	92.712	-0.079	-0.085
1973	94.098	84.769	-9.328	-9.914
1974	86.783	89.353	2.569	2.961
1975	77.839	72.619	-5.221	-6.707
1976	82.782	82.040	-0.743	-0.897
1977	96.532	104.011	7.479	7.748
1978	89.717	100.054	10.337	11.522
1979	89.239	91.857	2.618	2.934
1980	80.230	76.931	-3.300	-4.113
1981	68.269	65.802	-2.468	-3.615
1982	83.975	79.468	-4.507	-5.367
1983	75.246	68.403	-6.844	-9.095
1984	72.721	73.485	0.764	1.051

	TRGMVAMEPR$.A	TRGMVAMEPR$.M OD	Difference	% Difference
1985	68.129	70.296	2.167	3.181
1986	83.108	88.393	5.285	6.359
1987	80.121	75.714	-4.407	-5.501
1988	64.785	68.035	3.250	5.016
1989	62.441	65.337	2.896	4.638
1990	63.005	64.120	1.115	1.769

```
=>  M_COMPARE A MOD TRGMMEPR$;
```

	TRGMMEPR$.A	TRGMMEPR$.MOD	Difference	% Difference
1970	65.190	65.190	0.000	0.000
1971	60.760	58.710	-2.050	-3.374
1972	62.232	61.214	-1.018	-1.635
1973	67.400	62.655	-4.746	-7.041
1974	63.287	61.765	-1.522	-2.404
1975	52.469	51.928	-0.540	-1.030
1976	60.758	64.472	3.713	6.112
1977	70.926	72.841	1.915	2.700
1978	68.084	70.754	2.670	3.922
1979	67.402	66.177	-1.225	-1.817
1980	60.544	58.288	-2.256	-3.726
1981	50.774	51.639	0.865	1.703
1982	60.654	60.397	-0.257	-0.425
1983	55.246	54.279	-0.967	-1.751
1984	56.096	52.568	-3.528	-6.289
1985	52.272	53.666	1.395	2.668

	TRGMMEPR$.A	TRGMMEPR$.MOD	Difference	% Difference
1986	64.204	63.582	-0.622	-0.969
1987	64.946	65.639	0.693	1.067
1988	52.116	53.859	1.743	3.345
1989	49.780	51.220	1.440	2.892
1990	51.331	50.615	-0.717	-1.396

=> M_COMPARE A MOD TRGMDEUAVAMEPR$;

	TRGMDEUAVAMEPR$.A	TRGMDEUAVAMEPR$.MOD	Difference	% Difference
1970	8.503	8.503	0.000	0.000
1971	7.967	8.054	0.086	1.084
1972	9.016	9.332	0.315	3.497
1973	8.738	7.903	-0.835	-9.560
1974	7.756	8.094	0.338	4.353
1975	6.884	6.447	-0.436	-6.338
1976	7.726	7.627	-0.099	-1.276
1977	9.289	9.647	0.358	3.859
1978	8.322	9.137	0.815	9.795
1979	8.836	8.815	-0.021	-0.238
1980	8.160	7.895	-0.266	-3.257
1981	7.434	7.463	0.029	0.391
1982	8.625	8.740	0.115	1.335
1983	8.083	7.636	-0.448	-5.539
1984	8.223	8.265	0.042	0.507

	TRGMDEUAVAMEPR$.A	TRGMDEUAVAMEPR$.MOD	Difference	% Difference
1985	7.687	7.757	0.070	0.906
1986	7.717	8.268	0.551	7.137
1987	8.352	7.833	-0.518	-6.207
1988	6.889	7.163	0.274	3.979
1989	6.607	6.660	0.052	0.790
1990	6.327	6.421	0.094	1.480

```
=>   M_COMPARE A MOD TRGMDVAMEPR$;
```

	TRGMDVAMEPR$. A	TRGMDVAMEPR$. MOD	Difference	% Difference
1970	8.907	8.907	0.000	0.000
1971	8.532	7.891	-0.641	-7.514
1972	9.673	9.658	-0.016	-0.162
1973	9.217	8.311	-0.907	-9.837
1974	8.263	8.510	0.247	2.985
1975	7.344	6.851	-0.493	-6.713
1976	8.201	8.123	-0.078	-0.952
1977	10.046	10.834	0.788	7.844
1978	9.439	10.532	1.093	11.578
1979	9.691	9.985	0.293	3.024
1980	9.008	8.644	-0.364	-4.039
1981	8.028	7.741	-0.287	-3.572
1982	9.540	9.031	-0.509	-5.339
1983	8.754	7.954	-0.800	-9.136
1984	8.652	8.748	0.096	1.111

	TRGMDVAMEPR$. A	TRGMDVAMEPR$. MOD	Difference	% Difference
1985	8.018	8.270	0.252	3.148
1986	8.568	9.113	0.544	6.352
1987	9.001	8.507	-0.494	-5.490
1988	7.194	7.559	0.366	5.084
1989	6.838	7.180	0.341	4.993
1990	6.870	6.895	0.024	0.355

```
=>   M_COMPARE A MOD TRGMDMEPR$;
```

	TRGMDMEPR$.A	TRGMDMEPR$.MO D	Difference	% Difference
1970	5.302	5.302	0.000	0.000
1971	5.093	4.934	-0.159	-3.122
1972	5.933	5.830	-0.103	-1.736
1973	6.125	5.696	-0.429	-7.004
1974	5.812	5.667	-0.145	-2.503
1975	4.959	4.899	-0.060	-1.216
1976	5.377	5.705	0.329	6.112
1977	6.830	7.004	0.173	2.540
1978	6.430	6.675	0.245	3.816
1979	6.680	6.552	-0.128	-1.910
1980	5.990	5.771	-0.219	-3.656
1981	4.929	5.013	0.085	1.719
1982	5.883	5.864	-0.019	-0.330
1983	6.008	5.900	-0.108	-1.799
1984	5.911	5.534	-0.377	-6.382

	TRGMDMEPR$.A	TRGMDMEPR$.MOD	Difference	% Difference
1985	5.742	5.897	0.156	2.714
1986	6.480	6.422	-0.058	-0.891
1987	6.701	6.767	0.066	0.985
1988	4.967	5.129	0.163	3.275
1989	4.410	4.533	0.123	2.793
1990	4.834	4.775	-0.059	-1.227

=> M_COMPARE A MOD ICVTMEX78VP;

	ICVTMEX78VP.A	ICVTMEX78VP.MOD	Difference	% Difference
1970	8.056	8.056	0.000	0.000
1971	6.880	4.919	-1.961	-28.505
1972	2.557	4.625	2.068	80.863
1973	7.395	12.028	4.633	62.655
1974	18.815	24.409	5.593	29.729
1975	19.744	15.076	-4.668	-23.642
1976	15.082	16.013	0.931	6.173
1977	24.743	30.053	5.310	21.459
1978	17.601	17.675	0.074	0.418
1979	18.100	18.493	0.393	2.172
1980	32.543	27.226	-5.317	-16.339
1981	34.327	28.816	-5.511	-16.054
1982	65.076	61.771	-3.305	-5.079
1983	114.242	107.243	-6.999	-6.127
1984	68.739	68.787	0.048	0.070

	ICVTMEX78VP.A	ICVTMEX78VP.MOD	Difference	% Difference
1985	60.416	60.511	0.095	0.158
1986	83.293	90.763	7.470	8.969
1987	139.919	139.183	-0.736	-0.526
1988	118.043	120.422	2.379	2.016
1989	21.928	20.432	-1.496	-6.822
1990	23.756	28.308	4.552	19.164

=> M_COMPARE A MOD ICVTMEX78;

	ICVTMEX78.A	ICVTMEX78.MOD	Difference	% Difference
1970	35.367	35.367	0.000	0.000
1971	37.800	37.106	-0.694	-1.835
1972	38.767	38.823	0.056	0.144
1973	41.633	43.492	1.859	4.465
1974	49.467	54.108	4.641	9.383
1975	59.233	62.265	3.032	5.119
1976	68.167	72.236	4.069	5.969
1977	85.033	93.944	8.911	10.480
1978	100.000	110.549	10.549	10.549
1979	118.100	130.993	12.893	10.917
1980	156.533	166.656	10.123	6.467
1981	210.267	214.680	4.414	2.099
1982	347.100	347.290	0.190	0.055
1983	743.633	719.733	-23.900	-3.214
1984	1254.800	1214.817	-39.983	-3.186
1985	2012.900	1949.919	-62.981	-3.129

	ICVTMEX78.A	ICVTMEX78.MOD	Difference	% Difference
1986	3689.500	3719.725	30.225	0.819
1987	8851.800	8896.942	45.143	0.510
1988	19300.734	19610.846	310.111	1.607
1989	23533.066	23617.812	84.746	0.360
1990	29123.500	30303.572	1180.072	4.052

NUMBER OF UNITED STATES RESIDENTS TRAVELING ABROAD BY AIR
(Actual and Simulated Values)
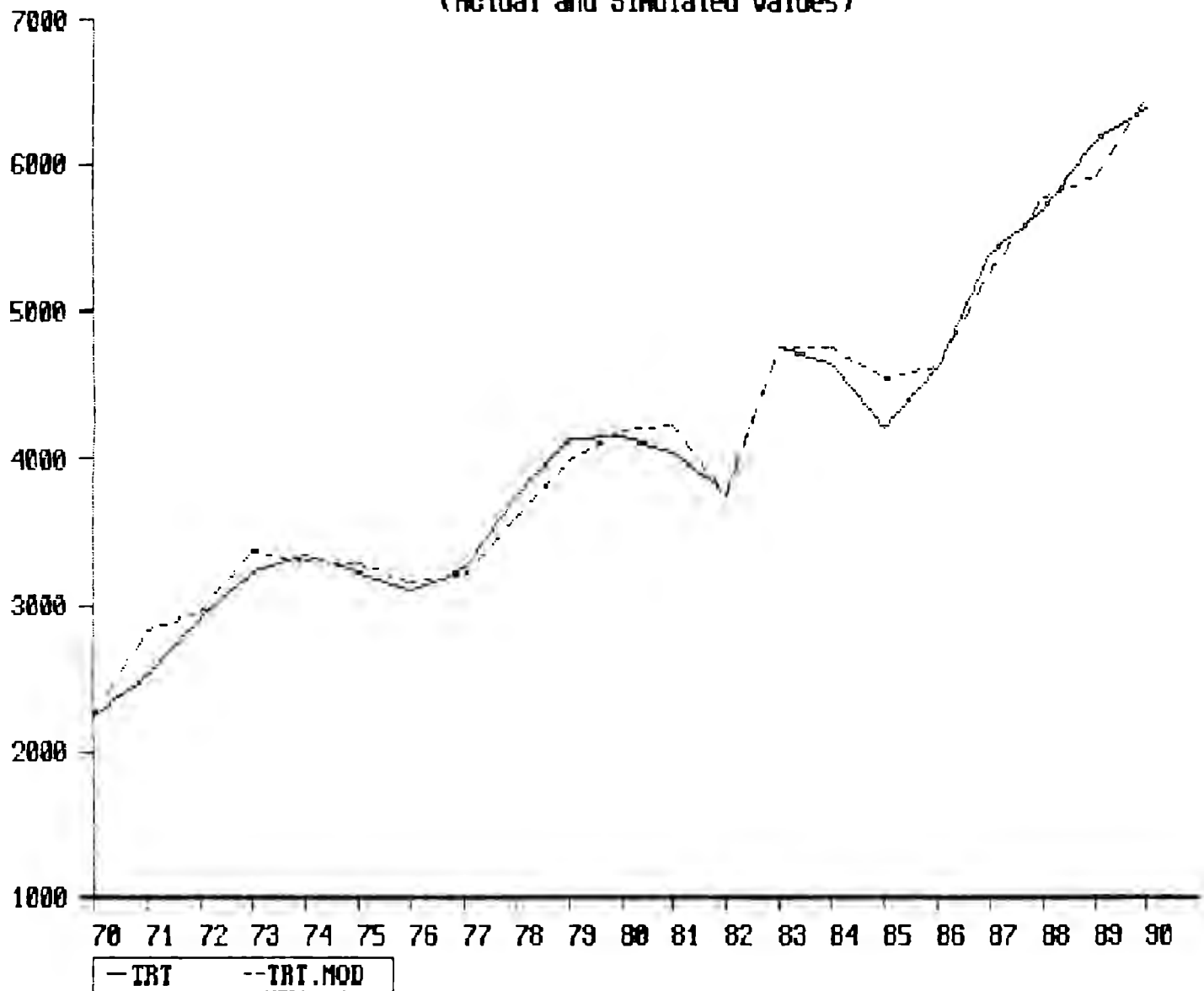

Legend: —NTEVAVEVA   --NTEVAVEVA.MOD

INCOING TOURISM FROM USA TO MEXICO BY AIR
(Actual and Simulated Values)

INGOING TOURISM TO MEXICO BY AIR
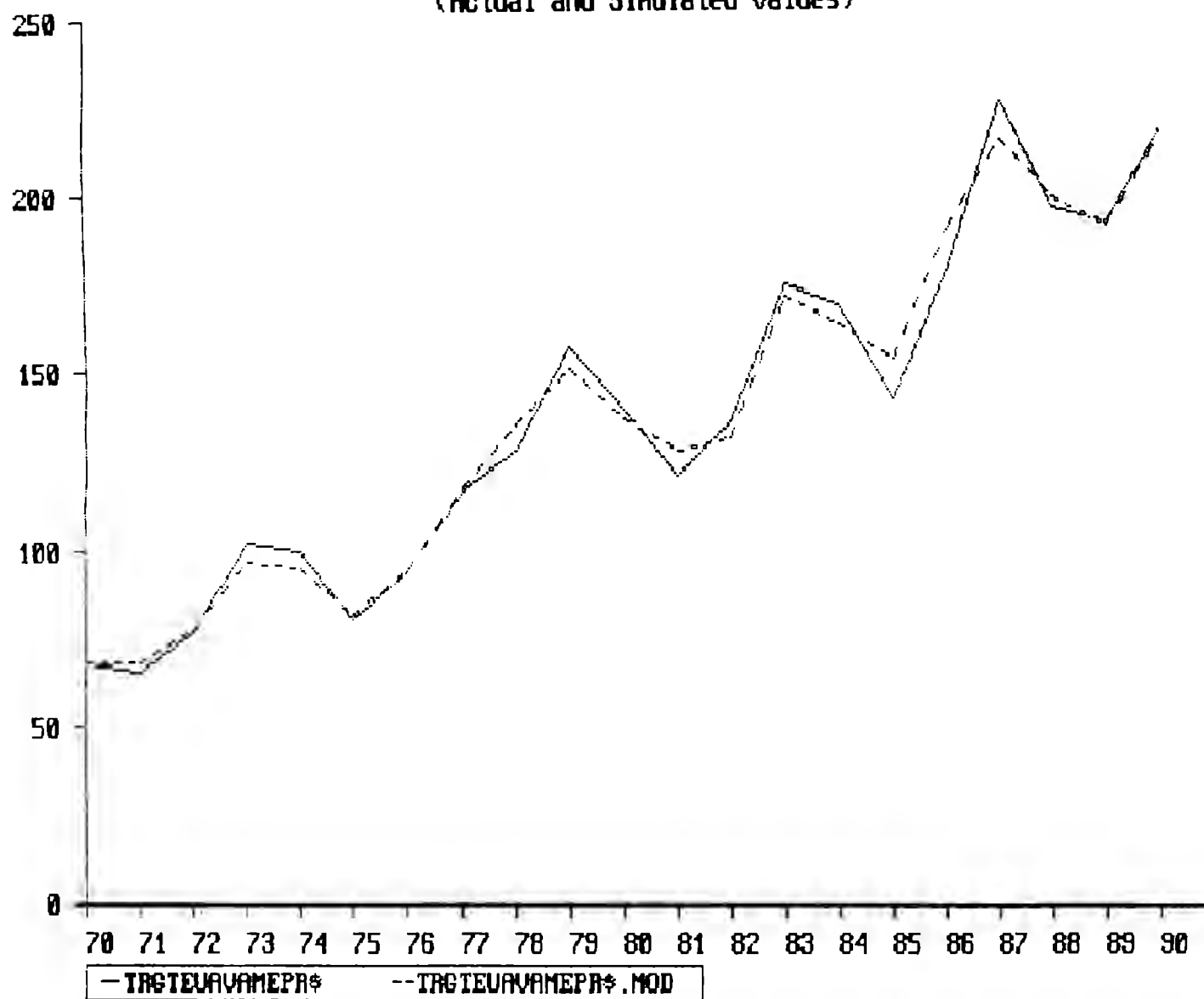### (Actual and Simulated Values)



Legend: — TRIVA   -- TRIVA.MOD
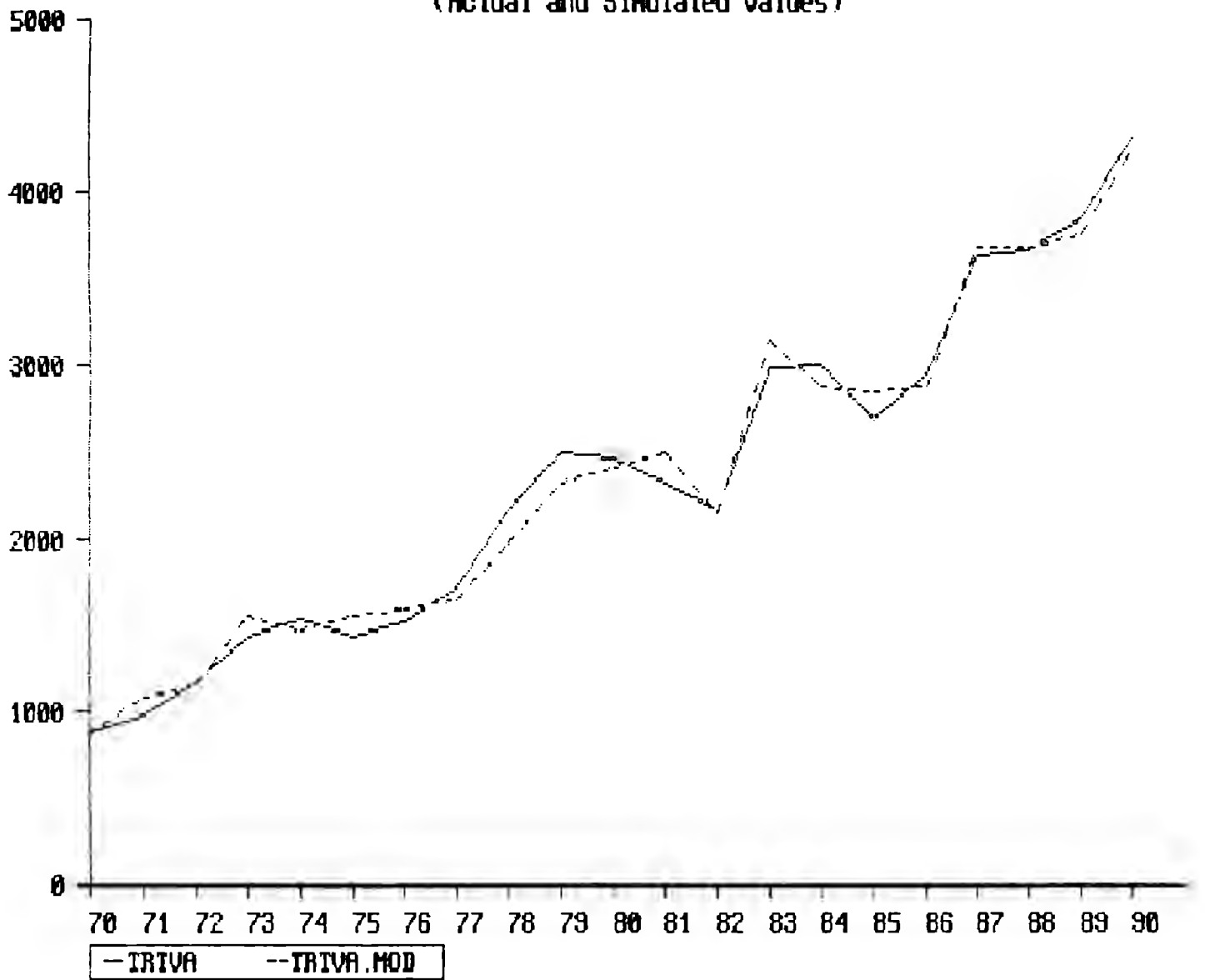
INGOING TOURISM FROM USA TO MEXICO BY AIR AND LAND
(Actual and Simulated Values)

Legend: —TRPOEUA   --TRPOEUA.MOD

TOTAL INGOING TOURISM TO MEXICO
(Actual and Simulated Values)

Legend: —TRT   --TRT.MOD

TOTAL EXPENDITURE OF TOURISTS FROM USA TO MEXICO BY AIR IN REAL MEP
(Actual and Simulated Values)

| —TRGTEURVAMEPR$ | --TRGTEURVAMEPR$.MOD |

TOTAL EXPENDITURE OF INGOING TOURISM TO MEXICO BY AIR IN REAL MEP
(Actual and Simulated Values)

TRGTVAMEPR$ --TRGTVAMEPR$.MOD

TOTAL EXPENDITURE OF INGOING TOURISM TO MEXICO IN REAL NEP
(Actual and Simulated Values)

— TRGTMEPR$ -- TRGTMEPR$.MOD

AVERAGE EXPENDITURE OF TOURISTS FROM USA TO MEXICO BY AIR IN REAL MEP
(Actual and Simulated Values)

— TRGMEUAVAMEPR$ --TRGMEUAVAMEPR$.MOD

AVERAGE EXPENDITURE OF INGOING TOURISM TO MEXICO BY AIR IN REAL MEP
(Actual and Simulated Values)
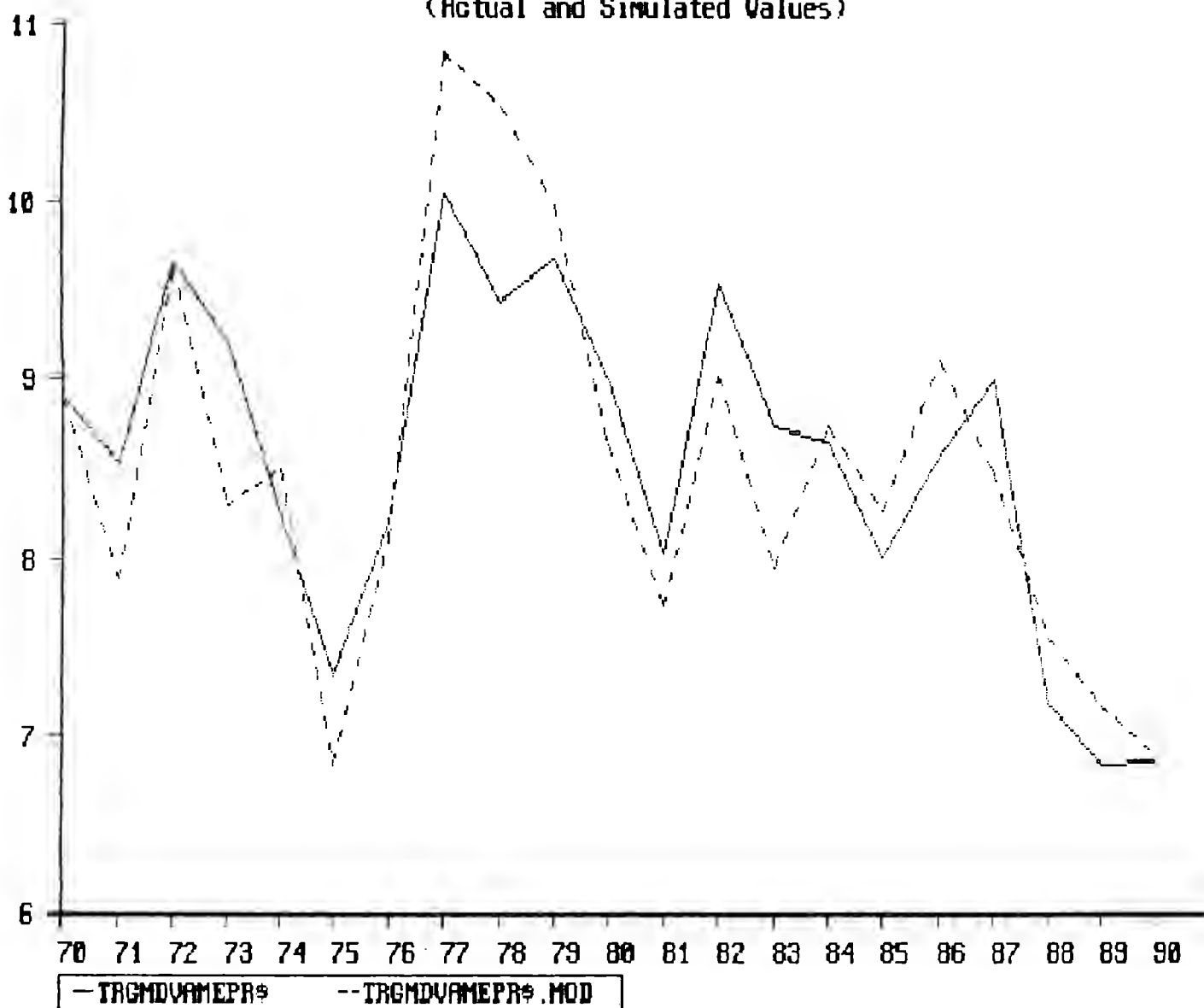
—TRGMVAMEPR$ --TRGMVAMEPR$.MOD
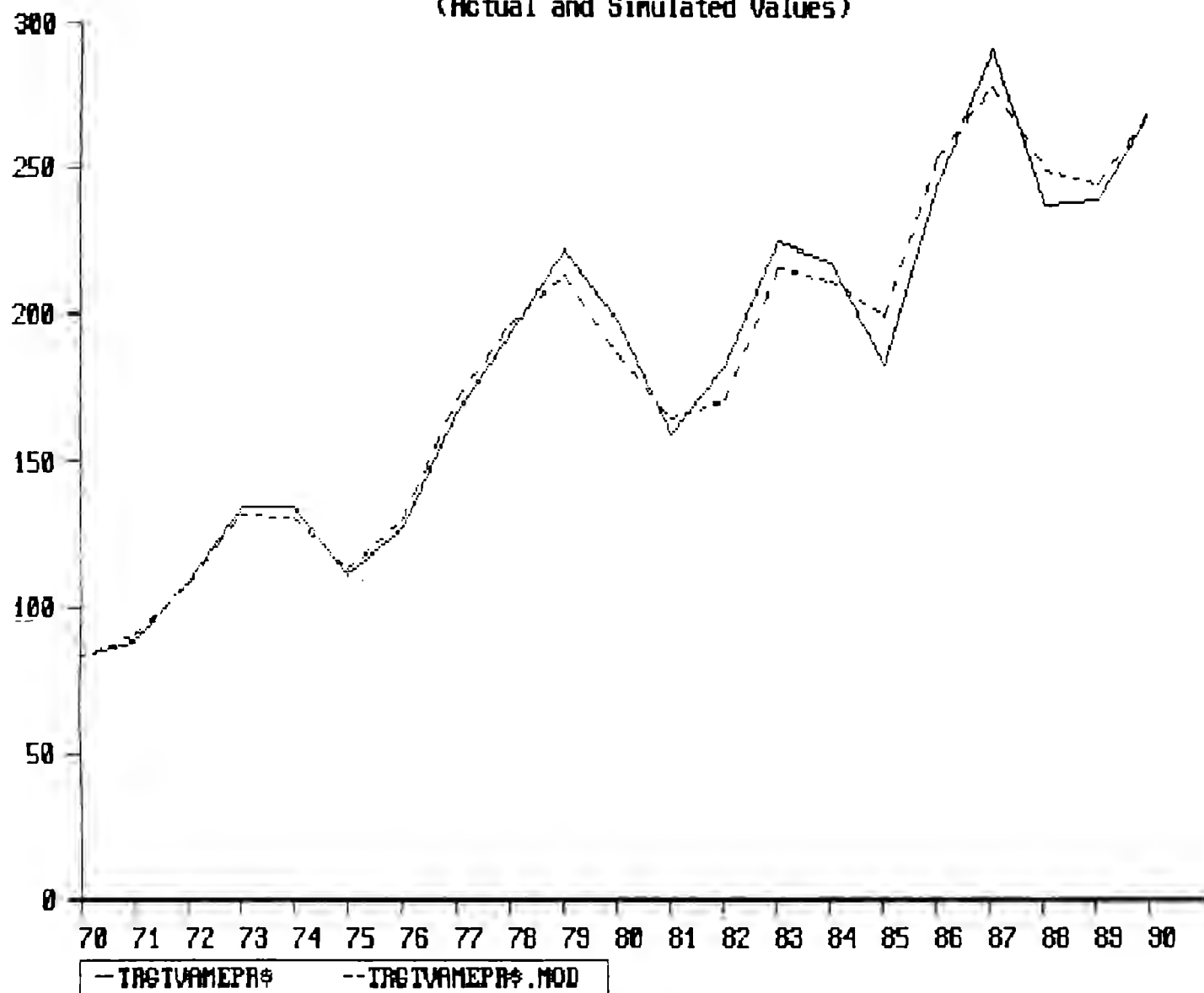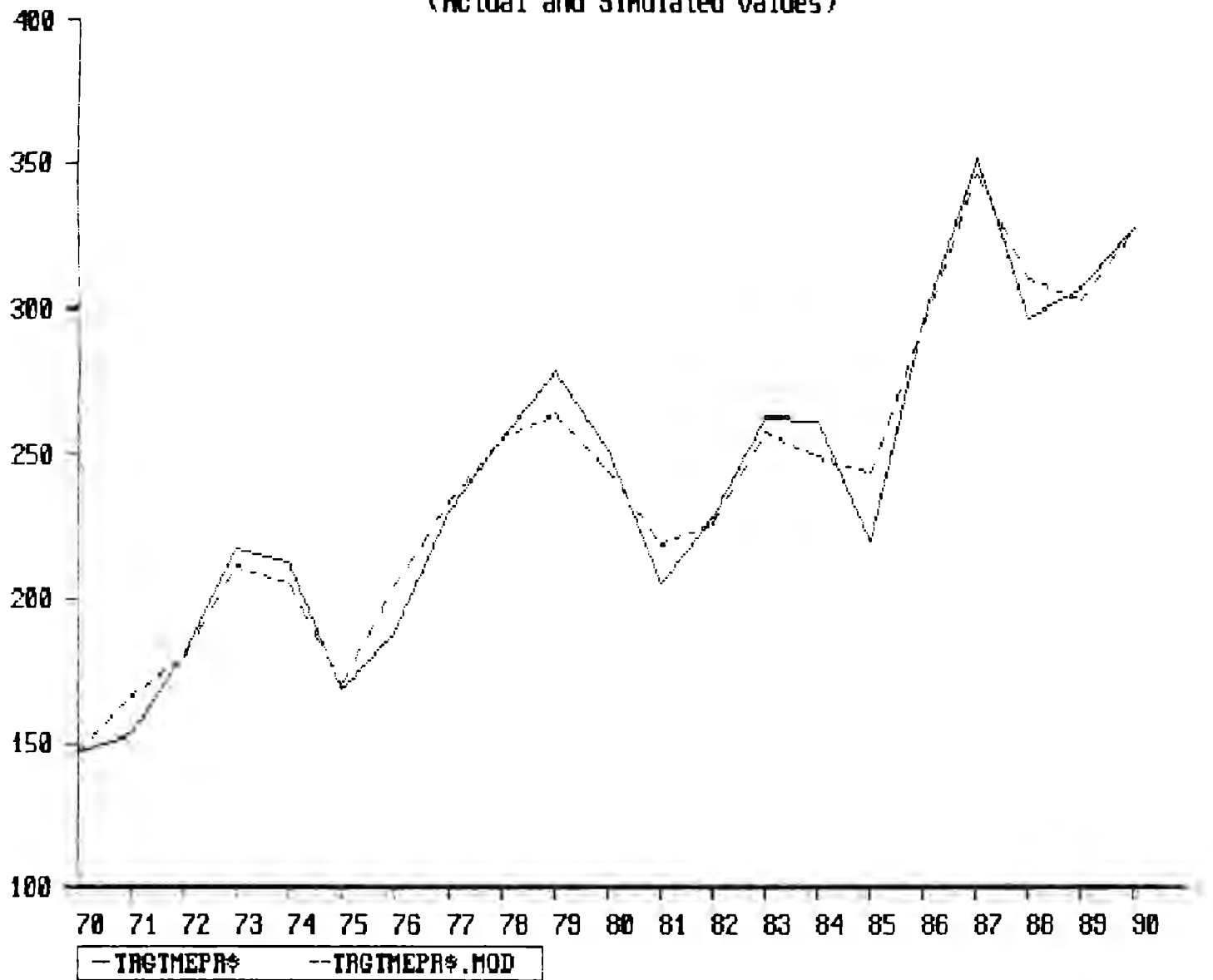
AVERAGE EXPENDITURE OF INGOING TOURISM TO MEXICO IN REAL MEP
(Actual and Simulated Values)

AVERAGE DAILY EXPENDITURE OF TOURISTS FROM US TO MEXICO BY AIR IN REAL MEP
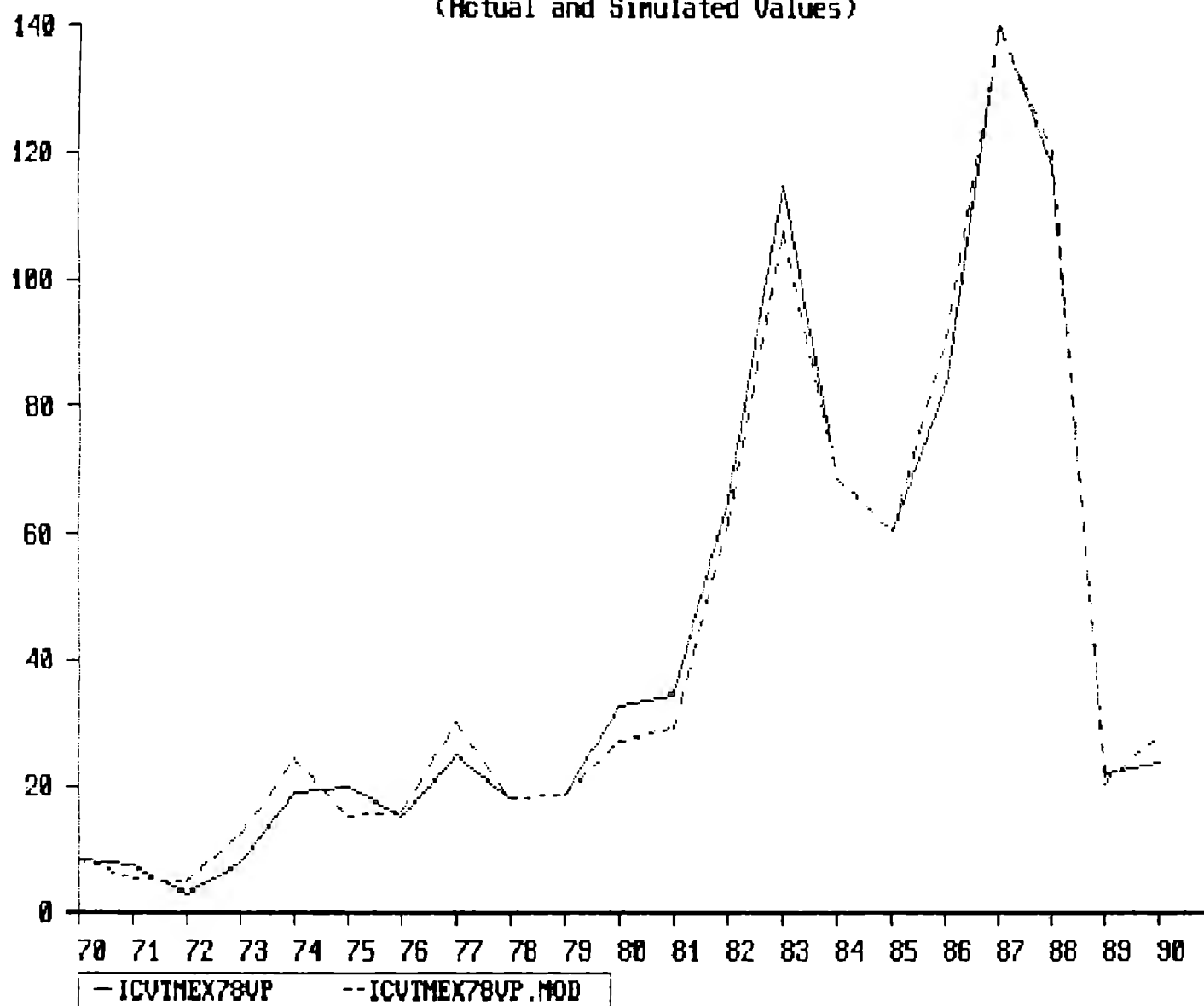(Actual and Simulated Values)

— TRGMDEUAVAMEPR$ --TRGMDEUAVAMEPR$.MOD

83

AVERAGE DAILY EXPENDITURE OF INGOING TOURISM TO MEXICO BY AIR IN REAL MEP
(Actual and Simulated Values)

— TRGMDVAMEPR$ --TRGMDVAMEPR$.MOD

AVERAGE DAILY EXPENDITURE OF INBOING TOURISM TO MEXICO IN REAL MEP
(Actual and Simulated Values)

—TRGMDMEPR$ --TRGMDMEPR$.MOD
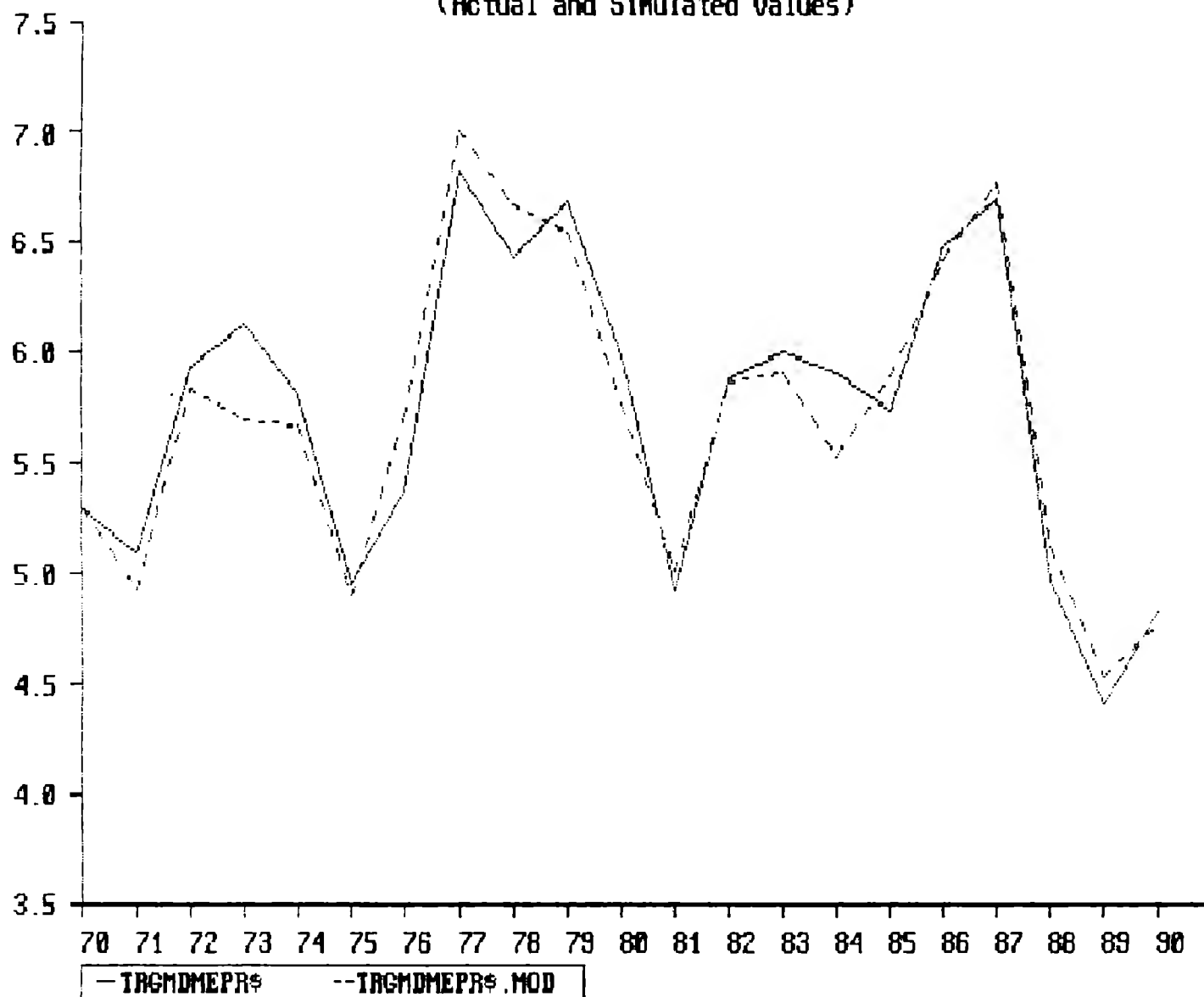
TOURISM COST OF LIVING INDEX IN MEXICO - PERCENT CHANGES
(Actual and Simulated Values)

— ICVTMEX78VP   --ICVTMEX78VP.MOD

TOURISM COST OF LIVING INDEX IN MEXICO
(Actual and Simulated Values)

SUMMARY OF SIMULATION STATISTICS
(SIMULATION PERIOD: 1970 -1990)

	RMSE	RMSPE	U	UM	US	UC
NTEUAVEVA	3074.08	3.92%	0.0774	0.0005	0.0014	0.9981
TRPEUAVA	316.97	4.17%	0.0759	0	0	1
TRTVA	487.34	5.37%	0.09583	1.9042	0.0012	-0.905
TRPOEUA	541.03	3.16%	0.07446	1.3983	0.0018	-0.4
TRT	655.85	4.02%	0.07739	·1.1716	0.0025	-0.174
TRGTEUAVAMEPR$	24.81	3.75%	0.08548	1.7371	0.0009	-0.738
TRGTVAMEPR$	36.17	3.88%	0.09456	1.1376	0.0001	-0.138
TRGTMEPR$	44.46	4.47%	0.09016	0.5117	0.0031	0.4852
TRGMEUAVAMEPR$	16.36	4.52%	0.10773	0.122	0.0014	0.8766
TRGMVAMEPR$	22.24	5.72%	0.1365	0.0662	1E-05	0.9337
TRGMMEPR$	9.15	3.27%	0.07616	0.0634	0.0005	0.9361
TRGMDEUAVAMEPR$	1.69	4.52%	0.10542	0.0282	0.0023	0.9695
TRGMOVAMEPR$	2.33	5.72%	0.1353	0.0135	0.0104	0.976
TRGMDMEPR$	0.86	3.25%	0.0748	0.0006	0.0003	0.9991
ICVTMEX78VP	17.20	26.10%	0.1472	2.2224	3.2804	-4.503
ICVTMEX78	423.42	5.39%	0.02216	97.951	390.17	-487.1

```
=> M_COMPARE A FRCST TRPEUAVA;
```

	TRPEUAVA.A	TRPEUAVA.FRCST	Difference	% Difference
1986	2384.400	2409.931	25.531	1.071
1987	3027.545	3091.758	64.213	2.121
1988	3154.952	2957.873	-197.079	-6.247
1989	3178.403	3230.533	52.130	1.640
1990	3684.000	3682.832	-1.168	-0.032

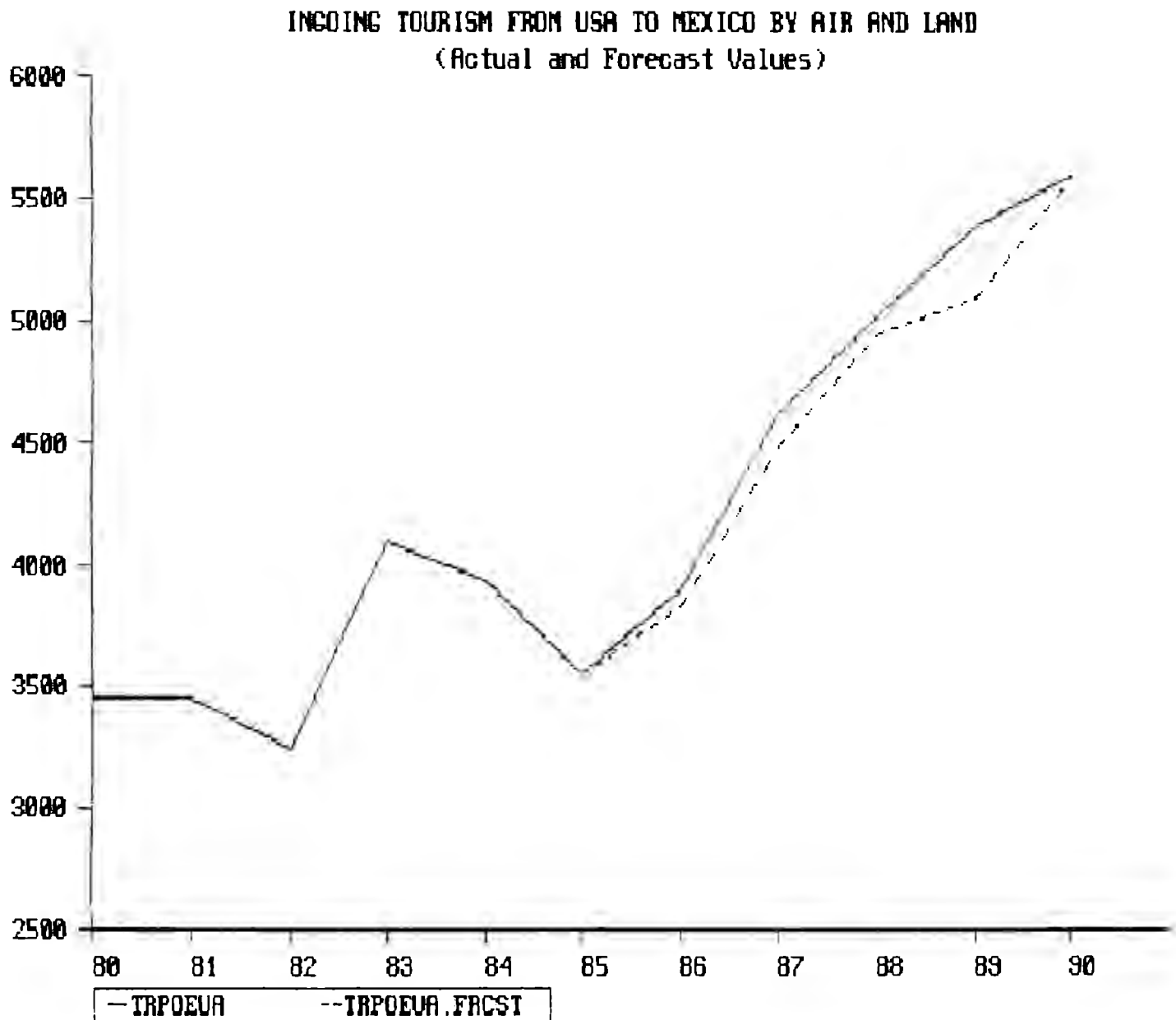INCOING TOURISM FROM USA TO MEXICO BY AIR
(Actual and Forecast Values)

—TRPEUAVA   --TRPEUAVA.FRCST
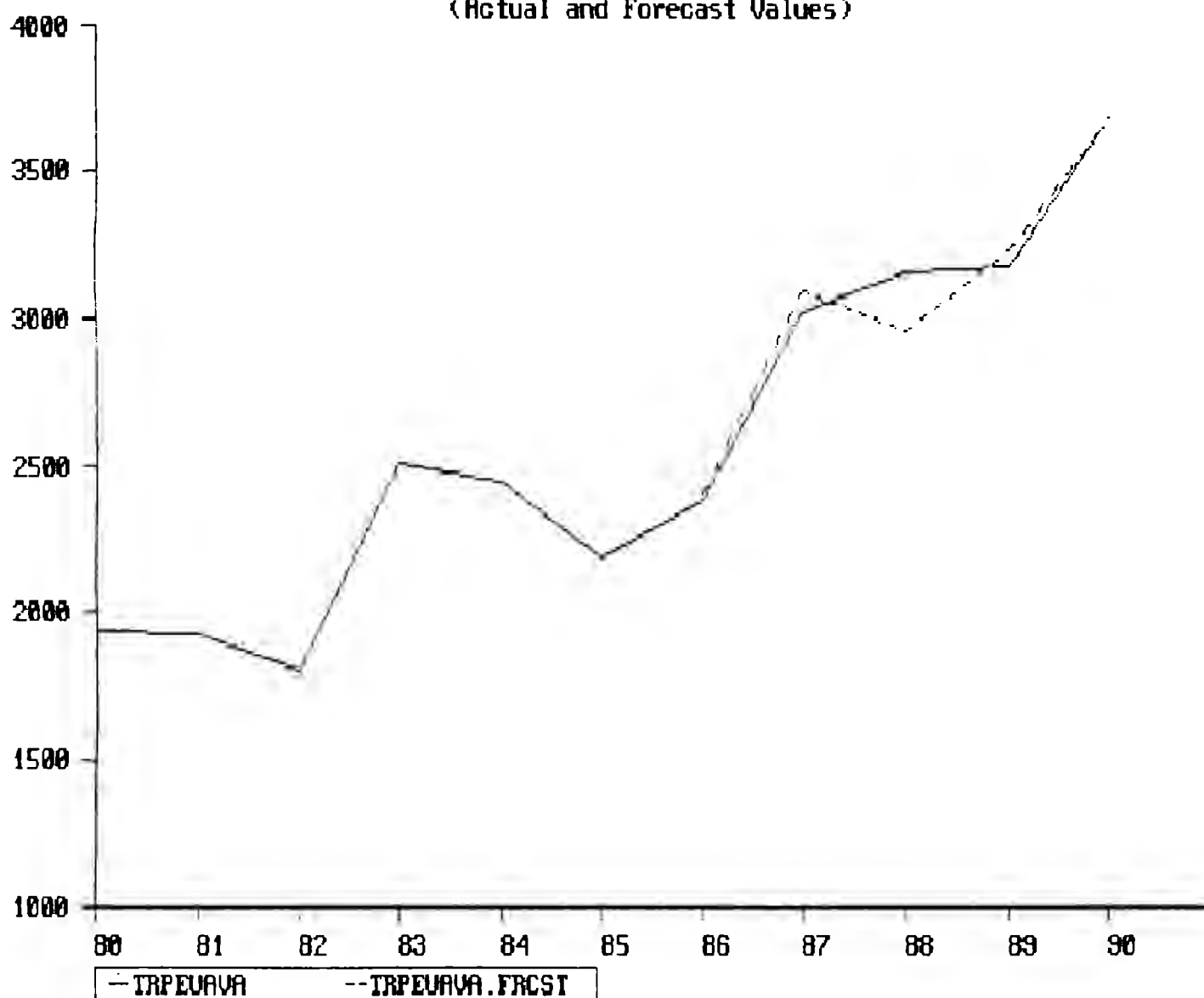
```
=>   M_COMPARE A FRCST TRTVA;
```

	TRTVA.A	TRTVA.FRCST	Difference	% Difference
1986	2950.000	2939.457	-10.543	-0.357
1987	3635.000	3690.869	55.869	1.537
1988	3667.000	3544.559	-122.441	-3.339
1989	3844.000	3841.947	-2.053	-0.053
1990	4313.000	4330.593	17.593	0.408

INGOING TOURISM TO MEXICO BY AIR
(Actual and Forecast Values)
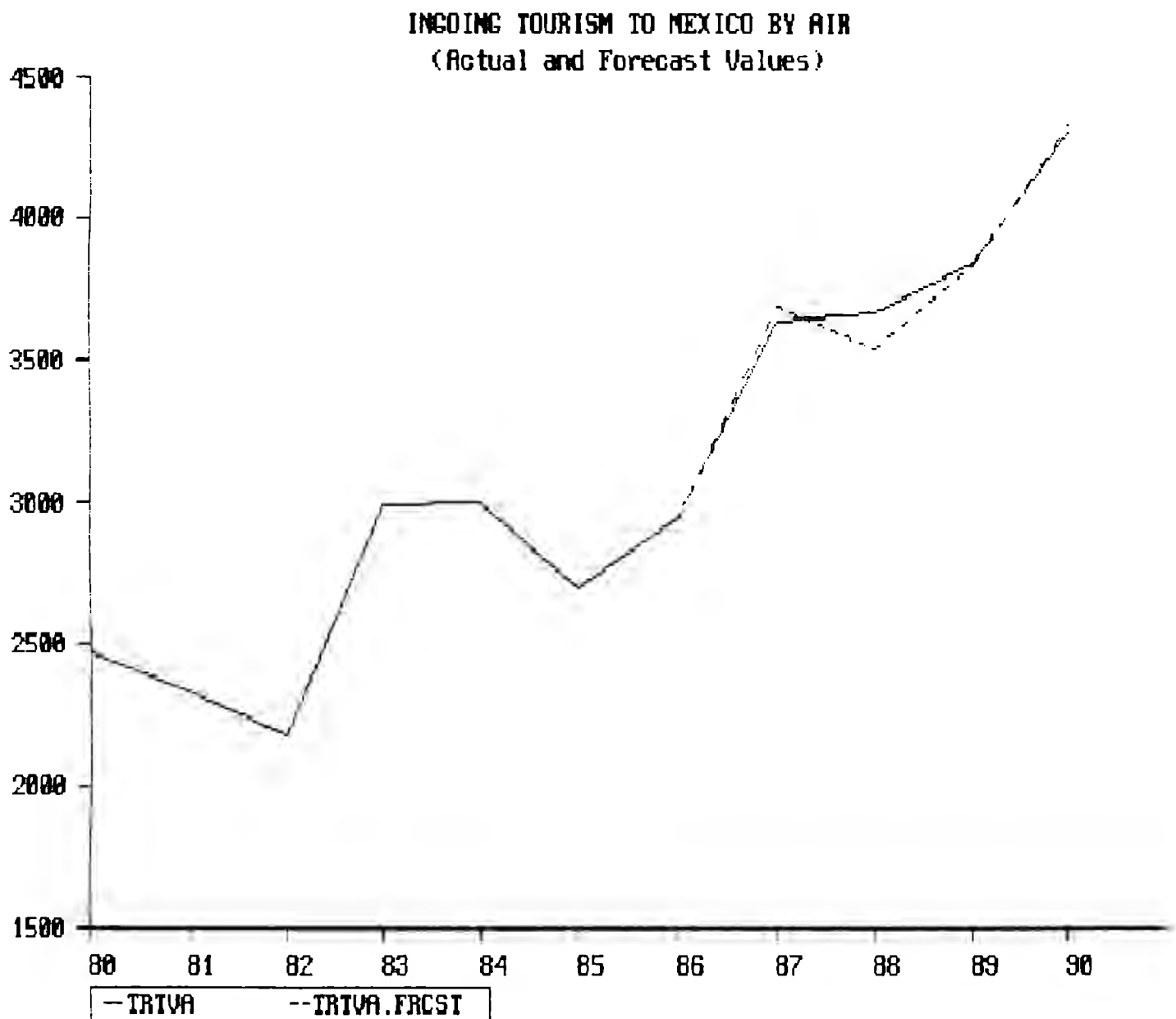
```
=>  M_COMPARE A FRCST TRPOEUA;
```

	TRPOEUA.A	TRPOEUA.FRCST	Difference	% Difference
1986	3895.000	3828.458	-66.542	-1.708
1987	4620.000	4480.884	-139.116	-3.011
1988	5016.000	4947.613	-68.387	-1.363
1989	5385.000	5090.219	-294.781	-5.474
1990	5598.000	5582.851	-15.149	-0.271

INCOMING TOURISM FROM USA TO MEXICO BY AIR AND LAND
(Actual and Forecast Values)

Legend: —TRPOEUA   --TRPOEUA.FRCST

```
=>   M_COMPARE A FRCST TRT;
```

	TRT.A	TRT.FRCST	Difference	% Difference
1986	4625.000	4510.045	-114.955	-2.486
1987	5407.000	5234.614	-172.386	-3.188
1988	5692.000	5758.855	66.855	1.175
1989	6186.000	5919.733	-266.267	-4.304
1990	6393.000	6464.582	71.582	1.120

TOTAL INGOING TOURISM TO MEXICO
(Actual and Forecast Values)
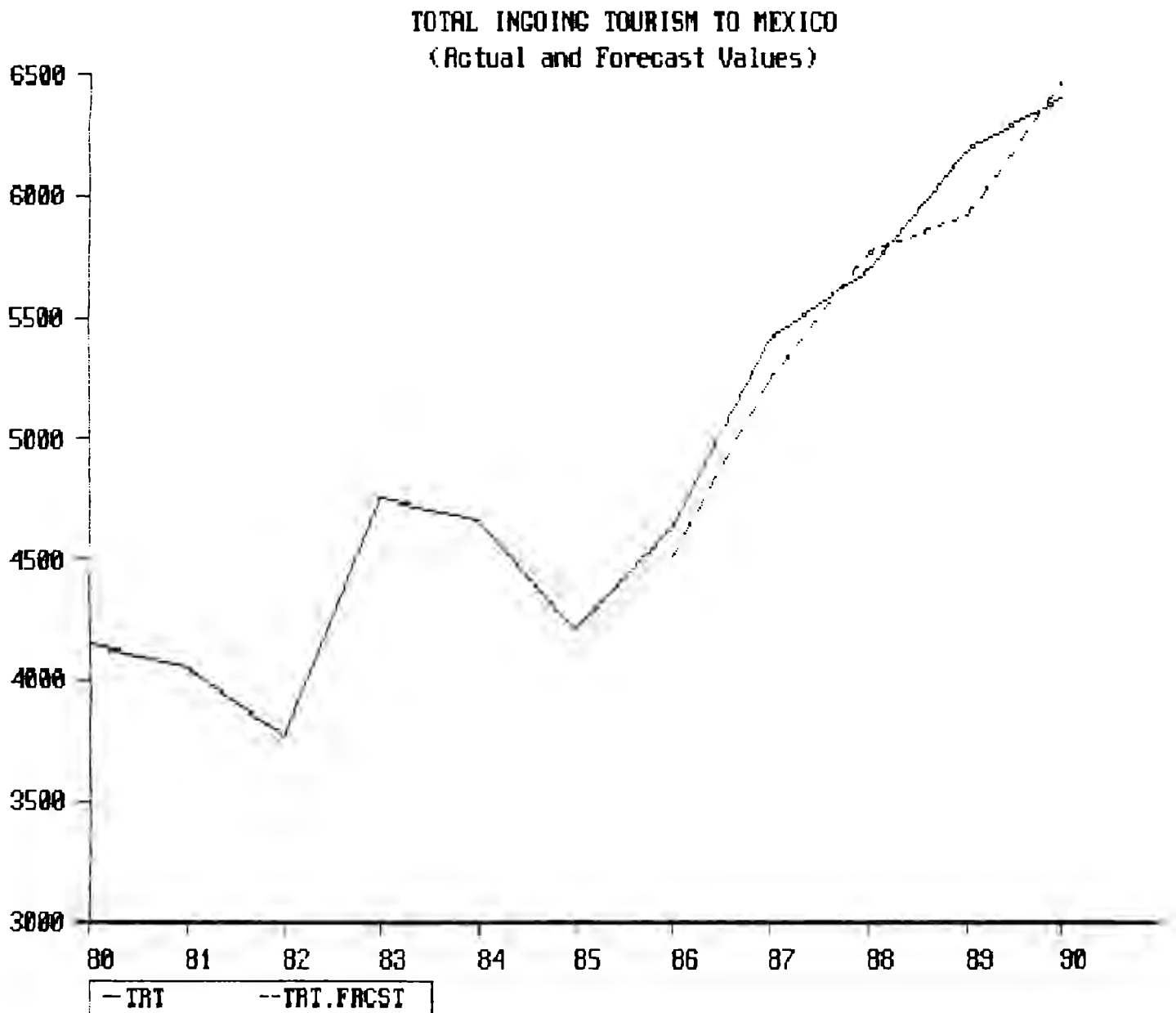
```
=>   M_COMPARE A FRCST TRGTEUAVAMEPR$;
```

	TRGTEUAVAMEPR $.A	TRGTEUAVAMEPR $.FRCST	Difference	% Difference
1986	178.479	189.462	10.983	6.154
1987	225.038	214.964	-10.075	-4.477
1988	195.612	198.654	3.042	1.555
1989	191.108	190.678	-0.430	-0.225
1990	216.772	214.664	-2.108	-0.972

TOTAL EXPENDITURE OF TOURISTS FROM USA TO MEXICO BY AIR IN REAL MEP
(Actual and Forecast Values)

Legend: — TRGTEUAVAMEPR$ --TRGTEUAVAMEPR$.FRCST
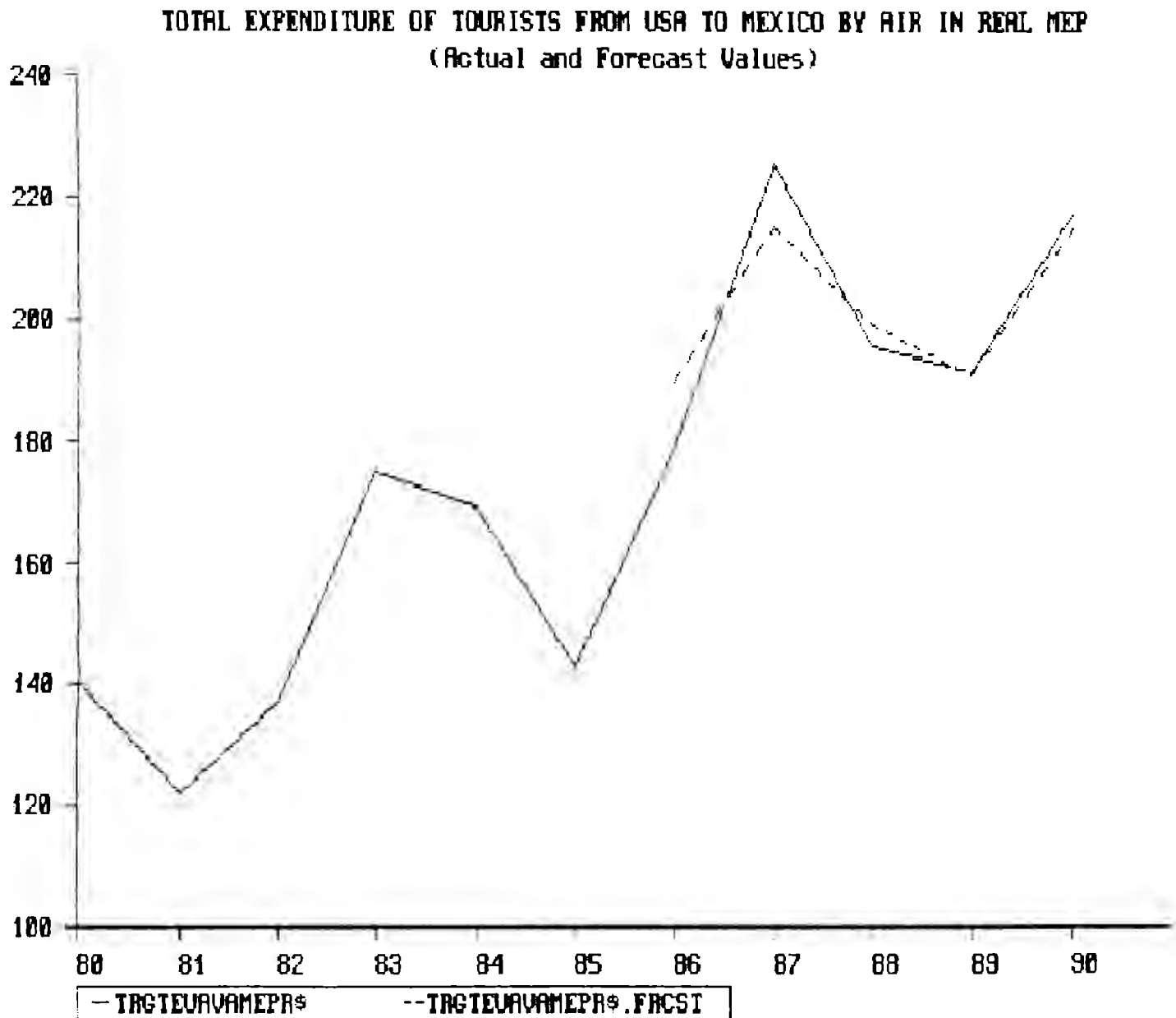
	TRGTVAMEPR$.A	TRGTVAMEPR$.F RCST	Difference	% Difference
1986	245.168	255.151	9.983	4.072
1987	291.241	278.760	-12.481	-4.286
1988	237.567	250.337	12.771	5.376
1989	240.024	245.042	5.018	2.091
1990	271.742	271.618	-0.124	-0.046

TOTAL EXPENDITURE OF INGOING TOURISM TO MEXICO BY AIR IN REAL MEP
(Actual and Forecast Values)

— TRGTVAMEPR$ --TRGTVAMEPR$.FRCST
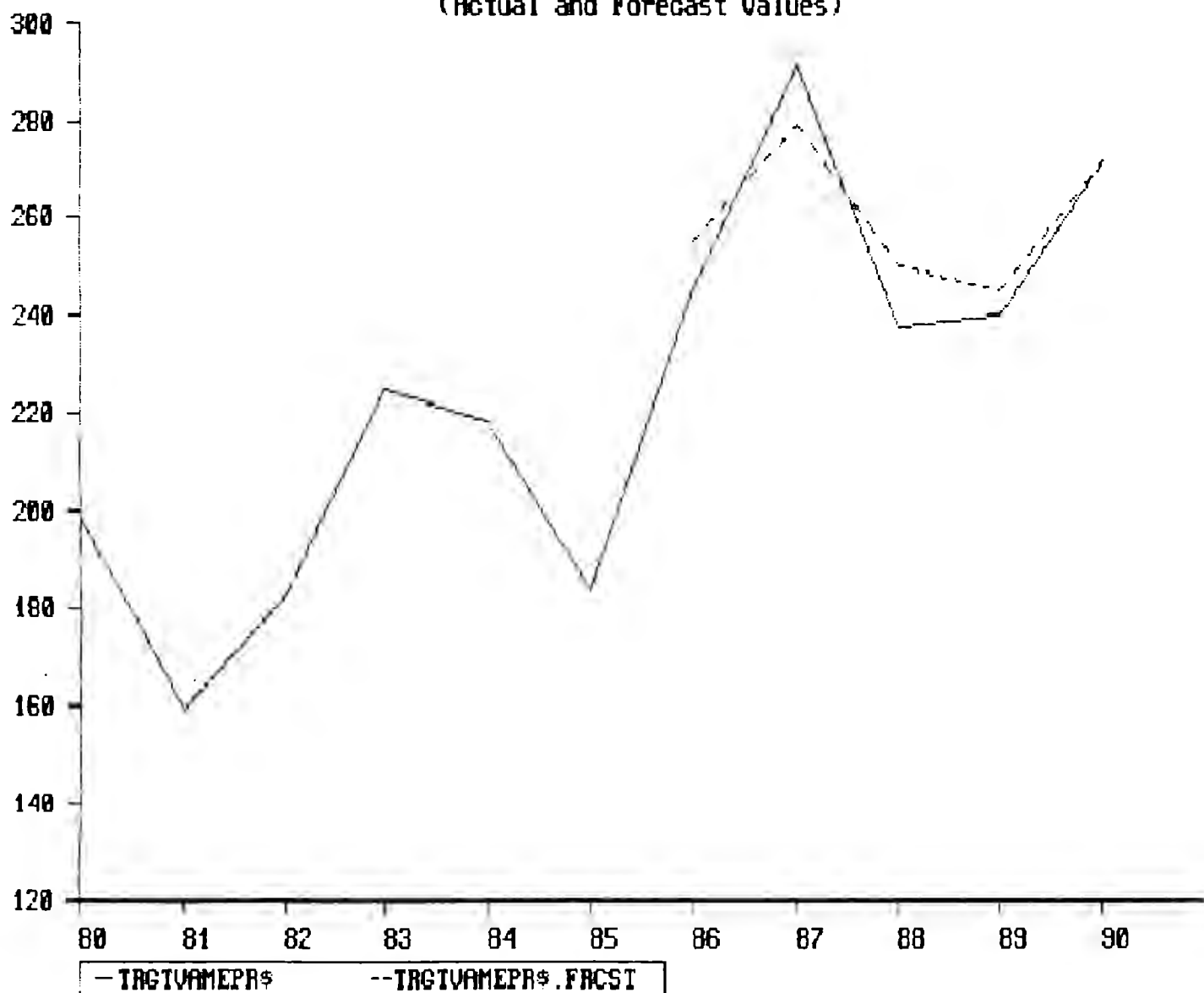
```
=>   M_COMPARE A FRCST TRGTMEPR$;
```

	TRGTMEPR$.A	TRGTMEPR$.FRCST	Difference	% Difference
1986	296.943	290.390	-6.553	-2.207
1987	351.163	345.031	-6.132	-1.746
1988	296.644	310.596	13.953	4.704
1989	307.939	303.346	-4.593	-1.492
1990	328.161	327.253	-0.909	-0.277

TOTAL EXPENDITURE OF INGOING TOURISM TO MEXICO IN REAL MEP
(Actual and Forecast Values)

— TRGTMEPR$ -- TRGTMEPR$.FRCST
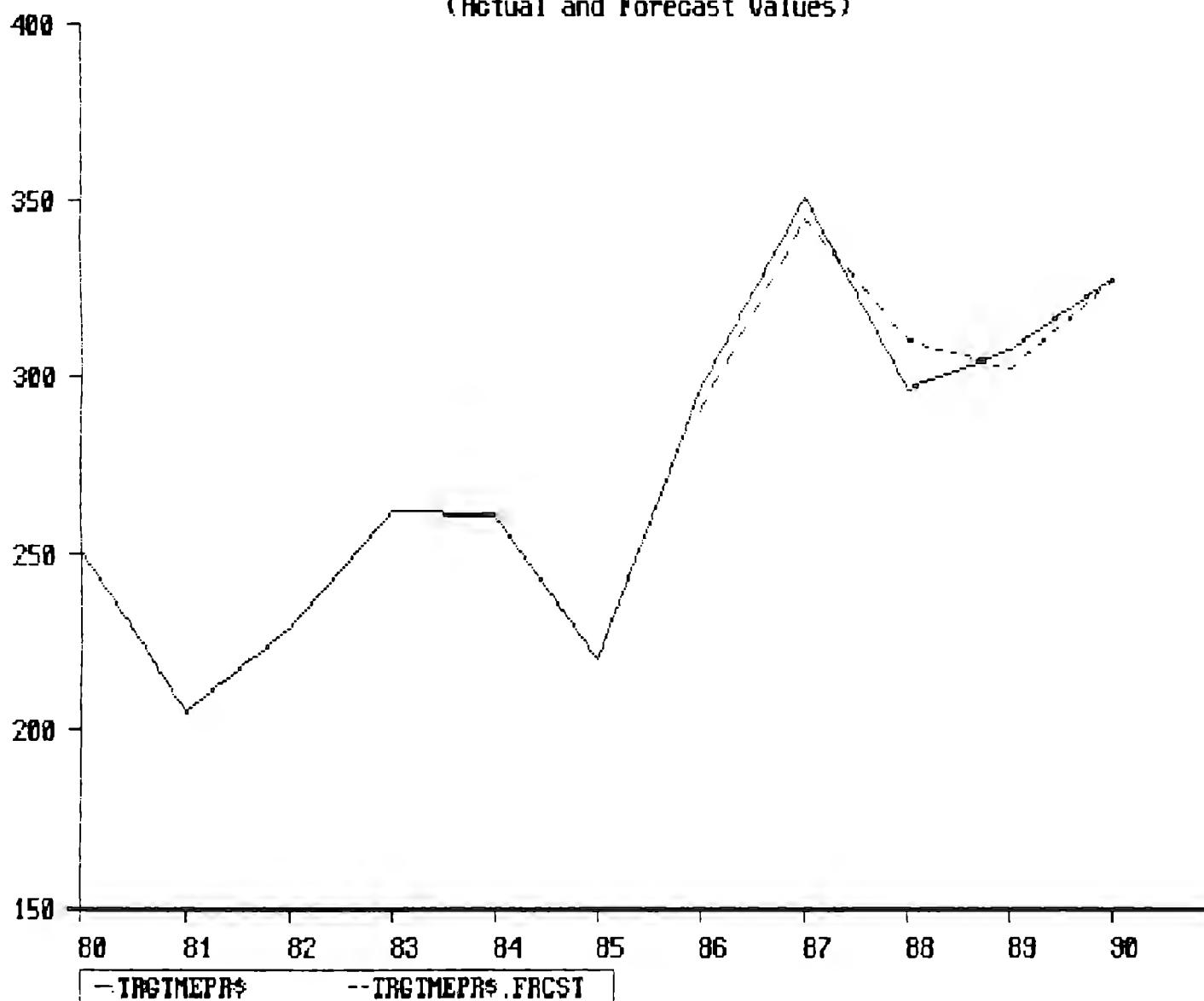
=>   M_COMPARE A FRCST TRGMEUAVAMEPR$;

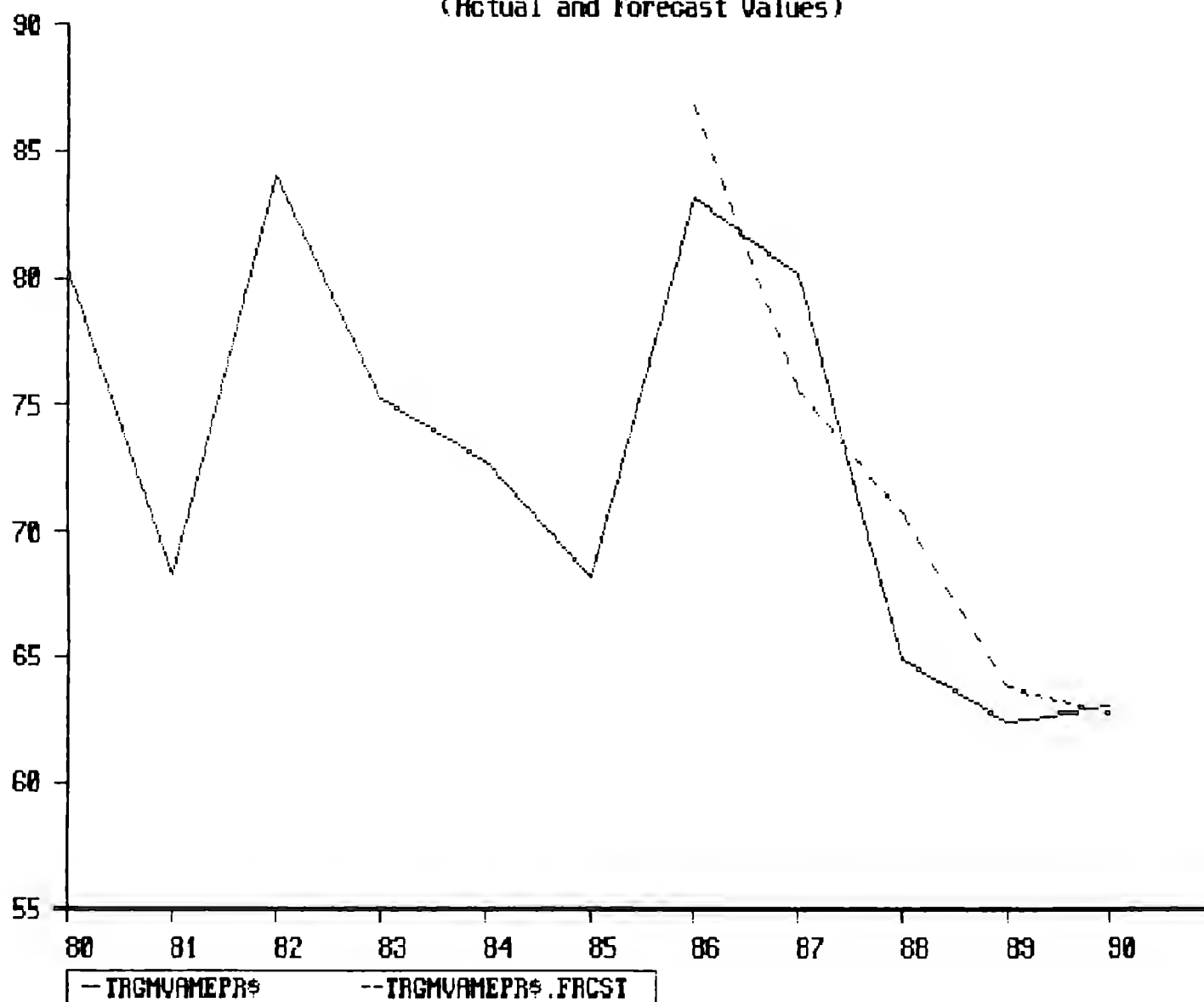|	TRGMEUAVAMEPR $.A	TRGMEUAVAMEPR $.FRCST	Difference	% Difference
1986	74.853	78.617	3.764	5.029
1987	74.330	69.528	-4.802	-6.461
1988	62.002	67.161	5.159	8.321
1989	60.127	59.024	-1.103	-1.835
1990	58.842	58.288	-0.554	-0.941

AVERAGE EXPENDITURE OF TOURISTS FROM USA TO MEXICO BY AIR IN REAL MEP
(Actual and Forecast Values)

—TRGMEUAVAMEPR$ --TRGMEUAVAMEPR$.FRCST

96
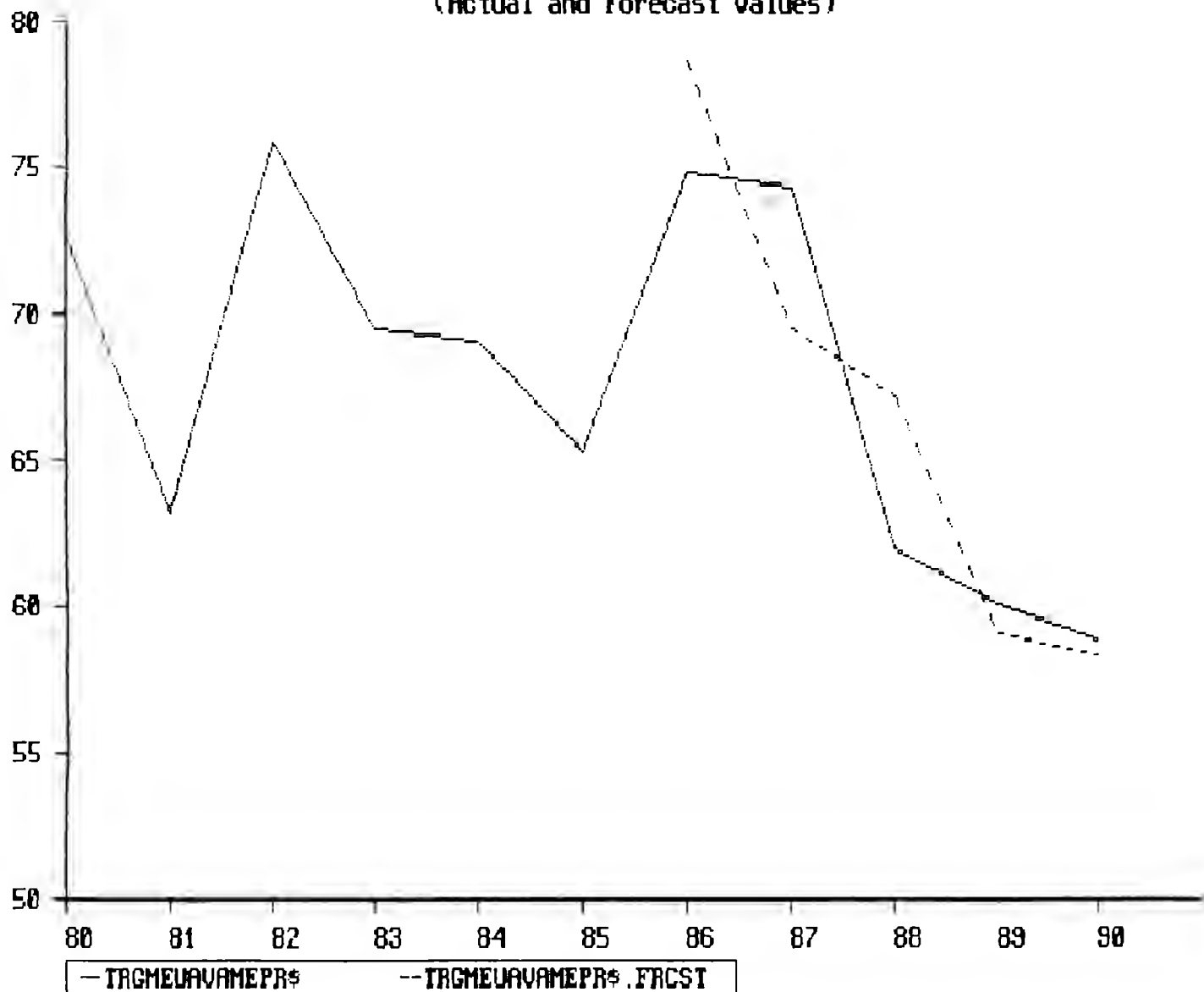
=> M_COMPARE A FRCST TRGMVAMEPR$;

	TRGMVAMEPR$.A	TRGMVAMEPR$.F RCST	Difference	% Difference
1986	83.108	86.802	3.694	4.445
1987	80.121	75.527	-4.594	-5.734
1988	64.785	70.626	5.841	9.016
1989	62.441	63.781	1.340	2.145
1990	63.005	62.721	-0.285	-0.452

AVERAGE EXPENDITURE OF INGOING TOURISM TO MEXICO BY AIR IN REAL MEP
(Actual and Forecast Values)

Legend: — TRGMVAMEPR$ -- TRGMVAMEPR$.FRCST

```
=>   M_COMPARE A FRCST TRGMMEPR$;
```

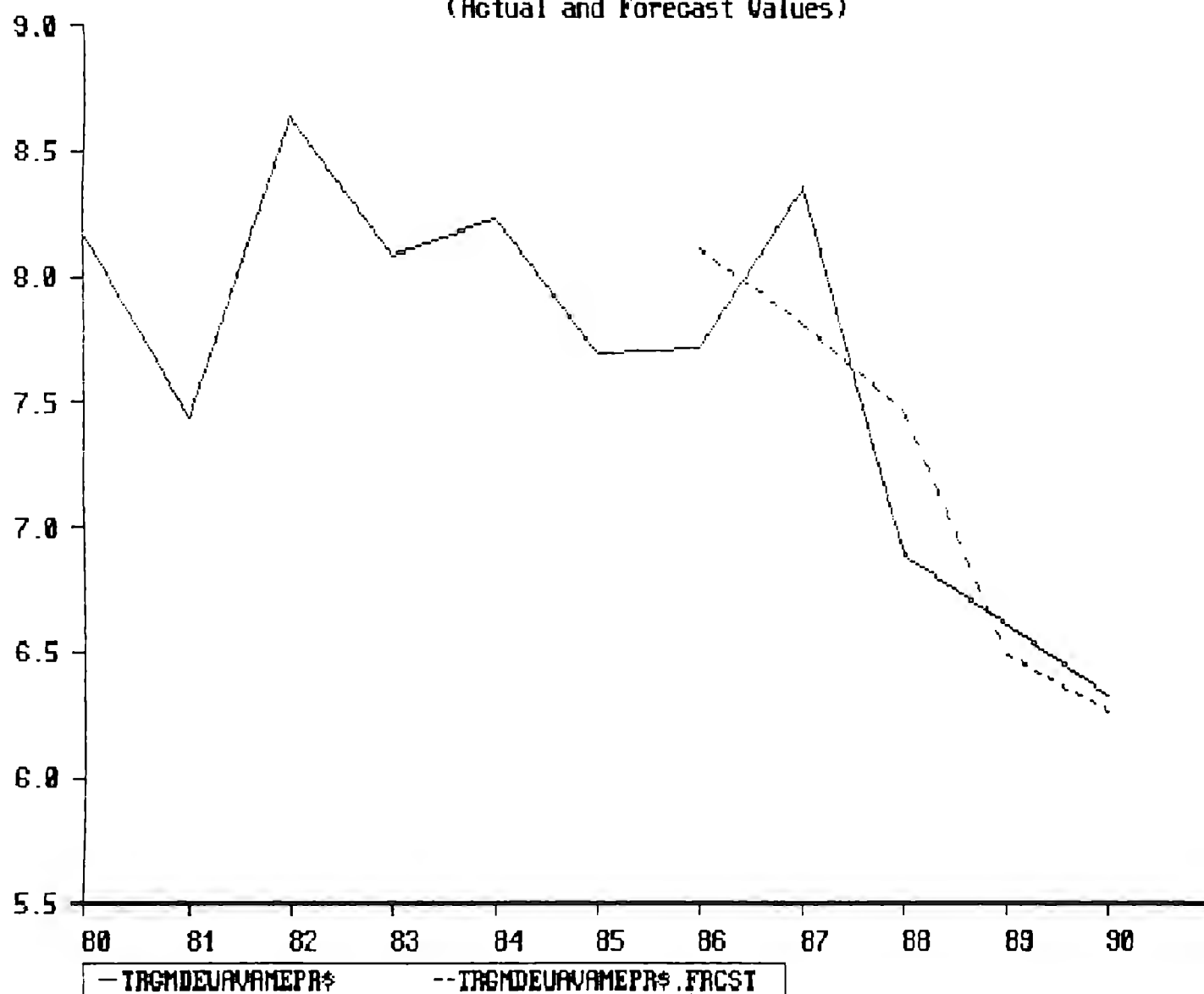|	TRGMMEPR$.A	TRGMMEPR$.FRCST	Difference	% Difference
1986	64.204	64.387	0.183	0.286
1987	64.946	65.913	0.967	1.489
1988	52.116	53.934	1.818	3.488
1989	49.780	51.243	1.463	2.939
1990	51.331	50.622	-0.709	-1.381

AVERAGE EXPENDITURE OF INGOING TOURISM TO MEXICO IN REAL MEP
(Actual and Forecast Values)
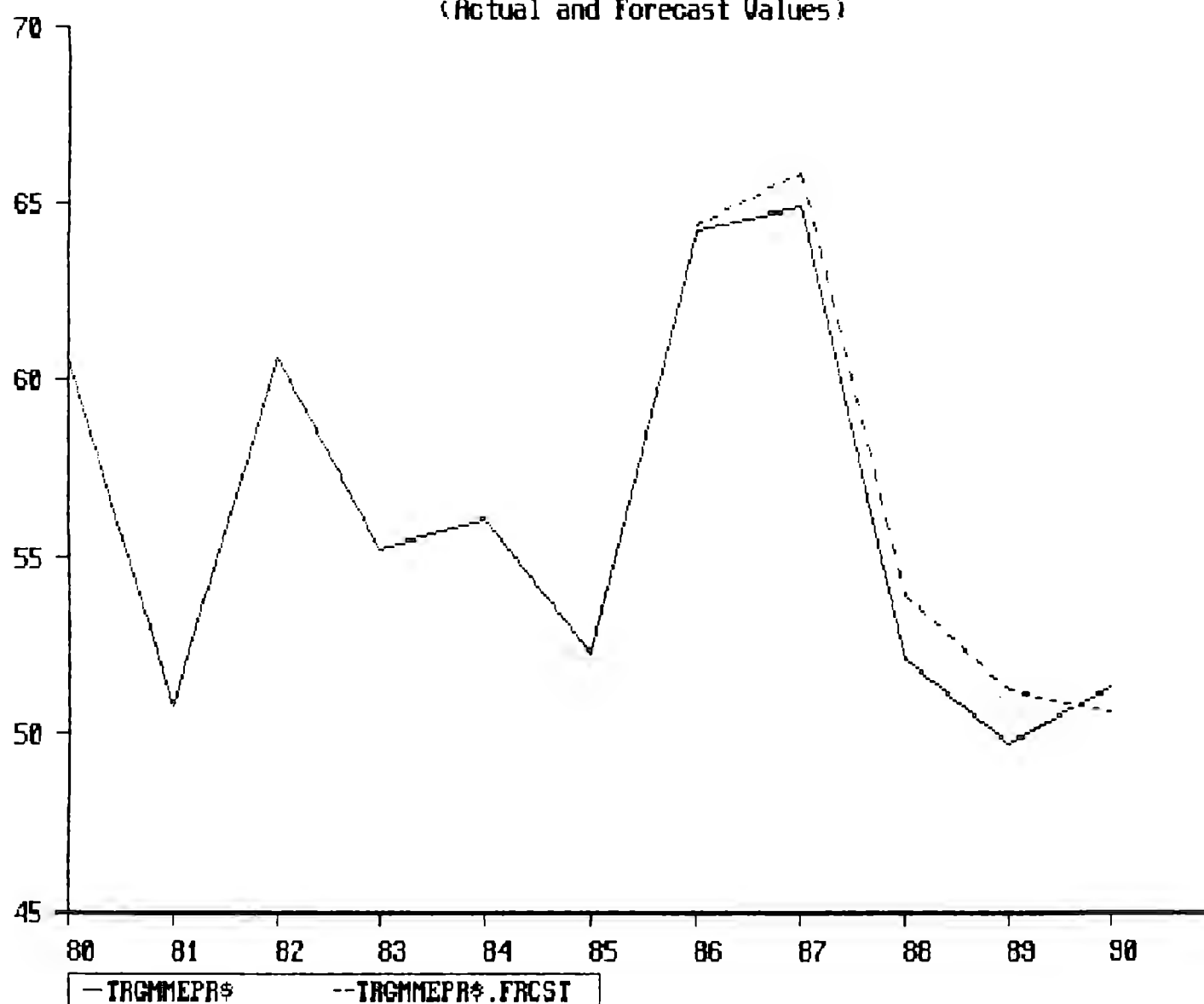
=> M_COMPARE A FRCST TRGMDEUAVAMEPR$:

|	TRGMDEUAVAMEP R$.A	TRGMDEUAVAMEP R$.FRCST	Difference	% Difference
1986	7.717	8.105	0.388	5.029
1987	8.352	7.812	-0.540	-6.461
1988	6.889	7.462	0.573	8.321
1989	6.607	6.486	-0.121	-1.835
1990	6.327	6.268	-0.060	-0.941

AVERAGE DAILY EXPENDITURE OF TOURISTS FROM US TO MEXICO BY AIR IN REAL MEP
(Actual and Forecast Values)

— TRGMDEUAVAMEPR$ --TRGMDEUAVAMEPR$.FRCST

|	TRGMDVAMEPR$. A	TRGMDVAMEPR$. FRCST	Difference	% Difference
1986	8.568	8.949	0.380	4.439
1987	9.001	8.486	-0.515	-5.724
1988	7.194	7.847	0.654	9.086
1989	6.838	7.009	0.170	2.492
1990	6.870	6.744	-0.126	-1.836

AVERAGE DAILY EXPENDITURE OF INGOING TOURISM TO MEXICO BY AIR IN REAL MEP
### (Actual and Forecast Values)

—TRGMDVAMEPR$ --TRGMDVAMEPR$.FRCST
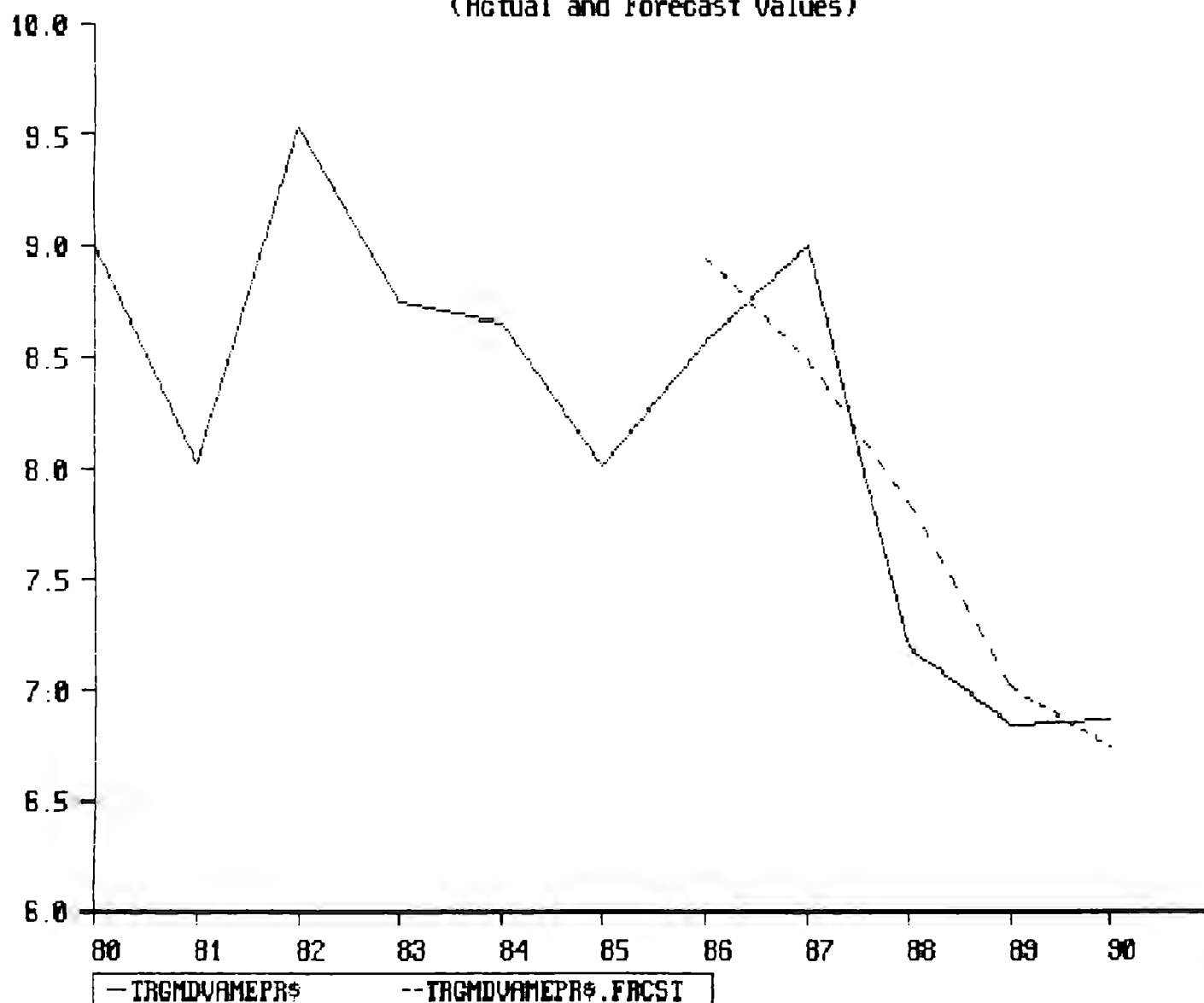
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=>   M_COMPARE A FRCST TRGMDMEPR$;
```

	TRGMDMEPR$.A	TRGMDMEPR$.FRCST	Difference	% Difference
1986	6.480	6.504	0.024	0.365
1987	6.701	6.795	0.094	1.408
1988	4.967	5.137	0.170	3.418
1989	4.410	4.535	0.125	2.840
1990	4.834	4.776	-0.059	-1.212

AVERAGE DAILY EXPENDITURE OF INGOING TOURISM TO MEXICO IN REAL MEP
(Actual and Forecast Values)

—TRGMDMEPR$ --TRGMDMEPR$.FRCST
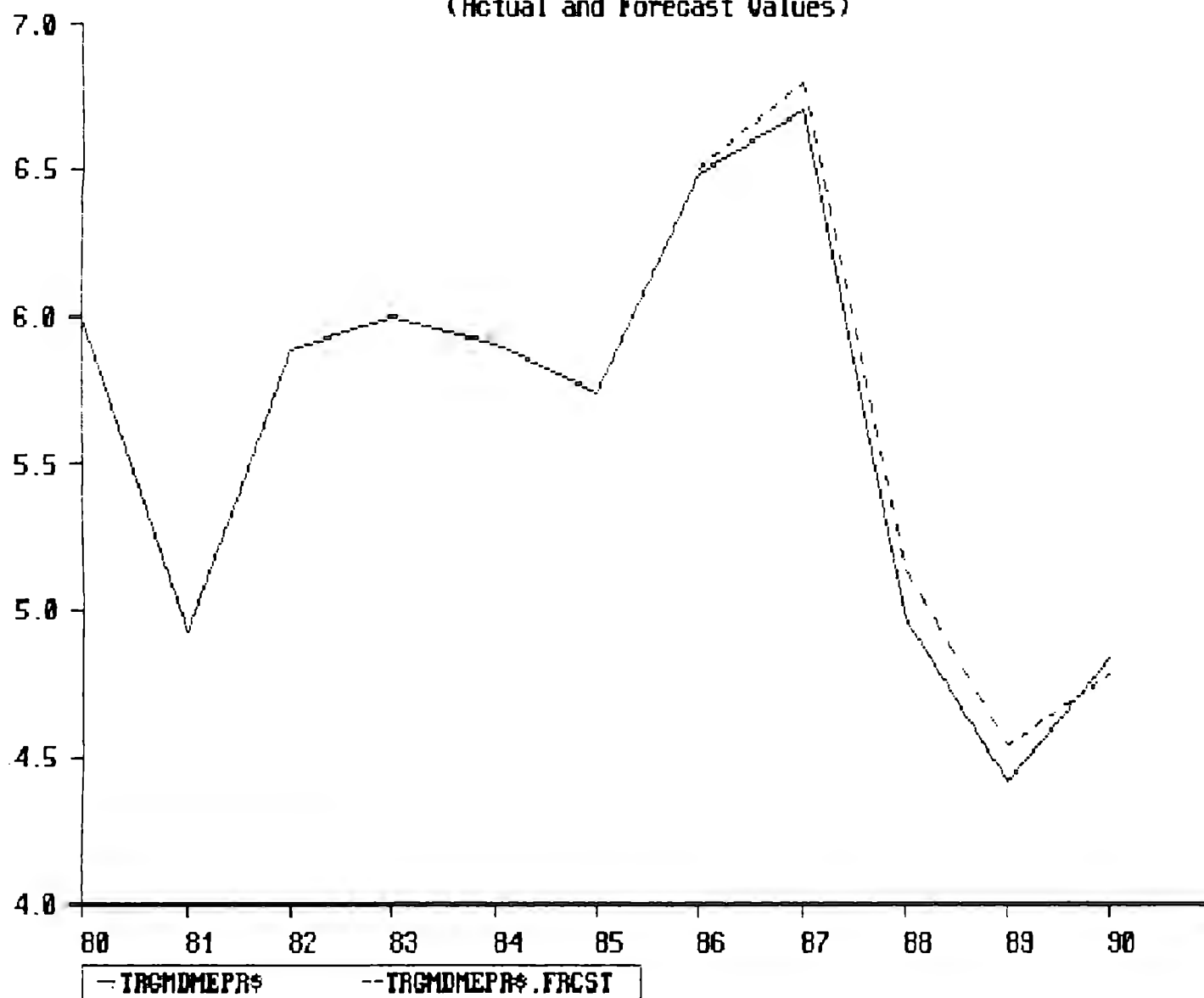
=> M_COMPARE A FRCST ICVTMEX78VP;

	ICVTMEX78VP.A	ICVTMEX78VP.F RCST	Difference	% Difference
1986	83.293	90.763	7.470	8.969
1987	139.919	139.183	-0.736	-0.526
1988	118.043	120.422	2.379	2.016
1989	21.928	20.432	-1.496	-6.822
1990	23.756	28.308	4.552	19.164

TOURISM COST OF LIVING INDEX IN MEXICO - PERCENT CHANGES
(Actual and Forecast Values)

— ICVTMEX78VP   --ICVTMEX78VP.FRCST

102
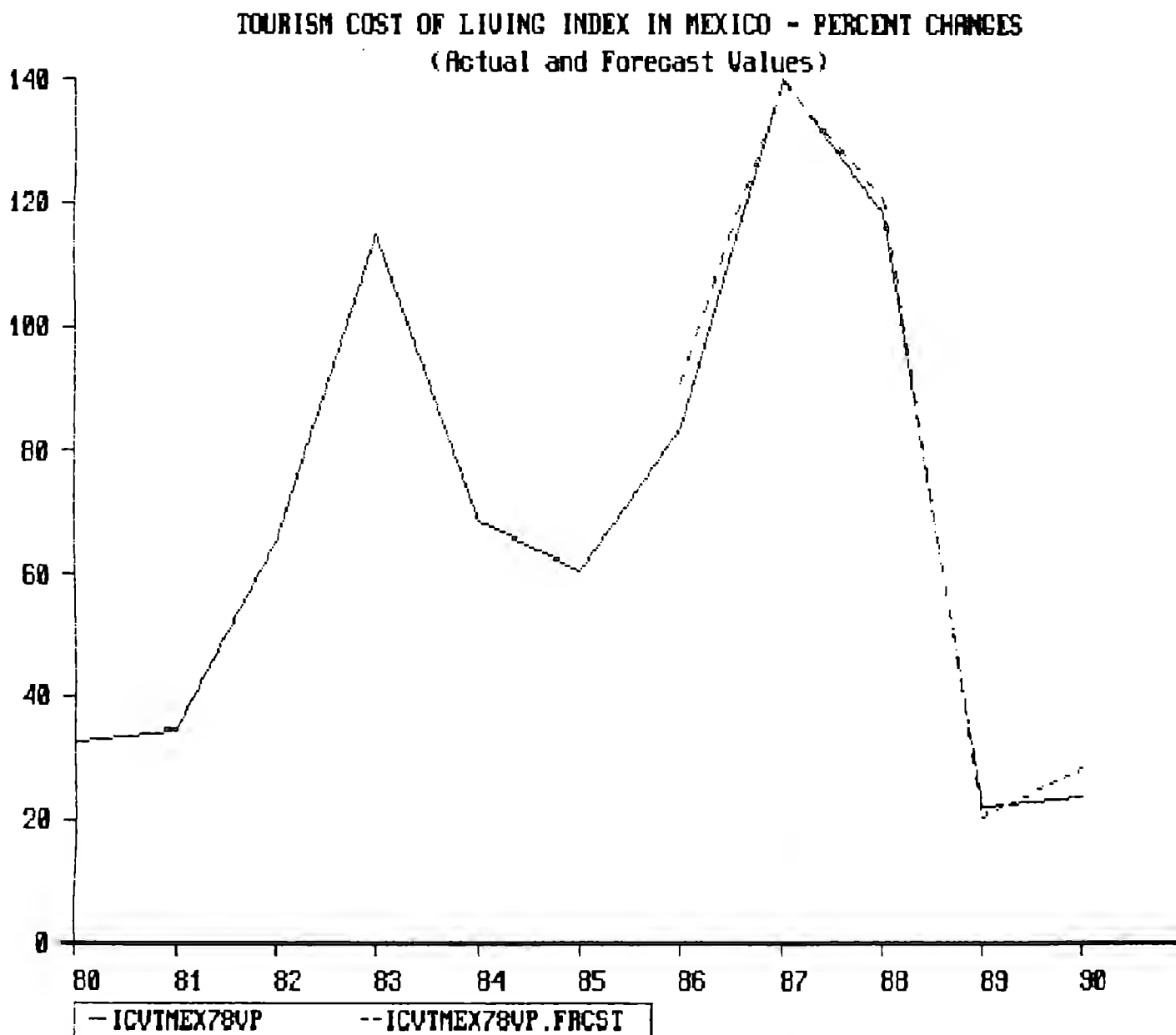
```
=>   M_COMPARE A FRCST ICVTMEX78;
```

	ICVTMEX78.A	ICVTMEX78.FRCST	Difference	% Difference
1986	3689.500	3839.870	150.370	4.076
1987	8851.800	9184.308	332.508	3.756
1988	19300.734	20244.264	943.529	4.889
1989	23533.066	24380.652	847.586	3.602
1990	29123.500	31282.359	2158.859	7.413

TOURISM COST OF LIVING INDEX IN MEXICO
(Actual and Forecast Values)

Legend: — ICVTMEX78   -- ICVTMEX78.FRCST
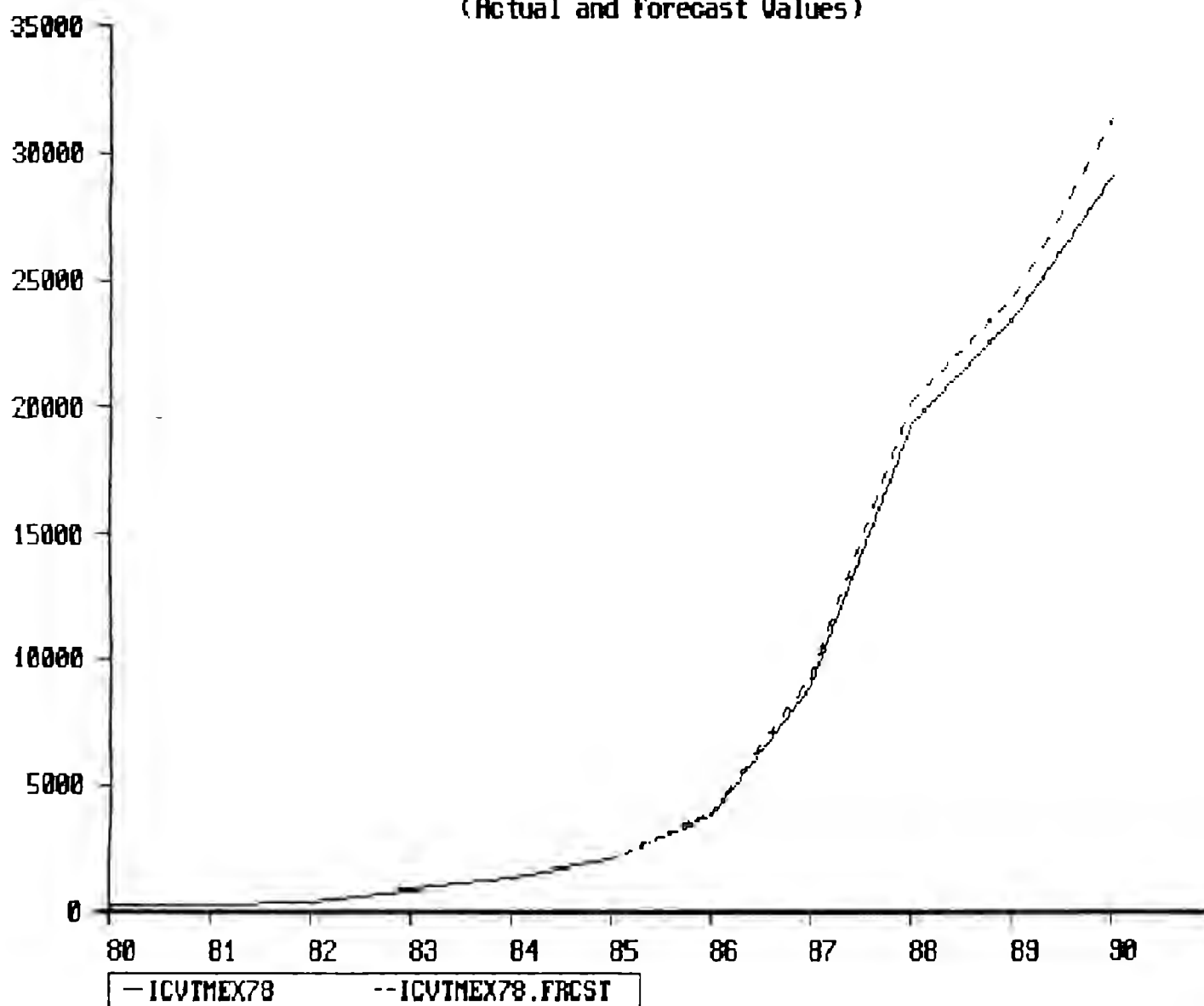
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