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THE ECONOMICS OF PEDDLING

Stuart Plattner

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Introduction

This paper analyzes itinerant peddling in an underdeveloped environment. A general model of the role of peddling in the development of a region is presented first, then some constraints affecting the business of peddling in a particular socioeconomic environment are investigated; and finally a sample set of 47 trading trips taken in a rural region of Southern Mexico is analyzed as an example of income production in an underdeveloped competitive market environment. The analysis describes the sorts of things peddlers use as factors of income production, isolates the effect each factor has on the net income, and evaluates peddling as a means of making a living in an underdeveloped region with specific cultural and economic characteristics. The focus of the study is analytic and descriptive within the domain of economic anthropology.

The model I will present is a general one, but my examples will be drawn from southern Mexico, where I did 20 months of fieldwork in a community of itinerant Ladino peddlers.¹ The peddlers lived in the city of San Cristobal las Casas, Chiapas, and sold goods to hinterland Indian subsistence farmers. Ladinos are commercially and politically dominant in the area since they control most of the valuable resources, while Indians are primarily small-scale subsistence oriented farmers (cf Cancian, 1965; Siverts, 1969; Vogt, 1969). Indians speak Mayan as their first language, in contrast to Ladinos who speak Spanish; Indians

live in rural areas while Ladinos tend to live in urban places; and Indians have "Indian" life-styles, which in Chiapas includes such symbols as wearing regionally differentiated clothing, wearing sandals instead of shoes, and living in "Indian-style" rather than "Ladino-style" houses. The overall economic and political situation in the region is changing rapidly as the area develops (cf Cancian, 1969), so that in particular details the analysis will be relevant to the situation as it existed up to 1966-1968. During this time there were no all-weather roads into the trade hinterland used by the peddlers, and they used mules and horses to transport merchandise to small towns and hamlets in the rugged mountains. They set up temporary stores in borrowed rooms in centrally located houses in each place, in addition to carrying large packs of merchandise on their backs from door to door among dispersed homesteads, allowing each customer to purchase goods in the privacy of his own home. Each peddler has a customary route, which he visited in a relatively fixed cycle of trips during the year. The trips varied from eight to over fifty days in duration, with the average lasting about one month. Since most hinterland Indians were monolingual Mayan speakers, all peddlers were fluent in at least one of the Mayan languages spoken in the area, in addition to their native Spanish.

The changes that are taking place derive from the intense program of road construction undertaken by the national government, the opening up of new employment opportunities in San Cristobal through the construction of new industries, and the ongoing demographic development, commercialization, and increasing inclusion into regional political

activities of the Indian communities. These changes are not dealt with here, and the "ethnographic present" will be used in reference to the previous situation.

A Model of Itinerant Peddling in a Developing Region

Itinerant peddlers are creatures of frontiers, or boundaries between systems of different developmental status. They are usually located in the central manufacturing-distributing place of a region in a particular early stage of underdevelopment, before conditions allow the establishment of market places served by market traders or fixed stores, but after the situation has progressed to the point where the rural homesteads are no longer self-sufficient. Peddlers export manufactured goods, consisting mainly of cloth, clothing and hardware, from the central trading city to the agricultural hinterlands, and frequently import farm goods to the city on their return trips. They arbitrage, by buying things in one sector of the market (using the term "market" to refer to the entire region) at low prices and selling them in another sector at higher prices.² In bringing a selected assortment of goods to their customers' homes they also significantly increase the real value of the goods to the consumers. Because of this I think of them as producers, and not different in the abstract from the person who combines factors to produce a physico-chemically altered product, such as craftsmen or farmers.

The demand for the peddlers' services will be considered first. They will be used as sources of supply by farm consumers when the total cost of the peddlers' goods, personalized and delivered to the consumer's

door, is less than the total cost of the same goods purchased by the consumer through other available channels. The real cost of the merchandise to the consumer must include the actual price, including the cost of credit if provided; the transport costs of the consumer's trip to and from an alternate source of supply; and the value of his time lost from other productive activities. In general, peddlers should be preferred by consumers when alternative sources of supply do not exist nearby; when travel and transportation are expensive for the consumer; when other needs, for legal, religious, or economic services, do not impell him to travel to the central source of supply anyway; and perhaps in many cases in underdeveloped areas, when the central place is also an alien, dominant ethnic community where the probability is high that the rural visitor will experience some personal unpleasantness.

The supply of peddling services is a function of the attractiveness of peddling as an occupation for townspeople. Peddling will be preferred when the income available from peddling is larger than the income available from other viable, meaning culturally acceptable, occupations. Peddling will be more attractive when the rural population is dense, highly commercialized, and easily accessible than when it is sparse, self-sufficient, and inaccessible. The "threshold income" for peddling, below which few people will enter the occupation, will rise when alternative sources of income in town become more attractive or available; conversely it will be low in the absence of acceptable alternative occupations. The structure of socialization is relevant in creating barriers to entry into any particular occupation,

insofar as occupations are frequently learned as part of the general process of enculturation rather than as specific goal-oriented activity. If one does not happen to be born into, or have close relatives in, the community with a certain occupational specialty the chances of entry into that occupation are slim. Restrictions upon the entry into various occupations can increase or decrease the attractiveness of the occupation, depending upon other market conditions. There are thus two ways to discuss the prevalence of peddling in a region: through the economic and cultural geography of the rural areas (the demand side), and the economic sociology of the urban center (the supply side).

Figure 1 is a model of the features of a rural hinterland and a central city which are of interest to a peddler. The figure is an abstract representation of a regional landscape surrounding a central city, with variations in shading representing density of population and degree of commercialization. The city is at the center of area A, where population density and commercialization are highest. The demand for purchased goods of all types is highest in this area, and correspondingly market places, fixed stores, and the most developed transportation systems exist here. Thus farmers can purchase their needs in the city or at nearby markets, and will have no reason, on the average, to deal with peddlers. Of course any particular peddler may monopolize the possession of a particular good or service, in which case area A residents will have no choice but to deal with him. Similarly commerce may be so developed here that specialists in the purchase of particular farm commodities such as eggs and poultry may exist. These specialists may look like peddlers, and indeed I believe that they are adaptations of the occupation of peddling to changing environmental

conditions; but they are more specialized in function than itinerant peddlers. They are restricted to buying one commodity, and are rarely able to sell merchandise to their farmer suppliers since they can't compete with fixed stores.

A few itinerant peddlers may also be able to function profitably in this area by shifting the emphasis of their trade from the supply of merchandise to the supply of credit. Some farmers will always exist who cannot obtain credit at other sources of merchandise, and a peddler may eke out a living by providing personal credit to a smaller number of such customers. Peddlers such as these, who should really be called installment sellers, also exist in slums in urban areas, and can probably still be found in any large North American city as well. In general, however, type A areas cannot be a major source of income for a large group of peddlers. In the Chiapas highlands the municipalities of Zinacantan, Chamula, Oxchux, and other townships surrounding San Cristobal las Casas represent this area.

Area B is the zone of greatest economic opportunity for peddlers. Population density, commercialization, and transport expense are at sufficient levels to allow a reasonable income from potential daily sales, since distance from the city and transportation expense make it unlikely that the farmers will make the trip themselves. The boundary between areas of types A and B is determined by the threshold level of demand for periodic markets or fixed stores. When demand per unit area reaches this level, fixed stalls are established, often by the same individuals who were peddlers previously, since they have a competitive advantage in knowledge of city supply sources and knowledge of rural

demand. This zone is represented in Chiapas by Ocosingo, Bachajon, Guaquitepec, Simojovel, and other Indian municipalities about 20 miles or more from San Cristobal.

Areas of type C are zones where demand per unit area is too weak to provide an income for peddlers. Population density is too low, household self-sufficiency too complete, and transport from the central place too expensive to make daily sales adequate to yield an adequate income. In Chiapas, this area is typified by the primitive (i.e., tribal) Lacandon region of the Usumacinta rain forest, near the Guatemalan border.

The main push to development in this model is the simultaneous growth of population, commercialization, and transportation. While in the long run it may be attractive to see population as the independent variable causing the latter two to change (cf Boserup, 1965), in any particular location it is easy to conceive of the latter facilitating change in the former (i.e., new roads inducing population shifts by allowing access to previously closed areas of settlement).

As population grows in the central zones, pressure for land increases in areas of type B, and farm families and even whole communities will migrate outward in search of living space. With a lowering in the cost of transportation, the zone of viable peddling will shift also. As the outside border of type B areas expands, however, the inside border (between areas B and A) shifts outward as well, in response to the establishment of new stores and markets. Thus the total area exploitable by peddlers may not grow at all, in fact it is likely to shrink. This is so because individual peddlers will be the agents of

the demise of peddling, as, predicting the future and making use of the new economic conditions, they drop out of peddling to establish fixed stores. They then are able to successfully compete with other peddlers who were not able to change.

This procession of economic zones across the landscape is occurring in Chiapas. Peddlers now (beginning about 1970) put their merchandise on trucks to traverse newly-built roads to central points in the hinterlands, where they load their goods onto mules and travel to previously unexploited areas. There they sell to recent immigrants from peasant areas who have driven the tribalists out.

The Local Socio-economic Environment of Peddling

The individuals living in the central places can be looked upon as decision-makers trying to do as best as they can in earning incomes to support themselves and their families, and facing particular sets of environmental constraints and possibilities. The previous section has illustrated some of the long-term, regional parameters affecting the prevalence of peddling as an occupational niche in the local economic system. In this section the immediate environment of the peddlers will be analyzed with respect to causes of the attractiveness of peddling as an occupation. The discussion is organized around the notion of access to valuable resources, the important resources being skills, or long-term knowledge of people, places, and techniques which can affect one's income; short-term knowledge, or information about immediate variations in supply and demand; and access to supplies and other "hard goods" necessary to the production of an income. These concepts can be used to define the structure of the market as inequalities in access

to these factors of income-production faced by different sociological groups and categories.

There are three underlying features affecting the supply market for peddlers in the region: ethnic (Indian-Ladino) stratification, demographic (rural-urban) discrimination, and local-community occupational specialization. The ethnic stratification in Chiapas benefits Ladino traders at the expense of the Indians (Colby, 1966; Siverts, 1969). Stratification prevents Indians from competing with Ladinos in peddling, because Indians are at a competitive disadvantage in obtaining merchandize on credit from city stores. All local traders depend on credit for survival in business, and loss of credit is more disastrous to a peddler than loss of his mules would be. Storeowners are happy to sell any amount of merchandize for cash to Indians, and many would undoubtedly set up credit relations with particular well-known and trusted Indians, but the average Indian cannot gain the friendship of a Ladino storeowner as easily as an average Ladino. Credit in agrarian societies is a personalized interaction, as Ward (1960) and Mintz (1961) have pointed out, and so by being disadvantaged personally Indians are discriminated against economically.

Part of the difficulties Indians face in entering large-scale trade in hinterland areas has nothing to do with ethnicity, however. Indians are rural people, but trade goods are urban resources. Any rural person would be disadvantaged, with respect to an urban person, in obtaining access to urban resources. So in addition to ethnic (Indian-Ladino) discrimination, demographic (rural-urban discrimination contributes to limit the entry of Indians into peddling by restricting their access to the necessary goods and knowledge.

Free entry into peddling does not really exist even among urban Ladinos. San Cristobal is composed of several named, relatively endogamous, occupationally specialized neighborhoods (barrios), which function in a caste-like fashion with respect to occupations. The peddlers live in the barrio of Cuxtitali, which had about 1200 inhabitants in 1967 and is noted for long-distance itinerant trading and for the import, slaughter, and market sale of pigs and pork products. Some examples of other neighborhood specialties are weaving, in the barrio of Mexicanos, and pottery-making, in the barrio of San Ramon. This occupational specialization by neighborhood means that one learns a trade as part of the general process of socialization, and not as a specific act of learning. Thus, each neighborhood absorbs the expense of training new producers at the cost of some lowering of general productivity. This lessened productivity comes about because some Cuxtitaleros may have the potential to be excellent weavers, but may be absolutely dismal failures at peddling. If an individual has no relatives in another barrio with whom he can live and apprentice himself, his chances of learning a trade different than that of his native barrio are slim. The only opportunity open to all traders, weavers, potters, carpenters, and others who are failures at their "native" trade is unskilled wage labor. Thus, even within the confines of San Cristobal the Cuxtitali peddlers have a relative monopoly on trade, and this restriction on the free entry of labor into peddling (through restricted access to training) may work to the peddlers' advantage.

Neighborhood specialization with Cuxtitali has another consequence for the conduct of peddling. The main product of the neighboring weaving barrio of Mexicanos is a heavy dark-blue cotton cloth known

as nagua, used by most Indian women in the region as a basic skirt cloth. Mexicanos is the only source of nagua in the region for the many Indian communities who no longer weave their own, and the cloth is acknowledged by peddlers as the basis of their trade. This means that most peddlers carry it, as it is the first thing their customers expect to see. A peddler who had no nagua would have small chances of interesting customers in the rest of his pack. Since the Cuxtitali peddlers live in the same town as the weavers of nagua, they have better access to the cloth than traders from other towns. Their advantage is due to the general backwardness of the regional economic system, in that communications and other institutional back-ups to commerce are undeveloped enough to insure a strong competitive advantage to someone living in the same local area as any particular producer.

An important aspect of the environment of trade which is to the peddler's advantage is the conditions under which retail sales occur. Each sale is bargained over in the well known haggling style or agrarian trade, of course. But rural customers have the luxury of being able to do their shopping within their own homes, which proves to be an expensive benefit when compared with the advantages of marketplace shopping for the consumer. The peddler's customer does not see many similar transactions and compare many similar offers to sell before he makes up his mind about his own purchase. His knowledge of the current price for any commodity is limited. Thus, peddlers have the advantage in the bargaining process, in addition to the benefits of their superior knowledge of stocks and future supply trends. This explains, by the way, the strong tendency for peddlers to introduce new goods and act as cultural innovators for their customers. The possibilities for large

markups are greater the less familiar the merchandise to the customer. Traders are therefore always on the lookout for new sorts of merchandise to introduce to their customers, as the potential profits on new goods are higher than for goods whose value is well known.

Other aspects of the environment of trade are disadvantageous to the peddlers. The occupational specialization within San Cristobal may limit entry into peddling from other barrios, but it also limits exit out of peddling from Cuxtitali. Many peddlers could be inept at peddling, but remain in trade because even the low income they receive from peddling could be higher than the local wages for unskilled wage labor (during 1967, 8 Pesos per day, or \$.64 US were considered fairly good wages).³ If many people within Cuxtitali remain in peddling when they would prefer to be in another trade, then competition within the barrio would be higher than otherwise, and incomes consequently lower.

In addition, the boundaries of social systems are rarely perfectly closed, and some slippage of people across specialty lines takes place in San Cristobal. There is a weaver, a fire-works maker, a few carpenters, and other specialists in Cuxtitali, and there are a few peddlers living in other barrios of the city. Rural traders also come from other towns in Chiapas, although they mostly deal in cattle and pigs and rarely in merchandise. In the long run there is always the possibility that labor does flow into and out of "restricted" occupations, in response to changing economic conditions. If this is so, then in periods of good sale conditions the Cuxtitali peddlers would face more competitive pressures and would have lower incomes as a result, other things being equal.

The demand for the goods that the peddlers sell is also relevant. If the Indians can "tighten their belts" and make do with what they have

during seasons of low income, then the peddlers' other advantages would count for less, since their sales would be very sensitive to variations in their customers' incomes. Alternatively, it is conceivable that the peddlers' goods are so necessary to the Indians that they buy relatively fixed amounts even when their incomes are very low. It is likely that the Indians' demand is income-elastic, the technical term which describes the former case. During periods of low income the Indians patch and repatch their clothes and the peddlers complain about reduced sales. The demand for clothing is seasonal, since the Indians restrict their purchases during the summer, pre-harvest months when food and cash are very scarce. One peddler reported his customer responding plaintively as he declined to buy some goods: "Senor, yo quisiera, me duele el alma, pero tengo la paga para el maiz, y no tengo la paga para la ropa" (Sir, I would like to, my soul hurts [at my inability to buy clothing], but I have the cash for corn and I don't have the cash for clothing).⁴ I observed that more peddlers seemed to get sick and remain home during the summer than at other times of the year as well, although this could easily be more due to the general increase in disease during the summer rainy season, as well as to the increased difficulty of traveling along the muddy roads, than to the lack of demand.

In analyzing the peddlers' income, one may judge it to be "excessive," or "proper." An excessive income would be revealed by patterns of consumption among peddlers that were much higher than consumption among similar groups of Ladinos. This is certainly not the case, as the barrio of Cuxtitali is one of the poorer barrios in the city.

Most of the houses have no piped water, and many have dirt floors. The average peddler's family probably eats meat or eggs no more than three times a week.

The average annual income of the sample of peddlers is about 10,300 Pesos. For comparison, the lowest level of elementary school teacher in the area (with the equivalent of a high-school education) earns between 10,800 and 14,000 Pesos annually, in addition to the extremely valuable social services that civil employees in Mexico are entitled to. Thus, trading yields an income that is neither excessively low nor excessively high. How can this income be understood or evaluated? I suggest that the theoretical framework of production function analysis is an appropriate means of analysis. The production function, meaning the completely specified relation between the set of inputs and the output, yields the values of the marginal products of the factors of production.⁵ The marginal product denotes the addition to the total product created by the addition of one more unit of the factor, other factors remaining constant. Each factor also has an opportunity cost, meaning the amount that it could have earned in an alternative use. If the marginal products of the factors used in trading are much larger than their opportunity costs, it would indicate that the peddlers are enjoying "profits" which derive from market imperfections, or restricted possession by them of valuable means of making an income. If the marginal products are similar to the alternative incomes the factors could earn, that would be strong evidence that the peddlers were efficient managers of their resources in a competitive setting.

The answer cannot be known deductively, or by subjective empirical evidence, but is best discovered through a statistical analysis.

A Model of Peddling as Income Production

Trading will be viewed as a systematic relation between a set of inputs possessed by each peddler, such as quantities of capital, cargo animals, merchandise, labor, various forms of entrepreneurial ability, and an output, consisting of the peddler's net income. One aspect of a peddler's knowledge is his familiarity with a specific route, which is best understood as a group of communities in a more or less naturally bounded area like a valley or a group of valleys. Each route has a total demand for the peddler's goods associated with it. This demand is presumed to set the periodicity of the peddler's trips. At his entrance into his selling area, usually after a two-day walk through intervening Indian communities who trade in San Cristobal, the demand is at its peak. After he passes through each community selling goods, the demand is satiated. The desire to buy the peddler's goods, as well as the ability to pay for them, is presumed to have a scalloped profile, slowly rising after a trip, but falling when the peddler arrives and people buy what they want. When the demand in the entire route is satiated, the peddler returns home to prepare for another trip. If he were an excellent manager, he would have planned his assortment of merchandise to correspond to the demand perfectly, so that the last day of the trip would see him selling the last items of merchandise in his pack. This never happens, for no peddlers are such perfect managers. Each customarily has an imperfect assortment of goods left at the end of his trip, which he stores in the selling area in order to sell on his next trip.

Each input is a factor of production, and has an elasticity of production associatable with it. The elasticity is the effect of a change in the quantity of the input, holding other inputs constant, on the output. An elasticity of .5 means that a 10 percent increase in the factor would increase the product by five percent.⁶

The elasticity of each factor is related to its marginal product, meaning the increase in the product caused by the addition of the last unit of that factor. Under optimal conditions producers would use each factor to the point where the marginal product was equal to that factor's cost.⁷

The production function is the statistical relation of the output to the set of inputs. It is the formal, or (in theory) completely specified, theoretical model of the production process. In general, the phrase "production function" implies that the variations in the quantities of output are deterministically related to variations in the quantities of inputs. The "function" refers to the form of the relationship, or the mathematical representation of the largest amount of output that can be produced with all possible combinations of a given set of inputs. As such it could also be called the set of "efficient production possibilities" (Walters, 1970: 272).

The general form of the production function is usually written as:

$$Q = f(X_1, X_2, \dots, X_n)$$

Where Q is the quantity of output, and each X is the quantity of labor, capital, or any other relevant input. The most popular form of function which satisfies the necessary conditions has been called the Cobb-Douglas function, since it was first proposed by the mathematician C.W. Cobb and the economist P.H. Douglas (1928). This is written as

$$Q = A x_1^a x_2^b \dots x_n^y, \quad A > 0, Q \geq 0, x \geq 0$$

where, as before, Q is the product and the X 's are the inputs. When transformed into logarithms this function has the attractive property of becoming linear:

$$\log Q = \log A + a \log x_1 + b \log x_2 + \dots + y \log x_n$$

This describes a linear relationship of the (logarithmically transformed) variables with a slope of 'a' on the (for example) labor axis, a slope of 'b' on the (for example) capital axis, 'y' on the axis of whatever input x_n measures, and an intercept of A .

The specific properties of the Cobb-Douglas function are mentioned in many econometrics texts.⁸ There are many problems with the function, including dangers of incomplete or incorrect specification of key variables; severe intercorrelation of variables; and the need to assume perfect competition in the interpretation of the model. But the Cobb-Douglas has been the most frequently used form of the production function in empirical research. Its specific attractive properties are that marginal productivity is defined as decreasing with the level of input; the immediate interpretation of the production elasticities and returns to scale; and the ease of computation. The general benefits in the present case derive from the exercise of seeing whether the data conform to a single functional form or not; from the ability to generate a marginal product at all (since most functional relations in ethnography are of the all-or-none variety); and from the procedure of formalizing variables and grappling with the statistical results. As Yotopoulos concludes, ". . . as long as we keep the drawbacks of this functional form clearly in mind, we can always exercise the necessary caution in interpreting its results." (1967: 55).

The Factors of Income-Production in Trading

Each trader will be looked upon as possessing, in varying degree, the different sorts of inputs or resources which he manipulates to produce his net income. Some of the inputs are purchasable on the market, like mules, merchandise, the labor of hired helpers, and food, feed licenses, and other necessities purchased while on trips. Other inputs are possessed by virtue of being enculturated in Cuxtitali, such as familiarity with all the nebulous or specific techniques of peddling, knowledge of specific communities and trails in the trading areas, and knowledge of Indian languages. Still other inputs are possessed by idiosyncratic characteristics of personality and intelligence, such as the ability to out-bargain merchandise sellers as well as buyers, the ability to care for animals and to manage one's time and money well, the skill in choosing items of merchandise that will sell quickly, and all of the other indistinct qualities that make up "salesmanship" or "entrepreneurial ability." For purposes of description, the inputs can be grouped under the two main headings of capital and labor:

Capital

1. One form in which peddlers use capital is in cash used to pay operating expenses while on each trip. Expenses represent the costs of the peddlers and their helpers; feed for their pack animals; wages of hired helpers;⁹ and in-pocket amounts of cash to pay taxes or buy farm produce before merchandise sales provide cash. The large standard deviations for the average amounts of capital used (in appendix 1) should be noted as they indicate the scope of the individual variation in the conduct of the trips.

2. Another form in which capital is used is in cargo animals used to transport merchandise along trails into the selling areas. The average peddler possesses about three animals, usually mules who are preferred to horses for their surefootedness and durability. The average purchase price of an animal and gear, corrected for inflation, is 1370 Pesos. This figure derives from a sample of eleven peddlers who were intensively interviewed about their ownership of cargo animals. The average cost, including lineal depreciation of animals, gear, and the value of pasturage, is 400 Pesos per mule per year. Pack animals carry an average of 1250 Pesos worth of merchandise.

3. The last form of capital is the stock of merchandise taken on the trip. This consists of cloth of all sorts, factory and local cottage-industry produced clothing, groceries, candy, notions, and trinkets. The merchandise is invariably obtained on credit. The custom is for each trader to spread his debt over three or four stores, which charge about ten percent of the cost as interest. The interest is in the form of a markup on the purchase price, and does not increase with the duration of the loan.

The cost of capital for peddlers can be estimated at 60% per year, or five percent per month on the original amount of the loan. This is the most common interest rate for small, private loans (i.e., obtained from a money-lender rather than from a bank). I do not believe that this cost is an accurate measure of the opportunity cost of the peddler's own capital, since it is unlikely that the average peddler could obtain five percent a month on the loan of his own money. Money-lending in an underdeveloped area is not something anyone can do, since the legal

backup in case of default is not easily obtained. All the moneylenders I knew personally were either rich and powerful in their communities, so that they could apply strong sanctions if necessary; or else they were ferocious in appearance, and gave the strong impression that they commanded ample physical sanctions. It is more likely that the true interest rate that would be generally obtainable for the average peddler is three percent a month, or about 36% a year.

Labor

Labor will refer to the entrepreneur's behavior, as the services of hired helpers were included with the other things paid for separately on each trip. The peddler-entrepreneur's labor can be separated into labor-time, referring to the number of days per trip, or per year, that each peddler spends in the practice of his occupation; and labor-quality, which refers to the managerial ability of the peddler in using his resources to create a net income.

1. Labor-time can be estimated by the trip or by the year, as most peddlers work full-time in preparing for, conducting, and terminating their trips. Trip lengths vary due to conditions of demand in the selling area, number of cargo animals possessed, and availability of capital. Each peddler has a customary trip length, which averages 27.5 ($s=12$) days for the sample (with a minimum of 8 and a maximum of 58). When the necessary time to prepare and terminate each trip is added to the customary trip length, the "entrepreneurial labor-time" can be calculated. This averages 33 ($s=13$) days for the sample. On the average 9 trips are taken per year ($s=4.7$), with a minimum of 4 and a maximum of 23 for any one peddler.

The opportunity cost of the peddlers' labor-time is about 8 Pesos per day, which is the average wage in San Cristobal for unskilled day labor. If a laborer could obtain 300 days of work per year, he would earn 2,400 Pesos, which thus represents the annual opportunity cost of the peddlers' labor.

2. Managerial ability is a complex variable. Knowledge of different routes is important, as there are three main regions where trade is conducted, each having different economic, cultural, and geographic qualities. In the last resort, the absence of roads makes it imperative that each peddler know just which of the maze of small trails he encounters leads to a settlement, in order not to waste his time wandering around fields. Since there are no hotels, knowledge as an economic quantity includes those contacts with people who will give the peddler a place to sleep.

Another important aspect of ability is whether the peddler engages in the pig trade. This is usually not a casual undertaking, as the labor involved in buying and transporting pigs is huge. Whether the peddler buys pigs affects his conduct in merchandise sales also, since pig buyers, needing cash to purchase pigs with, are less likely to sell merchandise for credit. Thus their average markups tend to be lower than peddlers who do not buy pigs.

Many other personal attributes affect an individual peddler's success in trade. The ability to purchase merchandise more cheaply; to out-bargain customers and sell cheap goods at expensive prices, while making them believe that they are buying expensive goods at cheap prices; and the ability to create loyalty in customers are some obvious

examples. The markup on the total stock of merchandise, defined as the difference between the buying cost and the selling price, expressed as a percent of the buying cost, will be used as a proxy measure of all of the separate yet related aspects of entrepreneurial ability which are not measured by the route and the style (pig or non-pig) of the peddler.¹⁰

Including a variable which explicitly measures entrepreneurial ability solves the common problem with production function analysis of missing management variables, with the attendant problems of heteroscedasticity and difficulties in the interpretation of returns to scale (Yotopoulos, 1967: 177). However, it should be clear that ability is a different sort of variable than mules, merchandise, labor and cash capital. Each peddler is assumed to be capable of varying his investment of mules (he can buy or sell a mule), merchandise (he can buy more or less merchandise), and cash (he can spend more or less). But we assume here that each peddler is using all of the ability that he has. Ability is thus a fixed factor with respect to each entrepreneur (although it can be seen as variable from the point of view of the community of peddlers). The significance of this point will be discussed later.

It is possible that difference in markup are determined by areal differences in demand. This possibility is checked for in Table I, where it is clear that the differences in average markup of merchandise stocks between different routes are not significant.

Analyzing the Economic Product of Trade

The relation between income and the productive inputs can be expressed as follows:

$$\text{Income} = f(\text{Capital, Labor, Ability})$$

But there is a problem here with the specification of labor. I have no information about individual laziness or proclivity to hard work, and so labor-time must be held constant. The variation in length-of-trip is assumed to be an economic strategy in response to variations in demand, capital, and other factors. Thus the annual input of labor-time will be held constant, and therefore will not contribute to the explanation of the variation in income. This is consistent with my ethnographic feeling that all peddlers work "hard," in that they rest little. The function thus becomes:

$$\text{Annual Income} = f(\text{capital, ability})$$

These variables are complex and are specified as:

$$I = f(C1, C2, C3, E1, E2), \text{ where}$$

I refers to Annual Net Income, defined as total sales - Total Costs.*

C1 refers to Number of Cargo Animals, as proxy for invested capital.

C2 " " Value of Merchandise, as measure of (mainly) borrowed operation capital.

C3 " " Trip Costs, including hired labor, food, animal feed, as measure of flow of cashing operating capital.

E1 " " Entrepreneurial ability, measured by the average mark-up on the total stock of goods.

E2 " " Entrepreneurial quality, as measure of ability to deal in pig trade. This quality is measured as a nominal (or "dummy") variable, taking the value of 1 for compound peddlers and 0 for simple peddlers.

* " " the precise calculation of the variables given in the notes to Appendix 1.

If A is the constant, the relation can be written in the Cobb-Douglas form as:

$$I = A C_1^{b_1} C_2^{b_2} C_3^{b_3} E_1^{b_4} E_2^{b_5}$$

Or, in words,

$$\text{Annual Income} = A (\text{Mules}^{b_1} \text{Merchandise}^{b_2} \text{Costs}^{b_3} \text{Markup}^{b_4} \text{Style}^{b_5})$$

This is a nonlinear function, with decreasing marginal products, as was mentioned above. It can be estimated by least-squares regression by transforming it into the linear function (denoting the natural logarithm of X as $\ln X$):

$$\ln I = A + b_1 (\ln C_1) + b_2 (\ln C_2) + b_3 (\ln C_3) + b_4 (\ln E_1) + b_5 (E_2 \text{dummy})$$

Or, in words,

$$\ln \text{Income} = A + b_1 (\ln \text{Mules}) + b_2 (\ln \text{Merchandise}) + b_3 (\ln \text{Costs}) + b_4 (\ln \text{Markup}) + b_5 (\text{Style})$$

The nominal, or "dummy" variable is not transformed into logarithms, since it is measured by zero's and one's.

The coefficients of the function (the "b's") can be directly interpreted as elasticities of production. Thus b_1 measures the elasticity of production of mules, with respect to income. A one percent change in the input of mules, holding the other variables constant, will change income by b_1 percent. If all of the elasticities of production sum to one, then the function is characterized by constant returns to scale. Given perfect competition, all firms in the long run would produce in that region of their production functions characterized by constant returns to scale, since nothing would be gained by increasing or decreasing their size.

The marginal products of the inputs in the function are

$$\text{Marginal Product } X_i = b_i \frac{Q}{X_i}$$

or, as the average product of input X_i multiplied by the elasticity of production of input X_i . All marginal products are calculated at the arithmetic mean of the logarithmic values of the variables, which is equivalent to the geometric mean of the (unlogged) variables. The estimated coefficients with the geometric mean values of the variables and the calculated marginal products are given in Table II. The second set of figures (denoted R2) is for a regression run with annual income respecified by deducting, from each case, a 5% risk premium and a \$400 cost and depreciation figure for each mule. The respecification resulted in a poorer "fit" of the function with the data, as measured by the values of R^2 , the correlation coefficient, and F, the ratio of the "explained" and "unexplained" sums of squared deviations from the mean (cf Blalock, 1960: 304; Walters, 1968: 49). A third regression (R3) was run with the original specification of Income (without deducting implicit costs) without the variable for cargo animals. The values of the coefficients are essentially similar to R1. The following discussion will refer to R1 and R3 interchangeably.

The high R^2 values indicate that the regressions fit the data well. The standard errors are small, and the fit is significant at more than the .001 probability level. The table of correlation coefficients shows little evidence of multicollinearity. All coefficients are significantly different than zero except for mules in R1 and costs in R2.

Discussion

The marginal products of capital spent on merchandise and capital spent on cash costs are substantially similar, being statistically different

at the .05 but not the .01 probability level. This is interpretable as indicating that traders are allocating their expenditures efficiently between costs and merchandise. If the marginal product of capital were significantly different in one input use than another, the traders could, insofar as they are able, shift capital from the less productive to the more productive input, and so increase their total income without increasing their inputs.

The fact that the coefficient for cargo animals is not significant means that variations in the number of mules, holding variations in merchandise, cash capital, ability, and style constant, do not affect variations in income. I interpret this as evidence that the causality between mules and income flows primarily through merchandise, meaning simply that the only reason peddlers take mules on their trips is to transport merchandise. Therefore merchandise "contains" the effect of mules, and after merchandise and the other variables have "explained" the variation in income, there is littler variation "left over" for mules to account for.

The coefficient of Markup, b4, is very large, indicating that a small change in Markup produces a large change in Income. But what does it take to produce a small change in Markup? It was argued above that Markup represents ability; peddlers who are able to obtain higher markups do so because of their possession of more ability. But the other traders, who are receiving lower markups, are assumed to be already using all of the ability they possess. Each peddler is assumed to adjust the scale of his business to the level of ability he possesses. It is not just a problem of hiring a more highly skilled assistant than

usual, who could go on a separate itinerary and sell goods independently; the assistant must have more entrepreneurial ability than his employer for the markup charged on the trip to increase. And such people are usually already in business for themselves.

To sum up, coefficient b_4 indicates that variations in ability are significantly related to income in a cross-sectional basis; it shows the relative importance of ability as compared with capital; and shows that, on the aggregate level, or in the long run, there are tremendous benefits associated with increases in ability; due to its being in scarce supply, in turn due to the socio-economic structure of the barriers in the city. But on the level of individual traders, or in the short run, it is not an elastic factor of production since it cannot be varied by the trader.

The variable factors, b_2 and b_3 (merchandise and cash capital), have meaningful elasticities of production which sum to one ($.865 + .161 = 1.026$ in R_1 ; $.819 + .142 = .961$ in R_3), indicating constant returns to scale with respect to these factors. This means that the traders could not achieve scale benefits by increasing or decreasing their level of use of those variables. Do they also use capital to the point where its marginal product equals its cost? The marginal product of capital used in trade is about .25. The opportunity cost of that capital was argued to be about .36, while the cost of obtaining more capital (in the form of loans) was said to be .60. By either measure of the cost capital, the traders are using "too much" (although the difference between the opportunity cost measure (.36) and the

observed return (.25) is small). It is clear that it would not pay traders to borrow money to invest in their business, and in fact they do not. They rationalize their non-utilization of this form of capital in terms of the extreme liquidity of capital, i.e., money in their pockets is easily spent; and they are afraid that borrowed money would thus be difficult to repay. However, the marginal analysis affords a better rationalization: it simply does not pay to use borrowed capital in trade.

The marginal product of entrepreneurial ability (as measured by the Markup variable), was not calculated because it would have been difficult to interpret from a short-run point of view. Even a long run viewpoint, without some notion of the cost ability, the marginal product is meaningless. Conceptually such ability has a cost, measurable in the obvious costs of people working for very low salaries in order to learn the trade; as well as the implicit costs to the community at large of diminished average productivity created by barriers to a free flow of labor-talent between occupations. But such long-run costs are impossible to measure in this case.¹¹

The zero elasticity of mules does not imply that the product of another mules would necessarily be zero. Traders can always take things like sweet rolls and candy, which are always disposable, but normally too cheap for their bulk to make them worthwhile in quantity. And it must be remembered that the analysis pertains to the "average" trader. Any individual trader could have serious need for another mule, or have so many mules that the last ones barely earn their subsistence.

Although the discussion to this point has been in terms of the average trader, the sample data contains enormous variation. Some traders are earning less than they could earn if they worked as wage laborers, but on the other hand trading has higher prestige associated with it than wage labor. It is assumed that this prestige has some equivalent in money, and within this equivalence individuals may prefer to remain traders even though it costs them some amount of Pesos foregone (similar to the case of academics in advanced countries who could earn higher salaries in industry, but prefer the prestige of academic positions). Trading also holds out the constant possibility of making a very high income, and an individual may be willing to sacrifice some portion of an assured, but relatively low income, for the small chance of achieving a very high income.

The high coefficient of markup, the proxy variable for entrepreneurial ability, can be interpreted in a regional framework. Skills and knowledge are economically valuable, and are learned in the normal process of enculturation in Cuxtitali. The community functions like a school, and does so efficiently because it is endogamous and occupationally specialized: in other words, it has a restricted subject to teach to a restricted audience. In a more developed society, such teaching would take place in a school which was publically supported (through taxes and/or tuition fees). Cuxtitali, as an "organic" entity, can be seen as receiving "payment" for its educational services in the form of increased incomes received by the average Cuxtitalero, which are increased over what they could earn in their alternative occupations precisely because of the additional value of their labor-time

due to their skills and knowledge. Thus endogamy and occupational specialization go together (as would a system of guilds and apprenticeships in exogamous communities) in providing economically valuable training with formal public support.

Conclusion

Findings from the statistical analysis include the fact that the sample data is representable by a single production function, meaning that trading in Cuxtitali is a systematic productive enterprise, and that all traders are really involved in the same sort of business. The demonstration that ability is an important variable validates the assumption that the structural limitations barring free entrance into trade, insofar as they create a scarcity of trading skills, will make those skills highly productive. And the finding that the marginal product of capital used in merchandise was similar to the product of capital used as cash is extremely meaningful, because it indicates that the peddlers allocate their variable resources efficiently. Thus the analysis shows that the peddlers enjoy the advantage of limited entry into trade, but must also adjust to an effective competition among those already trading.

Is the income from peddling excessive? Are the peddlers reaping monopolistic profits due to their advantages in securing the factors of production in peddling? Or are the hinterland farmers the unwitting recipients of cheap peddling services caused ultimately by the very low opportunity cost of the peddlers' labor? The relatively low level of living in the barrio, coupled with the evidence of efficiency

provided by the marginal products of capital, implies that the peddlers are not enjoying any tremendous monopolistic profits; while the size of their average incomes indicate that they certainly are earning more than their opportunity costs. But this answer is only tentative, since the marginal product of the peddlers' labor-time was impossible to estimate, and the cost of ability was impossible to calculate. For unless we know the true cost of the peddler's ability, we cannot fully evaluate the size of their incomes. If their ability is "cheap," then their present incomes may be "excessive;" but if their ability is expensive the income created by that ability may be just a normal return on its cost.

The difficulty in evaluating the propriety of the peddlers' income is an interesting academic problem that will be dealt with in a later paper. In the real world, however, it is clear that peddling is headed for economic extinction. The construction of new roads allows Indians to come directly to the city for their commerce, and also allows more heavily capitalized traders, with trucks, to reach these new consumer markets. The peddlers are at present making use of the new roads to retain their old function, as they truck merchandise to far-off rural centers and then put the goods on mules to walk into further hinterlands. This will be a short-lived expedient, however, as the road construction will soon permit trucks to reach almost all areas of sufficient population to support a large group of peddlers. A few of the peddlers have already settled down in rural central places and opened fixed shops; others, who had the capital, have attempted to buy small trucks and remain in long-distance trade; while others have

become wage laborers in San Cristobal's expanding industry. Thus it seems that the peddlers will evolve into more specialized economic niches at the same time that their ex-customers evolve into their own more specialized roles of commercial farmers and rural laborers.

APPENDIX 1

ARITHMETIC MEANS AND STANDARD DEVIATIONS OF VARIABLES USED IN THE ECONOMIC ANALYSIS*

a	b	c	d
Trip Length 27.5 (12.0)	Pack Animals 3.1 (1.7)	Cash ¹ 328 (843)	Cash Merchandise 1,272 (2,171)
e	f	g	h
Credit Merch. 3,375 (2,562)	Pigs-Produce 1,904 (3,033)	Animal Costs ² 89 (86)	Food Costs ³ 204 (161)
i	j	k	l
Wage Costs ⁴ 204 (214)	Merch. Sales ⁵ 6,212 (4,894)	Pigs-Prod. Sales 2,178 (3,293)	Average Markup 34.9% (14.7%)
m	n	o	p
Entrepreneur labor ⁶ 32.8 (13.0)	Net Return 1,342 (1,164)	Annual Trips ⁸ 9.4 (4.3)	Annual Value of Merchandise 35,937 (25,277)
q	r		
Annual Value of all Trip Costs ⁹ 8,037 (14,980)	Annual Value of Net Return 11,273 (9,400)		

* All variables are original observations made on single trips, except for m and o.

NOTES

1. Variable c refers to cash money taken along for the expenses of the first few trip days, before the trader began to sell, and also to cash taken to buy pigs with.
2. These trip costs pertain to animals and consist of feed costs and pasturage charges, horseshoes, and other mule-related costs.
3. These trip costs pertain to human subsistence and consist of food charges.

4. These trip costs consist of wages paid to hired helpers.
5. This figure is the total sales receipts, including cash and credit merchandise.
6. The formula used to calculate the entrepreneur's labor time is:
$$\text{labor} = \text{Trip length} + 3 + (\text{Merchandise}/2,000) + (\text{Pigs}/3,000).$$
7. The formula used to calculate the Net Return given here is (using the identifying letters of this table): $\text{Net Return} = (j + k) - (c + d + e + f + g + h + i).$
8. The formula used for calculating the number of annual trips is:
$$\text{Annual Trips} = 300/(\text{Labor} * 1.1).$$
9. This is the average of the annual total costs, including animal, food, and wage costs.

NOTES

1. Fieldwork in Chiapas, Mexico, was conducted from January 1967 to June, 1968 and from June through August, 1970, supported by PHS Research fellowship (5 F1 MH 301281), PHS Research (MH 13097) and by a grant-in-aid from the American Philosophical Society.

I would like to acknowledge the help I received in thinking through the analysis from Charles Lave. I also learned from Hugh Gladwin, Cristina Gladwin, William Jones, Paul Mandell, David Rutledge, Ken Shapiro, Carol Smith and Pan Yotopoulos. None of these people is responsible for any errors of fact or interpretation I may have made.

2. The sectors can be defined geographically, as for example the present case of urban-based peddlers selling to rural consumers; or defined culturally, as in the case of dominant Ladino traders and subordinate Indian customers.

3. The Peso is the national currency of Mexico, and is used here. Since Mexico uses the symbol "\$" to denote Pesos, it was omitted here to prevent confusion with dollars. The Mexican Peso is divided into 100 cents. The exchange rate is:

\$1.00 US = 12.50 Pesos

\$.08 = 1.00 Peso

4. While the income-elasticity of demand for clothing seems to be elastic on a seasonal cycle, it is likely that the price-elasticity of demand for the peddlers' goods is inelastic, especially during the majority of the year after the preharvest period. My reasons

for believing this are given below in the chapter about the simulation game PEDLAR, in the discussion of the shape of the demand curves.

5. Walters, 1968, provides a good introduction to the economic theory of production.
6. If the elasticities of production sum to less than one (termed decreasing returns to scale), a doubling of the inputs would increase production by less than a factor of two. Similarly, a halving of the inputs would decrease the product by less than two, so it would pay to decrease the scale. With increasing return to scale, increasing the total inputs would increase the product by a factor greater than one, and it would pay to increase scale.
7. It is worth noting that this prediction need not necessarily rest on an assumption of maximizing economic actors. The more efficient firms (or actors, or groups) will survive difficulties that would put less efficient competitors out of business. Thus a sort of natural selection will ensure the long run survival of the more efficient firms.
8. Johnston, 1963, is standard, but highly technical. Wonnacott and Wonnacott, 1970, is more elementary, but not very empirically oriented. The best treatments I have found are in Walters, 1970 and in Yotopoulos' research report (1967). The latter is particularly interesting as a description of a carefully detailed piece of empirical economic research.
9. Hired helpers are included as an aspect of capital rather than of labor in order to reserve the latter category for the more significant quantities and qualities of the entrepreneur-trader himself (i.e., each trader's labor-time and labor-quality).

10. Note that this formulation does not preclude the possibility that some peddlers have higher markups because they buy the merchandise for cash, and so receive discounts that credit-buyers do not get. This happens quite frequently, and the possession of cash is taken to be evidence of past successful trading. This is a common understanding in Cuxtitalli, where the answer to the question, "What makes one peddler better than another?" is the answer, "More money!"
11. A reader of an earlier version of this paper was concerned with the possibility that markup, the proxy variable for ability, could be determined in part by the dependent variable, income. Although I do not think this criticism is valid I have included information from a regression without markup here. The coefficients are:

Merchandise	Cash Costs	Style	R ²	F
.92	.05	.18	.45	12
(.17)	(.12)	(.21)		

The R² has decreased somewhat, as have the coefficients for cash capital and the dummy variable, style (See Table II for the original values). But the coefficient for merchandise capital is strikingly the same, and all of the variables entered the regression in ways similar to the original one (i.e., none of them are negative or were not able to be entered into the equation, and the relations between the coefficients are similar).

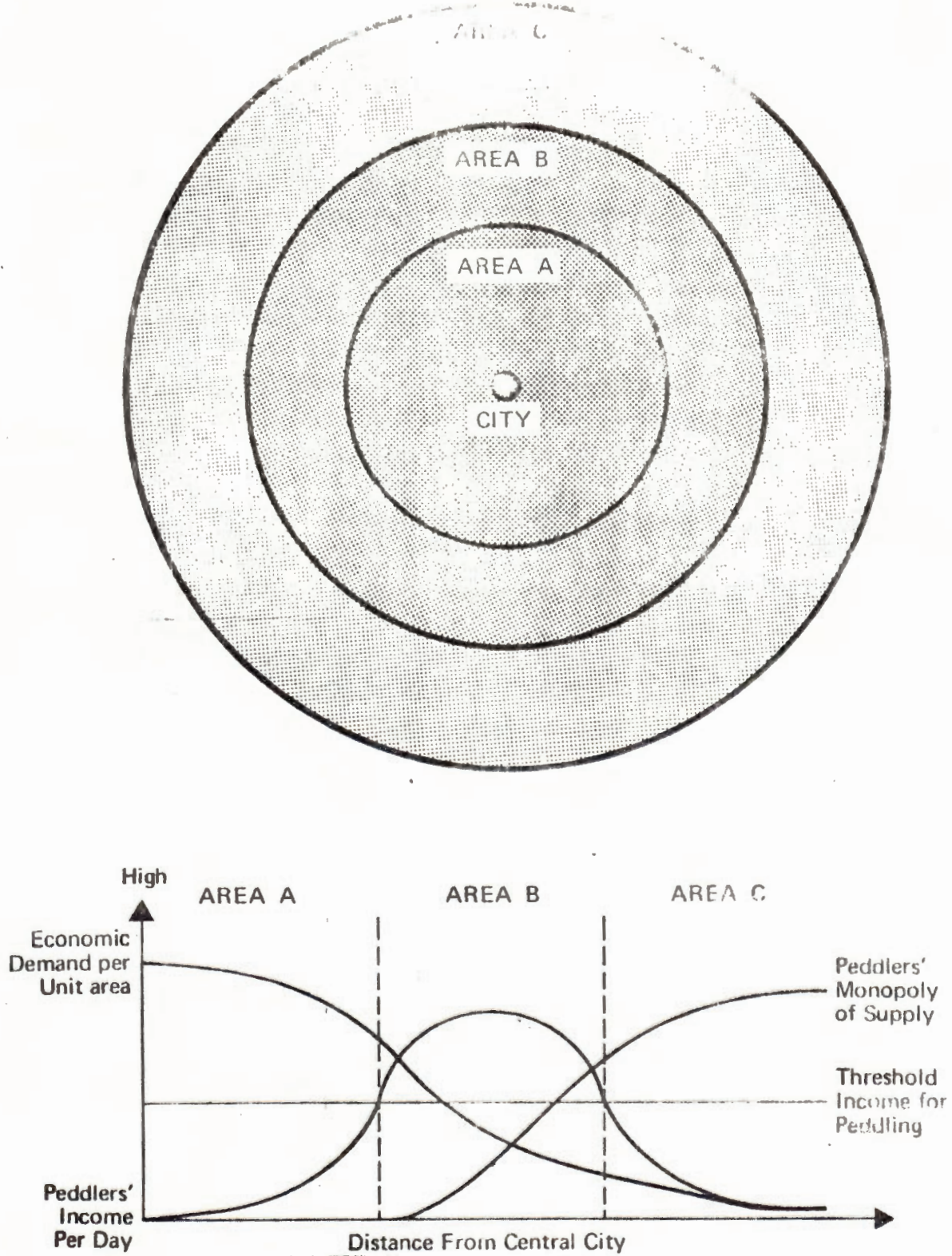


Figure 1. Peddling in a developing region*.

*Shading indicates density of population and degree of commercialization.

Table I

RELATION OF AVERAGE MARKUP TO ROUTE

Route	Average Markup*	t Statistic
a) Ocosingo	33.6% (12)	a:b 1**
b) Bachajon/Yajalon	30.6% (6.6)	a:c 1**
c) Simojovel	39.5% (20)	b:c 1.5**

* Figures in parenthesis are standard deviations
 **Not significant at the .01 level

Table I.

COEFFICIENTS, MEANS, AND MARGINAL PRODUCTS
FOR THREE REGRESSIONS

	<u>Coefficients</u>						R^2	F	N (Observations)
	I Income	b1 Mules	b2 Merchandise	b3 Costs	b4 Markup	b5 Style			
R1	... (.379) ^a	-.100** (.128)	.865 (.111)	.161 (.070)	1.657 (.169)	.619 (.124)	.84	42	17
R2	... (.668) ^a	-.315** (.226)	1.119 (.196)	.199* (.123)	2.172 (.298)	.895 (.224)	.72	22	47
R3	... (.377) ^a819 (.093)	.142 (.065)	1.668 (.168)	.623 (.126)	.83	53	47
<u>Sample Means (geometric)</u>									
R1	8,100	2.75	29,543	4,446	32.5%	(45%) ^b			
R2	5,787	"	"	"	"	"			
R3	8,100	"	"	"	"	"			
<u>Marginal Products^c</u>									
R1			.24	.29					
R2			.22	.26					
R3			.22	.26					

NOTES

R1 relates annual income to all variables.

R2 relates disposable annual income, or annual income minus implicit costs, to all variables.

R3 relates annual income on all variables but mules.

Numbers in parenthesis under the coefficients are the standard errors.

a. Figures in parentheses marked "A" are the standard error of the estimates, or the standard deviation of the residual.

b. This represents the proportion of the total sample who are compound peddlers.

Table 11
(continued)

c. The marginal products of merchandise and cash costs are not significantly different from each other at the .01 probability level, but are different at the .05 level

* Starred coefficients are not different than zero at the .01 probability level.

** Double starred coefficients are not different than zero at the .05 probability level.

Unstarred coefficients are different than zero at more than the .001 probability level.

TABLE OF CORRELATION COEFFICIENTS

	Income	Mules	Merch.	Costs	Markup	Style	Income ¹
Income	1.00	.33	.65	.24	.57	.08	.97
Mules	.33	1.00	.58	.44	-.08	.06	.22
Merchandise	.65	.58	1.00	.24	.09	-.06	.57
Costs	.24	.44	.24	1.00	-.23	.32	.19
Markup	.57	-.08	.09	-.23	1.00	-.41	.54
Style	.08	.06	-.06	.32	-.41	1.00	.11
Income ¹	.97	.22	.57	.19	.54	.11	1.00

1. Income¹ is the respecification of Income as $.95 (\text{Income}) - (400 (\text{Mules}))$

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