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Geographical Exclusion in Rural Areas of El Salvador: Its Impact on Labor Market Outcomes

by

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Abstract

The main objective of this study is to examine one aspect of social exclusion, the geographic isolation of individuals living in El Salvador's rural areas and its impact on three labor market outcomes: labor force participation decision, sector of employment, and labor income. In this study, it is hypothesized that living in geographic isolation has a negative impact on rural workers' labor outcomes, that geographic isolation, through a combination of security hazards, increasing transaction and working costs, depresses individual's labor force participation rates, increases the likelihood of working in low-productive jobs, and results in lower labor income levels. The main results of this study indicate that the degree of geographic isolation does not discourage men from working; on the contrary, men living farther away from urban and *maquila* jobs are more likely to work. The degree of geographic isolation determines individuals' sector allocation and their labor income as well. Women living farther away from urban areas or with less access to paved roads are highly concentrated in own-production agricultural activities, where women's skills are rewarded less than comparable men's skills. Own production in agriculture is a sector where women's human capital accumulation does not influence their income labor level, though it does reward men's skills. Through concentration into this sector, women living in geographic isolation obtain worse labor outcomes than men. Living in geographic isolation decreases women's labor income. When working in own-account non-agricultural production, geographic isolation also has a negative impact on men's labor income.

1. Introduction

The vulnerability of large segments of the society, the absence of opportunities, and the social exclusion of large groups of productive individuals is a reality in El Salvador, especially in rural areas. In spite of being the smallest country of Central America, El Salvador concentrates the highest poverty levels in its rural area, where 43 percent of the population resides. Approximately 61.5 percent of the rural population lives in poverty. Only 35 percent have access to running water, and only 56 percent have access to electricity. Rural individuals, on average, complete only 3.2 years of schooling (DYGESTIC, 2000). Lack of working opportunities and violence are the reasons most often stated regarding why migrants flee rural areas and migrate to cities or leave the country (DYGESTIC, 1999).

In terms of economic participation, 37.3 percent of the Salvadoran labor force lives in rural areas (DYGESTIC, 2000). From 1992 to 1998, the labor force participation (LFP) rates for males and females in rural areas increased by 5 and 3 percentage points, respectively; that is, women's (men's) labor participation increased from 23 (43) percent to 28 (46) percent (DYGESTIC, 1993, 1999). A large number of these rural workers are clustered in non-remunerated family employment (13 percent), retail trade (15 percent), own account production (31 percent), and subsistence agriculture (11 percent), all economic activities where labor productivity is extremely low. The average rural labor income is 49 percent of urban areas (90 percent of rural workers make less than the urban minimum wage). This group of workers is of great concern for policymakers. Several questions are typically posed regarding this group. Who are these workers? Is their geographical location a determinant of poor labor market outcome? Are these workers socially excluded? Even if they had the human capital skills, would these individuals have equal access to better conditions, job networking, and good jobs?

The lack of understanding of the extent of social exclusion, the consequences social exclusion may have for labor markets (i.e., lower labor participation rates, concentration in lower-paid jobs, lower labor income, etc.) and the mechanisms that lead to the social exclusion of workers, especially those living in rural areas, has resulted in an absence of policies that could promote a more inclusive society; a more egalitarian labor income distribution; and improve the efficiency and equity of human resources in El Salvador. The present study attempts to address this lack of research.

The paper's main objective is to study one aspect of social exclusion, namely, the geographic isolation of individuals living in El Salvador's rural areas and its impact on three labor market outcomes: labor force participation decision, sector of employment, and labor income. In this study, it is hypothesized that living in geographic isolation has a negative impact on rural workers labor outcomes, that geographic isolation—through a combination of security hazards, increasing transaction and working costs—depresses labor force participation rates, increases the likelihood of working in low-productivity jobs and results in lower labor income levels.

The results of this study indicate that the degree of geographic isolation does not discourage individuals from working. In fact, men living far from urban and *maquila* jobs are more likely to work. The degree of geographic isolation determines women's sector allocation and their labor income as well. Women living in geographic isolation are highly concentrated in own-production agricultural activities, where women's skills are not rewarded as highly as men's. Own production in agriculture is a sector where women's human capital accumulation does not influence their income labor level, whereas it does reward men's skills. Through concentration in this sector, women living in geographic isolation experience worse labor outcomes than men, as geographic isolation decreases women's labor income. Geographic isolation has a negative impact on men's labor income when they work in own-account non-agricultural production.

2. Data

This study uses micro-level data from the "Rural Household Survey" of 1999 gathered by the Salvadoran Foundation for Economic and Social Development (FUSADES). This survey was designed as a stratified random sample representative of the rural population at a 10 percent significance level. The Rural Household Survey design is similar to the Living Standards Measurement Surveys "LSMS," which include a broad array of socio-economic information on individuals and households. The data include education, family composition, distances (measured in time and kilometers from place of residence to closest post office, work place, primary school, health care facilities, etc.), health, demographics, migration, remittances,

agricultural activities, employment, sector of employment, income, and questions on perception of access to financial and health care markets.[1]

Previous to the Rural Household Survey of 1999, FUSADES assembled two similar rural surveys for 1995 and 1997. The main purpose of the first survey was to provide information on rural households for a World Bank study on the country's rural development. In 1997, a second rural survey interviewed 70.6 percent of the 1995 households; attrition at the individual level was about 40 percent. Early versions of this research tried to use all three surveys; a brief attrition analysis, however, suggested that attrition was correlated with the working decision and with labor income, two labor outcomes of interest to this study. Moreover, the two previous surveys lacked key variables needed to pursue the analysis on geographic exclusion. Therefore, we decided to concentrate our efforts on a cross-sectional study using the yearly data of 1999; the 1999 survey did contain the necessary elements to examine the link between geographic exclusion and labor market outcomes.

2.1 Data Description

This study focuses on individuals between 16 and 65 years of age. Workers are defined as individuals working at least 26 hours within a year. Table 1 provides descriptive statistics for the main variables of interest for workers and non-workers. On average, working individuals are older, have lower education, have fewer migrants in the household, receive lower remittances, and participate more in community organizations than non-workers. In addition, the relatives of workers live in the same community longer, and in terms of geographic location workers live further away than non-working individuals.

[1] A copy of the 1999 questionnaire can be found at the Ohio State University web site: http://www-agecon.ag.ohio-state.edu/ruralfinance/new_page_2.htm

Table 1. Worker and Non-Worker Basic Statistics by Gender

	Whole Sample			Men			Women		
	Non-workers	Workers		Non-workers	Workers		Non-workers	Workers	
Variable	Mean	Mean		Mean	Mean		Mean	Mean	
Age	32.79	34.77	*	30.09	34.89	*	33.42	34.6	
Marital status (married=1)	0.27	0.31		0.12	0.31	*	0.31	0.3	
Household members	6.99	2.81		6.72	6.97		7.05	6.87	
Children in household	2.49	2.66		1.86	2.61	*	2.64	2.71	
Literacy	0.75	0.78		0.83	0.8		0.73	0.75	
Schooling	4.7	4.36	**	6.63	4.5	*	4.24	4.16	
Average schooling of household	2.97	2.73	*	3.47	2.69	*	2.86	2.78	
Annual remittances (col.)	3,959	2,399	*	5,051	2,151	*	3,703	2,750	* *
Number of hh migrants	1.05	0.79	*	1.02	0.79		1.05	0.78	*
Electricity	0.72	0.69		0.79	0.68	*	0.71	0.7	
Piped water	0.47	0.46		0.44	0.46		0.48	0.46	
Belongs to an organization	0.31	0.34		0.35	0.34		0.3	0.35	* *
Organizations belonged to	0.38	0.46	*	0.46	0.47		1.27	0.46	*
Time the family has lived in the community (years)	60.45	62.35	**	60.87	61.93		60.35	62.94	*
Distance to paved road (km.)	4.67	5.07		3.97	5.15		4.83	4.96	
Distance to post office (km.)	5.19	5.51		5.27	5.54		5.18	5.47	
Distance to market (km.)	7.63	7.81		7.14	7.94		7.74	7.62	
Time to paved road (min)	28.63	33.11	*	24.28	33.33	*	29.67	32.78	
Time to post office (min.)	32.99	35.83	**	33.22	35.93		32.94	35.68	
Time to market (min.)	40.55	42.66		39.68	43.12		40.75	42.02	

* Indicates significance at 5 percent level and ** at 10 percent level

Regardless of gender, on average individuals live 4 to 8 kilometers away from the closest paved road, market and post office, commute 18 minutes to work, and must spend 32 to 35 minutes to reach the closest paved road, market, and post office. Also, 21 percent of individuals travel an hour or more in order to reach the closest paved road. Whether living in geographic isolation affects their decision to work, sector of employment and labor productivity provides the basic research questions explored in this study.

Working women receive lower remittances, have fewer migrants in the household, and belong to more organizations than non-working women, and their relatives remain in the same community longer than those of non-working women. Working men spend more time getting to

the closest paved road than non-working men, are more likely to be married, and have more children living in the same household. The differences between working and non-working men, i.e., age, schooling, marital status, number of children in household, suggest the importance of estimating separate labor market equations by gender.

Table 2 shows the sector of employment per gender. Three sectors of employment are examined: salaried, own production, and a mixed sector. The mixed sector aggregates a large group of individuals who, during a particular year, work in several sectors. The salaried and own-production sectors were divided into agricultural and non-agricultural activities. There are substantial gender differences on the sector of employment. Women are heavily represented in own-production and non-agriculture salaried sectors. Men are mostly concentrated in the mixed sector, which means that during a given year men work in more than one sector; this secotr accounts for men's higher labor force participation rates.

Table 2. Workers by Sector and Employment Status by Gender [(a)]

Sector and Status	Men	Women		Both
Participation in the labor force	90%	60%	*	75%
Sector				
I. Salaried				
Agriculture Salaried	13%	10%		12%
Non-Agriculture Salaried	18%	21%	**	19%
II. Own Production				
Agriculture Own Production	20%	32%	*	25%
Non-Agriculture Own Production	4%	17%	*	10%
III. Mixed sectors	45%	19%	*	34%

(a) Using sample of individuals more than 15 –65 years of age; workers are individuals working at least 26 hours during the whole year.
* Indicates significance at 5 percent level and ** at 10 percent level.

Table 3 shows the total labor income and hours worked by sector and gender. Working men earn higher total income than women in all sectors but the mixed sector. At the same time, men work longer hours than women in all sectors but the salaried non-agriculture sector. Self-employed men working in agricultural activities receive 47 percent more labor income and work twice as many hours as women in the same sector. On the other hand, men working in salaried non-agriculture activities (i.e., *maquila*) make 45 percent more labor income than

women, while working the same number of hours. Women who worked in agricultural activities, whether salaried or in own-account production, worked fewer hours than men.

Table 3. Labor Income and Hours Worked per Sector and Gender [(a)]

	Hours Work			Total labor income		
Sector and Status	Men	Women		Men	Women	
Sector						
I. Salaried						
				¢		
Agriculture Salaried	1,715	774	*	8,481	¢ 3,720	*
Non-Agriculture				¢		
Salaried	2,218	2,306		20,497	¢ 14,675	*
II. Own Production						
Agriculture Own				¢		
Production	1,334	628	*	5,136	¢ 1,726	*
Non-Agriculture Own				¢		*
Production	2,380	1,879	*	22,145	¢ 14,661	*
				¢		
III. Mixed sectors	2,052	1,660	*	9,166	¢ 10,133	
				¢		
Total	1,907	1,409	*	10,796	¢ 8,486	*

(a) Using sample of individuals 15-65 years of age. Total hours and labor income are given per year. Workers are individuals working at least 26 hours during the whole year.

* Indicates significance at 5 percent level and ** at 10 percent level

Table 4 shows total labor income by gender and per schooling level. Overall, more educated workers have higher labor income than less educated workers. Men and women with some high school education (10 school years and more) make 45 and 29 percent more than workers with fourth to sixth grade education. Labor force participation rates per schooling level are also shown in Table 4. Individuals with less education have higher participation rates than individuals with higher education levels. Conversely, women with no education have lower labor participation rates than women with some primary schooling. The total labor income differentials between genders are especially large for workers with no education, and between those with four to six years of schooling. However, the gender total labor income differential between workers with seven and more years of schooling is not significant.

Table 4. Labor Incomes per Education Level

Schooling Level	Total Income Labor				Labor Force Participation Rates	
	Whole Sample	Men	Women	T-test	Men	Women
None	6,519	7,621	5,209	2.44	0.92	0.59
1-3	8,732	9,032	8,354	0.45	0.94	0.64
4-6	10,982	12,319	8,665	2.54	0.95	0.62
7-9	10,670	11,323	9,755	0.90	0.86	0.60
>10	15,910	15,888	15,944	-0.02	0.76	0.57

To assess the characteristics of individuals living in more or less isolation, we first sorted and ranked all individuals based on the time (in minutes) they needed to reach the closest paved road, so that we could create five groups. The fifth quintile refers to individuals with the highest travel times to the nearest paved road, and therefore living in the greatest isolation. The first quintile consequently refers to the least isolated population. Table 5 shows selected gender characteristics for the first and fifth quintile. Regardless of gender, individuals living in less isolated places have more education (+years of schooling) than individuals living farther away from paved roads. Men living in geographic isolation have less schooling, reside where their parents and relatives have lived or were born, and have inherited land or obtained it through a government program. In addition, men living in isolated areas are more likely to work as self-employed in agricultural activities or in more than one sector during the same year; their labor income is 60 percent lower than men who are less geographically excluded. Women living in higher isolation are also more likely to have inherited their land, work fewer hours, work in own-account agriculture production, and make only 36 percent of what women living closer to a paved road do.

Table 5. Characteristics of Individuals per Geographic Exclusion Level[(b)]

	Men			Female		
Characteristics	- Isolated	+ Isolated		- Isolated	+ Isolated	
Education	5.38	3.56	*	5.21	3.52	*
Age	34.41	34.62		34.27	32.29	
Marital Status (Married=1)	0.29	0.36		0.33	0.37	
Household Members	6.71	6.60		6.81	6.58	
No. Children living in hh	2.22	2.63		2.40	2.72	
Landownership	0.63	0.72		0.65	0.65	
Remittances (colones x year)	¢3,869.64	¢2,575.27		¢3,534.23	¢3,861.84	
Parents living/born in same place	0.73	0.87	*	0.78	0.85	
Land given in heritage	0.22	0.32	**	0.25	0.40	*
Land given Gov	0.09	0.17	*	0.07	0.09	
Working (Yes =1)	0.85	0.97	*	0.61	0.68	
Working as salaried in ag.	0.06	0.12		0.04	0.06	
Working as salaried in non-ag.	0.20	0.07	*	0.18	0.06	*
Working as agriculture own-prod.	0.14	0.24	*	0.17	0.36	*
Working as non-ag own-prod.	0.09	0.04		0.12	0.05	**
Mixed sectors	0.36	0.49	*	0.09	0.15	
Hours worked	1748.81	1869.56		987.36	675.79	*
Income (average x hour)	5.21	4.17		4.13	2.48	*
Time to closest paved road	2.56	115.56	*	2.48	114.95	*
Time living in same community	32.45	40.91	*	31.32	38.70	*
Total labor income	12702.48	9269.31		6971.18	2544.04	*
Total Sample	187	90		208	95	

(b) Using time to closest paved road as measure of geographic exclusion

* Indicates significance at 5 percent level and ** at 10 percent level

Men living in isolation have resided for longer time periods in the same community where their parents and relatives lived or were born. This may suggest that the individuals' decision to remain in one location may be impacted by their parent's social capital accumulation. Regardless of gender, remittances and degree of geographic isolation were not correlated.

3. Theoretical Framework

There is a large body of literature on social exclusion (Gore and Figueiredo, 1997; European Foundation, 1995; Gacitua and Davis, 2000; Figueroa, 2000; Sojo, 2000; Ordoñez, 2000; Trouillot, 2000; Do Valle Silva, 2000). These studies, mostly descriptive or theoretical in nature, discuss concepts and social exclusion indicators, elaborating on what exclusion is or should be about. For instance, Gore and Figueiredo (1997) recommend measuring social exclusion with

both a set of multiple social and material deprivation indicators (using the categories of Townsend, 1993) and by including groups' perception of their position in society to see if groups have chosen to exclude themselves from society.

For this project, social exclusion is defined as the process where "individuals or groups are partially or totally excluded of their participation in the society where they belong" (European Foundation, 1995; Trouillot, 2000), a process that results in a "denial of equal access to opportunities imposed by certain groups of the society upon others" (IDB, 2000). This exclusion process is accumulative and multi-dimensional (Figueroa, 2000; Gacitua and Davis, 2000). This concept assumes that at the individual level social exclusion is involuntary (Gore and Figueiredo, 1997).

One area where there is a significant body of empirical research is on geographical segregation ("ghetto neighborhoods") and race/ethnic tension (Borjas, 1997, 1995; Cutler, Glaeser, Vigdor, 1997, Case and Katz, 1991; Crane, 1991; Evans, Oates, and Schwab, 1992; Jencks and Meyer, 1990; Manski, 1993). On this subject, the existing literature analyzes three distinct issues. The first set of studies provide measures of the extent of geographic segregation faced by particular groups by counting the number of persons who reside in particular geographic areas and calculating various segregations indices from these counts (Bean and Tienda, 1987; Massey and Denton, 1989; McKinney and Schnare, 1989). These studies focus on residential segregation and are concerned with the impacts of social exclusion on large numbers of individuals/workers living in isolated geographical areas. Such impacts may promote a set of cultural attitudes, social contacts, and economic opportunities that affect individuals throughout their lives.

A second set of studies, examine the implications of residential segregation on labor market outcomes (Cutler and Glaeser, 1997; Elliot, Julius, Huizinga *et al*., 1996; Borjas, 1995; Crane, 1991; Case and Katz, 1991). For instance, Borjas (1995) found that earnings of children are strongly affected not only by parental earnings, as traditional models of intergenerational income suggest, but also by the earnings of the ethnic group in the parents' generation, what he calls "ethnic capital." Borjas suggests that the ethnic neighborhood is one of the mechanisms through which ethnic externality works, linking residential segregation and human-capital accumulation. Ethnic capital is measured as the mean earnings of the ethnic group in parent's

generation. This variable is then utilized as a proxy for the socioeconomic background of the neighborhood where the children were raised.

A third strand of research debates the identification problem, where the same unobserved factors that lead to a particular location choice may also lead to other socioeconomic outcomes. These studies conclude that measures of residential segregation and their impacts on labor market outcomes may only reflect spurious correlation (Evans, Oates, and Schwab, 1992; Jencks and Meyer, 1990; Manski, 1993). To address the endogeneity issue of neighborhood choice, Borjas (1997) examines how individuals choose the neighborhood where they wish to reside. His findings suggest that choice of neighborhood depends on both the household's skills and economic resources and on aggregate characteristics of ethnic groups.

Relevant to our research is another group of studies focusing on the spatial separation or mismatch between poor workers and job location. John Kain studied the effects of job decentralization (factories moved from inner cities, where many minority groups live, to suburban areas) and housing discrimination on both the spatial distribution of black workers and on their ability to find work (Kain, 1968, 1992; Holzer, 1991). Kain suggested that minorities' poor labor outcomes were due to the spatial mismatch between workers and jobs locations. Since Kain's seminal work in 1968, there has been a vast number of studies debating all aspects of spatial mismatch (Bell, 1974; Madden, 1980; Madden and White, 1980; Reid, 1985; Vroman and Greenfield, 1980; McLafferty and Preston, 1992; Ihlandfeldt and Sjoquist, 1990, 1998; Ihlandfeldt and Young, 1996; Sanchez, 1999; Sawicki, 2000; Thompson, 1997). Most of these studies conclude that the separation of neighborhoods from entry-level jobs has a negative impact on the success of minorities in the labor market. Moreover, spatial separation of poor workers from entry-level jobs creates not just physical separation but also spatial isolation from job networks and information; spatial separation increases when public and private transportation for poor individuals is weak, thus lessening the mobility of poor workers.

4. Methodology

The main objective of this paper is to study the geographic isolation aspect of social exclusion by analyzing the impact of living in isolated rural locations on three labor market outcomes: labor force participation decision, sector of employment, and labor income. In this study, we hypothesize that through a combination of security hazards, transaction costs, and mobility costs,

living in geographic isolation decreases labor participation, allocates workers into low-productivity jobs and lowers labor incomes, which further perpetuates individuals' social exclusion.

This study limits its scope to the study of the geographic separation of workers with respect to local markets. We compare the labor market outcomes of individuals living close to urban jobs and closest to paved roads to those living further away. Two measures of geographic exclusion are utilized in order to study the effect of geographic isolation, namely distance to closest paved road (kilometers) and a location index. In the next section, we explain the content, advantages and limitations of these two measures of geographic isolation.

The main objectives are accomplished in two simple steps:

- First, we identify factors correlated with the choice of where to live. In this step, we explore the link between choice of location and intergenerational income effects (parents' landownership, place of residency, and socioeconomic status), remittances, landownership, household income/resources, and human capital variables. The identification of these factors is of great interest itself but also provides the instrumental variables estimates to be used in our exploration of the relations between location and labor market outcomes.
- Second, adjusting for self-selection due to individuals' location choice, we use instrumental variable estimation where the predicted value of the geographic isolation measure is included into each of the three labor market outcome estimations: labor force participation, sector of allocation, and labor income per gender.

4.1 Measures of Geographic Isolation

The Rural Household Surveys contain information on individual's place of residency, topographic characteristics of the land, and the exact residential coordinates (latitude and longitude)[2]; in addition, it contains detailed information on the time and distance it takes individuals to move from their place of residency and closest postal office, primary school, secondary school, health care facility, paved road, market, bus station, and others.

2 The topographic characteristics and coordinates data are currently being processed and were not available for this study.

For the purpose of this study, we use "travel time to closest paved road" as one measure of geographic isolation. Access to paved roads is believed to decrease transaction costs and increase labor mobility, linking individuals not only to more productive jobs, but also to job networks, health care facilities, and markets where rural products can be sold. The main drawback of using the simple measure of geographic separation is the implicit assumption that access to all paved roads has the same impact on individuals' labor outcomes. That is, travel time to paved roads ignores the market differences of alternative destination; it also ignores differences in terms of jobs availability, wages, financial and commercial institutions, and economic intensity. For instance, two individuals "A" and "B," spending 30 minutes to reach the closest paved road, will be assigned the same degree of geographic isolation, without considering that individual "A's" closest paved road leads him to a tiny community with less than 100 inhabitants, while B's closest paved road leads him to San Salvador, the largest urban city of El Salvador.

To overcome this limitation, we use as a measure of job access the "location index" developed by Lardé de Palomo and Argüello de Morera (2000). The location index has two components. The first measures access to urban jobs, and the second measures access to free trade zone jobs. The first component captures the number of urban jobs available in the closest urban population of fifty thousand inhabitants or more, adjusted by the distance each individual would have to commute to the get there. The second component measures the number of jobs available in free trade zones located within a 30-kilometer radius from the household, adjusted by the distance that must be traveled in order to get to the free trade zone. The location index adds both urban jobs and free zone jobs. The location index ranges from 0 to 1, the closer to one the higher access to urban jobs and/or free trade zones jobs.

This study does not argue that access to markets with fifty thousand inhabitants or more is the only appropriate benchmark for measuring lack of access to employment or geographic isolation. El Salvador has three developed urban markets: San Salvador, San Miguel, and Santa Ana. It could easily be argued that any measure of geographic isolation would use any or all of these markets as a reference. A similar argument can be made when using other regional or international markets such as Guatemala, Costa Rica, Mexico, or even the United States. This study however, limits its scope to the study of geographic isolation with respect to local and closest more populated markets.

4.2 Factors Determining Geographic Location

In this paper, we explore the link between choice of location and intergenerational income effect (parents' landownership, place of residency, parent's employment status) as proxies of parent's socioeconomic status, remittances, landownership, size of the community, other household income/resources, and human capital variables. From these estimates, we will learn about the factors behind individuals' geographical decision and we will additionally identify some of the instrumental variables we need in the exploration of the relations between location and labor market outcomes.

Individuals with higher skills are expected to live in less isolated locations. The correlation between income and location choice can go in either a positive or negative direction. On one hand, individuals with higher income may live in less isolated areas due to their taste and capacity to afford the living expenses of less isolated areas. On the other hand, individuals with higher incomes may wish to remain in isolated communities, where perhaps they have lived most of their lives. It is possible that travel costs and the opportunity costs of living in isolated communities may be lower for individuals with higher incomes.

A binary variable controlling for individuals living in the same place where parents or relatives lived or were born is also included in the geographic location equation. In this study, we claim that individuals may choose to live and remain in the same place where parents or relatives were born or lived most of their lives to capitalize on parents' social capital accumulation and sense of belonging. The significance rather than the sign of these dummy variables is of interest. If significant, the coefficient will show that individuals make location decisions, even to remote areas, in order to capitalize on parents' social capital gains. On the other hand, we assume that parents' or relatives' geographic location and the time they remained in that location are factors not directly correlated with individuals' current labor outcomes. Current individual labor outcomes fully depend on individuals' human capital accumulation and whether they currently live in geographic exclusion from society.[3]

Another dummy variable is added to control for the land provided through government programs. At the end of the civil war in 1990, under the terms of the peace agreements the

3 Previous studies argue that intergenerational factors such as parents' education do have a strong correlation with offspring human capital accumulation and therefore on their current labor productivity. The lack of this variable in

government gave away land to individuals. In these cases, location choices and the degree of isolation were not up to the individual, but determined by the government, making it necessary to control for such cases (less than 5 percent in the sample). For these cases, a positive coefficient will show that the government gave away land located in remote areas and that the people who were given land in remote places were unable to sell or rent it and consequently had no choice but to live on it.

We estimate a linear regression equation per each of the two measures of geographic exclusion, first for the whole sample and then per gender.

4.3 Geographic Location and Work Participation

We want to analyze the individual working decision and measure the impact of geographic location on that decision. It is argued that the working decision and therefore the labor supply of men and women are jointly determined at the household level. The proper way to model family decision-making is not entirely clear, and economists have adopted various approaches (Killingsworth, 1983). One assumes that the marriage partners have a collective set of preferences and behave as a single unit. Another approach assumes that each partner has an individual utility subject to a family budget (Manser and Brown, 1980). Modeling the joint decision and their estimation is complex; multinomial logit model (to estimate each partner's choice probability) and simultaneous equations are some of the techniques being used. For simplicity however, in this study, we analyze the probability of labor force participation for men and women separately. We use a probit model to examine the consequences of geographic location for individuals' labor participation decisions.

In the probit model, we have $P(Y=1|X) = F(\beta X)$ where here F(.) is the standard normal cumulative distribution function (cdf). The decision of whether to work in the market depends on the market wage, W, and the shadow price or reservation wage, Z. Market wage is used here if $W > Z$, the person works either in own production or as an employee. Thus, the dependent variable takes on the value of one (1) if the person participates in the labor market and zero (0) if the person does not.

The shadow price or reservation wage (Z) depends upon productivity in activities other than labor market work. For both men and women, the reservation wage depends upon personal

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the data at hand made it impossible for us to test this hypothesis.

characteristics, such as marital status, age, and number of young children, and on the "need" for income, which is measured by remittances, landownership, and family income (excluding the individual's own labor income), and individual's geographical isolation. Whether to work would depend on those factors and the reservation wage. According to the theory, a woman's decision is based on her value of time at home or her previous earnings versus the offered wage or potential earnings. A man's work decision, however, is based on his value of time if he remains unemployed—waiting for a better match—or his previous earnings versus the offered wage or potential earnings. Despite the gender differences in the factors affecting the labor force participation decision, both men and women can be viewed as setting minimum standards for their decision to work. As such, when the earnings from that job surpass a critical value the job will be accepted; otherwise it will be rejected. This means that the samples of working men and women are self-selected.

In the probit participation functions, age is entered as a series of dummy variables for each age group (in six year cohorts) to take into account any non-linearity in the effect of age on participation. It is not clear a priori what the signs should be on the coefficients for age variables. Younger individuals may be more likely to be out of the work force and in school, which would decrease the probability of this group's participation. When enrollment in higher education is high, labor force participation of young people will also be lower. However, given the small percentage of individuals with higher education, especially in rural areas of El Salvador, this variable may have little effect.

Heads of household are more likely to work to support the family. Married women are expected to have a lower probability of participation than unmarried women, while the opposite relationship is expected for men. Remittances and family income, originating from an individual's spouse or other relatives living in the household or out of the country, are also included in the probit equation to measure the income effect on the participation decision, and they are expected to have a negative impact on participation. Family remittances may also have a positive impact on participation by increasing individuals' access to outside more-developed financial and labor markets (rural, urban, and international). When available, time living in same location is also entered as to control for migration effect.

According to the spatial mismatch literature, residential location is an important determinant of individuals' labor participation. The impact of geographic isolation on labor force

participation rates can go in either direction. Some empirical studies on spatial mismatch show that living apart from jobs increases worker mobility costs and detaches individuals from job networks. Together, both of these factors decrease individual labor force participation rates. On the other hand, individuals living in rural areas, even when living in great geographic isolation, can still work on their own land for commercial or subsistence purposes. Even in times of crisis, when non-agricultural or salaried employment becomes unavailable, labor force participation rates may still increase through work in agriculture activities. In this study, we hypothesized that geographic isolation imposes higher opportunity costs and greater hardships on women than men, which may lower women's labor force participation rates further than men's. Security reasons, plus women's cultural role in the society as child bearer and family caretaker, may be the principal mechanisms whereby geographic isolation limits women's labor force participation more than men's. In addition, El Salvador is one of the most violent countries in Latin America; therefore the risk of walking alone on dark, muddy paths (rather than roads), and of being physically attacked are additional transaction costs faced by rural women more than by men. Such security risks, as well as time and transportation costs, impose higher working opportunity costs on women than on men. Moreover, geographic isolation may also increase the value of women's household production activities by raising women's value as protector of children and care provider, and further reducing the probability of their participation in the labor market. We argue that geographic isolation, through a combination of security hazards and women's cultural role in society, is an important factor in women's exclusion from the rural labor market. On the other hand, higher working costs and the minimization of risk hazard costs may lead women living in isolated communities to increase their participation decision by working in agriculture activities at home or close to home. Geographic isolation may thus increase rather than decrease labor force participation rates.

4.4 Geographic Isolation and Sector Allocation

To test the impact of geographic isolation on the sectors of employment we use a multinomial logit model. We divide rural Salvadoran workers into those allocated into salaried sectors, either agricultural or non-agricultural, and those allocated into own production, either agricultural or

non-agricultural activities.[4] To classify all rural workers into mutually exclusive sectors, we also had to include a fifth sector, called the "mixed" sector. This mixed sector includes all individuals who work in two or more sectors during the previous year. The underlying assumption is that rural Salvadoran labor markets are fully described by these five sectors.

Specification of the Sector Allocation Model

This model first assumes that an individual chooses to work in a specific sector, and then his/her labor income is observed. Therefore, in the sector assignment estimation we cannot include any variables that are determined by sector membership, such as experience in the labor market, payments in kind, and whether a job is temporary or permanent. However, in the sector assignment estimation, we need to include some variables that are related to productivity and could influence employers' preferences for workers. We estimate the following equations for the whole sample, and then for males and females:

$$\log (p_1/p_2) = \alpha_{12} + \beta_{12}\,GEO + \gamma_{12}\,ED1 + \delta_{12}\,ED2 + \zeta_{12}\,ED3 + \eta_{12}\,ED4 + \omega_{12}\,REG2 + \varsigma_{12}\,REG3 + \tau_{12}\,REG4 + \theta_{12}\,AGE16\text{-}20 + \Theta_{12}\,AGE21\text{-}25 + \phi_{12}\,AGE26\text{-}30 + \psi_{12}\,AGE31\text{-}35 + \chi_{12}\,AGE36\text{-}40 + \varepsilon_{12}\,AGE41\text{-}45 + \nu_{12}\,MAR + e_{12}$$

$$\log (p_3/p_2) = \alpha_{32} + \beta_{32}\,GEO + \gamma_{32}\,ED1 + \delta_{32}\,ED2 + \zeta_{32}\,ED3 + \eta_{32}\,ED4 + \omega_{32}\,REG2 + \varsigma_{32}\,REG3 + \tau_{32}\,REG4 + \theta_{32}\,AGE16\text{-}20 + \Theta_{32}\,AGE21\text{-}25 + \phi_{32}\,AGE26\text{-}30 + \psi_{32}\,AGE31\text{-}35 + \chi_{32}\,AGE36\text{-}40 + \varepsilon_{32}\,AGE41\text{-}45 + \nu_{32}\,MAR + e_{32}$$

$$\log (p_4/p_2) = \alpha_{42} + \beta_{42}\,GEO + \gamma_{42}\,ED1 + \delta_{42}\,ED2 + \zeta_{42}\,ED3 + \eta_{42}\,ED4 + \omega_{42}\,REG2 + \varsigma_{42}\,REG3 + \tau_{42}\,REG4 + \theta_{42}\,AGE16\text{-}20 + \Theta_{42}\,AGE21\text{-}25 + \phi_{42}\,AGE26\text{-}30 + \psi_{42}\,AGE31\text{-}35 + \chi_{42}\,AGE36\text{-}40 + \varepsilon_{42}\,AGE41\text{-}45 + \nu_{42}\,MAR + e_{42}$$

$$\log (p_5/p_2) = \alpha_{52} + \beta_{52}\,GEO + \gamma_{52}\,ED1 + \delta_{52}\,ED2 + \zeta_{52}\,ED3 + \eta_{52}\,ED4 + \omega_{52}\,REG2 + \varsigma_{52}\,REG3 + \tau_{52}\,REG4 + \theta_{52}\,AGE16\text{-}20 + \Theta_{52}\,AGE21\text{-}25 + \phi_{52}\,AGE26\text{-}30 + \psi_{52}\,AGE31\text{-}35 + \chi_{52}\,AGE36\text{-}40 + \varepsilon_{52}\,AGE41\text{-}45 + \nu_{52}\,MAR + e_{52}$$

4 Ideally the salaried sector should be divided into private and public sectors. Previous studies (Briones and Andrade, 2000) had shown the importance of separate the public and private sectors; the public sector has different skill requirements and wage-setting mechanisms than the private sector, especially for women; however, the structure of the Rural Household Survey did not separate these two sectors.

where:

1 =	Agriculture Salaried Sector
2 =	Agriculture Own Production
3 =	Non-Agriculture Salaried Sector
4 =	Non-Agriculture Own Production
5 =	Mixed Sector
p_i =	Probability of i^{th} individual of working in the k^{th} sector
GEO=	Predicted geographic isolation measure
ED1=	1 if 1-3 Years of Schooling, 0 otherwise
ED2=	1 if 4-6 Years of Schooling, 0 otherwise
ED3=	1 if 7-9 Years of Schooling, 0 otherwise
ED4=	1 if more than 10 Years of Schooling, 0 otherwise
REG2=	1 if West region, 0 otherwise
REG3=	1 if Central region, 0 otherwise
REG4=	1 if East region, 0 otherwise
AGE1620=	1 if Age 16-20 years
AGE2125=	1 if Age between 21 - 25 years
AGE2630=	1 if Age between 26 - 30 years
AGE3135=	1 if Age between 31 - 35 years
AGE3640=	1 if Age between 36 - 40 years
AGE4145=	1 if Age between 41 - 45 years
MAR=	1 if Married (or living together), 0 otherwise.

For each year, we estimate four sector assignment equations, one set of four equations for each geographic exclusion measure: time and index location. The reference groups include individuals with zero years of formal education, living in the Metropolitan area, and between 46 and 65 years old. In the estimation of sector assignment, we use the agriculture own-production sector as the reference sector; that is, all coefficients on the agriculture own-production sector are normalized to zero. The outcome of the sector assignment estimation tells us about the worker's propensity to be in the non-agriculture own production sector or located in the salaried agriculture or non-agriculture sectors rather than in the agriculture own production sector.

Educational attainment is measured using four dichotomous variables. It is assumed that the more education a worker has, the more likely he or she is to find work in the non-agricultural salaried sector; similarly, workers with less education are more likely to be working in the agricultural sector, especially in the salaried agricultural sector. Therefore, in regard to the propensity of being in the non-agriculture salaried sector rather than in the agriculture own-production sector, the coefficients with respect to education of workers with high education (EDU3 and EDU4) should be positive: $\zeta_{32} > 0$ and $\eta_{32} > 0$. In contrast, the higher the worker's education the lower the probability of being in the agriculture salaried sector. Hence, the coefficients with respect to high education should be negative: $\eta_{12} < 0$, $\zeta_{12} < 0$.

In order to control for the cohort effect, age is measured using six dichotomous variables. It is difficult to predict the sign on these coefficients. Age serves as a proxy for the date of entry into the labor market and may also represent workers' labor market experience. Higher market competition faced by salaried enterprises makes them increase their demand for younger workers, who may be considered as much easier to train, and be more willing to sacrifice an experienced labor force. Therefore, new entrants into the labor market may have better job opportunities in the salaried sector than elsewhere. From this partial analysis, we predict that $\theta_{32} > 0$ and $\theta_{12} > 0$.

At the same time, the effect of greater labor market experience can make some of these age coefficients negative. More experience may lead to more "know how," more information about the functioning of the financial markets, more contacts, etc. Therefore, we can predict that some of the coefficients, especially for prime age workers or older workers, may be negative, showing a higher propensity for working in the own production sector than elsewhere.

In general we argue that married people look for job stability and may have stronger tastes for jobs that offer better working conditions. Firms in the salaried sector, non-agriculture, are more likely to offer job stability and job security, and comply with legal fringe benefits. If these firms also have greater tastes for married workers, who may be seen as more stable and responsible than other workers, we expect the coefficients on these dummy variables to be positive: $\nu_{32}>0$ and $\nu_{12}>0$. However, these coefficients may turn out to be exactly the opposite for women. If firms in the salaried sector have a greater preference for single women, who do not have children to take care of but have more time for their jobs, or married women may prefer

jobs with more flexible time schedules, the married coefficients may then be negative: $\nu_{32}<0$ and $\nu_{12}<0$.

To control for differences in sector allocation across regions, we include three dummy variables. The omitted region is the Metropolitan area, which includes the capital of El Salvador (San Salvador). As in many developing countries, economic activity is highly concentrated in urban areas, especially in the capital. Assuming that the own-production sector is more common in places where employment opportunities are scarce in the salaried sectors and where economic activity is depressed, workers living in the metropolitan area (the capital and immediate surroundings) may have a greater opportunity to obtain employment in the salaried non-agriculture sector than elsewhere. Also, the effect of the civil war, mostly concentrated in the Eastern part of the country, reinforces the fact that enterprises may be located far from the East and closer to the capital and immediate areas.

In this study we use two measures of geographic exclusion. We again include the predicted value of geographic isolation to measure the impact of residential location on sector allocation. Assuming that non-agriculture salaried jobs are located in more urbanized areas, we hypothesized that workers living closer to urbanized jobs, i.e., living in less isolation, will have more access and then work in the non-agriculture salaried sector. Workers living in more isolated places are expected to work in own production activities, especially in the agriculture sector.

4.5 Geographic Isolation and Labor Income

The chosen earnings equation is a variant of Mincer's (1974) standard human capital equation. The exact functional form is (ignoring the male, female, and the sector specific subscripts):

$$\ln W = \beta_0 + \beta_1 EDU + \beta_2 EXP + \beta_3 EXP2 + \beta_4 GEO + \xi_1$$

where

ln W	=	the natural logarithm of hourly wage
EDU	=	years of schooling
EXP	=	years of potential labor market experience
GEO	=	Geographic isolation measures
ξ_1	=	error term

Education increases individuals' labor productivity and labor income; the coefficient on education is thus expected to have a positive sign. Similarly, based on the concavity of the experience/earnings profile, we expect that the estimated coefficient on experience (β_2) will have a positive sign and the quadratic term (β_3) a negative sign. We include age as a proxy of experience.

To measure the impact of residential location on labor income, we include the predicted value of geographic exclusion in the earning equation. Living in isolation from the rest of society may impact labor productivity via increasing transactions costs (increasing the human effort to reach places), limiting access to markets for selling their products or buying raw material with better prices and selection, limiting access to key information on new technology, etc. If individuals living in higher geographic isolation are those who work in agricultural activities, especially as self-employed workers, and the labor productivity of these workers is lower than the rest of individuals working in salaried activities or who work in more than two sectors during the year, then we would expect that workers living farther from urban markets will have lower labor income.

5. Results

5.1 Geographic Exclusion

The two aims of estimating the geographic isolation regression were to identify the factors behind individuals' geographical decision and to define the instrumental variables we need later in our exploration of the relation between location and labor market outcomes. These instrumental variables should be uncorrelated with current labor market outcomes but correlated with choice of location. Table 6 shows the results of the geographic isolation regressions where geographic isolation is measured by the location index (from 0 to 1; closer to 1 shows greater access to urban jobs and industrial parks) and by time individuals need to invest to reach the closest paved road (in minutes). The adjusted r-squared of all regressions ranged from 6 to 16 percent, that is, our control variables explain very little of individuals' decision on where to live. From results shown in Table 6, we conclude the following:

1. Individuals with higher education levels are located in less isolated areas. This conclusion is supported by the positive schooling coefficient in the location index regression and the negative schooling coefficient in the time to closest paved roads regression. The negative schooling coefficient, in the time to closest paved roads, suggests that less education correlates with longer travel times to paved road. The positive schooling coefficient in the location index regression suggests that individuals with more skills live closer to urban markets where access to urban employment and industrial parks is higher.
2. Utilizing age as a proxy for labor market experience, we conclude that more experienced (or older) individuals live closer to paved roads (need less time to get to closer paved roads).
3. Men receiving remittances from relatives outside the household may have better access to urban jobs; phrased differently, individuals receiving or reporting remittances may be the ones living in less isolated places. The effect of remittances on geographic isolation, however, is small; when significant, an increase of 10,000 colones in remittances (equivalent to $1,142) reduces the time to closest paved road by 3 minutes. In our sample, only 24 percent of men living in isolated areas received some remittances, and only 10 percent of them report receiving 10,000 or more colones per year.
4. Variables for land, either inherited or received through a government program, were not significantly correlated with measures of residential location.
5. The variable “living in same place where parents or relatives lived or were born” is positively correlated with geographic location. This result may indicate that individuals in fact decide to live and stay even in isolated areas to capitalize on parents’ social capital gains.
6. Number of families living in same community correlates with geographic separation. This result was expected and indicates that communities with more families, larger communities, have better access to paved road and therefore, their individuals are less isolated from the rest of the society. Individuals living in isolation live in small communities where only a few families live close by, which in facts confirms their geographic isolation.

7. Number of group memberships (number of organization the household participate in) correlates positively with geographic isolation. Networking and affiliation with different groups seems to be important when living in isolated communities; therefore, membership in social, religious, sport, political, and other groups may be an important type of social capital for individuals living spatially excluded from the rest of society.
8. As expected, in all regions but the Metropolitan area (region of reference) individuals live in greater isolation. Individuals from the Central region take longer travel times to paved road than the rest of regions.
9. Geographic isolation is not gender related. The coefficient controlling for gender differential was not significant; hence, women are not more isolated than men.

From these results, the variables that correlate with residential location (measured with time to closest paved road) that are uncorrelated with labor market outcomes are: “living in same place as parents” and “families in same community” The correlation between these two variables to labor outcomes such as “working status” and “labor market income” are 0.057 and -0.013, respectively. We regressed these two variables with the residuals of labor income and the coefficient became not significant ($p>0.05$). We then selected these two variables as our exclusion restrictions, explaining the location decision and not included in the labor outcome equations. Other variables, such as schooling, remittances, number of organizations, and experience correlate with both individuals’ residential location and their labor market participation decision and earnings level.

Table 6. Geographic Isolation Regression Results per Gender

	Time to Paved Road (minutes)						Location Index (0-1)					
	Whole Sample		Women		Men		Whole Sample		Women		Men	
Variable	Parameter Estimate		Parameter Estimate		Parameter Estimate		Parameter Estimate		Parameter Estimate		Parameter Estimate	
Intercept	20.3773	***	26.0016	***	14.5508	**	0.1711	***	0.1796	***	0.1685	***
	(5.39)		(7.98)		(7.12)		(0.01)		(0.02)		(0.01)	
Income	0.0002		0.0000		0.0003		0.0000		0.0000		-0.0000	
	(0.00)		(0.00)		(0.00)		(0.00)		(0.00)		(0.00)	
Remittances (Thousand Colones)	-0.2		-0.1		-0.3	*	-0.000	*	-0.0000		-0.0000	
	(0.00)		(0.00)		(0.00)		(0.00)		(0.00)		(0.00)	
Landownership	-3.5406		-3.9068		-2.5801		-0.0081	*	-0.0111		-0.0065	
	(2.15)		(3.08)		(3.00)		(0.00)		(0.01)		(0.01)	
Schooling	-1.2843	***	-1.4256	***	-1.2116	***	0.0009	*	0.0016	**	0.0003	
	(0.24)		(0.35)		(0.33)		(0.00)		(0.00)		(0.00)	
Age	-0.1939	**	-0.3067	**	-0.1031		0.0001		0.0003		-0.0000	
	(0.06)		(0.10)		(0.08)		(0.00)		(0.00)		(0.00)	
Number of Children	1.3793	***	0.9544		1.7198	**	-0.0007		-0.0002		-0.0009	
	(0.42)		(0.60)		(0.59)		(0.00)		(0.00)		(0.00)	
Inherited land	3.5257		4.6173		2.0199		0.0005		-0.0004		0.0025	
	(2.15)		(3.04)		(3.03)		(0.00)		(0.01)		(0.01)	
Land given by Government	1.4291		-1.2105		3.8021		-0.0006		0.0033		-0.0041	
	(2.76)		(3.99)		(3.81)		(0.01)		(0.01)		(0.01)	
Families same Community	-0.0035	***	-0.0036	***	-0.0036	***	0.0000		0.0000		0.0000	
	(0.00)		(0.00)		(0.00)		(0.00)		(0.00)		(0.00)	
Number of Organizations	5.5127	***	3.3626	**	7.3456	***	-0.0056	**	-0.0031		-0.0076	**
	(1.10)		(1.63)		(1.49)		(0.00)		(0.00)		(0.00)	
Live same place as parents	7.6027	***	6.2376	**	9.1958	**	-0.0038		-0.0053		-0.0025	
	(2.21)		(3.17)		(3.07)		(0.00)		(0.01)		(0.01)	
Parent's Landowners	1.2444		1.6809		0.9410		0.0046		0.0090		-0.0001	
	(1.81)		(2.57)		(2.53)		(0.00)		(0.01)		(0.00)	
West Region	4.3249		5.4028		3.0025		-0.0938	***	-0.1072	***	-0.0829	***
	(4.11)		(6.12)		(5.53)		(0.01)		(0.01)		(0.01)	
Central Region	13.4485	***	15.9061	**	10.8815	**	-0.1256	***	-0.1461	***	-0.1082	***
	(4.02)		(6.02)		(5.41)		(0.01)		(0.01)		(0.01)	
East Region	0.9072		1.9507		-0.2144		-0.0427	***	-0.0484	***	-0.0383	***
	(1.38)		(2.06)		(1.87)		(0.00)		(0.00)		(0.00)	
Time living in same location	0.1991	***	0.1588	**	0.2367	***	-0.0002	**	-0.0001		-0.0003	**
	(0.04)		(0.06)		(0.06)		(0.00)		(0.00)		(0.00)	
Gender (Women=1)	-1.3551						0.0046					
	(1.60)						(0.00)					
Log Likelihood	-8902.12		-4666.85		-4214.45		1235.53		441.61		821.19	
N	1661		841		820		1672		847		825	

Notes: 1) Standard Errors in parentheses

2) The following levels of significance apply: * p<0.10, ** p<0.05, *** p<0.01, two-tailed test .

3) Missing values in variables: Schooling, Families in same community, Time living in same location.

5.2 Labor Market Participation

Table 7 reports the results of the probit regression for the work participation functions. Moving from left to right, Table 7's first three columns show the probit results when using the predicted time to closest paved road value as a measure of geographic exclusion for the whole sample, for men, and for women, respectively.[5] The last three columns show the probit results when using the predicted location index as a measure of geographic exclusion for the whole sample, for men, and for women, respectively. The results indicate the following:

1. The age profile of participation has an inverted U-shape for both men and women. Men younger than 36 years old are likely to be working. Women's participation decision is more age sensitive than men's.
2. Married women are less likely to work. For men, marital status did not impact on their decision of whether to work.
3. Being a household head, regardless of gender, is positively correlated with the probability of participation.
4. Remittance amount decreases men's likelihood to work but has no impact on women's working decision.
5. A greater number of children living in a household increases men's likelihood of working.
6. Higher schooling levels decrease men's probability of participation. This would suggest that the reservation wages for men with higher education are higher than the actual wage offers in the market, and therefore tend to participate less. Education is not a determinant on women's labor participation decision.
7. When significant, geographic isolation impacts only men's working decision. When using only men's sample, the probit results suggest that living apart from urban centers (lower location index) increases men's likelihood to work. On the other hand, geographic isolation seems to depress women's labor participation, but both measures (predicted time to paved road and predicted location index) are not statistically significant. However, the effect of geographic location on men's working decision is small. For instance, men living less than 2 minutes away from closest paved road

5 We thank Alejandro Gaviria for facilitating the procedure designed by Deon Filmer that estimated the correct

have a working probability of 89 percent; a man living 50 minutes away has a working probability 4 percent points higher (93 percent).

Table 7. Labor Force Participation Results

Dependent Variable: Working / Non-Working												
	Time to paved road (minutes)						Location index (0-1)					
	Whole Sample		Men		Women		Whole Sample		Men		Women	
Variable	Parameter Estimate		Parameter Estimate		Parameter Estimate		Parameter Estimate		Parameter Estimate		Parameter Estimate	
Age: 16 - 20 years	-0.1153		0.5053	*	-0.3067	*	-0.1279		0.4959	*	-0.3222	*
	(0.14)		(0.30)		(0.17)		(0.14)		(0.30)		(0.17)	
Age: 21 - 25 years	0.2787	*	1.0880	***	0.0803		0.2697	*	1.0857	***	0.0723	
	(0.15)		(0.33)		(0.17)		(0.14)		(0.33)		(0.17)	
Age: 26 - 30 years	0.4081	**	0.8913	**	0.3576	*	0.4139	**	0.8746	**	0.3639	*
	(0.16)		(0.35)		(0.19)		(0.16)		(0.35)		(0.19)	
Age: 31 - 35 years	0.2442		0.9712	**	0.1426		0.2442		1.0000	**	0.1369	
	(0.17)		(0.39)		(0.20)		(0.17)		(0.39)		(0.20)	
Age: 36 - 40 years	0.2431		0.4022		0.3024		0.2542		0.5035		0.3254	*
	(0.16)		(0.35)		(0.19)		(0.16)		(0.36)		(0.19)	
Age: 41 - 45 years	0.2959	*	0.4042		0.3151	*	0.2717	*	0.3149		0.2982	*
	(0.15)		(0.38)		(0.17)		(0.15)		(0.37)		(0.17)	
Number Family Members	-0.0051		-0.0382		0.0049		-0.0070		-0.0450		0.0039	
	(0.02)		(0.04)		(0.02)		(0.02)		(0.04)		(0.02)	
Schooling	-0.0174		-0.0425	**	-0.0050		-0.0143		-0.0387	**	-0.0018	
	(0.01)		(0.02)		(0.01)		(0.01)		(0.02)		(0.01)	
Number of Children	0.0284		0.1348	**	-0.0091		0.0340		0.1465	**	-0.0007	
	(0.03)		(0.06)		(0.04)		(0.03)		(0.06)		(0.04)	
Married	-0.0706		0.2772		-0.2066	*	-0.0554		0.2856		-0.1845	*
	(0.10)		(0.23)		(0.11)		(0.10)		(0.23)		(0.11)	
Landowner	-0.1312		-0.0662		-0.1551		-0.1276		-0.1819		-0.0925	
	(0.09)		(0.17)		(0.10)		(0.09)		(0.17)		(0.10)	
Remittances	-0.0000	**	-0.0000	*	-0.0000		-0.0000	**	-0.0000	**	-0.0000	
	(0.00)		(0.00)		(0.00)		(0.00)		(0.00)		(0.00)	
Head of Household	0.6670	***	0.9967	***	0.4226	**	0.6708	***	1.0032	***	0.4447	**
	(0.13)		(0.26)		(0.19)		(0.13)		(0.27)		(0.19)	
Family Living Abroad	-0.0204		-0.0132		-0.0238		-0.0201		-0.0296		-0.0158	
	(0.03)		(0.06)		(0.04)		(0.03)		(0.06)		(0.04)	
Health Problems last 12 mo.	0.1344	*	0.2025		0.1055		0.1414	*	0.1981		0.1121	
	(0.08)		(0.14)		(0.10)		(0.08)		(0.14)		(0.10)	
Predicted Geographic Exclusion	0.0003		0.0042		-0.0031		-0.7637		-5.1288	**	2.0499	
	(0.00)		(0.01)		(0.00)		(1.23)		(2.20)		(1.45)	
Gender (Women=1)	-0.9327	***					-0.9459	***				
	(0.09)						(0.09)					
Intercept	1.1601	***	0.5029		0.4939	**	1.1939	***	1.0146	**	0.1880	
	(0..22)		(0.41)		(0.25)		(0.21)		(0.40)		(0.23)	
Log Likelihood	8902.1243		4214.4501		4666.8512		1235.5334		821.1889		441.6140	
N	1661		820		841		1672		825		847	

Notes: 1) Corrected standard errors in parentheses
2) The following levels of significance apply: * p<0.10, ** p<0.05, *** p<0.01.

standard errors when performing an instrumental estimation using probit and continuous equations.

5.3 Sector Allocation

Tables 8 and 9 provide the maximum likelihood logit estimates for the sector allocation decisions of male and female workers respectively. In these two estimations we used the predicted value of time to closest paved road to control for individuals' geographic isolation.

Table 8. Maximum Likelihood Logit Estimates of Sector Allocation for Male Workers [(b)]

	Agriculture Salaried		**Non-Agriculture Salaried**		**Own-Production Non-Agriculture**		**Mixed**	
Schooling: 1-3 Year	0.6488		-0.1293		1.1236		0.6966	
	(0.63)		(0.66)		(0.87)		(0.43)	
Schooling: 4-6 Year	1.5175		-0.4470		1.8957		1.1190	
	(1.13)		(0.99)		(1.59)		(0.76)	
Schooling: 7-9 Year	2.5943		-0.9805		2.4398		1.5154	
	(1.79)		(1.50)		(2.48)		(1.21)	
Schooling: 10 +	2.4373		-2.6949		2.0424		1.1438	
	(2.48)		(2.06)		(3.52)		(1.64)	
West Region	1.1583		-0.2205		1.8189		0.7186	
	(0.84)		(0.67)		(1.31)		(0.62)	
Central Region	-0.6087		-0.7453		0.8940		-0.0553	
	(0.85)		(0.64)		(1.30)		(0.60)	
East Region	-0.0936		-0.3976	*	-0.1360		0.1144	
	(0.28)		(0.23)		(0.48)		(0.20)	
Age: 16-20	-0.7040		-2.4548	***	3.1521		-0.5043	
	(0.75)		(0.63)		(2.06)		(0.57)	
Age: 21-25	-0.7558		-1.4711	**	3.3096	*	-0.1334	
	(0.72)		(0.58)		(1.84)		(0.53)	
Age: 26-30								
Age: 31-35	1.8468	**	0.8335		4.1467	**	1.3949	**
	(0.73)		(0.68)		(1.46)		(0.63)	
Age: 36-40	-0.1231		-0.4462		1.7847		0.6342	
	(0.72)		(0.62)		(1.31)		(0.47)	
Age: 41-45	1.1336	*	0.3352		2.5810	**	1.1541	**
	(0.64)		(0.66)		(1.02)		(0.49)	
Married	-0.9850	**	0.6325	*	-0.6108		-0.2343	
	(0.41)		(0.38)		(0.51)		(0.28)	
Predicted time to paved	0.0014		-0.0140	**	-0.0121		-0.0001	
Road	(0.00)		(0.00)		(0.01)		(0.00)	
Constant	2.3993	*	5.1430	***	-7.4468	**	1.7834	*
	(1.44)		(1.25)		(3.31)		(1.05)	
-2 Log Likelihood Ratio	1666.7137							
N	744							

Notes:

1) All coefficients on Own Production Agriculture Sector have been normalized to zero
2) Figures in parentheses are asymptotic standard errors
3) Workers age 26-30 were excluded because of missing values in some sectors.

b) Using "predicted time to paved road" as measure of geographic exclusion

Coefficients for the agriculture own-production sector are normalized to zero. A likelihood ratio test of each logit shows that the coefficients, taken as a group, are significantly different from zero at the one percent level of significance; this indicates that male and female Salvadoran workers are assigned non-randomly to these five sectors: agriculture and non-agriculture, salaried and own-production, and the mixed sector. The pseudo R-squared was 18 and 17 percent in men and women's multinomial logit, respectively.

Table 9. Maximum Likelihood Logit Estimates of Sector Allocation for Female Workers [(b)]

	Agriculture Salaried		**Non-Agriculture Salaried**		**Own-Production Non-Agriculture**		**Mixed**	
Schooling: 1-3 Year	-0.2843		-0.6430		-0.6668		0.3580	
	(0.75)		(0.64)		(0.58)		(0.53)	
Schooling: 4-6 Year	-0.0283		-0.4568		-1.1689		1.3538	
	(1.26)		(1.03)		(1.05)		(0.99)	
Schooling: 7-9 Year	1.3515		-0.9421		-1.0062		2.6146	*
	(1.99)		(1.58)		(1.63)		(1.58)	
Schooling: 10 +	0.9433		-1.5553		-1.9052		3.7562	
	(2.84)		(2.27)		(2.36)		(2.28)	
West Region	-1.5359	*	-1.7145	**	-0.9994		0.1425	
	(0.81)		(0.80)		(0.80)		(0.97)	
Central Region	-1.9410	**	-1.0815		-0.8188		0.1950	
	(0.83)		(0.79)		(0.79)		(0.98)	
East Region	-1.2052	***	-0.8357	**	-0.6349	**	-0.1932	
	(0.30)		(0.27)		(0.27)		(0.33)	
Age: 16-20	6.7254	**	3.9698	*	1.5029		-0.3089	
	(3.39)		(2.26)		(1.69)		(1.63)	
Age: 21-25	6.3394	**	4.2103	**	1.3552		0.8727	
	(2.99)		(1.96)		(1.47)		(1.39)	
Age: 26-30	5.9228	**	3.5440	**	0.4802		0.3875	
	(2.55)		(1.68)		(1.30)		(1.18)	
Age: 31-35	3.5804		2.2579		1.1732		1.1120	
	(2.24)		(1.46)		(1.08)		(0.99)	
Age: 36-40	3.9154	**	2.1725	*	0.6170		0.7886	
	(1.81)		(1.18)		(0.89)		(0.81)	
Age: 41-45	3.3966	**	1.3856		0.6565		0.7126	
	(1.40)		(0.94)		(0.68)		(0.60)	
Married	-0.5110		-1.1684	**	0.0130		-0.3677	
	(0.44)		(0.41)		(0.32)		(0.29)	
Predicted time to paved	-0.0027		-0.0155	**	-0.0080	*	-0.0012	
Road	(0.00)		(0.00)		(0.00)		(0.00)	
Constant	-6.0066		-3.7382		-0.8718		-1.2828	
	(4.96)		(3.39)		(2.59)		(2.55)	
-2 Log Likelihood Ratio	1341.8753							
N	523							

Notes: 1) All coefficients on Own Production Agriculture Sector have been normalized to zero
2) Figures in parentheses are asymptotic standard errors
b) Using "predicted time to paved road" as measure of geographic isolation

Tables 10 and 11 report the expected sector probability for a worker at different levels of education, age, region, and degrees of geographic isolation. Generally, higher education increases the probability of obtaining a job in the salaried sector, especially in the non-agriculture sector, regardless of gender. The likelihood of working in the salaried non-agriculture sector for a woman with some high school education is 40 percent, while the probability of a similar worker with no schooling is only 10 percent.[6] Lower or no education in women increases their likelihood of being allocated into the own-production agriculture sector. Women with less than third grade have a greater than 40 percent chance of working in own agriculture production (more likely for own consumption); men with less than third grade have a larger probability of working in the mixed sector, working in more than two activities during the year. Regardless of gender, workers less than 30 years of age, are more likely to work in the salaried sector in both agriculture and non-agriculture. Older workers are more likely to work in own production activities. One possible explanation is that, after a period of paid employment in the salaried sector, experienced workers decide to become self-employed.[7]

Table 10. Probabilities of Working in Each Sector by Education, Age, Marital Status and Residential Location for Women

	Agriculture Salaried	**Non-Agriculture Salaried**	**Own-Production Agriculture**	**Own-Production Non-Agriculture**	**Mixed**
Education Level					
No School	0.097	0.097	0.407	0.166	0.234
1-3 Schooling years	0.098	0.128	0.414	0.158	0.203
4-6 Schooling years	0.095	0.254	0.317	0.143	0.190
7-9 Schooling years	0.203	0.230	0.203	0.216	0.149
>Middle School	0.089	0.400	0.156	0.200	0.156
Age Groups					
16-20	0.167	0.267	0.311	0.178	0.078
21-25	0.143	0.341	0.209	0.143	0.165
26-30	0.203	0.234	0.328	0.078	0.156
31-35	0.048	0.119	0.310	0.214	0.310
36-40	0.094	0.151	0.358	0.151	0.245
41-45	0.111	0.095	0.333	0.175	0.286
46-65	0.025	0.075	0.458	0.217	0.225

6 We estimate the age effect within each educational level and the results were basically the same: individuals with more education regardless of age were more likely to work in the non-agriculture salaried sector than elsewhere.

7 The behavior of these workers may be due to inappropriate pension programs. Getting a smaller pension in comparison to the wage level, older people may decide to enter the own-production labor market in an attempt to make up for lost income. The own-production sector becomes a source of extra income that does not require workers to report their activity and thereby jeopardize their retiree legal status.

Table 10, continued

	Agriculture Salaried	Non-Agriculture Salaried	Own-Production Agriculture	Own-Production Non-Agriculture	Mixed
Married	0.077	0.071	0.423	0.199	0.231
Time to Paved Road					
<2 Minutes	0.113	0.326	0.222	0.176	0.163
<10 Minutes	0.104	0.291	0.247	0.205	0.154
10 - 15 Minutes	0.118	0.180	0.314	0.190	0.197
15 - 30 Minutes	0.108	0.190	0.344	0.161	0.198
30 - 50 Minutes	0.104	0.126	0.374	0.159	0.238
>50 Minutes	0.119	0.129	0.418	0.132	0.202
Location index					
Less isolated	0.137	0.214	0.271	0.195	0.183
More isolated	0.083	0.159	0.409	0.143	0.207

Notes:
1) Expected probabilities are based on estimates coefficients reported in Table 9, using the formula: P_{ij} = exp $(X_iB_j)/Sum_{k=1,\ldots,j}$ exp (X_iB_k)
2) More isolated = individuals whose location index is less than 0.024, N=1000 when using whole sample.
3) Less isolated = individuals whose location index is more or equal to 0.024, N=977 when using whole sample.

Turning to geographic location, workers living in less isolation have greater chance of getting jobs in the salaried sector, especially into the non-agriculture sector. The residential location determines women's sector allocation more than men; women living separated from economic activity and living in greater isolation are concentrated in own-production agriculture activities. The likelihood of working in the own-production agriculture sector for a woman living 50 minutes or more away from the closest paved road is 42 percent, while the probability for a man living at a similar distance is 24 percent.

Table 11. Probabilities of Working in Each Sector by Education, Age, Marital Status, and Residential Location for Males

	Agriculture Salaried	Non-Agriculture Salaried	Own-Production Agriculture	Own-Production Non-Agriculture	Mixed
Education Level					
No School	0.154	0.053	0.237	0.041	0.515
1-3 Schooling years	0.119	0.094	0.188	0.056	0.544
4-6 Schooling years	0.108	0.185	0.180	0.050	0.477
7-9 Schooling years	0.121	0.293	0.155	0.034	0.397
>Middle School	0.065	0.377	0.273	0.013	0.273
Age Groups					
16-20	0.129	0.147	0.282	0.024	0.418
21-25	0.092	0.252	0.210	0.034	0.412
31-35	0.197	0.225	0.056	0.056	0.465
36-40	0.069	0.138	0.155	0.034	0.603
41-45	0.143	0.095	0.111	0.063	0.587
46-65	0.101	0.083	0.238	0.069	0.509
Married	0.075	0.186	0.199	0.049	0.491
Time to Paved Road					
<2 Minutes	0.134	0.225	0.149	0.078	0.414
<10 Minutes	0.119	0.252	0.156	0.059	0.413
10 - 15 Minutes	0.119	0.200	0.185	0.057	0.440
15 - 30 Minutes	0.106	0.178	0.215	0.038	0.464
30 - 50 Minutes	0.120	0.152	0.202	0.037	0.489
>50 Minutes	0.121	0.092	0.244	0.029	0.515
Location index					
Less isolated	0.137	0.219	0.154	0.052	0.438
More isolated	0.099	0.128	0.249	0.034	0.490

1) Expected probabilities are based on estimates coefficients reported in Tables 8, using the formula: $P_{ij} = \exp(X_iB_j)/Sum_{k=1,\ldots,j} \exp(X_iB_k)$
2) More isolated = individuals whose location index is less than 0.024, N=1000 when using whole sample.
3) Less isolated = individuals whose location index is more or equal to 0.024, N=977 when using whole sample.

The coefficient on marital status in the case of women indicates that married[8] women are concentrated in the agriculture own-production sector, and have either a lower preference or less access to jobs, in the salaried sector. Married men are concentrated in the mixed sector, which suggests that they work in more than one sector during the year. We also estimated the

8 The category "married" also includes men and women who are *acompañado/a* (i.e., in a relationship comparable to marriage, such as cohabitation).

multinomial logits using the predicted location index as measure of geographic exclusion, the results were very much the same as above.9

5.4 Earnings Regression Results

Table 12 and 13 shows the labor income equations for all five sectors, for males and females, respectively. In this set of labor income equations, the predicted location index is added as a measure of geographic exclusion. When significant, the coefficients have the expected signs. Particularly striking is the small adjusted R-squares reported by the regressions; the adjusted R-squares of the income labor regressions range from 0 to 25 percent, showing how little the usual human capital variables explain labor income for the rural sample. There must be other variables, besides skills, which perform much better at explaining the marginal product of labor; the results of our estimations then may have omitted variables biases and they should be treated with caution.

For women, when using all sectors, living geographically excluded decreases their labor income. When the estimated coefficients from the whole sample equation are used, a woman with 3 years of schooling, 20 years old, and living far away (location index equal to 0.2) earns 3.78 colones per hour; a women with similar characteristics but living closer to urban markets (location index of .6) earns 10.37 colones per hour. Schooling correlates positively with labor income especially when working in the salaried non-agriculture sector. Women's schooling label or labor market experience does not seem to be correlated with labor income when working in any other sector but the salaried non-agriculture sector (or we lack the power to detect small differences).

For male workers, education is a determinant of labor income when allocated in salaried non-agriculture sector and when working in the own-production agricultural activities. Assuming education increases workers' labor market productivity, this result implies that the agriculture own-production sector rewards men and women in a different way, increasing men's income while not being correlated with women's. A possible explanation may be that women could be mainly producing for own consumption while men produce for commercial purposes. Future research on labor rural income should control for these two types of rural production.

9 Tables 10 and 11 show the multinomial logit results using predicted value of time to closest paved road. We also estimated the multinomial logits using the predicted location index and the results were very similar. To shorten the document the latter results are not shown but are available upon request.

Experience increases men's labor income when they work in the salaried non-agriculture sector. When working in own-production, geographic isolation decreases men's labor income. According to the estimated coefficients, a man with 3 years of schooling, 20 years old, living far away (with a location index of 0.2) earned 11.80 colones per hour; a man with similar education and experience but living closer (with a location index of 0.4) earned three times more (36 colones per hour). Women with the same schooling and experience but living in isolation (location index 0.2) earn 3.78 colones per hour, while a woman with the same human capital accumulation but living closer to urban jobs (location index = 0.4) earns twice the amount (6.25 colones per hour).

Table 12. Income Labor Function for Male Workers per Sector (c)

		Salaried		Own-Production		
	Whole Sample	Agriculture	Non-Agriculture	Agriculture	Non-Agriculture	Mixed Sector
Depend Variable: Ln Labor Income per hour						
Schooling	0.0694 ***	0.0005	0.0576 ***	0.0773 *	0.0762	0.0441 ***
	(0.0109)	(0.0124)	(0.0129)	(0.0424)	(0.0668)	(0.0122)
Experience	0.0727 ***	-0.0078	0.1047 ***	0.0911	0.0256	0.0364 **
	(0.0170)	(0.0158)	(0.0266)	(0.0640)	(0.0717)	(0.0175)
Experience Square	-0.0009 ***	0.0001	-0.0012 ***	-0.0011	-0.0003	-0.0004
	(0.0002)	(0.0002)	(0.0004)	(0.0008)	(0.0009)	(0.0002)
Predicted Location index	-0.7686	-0.3176	-0.6136	-6.9794	5.5923 **	-0.6888
	(1.51)	(0.8377)	(0.8398)	(7.0285)	(1.7259)	(1.3732)
Constant	-0.2475	1.7190 ***	-0.1359	-0.9822	0.7244	0.2255
	(0.3032)	(0.2786)	(0.4479)	(1.1366)	(1.1441)	(0.3145)
R-squared	0.0717	0.0085	0.2343	0.0308	0.2451	0.0537
F-statistic	14.59 ***	0.11	10.53 ***	1.31	4.52 **	5.72 ***
N	690	86	127	113	32	332

Notes: 1) Figures in parentheses are corrected standard errors.
2) The following levels of significance apply: * p<0.1, **p<0.05, *** p<0.01
c) Using "predicted location index" as measure of geographic isolation

Table 13. Income Labor Function for Female Workers per Sector [(c)]

		Salaried		Own-Production		
	Whole Sample	Agriculture	Non-Agriculture	Agriculture	Non-Agriculture	Mixed Sector
Depend Variable: Ln Labor Income per hour						
Schooling	0.0639 ***	0.0170	0.0588 ***	0.0186	0.0333	0.0545 *
	(0.0142)	(0.0147)	(0.0174)	(0.0465)	(0.0258)	(0.0284)
Experience	0.0295	0.0111	0.0479	0.0221	0.0809	0.0037
	(0.0253)	(0.0249)	(0.0310)	(0.0553)	(0.0538)	(0.0557)
Experience Square	-0.0002	0.0000	-0.0006	0.0001	-0.0009	0.0000
	(0.0003)	(0.0003)	(0.0004)	(0.0007)	(0.0007)	(0.0007)
Predicted Location index	2.5246 *	-1.1726	-0.8480	-5.0917	3.9406	4.4038
	(1.3835)	(0.9139)	(1.3031)	(6.4898)	(2.7647)	(3.5891)
Constant	0.1415	1.1366 **	0.5615	-0.3649	-0.2314	0.8447
	(0.4635)	(0.4275)	(0.5024)	(1.0451)	(0.9995)	(1.0675)
R-squared	0.0421	0.0417	0.098	0.0532	0.0177	0.0268
F-statistic	6.48 ***	2.14 *	4.28 **	2.16 *	1.23	1.61
N	485	58	96	143	88	100

Notes: 1) Figures in parentheses are corrected standard errors
2) The following levels of significance apply: * p<0.1, **p<0.05, *** p<0.01
c) Using "predicted location index" as measure of geographic isolation

6. Conclusions and Policy Implications

The main objective of this research is to study the consequences of living geographically excluded on three labor market outcomes: labor force participation decision, sector of employment, and labor income. The following results stand in our research:

- Geographic isolation does not discourage rural men from working. On the contrary, living away from urban and *maquila* jobs increases men's likelihood of working, but the size of the effect is small (as 90 percent of men in the sample work).
- Male and female Salvadoran workers are non-randomly allocated into five distinct sectors: agriculture and non-agriculture, salaried and own-production, and the mixed sector; the rural labor market of El Salvador is then segmented. Each sector has a different labor income setting mechanism.

- The degree of geographic isolation determines women's sector allocation more than men's. Women living in isolation are especially highly concentrated in own-production agricultural activities where women's skills are not rewarded as highly as men's. Own production in agriculture is a sector where women's human capital accumulation does not determine income labor level, whereas it does reward men's skills. Through concentration into agriculture own-account production, women living in geographic isolation realize worse labor outcomes than men.
- Education is positively correlated with labor income, especially when individuals work in the salaried sector. However, traditional human capital variables explain only a small percentage of the labor income variation in our rural sample. Besides skills, there must be other variables explaining better the marginal product of labor when using a rural sample. The results of our income labor estimations may have omitted variables biases.
- According to the labor income results, living geographically excluded decreases women's labor income. When working in own-account non-agricultural production, geographic isolation has a negative impact on men's labor income.

In terms of policy implications, providing individuals with general skills or with incentives to obtain those skills may not be by itself a sufficient economic/social policy to reduce poverty and improve the insertion into society of Salvadorans who are excluded. According to our findings, increasing education may increase men and women's labor income but only when they are working in the non-agriculture salaried sector. By increasing individuals' education in rural areas, we may promote a more egalitarian labor income distribution (i.e., decreasing the rural-urban labor income gap, improving the general welfare of women and their children). However, this study also shows that education in rural areas does not automatically translate into higher labor income; there are sectors where education does not correlate with labor productivity.

This study shows that women do not live more or less geographically excluded than comparable men. However, women living in isolation do concentrate in own-account agricultural production, an economic sector where women's productivity may have less value than men's; whether the sector allocation is by choice or whether individuals' choice is impacted by the perception or real lack of access to employment in other sectors is still unanswered. Men have

traditionally worked in agricultural activities and now capitalize on that past training and work specialization; to raise women's productivity in this sector agricultural training could be promoted specifically for women, especially those living in geographic isolation.

In general, a combination of policies may be of value. These include expanding and improving infrastructure through measures such as extending paved roads, increasing the availability of potable water and electricity, and improving public transportation. These measures can be further accompanied by promoting a de-concentration of economic activities from urban to rural areas. Technology, information on access to new markets, diversification, contacts on new buyers, and sources of employment other than agricultural may thus reach rural and isolated areas. Ultimately, these policies may help to insert geographically excluded individuals into society and improve the efficiency of the labor market and of the society at large.

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