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MIGRADOLLARS AND MEAT:

FOOD EXPENDITURES IN MEXICAN MIGRANT-SENDING HOUSEHOLDS

A Thesis in

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By

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Abstract

Using the 2002 Mexican Family Life Survey, a nationally representative survey of individuals, households, and communities, I examined the relationship between receipt of remittances and exposure to US migration from relatives living in the US on the one hand, and monthly household food expenditures on the other hand, in 7,740 households. A series of OLS regression models shows that exposure to migration is associated with greater household expenditures on food each month. Additionally, migrant-sending households spend more on Westernized foods such as animal proteins and processed foods than other households in Mexico, even after controlling for household wealth, remittances, and household composition. The results further suggest that the relationship between migration and food expenditures operates primarily through the transmission of American ideas about food consumption rather than through remittance income. Food expenditures were more strongly associated with having relatives in the US than with remittance income; this was particularly the case for households with the lowest wealth. Among the wealthiest households, those without migration exposure expend more each month on food. Overall, the results from the analyses provide consistent support for the ideation mechanism, but inconsistent support for the income mechanism. Households with relatives in the US may receive remitted money, but dietary preferences appear to be more important for stimulating changes in food expenditures.

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Section 1

Introduction

Historical shifts in dietary patterns have roughly followed fertility, mortality, and disease transitions. Societies that have transitioned to a pattern of low fertility and mortality have also shifted from infectious diseases to chronic and degenerative diseases. Often accompanying these transitions are dietary changes leading to increases in the consumption of foods high in fats and refined sugars. Studies (e.g. Popkin 1993; 1994; 1998) have found empirical associations between the nutrition transition and the demographic transition, as well as the epidemiological transition. These transitions serve to change dietary composition and thus body composition and stature (Popkin 1993), although the underlying mechanisms are not clearly identified.

Two interrelated factors fueling the nutrition transition and dietary change in less developed countries are globalization and urbanization. Globalization is related to an increasingly rapid flow of goods and information across time and space. Through the process of globalization, individuals experience rising income and changing lifestyles (Hawkes 2006). Globalization not only alters the types and quantities of foods available, but also tastes and preferences for particular brands and categories, especially non-traditional foods in less developed countries. Leatherman and Goodman (2005) refer to this process as the coca-colonization of diets. Globalization may further reduce food prices, particularly of unhealthful foods, contributing to the rise in body weight worldwide.

Urbanization, which tends to accompany modernization, is associated with contemporary forms of transportation, post-industrial jobs due to the mechanization of tasks and processes, and rising incomes. Modernization and urbanization also encourage increasing reliance on convenient packaged foods and a Westernized diet high in animal sourced foods, caloric

sweeteners, and more processed foods. Urban dwellers, in both more and less developed countries, consume more animal sourced foods and caloric sweetened foods and participate in less physical activity than those living in rural areas (Popkin and Gordon-Larsen 2004).

Another aspect of urbanization that arguably stimulates dietary change is migration. Migration, both domestic and international, is conceptualized as only *one of many* components of urbanization (Popkin 1993; 1998). Those who migrate may have increased food availability and exposure to different types of foods, which may lead to dietary change. The dietary changes are not limited to the migrant, but may also be transferred to the migrant-sending household. Popkin argues: "Migration within countries is believed to affect the diets of migrants and those of their communities of origin and destination; however, the causes and dimensions of such dietary changes are poorly understood" (1993; 143).

One of the reasons why dietary change and migration have not previously been explored is because migration has been understood as one of many features of urbanization and globalization. By broadening the conceptualization of migration and its implications, the association between dietary change and migration becomes evident. As a result, this paper puts forth the argument that the factors associated with the nutrition transition and dietary change—urbanization and globalization—are also linked to the mobility transition. In his description of the mobility transition, Zelinsky noted that "there are definite, patterned regularities in the growth of personal mobility through space-time during recent history, and these regularities comprise an essential component of the modernization process" (1971; 221-22). The mobility transition entails the diffusion of ideas, innovations, and people through space and time. Globalization and urbanization coupled with mobility allow information to be as transportable as individuals.

Figure 1-1 outlines the demographic, nutrition and mobility transitions together by combining work by Popkin (1993; 1994) and Zelinsky (1971). At the beginning of the 1970s, Zelinsky presented work drawing parallels between the 'vital' or demographic transition and the mobility transition; then in the early 1990s, Popkin provided theoretical and empirical evidence relating the demographic and nutrition transitions. Therefore both the nutrition and the mobility transition were aligned, albeit separately, into phases with the demographic transition. This paper unites the nutrition and mobility transitions, using the demographic transition as the connecting spatiotemporal process. This paper is, to my knowledge, the only piece to link the mobility transition to the nutrition transition.

Figure 1-1: Connections between the Demographic, Nutrition, and Mobility Transitions

Stage	Demographic Transition	Nutrition Transition	Mobility Transition
Phase III	1) Declines in fertility, slow at first then rapid, and reach the mortality level 2) Continuing but slow declines in mortality 3) Declines in natural increase	Receding Famine: 1) A diet high in starches, low-fat, high-fiber foods 2) Work is labor intensive 3) Slow mortality declines	1) Movement from countryside to city 2) Smaller flow of migrants to colonization frontiers 3) Emigration declines 4) More circular and complex movement
Phase IV	1) Fertility decline is over or at a low level 2) Mortality is low or near the level of fertility 3) Slight rate of natural increase	Degenerative Diseases: 1) Dietary intake shifts towards more fat, sugar, and processed foods 2) Work and leisure become increasingly sedentary 3) Rising obesity and bone density problems 4) Higher life expectancy	1) Residential mobility at a high, but stable level 2) **Movement from countryside to city** 3) Movement of migration from urban to urban 4) **Frontiers are declining** 5) Inflow of unskilled immigrants from developing countries to more developed countries 6) **Rise in international migration or circular flow of**

			skilled migrants 7) **More circulation for economics and leisure**
Phase V	1) Controlled fertility 2) Stable mortality	Behavioral Change: 1) Reduced fat, increased fruits, vegetables, and fiber 2) More physically active recreation 3) Reduced body fat and better bone health 4) Extended healthy aging	1) Declines in circular and residential mobility 2) Residential mobility is interurban 3) More unskilled workers migrate 4)More international circular movement 5)Political control of movement

Sources: Popkin (1993; 1994), and Zelinsky (1971)

Referencing Phase IV, the connection between the nutrition and mobility transition are clear. The mobility transition in this phase emphasizes international migration, urbanization, and circular movement of migrants between home and host country. Also essential to the mobility transition is the declining significance of political borders due to globalization. In this same stage, the nutrition transition points to shifting dietary patterns due to urbanization and globalization.

Rivera and colleagues contend that Mexico is currently in the Phase IV of the nutrition and demographic transition and has been since the 1990s (Rivera et al. 2004). Moreover, the rate at which Mexico is transitioning is rapid compared with other countries. The period of transition parallels a time when international and circular migration from Mexico to the United States was surging. From 1990-1995, the average annual number of Mexican migrants to the US was 290,000; from 1996-2000 this figure had increased to 505,000 (Latapi and Martin 2006).

Contemporaneous to the flow in Mexican migration to and from the US are marked negative nutritional changes in Mexico. The overall amount of kilocalories available per capita in Mexico rose from 1990 to 1999 to a peak of approximately 3200 kcal (Bermudez and Tucker

2003). Mexican diets of both the wealthy and poor experienced a substantial shift from the late 1980s to 1999 towards a diet higher in fat and refined carbohydrates and lower in cereals, vegetables, starchy roots and fruits (Rivera et al. 2004; Bermudez and Tucker 2003).

Section 2

Review of the Literature

As previously discussed, Popkin (1993) hypothesized that migration not only alters the diet of the individual migrant, but also the diets of those left behind in the migrant-sending household. While he puts forth this argument, he offers no ideas about the potential mechanisms linking migration to the diet of the migrant and those remaining in the sending household. Thoughts about the mobility transition and globalization point to the possibility that migration leads to dietary change through two mechanisms—increased income from remittances flowing back to the migrant-sending household and from the migrant acquiring Westernized dietary ideas that are transferred to their non-migrant relatives. Both are discussed in greater detail below.

Income

A Mexican household that receives remittances, domestic or international in origin, has an additional source of income to supplement the household's total income. For the 4 million Mexican households that receive remittances (i.e., "migradollars") each year, the "migradollars" can more than double the household income (MIF-IDB 2007; Massey and Parrado 1994). Moreover, it is estimated that 73 percent of the Mexican-born population living in the United States remits money to their families and communities in Mexico (MIF-IDB 2007). By 2006, the amount of remittances flowing from the US to Mexico surpassed US $25 billion (MIF-IDB 2007). Much less in know about the flow of domestic remittances within Mexico.

Remittances have the potential to transform the dietary preferences of the recipients toward a more Westernized diet primarily because remittances tend to be used for immediate consumption purposes (Koc and Onan 2004; Conway and Cohen 1998; Sana 2005; Durand, Parrado, and Massey 1996). Families that receive the remittances use them for "family maintenance" which includes food, clothing, health care, or other basic purchases. In Mexico, Massey and Parrado found that households spent 47.6 percent of the remittance income on family maintenance (1994). In a review of remittance expenditure literature, Durand and colleagues conclude that 50 to 90 percent of remittances are spent on current consumption (Durand, Parrado, and Massey 1996).

Remittances, even if used for current consumption purposes, are a source of further income that provide Mexican households with room in their monthly budget to purchase alternative food products that might not ordinarily be included in the expenditure. Durand and colleagues contend, "By easing household budget constraints, migradollars (remittances) enable the purchase of products that would be difficult to acquire in the absence of US migration" (Durand, Parrado, and Massey 1996; 440). As a result, remittances strengthen demand for food and in particular, Westernized foods.

Mexican households that receive remittances may alter their food expenditure patterns towards more expensive or higher quality foods, greater quantities of foods they already purchase, or new types of foods. Studies have shown that the relationship between a households' total income from remittances was negatively related to expenditures on traditional foods such as maize, beans, and chilies and positively related to expenditures on luxury food items like meat, milk, and fruit. Migrant households also spend significantly more of their income on processed foods like bread, pasta, and snacks (Kaiser and Dewey 1991).

Mexican households receiving remittances may use the income to enhance the well-being of its members. A primary method of fostering well-being is through purchasing more or different types of foods. In a mid-socioeconomic status country such as Mexico, under-nutrition has been a standing concern, despite recent reductions in its prevalence (Rivera et al. 2004). Remittances can provide much needed income to alleviate worries of food insecurity and under-nutrition while also modifying dietary consumption ideas and practices.

However, the association between remittance income and food expenditures may vary according to household wealth. Wealthy Mexican households, compared to less wealthy households, may have more financial flexibility when it comes to spending remittance income. The wealthy households in Mexico that receive remittances may choose to spend the additional income on different types of foods, higher quality foods, food similar to those purchased by the wealthy living in the United States (which tend to be a diet high in fruits, vegetables, and complex carbohydrates and limited animal sourced foods) compared to less wealthy Mexican households. Additionally, wealthy households may forgo using the remittance income on food expenditures and instead spend the remittance income or on non-food items. Therefore, for wealthy household in Mexico, remittance income may be a source of productive capital for investment rather than an additional source of income for family maintenance and food expenditures.

Ideation

Literature on the consequences of migration focuses on remittances and the economic implications of money flowing back to the migrant-sending household and often ignores the ideological implications of migration exposure. Because economic remittances are the tangible aspect of a household's migration exposure, ideation and behavioral change from exposure to

migration is less directly apparent (McKenzie 2005). Yet, in addition to economic remittances, migrant-sending households receive social remittances or the "ideas, behaviors, identities, and social capital that flow from receiving-to sending-country communities…[that] bring the social impacts of migration to the fore" (Levitt 1998; 927). Social remittances are the intangible aspects of migration that can have significant impact on the recipient.

This paper makes the case that ideas about and proclivities for Westernized foods are part of the social remittances flowing from the US to Mexico. Mexican households that have US relatives are exposed to American culture and food consumption preferences (Leatherman and Goodman 2005). Migration exposure may affect dietary preferences by encouraging families in Mexico to alter their food expenditures due to the introduction of novel ideas and information about non-traditional foods and a desire to emulate their relatives living in the US.

When social remittances are transferred, normative structures and systems of practice are arguably transmitted (Levitt 1998). In this transfer, recipients of social remittances obtain ideas about what types of food to eat, thus modifying their notions and standards of dietary expenditures and preferences. Once normative conceptions of diet have shifted, new dietary practices emerge. For example, a Mexican migrant living in the US may remit ideas about preferences for a diet high in animal sourced foods and processed foods back to the sending household. These households in Mexico might adopt the new dietary norms and begin to purchase and consume a diet similar to the migrant's.

In addition to the exchange of social remittances, immigrants to the US may experience dietary acculturation—or the acquisition of food preferences and behaviors of the host country—resulting in changes in one's diet (Satia-About et al. 2002). Dietary acculturation among immigrants often leads to the adoption of deleterious food preferences for Westernized foods

high in fat, artificial sweeteners and animal sourced foods (Popkin 2004). The new food preferences are then transferred back to the migrant-sending household in Mexico.

Additionally, research on dietary change among immigrants in the receiving country indicates that with increasing duration and across generations, immigrants adopt unhealthy dietary preferences. This implies that migrant-sending households or households in Mexico with US relatives have sustained exposure to negative Westernized dietary preferences (Akresh 2007; Landman and Cruickshank 2001). Over time, the continual contact with Westernized dietary preferences may encourage dietary change among those remaining in Mexico.

The effect of social remittances, dietary acculturation, and prolonged exposure to an Americanized diet could be worse for low wealth households in Mexico. Low wealth households may be less able to deflect the negative influences of migration exposure on Westernized food expenditures. According to the fundamental cause of disease theory (Link and Phelan 1995), those with higher socioeconomic status or wealth are able to use their resources, both in terms of health knowledge and financial, to protect themselves from health risks (e.g. a Westernized diet high in animal sourced foods and processed foods). Households with greater wealth are more likely to have more health knowledge that would guard against unhealthy dietary changes (Thomas, Strauss, and Henriques 1991). Additionally, the wealthy in Mexico may desire to emulate those of similar status in the United States who engage in more healthful dietary behaviors.

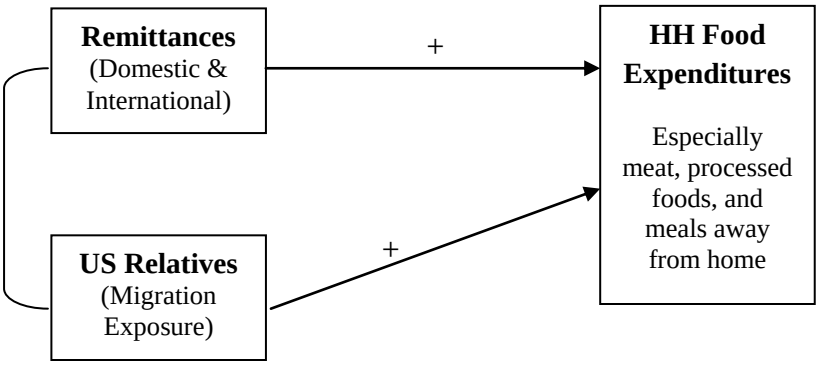
Section 3

Hypotheses & Conceptual Models

The goal of this study is to use multivariate analysis to clarify how exposure to migration and remittances change household food consumption expenditures using nationally

representative Mexican data. By analyzing the association of remittances, migration exposure and food expenditures, this research will shed light on the process of assimilation or "Americanization" of diets as a result of migration activity, even for those who merely are related to immigrants and are not immigrants themselves. Even more generally, the research will provide an example of the linkage between the nutrition and the mobility transition.

Figure 3-2: Basic Conceptual Model

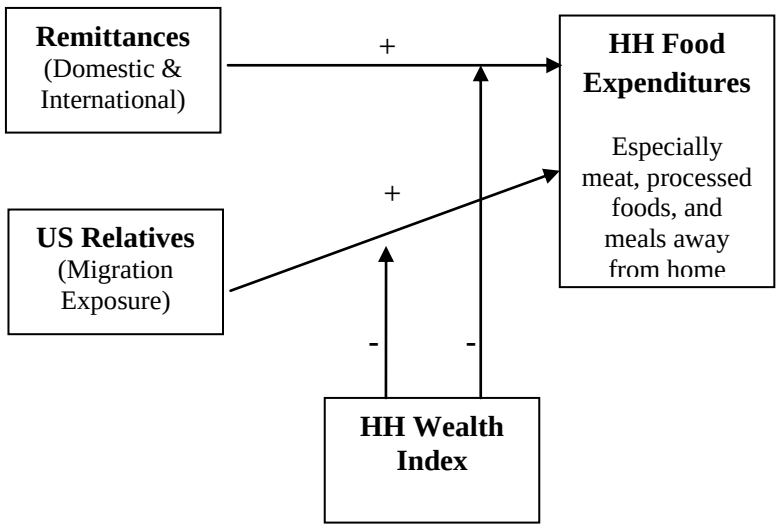


Hypothesis 1: Having relatives in the United States and the receipt of remittances are associated with higher household income; therefore, the receipt of remittances will be associated with increased household expenditures on food. I refer to this idea as the income hypothesis.

Hypothesis 2: Exposure to US migration through relatives living in the US will be positively associated with food expenditures. Therefore, US relatives will have a direct effect on food expenditures that does not work through remittances. I refer to this idea as the ideation hypothesis.

Hypothesis 3: Households that receive remittances and have US relatives will increase expenditures on foods associated with a Westernized diet—especially meat, processed foods, and meals away from home.

Figure 3-3: Moderation Conceptual Model



Hypothesis 4: The level of household wealth will moderate the relationship between remittance income and household food expenditures in migrant-sending households. Households with higher wealth are expected to spend less remittance income on food than less wealthy households. The reason is that wealthier households have a choice to spend remittances on productive investments or on current consumption. Given this choice, they may be more likely to spend remittances on non-food items (i.e., non-essentials).

Hypothesis 5: A household's level of wealth will moderate the relationship between US migration exposure and household food expenditures. Exposure to American ideals and culture through relatives living in the US may lead wealthier households to change their social comparison group. Members of wealthy migrant-sending households may come to compare themselves to wealthy US natives and Mexican-Americans rather than wealthy Mexicans. The wealthy in Mexico may desire to emulate the diet of wealthy Americans whose diet is shifting towards behavioral change in the fifth stage of the nutrition transition (i.e., shifts away from processed foods and meat and toward smaller portions, more fresh fruits and vegetables, and increased physical activity).

Section 4

Data

This study used the 2002 wave of the Mexican Family Life Survey (MxFLS) to test the hypotheses about exposure to migration and changes in household food consumption patterns. The Mexican Family Life Survey is a nationally representative, longitudinal study of individuals, households, and communities conducted by Centro de Investigaction y Docencia Economicas, A.C. (CIDE), Universidad Iberoamericana (UIA) and National Institute of Geography Statistics and Information (INEGI, Spanish acronym). The MxFLS is a probabilistic, stratified multistage cluster sample, a strategy also used by the INEGI. At every stage the sample is independent. The primary sampling units are private Mexican households in 2002. MxFLS selects PSUs "under criterions of national, urban-rural, and regional representations on pre-established demographic and economic variables" (Rubalcava and Teruel 2006).

The baseline wave of data (2002) surveyed 8,440 households and 35,677 individuals in 150 communities in Mexico. The survey included an oversample for rural communities with populations less than 2,500 people. The survey is representative at the national, regional, and urban/rural levels. The survey collected social, economic, demographic, and health behavior information for individuals, families, and communities. The MxFLS team interviewed every household member over 12 years of age.

The analytical sample for the analysis was reduced from 8,441 households in the entire sample to 7,740 households that have complete information on food expenditures, the key independent variables, and the controls. All households reported information on relatives living in the United States. Approximately 5 percent of households are excluded from the analysis due to missing values on remittance income. A household remittance income of zero was considered

a valid response. The remaining households (4.61%) were excluded from the analytical sample due to missing values on the monthly income variable.

Section 5

Measures

Dependent Variable

The dependent variable is the log of monthly household food expenditures. This variable was constructed by first creating six exhaustive monthly household food expenditure food categories: fruits (bananas, apples, oranges, and other fruits); vegetables (onions, potatoes, chilies, and other vegetables); cereals and grains (pasta, rice, crackers, legumes, and other cereals); animal protein (beef, pork, tuna, fish, cheese, dairy products, and other animal sourced foods); processed foods (beverages, coffee, vegetable oils, and packaged foods); and meals away from the home either at restaurants or street vendors. The food expenditure categories were summed to create a monthly food expenditure variable. The log was taken of the sum of the food expenditures to provide an approximately normal distribution of the variable. The variable ranges from 0 to 12.56 with a mean of 6.71 and a standard deviation of 1.26. For the analysis by individual expenditure categories, each food expenditure category was logged to approximate a normal distribution.

Independent Variables

The association of migration with food expenditures at the household level is theorized to operate through two mechanisms—ideation and income. Ideation was operationalized as exposure to US migration through relatives living in the US and income as remittance receipt.

Exposure to Migration

All adult household members aged 12 and above were asked whether or not they have relatives in the US. Each individual was permitted to report a maximum of four relatives in the US. The individual level variable was collapsed at the household level to provide each household with the maximum number of US relatives reported by any household member. At the household level, the maximum number of reported US relatives did not exceed four. This strategy was employed rather than summing the number of relatives reported across all household members because of concerns of double counting and overstating a household's total number of US relatives[1]. The continuous measure of US relatives was dichotomized. In the analytical sample, 48.77 percent of households reported exposure to migration through US relatives.

Remittances

Remittances are conceptualized as monetary transfers from non-household members that confer additional income to a migrant-sending household. Questions regarding the receipt of monetary transfers were asked to all household members over age 12. The respondent was asked if they received any transfers from a parent, sibling, child, or other non-resident person. The questions asked, "During the last 12 months, what kind of help did you totally receive from these people and how much was that?" 1) Money to pay expenses related to their health; 2) Pay school tuition; 3) Any other money support; 4) Other, specify monetary amount. The total amount of transfers received from any person was summed for each individual in the household. A total household remittance value was calculated by summing across the individuals in the household. It is unlikely that more than one member of the household reported the same remittance, reducing the likelihood of overstating a household's total remittance receipt.

[1] In the analysis, both constructions of exposure to migration are tested and found not to produce differing results.

To capture an income effect on food expenditures it was necessary to include all remittances, not just those originating from the US. The data provides information on whether or not a household receives remittances and whether or not a household has relatives abroad, but data limitations make it difficult to pinpoint whether the remittance is from the same relative living in the United States, Mexico, or elsewhere. Therefore, the remittances included domestic and international transfers. While it is likely that US relatives remit money to their Mexican families, the correlation between US relatives and remittances in the analytical sample was only 0.05 possibly reflecting a data quality problem or a possible distinction between the income and ideation hypotheses. I also tested whether the association of remittances with food expenditures differs between households with migrants in the US and households without US migrants. That is, an interaction term between US relatives and remittances was tested to determine if the origin of the remittance (i.e. domestic or international) was important. The interaction term was statistically insignificant and was dropped from the models. This suggests that the association of remittances with food expenditures does not depend on where the remittances come from.

Remittances were reported in 1000s of pesos[2]. Of the households in the analytical sample, 61 percent reported the receipt of a remittance with the average remittance approximately 2438.37 pesos (sd=17,362.82 pesos).

Controls

Demographic and geographic controls were used in the multivariate models. The socioeconomic status (SES) of a household was measured using three variables. First, monthly income was estimated as the logged monthly earnings of a household from wage labor, but excluding remittance or transfer income. The mean monthly household income for the analytical

[2] Remittance income, unlike the other monetary variables, was not logged. A log transformation of remittance income was tested, but did not approximate a more normal distribution than the non-transformed variable.

sample was 4277.53 (sd=18,385.25). Second, household participation in social programs in 2002 was measured using a dichotomous indicator (1=household participation). Almost twenty-four percent of households participate in some type of social program that provides monetary or in-kind support. Finally, household socioeconomic status was measured by a wealth index including the presence of household appliances like a washing machine, stove, and a telephone, if a house had electricity, the type of plumbing, and the flooring material. Research in developing countries often employs a wealth index (Titaley et al. 2008; Hong, Banta, and Betancourt 2006). The measure ranged from 0 to 11; a score of 11 indicated the highest level of wealth. In the analytical sample, the mean of wealth was 7.23 (sd=2.0).

Place of residence was measured by a rural dummy variable (areas that have less than 2,500 residents) and five regional dummies in order to control for the relative wealth and industrialization of Mexican regions. The reference category was the northwest region of the country that is heavily industrialized and considered the wealthiest region. Forty-two percent of the sample resided in a rural area of Mexico. The sample was evenly distributed in the five regions of the country with the exception of the central region only representing 19.5 percent of the sample.

The household food expenditures variable did not take into account the age and sex structure of a household. Therefore, it was necessary to construct a household adult equivalency (AE) to control for the daily energy requirement of the household members while considering household composition. For example, a household of four adults would have a higher AE than a household with two adults and two children under the age of 10. To construct the adult equivalency, the recommended dietary allowance (RDA) for each household member (based on

age and sex) was divided by the adult RDA, 2250 kcalories[3]. The individual adult equivalencies were then summed across a household to create the household adult equivalency (AE).

Additionally, the number of children aged eighteen years or younger residing in a household was used as a control. Ninety-seven percent of the households in the sample had five or fewer children.

Two characteristics of the household head, gender and educational attainment, were used as controls. Approximately 20 percent of the households in the sample were headed by women. Forty-seven percent of the household heads in the sample had only an elementary level education; almost 20 percent had a secondary level education; 9 percent had a high school education, and 9 percent had a college level education. Roughly 15 percent of the household heads had no education.

The final measures were interaction terms between the dichotomous indicator of US relatives and household wealth and between remittance income and household wealth. The former interaction was used to estimate the association of exposure to migration with households' food expenditures depending on a households' level of wealth. The latter interaction was used to demonstrate how at differing levels of household wealth food expenditures vary according to remittance income.

Section 6

Analysis

To test the aforementioned research hypotheses, this study estimated a series of ordinary least squares regression (OLS) models. In ordinary least squares regression, the aim is to

[3] The recommended dietary allowances are taken from the 10th Edition of the *Recommended Dietary Allowances*, published in 1989 by the Food and Nutrition Board Commission of Life Sciences, National Research Council in the United States. Prior work by Rivera et al. (2002) utilized the US RDA's when analyzing Mexican food expenditures. The analysis presented in this paper will also test recommended dietary allowances specific to Mexico as specified in Coplamar (1982).

minimize the sum of the squared residuals to find the best, linear unbiased estimator (BLUE). OLS minimizes the difference between the observed values and the predicted values. The coefficients are interpreted as for each unit increase in X_k, there is a β_k increase in y holding all other predictors constant.

The OLS equation for the analysis of household food expenditures was:

$$Y_{logged\ HH\ \text{Food Expneds}} = \beta_0 + \beta_1 X(\text{US relatives}) + \beta_2 X_2\ (\text{Remittances}) + \boldsymbol{\beta_3 X(SES)} + \boldsymbol{\beta_4 X(Region)} + \boldsymbol{\beta_5 X(HH\ head)} + \beta_6 X_6\ (\text{Children in HH}) + \beta_7 X_7\ (\text{AE}) + E$$

where X_1 (US relatives) is dichotomous indicator of whether any household member has a relative living in the United States; X_2 (Remittances) is a continuous measure of the total households income from domestic and international remittances measured in 1000 pesos; **X(SES)** is a vector of socioeconomic status variables including a household's monthly income (not including remittance income), the level of household wealth, and a dichotomous indictor of household participation in social programs; **X(Region)** is a vector of regional dummy variables to control for rural dwelling and region of Mexico; **X(HH head)** is a vector of characteristics of the household head including gender and educational attainment; X_6 (Children in HH) is a continuous measure of the number of children aged 18 and under residing in a household; and X_7 (AE) is a control for the household adult equivalency.

To test the first two hypotheses, an OLS regression was estimated regressing household food expenditures on US relatives and a household's total remittance income controlling for AE, number of children, region, the characteristics of the household head, and the socioeconomic status of the household. Household food expenditures were expected to be more Westernized with increasing economic and social remittances as stated in Hypothesis 3. To test this hypothesis, each food expenditure category was regressed on the indicators of US relatives and total remittances and the set of control variables.

As another test of the relationship between ideational and income effects on household food expenditures, interaction terms were added to the basic model regressing household food expenditures on US relatives, remittance receipt, and the control variables. Hypothesis 4 suggested an interaction between household wealth and remittance income—testing the income theory of dietary change; hypothesis 5 implied an interaction between household wealth and US relatives—assessing the suggestion that ideational changes drive dietary modifications.

Section 7

Results

Table 7-1 presents the descriptive statistics for the analytical sample broken down by whether or not households report relatives living in the United States. The two types of households are similar on most characteristics, with the exceptions being remittance values and food expenditures by category. The majority of Mexican households do not have US relatives (51.23 percent). Households reporting US relatives receive, on average, a remittance twice that of households without US relatives (3389.69 pesos versus 1532.64 pesos). Households with US relatives have higher household wealth (7.58 versus 6.90), but lower monthly income than households without US relatives (4251.78 versus 4302.05).

The mean household total food expenditures vary depending on whether a Mexican household has US relatives. Households with US relatives report spending an average of 78 pesos more each month on food (about 6 percent more). Supporting evidence found by prior research, households without relatives living in the US report higher spending each month on vegetables and cereals/grains by approximately 30 pesos. On the other hand, households with US relatives expend between 30 and 70 pesos each month on meals away from home, processed foods, and animal sourced foods.

Table 7- 1: Descriptive Statistics for Migrant-Sending and Non-migrant sending Households (N=7740)

	US Relatives	No US Relatives
Mexican Households	48.77%	51.23%
Mean Remittance Value[1]	3389.69 (23411.29)	1532.64 (8066.03)
Household Wealth	7.58 (1.77)	6.9 (2.15)
Household Monthly Income[12]	4251.78 (7394.30)	4302.05 (24654.86)
Mean Total Food Monthly Expenditures[1]	1382.15 (2908.17)	1304.34 (4901.15)
Fruit	139.1 (201.47)	137.4 (709.90)
Vegetable	172.77 (262.85)	204.7 (3192.86)
Cereal/Grain	182.71 (681.36)	216.62 (1924.75)
Animal Sourced Foods	456.78 (670.11)	389.64 (419.04)
Processed Foods	260.49 (1169.54)	213.58 (341.10)
Meals away from Home	170.3 (1513.09)	142.42 (454.16)
Rural	42.36%	41.36%
Northeast	21.56%	18.56%
West	26.89%	13.57%
Central	17.09%	21.72%
South Southwest	13.19%	26.89%
Northwest	21.27%	19.27%
Number of Children in the Household	1.89 (1.62)	1.73 (1.64)
Adult Equivalency	4.41 (2.04)	4.12 (2.08)
Female Headed Household	20.29%	20.08%
Education of Household Head		
No Education	12.66%	16.42%
Elementary	48.29%	45.93%
Secondary	20.29%	18.54%
High School	9.40%	9.53%
College	8.82%	9.23%

[1] In pesos

[2] Income does not include remittance income

(Standard Deviations in parentheses)

Hypotheses 1 and 2 are tested by estimating the association between US migration exposure and household remittance income with household food expenditures in Models 1 and 2

of Table 7-2. The second model includes a measure of household wealth. Households that have relatives living in the US spend significantly more each month on food (10.7 percent) than households without US relatives (Model 1) providing support for Hypothesis 2. The receipt of remittances from domestic or international sources is positively associated with food expenditures for Mexican households (0.2 percent per 1000 pesos) supporting Hypothesis 1; but is modest in comparison to exposure to migration (Model 1). Whereas having US relatives is associated with a 10.7 percent increase in food expenditures, the average remittance among migrant-sending households (3,390 pesos) is associated with an increase of only 0.7 percent. Household income is also positively related to monthly food expenditures.

Households in every other region of Mexico expend significantly less money on food than those in the wealthy, industrialized northwest region. Moreover, urban households spend more on food than rural households, probably due to the availability of food in urban areas. Female headed households spend about 10 percent less on food each month compared to male headed households holding all else constant (Model 1). The level of educational attainment of the household head is positively associated with household monthly food expenditures. Households run by a head with less than a high school education spend between 14 and 70 percent less on food than households headed by a high school graduate. Compared to high school educated household heads, only households headed by college educated individuals spend significantly more each month on food (by 21 percent, Model 1).

The household wealth index is added in Model 2 and is a significant predictor of household food expenditures. The relationship between household wealth and food expenditures is positive; each unit gain in household wealth is associated with higher food expenditures (by 11.2 percent). The inclusion of wealth, as a control for socioeconomic status, reduces the

relationship between migration exposure and food expenditures by almost half. Receipt of remittances, controlling for the inclusion of wealth, remains significant in predicting household food expenditures. In Model 2, US relatives, while only marginally significant, has a larger effect than remittances. Overall, Table 7-2 provides mixed support for both the income (Hypothesis 1) and ideation (Hypothesis 2) mechanisms.

Table 7-2: OLS Regression Predicting the Log of Monthly Household Food Expenditures (N=7740)

	Model 1		Model 2	
	B	SE(B)	B	SE(B)
Constant	6.633 ***	0.064	5.796 ***	0.088
Adult Equivalency	0.097 ***	0.012	0.068 ***	0.012
US Relatives	0.107 ***	0.027	0.051 †	0.027
Remittances (1000 pesos)	0.002 **	0.001	0.002 *	0.001
Household Wealth Index			0.112 ***	0.008
Log Monthly Household Income[1]	0.039 ***	0.004	0.035 ***	0.004
Household Social Program	-0.070 †	0.036	-0.024	0.036
Rural	-0.244 ***	0.032	-0.141 ***	0.032
Northeast	-0.203 ***	0.042	-0.253 ***	0.042
West	-0.233 ***	0.042	-0.206 ***	0.042
Central	-0.218 ***	0.042	-0.168 ***	0.042
South Southwest	-0.212 ***	0.042	-0.094 *	0.043
Female Headed Household	-0.097 **	0.035	-0.095 **	0.035
Education of HH Head				
No Education	-0.693 ***	0.058	-0.527 ***	0.059
Elementary	-0.406 ***	0.048	-0.321 ***	0.048
Secondary	-0.141 **	0.052	-0.116 *	0.051
College	0.212 ***	0.061	0.144 *	0.061
Number of Children in HH	-0.016	0.014	0.016	0.014
R-Squared	0.1369		0.1574	

*p<0.05; **p<0.01; ***p<0.001

†p<0.10

[1] Monthly Household Income does not include remittance income

The results from Table 7-2 suggest a positive relationship between food expenditures in migrant-sending households and exposure to migration and the receipt of remittances; however,

the results do not reveal which food categories drive the positive association with food expenditures. Table 7-3 presents the results for a series of regressions predicting each food expenditure category, testing Hypothesis 3. These models include all the controls as in Model 2 in Table 7-2, including household wealth. US migration exposure and the receipt of remittances is positively related to food expenditures, including foods associated with a Westernized diet (animal sourced and processed foods) and those associated with a more traditional diet (fruits and vegetables).

Exposure to American ideas about dietary preferences through US relatives is significantly related to positive expenditures on animal sourced foods (by 13.5 percent), processed foods (by 10.8 percent), vegetables (by 8.5 percent), and fruits (by 11.7 percent) as seen in Table 7-3. Conversely, remittances do not operate in the expected direction. Remittances are positively related to expenditures on vegetables, but negatively associated with animal sourced food expenditures.

Wealthier households spend significantly more on each food category than less wealthy households. As wealth increases, households on average spend 17 percent more on fruit and 20 percent more each month on animal sourced foods holding all else constant, including monthly household income and remittance income (Table 7-3). Additionally, households with higher monthly incomes spend more in each food expenditure category than households with lower monthly incomes.

Table 7-3: OLS Regression Predicting the Log of Monthly Household Food Expenditures by Category (N=7740)

	Fruit		Vegetables		Cerals/Grains		Animal Sourced Foods		Processed Foods		Meals Away from Home	
	B	SE(B)	B	SE(B)	B	SE(B)	B	SE(B)	B	SE(B)	B	SE(B)
Constant	2.371 ***	0.132	3.077 ***	0.107	3.531 ***	0.120	3.574 ***	0.134	4.075 ***	0.114	1.547 ***	0.183
Adult Equivalency	0.063 ***	0.017	0.136 ***	0.014	0.092 ***	0.016	0.114 ***	0.018	0.082 ***	0.015	-0.107 ***	0.024
US Relatives	0.117 **	0.041	0.085 *	0.033	0.001	0.037	0.135 ***	0.042	0.108 **	0.035	0.110 †	0.057
Remittances (1000 pesos)	0.000	0.001	0.002 *	0.001	-0.001	0.001	-0.002 †	0.001	-0.001	0.001	0.001	0.002
Household Wealth Index	0.169 ***	0.012	0.096 ***	0.010	0.072 ***	0.011	0.196 ***	0.012	0.106 ***	0.011	0.106 ***	0.017
Log Monthly Household Income[1]	0.045 ***	0.006	0.034 ***	0.005	0.028 ***	0.006	0.041 ***	0.006	0.037 ***	0.005	0.067 ***	0.009
Household Social Program	-0.129 *	0.054	-0.019	0.044	0.051	0.049	-0.110 *	0.055	-0.089 †	0.047	0.078	0.075
Rural	-0.168 ***	0.048	0.009	0.039	-0.015	0.044	-0.248 ***	0.049	-0.222 ***	0.042	-0.342 ***	0.067
Northeast	-0.172 **	0.062	-0.126 *	0.051	-0.045	0.057	-0.285 ***	0.063	-0.428 ***	0.054	-0.358 ***	0.086
West	0.161 **	0.063	-0.176 ***	0.051	-0.266 ***	0.057	-0.358 ***	0.064	-0.578 ***	0.054	-0.046	0.087
Central	0.211 ***	0.063	-0.004	0.051	-0.345 ***	0.057	-0.268 ***	0.064	-0.683 ***	0.054	0.238 **	0.087
South Southwest	-0.010	0.064	-0.272 ***	0.052	-0.011	0.058	-0.090	0.065	-0.337 ***	0.055	-0.023	0.089
Female Headed Household	0.030	0.052	-0.035	0.042	-0.051	0.047	-0.125 *	0.053	-0.029	0.045	0.058	0.072
Education of HH Head												
No Education	-0.577 ***	0.087	-0.107	0.071	-0.444 ***	0.080	-0.685 ***	0.089	-0.570 ***	0.076	-1.333 ***	0.122
Elementary	-0.287 ***	0.071	0.059	0.058	-0.317 ***	0.065	-0.286 ***	0.073	-0.303 ***	0.062	-1.075 ***	0.099
Secondary	-0.056	0.077	0.173 **	0.063	-0.098	0.070	-0.017	0.078	-0.112 †	0.066	-0.673 ***	0.107
College	0.076	0.091	0.031	0.074	-0.068	0.083	-0.031	0.092	0.003	0.079	0.654 ***	0.126
Number of Children in HH	0.031	0.021	-0.018	0.017	0.089 ***	0.019	0.009	0.021	0.009	0.018	-0.004	0.029
R-Squared	0.117		0.092		0.083		0.154		0.129		0.119	

*p<0.05; **p<0.01; ***p<0.001

†p<0.10

[1] Monthly Household Income does not include remittance income

Table 7-4 shows the results when interaction terms between wealth and remittances and wealth and US relatives are added to the food expenditure model. Model 1 tests if ideational change is a moderating mechanism for shifting food expenditures as suggested in Hypothesis 5. The interaction is statistically significant demonstrating the relationship between exposure to American ideas through migrant relatives and monthly food expenditure varies according to a households' level of wealth. Model 2 tests the interaction between household wealth and remittances, or the idea proposed in Hypothesis 4 that dietary change is the result of higher household income; this interaction is statistically non-significant. Both interaction terms are added to Model 3 of Table 7-4. The results of the previous two models hold providing further support for the hypothesis that ideation is the mechanism that appears to modify food expenditures.

The interaction between wealth and US relatives is plotted in Figure 7-4. For households with the lowest wealth, those with migration exposure have higher monthly food expenditures than similar wealth households with no US migration exposure. Food expenditures are equivalent between households with and without US relatives when the household wealth index is between 9 and 10. The wealthiest households without US relatives spend more on food than households with US relatives, indicating a reversal in food expenditures by migration exposure. Wealthier households in Mexico may desire to emulate the wealthy living in the US because of their exposure to American ideas and culture through migration. Thus, wealthy Mexican households with exposure to migration report lower food expenditures than households without migration exposure.

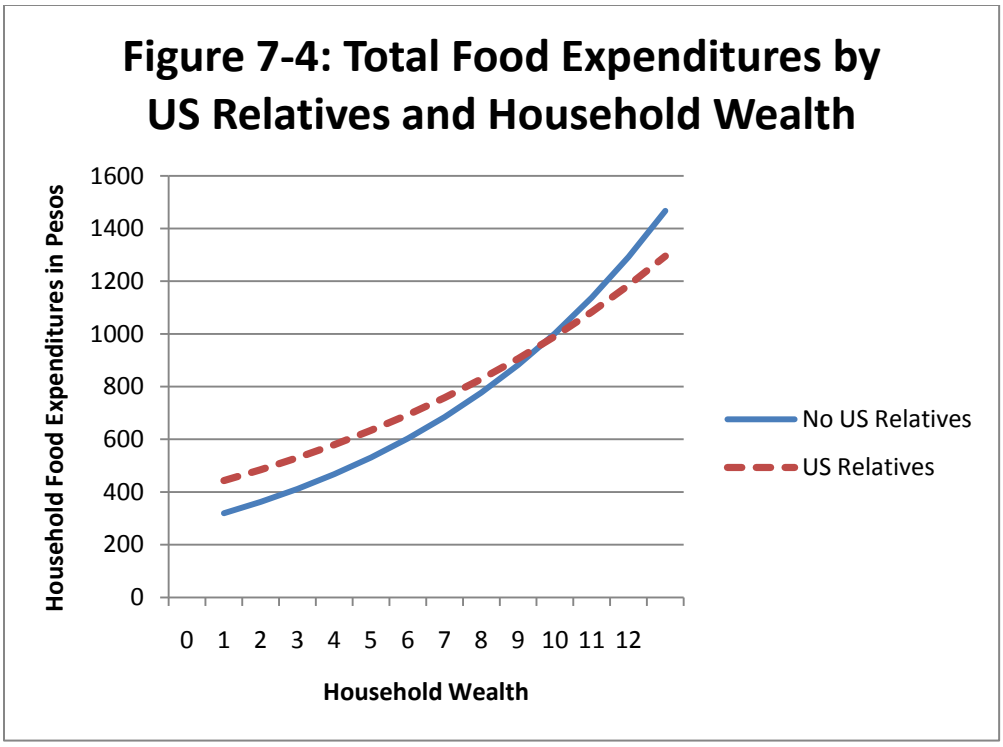
Table 7-4: OLS Regression Predicting the Log of Monthly Household Food Expenditures with Wealth Interactions (N=7740)

	Model 1		Model 2		Model 3	
	B	SE(B)	B	SE(B)	B	SE(B)
Constant	5.688 ***	0.097	5.803 ***	0.089	5.693 ***†	0.097
Adult Equivalency	0.069 ***	0.012	0.069 ***	0.012	0.069 ***†	0.012
US Relatives	0.328 **	0.104	0.052 †	0.027	0.336 ***†	0.104
Remittances (1000 pesos)	0.002 *	0.001	-0.002	0.005	-0.003	0.005
Household Wealth Index	0.127 ***	0.010	0.111 ***	0.008	0.126 ***†	0.010
Household Wealth*US Relatives	-0.038 **	0.014			-0.039 **	0.014
Household Wealth*Remittances			0.000	0.001	0.001	0.001
Log Monthly Household Income[1]	0.036 ***	0.004	0.035 ***	0.004	0.036 ***†	0.004
Household Social Program	-0.024	0.036	-0.024	0.036	-0.025	0.036
Rural	-0.139 ***	0.032	-0.141 ***	0.032	-0.139 ***†	0.032
Northeast	-0.254 ***	0.042	-0.253 ***	0.042	-0.253 ***†	0.042
West	-0.210 ***	0.042	-0.207 ***	0.042	-0.210 ***†	0.042
Central	-0.168 ***	0.042	-0.168 ***	0.042	-0.168 ***†	0.042
South Southwest	-0.089 *	0.043	-0.094 *	0.043	-0.089 *	0.043
Female Headed Household	-0.098 **	0.035	-0.095 **	0.035	-0.098 **	0.035
Education of HH Head						
No Education	-0.524 ***	0.059	-0.527 ***	0.059	-0.524 ***†	0.059
Elementary	-0.322 ***	0.048	-0.322 ***	0.048	-0.322 ***†	0.048
Secondary	-0.116 *	0.051	-0.115 *	0.051	-0.116 *	0.051
College	0.144 *	0.061	0.143 *	0.061	0.144 *	0.061
Number of Children in HH	0.016	0.014	0.016	0.014	0.015	0.014
R-Squared	0.158		0.158		0.158	

*p<0.05; **p<0.01; ***p<0.001

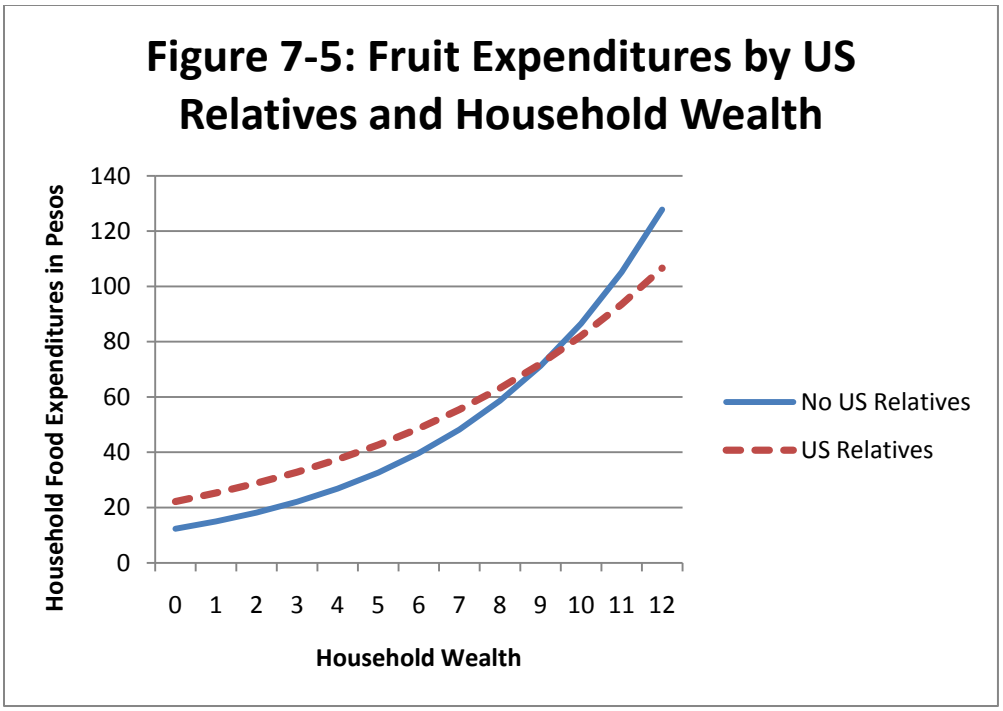
†p<0.10

[1] Monthly Household Income does not include remittance income

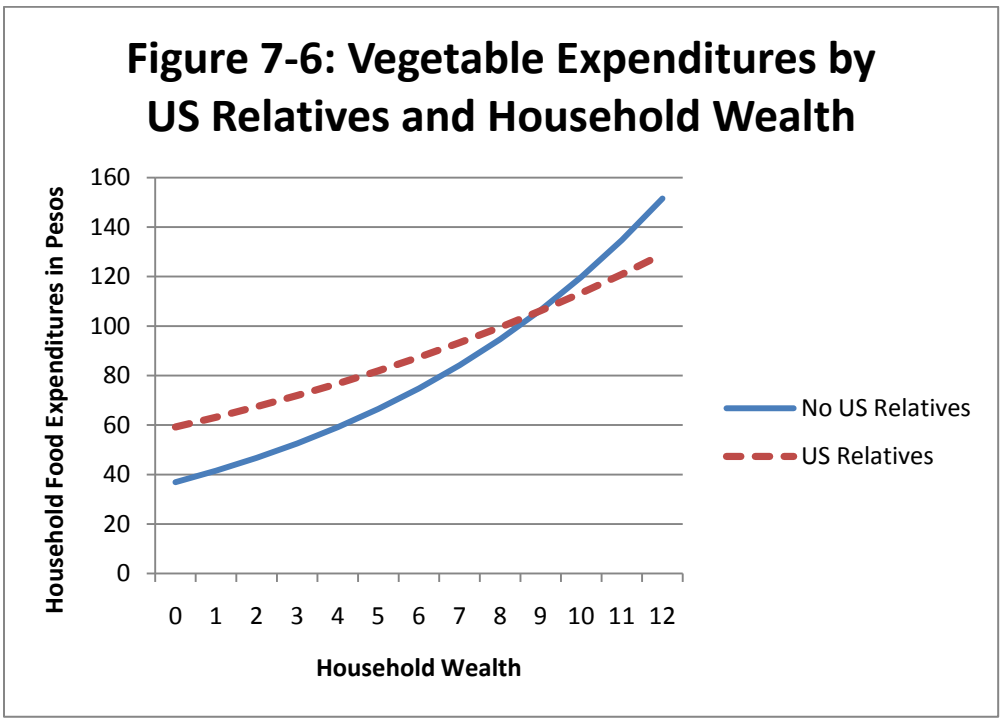


Source: Table 7-4, Model 1

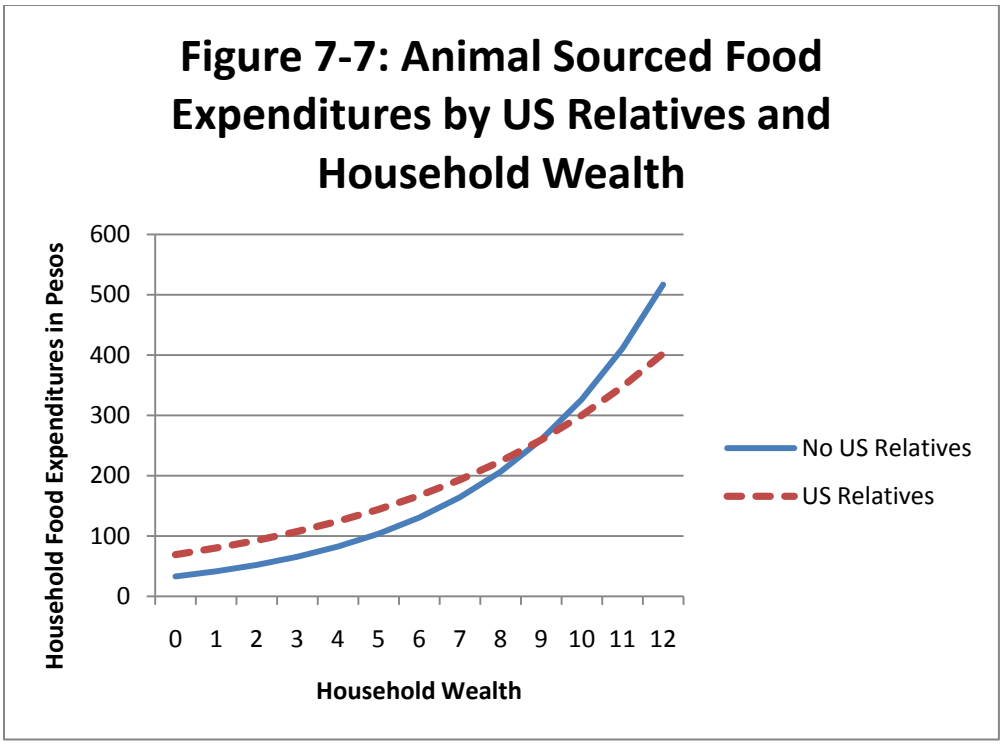
Given the significance of the interaction between wealth and US relatives in the general food expenditures model, it was added to the models predicting food expenditures separately by category (table not shown). The interaction was significant in the models predicting fruit, vegetable, animal sourced food, and processed food expenditures. The predicted association between these types of expenditures with US relatives and wealth are plotted in Figures 7-5, 7-6, 7-7, and 7-8. The pattern found in the models run by food categories is comparable to that for overall food expenditures. The wealthiest Mexican households, regardless of US relatives, spend more on fruits, vegetables, animal sourced food, and processed foods compared to all other households. For the least wealthy households, US migration exposure is associated with greater food expenditures. As household wealth increases, the relationship between migration exposure and food expenditures shifts; of wealthiest households, those *without* US relatives have the highest expenditure on fruits, vegetables, and animal sourced foods.



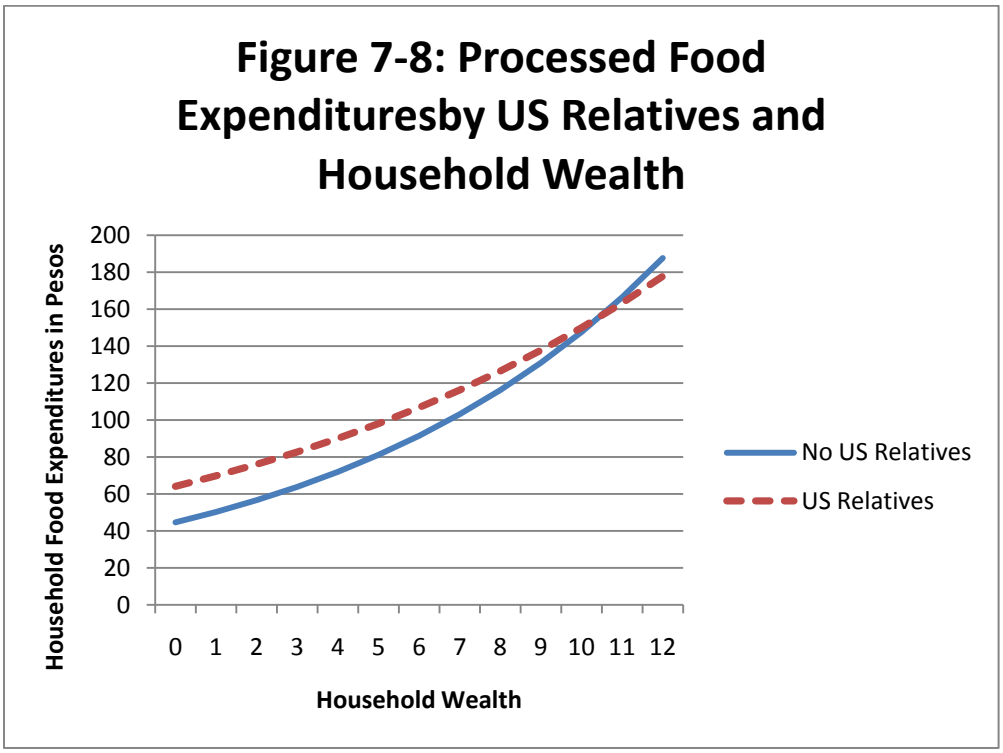
Source: OLS Regression Predicting the Log of Monthly Household Food Expenditures by Category with Wealth Interaction (Table not shown)



Source: OLS Regression Predicting the Log of Monthly Household Food Expenditures by Category with Wealth Interaction (Table not shown)



Source: OLS Regression Predicting the Log of Monthly Household Food Expenditures by Category with Wealth Interaction (Table not shown)



Source: OLS Regression Predicting the Log of Monthly Household Food Expenditures by Category with Wealth Interaction (Table not shown)

Section 8

Discussion

The nutrition transition and the shifting of diets towards more Westernized foods is occurring worldwide (Popkin and Gordon-Larsen 2004; Bermudez and Tucker 2003; Popkin 1998). Less developed countries, including Mexico, are rapidly transitioning towards diets higher in fat, refined carbohydrates, and processed foods (Rivera et al. 2004). Globalization and urbanization are thought to be the driving processes behind dietary change. However, these processes neglect an explicit discussion of migration and its role in dietary change. The process of migration, as discussed through the mobility transition, fosters increased circular movement of people, money, and ideas and more porous borders enabling migrants and those remaining in the sending community to modify their diets. For example, research indicates that in the 1990s when the rate of migration from Mexico to the US peaked, Mexico was also undergoing rapid demographic, epidemiological, and nutrition transitions (Rivera et al. 2004; Rivera et al. 2002).

Prior research provides evidence of dietary change among immigrants in the host country. Satia-About and colleagues (2002) found that immigrants to the US acculturate to an American diet low in fruits and vegetables and high in fat. But the adoption of American dietary behaviors by Hispanic immigrants to the US is dependent on the immigrant's socioeconomic position, with lower SES immigrants adopting negative dietary behaviors (Akresh 2007). The adoption of an unhealthy American diet is associated with a higher body mass index (BMI) for Hispanic immigrants (Akresh 2007), and a high BMI is associated with a wide range of negative health outcomes including diabetes and cardiovascular disease.

This paper is the first to examine food expenditures in migrant-sending households. The analysis presented in this paper tested two possible mechanisms related to shifting dietary

preferences in migrant-sending households, ideation and income. Overall, the results from the analyses presented in this paper provide inconsistent support for the income mechanism. However, evidence of the ideation mechanism driving dietary expenditures in Mexican migrant-sending households is found in all of the analyses.

Five hypotheses were put forth and tested to examine the association of ideation and income with food expenditures. The first hypothesis suggests that receipt of remittances is positively associated with food expenditures for migrant-sending households because economic remittances increase a household's total income, affording households the opportunity to buy more food or new foods. The results in Table 7-2 provide modest support for this hypothesis. The receipt of remittances is associated with slight increases in food expenditures by about 0.20 percent per 1000 pesos (Table 7-2).

Hypothesis 2 proposes that exposure to US migration is associated with increased food expenditures in migrant-sending households. The results presented in Table 7-2 demonstrate that even when controlling for household wealth, exposure to migration is positively associated with higher food expenditures supporting Hypothesis 2. The research presented in this paper suggests that exposure to American or Westernized ideas about dietary preferences, through a migrant relative living in the US, modifies dietary behaviors in Mexico.

Models were run separately on each food expenditure category to test the third hypothesis that both remittance receipt and exposure to migration are positively related to expenditures on Westernized foods. While the results of Table 7-3 suggest that households with migration exposures expend more each month on Westernized foods such as animal sourced foods and processed foods, they also spend more on fruits and vegetables. Therefore, Hypothesis 3 receives mixed support given the increases in Westernized and the concurrent increase in spending on

traditional foods. Surprisingly, remittance income is associated with increased expenditures on vegetables and decreased expenditures on animal sourced foods. It is possible that households receiving remittances rely on remittance income to survive and do not have the financial flexibility to spend an increasing proportion of their food budget on Westernized foods.

Hypothesis 3 also receives mixed support in the food expenditure models run separately by category that include the interaction of wealth and US relatives. Again, households with migration exposure spend more on both animal sourced and processed foods and fruits and vegetables.

Wealth interactions are proposed in Hypotheses 4 and 5. The former puts forth the idea that the association between remittance income and food expenditures varies according to the level of household wealth. Wealthier households are possibly more likely to expend their remittance income on productive investments rather than essential items such as food. The results presented in Table 7-4 show that Hypothesis 4 does not receive empirical support; wealthy Mexican households appear to be spending rather than investing their remittance income.

Hypothesis 5 proposes that the relationship between migration exposure and food expenditures is variable according to the level of household wealth. This hypothesis is supported in Models 1 and 3 of Table 7-4. Households with high wealth and migration exposure expend less than high wealth households without migration exposure. Those with US relatives may have greater exposure to health knowledge that makes them less susceptible to deleterious Westernized food preferences.

Overall, remittance income is a weak predictor of food expenditures in Mexican households. The finding is surprising given the amount of remittances flowing into Mexico from

the US and from within Mexico. Yet, it appears as if the effect of remittances on food expenditures is subsumed by household income. Prior research has shown that a large portion of Mexican households' use the majority of their remittance income for household maintenance (Goldring 2004; Massey and Parrado 1994; Durand, Parrado, and Massey 1996). Remittance income is written into the budget of Mexican households which may explain why remittances do not play a large role in changing diets. Goldring (2004) notes that households with and without remittance income allocate the same portion of their budget toward current consumption and household maintenance. The reliance on remittances prohibits the additional income to have any impact on dietary preferences; yet, exposure to migration appears to be associated with ideational dietary change. Households with relatives in the US may be remitting money, but more importantly dietary preferences that stimulate change in food expenditures.

Changes in dietary preferences among migrant-sending households may also be related to growing exposure to advertisements and other media sources. This could explain rising expenditures on processed foods. Yet it seems likely that advertising would also add to the number of meals households report eating away from home. The results do not indicate that households spend significantly more on meals away from home. The mixed results suggest that advertising may not play a large role in modifying food expenditures in Mexico. Another explanation for an insignificant finding for meals out is that the question regarding meals out does not distinguish between eating out at a street vendor or a meal at a restaurant. Most Mexican households report eating from street vendors regardless of income level; therefore, exposure to migration and remittance receipt may have little influence on meals eaten away from home (Maxwell et al. 2000 as cited in Haddad 2005).

Further analyses were estimated to test ideational and income effects on wealth expenditures in Mexican households. When used as a control variable, wealth is treated as if it were a static (i.e., exogenous) characteristic of the household. The inclusion of wealth in models predicting household food expenditures eliminates much of the ideational and income effects associated with migration. It is possible; however, that wealth may be better conceptualized as a dynamic expenditure category, like foods, that is sensitive to income and ideational influences. Supplementary analyses suggest that households with migration exposure or those that receive remittances differentially spend or invest in their households' wealth compared with non-migrant sending households (results available from the author). More research using longitudinal data is needed to understand wealth as a modifiable expenditure category.

Section 9

Limitations

This study has several limitations. First, the food expenditure categories are based on the household head's recall of an average week's food purchases. The categories may not capture the full range of possible food purchases. Moreover, the data do not provide information regarding the calorie or fat content of the food. For example, households may purchase low-fat animal sourced foods instead of full-fat products. Additionally, the data do not provide detail on processed foods or what type of food households consume in their meals away from home. Finally, food expenditures do not capture average food intake or alternative sources of food such as household gardens which are a source of healthful, fresh fruits and vegetables.

Second, factors other than migration exposure and the receipt of remittances can contribute to changing food preferences and behaviors. For instance, Mexicans might experience assimilation towards a more American diet even before moving to the US and factors other than

migration may contribute to dietary change. Those who choose to emigrate to the US may have lifestyles similar to Americans or come from regions in Mexico where an American diet is more prevalent regardless of migration exposure. Additionally, families that have exposure to migration, receive remittances from US relatives, or participate in circular labor migration may already be familiar with and attracted to American dietary preferences.

Finally, the analysis presented in this paper does not examine change over time in household food expenditures. Further analysis is needed to establish how migration exposure and the receipt of remittances are associated with shifting dietary preferences and expenditures over time.

Section 10

Conclusion

Exposure to migration is associated with greater household expenditures on food each month. Additionally, these households are purchasing Westernized food such as animal proteins and processed foods as well as more fruits and vegetables. Animal sourced foods are high in fat and are often more expensive than other foods and processed foods are typically refined carbohydrates and sugar-sweetened products. Fresh foods such as fruits and vegetables are part of a healthier diet, but are often expensive. Relatives in the US appear to send economic and, more importantly, social remittances including both negative and positive dietary preferences to their family in Mexico. The results of this paper suggest that food expenditures shift when Mexican households become engaged in international migration, but longitudinal analysis is needed to document these types of changes over time.

The results presented in this paper suggest a strong association between diet and migration, or more broadly, the nutrition transition and the mobility transition. As migration

between Mexico and the US continues, political boundaries are likely to continue to fade in importance and migrant-sending households in Mexico are likely to become exposed to American dietary preferences for fats, sugars, and processed foods. As such, the case of Mexico in the early 21st century provides a clear example of the connection between the nutrition and mobility transitions, especially in Phase IV of both transitions (refer to Figure 1-1).

While this paper is the first to theorize the relationship between the nutrition and mobility transitions, other empirical research has (unknowingly) established a similar association. In Phase IV of the nutrition transition, a diet high in fats, refined sugars, and processed foods is related to the rising prevalence of obesity at a time of international and circular migration in the mobility transition. Baker, Altman, and Van Hook (2009) found that among Mexican elementary school aged children living in Mexico, those exposed to US migration had higher odds of being overweight compared to Mexican children without US migration exposure. In other words, the findings propose a relationship between weight status and migration exposure—further relating the nutrition transition to the mobility transition.

One possible implication of the association between the nutrition and mobility transitions is that if the households that remained in Mexico eventually migrate to the US, they will take their newly acquired food preferences with them to the US. The logical result of increased consumption of energy dense foods over time is weight gain and change in weight status. For these immigrants, dietary acculturation and accompanying weight gain may therefore occur even prior to immigration and settlement in the US. Therefore, research on immigrant health should adopt a more comprehensive approach that takes into account migration and migration exposure in both sending and receiving communities when aiming to understand the process of dietary change towards an increasingly Westernized diet.

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