Impacts of the Great Recession on Migrant Household's Workforce Participation in Rural Guatemala

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Abstract

This thesis provides evidence of the effects of a global recession in a migrant-sending country. Building on the literature of the aggregate effects and changes in migration as a result from the Great Recession, I explained how the declines in migration and remittances from the US and Mexico led to a small increase in the workforce participation of migrant households in rural Guatemala. Considering the Great Recession as a natural experiment, I employed a difference in difference using data from the IRMISAN household survey of 2008 and 2012. My results indicated an increase in the workforce participation of migrant households, in part to offset the income lost from remittances. Furthermore, this thesis provided evidence that migrant household are more likely to experience adverse effects than non-migrant households in migrant-sending countries when recessions occur in migrant-sending countries.

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1. Introduction

As aggregate global recessions affect countries' economies differently, local economies and households also experience recession shocks in a similar fashion, although with more implications. At the intersection of aggregate global recessions and migration, this this study provides evidence that migrant households in migrant-sending countries may be disproportionally at-risk during recession compared to non-migrant households. Considering the Great Recession in the US as a natural experiment, this thesis answers the question of how net migration and remittance declines affected migrant household's workforce participation in rural Guatemala.

I built on previous literature of recession's global aggregate effects and migration effects to explain how a recession in the US led to the increase in the workforce participation of migrant households in rural Guatemala. The study of global recessions at the micro economic level had focused mostly on developed economies, whereas the study of migration tends to either focus on the impacts of migration in migrant-receiving economies or on the propensities to migrate in migrant-sending countries. Therefore, this thesis contributed to the expansion of the literature effects of global recessions in a migrant-sending country at a microeconomic level for an understudied subpopulation.

This thesis provides evidence of increases in rural migrant households' workforce participation as an effect of declines in net migration and remittance caused by the shock by the Great Recession. Using data from the extensive household panel data set *Impacto de las Remesas y Migraciones en la Seguridad Alimentaria y Nutricional*, I utilized a difference in difference design to estimate the average treatment on the treated for migrant households as a result from declines in net migration and in remittances.

My results suggest that although more migrant households joined the workforce after the Great Recession, there were not significant changes in the participation of different wage and non-wage economic activities. Moreover, substantial increases between periods for both households throughout the different economic sectors suggested that the ATT had not been substantially perceived.

I structured my thesis in the following way: in section 2, I analyzed the current literature on recession and migration; in section 3, I presented the information of my data-sets from the IRMISAN household survey; in section 4, I described and discussed my difference in difference design and the initial differences between migrant and non-migrant households; in section 5, I presented my results on the average treatment on the treated from the Great Recession on migrant household's workforce participation; in section 6, I discussed how the great recession might have impacted workforce participation in migrant households, the implications of local growth of the labor market on my ATT estimates and provided some of the policy implications of my estimates; finally in section 7, I presented the final conclusions of my study.

2. Literature Review

To explore the economic implications of the declines in net migration and remittance, I divided the literature review in three sections: First I explored the literature on the factors that affect migration, then the literature on the Great Recession's effects at micro and macro-economic levels, on migrants and on the sample I analyzed.

The literature suggests that one way to study individual's propensity to migrate may be through distinguishing push from pull factors, and that those who migrate tend to follow historical migration corridors. In addition to the economic conditions, an individual's decision to migrate is susceptible to the perceptions of the conditions abroad and from within their community. Rubenstein proposed that factors that lead to migration events may be categorized in pull and push factors: push factors incentivize individuals to migrate given the conditions from within their community of origin, whereas pull factors incentivize individuals to migrate given the conditions from outside their community (2017). Additionally, these factors may have dominant determinants, which Rubenstein classifies them as: economic factors that seek to provide better livelihood opportunities; environmental factors that might arise as a response to natural disasters or climate change; social factors that seek better or stable access to services like education or healthcare; and safety/cultural factors that derive from violent experiences, corruption, or poor governance (2017). Additionally, long term trends studied by the International Organization for Migration (IOM) suggest the existence of migration corridors that capture the accumulation of migratory movements (IOM, 2019). In the case of Guatemala,

historical migration patterns suggest that the United States, Mexico, Belize, Canada, and Spain have been the top five destination countries for outflow migration (IOM, 2020).

The Great Recession has provided a natural experiment for research on aggregate economic shocks and topics have ranged from their micro to macro-economic implications. Literature on the micro economic implications has focused on in high-income countries like the United States, like the long-term effects of intergenerational redistribution, financial shocks versus productivity slowdown, or its impact on education (Glover et al. 2020; Larkin 2021; Jackson et al. 2021; Chakrabarti 2021; Bocci, 2021). When it came to immigration, the research focused on the dual differences of outcomes between immigrant and native's employment and mechanism that could explain migration inflow and outflow (Cadena et al. 2016; Mora 2019; Fusaro et al. 2021; Tamborini et al 2021).

On the other hand, literature on the macro-economic implications has focused on the global economy. Even with a low aggregate level of immigrants around the world, the role of remittances to migrant sending countries remain far away from trivial or exclusive. In 2008, remittance flows in Latin America accounted for a substantial part of their gross domestic product, for some even ten percent (Mohapatra et al. 2010). In 2009 remittance flows declined 11.8 percent from the previous year, amounting to only $57 billion (World Bank, 2013). It took the region almost four years to rebound from its pre-recession flows (World Bank, 2013).

Additionally, literature on immigrants during the Great Recession, particularly in the United States has provided information on return migration patterns and migrant's employment vulnerabilities. Rendall et al. provided evidence that return migration declined in Mexico between 2007 and 2009, particularly in the fourth quarter of 2008 (2011), adding to the debate of whether declines, stagnation or increases in return migration occurred during this period (Rendall et al, 2011). Mora suggested that networks between migrants and their communities provided effective communication to reduce out-migration during times of recession using evidence of the Great Recession in the US (2019). Furthermore, Tamborini and Villareal used information from the Survey of Income and Program Participation to assess the risk that male immigrants' relative risk of experiencing involuntary job loss or underemployment during the Great Recession (2021). They found that immigrants were more likely to experience involuntary job loss and

underemployment relative to native-born workers (2021). Undocumented immigrants faced a greater risk of adverse job transitions, particularly underemployment in the first part of the Great Recession (Tamborini and Villareal, 2021).

For the sample I analyzed, Carletto et al. (2011) examined the relationship between migration and child growth in the rural highlands of Guatemala, finding that migration exposure increased children's Heigh-for-Age Z-scores by 0.5 standard deviations, and decreased prevalence of stunting. Furthermore, Carletto et al. assessed the effects of aggregate shocks like the Great Recession on the HAZ-scores on migrant households, providing evidence that gains on child anthropometry associated with migration exposure were susceptible to be lost during recessions (2021). In part, to the uncertain resident status of many immigrants and higher employment vulnerability that they faced during the recession (Carletto, et al., 2021). Their work contributed to the growing literature of the indirect implications of subpopulations in migrant sending countries within the discussion of the effects of Great Recession.

This research built on the literature of recession's global aggregate effects and migration to explore how the declines in net migration and remittance affected a rural region in a migrant-sending country. Using micro level data, I provide evidence of increases in migrant households' workforce participation as an effect of a recession shock in a migrant-receiving country. Furthermore, this analysis explores the patterns that migrant households pursue to offset income loss from when remittances. Additionally, I also provided evidence and policy recommendations for the case of Guatemala during recessionary periods in migrant-receiving countries, particularly the US.

3. Data

For this study I will be using household level panel data to estimate the effects of the Great Recession on migrant households' economic activities. I used *Impacto de las Remesas y Migraciones en la Seguridad Alimentaria y Nutricional* panel data set (IRMISAN) for the years of 2008 and 2012. This household survey included 52 community clusters in 6 different villages from four municipalities in Huehuetenango, located in the Western Highlands of Guatemala.

IRMISAN is an extensive household survey that also collected information on migration histories of all household members as well as residential location for all adult children and

siblings of the household head or spouse. One of the advantages of this data set is that it evenly sampled households based on migration experience and geoclimatic heterogeneity[1] of the region (Carletto et al. 2021).

This panel data set had an attrition of 7.8 percent, with information collected on 1,308 different households in 2012 (181 split-off HH and 1,127 HH of 2008) of the original 1,222 households surveyed in 2008. Geographic identifiers are provided at the cluster level (Carletto et al. 2021). Split-off households in 2012 were accounted in their original household in 2008 leaving a total of 2349 observations.

A household member was defined as any person who ate and slept on the same dwelling for at least a month over the last twelve months (Carletto et al. 2021). This differs from other household surveys in Guatemala that consider household members only to those who have dwelled for at least three months over the last twelve months. This was meant to capture the migration experiences of those members who were current migrants but had returned to their households for short periods of time over the last twelve months (Carletto et al. 2021).

I used retrospective information on household members' last and first migration experiences using the 2008 IRMISAN sample as the baseline to determine migrant households in 2008 and 2012. Migration status was determined if at least one household member, or household head's spouse or children if they did not live in the same household, was fifteen years or older and was a migrant at any year between 2004 to 2008.

Furthermore, I estimated the changes of the household workforce participation using individual level information on their work experiences. Work experiences for members 12 years asked the question if they had worked over the last twelve months and if they worked in an agricultural employment, a non-agricultural wage employment, as an owner, as a non-agricultural contractor, in their own agricultural activities or in a not remunerated position. Additionally, I used information of the annual income source composition. Constructed information of the annual income was decomposed in agricultural wages, non-agricultural wages, any wage income, net crop income, net livestock income, net income from

[1] Microregion's geoclimatic affinity may influence the agricultural and economic potential of each household. Having a representative sample by this microregions may allow to account for variation in migration experiences and economic outcomes.

non-agricultural business, total transfers income and land rental income. Furthermore, I used information on income from remittances.

Imputed information on the annual amount and the sector of the household's income provided data to estimate the changes that migrant households experienced during the period of the Great Recession. Moreover, migration experiences also informed us about the changes in net migration that occurred during the recession shock.

4. Methodology

Prior research using the sample we analyze has used differences in differences when assessing the effects that migration had on children anthropometry and its fragility (Carletto et al. 2011; Carletto et al. 2021). Consistent with prior works, I used a difference in difference design to estimate the impacts of the recession shock on the household's workforce participation. Moreover, assessing the changes in the annual income composition of the household using the same research design provided an estimate of the effects on the income sources of the household during the period of the shock.

Historical migration patterns in Guatemala suggest a mixed combination of push and pull factors. In the case of Guatemala some of the driving factors of migration relied in employment opportunities, better wages, relative physical and cultural closeness to the US and Mexican context, as well as, family reunification, vulnerability to natural disasters, crime, and insecurity (World Bank, 2018; Congressional Research Service, 2019a & 2019b). Nonetheless, I assumed that changes in pull factors affected the migration patterns during the recession shock as the benefit from migration decreased.

According to the literature, at the start of the Great Recession immigrants were affected first, leading to substantial decreases in remittance flows. Additionally, evidence of migration patterns in Mexico suggested that return migration did not seem to increase, and in some cases, it decreased, but also new migration was reduced substantially. Hence, I expected that net migration might have declined. With these new economic conditions, migrant households in Guatemala may be expected to try to offset the potential income loss from remittances.

Considering the Great Recession as natural experiment, my research design assumes two things: that there are parallel trends between migrant households and non-migrant households, and that decreases in the economic opportunities in the migrant-receiving countries caused by the

recession shock is the only thing changing in the household that can affect our outcome of interest (single treatment).

First, my study assumed the validity of the comparison group comprising of households who did not have a migrant member at any year between 2004 to 2008, i.e. the parallel or common trends assumption. For this I elaborated three balance tables by household migration status of household characteristics, household workforce participation, and household income activity. These balance tables indicated that migrant households (MHH) had larger household size, and more female potential labor than non-migrant households (NMHH). Furthermore, they also showed that fewer MHH participated in the workforce particularly in wage employments, more likely to receive income from livestock, land rental and net crop harvest but less likely to receive income from agricultural and non-agricultural wages. Self-selection, observable time-variant variables or other unobservable variables might bias our estimation in the following ways: If changes over time for migrant households were higher than expected due to selectivity, then it would positively bias my results, ending in an overestimation, whereas if the changes in migrant households were lower than expected, then it would negatively bias my results, ending in an underestimation. Indeed, selectivity is one of the main issues when estimating the causal effects of migration (Mckenzie et al., 2010).

To address observable time-variant variables I used a set of controls taken from Table 1. I then assessed how this set of variables changed because of the recession shock in table 6. Although most of these variables changed because of recession shock, their changes were not substantial. Furthermore, Carletto et al. (2021) found evidence of spillover effects of the crisis on NMHH in the four communities from qualitative research, suggesting attenuation of the ATT estimate. Nonetheless, lack of prior data stops me from assessing the validity of the commons trend assumption.

For my second assumption, citing Carletto et al, (2021) the economic downturn of Guatemala during the recession shock suggested that non-migrant households were likely to experience the economic downturn from the local economy causing an attenuation of my ATT estimate.

The causal effect of the economic crisis relies on the exogeneity of the Great Recession that did not directly impact these rural communities in the Western Highlands of Guatemala or that at least non-migrant households were overall positively affected by the GR in the US.

My estimating equation will be:

Equation 1 Estimating Equation

$$y_{ict} = \alpha_0 + \alpha_1 yr12 + \alpha_2 m_i + \delta_{DD}\left(m_i \times yr12_t\right) + \varepsilon_{ict}$$

Where y_{ict} is an outcome for household i in cluster c at time t; $yr12$ equals 1 in year $t = 2012$ and 0 in $t = 2008$; m_i equals 1 if the household had at least one migrant in $t = 2004$ through 2008 in IRMISAN 2008 sample and 0 otherwise; and ε_{ict} is an assumed idiosyncratic error term. δ_{DD} yields the estimate of the Average Treatment on the Treated (ATT) (Cunningham, 2021) of the effect of the economic shock on the migrant household's work force after the time of the recession.

Furthermore, to estimate the Average Treatment on the Treated for household workforce participation, I used the individual work experiences and set three categories: agricultural wage employment for agricultural employment labor (agricultural employment labor and owners), non-agricultural wage employment (non-agricultural wage employment) and non-wage employment (non-agricultural contractors, those who worked in their own agricultural activities or in a not remunerated position). These three categories were exhaustive but not mutually exclusive within households. Then I created a new variable if any member was employed over the last 12 months and a wage employment from the union of agricultural and non-agricultural wage employments. Then, I accounted the individual information by household adding the number of individuals in each category. Finally, I generated an indicator if the household participated in any of the five workforce categories. Similarly, I generated an indicator if the household received any income from the household's income activities.

To assess the ATT on MHH from the recession shock, I analyzed the initial differences in household characteristics, household workforce and household income activity between MHH and NMHH using balance tables (tables 1,2 and 3), established the declines in net migration and remittances (tables 4 and 5), assessed the endogeneity on my set of controls (table 6) and finally assessed the ATT for changes in the HH workforce participation (table 8) and HH income

activities (table 9) using three reduced-form models. My first reduced-form model was a simple DD from equation 1 clustering standard errors to their stratum level to address the over rejection of the null hypothesis in Diff-in-Diff designs (Bertrand et al. 2004), then I added household-level fixed effects to account for heteroskedasticity, and my third model added the set of controls from table 6 to account for time-variant changes within HH.

4.1 Balance Household Tables

Tables 1, 2 and 3 provided evidence of there were differences in household characteristics, workforce participation and income activities between migrant households and non-migrant households. Table 1 suggested significant differences in household characteristics except in male potential labor. Table 2 suggested that migrant households participated less but had not significant differences in the number of members in the workforce. Table 3 showed significant differences in the household income sources except in non-agricultural business, whereas differences in income amounts were not shown to be very different, in part for the size of their standard deviation.

Table 1 showed the household differences between those with at least one migrant and those without. Migrant households were more likely to have a larger household size, more members in their potential labor (in in their working wage 15 years and older but younger than 60), a larger number of female potential labor (PL) than NMHH. Additionally, MHH's heads were more likely to be female, older but less likely to have more education or being Ladino (non-indigenous) than NMHH. Furthermore, this sample region in 2008 showed to have a total dependency ratio of 49.6 percent within the HH, as well as a higher number of females in their working age than men. The last column indicated how many standard deviations were the differences between MHH and NHH.

Table 2 showed the average household workforce participation in 2008 by migration status. This table suggested that MHH had a lower participation in employment activities but had not significantly different average number of workers in except in non-wage activities. Panel A described that MHH on average participated less in the workforce, agricultural wage employment, they participated more in non-wage employments than NMHH. Panel B suggested that compared to NMHH, MHH had not a significant difference in the number of members

employed over the last twelve months, including wage employments in agricultural and non-agricultural activities except for non-wage activities where MHH had a higher number of participants.

Table 3 showed the difference between average household income activities in 2008 by their migration status. This table suggested there were significant differences in income activities between households, but the differences in income amount between households were less significant. In fact, large standard deviations in panel B caused by potential measurement errors[2] led me to include only Panel A in my final analysis. Panel A suggested that on average, MHH were less likely to receive income from wages than NMHH, in both agricultural and non-agricultural wages. On the other hand, MHH were more likely to receive income from livestock, land rental and net crop harvest. Consistent with their migration status, 61 percent of MHH received any income from remittances, compared to none for NMHH. This provided evidence of the exogeneity of the Great Recession. My Diff-in-Diff design assumed that any shocks in income from remittances from the US caused by the Great Recession would not impact NMHH directly. Additionally, income from remittances drove up the difference in income received from Public & Private Transfers. Panel B showed that on average MHH earned lower income from most activities, but remittances offset those differences. Consistent with my Panel A, MHH earned on average less income from wage employment (both agricultural and non-agricultural wages), non-agricultural business and net crop harvest compared to NMHH. Furthermore, MHH received more income from land rental, but the average income difference was minimal. Moreover, annual income from employment in 2008 was the highest source of income outside net transfers for both MHH and NMHH.

4.2 Great Recession changes in migration patterns and effects on remittances

Table 4 shows individual migration patterns between 2004 to 2012. This table was constructed using retrospective migration experiences of all household members, children of the HH Head or their spouse in 2012. The number of migrants in either the US or Mexico constantly increased from 2004 to 2012. Furthermore, the number of new migrants constantly increased until 2008, then it dropped to 53 in 2010, and finally bounced back to 210 in 2011. On the other

[2] In the data set, I found a significant number of households that had negative values and zeros in income activities like wage employments that caused larger standard deviations.

hand, return migration remained low until 2008 when it increased to 43 in 2009, reaching 170 in 2011. Moreover, during the period of the Great Recession in the US the ratio of return for migrants increased from 20 percent to 96.2 percent in 2010. This suggests that although the number of migrants constantly increased from 195 in 2004 to 656 in 2012, net migration declined over the period of the GR from 60 in 2007 to 40 in 2012. Table 4 provided evidence that during the Great Recession Migrant Households might either experience a larger number of members within their working age or did not change given that HH members who migrated after the 2008 HH survey might have already returned before the 2012 HH survey. On average, table 4 does not provide evidence of negative net migration, which suggest that MHH might experience lower potential labor supply if the effects were equally spread throughout MHH. Nonetheless, we might also learn that declines in overall net migration would signal a larger potential labor supply from the number of migrants returning home.

Table 5 shows the reduced-form models for change in remittances. Table 5 includes two reduced-form models, a simple DD and one with household-level fixed effects with clustered standard errors and without control. My first model estimates that Average Treatment on the Treated led to a 45.1 percentage points decrease or a 73.7 percent decrease in the number of MHH that received any income from remittances. Model 2 and provide evidence that the decrease was consistent with the inclusion of HH fixed effects. Additionally, model 1 shows that in 2012 4.91 in NMHH received an income from remittances compared to only 21.2 percent of MHH. In sum, we observe a substantial decrease in the number of MHH that received any remittance.

4.3 Time-varying controls

Table 6 shows the reduced-form models for change in my set of controls. Despite this table suggests that my controls were correlated with the recession shock, their estimates are not substantially higher. Using two Difference in Difference models on my set of control variables, I estimate that there was a positive correlation between change in my controls and the impact of the Great Recession. Nonetheless these changes would only bias my results upwards, leading to an underestimation of my ATT. My simple DD model suggests increases in HH size, FPL and MPL and HH Head's years of education and a decrease in the HH Head's age. Although only the

MPL estimate was statistically significant at a five percent level, it suggests an 18.7 percent increase (0.25 people) in the male potential labor of MHH. Moreover, both MHH and NMHH experienced overall increases from 2008 of 0.45 people in their MLP, overshadowing the increases from the recession period. With the inclusion of HH fixed effects I learned that most controls were affected by our treatment and were statistically significant, except by FPL. As a result of the treatment, in MHH the HH Head's age decreased by 2 percent, the HH size increased by 5 percent, the FPL increased by 3 percent, the MPL increased by 20 percent and HH Head's years of education increased by 11 percent. This suggests that although my controls are on average positively affected by the GR, the increases were below 10 percent, except by MPL and HH Head's year of education. The increase in MPL might signal the return of male migrant members to their MHH. Changes in the HH head's age and education might signal that given that there were split off HH in 2012, the HH head change may derive from the average age of the HH in the split off HH of that original HH, or changes in the internal composition of the HH head.

5. Results

Table 7 shows the average labor participation before and after the Great Recession in the US per household migration status. This table illustrated the difference in difference design and provided evidence of the changes of the Great Recession. After the Great Recession, the number of MHH that had at least one person working outside the HH over the last 12 months increased by 10.6 percentage points, compared to 3.7 percentage points for NMHH. The gap between MHH and NMHH decreased from 10.0 percentage points before the Great Recession to 3.1 percentage points after the recession. This estimate provides evidence that given the decreases in the number of MHH that received any remittances over the last 12 months in 2012, and the declines in net migration, it led to more MHH to join the labor force. Furthermore, the number of MHH and NMHH that did not have any member working decreased. Table 8 and 9 further describe the changes in the labor and income participation due to this increase.

Table 8 shows the reduced-form models for change in household labor participation. Column 1 suggested that the rate of increase LP for MHH was higher than NMHH after the period of the Great Recession. The simple ATT estimate on LP is consistent with my ATT

estimate in table 7. The ATT estimates suggest a 6.9 percentage points (pp) (an 8.3 percent increase) in the number of MHH that had at least one member participating in the LF (column 1), along with an 11.6 percent increase in the average number of members (ANM) participating in the LF (column 6), and both estimates were statistically significant at a 1 percent level with the introduction of HH level fixed effects and clustered standard errors. Additionally, both HH experienced an overall increase of 3.71 percentage points in LP and 0.48 people in the ANM participating in the LF, both statistically significant at a 1 percent level.

Furthermore, table 8 showed that the ATT estimates did not significantly affect the workforce participation in any employment category except in non-agricultural wage, although not statistically significant. The increase in the LP of MHH did not significantly change the employments in Wage and Non-wage categories. On the one hand, MHH experienced a 2.95 pp (4.0 percent increase) in wage employment participation (column 4), and a 2.3 percent increase in the ANM participating in wage employment (column 10). Wage employments were categorized in two non-exclusive categories: agricultural and non-agricultural. MHH experienced a 4.86 pp (an 8.1 percent increase) in agricultural wage employment participation (column 2), and a 7.4 percent increase in the ANM participating in that employment (column 7), compared to a 10 percent decrease in non-agricultural wage employment participation (column 3), and an 11.2 percent decrease in the ANM participating in that employment (8). On the other hand, MHH experienced a 6.2 percent decrease in the participation of non-wage employments (column 5), and a 0.02 percent decrease on the ANM participating in those employments. The introduction of household level fixed effects, clustered standard errors and controls changed point estimates to different degrees. The ATT changed from positive to negative with the inclusion of controls in HH participation in wage employment, and the ANM participating in wage employments, agricultural wage employments, and non-wage employments. This might suggest that the small increases in these ATTs could be accounted by my set of controls. Nonetheless, none of the ATT estimates were statistically significant at a 10 percent level.

Additionally, we observe overall increases in the HH and ANM participating in wage employments, agricultural wage employments, and non-wage employment, as well as increases at lower rates in non-agricultural wage employments.

Table 9 showed the reduced-form models for change in household income activities. Column 3 suggests that the ATT caused by the economic shock led to a 4.5 percent decrease in fraction of MHH that received any income from wage activities. Examining the ATTs from the fraction of MHH that received any income from agricultural and non-agricultural wages, I found an 11.9 decrease in the fraction of MHH that received any income received from agricultural wage activities (column 1), and a 17.9 percent in the fraction of MHH that received any income received from non-agricultural wage activities column 2). Furthermore, MHH experienced an 8.3 percent increase in the fraction of HH that received any income from non-agricultural business(es) (column 4). MHH experienced an 8.7 percent decrease in the fraction of HH that received any income from livestock (column 5). MHH experienced an 87.4 percent decrease (a 2.71 pp) in the fraction of HH that received any income from land rental (column 6). MHH experienced a 0.8 percent decrease in the fraction of HH that received any income from crop harvest activities (column 7). MHH experienced a 64.7 percent decrease in the fraction of HH that received any income from public and private transfers (column 8). The introduction of household level fixed effect, clustered and standard errors and controls change point estimates to different degrees. The ATT changed from negative to positive with the inclusion of controls in the fraction of HH that received any income from crop harvest activities. This might suggest that such small decrease may be accounted by my set of controls. Additionally, the changes experienced in private and public transfers, land rental income remained statistically significant at a 1 percent level through the three models, except by land rental income that fell to a 5 percent level. Furthermore, the changes in crop income were only statistically significant at a 5 percent level with the inclusion of controls. The rest ATT were not statistically significant at a 10 percent level.

Additionally, table 9 showed substantial growth from 2008 in the fraction of HH that received any income from wage employment, agricultural wage employment, crop harvest, non-farm business(es) and lower increases in income from livestock. Overall, the fraction of MHH that received any income in 2012 compared to 2008 experienced a 68.9 percent increase in income from wage employment (to 64.89 percent), a 131.9 percent increase in agricultural wage employments (to 55.31 percent), a 12 percent increase in crop harvest (to 99.7 percent), a 41

percent increase in non-farm business(es) (to 16.37 percent), a 11.6 percent increase in livestock (to 66.5 percent). On the other hand, MHH also experienced decreases from 2008 in the fraction of HH that received any income from non-agricultural wage employment, and land rental income. Overall, the fraction of MHH that received any income in 2012 compared to 2008 experienced a 1.4 percent decrease in non-agricultural wage employment (to 18.35percent) and a 99.5 percent decrease in land rental income (to 0.01 percent).

NMHH experienced a growth in the fraction of HH that received any income in all income generating activities, with the exemption of non-agricultural wage employment where they experienced an 18.2 percent decrease (to 16.2 percent), and a 63.9 percent decreased in land rental income (to 0.2 percent).

6. Discussion

Table 8 provided evidence that MHHs in a migrant sending country increased their participation in the workforce during a recessionary economic shock in a migrant receiving country. Consistent with an 8.3 percent increase in the fraction of MHH that had at least one person employed over the last twelve months from the economic shock, other employment categories did not change significantly. In this section I will first discuss how some factors might have affected the increase in the LP in MHH. Secondly, I will discuss some of the implications that increases in both HH experienced had on the LP. Thirdly, I discussed the connections between Tables 8 and 9. And lastly, I addressed the effects on migrant household from a policy perspective in Guatemala.

Examining the significance that remittances had on MHH's livelihoods, and how migration patterns might have affected the HH potential labor composition provide an explanation of how the economic shock affected MHH. First, remittances played a significant part of their total annual income of MHH that offset the income differences between MHH and NMHH (Table 3). My ATT estimate on remittances suggest a 73.7 percent decrease in the fraction of MHH that received any income from remittances (Table 6). Second, 61 percent of MHH received any income from remittances in 2008 (Table 3). Third, the benefits of migrating decreased while their cost of living in the US increased. For new migrants the opportunity costs to migrating decreased, while for those living in the US their costs of living increased as

consequence of the recession shock Increases in return migration during the first years of recovery from the Great Recession in the US (Table 4) signaled the difficulty that recent migrants experienced in those years, and in part consistent with the idea that earlier migrants might have saved enough to return home, suggesting that the opportunity cost returning home to staying decreased given the economic difficulty the US and Mexico. Saenz de Tejada (2009) provide evidence from focus groups and interviews that many migrants in the US fell into under- or unemployment at the beginning of the GR. Carletto et al. (2021) indicated that most returned migrants had come back home because of the lack of job opportunities, and only a small fraction that had been deported. Additionally, MHHs that did not experience reductions in their remittances during the Great Recession mentioned that their migrant member had a more stable permanence in the US such as legal status or a salaried position, while MHHs that experienced reductions in remittances mentioned that their migrant member could only afford remain in the US and did not enough money to send home (Saenz de Tejada, 2009). Fourth, return migration changed the household's potential labor force. As result from the Great Recession, HH size increased by 4.6 percent, MPL increased by 20 percent compared to a 3 percent increase in FPL for MHH (Table 5). Hence, it is reasonable to assume that a decrease in remittances was a driving factor that led to an increase in participation of MHH members in the labor force.

Hence, it is sensible to estimate that small ATT increases on the number of MHH joining the workforce may not bring significant changes in the different employment categories. In fact, in table 8 we find that there were not significant changes caused by the economic shock in the US, that is low percentage increases in HH workforce participation and the ANM who were in those employment categories and were not statistically significant changes. Nonetheless, increases in the different workforce categories from 2008 to 2012 (Table 8) might have been driven in part by changes in the composition of households, for example larger HH size, FLP and MLP, and more years of education of the HH head (Table 6). Only non-agricultural wage employments did not experience substantial endogenous increases in labor participation. Further research might explore how these endogenous increases impacted the productivity of the regions in which both HH were employed.

Moreover, decreases in the fraction of MHH that received any income from private and public transfers (Table 9) was consistent in magnitude with the declines in the number of MHH that received any remittance (private transfers) over the last 12 months (Table 5). This might suggest that magnitude of changes in public transfers might not have been significant compared to the declines in private transfers. Additionally, substantial decreases in the fraction of MHH that received any income from Land Rental Income may signal that MHH decided to increase their use of their land to cover some of the reduced income from remittances, given that income from Land Rental was minimal compared to Remittances (Table 3). Additionally, we may presume that return migrants who could not pay for their cost from migrating to the US might have sold a portion of their farmland to pay off their debts.

Finally, large standard errors and small ATT estimates in Tables 8 and 9 may be the cause of incongruency between more MHH participating in wage labor employment but fewer MHH receiving any income from wage employments as effects of the recession shock. This issue may derive from either imprecise measurement when the HH survey occurred or imprecise measurements from combining split off households in 2012 into their original household in 2008, or from small sample sizes. In fact, given that my ATT estimates were quite small, my Diff-in-Diff design would have required larger sample sizes to reduce the size of the standard errors and improve the accuracy of my estimates. Additionally, when I clustered standard errors at the sample's stratum level to address the over rejection of the null hypothesis in Diff-in-Diff designs (Bertrand et al. 2004), my estimates became less precise even when addressing some of the omitted variable bias from time-variant characteristics. Furthermore, changes experienced in both households were significantly larger than most ATT estimates which might also suggest that they might have overshadowed ATT results. Increasing my sample size would provide smaller standard errors and more accurate ATTs, and given that I am working with samples using a randomization inference to reduce the standard errors is not a reasonable option, otherwise I would fail to reflect the sample's uncertainty (Cunningham, 2021). Finally, I may also argue that the small ATT estimates occurred because it had already passed four years since the beginning of the Great Recession in the US providing time for MHH to converge with the trends of non-migrant households. This means that given that I do not have data between 2008 and 2012,

the time lag between samples may be underestimating the effects of aggregate economic shocks in migrant-receiving countries on the labor participation of migrant households in migrant-sending countries.

Although this study does not provide evidence to understand the labor demand side of the labor market in rural areas, it provides some implications of the supply side. Nonetheless, the effects may not significantly increase the wage labor market, reducing participation in non-agricultural wage labor markets. Following my assumption that the economic shock experienced by migrant household was exogenous to the local labor market, it is sensible to presume a slight rightwards shift on the supply for wage employments, particularly agricultural wage employments with a slight leftwards shift on the supply for non-agricultural wages, ceteris paribus. Moreover, my ATT estimate on Labor Participation not only suggests that more migrant households participate in the labor market, but it also signals the need for labor demand to meet the labor supply surplus. Wages would then be determined by the labor elasticity of agricultural and non-agricultural activities, ceteris paribus. For instance, local wages might experience substantial decreases if local wage labor demand is inelastic or return migrants might find themselves underemployed or unemployed in their own country if the shifts in the labor supply cannot be met by the current demand.

In fact, migrant households in migrant-sending countries are more vulnerable to under- or unemployment when current labor demand cannot meet the surplus labor supply. Global aggregate economic shocks like the induced recession from the COVID-19 pandemic not only affected migrant-receiving countries, but also migrant-receiving countries. This meant that migrant households had to navigate high levels unemployment at their home countries, while searching for income activities that could mitigate the lost income from remittances. In addition, the demand for labor force decreased from the public health restrictions on in-person jobs that were non-essential. Hence, leaving regular public transfers insufficient to mitigate the local and external economic shocks. In fact, governments intervention would require a comprehensive investment in human capital and mechanisms to dynamize the local economy and avoid leftwards shift on the demand curve, ceteris paribus.

In addition to the literature contribution on the aggregate effects of recessions in migrant-sending countries in subpopulations of migrant-receiving countries, this study may inform how existing government programs in Guatemala could have more effective outcomes on food security, frictional unemployment and human capital in rural areas. First, my results provide evidence that increases in transfers were driven by more non-migrant households receiving remittances (private transfers) in 2012, rather than increases in public transfers, despite both household groups having experienced some degree of food insecurity during this period (Carletto, et al, 2021). Considering that the household survey was taken at the middle of 2012, information from public transfers would be impacted by the last months of president Colom's government and newly elected president Perez suggesting that public transfers had institutional deficiencies rather than only political bias. One recommendation to local and national institutions is to pay particular attention to municipalities that have high migration density during recessionary periods in migrant-receiving countries, as these regions are directly impacted by the economic shock experienced by migrants abroad. Furthermore, government intervention policies may be divided into short term and medium/long term actions.

In the short term, during recessionary periods in the US migrant households are more propense to return to the similar levels of food insecurity and malnutrition than non-migrant households (Carletto et al., 2021), and may find fewer employment opportunities to offset the significant decreases. Therefore, public transfers in-kind or cash may mitigate households from falling into or worsening their food insecurity. Furthermore, agricultural subsidies or agricultural insurance programs would encourage crops for subsistence and agricultural wages for the agricultural season. Targeting at risk populations rather than just expanding programs like "Mi Bolsa Solidaria/Segura" or "Mi Familia Progresa/Bono Seguro" would yield more efficient and effective outcomes. Additionally, medium- and long-term programs would focus on re- or training programs to improve the human capital of migrant households facilitating their access to skill wage employments, or more productive agricultural practices, overall yielding in more diverse and resilient livelihoods. In fact, there have been multiple discussions in Guatemala to expand the INTECAP's [3] coverage in rural areas and more recently to match return migrants who

[3] INTECAP (Instituto de Capacitacion) is a public Guatemalan institution that provides technical training for young people and has presence in all Guatemala's departments (INTECAP, 2022).

speak English with call-center who offer skilled salaries above the minimum wage in Guatemala. Moreover, access or improvement in financial literacy would incentivize more effective investment from remittances, improving the diversification of migrant household's portfolio and making them less responsive to aggregate economic shocks.

7. Conclusion

Declines in net migration and remittance during the Great Recession in the US increased the migrant households' labor participation in Rural Guatemala. Building on the literature of recession's global aggregate effects, this study provides evidence that more migrant households participate in the work force in a migrant-sending countries during recessions in migrant-receiving countries. Nonetheless, major changes in migrant households' participation in the labor market were induced from increase in both migrant and non-migrant households.

Furthermore, this study provided evidence that substantial decreases in the fraction of migrant households that received any income from remittances and overall declines in net migration pushed more migrant households to join the labor force to offset some of the economic shocks. Moreover, the average number of members participating in the labor force in migrant households also increased.

Finally, further research might focus on how the productivity and labor costs may be impacted by local increases in the workforce participation of migrant households and return migrants.

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Appendix

Table 1
Average Household Statistics in 2008 by household migration status

	Overall Average	Standard Deviation	Migrant Average	Non-Migrant Average	Difference/SD: (Migrant−Non-Migrant)/SD
HHH Head male =1	0.75	0.43	0.65	0.90	-0.59
HH Head's Age	46.26	15.40	47.99	43.83	0.27
HH Head Ladino =1	0.43	0.50	0.39	0.50	-0.21
HH Head's education	1.90	2.23	1.74	2.12	-0.17
Household Size	6.09	2.84	6.26	5.86	0.14
Potential Labor	3.02	1.79	3.17	2.81	0.20
Male Potential Labor	1.34	1.07	1.33	1.35	-0.02
Female Potential Labor	1.68	1.08	1.84	1.46	0.35
Male Potential Labor Share	0.39	0.24	0.36	0.45	-0.38
Female Potential Labor Share	0.57	0.26	0.61	0.51	0.38

Notes: This table used the 2008 IRMISAN household survey sample. Migration households are those with at least one migrant member between 2004-2008. Potential Labor is the average number of members who were between 15 and 64 years old. Male potential labor is the average number of male members who were between 15 and 64 years old. Female potential labor is the average number of women who were between 15 and 64 years old. Number of observations: 1222.

Table 2
Average Household Workforce Participation Statistics in 2008 by household migration status

	Overall Average	Standard Deviation	Migrant Average	Non-Migrant Average	Difference/SD: (Migrant−Non-Migrant)/SD
Panel A. Binary Work Force Activity					
Employed over the last 12 months =1	0.88	0.33	0.83	0.94	-0.31
Wage Employment =1	0.59	0.61	0.55	0.64	-0.15
Wage Employment- Agriculture & Fishing =1	0.41	0.49	0.36	0.48	-0.24
Wage Employment- Nonfarm Activities =1	0.18	0.38	0.19	0.16	0.08
Non-wage Employment =1	0.63	0.48	0.65	0.60	0.12
Panel B. Continuous Work Force Activity					
Employed over the last 12 months	1.65	1.25	1.69	1.59	0.08
Wage Employment	0.85	1.09	0.84	0.85	-0.01
Wage Employment- Agriculture & Fishing	0.62	0.98	0.61	0.65	-0.04
Wage Employment- Nonfarm Activities	0.22	0.54	0.24	0.21	0.05
Non-wage Employment	1.12	1.21	1.20	0.99	0.17

Notes: This table used the 2008 IRMISAN household survey sample. Migration households are those with at least one migrant member between 2004-2008. In Panel A, work force activity =1 if the household had at least one member 12 years or older who worked over the las 12 months. Panel B refers to the average number of members who worked over the last 12 months and were 12 years or older. Number of observations: 1222.

Table 3
Average Household Income Activity Statistics in 2008 by household migration status

	Overall Average	Standard Deviation	Migrant Average	Non-Migrant Average	Difference/SD: (Migrant−Non-Migrant)/SD
Panel A. Binary Income Activity					
Agriculture Wage Employment =1	0.26	0.44	0.24	0.28	-0.10
Non-Agricultural Wage Employment =1	0.19	0.39	0.19	0.20	-0.03
Wage Employment =1	0.41	0.49	0.38	0.44	-0.11
Non-Agricultural business =1	0.12	0.32	0.12	0.12	0.00
Livestock Income =1	0.54	0.50	0.60	0.46	0.27
Land Rental Income =1	0.02	0.14	0.03	0.01	0.18
Crop harvest income =1	0.89	0.32	0.89	0.88	0.03
Income Public & Private Transfers =1	0.40	0.49	0.64	0.06	1.18
Remittance =1	0.36	0.48	0.61	0.00	1.28
Panel B. Continuous Income Activity					
Annual Income Agricultural Employment	3025.83	7983.25	2886.24	3221.37	-0.04
Annual Income Non-Agricultural Employment	2732.89	9168.36	2428.99	3158.58	-0.08
Annual Income Employment	5758.72	12278.49	5315.23	6379.95	-0.09
Annual Income Non-Agricultural business	2370.16	15652.06	2212.68	2590.77	-0.02
Annual Net Livestock Income	44.18	1003.84	28.73	65.83	-0.04
Annual Income Land Rental	20.23	178.26	24.58	14.15	0.06
Annual Net Crop Harvest Income	1648.74	3201.00	1556.64	1777.54	-0.07
Annual Income Public & Private Transfers	4878.43	15365.49	8314.19	65.67	0.54
Annual Income Remittances Transfers	6008.86	24733.68	10298.50	0.00	0.42

Notes: This table used the 2008 IRMISAN household survey sample. Migration households are those with at least one migrant member between 2004-2008. In Panel A, income activity =1 if the household received any income (positive or negative) from such activity category. Panel B: Income amount are in Guatemalan Quetzales. Number of observations 1222.

Table 4
Migration Patterns 2004-2012

Year	Migration	New Migrants	Migrants returned following year	Ratio of Return/new migration
2004	195	-	2	-
2005	236	43	1	0.02
2006	295	60	4	0.07
2007	354	63	3	0.05
2008	419	68	14	0.21
2009	465	60	43	0.72
2010	475	53	51	0.96
2011	634	210	170	0.81
2012	656	192	-	-

Notes: This table used samples from the 2012 IRMISAN household survey. Migration experiences were determined using retrospective data on first and last migration of all household members who were 15 years or older, and HH head's spouse and children if they did not live in the same household. Migration status was determined if the individual was in either the US or Mexico in year *t*. A new migrant is determined if the individual was not a migrant in year *t* but was a migrant in year *t+1*. A return migrant was determined if the individual was a migrant in year *t* but was not a migrant in year *t+1*. Rate of return is the number return migrants divided by the number of new migrants in that year. The sample size was 6160 individuals

Table 5
Reduced-Form Models for Change in Remittances

	Remittance =1
Simple DD without controls	
Migrant household = 1	0.614***
	(0.0251)
Year 2012 = 1	0.0491***
	(0.0110)
DD	-0.451***
	(0.0280)
Constant	0
	(6.60e-10)
SD	0.436
N	2,348
Household-level fixed effects, clustered standard errors DD without controls	
DD	-0.461***
	(0.0286)
N	2,348

Notes: This table used samples from the IRMISAN household survey in 2008 and 2012. Migration households are those with at least one migrant member between 2004-2008, using the 2008 sample as baseline. The constant term refers to non-migrant households in 2008. Refer to table 6 for set of controls. Robust standard errors (for the simple DD model) and stratum-level clustered standard errors are in parentheses. Changes in the sample size occurred because there were HH that did not have information on Female or Male Potential Labor. *** p<0.01, ** p<0.05, * p<0.1

Table 6
Reduced-Form Models for Change in Set of Controls

	HH Head's age	HH Head's age^2	Household Size	Female Potential Labor	Male Potential Labor	HH Head's education
	(1)	(2)	(3)	(4)	(5)	(6)
Simple DD without control						
Migrant household = 1	4.168***	376.2***	0.397**	0.385***	-0.0299	-0.385***
	(0.888)	(90.16)	(0.161)	(0.0584)	(0.0605)	(0.133)
Year 2012 = 1	2.606***	226.1**	1.075***	0.504***	0.459***	0.206
	(0.976)	(102.1)	(0.193)	(0.0717)	(0.0718)	(0.161)
DD	-0.817	-59.49	0.296	0.0309	0.255**	0.211
	(1.270)	(133.2)	(0.281)	(0.103)	(0.105)	(0.197)
Constant	43.83***	2,157***	5.859***	1.526***	1.395***	2.122***
	(0.682)	(68.91)	(0.115)	(0.0396)	(0.0143)	(0.109)
Household-level fixed effects DD with clustered standard errors						
DD	-1.079**	2,377***	0.322**	0.0463	0.274***	0.237**
	(0.462)	(13.67)	(0.130)	(0.0595)	(0.0532)	(0.101)
N	2,348	2,348	2,348	2,251	2,251	2,348

Notes: Columns 1-6 utilized samples from the IRMISAN household survey in 2008 and 2012. Migration households are those with at least one migrant member between 2004-2008, using the 2008 sample as baseline. The constant term refers to non-migrant households in 2008. Potential Labor is the average number of members who were between 15 and 64 years old. Male potential labor is the average number of male members who were between 15 and 64 years old. Female potential labor is the average number of women who were between 15 and 64 years old. Robust standard errors (for the simple DD model) and stratum-level clustered standard errors are in parentheses. Changes in the sample size occurred because there were HH that did not have information on Female or Male Potential Labor. *** p<0.01, ** p<0.05, * p<0.1

Table 7
Average Work Force Participation per Household Before and After the Great Recession in the US

	WF =1 2008	WF =1 2012	Difference
Migrant	0.835	0.941	0.106
Non-Migrant	0.935	0.972	0.037
Difference	-0.100	-0.031	0.069

Notes: This difference in difference used samples from the IRMISAN household survey in 2008 and 2012. Migration households are those with at least one migrant member between 2004-2008, using the 2008 sample as baseline. WF refers to workforce. Number of observations: 2348.

Table 8
Reduced-Form Models for Change Household Labor Participation

	Employed over the last 12 months =1	Wage Employment-Agriculture & Fishing =1	Wage Employment-Nonfarm Activities =1	Wage Employment =1	Non-wage Employment =1	Employed over the last 12 months	Wage Employment-Agriculture & Fishing	Wage Employment-Nonfarm Activities	Non-wage Employment	Wage Employment
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Simple DD without controls										
Migrant household = 1	-0.101***	0.119***	0.0296	0.0893**	0.0563*	0.100	-0.0424	0.0293	0.211**	-0.0131
	(0.0202)	(0.0326)	(0.0208)	(0.0356)	(0.0319)	(0.0813)	(0.0693)	(0.0262)	(0.0821)	(0.0714)
Year 2012 = 1	0.0371**	0.185***	0.0184	0.204***	0.138***	0.481***	0.491***	0.0288	0.307***	0.519***
	(0.0150)	(0.0386)	(0.0221)	(0.0460)	(0.0402)	(0.0607)	(0.0711)	(0.0318)	(0.0888)	(0.0792)
DD	0.0692***	0.0486	-0.0192	0.0295	-0.0406	0.181**	0.0449	-0.0258	0.000268	0.0191
	(0.0195)	(0.0377)	(0.0274)	(0.0477)	(0.0388)	(0.0722)	(0.0851)	(0.0408)	(0.0919)	(0.0909)
Constant	0.935***	0.479***	0.161***	0.640***	0.597***	1.591***	0.648***	0.206***	0.992***	0.855***
	(0.0145)	(0.0306)	(0.0202)	(0.0328)	(0.0301)	(0.0612)	(0.0447)	(0.0303)	(0.0674)	(0.0488)
SD	0.329	0.492	0.383	0.610	0.483	1.245	0.983	0.541	1.210	1.092
N	2,348	2,348	2,348	2,348	2,348	2,348	2,348	2,348	2,348	2,348
Household-level fixed effects, clustered standard errors DD without controls										
DD	0.0746***	0.0451	-0.0180	0.0271	-0.0206	0.196***	0.0416	-0.0275	0.0368	0.0141
	(0.0199)	(0.0382)	(0.0267)	(0.0474)	(0.0395)	(0.0720)	(0.0858)	(0.0395)	(0.0946)	(0.0878)
N	2,348	2,348	2,348	2,348	2,348	2,348	2,348	2,348	2,348	2,348
Household-level fixed effects DD, clustered standard errors with controls										
DD	0.0715***	0.0323	-0.0415	-0.00920	-0.0232	-0.0238	-0.0698	-0.0509	-0.113	-0.121
	(0.0204)	(0.0393)	(0.0299)	(0.0501)	(0.0380)	(0.0674)	(0.0820)	(0.0434)	(0.0975)	(0.0869)
N	2,251	2,251	2,251	2,251	2,251	2,251	2,251	2,251	2,251	2,251

Notes: Columns 1-8 utilized samples from the IRMISAN household survey in 2008 and 2012. Migration households are those with at least one migrant member between 2004-2008, using the 2008 sample as baseline. Column 4 is the union of column 2 and 3. The constant term refers to non-migrant households in 2008. Refer to table 6 for a set of controls. Stratum-level clustered standard errors are in parentheses. Decreases in the sample size occurred because there were HH that did not have information on Female or Male Potential Labor. *** p<0.01, ** p<0.05, * p<0.1

Table 9
Reduced-Form Models for Change in Household Income Activities

	Agriculture Wage Employment =1	Non-Agricultural Wage Employment =1	Wage Employment =1	Non-Agricultural business =1	Livestock Income =1	Land Rental Income =1	Crop harvest income =1	Income Public & Private Transfers =1
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Simple DD without controls								
Migrant household = 1	-0.0445	-0.0119	-0.0538*	-0.000907	0.136***	0.0250***	0.00833	0.577***
	(0.0295)	(0.0206)	(0.0310)	(0.0204)	(0.0281)	(0.00797)	(0.0217)	(0.0286)
Year 2012 = 1	0.343***	-0.0360	0.282***	0.0379**	0.121***	-0.00376	0.114***	0.0502***
	(0.0396)	(0.0234)	(0.0432)	(0.0181)	(0.0327)	(0.00398)	(0.0232)	(0.0184)
DD	-0.0284	0.0334	-0.0173	0.00967	-0.0519	-0.0271***	-0.00686	-0.413***
	(0.0325)	(0.0283)	(0.0366)	(0.0293)	(0.0410)	(0.00810)	(0.0220)	(0.0352)
Constant	0.283***	0.198***	0.438***	0.116***	0.460***	0.00589*	0.882***	0.0609***
	(0.0260)	(0.0232)	(0.0316)	(0.0205)	(0.0269)	(0.00328)	(0.0226)	(0.0120)
SD	0.437	0.394	0.491	0.320	0.499	0.142	0.317	0.490
N	2,348	2,348	2,348	2,348	2,348	2,348	2,240	2,348
Household-level fixed effects, clustered standard errors DD without controls								
DD	-0.0298	0.0369	-0.0152	0.0108	-0.0354	-0.0246***	0.0299	-0.425***
	(0.0321)	(0.0283)	(0.0356)	(0.0292)	(0.0431)	(0.00750)	(0.0191)	(0.0363)
	2,348	2,348	2,348	2,348	2,348	2,348	2,240	2,348
Household-level fixed effects DD, clustered standard errors with controls								
DD	-0.0504	0.0175	-0.0482	0.0152	-0.0490	-0.0192**	0.0393***	-0.403***
	(0.0322)	(0.0308)	(0.0355)	(0.0290)	(0.0480)	(0.00787)	(0.0181)	(0.0367)
N	2,251	2,251	2,251	2,251	2,251	2,251	2,157	2,251

Notes: Columns 1-8 utilized samples from the IRMISAN household survey in 2008 and 2012. Migration households are those with at least one migrant member between 2004-2008, using the 2008 sample as baseline. Column 3 is the union of column 1 and 2. The constant term refers to non-migrant households in 2008. Refer to table 6 for a set of controls. Stratum-level clustered standard errors are in parentheses. Decreases in the sample size occurred because there were HH that did not have information on Female or Male Potential Labor. *** p<0.01, ** p<0.05, * p<0.1