Workers' Remittances and Business Ownership in the Dominican Republic

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Abstract: Using household level data from the Dominican communities in the Latin American Migration Project (LAMP-DR6), we examine the role played by remittances on business ownership. In this analysis we account for the reverse causality regarding the likelihood of business ownership and remittance receipt. The results from the estimation of a system of simultaneous probit models do not support the proposition that remittances encourage business investment in the Dominican Republic. While remittances may fulfill basic consumption needs, add to the housing stock, increase the availability of healthcare for individuals, or contribute to the education of household members, the results of our study do not support the notion that remittances promote business ownership in the case of the Dominican Republic.

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I. Introduction

Remittances, the repatriated earnings of emigrant workers, have grown to constitute a substantial portion of many developing nation's economic resources. Studies that track the volume of remittances over time (Orozco 2001, de la Garza and Orozco 2002) suggest that these resource flows will persist in light of continued migration from poor nations to richer countries. Given the anticipated growth and persistence in these transfers, we are interested in learning about the likely impacts of remittances on recipient nations. In particular, we attempt to sort out and uncover some of the potential effects of workers' remittances by examining how these flows affect business ownership in the Dominican Republic.

A substantial amount of controversy continues to exist regarding the impact of remittances on recipient nations (Russell 1992, Durand et al. 1996, Jones 1998). Some of the literature views workers' remittances as loosening capital constraints for resource-poor communities (Lozano Ascencio 1993, Taylor et al. 1996a, Taylor et al. 1996b). The transfers of money from emigrants to their home communities—sometimes referred to as migradollars—can have long-run beneficial impacts on recipient nations if these funds are put to use in productive projects.

But an alternative view of remittances argues that these resource flows are not used to accumulate productive capital (Martin 1991) and that, instead, they promote dependency of recipient nations (Diaz-Briquetes 1991). Contributing to this view is the observation that a substantial proportion of workers' transfers are used to finance current consumption. As such, remittances do not contribute to the stock of capital and development of basic infrastructure. This view has been corroborated by studies pointing out that the receipt of remittances is sometimes associated with reductions in labor force participation of family members in the home

country (Funkhauser 1992, Rodriguez and Tiongson 2001). The brain drain literature (for a summary see Taylor et al. 1996a) also contributes to the negative view of remittances with its observation that migrants are positively selected, resulting in a loss of human capital that exceeds the resources returned to the home country via migradollars.

In this paper we attempt to contribute to the scorecard on remittances by exploring one under-researched area regarding the impacts of these monetary flows. In particular, using data from the Dominican Republic, we examine the role played by remittances on business ownership while accounting for the reverse causality regarding the likelihood of business ownership and remittance receipt at the household level. Aside from identifying some of the determinants of each of these events, we test the hypothesis that workers' remittances contribute to economic development by facilitating entrepreneurial activity on account of greater availability of financial support.

Our findings reveal that, while remittances are more likely to be received by households with greater economic needs (as proxied by the percent of family members of non-working age living in the households and the lesser human capital of the household head), business ownership does not seem to be a statistically significant determinant of the household's likelihood of receiving money transfers from abroad. Furthermore, when examining the determinants of business ownership, we find business ownership to be directly associated to the household head's previous business experience, U.S. work experience, educational attainment, as well as to the average educational attainment and U.S. work experience of all other Dominican-based household members. However, remittances inflows are associated with a lower likelihood of business ownership by households. As seen in other settings, the possibility exists that remittances increase the reservation wage of family members in the Dominican Republic and,

hence, are used to finance leisure and/or current consumption in place of business ownership. While these findings do not support the view that workers' remittances contribute positively to economic development through the promotion of business ownership, they do not imply that remittances are not put to productive use by developing economies. For instance, one of the current consumption items that remittances often buy is schooling for household members. In this respect, previous studies (e.g. Cox Edwards and Ureta 1999, Hanson and Woodruff 2003) have suggested that workers' remittances are often used to pay for the education of younger household members. Under such circumstances, remittances may still contribute to the economic development of these countries through a more productive future workforce.

II. Remittances in the Dominican Republic: The LAMP-DR6 Database

Much of the literature on the likely contribution of remittances to economic development is based on survey data regarding the intended use of the remittances by the sender. For example, it has been found that Mexican migrants claim that about three-quarters of their repatriated earnings are intended to purchase consumption (Durand et al. 1996, Amuedo-Dorantes and Pozo 2003). As such, the possible role of remittances for economic development is thought to be rather limited. A priori, we do not subscribe to this conclusion. Even if 75 percent of earnings are consumed, a non-trivial 25 percent remains for saving and investment. While a full accounting of the contribution of remittances to economic development is beyond the scope of this paper, a better understanding of whether remittances do indeed contribute to capital investment is possible to ascertain.

In this paper, we focus on the impact of remittances on a particular form of investment—

business ownership. We undertake this project using data derived from the Latin American Migration Project (LAMP).[1] The LAMP is an extension of the Mexican Migration Project (MMP) begun in 1982 to study the migration patterns of Mexicans both in Mexico and in the United States. The purpose of the LAMP is to expand our knowledge of migration and immigration by exploring these patterns for individuals originating from other countries and areas of Latin America. We use the Dominican survey data, known as the LAMP-DR6.

To ascertain whether there is a link between remittances and business investment, we study how remittances to Dominican households affect business ownership. It is natural to focus on Dominican households given the importance of remittances to the Dominican population. Aggregate economic data reveal that remittances are a growing component of national income. In 1982 workers' remittances amounted to 2.4 percent of Dominican GDP, while in 2000 workers' remittances had grown to account for 8.7 percent (IMF, BOP Yearbook).

Our data are derived from surveys conducted in six communities from 1999 to 2001 as described in Tables 1 and 2.[2] For confidentiality reasons, we do not know the location of these six communities within the Dominican Republic. However, given the municipality populations, we can infer that two of these communities are located in a large urban area (with a population of 2.2 million in 1993). The other 4 communities are in areas with total populations of between 51 and 175 thousand persons. In addition to interviewing families located in these six Dominican communities, the LAMP secured interviews from a number of households in the U.S. who originate from these communities. This follows the MMP methodology with its objective of obtaining information from households who might never return to their origin communities. A

[1] The Latin American Migration Project (LAMP) is a collaborative research project based at the University of Pennsylvania and the University of Guadalajara, supported by the National Institute of Child Health and Human Development (NICHD). The LAMP website is: http://www.pop.upenn.edu/lamp/

[2] A few households were surveyed in 2001, but the majority of them were interviewed in the preceding 2 years.

total of 59 households (out of 812) were interviewed in the U.S. However, given the focus of our study—namely, how receipt of remittances affects investment in businesses in the Dominican Republic—we focus only on households located in the Dominican Republic and drop the 59 households who are settled in the U.S.

The survey responses from the LAMP-DR6 suggest that a good percentage of households receive private transfers from individuals abroad. As displayed in Table 3, more than a quarter of all households receive transfers. Furthermore, among those who report receiving remittances, a little more than a quarter reported that the transfers constitute a significant portion of the household's income (see Table 4). It is of interest to note that households do not need to have claimed that they have a family member abroad to be receiving remittances. The conditional probability of having a migrant household member given that the household receives remittances is a mere 0.12. That is, only one-eighth of the households who claim to receive remittances from abroad declare having a household member abroad. Evidently, receipt of remittances from friends and more "distant" relatives is a common occurrence in the Dominican Republic.

Given the significant growth in workers' remittances as a portion of aggregate Dominican national income, we ask how the growth and development of the Dominican Republic will be impacted. The general consensus of the effects of migration on economic development is a pessimistic one. In an extensive review of the literature, Taylor et al. (1996a and 1996b) document the large volume of studies that conclude that migration contributes negatively to the development of out-migration areas along the lines of dependency theory. Remaining family members reduce their investments and effort in productive activities, learning instead to consume and spend out of remittances transfers from abroad.

Despite documenting this pessimistic view of migration, Taylor et al. (1996a and 1996b) are quick to point out that they do not subscribe to this outlook. They argue, to the contrary, that a great many of the studies that conclude that out-migration is harmful fail to account for the indirect impacts of labor and resource flows as well as for their dynamics. For example, emigrants' contributions to the human and physical capital stock of the home community is often not recognized, resulting in underestimation of productivity increments due to post-migratory financial flows. Once one accounts for these impacts over time, a more optimistic picture of the contributions that migration may have on migrant sending regions emerges. As such, we are warned of the complexity of deriving conclusions about the impacts of labor migration and the resource flows that accompany them.

III. Previous Literature on the Impact of Remittances on Business Investment

To date, there is some evidence that the remittances of emigrants can positively impact economic output and business formation in the remittance receiving areas. For example, although Funkhouser (1992) finds that the receipt of remittances appears to decrease labor force participation in Nicaragua, he also finds that remittances are associated with increases in self-employment. Given the association of self-employment with complementary investments in capital, it follows that remittances may be contributing positively toward the accumulation of capital stock and toward business formation. In this vein, previous studies using information on Turkish and Egyptian return migrants (McCormick and Wahba 2000, Dustmann and Kirchkamp 2001) have found that return migrants appear to have a comparative advantage in business formation and entrepreneurial activity possibly linked to their importation of both human and financial capital. As such, we may be able to credit migration and accompanying financial flows with economic progress.

The link between remittances and investment has also been noted in other studies (e.g. Lindstrom 1996, Ahlburg and Brown 1998). In particular, Lindstrom finds that migrant trip duration is directly related to investment opportunities in the origin communities using Mexican data. When investment opportunities are plentiful, he finds that migrants remain longer in the United States, presumably accumulating greater amounts of capital assets that can be put to work in those communities upon their return. In contrast, individuals originating from communities with poorer investment opportunities stay for shorter periods in the United States, remitting moneys home for consumption purposes. In a follow-up to this hypothesis, Reyes (2001) confirms that trip duration is directly related to opportunities in the origin community, but finds that while the "target saving for investment motive" fits female migrants, it does not seem consistent with the male migrants in the sample.

Some researches have also directly linked remittances to specific capital investments in businesses and farm holdings. Woodruff and Zenteno (2001) estimate that 27 percent of investments in microenterprises located in urban areas in Mexico originate from remittances from abroad. Using a panel for a number of rural communities in Pakistan, Adams (1998) is able to attribute the acquisition of irrigated farmland to the receipt of external remittances. He notes that the propensity to acquire rural assets is much greater through remittances (a transitory source of income) relative to labor income (a more permanent source of income). As such, Adams presents a positive role for remittances in the development process.

Overall, a review of the literature suggests that in examining the impact of remittances on business investment—and, in addition to the availability of other resources complementary to the existence of a household business, it is important to recognize: (a) the migrant's accumulated and

imported human capital, and (b) the investment opportunities available to migrants in their origin communities, which in this paper we capture with household business holdings.

IV. Some Hypotheses Regarding the Link Between Remittances and Business Investments

Credit and capital constraints are often blamed for the lack of investment and business formation in many developing countries. However, it may be that migration and the remittances that often accompany migration can help areas overcome these constraints. The scarcity of capital in many remote regions may be compensated for by inflows from former residents in the way of remittances. If put to work appropriately, these regions may become centers of growth and development as local entrepreneurs put these small pockets of money to work in small locally developed enterprises.

An initial evaluation of the possibility that remittances help overcome local credit constraints can be made by examining Table 5, which displays the propensity of household business ownership conditional on remittances receipt. The LAMP survey asks individuals whether they have owned a business. Information on when the business was formed and when it closed down (if it is no longer in operation) is obtained for up to four businesses per household. We code whether the household currently owns one or more businesses and relate that to whether the household claims to be receiving remittances from abroad. The figures in Table 5 do not support the notion that receipt of remittances prompts individuals to form businesses. Fourteen percent of remittance-receiving households own at least one business versus 25 percent of non-remittance-receiving households.

Furthermore, Table 6 indicates that the probability of business ownership declines with the size of the remittance flow. Households receiving greater money transfers from abroad (in relation to average households income) are the least likely to own businesses. It is conceivable

that remittance-receiving households are in other ways different from non-remittance receiving households. For example, out-migration and subsequent remittance receipts may be greater for households at a disadvantage to start a business. Hence, despite the receipt of remittances, one might not expect to see much business ownership (Taylor 1987) if local conditions do not warrant such activity. In this instance, the lack of business ownership should be attributed to household and local business conditions and not to the lack of capital resources. Consequently, one needs to control for other household and regional characteristics in order to truly understand the impact that remittances has on household business ownership. Alternatively, the possibility exists that the receipt of remittances increases the reservation wage of household members in the Dominican Republic, reducing their labor force participation and, in turn, their decision to run a business.

More importantly, as we shall discuss in what follows, there could be a simultaneous link between the likelihood of receiving remittances and that of having a household business. In particular, focusing on the impact of business ownership on remittances receipt, one could hypothesize two different effects. On the one hand, it could be the case that households owning a business may attract remittances from family members abroad since emigrants may regard the home business as part of their future assets. To maintain a stake in the family business and to lay claim to a portion of the family's assets, migrants may have an incentive to remit (Lucas and Stark 1985, Schiedeer and Knerr 2000). Business ownership in this case will result in greater flows of remittances from abroad. In fact, de la Brière et al. (2002, p. 309) find that Dominican migrants in the U.S. remit to family in the Dominican Sierra for the purpose of "investing…in potential bequests." An alternative hypothesis regarding the effect of business ownership on the receipt of remittances is that households owning a business may receive fewer remittances from

family members abroad because the emigrants do not perceive that the family in the home community has an economic need for money transfers from abroad.

While we have established that business ownership may motivate emigrant family members located abroad to alter their gifts of money to the household located in the home community, it is also the case that the receipt of remittances by the family in the origin community may affect the decision to own a business. As with the impact of business ownership on remittances receipt, one could hypothesize two different effects of remittances receipt on business ownership. On the one hand, remittances may loosen capital constraints faced by the household for starting businesses. Thus, it is possible that families that receive transfers from abroad are more likely to own a business. On the other hand, the possibility exists that remittances are used for other purposes—for buying a home, to acquire human capital, or to purchase leisure. In several studies of the impact of remittances on labor force participation (e.g. Funkhauser 1992, Rodriguez and Tiongson 2001), it has been observed that receipt of remittances reduces participation in the workforce, possibly as a result of the increased reservation wage of household members. Such an effect may carry over to the decision to run a business.

Before we proceed to examine the role played by remittance inflows on business ownership, it is of interest to describe some of the characteristics of the businesses being analyzed. This is done in Table 7 and Table 8. In particular, the final column of Table 7 reports on the receipt of remittances by all business owners in our sample. Twenty-one percent of households owning a business receive remittances from family members abroad. Nonetheless, in a variety of cases, the percentage of households receiving money transfers exceeds 21 percent, depending on the type of business owned. For instance, fifty percent of all personal services and

agriculture related businesses, approximately 40 percent of the stores, about 33 percent of factories, and 22 percent of cattle raising businesses are owned by households receiving remittances.

Table 8 displays the differential pattern of the work force in businesses owned by households receiving remittances as opposed to businesses owned by households not receiving remittances. In general, businesses of households receiving remittances appear to be smaller in size than those of households not receiving remittances. Additionally, businesses owned by households receiving money transfers from abroad do not have a greater impact on the local labor market through the hiring of a larger number of family and non-family workers. In fact, we do not find a significant difference in the average number of family workers employed in businesses owned by households receiving remittances relative to households not receiving remittances. Furthermore, businesses owned by households that do not receive remittances seem to employ a significantly greater number of non-family workers.

V. Conceptual Framework and Empirical Methodology

As previously argued, in examining the role played by remittance inflows in the household decision to own a business, we need to account for a variety of household and household head characteristics highly correlated with business ownership. In particular, in addition to controlling for the possibility that remittance inflows loosen capital constraints faced by the households, we account for the availability of other resources complementary to the existence and development of a household business. We incorporate several categories of variables to capture the household's level of human capital: a) the educational attainment of the

household head and the average educational attainment of other household members,[3] b) the household head's previous U.S. work experience and the average U.S. work experience of other household members—to account for the role that the importation of human capital might play in entrepreneurial activity (Portes and Guarnizo 1991, McCormick and Wahba 2000, Dustmann and Kirchkamp 2001) and c) the household head's previous business experience (Portes and Guarnizo 1991). Additionally, we include information on the percent of family members of non-working age to account for the availability (or lack) of household labor to help with the business. Finally, we include a dummy variable reflecting the gender of the household head to address the fact that most business owners in our sample are male, and an urban dummy variable to capture local business conditions. As a result, the household's likelihood of owning a business can be expressed as a function of the receipt of money transfers from abroad, personal household head characteristics, household characteristics, and the urban dummy as follows:

$$(1) \qquad Business_i^* = \alpha_1' Remittances_i + \beta_1' P_{1i} + \delta_1' H_{1i} + \gamma_1' U_i + \varepsilon_i,$$

where:

$$Business_i = \begin{cases} 1 \text{ if } Business_i^* > 0, \\ 0 \text{ otherwise.} \end{cases}$$

$Business_i^*$ is the latent variable and $Business_i$ is the observed variable. $Remittances_i$ is a dummy variable indicating whether the household receives remittances from abroad. P_{1i} is a vector of personal characteristics of the *i*th household head—i.e. gender, educational attainment, previous U.S. work experience, and previous business experience. H_{1i} is a vector including the average educational attainment and previous U.S. work experience of other household members, as well

[3] With the intent of constructing an "education of household members" variable that controls for the potential of acquiring education according to age, we compare the individuals actual number of years of education to the number they could potentially have obtained given their age. Individuals 23 and older were assumed to have had the potential of acquiring 16 years of education; while those less than 7 have had the potential to acquire none. Between the ages of 7 and 22, individuals were assumed to have had the potential of obtaining age minus 6 years of

as information on the percent of household members of non-working age in the households as a proxy for the availability of potential household labor to help with the business. Finally, U_i refers to whether the household resides in an urban or rural area.

Note, however, that the receipt of remittance flows by the household in equation (1) may be endogenous to the household's participation in the business community. As previously argued, migrants' remitting patterns may vary according to the household's needs, which may be lower for those households owning business assets. Alternatively, migrants' remitting patterns may vary with their future intentions of returning to their home communities and their motivations with respect to laying claim to family assets. As posited in the migration literature (Lucas and Stark 1985, Lindstom 1996), these intentions are likely to vary according to economic conditions in the origin community. Specifically, the household's ownership of a business is possibly indicative of already existing capital assets back home that may encourage return migration, money transfers and/or investment in the household business.

In modeling the household's likelihood of receiving remittance inflows from family members in the U.S., we try to account for the economic situation of family members in the Dominican Republic, as well as some of the migrant members' characteristics possibly affecting their remitting patterns. To best capture the household economic situation and in addition to whether or not the household owns a business ($Business_i$), we include information on the human capital of household members in the Dominican Republic indicative of the household's earnings potential—such as their average educational attainment.[4] Additionally, since female-headed households are traditionally more likely to be poor (and, hence, display greater economic need),

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education. The actual number of years of education divided by potential education variable serves as our proxy value for the educational attainment of the head and non-head household members.

[4] While a better proxy for the household economic situation is the employment status of its household members, the receipt of money transfers from abroad and the household members' current employment status are likely to be

we include information on the gender of the household head in the Dominican Republic. Similarly, to capture economic dependency of additional household members, the percent of family members of non-working age living in the household is also included along with the previous household characteristics in the vector H_{2i}.

Aside from the household economic situation, the household likelihood of receiving remittance flows will depend on the number of household members currently residing in the U.S. and on whether they are currently employed in the U.S. In particular, the greater the percent of family members in the U.S., the greater should be the likelihood of receiving remittances. Nonetheless, it is worth noting that the percent of households receiving remittance flows from the U.S. is actually greater than the percent of households with members currently residing in the U.S. Hence, receiving money transfers from abroad is not constrained to having family members abroad. As with the percent of family members in the U.S., the migrant's work status in the U.S. could serve as a proxy for the migrant's ability to remit money home. Hence, we include information on the number of household migrants in the U.S. and on their employment status in the vector M_i.

Finally, a dummy variable indicating whether the household lives in an urban versus rural area (U_i) is incorporated to the model to reflect the better banking-type infrastructure available for receiving remittance transfers in urban areas (Iglesias 2001). As a result, the household likelihood of receiving remittances is given by:

(2) $$Remittances_i^* = \alpha_2' Business_i + \beta_2' H_{2i} + \delta_2' M_i + \gamma_2' U_i + \nu_i$$

where:

$$\text{Remittances}_i = \begin{cases} 1 \text{ if } Remittances_i^* > 0, \\ 0 \text{ otherwise.} \end{cases}$$

simultaneously determined. Hence, we resort to information on pre-determined educational attainment and work experience as proxies for the economic situation of the household.

Remittances$_i$* is the latent variable and *Remittances*$_i$ is the observed variable, equal to 1 only if the household receives money transfers from abroad.[5]

Given the simultaneity of household business ownership and receipt of remittances, estimating equations (1) and (2) as two separate probit models would result in inconsistent and biased estimates of the determinants of the household receipt of money transfers from abroad and of the implications of these remittance flows on business formation. In order to account for the existing reverse causality, we estimate equations (1) and (2) as a system of simultaneous probit models. Equation (1) is identified by the inclusion of the household head's previous U.S. work experience and business experience, and other Dominican resident household members' average previous U.S. work experience, all of which are highly correlated with the likelihood of owning a business. These three regressors are excluded from equation (2) since they are not statistically significant in explaining households' current receipt of remittances. Similarly, equation (2) is identified by the inclusion of information on the percent of household members currently residing in the U.S. and on their employment status. The conditional probability of receiving remittances given that a household member is abroad is 0.72, making the percent of migrant household members residing in the U.S. a good instrument for the household receipt of remittances. Similarly, migrants' employment status is highly correlated with the likelihood of receiving money transfers from abroad. However, both instruments (i.e. the percent of household migrants in the U.S. and their employment status) are excluded from the business equation since they do not significantly explain the household likelihood of owing a business in the Dominican Republic other than through the receipt of remittances itself.

[5] A detailed description of all the variables employed in the analysis, along with their means and standard deviations, is included in Table A in the appendix.

In addition to checking for the correlation of our instruments with the variables to be instrumented (i.e. household business ownership and the household receipt of remittances), we test if our proposed instruments are uncorrelated with the error terms from the respective equations to assess their validity as instruments. The results from the over-identification test confirm the exogeneity of our instruments.[6] Finally, we compute the appropriate variance-covariance matrix following Maddala (1983).

VI. Remittances Receipt and Family Business Ownership in the Dominican Republic

Table 9 displays the results from estimating the simultaneous equation model with binary variables constituted by equations (1) and (2). Columns 1 through 3 in Table 9 display the estimated coefficients, robust standard errors, and marginal effects (*dy/dx)* for the likelihood of owning a family business once we account for the simultaneity between the family receipt of remittances and family business ownership.[7] As we anticipated, family business ownership is directly related to the household head's (also business owner's) gender and human capital, as captured by the head's educational attainment, previous U.S. work experience, and any previous business experience. Similarly, the average human capital of all household members significantly affects business ownership. Both, educational attainment and imported human capital have a positive effect on the likelihood of business ownership as denoted by the positive coefficient on average number of years of education and U.S. experience on the part of household members. In addition to the business owner's personal and family characteristics, the results in columns 1 through 3 reveal the role played by remittance inflows on household

[6] These tests are carried out estimating equations (1) and (2) as simultaneous linear probability models by 3SLS. The results from these tests are included at the bottom of Table 9. In both instances, the test confirms that our instruments are uncorrelated with the error terms.

[7] For continuous variables, the marginal effects (*dy/dx)* are evaluated at their mean values; for dummy variables, the marginal effects are computed by evaluating discreet changes in the dummy variables.

business ownership. Confirming the descriptive statistics displayed in Table 5, the estimates suggest that households receiving money transfers from abroad are approximately 12 percentage points less likely to own a family business than households not receiving remittance flows. Why may this be the case? One possibility may be that remittances increase the reservation wage of household members in the Dominican Republic. As a result, remittances may be used to increase family leisure and/or current consumption of goods and services.

The estimates in columns 4 through 6 of Table 9 address the receipt of remittances by the household and, in particular, the impact of business investments on the household likelihood of receiving any money transfers from abroad. Turning first to the control variables, household economic need appears to be directly linked to the household's likelihood of receiving money transfers from abroad. For instance, female-headed households are often assumed to have greater economic needs, as are households with less educated heads, households with a greater percentage of members of non-working age, and households residing in rural areas. We find that these characteristics significantly increase the likelihood of receiving remittances. For instance, female-headed households display a 15-percentage point higher likelihood of receiving remittance, and if the percentage of household members who are non-working age rises from 50 percent to 60 percent, the probability that the household will receive remittances rises by approximately 2.8 percentage points. By contrast, the impact of business ownership has no effect on remittance receipt from abroad. This result is at odds with those from Lucas and Stark's (1985) and de la Brière et.al. (2002), who find that family assets appear to prompt greater remittance flows in anticipation of future bequests. The differential findings may be due to the different samples used in each study—the LAMP-DR6 versus a sample of Botswanan households and farming households in the Dominican Sierra, respectively. Additionally, the

difference in the results may be explained by the failure to account for the endogeneity of remittances and family assets by earlier studies. In our case, business holdings by the home country family do not appear to induce remittances flows. Altruism, instead, may be one of the motivations for remitting as hinted by the impact of economic need on the likelihood of receiving remittances.

In addition to the household economic need, the likelihood of receiving money transfers from abroad is directly associated with the ability to remit as captured by the percent of household members residing in the U.S. and their employment status. In particular, for the example of a family consisting of 10 persons, a rise in the number of U.S. based migrants from 1 to 2 will increase the household's likelihood of receiving remittance payments by approximately 9 percentage points. Similarly, a 10-percentage point increase in the employment of household members in the U.S. would raise the household's likelihood of receiving remittances by about 3.6 percentage points.

In sum, our findings indicate that households receiving remittance flows are actually less likely to be business owners than their counterparts not receiving money transfers from abroad. Instead, remittances may increase the reservation wages of household members who, in turn, may choose to purchase more leisure and/or to consume more goods and services in place of engaging in business enterprises.

VII. Summary and Conclusions

This study examines the role of workers' remittances in promoting business ownership in the Dominican Republic. Recognizing the possibility of simultaneity of the likelihood of household business ownership and receipt of remittances, we estimate a system of simultaneous probit models examining both likelihoods.

While it has been suggested that workers' remittances may loosen capital constraints faced by households in developing economies when starting or maintaining businesses, our findings do not appear to support the notion that inflows of emigrant's earnings to the Dominican Republic from abroad overcome credit and capital constraints that face individuals engaging in or contemplating business ventures. To the contrary, we find that remittances inflows are associated with a lower likelihood of business ownership by households. The possibility exists that remittances increase the reservation wage of household heads, reducing the likelihood that households will engage in business activities. This is not to say that remittances cannot contribute to the well being of individual recipient families and communities in the Dominican Republic. Remittances may fulfill basic consumption needs, contribute to the housing stock, increase the availability of healthcare for individuals, and contribute to the education of household members. However, the results of our study do not support the notion that remittances promote business ownership in the case of the Dominican Republic. It would be of interest for future research to examine whether this is the case for other Latin American and Caribbean countries where the volume of remittances from their nationals has often quadrupled over the last decade. Such a finding would be of interest to the international development aid community who devises programs that redirect remittance flows to activities supporting economic development (Dinerstein 2003).

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Table 1: Sample Distribution by Survey Year

Survey Year	N	Percent
1999	604	74.38
2000	186	22.91
2001	22	2.71

Source: Authors' tabulations using the LAMP-DR6.

Table 2: Sample Distribution by Community Being Surveyed

Community Code Number	N	Percent
1	151	18.60
2	104	12.81
3	132	16.26
4	108	13.30
5	163	20.07
6	154	18.97

Source: Authors' tabulations using the LAMP-DR6.

Table 3: Households Receiving Remittances from the U.S.

Remittance Receipt	N	Percent
Yes	206	27.88
No	533	72.12

Source: Authors' tabulations using the LAMP-DR6.

Table 4: Size of the Remittance Flow as a Fraction of household Income

Size of Remittance Flow	N	Percent
Small	103	50.00
Medium	44	21.36
Large	59	28.64

Note: Computed for those households that receive remittances using the LAMP-DR6.

Table 5: Percent of Households Owning a Business by Remittance Receipt

Business Ownership	Receives remittances	Does not receive remittances
Owns at least one business	11.65	24.02
Does not own a business	88.35	75.98

Source: Authors' tabulations using the LAMP-DR6.

Table 6: Likelihood of Owning a Household Business by Size of the Remittance Flow (in percent)

Small	Medium	Large
18.45	13.64	6.78

Note: Conditional on receiving remittances the likelihood of owning a business using the LAMP-DR6.

Table 7: Remittance Receipt for the Family Conditional on Type of Business

Household Receives Remittances	Store	Street Vendor	Restaurant & Bar	Workshop	Factory	Middleman	Personal Services	Professional & Technical Services	Other Service	Agriculture	Cattle Raising	Total
Yes	40.00	10.53	0.00	14.29	33.33	15.38	50.00	0.00	16.67	50.00	22.38	20.96
No	60.00	89.47	100.00	85.71	66.67	84.62	50.00	100.00	83.33	50.00	77.62	79.04
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source: Authors' tabulations using the LAMP-DR6.

Table 8: A Comparison of Family and Non-family Employees Working in the Business by Household Receipt of Remittances

Variables	Minimum	Maximum	Median	Mean	Standard Error	Difference in Means	T-statistic
Family Workers							
Household Receives Remittances	1	4	1	1.92	0.23	-	-
Household Does Not Receive Remittances	1	10	1	1.91	0.13	-2.60e-03	-9.70e-03
Non-family Workers							
Household Receives Remittances	0	12	0	1.25	0.51	-	-
Household Does Not Receive Remittances	0	37	0	2.56	0.49	1.31	1.86*

Note: Authors' tabulations using the LAMP-DR6. *** Signifies statistically different from zero at the 1% level or better, **signifies statistically different from zero at the 5% level or better and *signifies statistically different from zero at the 10% level or better.

Table 9: Results from the Estimation of the Simultaneous Probit Model

Independent Variables	Likelihood of Having a Business			Likelihood of Receiving Remittances		
	Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
	Coefficient	S.E.	Marginal Effect	Coefficient	S.E.	Marginal Effect
HH Receives Remittances	-0.4469**	0.2195	-0.1190	-	-	-
Male HH Head	0.4333***	0.1324	0.1034	-0.4514***	0.0648	-0.1545
HH Head's Education Attainment	0.3325***	0.0968	0.0885	-0.2407***	0.0668	-0.0771
HH Head's Previous U.S. Work Experience	0.0027***	0.0006	0.0007	-	-	-
HH Head's Previous Business Experience	0.0495***	0.0012	0.0132	-	-	-
Average Education Attainment of HH Members	0.7059***	0.1378	0.1879	-0.0008	0.1215	-0.0003
Average Previous U.S. Work Experience of HH Members	0.0022*	1.41e-03	0.0006	-	-	-
Percent of HH Members of Non-working Age	0.2226	0.1929	0.0593	0.8773***	0.1241	0.2812
HH Owns a Business	-	-	-	0.0148	0.0445	0.0047
Percent of HH Members Currently in the U.S.	-	-	-	2.8058 ***	0.4676	0.8993
Percent of HH Members Currently Employed in the U.S.	-	-	-	1.1142*	0.6568	0.3571
Urban	0.0429	0.0856	0.0115	-0.2190***	0.0621	-0.0680
Number of Observations		631			620	
Wald Chi2		71.83			36.91	
Prob > Chi2		0.0000			0.0000	
Overidentification Test[a]		$0.43 < \chi^2_{2,\,5\%} = 5.99$			$4.15 < \chi^2_{3,\,5\%} = 7.81$	

Note: [(a)] The OID test is carried out using the number of observations and the R-squared obtained from regressing the residuals from the structural equations estimated using 3SLS on all the system's exogenous variables (Wooldridge 2003, p. 508). *** Signifies statistically different from zero at the 1% level or better, **signifies statistically different from zero at the 5% level or better and *signifies statistically different from zero at the 10% level or better. The regressions include a constant. The percent of HH members currently unemployed or out of the labor force in the U.S. is used as reference category.

Appendix

Table A: Means and Standard Deviations of Variables Used in the Analysis

Variable Names	Description	Mean	S.D.
HH Receives Remittances	Dummy variable equal to 1 if the household receives remittances from abroad.	0.2788	0.4487
Male HH Head	Household head gender dummy.	0.6959	0.4603
HH Head's Education Attainment	Years of schooling received by the HH head as a fraction of potential number of years of schooling.	0.5651	0.3095
HH Head's Previous U.S. Work Experience	HH head's previous U.S. work experience (in years).	13.8367	49.6164
HH Head's Previous Business Experience	HH head's previous business experience (in years).	4.6308	10.5260
Average Education Attainment of HH Members	Average of years of schooling received by HH members in the DR (other than the HH head) as a fraction of the age-specific potential number of years of schooling.	0.6420	0.2518
Average Previous U.S. Work Experience of HH Members	Average years of U.S. work experience of HH members in the DR) other than the HH head).	2.6404	20.1995
Percent of HH Members of Non-working Age	Percent of household members in the DR of non-working age.	0.4605	0.2677
HH Owns a Business	Dummy variable equal to 1 if the household owns a business.	0.2125	0.4093
Percent of HH Members Currently in the U.S.	Percent of all household members currently residing in the U.S.	0.0197	0.1077
Percent of HH Members Currently Employed in the U.S.	Percent of all household members currently employed in the U.S.	0.0091	0.0619
Percent of HH Members Currently Out of the Labor Force in the U.S.	Percent of all household members currently out of the labor force in the U.S.	0.0097	0.0692
Percent of HH Members Currently Unemployed in the U.S.	Percent of all household members currently unemployed in the U.S.	0.0010	0.0204
Urban	Dummy equal to 1 if the household resides in an urban area	0.2948	0.4563

Source: Authors' tabulations using the LAMP-DR6.