

## The effect of remittances on female hours of work in Jamaica

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### Abstract

Jamaica has had substantial levels of remittance transfers in recent years; this paper looks at whether these funds correlate with changes in labor market activities of married women. In this article, we use the Jamaica labor force and the living conditions surveys to do a household level cross-sectional labor supply study. In 2006, the Jamaica Statistical Institute conducted a special module on remittances, incorporating detailed questions on both cash and in-kind remittances, which is why we focus on the year 2006 in our analyses. Our findings for the spouse of the head of the family changes based on the type of modeling approach we take, with estimates of wage elasticity ranging widely but remaining positive. The remittance effect is not significant across all procedures. It appears after controlling for various effects on hours of work that remittance receipts do not influence the labor market activities of wives in Jamaican households.

**Keywords:** Remittances, hours of work, labor supply, Jamaica

**JEL CODES:** F24, J22, O54,

### Introduction

In labor supply studies, we are interested in the wage and income elasticities after controlling for other factors that are likely to affect labor market conditions. These studies are usually broken down into two broad types. There are first generation models that focus on simplified linear labor functions, and second generation models that account for self-selection into the labor market.

Remittances and Immigration typically follow a straightforward pattern, where individuals move from less developed countries to more developed ones, obtain employment, and send remittances in the opposite direction. For Jamaica, the case presented in this essay, these two trends are extremely pronounced. The World Bank estimates that 80 percent of Jamaica's tertiary graduates reside abroad, and the country consistently ranks among the top five countries in per capita remittances (Seaga 2006)<sup>1</sup>. The combination of high migration and high per capita remittances establishes Jamaica as an excellent case study for research on the effects of remittances on labor supply.

To advance economically, Jamaica must maintain a well-functioning labor market that provides proper incentives for workers. With remittances being a significant source of additional income, they may increase reservation wages and provide a disincentive to work in Jamaica while reducing the observed supply of labor in recipient countries (Airola, 2008; Kim, 2007). Like a regular welfare payment, remittances are usually transferred to lower income persons who are dependent on the sender. Whether or not the effects on labor in

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<sup>1</sup>In the Jamaican Gleaner article, dated January 8, 2006.

cases of government transfers and person to person remittances are the same is open to debate, but providing additional research to answer this question is one goal of this dissertation.

The remainder of this paper is as follows. The next section provides background information on the flows of remittances and migration, followed by a section specifying the motivations for this study. In the next two sections, we describe what we view as our important contributions, and discuss in greater detail the relevant literature. We then present our methodology and discuss econometric issues. Next, we discuss data and present results, and finally, we conclude by further discussing these results and offer explanations of our findings.

## Background

One of the driving forces behind the trends of migration and remittances is the economic welfare of households. Persons leave or are encouraged to leave if the household thinks that this will increase overall welfare relative to the expected level had that person instead participated in the local labor market. Differing economic conditions in urban and rural areas, as well as between developing and developed countries, are anecdotally behind the wide-scale migration of labor. Remittances often follow this migration in the short and long-run, and circular migration<sup>2</sup> in the long-run. The revolving cycle of migration is expected to persist as long as regional economic disparities continue.

For developing countries, there are several benefits of this migration cycle. First, remittances add resources to the domestic economy. Second, migrants may return with new skills and money which in time may benefit other natives who either learn from these returning residents or gain employment by working with them. Finally, migration of some workers may increase the wages of those remaining in the developing country if the drop in the supply of labor in the home country is significant<sup>3,4</sup>.

While there are benefits to the developing countries from the migration and remittance cycle, developed countries, too, may benefit. For example, the introduction of immigrant workers adds to the diversity of the labor market and provides workers willing to accept lower wages than that required by residents. There may be some ambiguity as to whether immigrants suppress wages and employment opportunities for natives in developed country, but empirical findings suggest the opposite is true that immigrants may have a positive or no effect on natives' job prospects (Card, 2005).

To better understand the migration and remittance cycle, specifically in Jamaica, a quick overview of the immigration process is necessary. Most individuals emigrating from Jamaica, for the purpose of employment, usually file for permanent residency or work visas in one of three countries: the United States of America, Canada, and the United Kingdom. When applying for permits, the burden of proof is on the applicant to assure the local Embassies (of USA and Canada) and high commissions (of the UK) that they have sufficient economic and social ties and will not be a burden to host economies. This process can be lengthy and expensive, evidence that the perceived benefits are enormous.

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<sup>2</sup> Circular migration refers to the return of migrants to their countries of origin with enhanced skills, experiences, and earnings garnered in the host countries. Although not a new concept, there is growing research in this area.

<sup>3</sup> The expected change in wages depends upon the elasticity of labor supply and migration relative to the remaining labor supply. For lower skilled jobs in Jamaica, migration may not have a significant effect, but given that 80% of Jamaicans with tertiary degrees move abroad, the effect on skilled wages may be more significant.

<sup>4</sup> The effect of increased wages for some workers could also be a positive or negative for the developing country. Wage increases may reduce poverty but could be negative in that they cause inflation, increase businesses' labor costs, and reduce the competitiveness of the country's firms in the global economy.

In Jamaica, remittances arrive through money transfer companies, namely, Western Union, Jamaica National Building Society, Money Gram, Quick Cash, Victoria Mutual Building Society, Money Express, and Sun Money. Together, these firms accounted for approximately 77 percent of remittance flows in 2005. Just 16 percent of remittances arrive via traditional commercial banks, a number likely the result of the higher transaction cost compared to transfer companies and the fact that many individuals lack regular bank accounts. Only two percent of recipients report receiving remittances through the postal service, and a surprisingly low four percent report receipts via friends or relatives who traveled abroad (Dade, 2006). The last of these numbers, remittances through post office mail or traveling friends and family, may be the most understated, as there is no official record of these funds by the private or public sectors.

In addition to financial remittances, individuals abroad may send in-kind remittances consisting of clothing, housewares, and school supplies, among other items. These in-kind transfers are made either using shipment containers or friends and relatives who travel abroad.

A survey by the Canadian Foundation for the Americas (FOCAL) estimates the total value of cash and in-kind remittances in Jamaica in 2005. A sample of 766 survey respondents were asked to report the average amount of remittances typically received on a single occasion and the frequency with which they received remittances. FOCAL reports the modal category of cash remittances as 6,000-10,000 Jamaican dollars (or \$100-\$161 U.S.), selected by thirty percent of respondents, and the modal frequency of receipts as once per month (twenty-four percent of those surveyed). Of the 766 respondents, 43 percent reported they had received at least one barrel of goods sent from abroad. When asked the value of the contents, almost forty percent did not know or could not recall. Of those who specified a range, most indicated the value exceeded \$30,000 Jamaican or \$500 U.S.

### **Motivation**

Relative to average income in Jamaica, remittances are significant revenue for some Jamaican households, motivating the importance of studying the effects of remittances on recipients' behavior. As seen in Figure 1, real remittances grew between 2001 and 2006 before leveling off through 2008 and falling slightly in 2009, as a result of the recent global recession. As a percentage of GDP, aggregated remittances consistently comprised more than 10 percent since 2001 and more than 14 percent for the last five years. According to the 2002 Jamaica Labor Force Survey, 47 percent of households surveyed considered overseas remittances to be their principal means of support.

This study is also motivated by the state of the labor market in Jamaica. As Figure 2 shows, Jamaica has one of the largest unemployment rates in the Caribbean region, with an urban unemployment rate of 19.4 percent for the period 1980-2000 (Heckman, 2003). More recent data indicate that higher than average unemployment in Jamaica persists. Although the rate equaled the Caribbean and Latin American average in 2003, the decline between 2003 and 2006 in Jamaica fell short of the region's decline, leaving Jamaica with a rate above ten percent while the rest of the region averaged 9 percent. Jamaica receives greater remittances both in absolute and per capita terms than other Caribbean countries, again suggesting a link between remittances and labor behavior.

A third reason for studying remittances in Jamaica is the "barrel children" phenomenon. The term describes families in which the parents migrate and remit goods for the children and other family members, in cylindrical-shaper containers (called barrels). Items shipped are often those unavailable in local markets or priced significantly higher than comparable costs in the parents' host countries. Many Jamaicans believe that the migration of parents from Jamaica has resulted in detrimental side effects for Jamaica, with the absence of parents adversely affecting children's schooling and behavior. Anecdotal evidence suggests that this is

not a far-fetched causal relationship, and some empirical research suggests ill effects on children (Lu & Treiman, 2007). This detrimental effect, however, disappears once those caring for the children receive remittances. A better understanding of the labor impact of remittances may provide information that is useful in analyzing the barrel children issue in further research.

The final motivation for this research arises from an interest in studying non-labor income in a developing country, a topic often limited by the availability of data. Examples of non-labor income include interest on savings, capital gains, welfare payments from the government, and as discussed thus far, remittances. Arguably, it is government welfare payments that are most analogous to remittances. While substantial research exists on the effect of non-labor income on household labor supply in developed countries, we know less about this relationship for households in less developed countries such as Jamaica.

Overall, the issue of how remittances affect labor supply is essential for any developing economy to understand. Changes in policies that either ease or restrict the flow of remittances could have substantial effects on labor markets and expenditures in the recipient countries; such changes could include taxing remittances similarly to income in an attempt to make the tax system more horizontally equitable.

### **Main Contributions**

The sheer magnitude of remittance flows to a small developing country such as Jamaica, combined with the availability of data, makes Jamaica a reasonable choice for the study of remittances (Alleyne, Kirton, McLeod, & Figueroa, 2008; Bussolo & Medvedev, 2007; Kim, 2007; Kirton, 2005). Although the country of Jamaica is not a unique choice, the empirical methods selected in this essay, as described in more detail below, offer a new perspective on the relationship between remittances and labor supply.

The first contribution of this paper to the literature is to account for the endogeneity of remittances and self-selection into the labor market. If we believe that remittances are to some degree determined by the wages received by the recipient or other unobservable factors that contribute both to the level of remittances and the labor of the household, then neglecting to account for the endogeneity of remittances may result in biased estimates. One previous study attempts to correct for this problem by treating remittances as endogenous (Acosta, 2006). Acosta (2006) uses an instrument (number of migrants from the household's village) and propensity score matching techniques to estimate the effect of remittances on child labor. The first of these methods relies on an instrument while the second, propensity score matching, cannot match households on unobservable factors.

Generally speaking, the lack of information on those individuals remitting funds has prevented other scholars from implementing more advanced empirical techniques (Bussolo and Medvedev 2007; Kim 2007). As most of the literature does not control for endogeneity, it is important to add to the evidence with a more realistic approach as we do.

Self-selection into the labor market by those remaining in the developing country is a similar issue; if not addressed econometrically, self-selection can produce biased results. Individuals choose whether or not to participate in the local labor market, and thus, proper estimation controls for the unobserved characteristics of those reporting hours worked relative to those remaining outside of the formal labor market (Heckman, 1974).

## Review of the Literature

Remittance transfers, ensuing from migration, are expected to affect labor supply in two ways (Acosta 2006; Kim 2007). First, migration implies an immediate decline in the labor supply for the home country, often referred to “brain drain.” Legal migrants are not randomly selected (Borjas, 1987) and tend to be more educated than the average individual from a developing country. Better skilled individuals are more likely satisfy the requirements to work abroad and are therefore over-represented in the migrant population. The selection process ensures that the most skilled migrants are eligible for work permits.

Potentially negative changes in the labor supply of the developing country may be partially offset by the receipt of remittances and theoretically higher wages for those that remain, particularly the educated if this group is disproportionately affected by a loss in labor market competition. Such flow of labor may also be advantageous to the developing countries, where shortages, such as those in nursing, may be filled by foreign-born individuals (Buerhaus, Staiger, & Auerbach, 2003). This movement of labor across countries is the main subject of the “new economics of migration,” a school of thought that focuses on mutually beneficial aspects of labor flows at both the microeconomic and macroeconomic levels (Massey et al., 1993).

Migration may also result in a second wave of decreased labor supply, through the effect of remittances. Once the migrant settles in the host country, they may then decide to send proceeds gained through employment back home in the form of remittances. When this money is received, it can be treated as any other non-labor income, with the usual income and substitution effects resulting in increased consumption and leisure (if leisure is a normal good), resulting in an unambiguous effect on labor. Such theory, however, ignores the complexity of remittances, particularly if motivated by investment. Suppose, instead that the remittances are used for investment and business expansion purposes by the recipient, in which case remittances could actually be associated with increased labor if the result is a larger, stronger entrepreneurial effort. A negative relationship between remittances and labor supply predicted by simple economic models is not a foregone conclusion, and many scholars have attempted to measure both the direction and magnitude of this relationship.

Airola (2005) determines that like other sources of unearned income, remittances reduce total labor hours. He estimates income elasticity in the range -0.006 to -0.03 (Airola, 2008). Similarly, Kim (2007) finds a 3.6 percent reduction in hours worked due to remittances, and this remains robust to cross-sectional and panel data specifications. Bussolo and Medvedev (2007) use a general equilibrium model and also find an overall adverse effect of remittances on labor force participation for Jamaica. Acosta (2006) concludes that there are negative effects of remittances on labor for females, but remittances are positively related to labor supply for middle-aged men, suggesting that remittances may be creating work opportunities in self-employment.

Kim (2007) separates the decision to enter the labor market from the decision of hours worked. Specific to Jamaica, a country with increasing real wages coupled with persistently high unemployment, Kim (2007) determines that hours per week conditional on working not different between households across remittance status. The receipt of remittances, however, reduces the probability of entering the labor market, thereby reducing total hours worked for the country. These findings may reflect workers’ inability to freely vary hours of work, often confined to non-optimal part-time or full-time hours. Kim (2007) claims that the receipt of remittances appears to increase the reservation wage, and recipients of remittances are therefore less likely to work. Thus, coupled with increased migration of skilled labor, higher remittances seem to exacerbate the phenomenon of high wages along with high unemployment, a symptom of a poorly functioning labor market (Kim, 2007).

Kim (2007) and Bussolo and Medvedev (2007) each use Jamaica as a case study, making their findings most relevant to the current paper. Their findings, however, differ, perhaps a result of differences in methodology. Kim (2007), for example, does not adjust for the endogeneity between wages, non-earned income such as remittances, and hours worked. Failing to correct for this problem in ordinary least squares (OLS) models could bias results (Heckman 1974).

Several studies looked at additional effects of remittances on household behavior. Lu and Treiman (2007) find that benefits may accrue for black children in South Africa who are in households receiving remittances, controlling for expenditures on education. Specifically, the researchers find lower levels of child labor in households receiving remittances (Lu & Treiman, 2007). (They also find that children in households where a parent has migrated but has not remitted funds may be worse off than children in non-migrant households because of the adverse effect of out-migration without the positive economic effect.) Overall, while remittances reduce labor supply, the finding that remittances reduce *child labor* is probably one instance in which a reduction in labor is a positive change.

## Methodology

As in Mroz (1987) and other studies, the core labor supply function is:

$$(1) h_i = b_0 + b_1 \ln(w_{fi}) + a_2 Y_i + b_3 Z_i + e_i$$

where  $h_i$  is the wife's hours of work per week,  $w_{fi}$  is the hourly wage,  $Y$  is income (which we separate into labor income and remittance income), and  $Z_i$  represents other control variables. Our first approach is to apply OLS to the equation for the sample of working wives. This allows us to compare wage and income elasticities to early studies even though we are yet to account for endogeneity and sample selection biases.

Next, we address the endogeneity of several important variables in our model. The wage rate is expected to be endogenous, given that other control variables determine it. We use the area in which the household lives and the wife's age as the key instrumental variables for the wage variable. Similarly, non-wife household income may be endogenous and is instrumented using the household size, the number of children, and the age of the wife. Also, remittance income is likely endogenous and is instrumented using total remittances at the district level, which is a measure of the propensity of different areas to receive remittances. The belief is that certain areas in Jamaica are more likely to receive remittances than others and in this way this instrument is similar to that used in other studies (Acosta 2006).

In a second model, we do a Heckit estimation of the labor supply function. We generalize Equation 1 to allow for the desire to work among all households, which may be negative for individuals with reservation wages which are above what is offered in the labor market.

$$(2) h_i^* = b_0 + b_1 \ln(w_{fi}) + a_2 Y_i + b_3 Z_i + e_i$$

where  $h_i = h_i^*$  if  $h_i^* > 0$ , and  $h_i = 0$  if  $h_i^* < 0$

If the residuals in (2) are normally distributed, it can be shown that,

$$(3) E(h_i | h_i > 0) = x_i \beta + E(\varepsilon_i | \varepsilon_i > x_i \beta) = x_i \beta + \sigma \frac{\phi\left(\frac{x_i \beta}{\sigma}\right)}{\Phi\left(\frac{x_i \beta}{\sigma}\right)} = x_i \beta + \sigma \lambda\left(\frac{x_i \beta}{\sigma}\right)$$

where  $\Phi(\cdot)$  is the cdf of a  $N(0,1)$ ,  $\phi$  is the normal density function, and  $\lambda(c) = \frac{\phi(c)}{\Phi(c)}$  is the inverse mills ratio. We use the STATA Heckit command, which commutes the standard errors correctly, by allowing for heteroscedasticity.

### Empirical issues

Three key issues are known in the literature to affect a correct estimation of the labor supply function. First, the wage of non-participants is not observed. One solution is to use a model with only workers. Second, the desired hours of non-participant is also not observed. The common solution is to use Tobit procedures to account for the censoring, but the Heckit procedure is preferred given that it does not require creating a variable for the desired number of hours worked. We estimate the labor force participation with Probit, using variables that are available for both participant and non-participants. Even using the Heckit procedure, the offer wage, one of our most important repressors, is missing for individuals that do not work, but we handle this complication by estimating the offer wage for all wives.

Our third source of estimation problems is that we may have endogeneity of the wage rate, remittance income, and “non-wife’s” labor income. Remittance receipt, for instance, is likely endogenous for various reasons. The characteristics of different households affect the likelihood that they are recipients. Some of these characters are observable, such as the number of children in the home, whether or not household members are parents of migrants and the income of the household. Other characteristics are unobservable, especially ones that involve information on migrants, such as the level of altruism of migrants and migrants’ household income. We instrument for the wage rate using the wife’s level of education, age, and location of employment, for remittances we use the total district level total remittances in the districts, and for non-wife labor income, we use the number of relatives in the household. More details on these variables are given in Table 4.

### The Data

We use two data sources, namely the Survey of Living Conditions (SLC) and the Jamaican Labor Force Survey (LFS). The SLC in Jamaica began in 1988 as part of a larger study of living standards in developing countries, with a greater emphasis on evaluating immediate effects of public policy<sup>5</sup>. The data collection and sampling frame of the SLC are based on the larger LFS. From the LFS, a smaller sample is randomly selected for inclusion in the more detailed Survey of Living Conditions. The Statistical Institute of Jamaica administers the Survey of Living Conditions. However, the principal investigator is the Planning Institute of Jamaica, both governmental departments. Surveyors ask questions about education, crime, and health, but specific modules also focus on food and non-food expenditures as well as remittances.

Though the surveys are conducted quarterly (January, April, July, and October) with the SLC conducted one month after each round of the LFS, the quarter that is considered most stable is the April quarter. For this reason, the data used for the official labor force statistics, and in this article, are from the April quarter. Using data from 2006, we can assess the characteristics of those households receiving remittances and look at differences in labor supply behavior between those families receiving remittances and those not receiving remittances. The household identification variable is used to link the Survey of Living Standards to the Jamaican Labor Force Survey.

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<sup>5</sup><https://siteresources.worldbank.org/INTLSMS/Resources/3358986-1181743055198/3877319-1190214215722/binfo2000.pdf> accessed on May 31, 2017.

The data are self-weighted, meaning that the means and other statistics from the sample in the survey can be taken to reflect the entire population without the need for sample weights. However, even the best of samples still suffers from missing data issues which affect this self-weighted attribute. This self-weighted feature remains true for all the years after using 'raising factors.' These raising factors are made up of two sample weights: first, to account for non-response, an enumeration district weight (edwght) is used, and secondly, to improve the parish representativeness, a parish weight (parwght) is used.

The dependent variable in this analysis is the number of hours worked, and the primary variable of interest is the level of remittances received. Additional variables, however, are included in the model; have yet to be formally introduced. Such variables include age, and education of the wife of the household, the corrected wage variable, and other sources of income for the household. Household characteristics, including the number of children five years old and under and six years only and over, and whether the household resides in a rural, other towns, and urban.

The instrumental variables we use are broken down into background, children, work experience, and remittance variables. Background variables include the area in which the household is located, the enumeration district, and the number of people in the household. The enumeration district is the area into which the country is divided for voting purposes. It is defined narrower than the 14 parishes and so is more homogenous. The number of people in the household is calculated using data from the LFS. The full list of these instruments is given in Table 2, along with their description.

## Results

### 1. OLS

Even though the OLS coefficients are likely not consistent, they provide a useful starting point for our investigations. Surprisingly, the compensated wage elasticity of 0.097 is close to the 0.09 reported for working women in the United States in a 1994 meta-analysis (Hum & Simpson, 1994). According to the OLS results, non-wife labor income and remittance income are both not significant determinants of working wives' hours, even though the coefficients have the expected negative sign.

### 2. Instrumental Variables Regression

The instrumental variables regression shows larger wage elasticity than what we observe for OLS, and now the income elasticity is significantly different from zero and is positive. This finding contradicts prior research (Mroz 1987) as well as economic theory which suggest that higher non-wife income would lead to lower labor supply among married women, thus negative income elasticity. In the case of Jamaica, it could be that the wives in higher income households are seeking to work more hours because, unlike poorer households, they are more educated and motivated.

### 3. Heckman estimation

Endogeneity can be the result of omitted variables, measurement error, or self-selection. If we assume that the main cause of endogeneity in our case is self-selection, then the Heckman's two-step procedure provides a consistent estimate of the wage and income elasticities. Table 5 gives the results of this estimation.

Since hours of work and all the key explanatory variables are in logs, the marginal coefficients are equal to the uncompensated elasticities. Mathematically, if hours worked is  $h$ , the wage rate is  $w$ , non-labor income is



$Y$ ,  $x$  is a vector of control variables, and  $\beta$  is a parameter vector. Then the hour's equation and the uncompensated labor supply elasticity for an individual with characteristics  $w$ ,  $Y$ , and  $x$  is as follows:

$$h = \theta(w, Y, x|\beta)$$

$$e = \frac{\partial \ln h}{\partial \ln w}$$

## Conclusion

We began this essay interested in the effects of remittances on labor supply in developing countries such as Jamaica. Reliance on remittances, particularly in a small nation such as Jamaica with significant emigration to the United States, Canada, and the U.K., can comprise a significant share of a household's income, thus affecting decisions such as labor market participation and hours worked. To the extent that a relationship between labor market outcomes and remittances exists, it is important to understand the direction of this relationship and whether it could create greater implications for economic growth in developing countries.

In this paper, we use standard labor supply estimation techniques to the Jamaican context. Our results on the uncompensated wage and income effects vary significantly across procedures; a finding that is consistent with what we observe in Mroz (1987). The economic and statistical assumptions we make seem to affect the estimates of the labor supply parameters. The magnitude of the effects varies widely, but in almost all instances, the sign of the effects is the same across procedures. Specifically, we see that the wage effect is unambiguously positive; the remittance effect is negative, while the income effect is positive except for in the OLS specification. In this study, we did not identify self-employed individuals and so are not able to control for this effect.

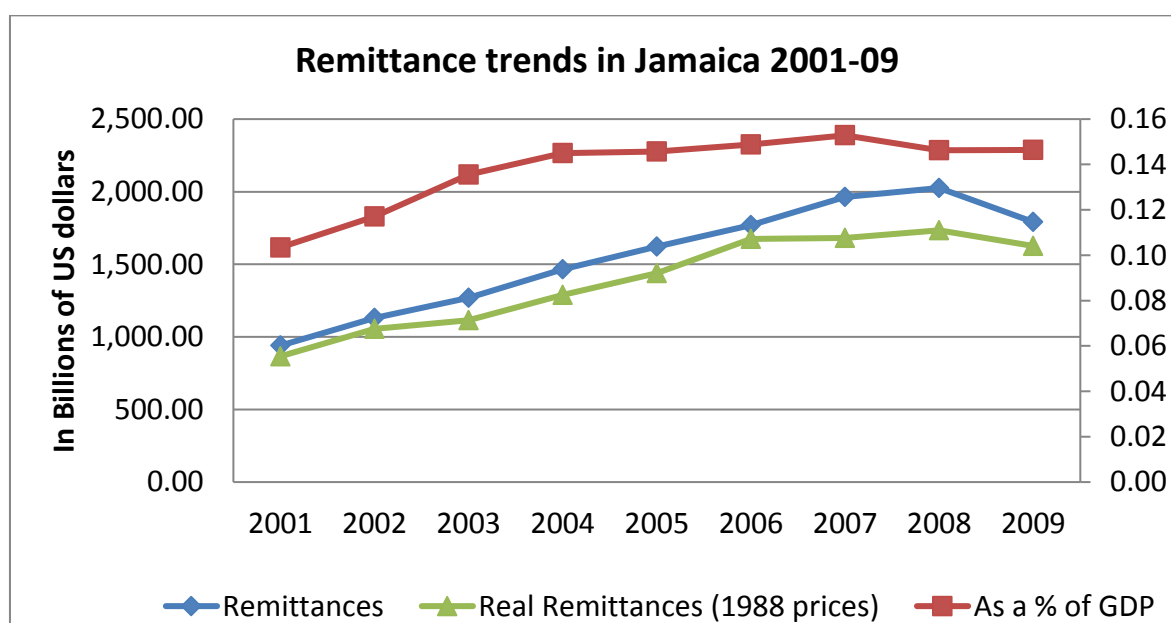
The evidence provided in this paper suggests that the receipt of remittances does not affect the supply of labor that is provided by wives in Jamaica. At least two possible explanations exist for this finding. First, the average amount of remittances may not be enough at the household level to sway labor decisions. Even though the total remittances the country receives at the macro level may have a significant, the household effect might be negligible. Second, there may be counteractive effects of remittances, with more remittances increasing hours of work especially in home production (self-employment), while reducing hours of work in regular jobs.

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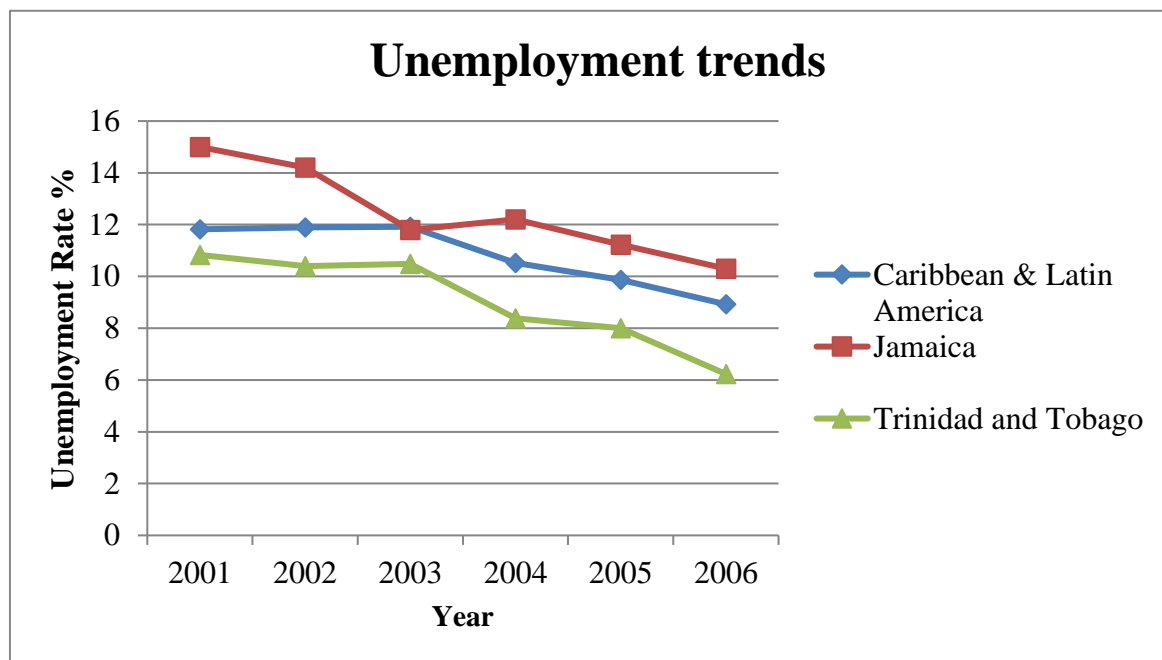
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**Figure 1: Remittance Trends**



Source: Bank of Jamaica ([www.boj.gov.jm](http://www.boj.gov.jm) as of June 23, 2011)

Figure 2: Trends in unemployment



Source: IMF International Financial Statistics<sup>6</sup>(2009)

<sup>6</sup>Countries included are: Argentina, Brazil, Chile, Colombia, Ecuador, Jamaica, Mexico, Trinidad and Tobago, Uruguay and Venezuela.

**Table 1: Data Summary by receipt of remittances**

Variable	Non-Recipients			Recipients		
	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.
Hours per week	268	41.7	9.7	141	40.37	8.98
age	441	46.3	14.92	240	44.76	16.4
Wage (estimated)	426	1.72	1.49	229	1.82	1.39
Non-wife labor income	288	7,971.88	12,237.47	164	6,631.63	10,661.34
HHLD Remittances	441	-	-	240	1,008.32	5,318.04
# of Children <6	441	0.32	0.61	240	0.45	0.71
# of Children ≥ 6	441	0.94	1.22	240	0.85	1.13
Level of Education	416	1.43	1.37	223	1.52	1.44
High School education	283	4.68	1.43	143	4.72	1.51
Area = kma	441	0.23	0.42	240	0.29	0.45
Area = urban	441	0.27	0.45	240	0.33	0.47
Area = rural	441	0.49	0.5	240	0.38	0.49
Ind_mining	441	0.00	0.00	240	0.00	0.00
Ind_agriculture	441	0.11	0.31	240	0.10	0.30
Ind_construction	441	0.01	0.08	240	0.00	0.06
Ind_manufacturing	441	0.03	0.18	240	0.03	0.18
Ind_transportation	441	0.00	0.00	240	0.00	0.06
Ind_wholesale	441	0.04	0.19	240	0.03	0.16
Ind_retail	441	0.01	0.09	240	0.00	0.06
Ind_finance	441	0.19	0.39	240	0.15	0.36
Ind_services	441	0.04	0.20	240	0.06	0.24
Ind_publicadministration	441	0.57	0.50	240	0.62	0.49

Source: Jamaica Surveys of Living condition and Labor Force, 2006

**Table 2: Definitions of Instrumental Variables**

Background variables	Area where household resides (Kingston metropolitan area, rural, or urban); the enumeration district of the household; the number of relatives in the household.
Children variables	Number of children under 6; Number of children over 6, who live in the household.
Work Experience Variables	Wife's current work experience (five years or more); Wife's previous work experience (Yes/No).
Remittance variables	Value of annual cash and in-kind household remittances income in 2006; District level remittances
F2	Quadratic terms in Wife's age; education, and age x education.
Non-wife Household Income	Total household income – wife's labor income

**Table 3: OLS (Dependent Variable: Logged Hours Worked)**

Number of Kids 5yo or less	-0.005 (0.21)
Number of Kids 6yo or more	-0.024** (2.17)
Logged wage (estimated)	0.097*** (5.09)
Logged remittances	-0.005 (0.89)
Logged non-wife h/h income	-0.002 (0.42)
Education level	-0.036*** (3.73)
High School (Yes/No)	0.026** (2.39)
Area = Urban	0.051 (1.24)
Area = Rural	0.091** (2.17)
Industry_agriculture	0.094 (0.74)
Industry_manufacturing	0.048 (0.37)
Industry_wholesale	0.040 (0.29)
Industry_retail	0.079 (0.46)
Industry_finance	0.050 (0.41)
Industry_services	0.136 (1.04)
Industry_publicadministration	-0.007 (0.06)
_cons	3.549*** (25.12)
$R^2$	0.18
$N$	232

\*  $p < 0.1$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$

**Table 4: Two-staged Least Squares (IV) - (Dependent Variable: Logged Hours Worked)**

Logged wage (estimated)	2.219*** (8.61)
Logged remittances	-0.107 (0.87)
Logged non-wife h/h income	0.134*** (3.54)
Number of Kids 5yo or less	0.130 (1.39)
Number of Kids 6yo or more	0.040 (0.79)
Industry_agriculture	0.794 (1.44)
Industry_construction	-0.890 (1.53)
Industry_manufacturing	0.480 (0.74)
Industry_wholesale	0.207 (0.33)
Industry_retail	-0.276 (0.36)
Industry_finance	0.796 (1.33)
Industry_services	0.114 (0.22)
Industry_publicadmin	-1.749*** (3.23)
_cons	0.330 (0.39)
$R^2$	0.46
$N$	639

\*  $p < 0.1$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$

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**Table 5: Heckman results (Dependent Variable: Logged Hours Worked)**

	Number of Kids 5yo or less	-0.043*
		(1.89)
	Number of Kids 6yo or more	-0.029**
		(2.18)
	Logged wage (estimated)	0.230***
		(4.73)
	Logged remittances	-0.001
		(0.22)
	Logged non-wife h/h income	0.001
		(0.16)
	Education level	-0.041***
		(3.42)
	High School (Yes/No)	0.022*
		(1.83)
	Area = Urban	0.040
		(0.99)
	Area = Rural	0.048
		(1.16)
	Industry_agriculture	-0.062
		(1.32)
	Industry_construction	-0.038
		(0.24)
	Industry_manufacturing	0.046
		(0.64)
	Industry_transportation	-0.073
		(0.26)
	Industry_wholesale	0.073
		(1.06)
	Industry_retail	0.078
		(0.55)
	Industry_finance	0.063
		(1.64)
	Industry_services	0.043
		(0.73)
	_cons	3.433***
		(40.84)
inlf	Number of Kids 5yo or less	0.325**
		(2.12)
	Number of Kids 6yo or more	-0.089
		(1.13)
	Education level	0.085
		(1.24)
	High School (Yes/No)	0.071
		(0.83)
	Area = Urban	-0.034
		(0.13)
	Area = Rural	-0.120

	(0.50)
Age of wife	0.125**
	(2.49)
Age of wife squared	-0.001*
	(1.72)
_cons	-2.456**
	(2.19)
mills lambda	0.070
	(0.43)
<i>N</i>	400

\*  $p < 0.1$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$  Standard errors in parentheses

**Table 6: Uncompensated elasticities**

Procedure	OLS	2SLS	Heckman
Wage Coefficient	0.097	2.219	0.230
Labor Income Coefficient	-0.002	0.134	0.001
Remittance Coefficient	-0.005	-0.107	-0.001