The Effect of Filipino Overseas Migration on the Non-Migrant Spouse's Labor Supply Behavior

by
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ABSTRACT

This paper examines the effect of the husband's overseas migration on the non-migrant wife's labor force participation and supply behavior. The study uses merged 2003 data sets from the nationally representative Labor Force Survey, the Family Income and Expenditures Survey and the Survey of Overseas Filipinos. Employing alternative empirical specifications of the wife's labor supply function, the study provides estimates of the income remittance and the conjugal home-time effects of overseas migration. Estimates establish that in households with pre-school age children, wives are less likely to hold a full-time paid job with larger effects in migrant than in non-migrant households. School-age children encourage the entry of women in non-migrant households into part-time paid employment while having the reverse effect for women in migrant households particularly on full-time paid employment. Children in the very young working age of below do not appear to affect significantly employment participation of women in non-migrant households but induces employment of women in migrant households, particularly into part-time self-employment. Attainment of a college education raises employment propensities for wives, but less so for migrant than for non-migrant households, implying the presence of a moral hazard problem where remittance receiving households reduce their work effort. And finally, the husband's earnings contribution to household income lowers the wife's market participation but the marginal effects are very small in magnitude with only slight variation between migrant and non-migrant households.

Keywords: Philippines, international migration**,** remittances, labor supply, conjugal-time allocation
JEL code: F22, J22, J61, J12, D1, O15

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1. Introduction

The labor diaspora of Filipino workers continues unabated and if anything, has become even more pervasive than before. The number of workers the country deploys annually to other countries follows a general upward trend from 755,684 in 1998 to 867,969 in 2003 and 981,677 in 2005 [POEA, 2006]. The estimated stock of Filipinos working or living overseas is 8.1 million, comprising about 10 percent of the country's population and 23 percent of its labor force. Remittances from overseas Filipino workers amounted to US$11.6 billion in 2004, representing an increase of about US$6.7 billion from the total remittances recorded in 1998, and accounted for about 13.5 percent of the country's GDP [WB, 2006].

Although the importance of this phenomenon is undeniable, local literature on the country's overseas labor migration is largely descriptive and with meager attention given on assessing its economic consequences. As such, the extent of its full impact on the Philippine economy remains poorly understood. This study takes a step in bridging this gap by focusing on the labor supply effects of overseas migration. In an intact household (i.e., household headed by a married couple), the migration of one member of the couple can affect the labor supply of the non-migrant spouse through two mechanisms: the income remittance effect and the conjugal home-time effect. The latter operates through the effect of a spouse's child care and leisure time at home on the other spouse's labor supply behavior.

By conventional assumption, a person decides to work positive hours if his or her market wage exceeds or equals his or her reservation or shadow wage. Remittances affects the labor force participation and supply behavior of the non-migrant spouse by increasing dramatically the latter's non own-wage income and the reservation wage compared to pre-migration levels. The higher the amount of remittances in comparison to the previous marginal household income contribution of husband's earnings, the higher also is the increase in the shadow price of the wife's home time and the lesser the market participation, if leisure is a normal good. On the other hand, if Filipino households are credit constrained, then migrant's remittances may ease up credit and risk constraints of households to engage in commercial production [Stark, 1991]. Thus, the income remittance effect on the wife's labor supply can go in either direction and will be determined empirically.

One aspect of overseas migration that is ignored in the literature is its effect on the demand for the non-migrant spouse's time in the home. In a typical Filipino household headed by a couple with children, both members of the couple spend time on child care, with the wives putting in a substantially greater time input than the husbands [Domingo, Raymundo and Cabegin, 1994]. Given that the time spent for child care between Filipino husbands and wives are very likely to be substitutes, wives of migrant husbands are expected to spend more time for child care following the migration, in order to compensate for the absence of the migrant parent. The departure of the migrant parent and his subsequent withdrawal from child care raises the shadow price of child care time by the remaining parent who now assumes the role of both mother and father in the household. This is particularly pertinent in the Philippines where parents (especially the mothers) continue to be mainly responsible for child care.

A positive husband's child-care time effect of migration on the wife's monetary value of non-market time in households with young children implies a reduction in the non-migrant parent's labor supply. This effect may shift employment towards traditional forms that allows greater compatibility of childcare and market work and may even result in the withdrawal from the labor force if the increase in the value of home time is large enough.

On the other hand, in Filipino households where domestic chores are primarily relegated to the wife, the husband's leisure time (excluding child care activities) at home is likely to increase the demand for the wife's time in housework. The complementarity of husband's leisure time at home with wife's time for housework implies that, *ceteris paribus*, the wife's labor supply will increase following the migration of the husband. As in the income remittance effect, the signs of the conjugal home time effects are indeterminate *a priori* and depend on the relative strength of the husband's leisure time and child care time effects.

2. The Empirical Model

The Filipino family remains largely patriarchal so that while members of a Filipino couple engage in some form of conjugal time allocation between household and market production, a Filipino wife typically specializes in home production and the husband in market production. However, in cases where the husband's earnings are inadequate to meet household needs, the wife has an incentive to supply positive hours of work in the labor market to augment family income while still devoting a significant amount of time to home production [Domingo, Raymundo and Cabegin, 1994; Cabegin, 1996]. Thus, a Filipino wife's labor force participation and supply behavior is quite likely influenced by the husband's labor market outcome. The symmetric effect of the wife's labor supply on the husband's participation in the labor market is at best weak, given the large concentration of husbands in full-time employment regardless of the wives' working hours.

The focus of this empirical analysis is on how the market participation and labor supply behavior of the wife is affected by the husband's migration's status, with the latter treated as independent of the wife's labor market outcome. The basic reduced-form labor supply function of the wife is expressed as:

$$H = h(E, C, X, E_h, N, M) \qquad (1)$$

In this equation, H is the wife's weekly hours of work and h(.) is a generalized function that accommodates different specifications of the labor participation-supply model. E represents the individual variables affecting the wife's earnings such as education and age. The substitution of these variables in lieu of wages is intended to deal with the censoring problem brought about by the lack of wage data for non-employed and self-employed women. Employing this measure can be taken to be trivially complete as the primary intent of the study is on the effect of migration on labor supply rather than on estimating wage elasticities of the demand for labor.

The vector C represents demographic variables that affect preferences of the wife for work and includes the number and age composition of children. The higher the number of children in the preschool and school ages, the higher also is the value of

wife's time in home production and the lower the likelihood of employment. X denotes other taste-influencing variables such as the presence of adult non-family members and geographic location dummies and a variable reflecting regional unemployment rates.

The husband's characteristics include E_h which represents the husband's earnings contribution to household income represented by the husband's annual earnings for those who work in the domestic market and equals the amount of annual remittances for husbands working overseas. [1] N is non-wage income and is calculated as the sum of asset income and earnings of household members other than the head and the spouse of the head. A possible estimation problem would be the potential endogeneity of non-own wage income with the wife's labor participation and supply behavior. This is dealt with in the study by instrumentation of husband's earnings with the predicted husband's marginal contribution to household income (Appendix A) and the use of the household's decile ranking in non-wage income in lieu of actual non-wage income.

M is the main focus of the study and indicates the overseas migrant status of the husband.[2] In a single equation model, variables denoting the interaction between the husband's migration status with the number and age of children and with the husband's earnings are included to test empirically the income-remittance and conjugal home-time effects of migration on the wife's labor force participation and supply behavior.

2.1 Switching Regression Model of the Wife's Labor Force Participation and Supply

A characteristic feature of labor supply behavior of married women is its variety, which is largely absent in the case of men. Many married women prefer to do housework rather than work for a wage, and for those who do work for a wage, a substantial number are engaged in traditional self-employment or in part-time work. In addition to estimating the probability function of women's market participation and hours worked equation for employed women, the paper also presents choice equations of paid and self-employment and corresponding selectivity-adjusted labor supply functions.

The hours-equation corresponding to paid-employment and self-employment are as follows:

$$H_p = Y_i\alpha + \gamma P_i + \varepsilon_{pi} \quad if \quad P_i^* > 0;$$
$$H_s = Y_i\alpha + \gamma P_i + \varepsilon_{si} \quad if \quad P_i^* \leq 0 \tag{2}$$

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[1] For husbands working in the domestic labor market, the husband's earnings equal the hourly wage rate multiplied by the number of hours worked in the reference week and by 52 weeks.

[2] An overseas Filipino migrant is defined as a Filipino who is engaged in paid work in a foreign country. The overseas migrants in the survey are primarily (close to 9 out of 10) overseas contract workers or migrant workers on a temporary employment contract. The data indicate that about 75 percent of the migrants have left the country a year before the survey or later and about 90 percent migrated two or years prior to the survey or later.

where P is an index denoting the observed paid-employment status and assumes the value of unity if the wife is in a paid job and zero if she is self-employed. Moreover, P is related to a latent variable, P*, an unobservable index of the likelihood to be observed in paid employment:

$$P = \begin{cases} = 0 & if \quad P_i^* \leq 0; \\ = 1 & if \quad P_i^* > 0; \end{cases} \tag{3}$$

$$P_i^* = Z_i \delta + \varepsilon_i^* \tag{4}$$

and where Z and Y are vectors of explanatory variables that affect the decision to be in paid or self employment and the corresponding labor supply, respectively; α, γ and δ represents unknown vectors of parameters and the ε´s are the random error terms.

The labor supply outcome, H_p, is observed only when the woman holds a paid job, $P_i=1$; otherwise, the woman is in self-employment ($P_i=0$) and works H_s number of hours in a week. If P is treated as an endogenous variable in the model, then the hours equations for paid and self-employment can be expressed as:

$$E\left(H_p \middle| P = 1\right) = Y_i \alpha + \kappa \lambda_{pi};$$
$$E\left(H_s \middle| P = 0\right) = Y_i \alpha + \kappa \lambda_{si} \tag{5}$$

where λ is the inverse Mill's ratio that corrects for sample selection into paid-employment or self-employment. Equation (5) can be augmented to include a correction for sample selection of women into employment denoted by λ_e:

$$E\left(H_p \middle| e = 1, P = 1\right) = Y_i \alpha + \kappa_1 \lambda_{ei} + \kappa_2 \lambda_{pi};$$
$$E\left(H_s \middle| e = 1, P = 0\right) = Y_i \alpha + \kappa_1 \lambda_{ei} + \kappa_2 \lambda_{si} \tag{6}$$

where *e=1* if the woman is employed and implies that she faces a wage rate in the labor market that exceeds her reservation wage.

Hence, the least squares estimates of the labor supply function are adjusted for selection into employment and conditional on employment, into either paid- or self-employment. To deal with the issue of identification, interaction terms of education with age are added in the selection function of paid employment and the identifying variables that do not appear in the hours-equation include the number of non-family members and the regional unemployment rates.

2.2 Multinomial Probit Model of Labor Force Participation and Supply

An important issue in the estimation of Equation (1) is distilling the income remittance and conjugal home-time effects from factors inducing a correlation between the husband's migration status and the wife's labor supply behavior. A single equation model would be inadequate to distinguish the income and home-time effects from possible heterogeneity effects operating through the differences in characteristics of women in migrant and non-migrant households.

An alternative econometric specification is the multinomial probit model (MNP) which treats wives with similar labor participation and supply outcomes but differ in husband's migration status as independent states. In this paper, the labor force participation and supply behavior of the wife is conditional on the husband's migration status, with the latter treated as independent of the wife's labor market outcomes. Parallel MNP models of the wife's labor force participation and supply were estimated separately for migrants and non-migrants households.

For computational tractability of the MNP model, the labor supply of women may be defined in discrete states so that H has three categories as follows: (1) non-employment; (2) part-time employment; and (3) full-time employment. Part-time employment is equivalent to working for fewer than 40 hours a week and full-time employment indicates working 40 or more hours a week. Non-employment indicates zero hours of work. A more elaborate variant of the different labor supply states of the wife further classifies part-time and full-time employment into self-employment and paid employment, leading to five independent employment states:

$$H = \begin{cases} 1 & \textit{if nonemployed} \\ 2 & \textit{if in part} - \textit{time, self} - \textit{employment} \\ 3 & \textit{if in full} - \textit{time, self} - \textit{employment} \\ 4 & \textit{if in part} - \textit{time, paid} - \textit{employment} \\ 5 & \textit{if in full} - \textit{time, paid} - \textit{employment} \end{cases}$$

Assuming full employment in migration destination countries, only wives with husbands working on a full-time basis is considered to circumvent problems of unobserved heterogeneity correlated with the husband's labor supply that might complicate comparisons between wives of husbands in different migration states.

For a given migration status, the resulting employment choice of a married woman includes five different employment states, which could be denoted as J alternatives, representing the husband's migration and the wife's labor participation-supply status. If U_j denotes the level of utility of occupying state j, the unconditional utility maximization problem across the different states is given by:

$$U_j^* = \max (U_j) \quad \text{, where j = 1,......,J} \tag{7}$$

where U^* is the maximal utility that an individual can attain.

In general, utility maximization will generate a choice of state j if the expected utility, U_j exceeds the expected utility of alternative r, U_r, where r denotes the elements of the set of alternative choices.

$$\max(U_j) \Leftrightarrow (U_j > U_r), \quad \forall \quad r \neq j \tag{8}$$

Although the utility levels are unobservable, the final labor force participation-supply state of the wife can be observed, which corresponds to U^*_j, or the maximum utility over the set of alternatives. Denote the observed choice as y_j

$$y_j = \begin{cases} 1, \text{ if } U^*_j \\ 0, \text{ if } otherwise \end{cases} \tag{9}$$

Suppose U_j is a linear combination of observed individual and household characteristics and a random component as follows:

$$U_j = V\delta_j + \mu_j \tag{10}$$

where V is a vector of individual and household variables identified in the RHS of Equation (1), δ the vector of corresponding parameters to be estimated and μ the error term. Then the solution to the maximization problem gives the probability of selecting state j (p_j):

$$\begin{aligned} p_j &= \Pr\left(V\delta_j + \mu_j > V\delta_r + \mu_r, \forall r \neq j, where\ r, j = 1, \dots, J\right) \\ &= \Pr\left(-\mu_{rj} > V\delta_{rj}, \forall r \neq j, where\ \mu_{rj} = \mu_r - \mu_j, \delta_{jr} = \delta_j - \delta_r\right) \\ &= \Pr\left(\mu_{rj} < V\delta_{rj}, \forall r \neq j\right) \end{aligned}$$

$$\tag{6}$$

If the error terms, μ_{rj}, follow a multivariate normal distribution, then p_j is given by:

$$p_j = \int_{-\infty}^{V\delta_{j1}} \int_{-\infty}^{V\delta_{jJ}} f(\mu_{1j}, \dots, \mu_{Jj}) d\mu_{j1} \dots d\mu_{jJ} \tag{11}$$

where f(.) is the normal density function (Maddala, 1983).

3. The Data

The analysis uses merged data from the 2003 Family Income and Expenditure Survey, the Labor Force Survey and the Survey on Overseas Filipinos. These are nationally representative surveys of the labor participation and supply characteristics of household members, household income and expenditures and characteristics of overseas workers.

The sample used in the analysis is limited to wives who are co-heading the household with the husband, with both members between the prime working ages of

25 and 54 years old. The age criterion intends to weed out members who are highly likely to be in school or have opted for early retirement. As mentioned earlier, the study assumes full-time employment in migration destination countries, so that only wives whose husbands are in full-time employment are considered. Moreover, husbands in self-employment are excluded because, given the patriarchal nature of Filipino families, wives may be obligated partners of husbands in self-employment. That is, married women may be obliged to assist their self-employed husbands, even if otherwise, they would choose to take on a paid job or prefer not to work. Applying these conditions and eliminating a negligible number of observations with missing values narrows the sample to 8, 629 married women.

Table 1 shows the percentage distribution of the different labor supply states of the wife by husband's migration participation. In general, Filipino married women are involved in diverse employment patterns. Slightly more than half of the sample (53 percent) does not work. About one-third (32 percent) works on a full-time basis and about 28 percent are in a paid job. In the sample, 7 percent of the wives have spouses working overseas. Although the differences are quite modest between migrant and non-migrant households, there is some indication that wives of migrant husbands are less likely to work, and when they do work, are more likely to be self-employed than wives in non-migrant households.

TABLE 1. Percent distribution of the wives by own-labor supply states and husband's migration status

Wife's labor supply status	Husband's Migration Status		Total
	Working Full-time In Domestic labor market % (N)	Working Overseas % (N)	
Non-employed	52.5 (4215)	54.3 (324)	52.6 (4539)
Self-Employment	19.1 (1536)	23.6 (141)	19.5 (1677)
Part-time	8.6 (691)	9.7 (58)	8.7 (749)
Full-time	10.5 (845)	13.9 (83)	10.8 (928)
Paid-employment	28.4 (1681)	22.1 (132)	28.0 (2413)
Part-time	6.9 (554)	2.7 (16)	6.6 (570)
Full-time	21.5 (1727)	19.4 (116)	21.4 (1843)
TOTAL	**100.0 (8032)**	**100.0 (597)**	**100.0 (8629)**

Table 2 presents summary statistics for the wife's variables by husband's migration status. Women in both migration states are quite similar with respect to age and the number and age composition of family household members. More pronounced differences are observed in the level of education with women in migrant households being relatively better educated. About 62 percent of these women have had at least some tertiary education compared to 32 percent of the non-migrant counterpart. Moreover, about 35 percent of women in migrant households have a college degree

while only 17 percent of the women in the non-migrant households are similarly categorized. There is a substantial increase in the husband's earnings contribution to household income associated with migration, which is close to thrice as much in migrant than in non-migrant households.

TABLE 2. Descriptive Statistics

Variable	Husband's Migration Status		All Sample
	Working Full-time In Domestic labor market % (N)	Working Overseas % (N)	
Age	37.01	38.72	37.13
Some high school education	0.14	0.05	0.14
College education	0.32	0.62	0.18
N preschool HH members	1.07	0.80	1.05
N HH members 7 - 15 yrs old	1.31	1.10	1.30
N HH members 16- 24 yrs old	0.80	0.98	0.81
N adult NF female members	0.14	0.39	0.15
N adult NF male members	0.08	0.15	0.09
Urban residence	0.58	0.74	0.60
Luzon	0.39	0.48	0.39
Visayas	0.23	0.19	0.22
Mindanao	0.25	0.11	0.24
Husband's earnings (000)	69.00376	186.45050	77.37579
Non-wage income (Rank)	6.15	9.66	6.39

4. Estimation results

4.1 Switching Regression Model of Labor Force Participation and Supply

Table 3 presents the results of the hours-regression model for paid- and self-employment, along with the estimates on the selection equations of working and of holding a paid job, conditional on employment. The coefficients of the conventional variables generally confirm findings of previous work on married women's labor supply and are in line with theoretical expectations. The coefficient for the age variable indicates that, even after controlling for other relevant factors, the participation of married women in the labor market increases up to a threshold level and then declines thereafter. However, conditional on employment, age does not appear to significantly affect married women's labor supply or the choice between a paid job and self-employment.

Indicative of the higher opportunity cost of non-employment, married women with a college education are much more likely to participate in the labor force than their less educated counterparts, and conditional on working are more likely to work longer hours. The presence of a female adult non-family member is, as expected, associated with higher market participation among married women and more particularly in paid employment than in traditional self-employment. Women in households with a female adult non-family member are also more likely to work longer hours. As

TABLE 3. Switching Regression Model on Employment States and Hours Worked

	Probit Results On:				Selection-Corrected OLS on (ln) Hours Worked[§]					
Variable	Model 3.1 Employment		Model 3.2 Paid Work Conditional on Employment		Model 3.3 Full Sample		Model 3.4 Paid-Employed Sample		Model 3.5 Self-Employed Sample	
	Coefficient	z-stat	Coefficient	z-stat	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
Age	0.1103***	4.96	-0.0081	-0.24	0.0015	0.09	0.0119	0.75	-0.0207	-0.64
Age squared	-0.0013***	-4.55	0.0001	0.12	0.0000	-0.12	-0.0002	-0.97	0.0003	0.81
College graduate	0.3760***	9.74	0.1578	0.61	0.0908***	2.66	0.0571	1.44	0.0257	0.36
N preschool age (<6) HH members	-0.1827***	-11.04	-0.0422	-1.57	-0.0337**	-2.39	-0.0238*	-1.67	-0.0322	-1.10
N School-age (7-15) HH members	0.0156	1.12	0.0012	0.05	-0.0279***	-2.83	-0.0420***	-3.69	-0.0048	-0.27
N Young Working age (16-25) HH members	-0.0230	-1.4	-0.0222	-0.93	0.0088	0.9	0.0073	0.75	0.0110	0.56
N adult NF female members	0.3071***	8.12	0.1409***	2.70						
N adult NF male members	-0.0214	-0.46	0.0731	1.09						
Urban	-0.0040	-0.11	0.0760	1.44	0.1419***	5.98	0.0790***	3.04	0.1974***	4.59
Predicted Husband's earnings♣	-0.0009	-1.41	-0.0037***	-3.72	0.0002	0.62	0.0002	0.69	0.0003	0.33
Non-wage income	0.0684***	14.0	-0.1179***	-15.78	0.0185***	3.92	0.0131	2.18	0.0540***	4.32
Migrant husband	-0.2888	-1.44	0.2495	0.77	-0.1191	-0.86	-0.1295	-1.12	-0.1487	-0.59
N Preschool*H migrant	0.1490**	2.2	-0.3782***	-3.54	-0.0229	-0.41	0.0227	0.43	0.0010	0.01
N SchoolAge*H migrant	-0.0977*	-1.79	-0.2508***	-2.63	0.0345	0.86	0.0844***	3.25	0.0464	0.66
N Working Age*H migrant	0.1179**	2.34	-0.1809**	-2.38	-0.0192	-0.58	0.0270	1.21	-0.0632	-0.97
H Earnings*H migrant	-0.0012	-1.28	0.0033**	2.17	0.0002	0.36	0.00004	-0.08	0.0002	0.18
Regional unemployment rates	-2.7663***	-3.91								
Selection factor-Employment					0.0261	0.34	0.0306	0.46	0.0445	0.26
Selection factor-Paid employment							0.0829	1.25		
Selection factor-Self employment									-0.1201	-1.39
Regional Dummies	Yes		Yes		No		No		No	
Age-Education Dummy Interaction			Yes		No		No		No	
Constant	-2.4646***	-5.74	1.5763**	2.40	3.3932***	10.05	3.4269	10.39	3.2637	4.58

♣Husband's earnings contribution to household income; §logarithm of hours worked in a week ; *** significant at .01 level; ** significant at .05 level; * significant at .10 level; Diagnostics: Model 3.1: N= 8375; Waldchi2(20)=841.26 ,Prob >chi2=0.0; Log likelihood=-5275.64; Pseudo R2=.0869; Model 3.2: N= 3972; Waldchi2(23)=529.8 ,Prob >chi2=0.0; Log likelihood=-2332.664; Pseudo R2=.1305; Model 3.3: N= 3972; F(15,3956)=13.54; Prob >F=0.0; R2=.0465; Model 3.4: N= 2339; F(16,2322)=7.98; Prob >F=0.0; R2=.0470; Model 3.5: N= 1633; F(16,1616)=7.51; Prob >F=0.0; R2=.0711;

expected, a higher regional unemployment rate discourages married women from participating in the labor force. The coefficient of the sample-selection correction factors are all positive but not significant. This implies that employed married women work the same number of hours as married non-employed women if in fact they had chosen to work. Moreover, workers who are in paid employment also have similar labor supply as women who are self-employed, if the latter had chosen instead to take on a paid job.

As evidenced by past literature, the presence of young children impacts prominently on the mother's labor participation and supply decision. As expected, the presence of pre-school aged children in the household significantly discourages married women from market participation and reduces their labor supply. The coefficients for school-age children in the selection equations are positive but not significantly different from zero. However, once working, a woman with school-age children is less likely to work longer hours particularly if she is holding a paid job. The wife's labor force participation and supply appear to be independent of the number of family members in the young working age below 25 years old.

The effect of husband's earnings contribution to household income is negative but not significant on the wife's labor force participation and labor supply. However, conditional on working, higher husband's earnings contribution reduces the wife's propensity to hold a paid job.

Of key interest to the study are the variables on migration status and its interaction with the number and age of children and with husband's contribution to household income. The coefficient of the dummy variable representing the husband's migrant status is negative in the employment function and positive in paid-employment but with both coefficients not significantly different from zero. However, for married women holding a paid job, those in migrant households are significantly less likely to work longer hours than women in non-migrant households.

The interaction of migration status with the children variables indicate that pre-school children do not reduce market participation of women in migrant households as strongly as they do for women in non-migrant households. However, once employed, pre-school children reduces the wife's likelihood of holding a paid job by a significantly greater magnitude in migrant than in non-migrant households. Having school-age children significantly discourages women in migrant households from market participation, and especially from paid employment. A married woman in a migrant household with a school-age child and who holds a paid job is more likely to work longer hours relative to the rest of the paid working women in migrant households. Finally, women in migrant households are more likely to participate in the market, particularly in self-employment, as children becomes of working age.

The negative effect of husband's earnings on the wife's market participation does not appear to differ significantly between migrant and non-migrant households. Conditional on employment, the higher the husband's remittances the more likely are women in migrant households to engage in self-employment and less likely to hold a paid job compared to women in non-migrant households.

4.2 Multinomial probit model of husband migration-wife labor participation and supply

This section discusses the parallel MNP models of the wife's labor force participation and supply states for the migrant and non-migrant households. Tables 4 and 5 present the MNP coefficients for key variables in the study using various reference categories. [3] A positive coefficient implies higher probability of being in employment state j relative to the reference category (i.e., the non-employed wives). Comparison between migrant and non-migrant households shows coefficients that differ in sign and magnitude for each of the employment categories. The model allows for non-linear effects of the explanatory variable on labor market and supply outcomes, so that the third panel of the tables presents the marginal effects of the key variables on the probability of being in employment state j.

Pre-school-age (<6 years old) children decrease market participation for all forms of employment in non-migrant households and from full-time paid employment in migrant households. The negative effect of pre-school-age children on the wife's likelihood of taking on a paid job, particularly on a full-time basis, is stronger in migrant than in non-migrant households. Women in migrant households with pre-school-age children switch from full-time paid employment towards self-employment and to some extent, to non-employment. Women in non-migrant households with pre-school-age children are likely to drop out from the labor force altogether with some shifts taking place from full-time towards part-time employment.

School-age (7-15 years old) children significantly reduces the wife's participation in paid employment by women in migrant households while inducing market participation among women in non-migrant households particularly in part-time paid employment. Women in migrant households with school-age children switch from full-time paid employment to non-employment or to self-employment. The presence of family members in the young working age (16-25 years old) do not appear to significantly affect employment participation of women in non-migrant households but appears to induce a re-entry to employment of women in migrant households particularly into part-time self-employment.

Given that employers do not discriminate between married women according to their husband's migration status, then women with equivalent market productivity characteristics are expected to have similar likelihood of market participation and labor supply. Thus varied effects of education on employment choices of wives in migrant and non-migrant households reflects indirectly the effect of husband's leisure time at home on the wife's time for household care. Note that in migrant households, the husband's leisure time at home is zero, reducing the gains from the wife's specialization in home production particularly in households with no children. If the husband's leisure time at home is complementary with the wife's housework time, then the husband's migration is expected to raise the wife's propensity for market participation.

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[3] Appendix B presents the estimates of the full model for both migrant and non-migrant households with non-employed wives as the reference category.

**TABLE 4. MNP coefficients of wife's labor participation and supply
(Various Reference Categories for Children Independent Variables)**

Husband's Migration Status/ Wife's Employment Status	Independent Variable					
	Pre-school Age Children		School-Age Children		Working-Age Children	
	Parameter	z-stat	Parameter	z-stat	Parameter	z-stat
Panel 4.1: Reference Category: Non-employed By Migrant Status						
Non-Migrant Households						
Self-Employment, Part-Time	-0.1695***	-5.51	0.0458	1.49	0.0045	0.15
Self-Employment, Full-Time	-0.2300***	-7.56	0.0093	0.01	-0.0060	-0.21
Paid-Employment, Part-Time	-0.1836***	-6.02	0.0954***	3.34	-0.0248	-0.79
Paid-Employment, Full-Time	-0.2658***	-9.98	0.0091	0.42	-0.0629	-2.51
Migrant Households						
Self-Employment, Part-Time	0.1144	0.91	0.0150	0.14	0.2409***	2.66
Self-Employment, Full-Time	0.1632	1.54	0.0005	0.01	0.1162	1.40
Paid-Employment, Part-Time	-0.2149	-0.96	-0.2640**	-2.18	-0.0711	-0.42
Paid-Employment, Full-Time	-0.3172***	-2.84	-0.1612*	-1.77	0.0233	0.26
Panel 4.2: Reference Category: Full-Time Paid-Employment, Migrant Status						
Non-Migrant Households						
Self-Employment, Part-Time	0.0962***	2.80	0.0458	1.70	0.0674**	2.13
Self-Employment, Full-Time	0.0358*	1.85	-0.0093	-0.35	0.0569*	1.88
Paid-Employment, Part-Time	0.0840**	2.38	0.0954***	3.39	0.0381	1.13
Migrant Households						
Self-Employment, Part-Time	0.4316***	3.07	0.2094*	1.67	0.2105*	1.89
Self-Employment, Full-Time	0.4804***	3.81	0.1925*	1.77	0.0779	0.76
Paid-Employment, Part-Time	0.1023	0.44	-0.0870	-0.58	-0.1073	-0.53
Panel 4.3: Marginal effects						
Non-Migrant Households						
Non-employment	0.0725***	11.31	-0.0054	-1.01	0.0101	1.58
Self-Employment, Part-Time	-0.0065*	-1.82	0.0038	1.34	0.0030	0.89
Self-Employment, Full-Time	-0.0162***	-4.36	-0.0015	-0.45	0.0016	0.48
Paid-Employment, Part-Time	-0.0066**	-2.29	0.0085***	3.53	-0.0009	-0.31
Paid-Employment, Full-Time	-0.0432***	-7.69	-0.0055	-1.22	-0.0138	-2.68
Migrant Households						
Non-employment	0.0175	0.66	0.0235	1.09	-0.0249	-1.18
Self-Employment, Part-Time	0.0211	1.47	0.0080	0.62	0.0293***	2.80
Self-Employment, Full-Time	0.0416**	2.37	0.0083	0.58	0.0163	1.23
Paid-Employment, Part-Time	-0.0076	-0.93	-0.0091*	-1.71	-0.0047	-0.72
Paid-Employment, Full-Time	-0.0726***	-3.46	-0.0308*	-1.81	-0.0161	-0.98

*** significant at .01 level; ** significant at .05 level; * significant at .10 level

TABLE 5. MNP coefficients of wife's labor participation and supply
(Various Reference Categories for Education and
Husband's Earnings Contribution to HH Income Variables)

Husband's Migration Status/ Wife's Employment Status	Education: College Graduate		Husband's earnings contribution to HH Income	
	Parameter	z-stat	Parameter	z-stat
Panel 5.1: Reference Category: Non-employed By Migrant Status				
Non-Migrant Households				
Self-Employment, Part-Time	0.0219	0.27	-.0024*	-1.90
Self-Employment, Full-Time	0.1074	1.45	.0001	0.11
Paid-Employment, Part-Time	0.1443*	1.79	-.0073***	-4.82
Paid-Employment, Full-Time	0.9119***	16.14	-.0004	-0.38
Migrant Households				
Self-Employment, Part-Time	-0.1247	-0.58	-0.0014	0.95
Self-Employment, Full-Time	0.1731	0.86	-0.0022	1.52
Paid-Employment, Part-Time	0.6710**	1.99	-.0047*	1.79
Paid-Employment, Full-Time	0.8679***	4.16	-0.0013	0.93
Panel 5.2: Reference Category: Full-Time Paid-Employment, Migrant Status				
Non-Migrant Households				
Self-Employment, Part-Time	-0.8901***	-11.01	-.0020	-1.56
Self-Employment, Full-Time	-0.8045***	-10.72	.0005	0.42
Paid-Employment, Part-Time	-0.7676***	-9.39	-.0069***	-4.45
Migrant Households				
Self-Employment, Part-Time	-0.993***	-3.97	-0.0002	0.98
Self-Employment, Full-Time	-0.694**	-2.94	-0.0009	0.58
Paid-Employment, Part-Time	-0.197	-0.56	-0.0034	1.27
Panel 5.3: Marginal effects				
Non-Migrant Households				
Non-employment	-0.1529***	-10.10	.0006**	2.21
Self-Employment, Part-Time	-0.0313***	-3.88	-.0002	-1.35
Self-Employment, Full-Time	-0.0222***	-2.69	.00002	1.27
Paid-Employment, Part-Time	-0.0125*	-1.79	-.0007***	-4.98
Paid-Employment, Full-Time	0.2189***	16.67	.0002	0.91
Migrant Households				
Non-employment	-0.1182***	-2.58	.0006*	1.71
Self-Employment, Part-Time	-0.0488*	-1.79	-.00007	-0.38
Self-Employment, Full-Time	-0.0042	-0.13	-.0003	-1.14
Paid-Employment, Part-Time	0.0171*	1.72	-.0002	-1.55
Paid-Employment, Full-Time	0.1541***	4.74	-.00008	-0.33

*** significant at .01 level; ** significant at .05 level; * significant at .10 level

An alternative interpretation of the differences in labor supply behavior of women with equivalent levels of human capital between migrant and non-migrant households is that remittances in migrant households can act as an insurance mechanism that assures families in the sending country of a financial guarantee for them to achieve a certain standard of living, regardless of the work effort levels of other household members (Lipton, 1980). This may engender a moral hazard problem by creating a sense of dependency by the migrant's family, who may reduce their market participation and labor supply in response to higher remittance income (Chami, R., C. Fullenkamp, and S. Jahjah. 2003).

The estimates indicate that the attainment of some college education increases wife's market participation, particularly in full-time paid employment but more so for non-migrant than for migrant households. Since husband's leisure time at home is likely to be complementary with the wife's time for housework (Domingo, Raymundo and Cabegin, 1994), the lower market propensity of wives in migrant households relative to non-migrant households may be indicative of a significant moral hazard problem.

An increase in husband's earnings significantly reduces the wife's likelihood of market participation, but the marginal effects are very small in magnitude and with only modest differences between migrant and non-migrant households.

5. Conclusion

The estimates indicate that for married couples, the husband's participation in overseas migration significantly modifies the non-migrant wife's labor participation and supply. The findings indicate that having pre-school children significantly reduce the likelihood of married women taking on a full-time paid job, with greater impacts for women in migrant than in non-migrant households. However, this reduction in paid employment among women in migrant households is accompanied by shifts towards self-employment so that the negative effect of pre-school children on overall employment is greater in non-migrant households where the wives are likely to exit from all forms of employment. School-age children encourage the entry of women in non-migrant households into part-time paid employment while having the reverse effect for women in migrant households particularly on full-time paid employment. Working-age children do not appear to significantly affect employment participation of women in non-migrant households but induces a re-entry to employment of women in migrant households particularly into part-time self-employment. The attainment of some college education increases wife's market participation, particularly in full-time paid employment but less so for migrant than for non-migrant households, suggesting the presence of moral hazard problem. And finally, the husband's earnings contribution to household income lowers market participation among wives. However, the marginal effects are very small in magnitude with no substantial variation between migrant and non-migrant households.

Appendix A:
Regression model on Husband's Earnings

Variable name	Model A.1: Husband Working Full-Time in Domestic Market		Model A.2: Husband Working Overseas	
	Coefficient	t-stat	Coefficient	t-stat
Husband-Age	0.0215***	2.69	0.1279**	2.44
Husband - Age squared	-0.0002**	-2.17	-0.0014**	-2.15
Husband- Some high school education	0.1048***	5.28	0.3897*	1.79
Husband-High school graduate	0.2186***	13.28	0.4630**	2.56
Husband-Some college education	0.2914***	14.09	0.7041***	4.00
Husband-College graduate	0.6513***	23.08	0.9514***	5.29
Husband- Occupation Dummy 1	0.4655***	3.94		
Husband- Occupation Dummy 2	0.3235***	2.7		
Husband- Occupation Dummy 3	0.2686**	2.11		
Husband- Occupation Dummy 4	0.2769**	2.39		
Husband- Occupation Dummy 5	0.3743***	3.16		
Husband- Occupation Dummy 6	0.0365	0.31		
Husband- Occupation Dummy 7	0.0077	0.07		
Husband- Occupation Dummy 8	-0.5109***	-4.28		
Husband- Occupation Dummy 9	0.0117	0.1		
Husband- Occupation Dummy 10	0.1349	1.14		
Husband- Occupation Dummy 11	0.0331	0.27		
Husband- Occupation Dummy 12	0.0314	0.27		
Husband- Occupation Dummy 13				
Urban	0.1950***	15.21	0.1951***	2.63
Husband-Months worked overseas			0.0804***	4.17
Husband in Professional & Technical occupation overseas			0.2034**	2.37
Husband- Destination Dummy 1			0.1824**	2.27
Husband- Destination Dummy 2			0.2544***	2.88
Constant	10.2019***	52.35	7.9521***	7.23

Diagnostics: Model A.1: N=8722; R-squared: .4271; F(19, 8702)=350.12; Prob>F=0.0; Model A.2: N=597; R-squared: .2504; F(11, 585)=16.88; Prob>F=0.0; *** significant at .01 level; ** significant at .05 level; * significant at .10 level

The estimates of the regression model on husband's marginal contribution to household income are presented in Appendix A by migration status. A husband's earnings contribution to household income is taken as a function of his age, education, occupation and urban residence. In addition to these variables, the husband's remittances for migrant households is also determined by the migrant's country of destination and duration of work experience overseas. The resulting estimates conform to expectation with earnings increasing with age until a threshold level is reached. Increasing the level of education raises earnings at an increasing magnitude. Earnings or remittances are significantly higher in urban than in rural areas. As expected, remittances increase with duration of work experience overseas.

APPENDIX B. MNP coefficients of wife's labor participation and supply§

	Model B.1 Non-migrant husband				Model B.2 Migrant husband			
	Self-employment		Paid work		Self-employment		Paid work	
	Part-time	Full-time	Part-time	Full-time	Part-time	Full-time	Part-time	Full-time
Age	0.1311***	0.1393***	0.1758***	0.1264***	0.1954	0.1098	-0.0903	0.1606
Age squared	-0.0016***	-0.0017***	-0.0021***	-0.0015***	-0.0023	-0.0011	0.0017	-0.0019
College graduate	0.0219	0.1074	0.1443	0.9119***	-0.1247	0.1731	0.6710**	0.8679***
N preschool HH members	-0.1696***	-0.2300***	-0.1836***	-0.2658***	0.1144	0.1632	-0.2149	-0.3172***
N HH members 7 - 15 yrs old	0.0367	0.0002	0.0863***	-0.0091	0.0150	-0.0005	-0.2640**	-0.1612*
N HH members 16- 24 yrs old	0.0045	-0.0060	-0.0248	-0.0629**	0.2409***	0.1162	-0.0711	-0.0233
N adult NF female members	0.2003**	0.2315***	-0.0314	0.5709***	0.0668	0.1929	0.2298	0.5561***
N adult NF male members	-0.1033	-0.0322	0.1410	-0.0396	-0.0625	-0.1728	-0.4675	-0.0793
Urban residence	-0.1693**	0.1429**	-0.0089	-0.0078	-0.4076*	0.1171	0.1120	0.2531
Luzon	0.1529	0.1917	-0.0014	0.1206	0.2808	0.2545	-0.3830	-0.2124
Visayas	0.6827***	0.5647***	0.3137***	0.3709***	0.2204	-0.0647	-0.8814	-0.5908
Mindanao	0.3740**	0.4931***	-0.1338	0.0149	0.3494	0.3042	-0.4947	-0.7832
Predicted Husband's earnings	-0.0024*	0.0001	-0.0073***	-0.0004	-0.0014	-0.0022	-0.0047*	-0.0013
Non-wage income (Rank)	0.1172***	0.1887***	0.0401***	0.0475***	0.0491	0.0834	-0.0638	-0.1294**
Regional unemployment rates	-3.7200***	-2.0054	-6.4572***	-3.2069**	-1.6376	-5.0052	-10.3814	-7.9036*
Constant	-4.2151***	-5.2754***	-4.1459***	-3.4646***	-5.5463***	-4.1456	1.7487	-1.9459

§Reference Category: Non-employed; *** significant at .01 level; ** significant at .05 level; * significant at .10 level; Diagnostics: Model B.1 N=7778; Wald chi2(60) = 1664.65; Prob > chi2 = 0.0; Log pseudolikelihood = -9155.596 ; z_{1_1}=3.12, z_{1_2}=-2.95, z_{1_3}=0.27, z_{1_4}=-5.51, z_{1_5}=1.49, z_{1_6}=0.15, z_{1_7}=2.43, z_{1_8}=-1.1, z_{1_9}=-2.54, z_{1_10}=1.17, z_{1_11}= 4.87, z_{1_12}=2.49, z_{1_13}=-1.9, z_{1_14}=13.47, z_{1_15}=-2.79, z_{1_16}=-5.13; z_{2_1}=3.36, z_{2_2}=-3.12, z_{2_3}=1.45, z_{2_4}=-7.56, z_{2_5}=0.01, z_{2_6}=-0.21, z_{2_7}=3.19, z_{2_8}=-0.39, z_{2_9}=2.13, z_{2_10}=1.63, z_{2_11}= 4.22, z_{2_12}=3.41, z_{2_13}=0.11, z_{2_14}=20.77, z_{2_15}=-1.49, z_{2_16}=-6.53; z_{3_1}=3.8, z_{3_2}=-3.48, z_{3_3}=1.79, z_{3_4}=-6.02, z_{3_5}=3.34, z_{3_6}=-0.79, z_{3_7}=-0.3, z_{3_8}=1.56, z_{3_9}=-0.13, z_{3_10}= -0.01, z_{3_11}=2.1, z_{3_12}= -0.82, z_{3_13}=-4.82, z_{3_14}=4.2, z_{3_15}=-4.66, z_{3_16}=-4.6; z_{4_1}=3.63, z_{4_2}=-3.24, z_{4_3}=16.14, z_{4_4}=-9.98, z_{4_5}=-0.42, z_{4_6}=-2.51, z_{4_7}=9.88, z_{4_8}=-0.55, z_{4_9}=-0.14, z_{4_10}=1.21, 3 z_{4_11}=.31, z_{4_12}=0.12, z_{4_13}=-0.38, z_{4_14}=6.31, z_{4_15}=-2.89, z_{4_16}=-5.16; Model B.2 N=597; Wald chi2(60) = 202.32; Prob > chi2 = 0.0; Log pseudolikelihood = -680.364 ; z_{1_1}=1.15, z_{1_2}= -1.08, z_{1_3}=-0.58, z_{1_4}= 0.91, z_{1_5}=0.14, z_{1_6}=2.66, z_{1_7}=0.39, z_{1_8}=-0.26, z_{1_9}=-1.72, z_{1_10}=0.72, z_{1_11}=0.44, z_{1_12}=0.6, z_{1_13}=-0.95, z_{1_14}=0.55, z_{1_15}=-0.3, z_{1_16}=-1.66; z_{2_1}=0.79, z_{2_2}=-0.61, z_{2_3}=0.87, z_{2_4}=1.54, z_{2_5}=-0.01, z_{2_6}=1.4, z_{2_7}=1.33, z_{2_8}=-0.8, z_{2_9}=0.5, z_{2_10}=0.76, z_{2_11}=-0.14, z_{2_12}=0.58, z_{2_13}=-1.52, z_{2_14}=0.99, z_{2_15}=-1.03, z_{2_16}=-1.41; z_{3_1}=-0.48, z_{3_2}=0.74, z_{3_3}=1.99, z_{3_4}= -0.96, z_{3_5}= -2.17, z_{3_6}= -0.42, z_{3_7}=1.15, z_{3_8}=-0.98, z_{3_9}=0.34, z_{3_10}=-0.74, z_{3_11}=-1.31, z_{3_12}=-0.65, z_{3_13}=-1.79, z_{3_14}=-0.73, z_{3_15}=-1.48, z_{3_16}=0.45; z_{4_1}=1.19, z_{4_2}=-1.14, z_{4_3}=4.16, z_{4_4}=-2.84, z_{4_5}=-1.77, z_{4_6}= -0.26, z_{4_7}=4.38, z_{4_8}=-0.37, z_{4_9}=1.08, z_{4_10}=-0.66, z_{4_11}=-1.37, z_{4_12}=-1.59, z_{4_13}=-0.93, z_{4_14}=-2.28, z_{4_15}=-1.75, z_{4_16}=-0.72

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