

Temporary International Labor Migration and Quantum Fertility: Evidence from the Philippines

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Abstract

Background: This paper examines the impact of temporary international labor migration on completed marital fertility using the 2010 Census of Population data from the Philippines. The case of the Philippines is investigated because it is uniquely a major source of male and female labor migrants to over 100 countries in the world.

Objectives: To identify the trends in male and female Filipino migrants to various destinations. To quantify the impact of international labor migration on completed marital fertility in the Philippines.

Methodology: A Two Stage Residual Inclusion Censored Poisson model was used to handle problems of endogeneity and observation censoring.

Results and Conclusions: The results provide strong evidence for the negative impact of international labor migration on completed fertility that can be similarly observed for married women with Overseas Filipino Worker spouses and married women who are Overseas Filipino Workers themselves. These women who are exposed to labor migration exhibit approximately 60 percent lower completed fertility compared to women not exposed to labor migration. The negative impact can be attributed to the long and cyclical spousal separations that disrupt couple childbearing and the assimilation and adaptation of destination country low fertility norms. The findings of the paper contribute to the sparse demographic literature on the effect of migration on fertility in sending regions and countries.

Keywords: migration, fertility, Philippines, sending country

Introduction

The Philippines is considered as a major source of labor migrants to over 100 countries and is one of the leading female-migrant sending countries in the world [1,2]. The surge of labor migration from the Philippines can be traced back to the early 1970s. At that time, an estimate of only 36,000 Filipino laborers was deployed overseas. It did not take long, however, for the estimate to increase six-fold by the 1980s. Despite global and regional upheavals that led to economic or political crises, labor migration from the Philippines continued to increase remarkably [3]. The 1990 Gulf war, 1997 Asian financial crisis, 2003 US invasion of Iraq, 2008 Global economic crisis, and the 2011 Western Europe recession did not have any significant reduction in labor migrant deployment levels. Today, around 5,000 Filipino labor migrants leave daily, totaling

to almost two million annually [4]. The Filipino labor migrant stock is also estimated to be more than 2 million scattered around the globe [5].

Through the boom-and-bust of the Philippine economy from the 1970s to the present, high unemployment has remained a continuous challenge of the country [3]. This persistent high unemployment has motivated Filipinos to seek better job opportunities overseas that would raise the economic and social life of themselves and their dependents [3,6]. Aside from pressing unemployment, a number of major global events also impacted on the likelihood of Filipinos to labor migrate [3]: (1) the oil crisis in 1973 facilitated the emergence of the Gulf region as a destination region of temporary migrant workers; (2) the rise of the new

industrialized countries in East and Southeast Asia in the 1980s stimulated additional demand for labor migrants; and (3) the onset of globalization in the 1990s generated massive demand for skilled and professional workers around the world [3,7]. These international opportunities led to a steady increase in the number of Filipino labor migrants throughout the years.

The many years of international labor migration have rendered it valued in Philippine society. The country considers Overseas Filipino Workers (OFWs) as modern day heroes [8] because of the hardships they have to endure to provide a better future for their loved ones that they leave behind in the Philippines. In fact, one of the main reasons why these Filipinos work overseas is to support their children's education [9]. In addition, the contribution of OFWs in keeping the country's economy afloat through their remittances is also remarkable [8].

It is established that temporary international labor migration affects the migrants themselves and the family members left behind in various ways [3,7,8,10]. Having an OFW family member usually solves a multitude of financial problems but it can also introduce changes in the family as it adapts to a new structure. Some of the social impacts of labor migration cover areas such as family cohesion, gender roles, education and health. The tendency of Filipino families towards a more nuclear living arrangement has been stalled as the departure of fathers or mothers reconfigured family arrangements into a more extended one. Household gender role reversals have also been triggered because of the feminization of labor migration. On the other hand, the effect of parental absence on the well being of children varied depending on who labor migrates and the age of the left-behind children [3].

Spousal separations due to international labor migration are also hypothesized to impact fertility and the demographic profile of the Philippines [6]. Trends show that the total fertility rate in the Philippines is slowly declining [11,12] while the number of OFWs has been increasing throughout the years [4]. Though considered in demographic research as a force that has a potentially disruptive influence on fertility [13], the impact of international labor migration on fertility has never been precisely studied and estimated in the Philippines. It is unfortunate that very little research exists which investigates this demographic link in-depth. This is why there is a need to quantify the impact as well as to establish the causality of temporary international labor migration on fertility in the Philippines.

Methodology

Data and Variables

This study used data from the 2010 Census of Population and Housing (CPH). The CPH is an inventory of the total population, and housing units in the Philippines and its characteristics. The census provides data that are useful in the formulation of policy, planning, and program development in government; in determining business opportunities and industry status; in research and development; and in further academic studies [14]. The 2010 CPH is also the only dataset in the Philippines that has information on both fertility and temporary international labor migration.

Census taking in the Philippines follows a de-jure concept wherein a person is counted in the usual place of residence or the place where the person usually resides. This means that information on OFWs who have been away at the time of the census for not more than 5 years from the date of departure and are expected to be back five years from the date of last departure are collected. The 2010 CPH was carried out through a combination of complete enumeration and sampling using various types of questionnaires. The study will use the data from the 20 percent sample households enumerated using CPH Form 3 (Sample Household Questionnaire). The CPH Form 3 has the additional question on children ever born that is needed for the study. Systematic cluster sampling was used to obtain efficient and accurate estimates at the municipal level. Each municipality was treated as a domain in the sampling scheme.

There are three scenarios of temporary international labor migration in the setting of marriage and family. Past literature have shown that the men are the ones who usually move alone to work in another place other than their country of origin [7]. Scenario 1 is the most common scenario wherein the woman experiences spousal separation because her husband is an OFW and she is left behind in the Philippines. However, recent findings show that this gender stereotype is now disappearing [16]. Scenario 2 is when the woman is the OFW herself and her husband is left behind in the Philippines. Scenario 2 is slowly but surely becoming an acceptable family setup in the Philippines. Scenario 3 is the least prominent setup wherein both husband and wife are OFWs deployed in countries outside the Philippines.

The sample has 2.1 million observations of married 15 to 49 year old women. This is equivalent to 10.5 million person cases when population weights are applied. Women who are

classified under scenario 1 make up 4 percent of the sample, while women under scenario 2 consist of 1.5 percent of the sample. Women under scenario 3 are most uncommon, only making up 0.3 percent of the sample. Table 1 shows the counts (unweighted and weighted) for the different scenarios of temporary international labor migration.

The main variable of interest is Children Ever Born (CEB), which counts the number of children a woman already has at the time of the Census. This is the outcome measure of fertility that will be analyzed throughout the study. The variable Exposed to Labor Migration (ELM) is the explanatory variable of interest which indicates whether a woman is

Table 1. *Distribution of Married 15 to 49 y.o. Women in the Sample*

Married 15 to 49 y.o. Women		Count	Percentage	Weighted Count
Scenario 1: Left behind Women with OFW Spouses	n1	86,053	4.0	424,488
Scenario 2: Women OFWs with left behind Spouses	n2	31,816	1.5	156,559
Scenario 3: Women OFWs with OFW Spouses	n3	5,652	0.3	27,648
Women not exposed to Labor Migration	n0	2,041,431	94.3	9,934,496
Total Observations in Sample	n	2,164,952	100.0	10,543,191

exposed to the scenarios of temporary international labor migration. That is, it is coded as 1 if the woman belongs to one of the scenarios of labor migration and coded as 0 otherwise. This is the main predictor while the other variables are included as control covariates. Age is the age of the individual at the time of the Census. Age at First Marriage is the age of the individual during the first marriage, which serves as a proxy for age at first sex. Education gives the highest grade completed of the individual. Labor Force Participation is an indicator of whether the individual is part of the labor force. Wealth is based on a wealth index score derived from household amenities, belongings and other types of ownerships in the Philippines. Place of Residence serves as a control for regional differences in culture, practices and development in the Philippines. Demographic literature identifies these covariates to be associated with fertility.

Two Stage Residual Inclusion (2SRI) Censored Poisson Model

Being an OFW and having an OFW spouse is not random and is selective on a set of observed and unobserved background characteristics. In addition, these observed and unobserved characteristics can also be correlated with fertility. This implies that experiencing spousal separation due to international labor migration which is the explanatory variable of interest is potentially endogenous because of selection bias.

For example, an individual with high education has a higher probability of deciding to be a labor migrant and experiencing spousal separation compared to an individual with low education. Sjaastad also argued that there are unobserved psychic costs of migration that are unique for

each individual and is also a determining factor for one's decision to migrate [15]. In other words, individuals based on their observed and unobserved characteristics "self-select" into labor migration. Various authors have also established the endogenous nature of migration in demographic and impact evaluation research [16,17]. If endogeneity is ignored, then the standard single equation estimator will be biased and inconsistent [18]. This study follows the two-stage residual inclusion (2SRI) model first developed by James Heckman and as shown in Cameron and Trivedi to deal with the problem of endogeneity [18,19,20,21] (see Appendix 1).

The estimation strategy is divided into two stages:

1st Stage – Linear Probability Model: Estimate (1) using ordinary least squares (OLS), and generate the residuals $\hat{\epsilon}_i$ from the model.

$$y_2 = \mathbf{X}'_{1i} \boldsymbol{\gamma}_1 + \mathbf{Z}'_i \boldsymbol{\gamma}_2 + \epsilon_i$$

where y_2 is the endogenous explanatory variable of interest: exposed to labor migration, $\mathbf{X}_1$ is the vector of exogenous explanatory variables which includes age, age at first marriage, labor force participation, education, wealth, and regional place of residence and $\mathbf{Z}$ is a vector of exogenous variables that affects y_2 nontrivially but does not directly determine y_1 . The vector $\mathbf{Z}$ is standardly referred to as instrumental variables (IV) or instruments.

2nd Stage – Survival Parameterized Censored Poisson Model: Estimate the parameters of the Poisson model shown in (2) after replacing ϵ_i by $\hat{\epsilon}_i$.

$$y_{1i} \sim \text{Poisson}(\mu_i)$$

$$\mu_i | y_{2i}, \mathbf{x}_{1i}, \varepsilon_i = \exp(\tau y_{2i} + \mathbf{x}'_{1i} \boldsymbol{\beta}_1 + \rho \varepsilon_i)$$

where y_1 is children ever born, y_2 is the endogenous explanatory variable of interest: exposed to labor migration and $\mathbf{x}_1$ is the same vector of exogenous explanatory variables in (1). In this case, the survival parameterized censored Poisson model is estimated via maximum likelihood where those who had already reached the age group 45 to 49 are considered uncensored and their number of children is considered exactly known while younger women are considered right censored and their number of children is considered known only up to the time of the census (see Appendix 1). Standard errors of the second stage model is corrected via bootstrapping to control for the estimation error in $\hat{\varepsilon}_i$ from the first stage regression [19]. The residuals $\hat{\varepsilon}_i$ is added to control for endogeneity. Intuitively, accounts for the unobserved confounders [22]. This will yield consistent estimates for $\boldsymbol{\beta}$ and [19]. It also induces overdispersion, so that the Poisson model has been generalized to control for overdispersion as would be the case if a Negative Binomial model was used [18].

Since the explanatory variable of interest y_2 is binary in nature, a percentage change interpretation is used [20,23]. The percentage change represented by $\% \Delta$ is the change in the expected count m as y_2 changes from 0 to 1, while holding other variables constant:

$$\% \Delta = 100 \times \frac{E(y_1 | y_2 = 1) - E(y_1 | y_2 = 0)}{E(y_1 | y_2 = 0)} = 100 \times (\exp(\tau) - 1)$$

This can be interpreted as: For the change of y_2 from 0 to 1, the expected count of children ever born changes by $100 \times (\exp(\tau) - 1) \%$, holding other variables constant.

To ensure the use of a linear probability regression to generate the correct residuals in the first stage, the estimation strategy was applied separately to each scenario of international labor migration discussed in section 2.2 above.

Instrumental Variables

This study identifies community-level international labor migration rates as valid instruments. It is recognized that access to a community with high incidence of labor migration may facilitate the migration of others in the same community.

People may imitate others in the community who work as Overseas Filipino Workers. Various authors have used community-level labor migration rates as instruments for models looking at outcomes in the home country [16]. Theoretically, these variables have a positive impact on the opportunity to be a labor migrant but at the same time not having any direct impact on fertility. Therefore, this study uses two types of community-level labor migration rates: (1) municipal-level labor migration rates which provide information about the immediate community of the husband and wife; and (2) provincial-level labor migration rates which provide insights on a broader scale capturing information that cannot be detected at very small municipalities. The relevance and exogeneity of the instruments are discussed in Appendix 2.

Results and Discussion

The descriptive statistics show evidence of differentials among the demographic characteristics of women under the different scenarios of temporary international labor migration. Table 3 presents the percentage distribution of the women in the sample across age, age at first marriage, educational attainment and wealth. In terms of age, it can be observed that women under scenario 1 and scenario 2 are very similar. Approximately 50 percent of their total counts are aged 30 to 40 years. This is in contrast to women not exposed to labor migration, where the counts are more evenly distributed in the ages 25 to 49 years. Looking at age at first marriage, higher proportions of women under scenario 1 and 2 marry at a later age compared to women not exposed to labor migration. The median age at first marriage for women under scenario 1 is 24 years while it is 22 years for women under scenario 2. On the other hand, women not exposed to labor migration exhibited a median age at first marriage of 21 years.

Major differences can also be seen across education and wealth. Women exposed to labor migration are more educated compared to women not exposed to labor migration. Around 67 percent of women under scenario 1 have college education, 52 percent of women under scenario 2 have college education while only 29 percent of women not exposed to labor migration have college education. In addition, women under scenario 1 and 2 are also wealthier compared to non-exposed women. This is partly expected because of the foreign remittances by OFWs. Table 3 also shows that there is a concentration of counts of women under scenario 1 and scenario 2 in the fourth and highest wealth quintile. This is largely in contrast to women not exposed to labor migration where the concentration of counts is on the lowest and second wealth quintile.

The differentials provide evidence that temporary international labor migration may be selective on background characteristics that could also affect fertility. The results shown in Table 3 support the selection hypothesis. Women under scenario 1 and 2 exhibit similar background characteristics to women with low fertility behavior. Similar to what [6,24]

found, women exposed to labor migration are better educated. Since education is influential in creating fertility differentials and is negatively associated with the level of fertility, it can be expected that women who are labor migrants or women who have labor migrant spouses will exhibit low levels of completed fertility even if they were not exposed to

Table 3. *Percentage Distribution of Women (In-Sample) across selected Variables*

	Scenario 1 Women	Scenario 2 Women	Women not exposed to Labor Migration
Age Group			
15 to 19	0.12	0.1	1.51
20 to 24	2.69	2.66	8.51
25 to 29	12.65	11.76	16.09
30 to 34	23.38	23.01	19.84
35 to 39	24.71	26.98	19.95
40 to 44	21.18	21.91	18.53
45 to 49	15.28	13.57	15.58
Total	100	100	100
Age at First Marriage			
15 to 19	14.72	27.15	33.7
20 to 24	42.57	44.48	42.03
25 to 29	31.92	20.23	18.2
30 to 34	8.74	5.93	4.6
35 to 39	1.78	1.87	1.21
40 to 44	0.23	0.28	0.22
45 to 49	0.04	0.05	0.04
Total	100	100	100
Education			
No Education	0.11	0.23	2.19
Elementary	3.66	5.15	24.72
High School	29.26	42.75	44.13
College	66.97	51.87	28.96
Total	100	100	100
Wealth Quintile			
Lowest	0.75	4.82	22.61
Second	3.21	15.23	21.38
Middle	10.56	24.63	20.02
Fourth	24.45	27.02	18.93
Highest	61.04	28.29	17.06
Total	100	100	100

labor migration. They also marry at a later age, which implies that their exposure to giving birth is also delayed.

Table 4 displays the observed differentials in completed fertility among women under the different scenarios of temporary international labor migration. The average number

of children ever born for women under scenario 1 is 2.3 children while this value is 2.4 children for women under scenario 2. For women not exposed to labor migration, the average number of children ever born is 3.0 children. These results are expected because of the observed selectivity (Table 3) in labor migration. Numerous studies have already established that education and

fertility are negatively associated [25,26]. Low fertility rates are usually observed in communities where there are high proportions of better-educated women. As Martin & Juarez showed, better-educated women have broader knowledge,

A negative impact could be observed because labor migration disrupts and compresses the childbearing schedules of women exposed to it since they are mostly of reproductive age [6]. The descriptive statistics in Table 3

Table 4. Children Ever Born

	Scenario 1 Women	Scenario 2 Women	Women not exposed to Labor Migration
Mean Number of Children Ever Born	2.33	2.43	3.04

higher socio-economic status and less fatalistic attitudes towards reproduction than less educated women [27]. Age of first marriage also has an effect on the eventual number of children in the family because it specifies the onset of a woman's exposure to child bearing [28].

2SRI Model for Women under Scenario 1

The main objective of this study is to quantify the impact of international labor migration on completed marital fertility in the Philippines. The impact can only be determined after controlling for the observed and unobserved confounders in the model. Table 5 displays the results of the 2-Stage Residual Inclusion (2SRI) Models for women under scenario 1. Models 1.1 and 1.2 have the same set of control covariates but Model 1.2 includes the exposure to risk of childbearing variable with a coefficient constrained to one. Both models exhibit a large first stage F-Stat that indicating that the instruments that were used are relevant. In addition, the first stage residuals included in the model are statistically significant confirming that there is an endogeneity problem and the use of the 2SRI model is needed. The Akaike Information Criterion (AIC) gives insight on which model is better to use and interpret. In this regard, Model 1.2 has a lower AIC and is used for interpretation and discussion.

Results of Model 1.2 show evidence for the negative impact of temporary international labor migration on completed marital fertility. Holding all other variables constant, women classified under scenario 1 exhibit 61 percent lower completed fertility compared to women who are not exposed to temporary international labor migration. This finding supports the hypothesis that women, or couples in general, who experience spousal separations due to international labor migration will have lower fertility due to disruptions in their childbearing schedule and their assimilation of low fertility behavior from OFW destination countries.

Table 5. 2SRI Models for Women under Scenario 1

	Model 1.1		Model 1.2	
	Coefficient	Impact	Coefficient	Impact
ELM	-0.9552* (0.3997)	-61.53 %	-0.9567* (0.4052)	-61.58 %
First Stage Residual	0.9362* (0.4006)		0.9372* (0.4055)	
Exposure	-		Coefficient constrained to 1	
Covariates	Age, Age at First Marriage, Education, Labor Force Participation, Wealth, Place of Residence			
First Stage F-Stat	5,374.2		5,374.2	
n	2,097,485		2,097,485	
AIC/n	0.7486		0.7459	
McFadden R2	0.5440		0.5456	

Legend: * significant at 5% level of significance
Notes: Bootstrapped S.E. in parenthesis
Full Model Results and diagnostics in Appendix 3

clearly show that 60 percent of women under scenario 1 are aged 25 to 39. Spousal separation due to labor migration can be considered as a natural method of contraception that hinders a woman to get pregnant during the season when she is not together with her partner. The fact that the OFW spouses of women under scenario 1 stay for long durations in their destination countries undeniably compressed and shortened the couples exposure to childbearing. In terms of duration of separation, OFWs generally get a two-year contract and have an average tenure of more than 6 years. Some OFWs even stay longer in their destination countries to avoid unemployment in the Philippines. Furthermore, findings from another study showed that a large proportion of OFWs are not ready to come back to the Philippines because they have not yet achieved their goals of financial security for their family and loved ones [29,30]. This extended length of spousal separation definitely increased the number of births averted [31,32]. The cyclical pattern of separations also adds to the negative impact since most OFWs only experience short durations of stay in the Philippines during contract breaks before being deployed again, making the disruption in child bearing continuous.

The adaptation and assimilation of low fertility norms of destination countries is also a reason why a strong negative

impact of labor migration on completed fertility can be observed. The assimilation and diffusion of adopted cultural values relating to fertility behavior is expected to exert a downward influence on fertility to add to any long-term impacts of disruption [33]. As discussed, OFWs stay extended periods of time in their destination countries that have lower fertility rates compared to the Philippines. Out of the 22 OFW destination countries, 21 have lower fertility rates compared to the Philippines (Table 1). Some of these OFW destination countries even have below replacement level TFR (Table 1). The constant interaction with people in the destination country would definitely shape ones beliefs and desires, including such things as the meaning of parenthood and the value of children [34]. Thus, fertility of women exposed to labor migration is expected to slowly approximate and become similar to the fertility of destination country populations. The long exposures to destination country fertility norms certainly influenced the migrant's behavior resulting to the lower completed fertility [35] that can be observed in Model 1.2.

2SRI Model for Women under Scenario 2

Table 6 shows the results of the 2SRI Models for women under scenario 2. It can be observed that Models 2.1 and 2.2 are similar in terms of control covariates but Model 2.2 includes the exposure to risk of childbearing variable which has a coefficient constrained to one. Results of first stage regressions of Models 2.1 and 2.2 also give support to the relevance of the instruments used. Likewise, Table 6 shows statistically significant coefficients of the first stage residuals indicating that the 2SRI models are useful to address the problem of endogeneity. The AIC is in favor for Model 2.2, which means that this model will be used for interpretation and discussion.

The negative impact of temporary international labor migration can also be observed for women under scenario 2. Holding all other variables constant, these women who are the OFW themselves and have left-behind husbands exhibit a significantly lower completed fertility (-64 percent) compared to women not exposed to labor migration.

The magnitude of the impact in Model 2.2 is very similar to Model 1.2. This is expected since the underlying mechanism of disruption and adaptation on which labor migration impacts fertility is the same for women under scenario 1 and scenario 2. First, both male and female labor migrants are subjected to lengthy and cyclical employment contracts. Second, male and female OFWs also have the same destination countries (Table 1). There are slight

Table 6. 2SRI Models for Women under Scenario 1

	Model 1.1		Model 1.2	
	Coefficient	Impact	Coefficient	Impact
ELM	-1.0361* (0.2585)	-64.52 %	-1.0368* (0.2520)	-64.54 %
First Stage Residual	0.9004* (0.2589)		0.8998* (0.2531)	
Exposure	-		Coefficient constrained to 1	
Covariates	Age, Age at First Marriage, Education, Labor Force Participation, Wealth, Place of Residence			
First Stage F-Stat	3121.05		3121.05	
n	2043494		2043494	
AIC/n	0.7510		0.7483	
McFadden R2	0.5542		0.5558	

Legend: * significant at 5% level of significance

Notes: Bootstrapped S.E. in parenthesis

Full Model Results and diagnostics in Appendix 3

differences in the distribution of male and female OFWs per country, for example there are more women OFWs that work in Hongkong, but both are still exposed to destination countries with lower fertility rates than the Philippines. This result implies that regardless of whether the OFW is the wife or the husband, exposure to temporary international labor migration will lead to low fertility outcomes.

Conclusion and Recommendations

The objective of the study was to quantify the impact of temporary international labor migration on completed marital fertility in the Philippines. The findings add to the sparse literature on the relationship of temporary international labor migration and fertility in origin countries. While past studies on this topic usually used data collected from a particular region in a country, this paper was able to use data from a nationally representative sample of the Philippines.

In summary, results of the research provide strong empirical evidence for the negative impact of temporary international labor migration on completed fertility in the Philippines. Using the two-stage residual inclusion model, it is clear that women exposed to labor migration have lower completed fertility. This negative impact can be attributed to the long and cyclical spousal separations that disrupt couple childbearing and the assimilation and adaptation of destination country low fertility norms. It should also be highlighted that the impact can be similarly observed for

married women with OFW spouses and married women who are OFWs themselves. Overall, the findings give support to the disruption and adaptation and assimilation hypotheses of migration and fertility.

The discoveries of the study are also consistent with past studies from Mexico, Bangladesh, Tajikistan, Mozambique, and Switzerland that show a negative association of migration and fertility due to spousal separations [33,36,13,37,38]. Furthermore, this research builds on the macro-level work of del Mundo [39] by providing similar and coherent evidence at the individual level. Results from the analysis also support the assertion that temporary international labor migration is selective on background characteristics that could also affect fertility. Due to this problem of selectivity in the study of the migration-fertility nexus, the use of single equation models should be cautioned from. In addition, there is no substantial reason to be concerned about high post-reunion fertility due to the presence of a clear long-term impact of labor migration observed in the study.

Finally, the impact of labor migration on completed fertility can only be estimated for scenarios 1 and 2. Unfortunately, assessing the impact under scenario 3 is currently not possible due to lacking information. In addition, the destination countries of OFWs are not available in the 2010 CPH. These limit the study to further dissect the impact to one caused by disruption or caused by adaptation. The study relies on data from other surveys of the Philippines Statistical Authority to ascertain where OFWs go.

More research is needed to cover new and significant international labor migration movements that could be arising. One direction for future study is to explore how temporary international labor migration affects the tempo dimension of fertility. For this endeavor, data on the duration, timing, destination, and seasonality of migration with complete birth histories and exact dates should be available. Information on these variables would also address the limitations of this research.

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