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Contraceptive Choice and Rural-Urban Migration in Malaysia: A Test of the Adaptation Model

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Abstract

The study of fertility behavior among rural-urban migrants has recognized that the difference between fertility of migrants and fertility of rural stayers could be due to selection of migrants, adaptation to urban constraints and norms, or disruption by migration. In this paper, data from the Malaysian Family Life Survey is used to determine whether there is adaptation resulting from rural-urban migration. In particular, the effect of duration in the urban area on the practice and choice of contraception is examined.

The major conclusion of this study is that adaptation by rural-urban migrants is a significant phenomenon. Contraception use rates increased significantly for migrants one year after they moved. The largest increase occurred five to ten years after migration. These findings suggest that adaptation operates so as to result in lower fertility among migrants. As such, a strong argument can be made that movement to urban areas should be encouraged as a mechanism for achieving lower national fertility rates. Policymakers may make special efforts to expedite and increase the fertility reductions associated with migration through educational programs directed at migrants or by providing them with easier access to family planning facilities.

Keywords: migration, fertility, contraceptive choice, Malaysia

Introduction

Although the relationships between migration and other demographic factors are well established in the literature, interest in the migration and fertility relationship has recently been revived among demographers and economists. This interest stems from concern over the fertility differential that is often observed between migrants and non-migrants and the impact (if any) that has on the population growth rate.

A number of studies have suggested that migrants have fertility levels lower than those of non-migrants. What is not clear, however, is whether differentials between migrants and non-migrants reflect selection at place of origin, adaptation at place of destination, or disruption of fertility associated with the process of movement. To what degree one or a combination of these factors accounts for the observed differences remains to be fully documented.

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According to Hendershot (1976), the adaptation model assumes that rural-urban migrants with average socioeconomic characteristics and fertility patterns come to acquire urban characteristics, including lower fertility norms, through a process of adaptation to city life. Researchers have different views on which factors are most important in stimulating changes in the fertility behavior of migrants. Lee and Farber (1985) emphasize economic factors, such as rural-urban differences in the costs of child rearing, men's and women's wages, and occupational structures. Schultz (1976), on the other hand, stresses noneconomic factors. For example, movement to cities, where health conditions are better, may reduce infant mortality and generate a replacement effect. That is, fewer births will be needed to achieve a given number of surviving children.

Few empirical studies have found that adaptation is an important factor in explaining the migrant/non-migrant fertility differential. This may be due to limitations of previous studies rather than to the actual insignificance of the adaptation of rural-urban migrants. Data for many previous studies did not provide information on the year of migration. Only two studies, Goldstein and Tirasawat (1977) and Ribe and Schultz (1980), used data on the year of migration. However, neither of these studies utilized both migration history data and pregnancy history data. Therefore, it is possible that previous studies were not able to find adaptation effects because insufficient data on migration and pregnancy histories did not allow them to trace the adaptation behavior of migrants. Also, previous studies were not successful in controlling for the selectivity of migration. Unless one has a good control for selectivity, the adaptation effect of migration cannot be identified. Previous studies attempted to control for selectivity by using various socio-economic and demographic characteristics of migrants. This approach has two serious drawbacks. First, the control variables (e.g., education and age) should be measured at or before the time of migration; this is not possible with most cross-section data. Second, it is necessary to control for differences in preferences relating to family size which cannot be measured.

In order to correct the deficiencies of previous tests for adaptation, this study utilizes data from the Malaysian Family Life Survey (MFLS) on detailed personal migration and birth histories to develop a multivariate model of contraceptive choice. Since the adaptation process involves a change in the use of fertility regulation over time, a model of contraceptive choice seems appropriate. If adaptation exists, migrants should adopt more effective contraceptive methods as they conform to the reproductive behavior of the destination population.

Data and Methods

The Malaysian Family Life Survey

This study is based on data contained in the Second Malaysian Family Life Survey (MFLS-2) carried out in Peninsular Malaysia in 1988-1989. MFLS-2 was designed as a follow-up to MFLS-1, which was fielded in three rounds in 1976-1977. Both surveys produced household level retrospective and current data from women and their husbands, covering traditional topics of demographic research (fertility, migration, nuptuality, mortality), as well as social and economic factors affecting family decision making.

MFLS-1 sampled private households in Peninsular Malaysia which included at least one ever-married woman aged less than 50 years at the time of the initial visit. A total of 1,262 households completed Round 1 of the survey. In MFSL-2, 889 of the women who were primary respondents to MFLS-1 completed the Female Life History Questionnaire, a follow-up rate of 72 percent of those eligible. These questionnaires record detailed information on marriage, pregnancy outcomes, and the use of contraception. The data also provide information from both wife and husband on education, employment, earnings, ethnicity, and other household characteristics.

Sine and Peterson (1993) have extensively investigated the quality of the MFLS-2 data on pregnancies and related life events by comparing statistics based on the MFLS-2 samples with those from Malaysian vital statistics, censuses, and other surveys, and by assessing the internal consistency of the data. Their analysis suggests that the MFLS-2 data are of high quality. Patterns of fertility rates in MFLS-2 data are consistent with expectations. The reported mean number of children born per MFLS-2 woman was very similar to that reported in both census reports and the Malaysian Population and Fertility Survey (MPFS). Women's ages also appear to be accurately reported in these data, and levels of education correspond closely to those reported in Malaysian Censuses for the same cohorts of women. Finally, data on contraceptive use compare remarkably well with data from the MPFS.

As noted previously, 889 of the original 1,262 MFLS-1 respondents were interviewed in MFLS-2. From the Panel surveys, couples were selected on the following criteria: (1) the couple is married at the time of the survey; (2) the wife was married only once; and (3) information on the work history of the husband is available.

In this study, rural-urban migrants are those whose current residence is urban but whose residence prior to marriage was rural. By this definition, 95 couples are classified as migrants.

There are merits and demerits to this definition. The merits include consistency with the underlying theoretical framework which is based on the couple's lifetime decision making on migration and fertility at the time of marriage, and the relatively large number of migrants included by a wide interval. The demerits include the aggregation of various alternative destinations open to migrants, which is a common problem in a two-regime model of this sort, and failing to distinguish among migrations which occurred at different times and under different historical circumstances.

Conceptual Framework

To develop the general framework of contraceptive choice, assume that utility consists of two components: a systematic part, which is a function of the observable characteristics of the couple, and a random part that arises from measurement error, idiosyncratic taste variation, lack of information, and so forth. If these two components can be expressed in a linearly additive form, then for any alternative *k,* the utility for the jth couple is:

$$\cup_{jk} = \overline{\cup}_{jk} + \tau_{jk} \qquad (1)$$

where $\bar{U}_{jk}$ represents the systematic part of the utility for the kth alternative and τ_{jk} is the random part of the utility derived by couple j from alternative k.

Since utility as defined in Equation 1 is an unobservable quantity, the selection of an alternative (k^*) is modeled as the probability that its utility ($U_{jk} = \bar{U}_{jk} + \tau_{jk}$) is greater than the utility from each of the remaining alternatives. Suppose that K represents the set of alternatives available to a couple; then the probability that alternative k^* is chosen is:

$$P(k^*|K) = P(\bar{U}_{jk^*} + \tau_{jk^*} \geq \bar{U}_{jk} + \tau_{jk}) \quad \forall k \in K \text{ where } k \neq k^* \tag{2}$$

That is, for any couple, the probability of choosing alternative k^* from the available alternatives is the probability that the utility derived from k^* exceeds the utility from any alternative (k) other than k^*.

Specification of the Model

In the present study we consider the probabilities of using various types of contraceptive methods, each relative to not using any contraceptive method. Following standard conventions, we assume that married couples choose from four alternatives--sterilization, the pill or IUD, less effective (i.e., traditional) techniques, or no method.

The sample for analysis consists of all at-risk inter-pregnancy intervals that begin within the survey period. We assume that each time a woman becomes at risk of pregnancy again (after the previous pregnancy outcome), she decides whether and with what method to practice contraception in that interval. Thus, intervals are the units of observation. As a result, there will often be more than one observation per woman. For example, a woman with two children will have two inter-pregnancy intervals: (1) from first birth to second conception, and (2) from second birth to 1989.

In order to control for migrant selectivity, we focus on the sub-sample of rural-urban migrants. Previous studies of adaptation compare migrant fertility with the fertility of natives in the destination. Adaptation, however, does not necessarily imply that migrants conform to urban fertility levels; rather, it assumes that changes in fertility values occur among migrants within several years after the move. Therefore, by restricting our analysis to migrants, we are presenting a more accurate test of the adaptation model.

To explore the impact of migration on fertility behavior, a set of dummy variables indicating the relative time of migration is included in the contraceptive choice equations. The coefficients on these variables show whether contraceptive choice changes with the amount of time spent in the urban area.

In addition to migration status, other influences on contraceptive use are considered in the multivariate analysis. In the following, we will examine these variables and justify their inclusion in the contraceptive choice model.

Desire for More Children: This variable is derived from each female respondent's reply about desired family size. We assume that couples have not drastically revised their fertility goals over time and use this response to create retrospective measures of their fertility preferences at various times in the past. Specifically, we create a variable indicating whether, at the beginning of each inter-pregnancy interval, the woman desired more children.

Wife's Education: Education of the wife is related to her awareness of contraceptive methods (including both the effectiveness of the method and its side effects) and her receptivity to "new technologies" (Michael, 1973).

Income: Income measures the couple's ability to afford the monetary costs of contraception.

Infant and Child Mortality: Parents may try to replace a child who has died by having a birth interval shorter than they otherwise would have had. This is in addition to the effect of curtailed breast-feeding, which shortens the duration of postpartum amenorrhea.

Location of Birth: Women who give birth in hospitals may receive advice about contraception from doctors or nurses.

Wife's Age: Couples should be least likely to practice contraception at extremes of maternal age. They should be least likely to practice abstinence early in a marriage, because coital frequency tends to decrease with marriage duration, and more likely to be sterilized at older ages.

Availability of Family Planning Clinics: Since the mid-1960s, Malaysia has had an active national family planning program. Other things equal, proximity to family planning clinics should encourage contraceptive use by reducing the time and money costs of fertility control.

Other factors, such as *ethnicity* and *calendar* year may reflect unobservable factors influencing norms and attitudes or information about family planning. These factors may have an independent effect even when the influences of the factors listed above are controlled.

All explanatory variables refer to the time of the inter-pregnancy interval under consideration except wife's education, which was measured at the time of the survey, i.e. 1989. The "operational" form of the model is given in Table 1.

Table 1: A Model of Contraceptive Choice

Variable	Definition
Endogenous variable	
Contraception	Dummy variable: 1 if the couple practiced contraception during the inter-pregnancy interval.
or Choice of method	Used to index the alternatives in a multiple choices model: 0 if no contraception is practiced, 1 is sterilization is used; 2 if pill/ IUD is used; 3 if an ineffective method is used.
Explanatory variables	
Desire More Children	Dummy variable: 1 if wife desires more children.
Wife's ED	Years of schooling completed by wife (1989).
Income	Log of husband's income (cash and kind).
Child Dead	Dummy variable: 1 if wife reports that a child died within 4 years before next pregnancy outcome.
Non-live Birth	Dummy variable: 1 if preceding birth resulted in non-live birth.
Hospital	Dummy variable: 1 if preceding child born in hospital.
Wife's Age	Age of wife in years.
(Wife's Age)^2	Square of wife' age.
Ethnicity (a)	
Chinese	Dummy variable: 1 if husband is Chinese.
Malay	Dummy variable: 1 if husband is Malay.
FPC	Dummy variable: 1 if a family planning clinic is within 1 mile of PSU boundary.
Time Spline	
Pre-1965	Date: [(Year-1900)*12] + month.
1965-1969	Max (Date-780, 0).
1970-1974	Max (Date-840, 0).
1975-1979	Max (Date-900, 0).
1980-1989	Max (Date-960, 0).
Time Spent in Urban Area (b)	
Up to 1 year	Dummy variable: 1 if inter-pregnancy interval occurred up to one year after migration.
1 to 5 years	Dummy variable: 1 if inter-pregnancy interval occurred one to five years after migration.
5 to 10 years	Dummy variable: 1 if inter-pregnancy interval occurred five to ten years after migration.
More than 10 years	Dummy variable: 1 if inter-pregnancy interval occurred more than ten years after migration.

Notes: (a) Reference group: Indian; (b) Reference group: Inter-pregnancy interval occurred before migration.

Estimation Procedure

Most studies of probabilistic choice have used the multinomial logit specification where the error terms in Equation 2 are assumed independent and identically distributed. The general form of the multinomial logit equation is:

$$P_j\left(k\middle|X_{jk}\right)=\frac{e^{X_{jk}\beta_k}}{\sum_{i\in K}e^{X_{ji}\beta_i}} \qquad (3)$$

where k indexes alternatives, j indexes couples, K is the set of alternatives facing each couple, X is the vector of explanatory variables, and

$$\sum_{k\in K}P_j(k)=1$$

An advantage to this specification is that the log odds ratio, $\ln\left(P_{jk}/P_{jK}\right)$, can be expressed as a linear function of X:

$$\ln\left(P_{jk}/P_{jK}\right)=\ln\left(e^{X_{jk}\beta_k}/e^{X_{jk}\beta_k}\right)=X_{jk}\beta_k \qquad (4)$$

Each coefficient, β_k, shows how a change in the variable, X_k, affects the probability of choosing alternative k relative to the normalized alternative K. (In this study we consider the probabilities of using three particular types of contraceptive methods, each relative to the probability of not using any contraceptive method.) In the equations estimated below, the value of each explanatory variable X is the same over all k for each interval. The effect of each X (i.e., β) is allowed to differ among the three specific contraceptive methods. For example, if β_k is the coefficient of a particular variable, X, in explaining the likelihood of use of contraceptive method k relative to the use of no method (category 0), $e^{\beta j}$ shows how a one-unit increase in X affects the odds ratio of choosing method k rather than 0, i.e., $P(k)/P(0)$. To assess the effect of an explanatory variable on the likelihood of choosing one contraceptive method versus another, one considers the difference in the coefficients; for example, if βk is the coefficient of education for method k, $e^{(\beta m-\beta n)}$ shows how a one-unit change in education affects the odds ratio of choosing method n relative to method m, i.e., $P(n)/P(m)$.

Using pregnancy intervals as the unit of observation creates the possibility that influences on contraceptive use in different intervals for the same woman may be correlated. As such, we introduce a set of couple-specific fixed effects for each alternative (α_{jk}) which capture characteristics of the couple that are unobserved and constant over time. With a fixed effects specification, equation 4 becomes:

$$\ln\left(P_{jk}/P_{jK}\right)=\alpha_{jk}+X_{jk}\beta_k \qquad (5)$$

This extension of the conventional logit model allows for non-homogeneous correlation among the observations for each couple.

Results

Column 1 of Table 2 presents coefficients and t-statistics of a dichotomous logit equation explaining whether contraception was practiced in an interval. Columns 2-4 present estimates of the parameters of the multinomial logit equation explaining choice of contraceptive method. All estimations were performed using LIMDEP 8.0, using robust standard errors derived from a sandwich-style covariance matrix estimator. This technique provides for more reliable estimation under conditions where heteroscedasticity may occur (Greene, 2002).

Table 2: Determinants of Contraceptive Use and Choice of Contraceptive Method (Tables entries are logit coefficients and, in parentheses, asymptotic t-statistics)

Explanatory Variables	Whether Practice Contraception	Choice of Method		
	Logit	*Multinomial Logit*		
		Sterilization	**Pill/IUD**	**Traditional**
Desire More Children	-0.9924***	-3.5332***	-0.8634*	-0.2870
	(-3.03)	(-4.20)	(-1.80)	(-0.68)
Wife's ED	0.0696**	0.0210	0.0400	0.0854**
	(2.03)	(1.25)	(0.68)	(2.15)
Income	0.2383**	0.6529*	-0.0400	0.3398**
	(2.10)	(1.72)	(-0.01)	(2.42)
Child Dead	-0.6511*	-0.726	-0.3872	-0.7503
	(-1.73)	(-1.07)	(-0.53)	(-1.25)
Non-live Birth	0.3573	-0.7830	-0.4774	0.8642*
	(0.84)	(-0.57)	(-0.55)	(1.83)
Hospital	0.5386*	0.8398*	0.6436*	0.3693
	(1.86)	(1.94)	(1.76)	(1.08)
Wife's Age	0.0685	1.2425*	0.3845*	-0.2812
	(0.42)	(1.75)	(1.85)	(-1.48)
(Wife's Age)^2	-0.0004	-0.0195*	-0.0084*	0.0038
	(-0.14)	(-1.72)	-(1.83)	(1.16)
Chinese	1.1059***	-0.5213	1.2947***	1.2594***
	(3.60)	(-0.71)	(2.55)	(3.34)
Malay	0.6321**	-1.9085**	1.0141*	0.7615**
	(2.05)	(-2.26)	(1.92)	(2.01)
FPC	0.3889*	-0.4294	0.6694*	0.2933
	(1.71)	(-0.74)	(1.75)	(1.10)
Pre-1965	0.0117***	0.0328	0.0672*	0.0090**
	(2.94)	(0.92)	(1.66)	(2.18)
1965-1969	-0.0060	-0.0352	-0.0430	-0.0117
	(-0.61)	(-0.73)	(-0.86)	(-1.05)
1970-1974	0.0071	0.0423	-0.0197	0.0137
	(0.51)	(1.22)	(-0.87)	(0.80)
1975-1979	-0.0278*	-0.0791**	-0.0113	-0.0178
	(-1.69)	(-2.17)	(-0.52)	(-0.88)
1980-1989	0.0287*	0.0504	0.0261	0.0245
	(1.74)	(1.24)	(1.02)	(1.10)
Up to 1 year	-0.1606	0.0846	-0.9493	0.0068
	(-0.36)	(0.07)	(-1.15)	(0.01)
1 to 5 years	0.9288***	0.2784	0.0360	1.2548***
	(3.00)	(0.31)	(0.06)	(3.66)
5 to 10 years	1.3018***	0.5193	0.9186*	1.2856***
	(3.70)	(0.58)	(1.72)	(3.11)
More than 10 year	0.6842	1.4793	0.4519	0.3784
	(1.54)	(1.58)	(0.64)	(0.66)
Constant	-10.23***	-52.07*	-61.01*	-7.42**
	(-3.06)	(-1.78)	(-1.87)	(-2.12)

Notes: * significant at 10% level; ** significant at 5% level; *** significant at 1% level.

In these data, women who want more children are less likely to practice contraception than those who have reached their family size goal. Couples who want more children are especially less likely to use effective methods of contraception, such as sterilization. Traditional methods are the only category of contraceptives whose use is not significantly related to family-size desires.

The results just discussed tend to confirm what has been found in other analyses for Malaysia (e.g., Chander et al., 1977) and in other developing countries (e.g., Phillips, Hossain and Kololinsky, 1985; Srikantan, 1985; Brackett, 1980)-that contraception is practiced primarily for limiting the number of births. However, these results tend to obscure the fact that in Malaysia a significant proportion of women who want more children use some form of contraception. This is illustrated in Table 3, which shows that, in the sample considered here, women who said that they still wanted more children practiced contraception in around 21 percent of their pregnancy intervals.

Table 3: Contraceptive Practice Among Women Who Do and Do Not Desire More Children

Contraceptive Method	Do Not Want More Children (n=97)	Want More Children (n=503)
Some Method	52.6%	21.3%
Sterilization	16.5%	0.6%
Pill/IUD	14.4%	6.8%
Traditional Methods	21.6%	13.9%
No Methods	47.4%	78.7%
Total	**100.0%**	**100.0%**

Educated women are significantly more likely to practice contraception than their less educated counterparts, other things equal. This finding is consistent with other studies of Malaysia (Rodriguez, 1978) and other countries (e.g., Hogan and Frenzen, 1981, for Thailand). The largest relative effect of education occurs for traditional methods. Other studies of developing countries have also found greater use of traditional methods (particularly safe-time) among the more educated (e.g., Liskin, 1981; Bulatao, 1985; Zablin, 1985). Bulatao (1985) has suggested that this relationship reflects better information about or more sensitivity to side effects of other contraceptive types among the more educated. This could explain the relatively low (and insignificant) education coefficient for the pill/IUD.

Husband's income has a positive effect on the overall likelihood that some form of contraception is practiced. When the various forms of contraceptive methods are considered separately, the income effect is significantly positive for sterilization and traditional methods. Though the coefficient is not statistically significant, it is interesting that income is negatively related to pill/IUD. This suggests that these methods are inferior goods.

The positive association between income and contraceptive use has been found in other developing countries (e.g., Bulatao, 1985; Mamlouk, 1982; Phillips et al., 1985) and in Japan (Coleman, 1981). Several studies have found cost a major obstacle to sterilization in developing countries (Honduras: Janowitz et al., 1983; Brazil and South Korea: Liskin and Rinehart, 1985).

It has frequently been hypothesized, and often found empirically, that when a child dies the mother tries to replace it by having a birth interval shorter than she otherwise might have had (Preston, 1978). Some of the relationship has been found to be biological, i.e., to operate via curtailed lactation and shorter amenorrhea. However, some of the relationship may be behavioral due to less contraception.

We explore this possibility in Table 2 by including a dummy variable that equals one if one or more children of the woman died within 48 months of the next pregnancy outcome (or date of interview). The negative and statistically significant coefficient of this variable in the dichotomous logit model is consistent with the hypothesis that women attempt to replace a child who has died by using contraception less. The relationship is negative for each of the three contraceptive methods considered, but is not statistically significant.

With regard to the effect of fetal loss, the analysis indicates that a woman increases her use of contraception (particularly traditional methods) following a miscarriage. It has been suggested in the literature that a miscarriage may increase the psychic costs of an additional pregnancy (Schultz, 1976). As such, women will try to avoid pregnancy by using contraception.

Women in our sample who give birth in hospitals are significantly more likely to practice contraception. This relationship may arise because women who give birth in hospitals receive advice about contraception from doctors and nurses there. Indeed, the National Family Planning Board postpartum program began with a hospital base and counseled women after they gave birth. The estimated effect of hospital birth is significant for both pill/IUD and sterilization.

In general, the estimated relationship between age and contraceptive practice has an inverted-U shape. The relationship is significant for sterilization and pill/IUD. WFS and CPS data reveal this same inverted U-shaped pattern in contraceptive use for at-risk women in all the developing countries surveyed (Brackett, 1980; Choe, 1985; Mamlouk, 1982).

Ethnicity strongly influences the practice of contraception as well as the type of contraception chosen. When other variables are controlled, Chinese and Malay women are more likely to practice some form of contraception than Indians. Relative to Indians, Chinese and Malays are especially likely to use the pill/IUD and traditional methods. The low probability of sterilization for Malays is consistent with the Islamic teaching that sterilization is only acceptable when the health of the mother is in danger (Ibrahim, 1977). By contrast, Chinese and Indian religions view sterilization as a generally acceptable form of contraception. The relatively high rate of sterilization among Malaysian Indians, most of whom are Hindus, is consistent with data from India showing sterilization rates to be highest for Hindus (Khan, 1985).

We include in Table 2 a dichotomous variable that indicates, for each primary sampling unit (PSU), whether a family planning clinic was nearby (within one mile of the PSU boundary) at the time of the interval. For contraceptive use in general, the establishment of a family planning clinic nearby significantly increases the probability that contraception is practiced. As we might expect, family planning clinics seem to be most effective in promoting the use of modern contraceptive methods (i.e., pill/IUD).

Calendar year is entered as a linear spline in Table 2 to allow its effect to be nonlinear. Using this method, we find that contraceptive use rates increased significantly prior to 1965 and in the 1980s. On the other hand, contraceptive use decreased significantly in the late 1970s. The time trends for specific methods are quite similar to those for contraceptive use in general. For example, the use of pill/IUD and traditional methods increased significantly prior to 1965. Sterilization increased in the 1970 to 1974 and 1980 to 1989 sub-periods, but decreased from 1975 to 1979.

To capture the effect of migration duration on the use of contraception, we included a set of dummy variables indicating when the inter-pregnancy interval started relative to migration. The four categories may be thought of as: (1) recent migrants-up to one year after migration, (2) short-term migrants-one to five years after migration, (3) long-run migration-five to ten years after migration, and (4) very long-run migrants-more than 10 years. The omitted reference group is those intervals starting before the time of migration.

When the other variables in Table 2 are held constant, contraceptive use rates increased significantly one year after the move to an urban area. The largest effect occurs five to ten years after migration. The estimated coefficient for recent (less than one year) migrants is negative; however, it is not statistically different from zero. These results are consistent with the notion that the fertility behavior of migrants gradually adapts to the economic and socio-cultural environment of the destination.

When other variables are not controlled, migration duration is stronger, especially for very long-run migrants, as shown in Table 4. This implies that much of the increase in contraceptive use after migration is accounted for by the variables included in the model. Nonetheless, the data indicate significant increases in contraceptive use after migration even when other correlates of contraception are controlled. This may be due to different norms and attitudes toward contraception or children in urban areas.

Table 4: Logit Coefficients (and t-statistics) For Migration Duration, With and Without Controls for Other Variables

Time Spent In Urban Area	Other Variables Controlled (a)	Other Variables Not Controlled
0 to 1 year	-0.1606	0.4036
	(-0.36)	(0.99)
1 to 5 years	0.9288***	1.1582***
	(3.0)	(4.33)
5 to 10 years	1.3018***	1.3090***
	(3.70)	(4.79)
10 years +	0.6842	1.0252***
	(1.54)	(3.58)

Notes: (a) From Table 2; *** significant at 1% level.

Regarding to the use of specific contraceptive methods, pill/IUD and traditional methods exhibited the greatest increase five to ten years after migration. Only the use of sterilization did not significantly change in post-migration inter-pregnancy intervals. As with contraceptive practice in general, there is no significant change in the use of specific methods for recent migrants.

Summary and Conclusion

Although the relationships between migration and other demographic factors are well established in the literature, interest in the migration and fertility relationship has recently been revived among demographers and economists. This interest stems from concern over the fertility differential that is often observed between migrants and non-migrants and the impact (if any) this has on the population growth rate.

A number of studies have suggested that migrants have fertility levels lower than those of non-migrants. What is not clear, however, is whether differentials between migrants and non-migrants reflect selection at place of origin, adaptation at place of destination, or disruption of fertility associated with the process of movement. To what degree one or a combination of these factors accounts for the observed differences remains to be fully documented.

The present analysis uses data from the Second Malaysian Family Life Survey to determine whether there is adaptation resulting from rural-urban migration. We examine the effect of duration in the urban area on the practice and choice of contraception. Fertility selectivity has been controlled by focusing on the contraceptive behavior of the rural-urban migrants in our sample.

The major conclusion of this study is that adaptation by rural-urban migrants is a significant phenomenon. We found that couples are more likely to practice contraception after migrating to the city. In particular, the data show a significant increase in contraceptive use one to ten years after the move. This relation held even when various socioeconomic variables and a time trend were taken into account.

A key question related to how much migration affects fertility levels is whether migrants would have had lower fertility if they did not move. If so, then migration itself could not be credited with reducing fertility. However, if such selectivity is part of a larger process in which both the decision to move and the decision to reduce fertility are interrelated, then movement may well be closely intertwined with other factors leading to a reduction in fertility. To the extent that such a reduction is reinforced or even enhanced by adaptation to the lower fertility norms at urban destinations, migration's effect on fertility levels becomes stronger.

This study suggests that adaptation operates so as to result in somewhat lower fertility among migrants. Geographic mobility in Malaysia is therefore likely to have some effect on overall fertility levels, but the extent of the effect will depend on the relative number of migrating women, their ethnic background, the point in their reproductive cycle at which they move, and the character of their places of origin and destination.

Because migration is selective of couples in their peak reproductive years, migrants can both raise the number of births in cities and contribute to the natural increase in urban growth. Concurrently, rural-urban migration lowers the absolute number of births in rural places; yet, if the process is selective of low fertility women, heavy rural out-migration may lead to rising rates of rural fertility, reflecting the higher fertility of the non-mobile women. A consequence of such movement may well be the exacerbation of rural-urban fertility differentials as a result of low fertility women in urban places. Nonetheless, to the extent that selection, adaptation, and disruption are operating to lower the fertility of migrants, rural-urban migration may well be a factor in lowering overall national fertility rates.

If migration had no costs at either place of origin or destination, but did result in lowering the fertility of migrants, a strong argument could be developed that movement should be encouraged as a mechanism for achieving lower national fertility levels. Such costs do exist, however, despite the benefits to both the places and the individuals involved. As a result, no simple policy recommendation seems appropriate. Recommendations must be made in the context of the more general costs and benefits of migration, for places of origin and destination, and for the society as a whole.

If adaptation can indeed be shown to lower fertility, then special efforts might well be made to expedite and increase the reductions that are associated with the process of residential change, whether these be through educational programs directed at movers or through providing them with easier access to family planning facilities. Also, there should be recognition that the extensive circular and return migration that occurs in many countries between rural and urban areas provides additional means by which to spread more favorable attitudes toward lower fertility and fuller knowledge of the means to achieve it. Movers who have adopted lower fertility norms and behavior or who have been exposed to such values and behavior through residence in low fertility environments may serve as models for modernization as they shift back and forth between low and high fertility areas. In this way, the contribution of migration to fertility reduction may extend beyond the effects achieved through disruption and adaptation to include diffusion as well.

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